

METTLER TOLEDO

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1 Introduction

Thank you for choosing a METTLER TOLEDO balance. The balance combines high performance with ease of use.

This document is based on the software version V 3.52.

EULA

The software in this product is licensed under the METTLER TOLEDO End User License Agreement (EULA) for Software.

▶ www.mt.com/EULA

When using this product you agree to the terms of the EULA.

1.1 Further documents and information

▶ www.mt.com/met-analytical

▶ www.mt.com/met-precision

This document is available in other languages online.

▶ www.mt.com/ME-T-RM

Instructions for cleaning a balance: "8 Steps to a Clean Balance"

▶ www.mt.com/lab-cleaning-guide

Search for software downloads

▶ www.mt.com/labweighing-software-download

Search for documents

▶ www.mt.com/library

For further questions, please contact your authorized METTLER TOLEDO dealer or service representative.

▶ www.mt.com/contact

1.2 Explanation of conventions and symbols used

Conventions and symbols

Key and/or button designations and display texts are shown in graphic or bold text, e.g.,  **Language**.

Note

For useful information about the product.



Refers to an external document.

Elements of instructions

In this manual, step-by-step instructions are presented as follows. The action steps are numbered and can contain prerequisites, intermediate results and results, as shown in the example. Sequences with less than two steps are not numbered.

- Prerequisites that must be fulfilled before the individual steps can be executed.

1 Step 1

➔ Intermediate result

2 Step 2

➔ Result

1.3 Acronyms and abbreviations

Original term	Explanation
ASTM	American Society for Testing and Materials
EMC	Electromagnetic Compatibility
FACT	Fully automatic time- and temperature-controlled internal adjustment
FCC	Federal Communications Commission
GWP	Good Weighing Practice
ID	Identification
LPS	Limited Power Source
MT-SICS	METTLER TOLEDO Standard Interface Command Set
OIML	Organisation Internationale de Métrologie Légale (International Organization of Legal Metrology)
RM	Reference Manual
SNR	Serial Number
SOP	Standard Operating Procedure
UM	User Manual
USB	Universal Serial Bus
USP	United States Pharmacopeia

1.4 Compliance information

National approval documents, e.g., the FCC Supplier Declaration of Conformity, are available online and/or included in the packaging.

► <http://www.mt.com/ComplianceSearch>

Contact METTLER TOLEDO for questions about the country-specific compliance of your instrument.

► www.mt.com/contact

United States of America

This equipment has been tested and found to comply with the limits for a **Class A** digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2 Safety Information

Two documents named "User Manual" and "Reference Manual" are available for this instrument.

- The User Manual is printed and delivered with the instrument.
- The electronic Reference Manual contains a full description of the instrument and its use.
- Keep both documents for future reference.
- Include both documents if you transfer the instrument to other parties.

Only use the instrument according to the User Manual and the Reference Manual. If you do not use the instrument according to these documents or if the instrument is modified, the safety of the instrument may be impaired and Mettler-Toledo GmbH assumes no liability.

2.1 Definitions of signal words and warning symbols

Safety notes contain important information on safety issues. Ignoring the safety notes may lead to personal injury, damage to the instrument, malfunctions and false results. Safety notes are marked with the following signal words and warning symbols:

Signal words

DANGER	A hazardous situation with high risk, resulting in death or severe injury if not avoided.
WARNING	A hazardous situation with medium risk, possibly resulting in death or severe injury if not avoided.
CAUTION	A hazardous situation with low risk, resulting in minor or moderate injury if not avoided.
NOTICE	A hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

Warning symbols



General hazard: read the User Manual or the Reference Manual for information about the hazards and the resulting measures.



Notice

2.2 Product specific safety notes

Intended use

This instrument is designed to be used by trained staff. The instrument is intended for weighing purposes.

Any other type of use and operation beyond the limits of use stated by Mettler-Toledo GmbH without consent from Mettler-Toledo GmbH is considered as not intended.

Responsibilities of the instrument owner

The instrument owner is the person holding the legal title to the instrument and who uses the instrument or authorizes any person to use it, or the person who is deemed by law to be the operator of the instrument. The instrument owner is responsible for the safety of all users of the instrument and third parties.

Mettler-Toledo GmbH assumes that the instrument owner trains users to safely use the instrument in their workplace and deal with potential hazards. Mettler-Toledo GmbH assumes that the instrument owner provides the necessary protective gear.

Safety notes



WARNING

Death or serious injury due to electric shock

Contact with parts that carry a live current can lead to death or injury.

- 1 Only use the METTLER TOLEDO power cable and AC/DC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids and moisture.
- 4 Check the cables and the power plug for damage and replace them if damaged.



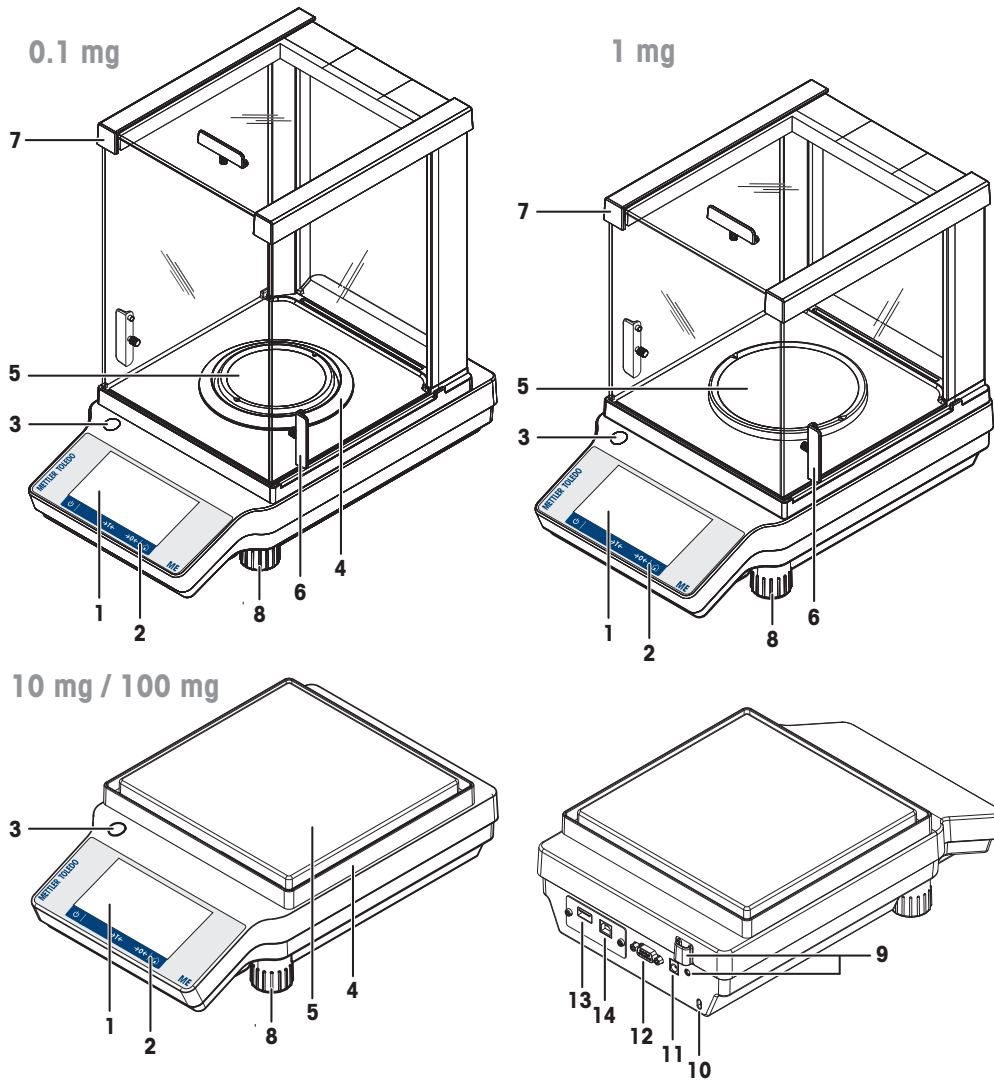
NOTICE

Damage to the instrument or malfunction due to the use of unsuitable parts

- Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

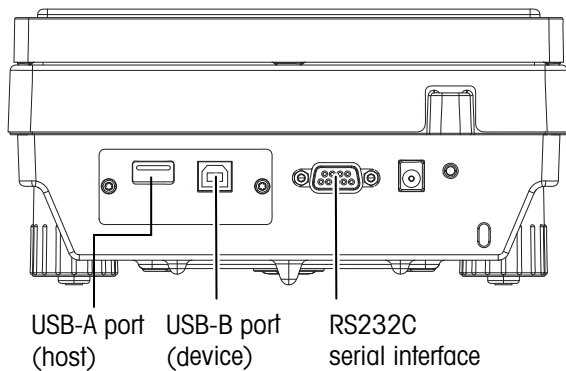
3 Design and Function

3.1 Overview balance



1	Touch screen (Capacitive color TFT)	8	Leveling feet
2	Operating keys	9	Legal for trade sealing
3	Level indicator	10	Kensington slot for anti-theft purposes
4	Draft shield element	11	Socket for AC/DC adapter
5	Weighing pan	12	RS232 serial interface
6	Handle for operation of the draft shield door	13	USB-A port (host)
7	Draft shield	14	USB-B port (device)

3.2 Overview peripheral devices



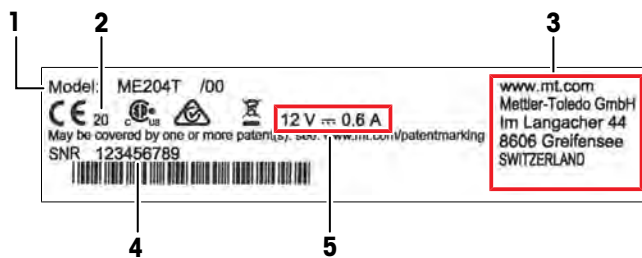
Interfaces and possible connectivity of peripheral devices:

USB-A port (host)	USB-B port (device)	RS232C
USB memory stick	PC	RS-P25
USB-P25 printer		Barcode reader
Barcode reader		RS 2 nd display
		PC

For more information about peripheral devices, see [Accessories ▶ Page 109].

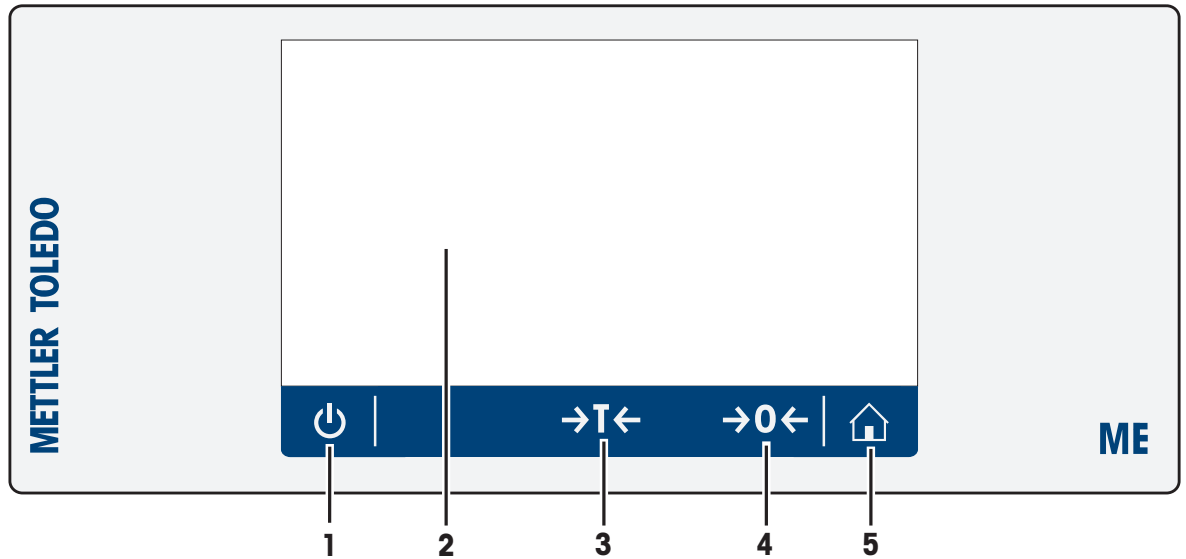
3.3 Overview type plate

The balance type plate is located at the side of the balance and contains the following information (example illustration):



1	Model designation	4	Serial number (SNR)
2	Year of manufacture	5	Power supply
3	Manufacturer		

3.4 Overview operation keys



	Key	Name	Description
1		ON/OFF	Switches the balance on or off.
2		Capacitive color TFT touch screen	General navigation
3		Tare	Tares the balance.
4		Zero	Zeros the balance.
5		Home	Returns from any menu level, or other window to the application home screen.

3.5 User Interface

The screen displays information and allows the user to enter commands by tapping certain areas on its surface. You can choose the information displayed on the screen, change the balance settings and perform certain operations on the balance.



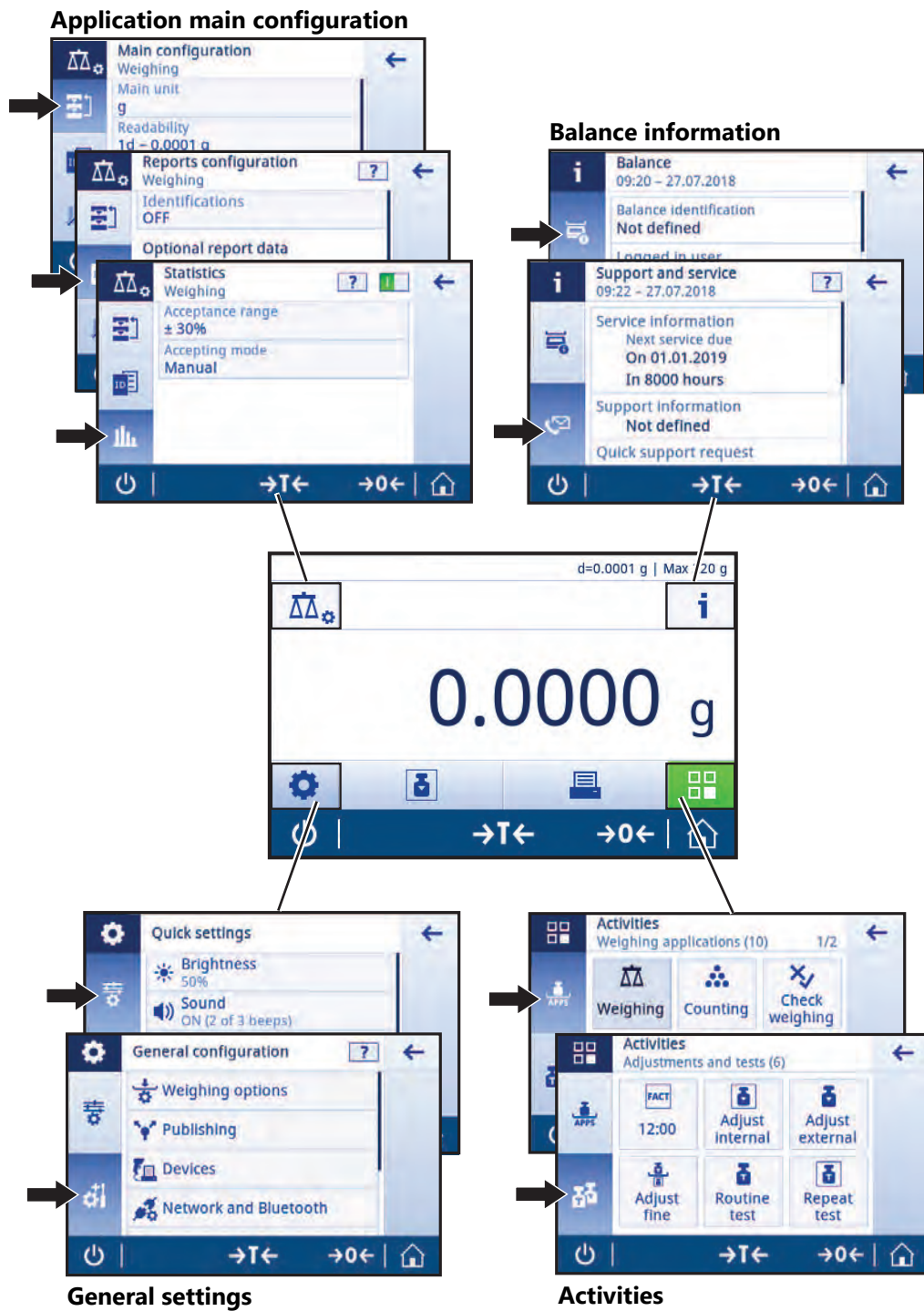
NOTICE

Damage to the touch screen due to pointed or sharp objects

- Operate the touch screen with your fingers.

3.5.1 Main settings and activities at a glance

Depending on the application, the options available to be selected and their content may differ.




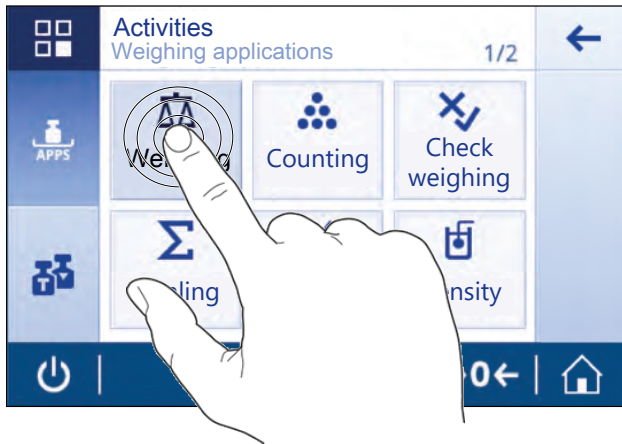
3.5.2 Touch screen navigation

To interact with the balance, use the screen and the operating keys at the bottom of the screen.

Opening an application

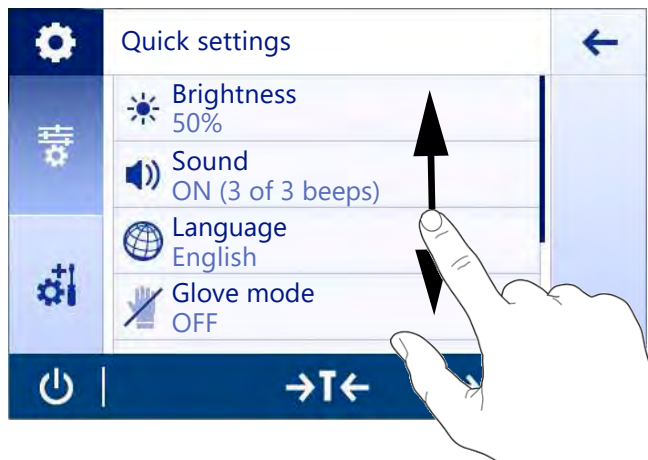
Due to its size, the display does not show all available applications at once. Scroll the applications by swiping the touchscreen horizontally.

To open settings or applications, tap the application symbol, e.g.,  **Weighing**.



Scrolling

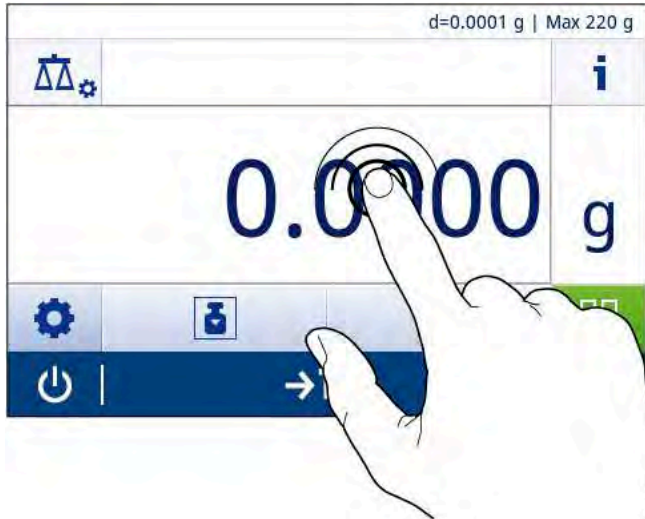
If not all content cannot be displayed on one page, it is indicated either by the page number (e.g. 1 / 2) or a blue scroll bar at right side of the screen. To scroll, swipe your finger across the screen, either horizontally (if page number is shown) or vertically (if blue scroll bar is shown).




Using shortcuts

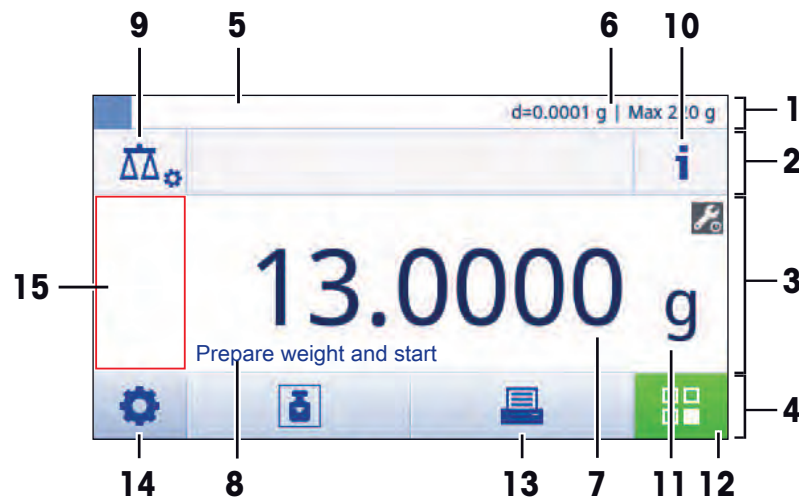
To simplify navigation on the touch screen, there are a few shortcuts that provide quick access to key areas of the balance. For example, the weighing value field on the application home screen works as a shortcut (see screen below), as does the weighing unit next to the weighing value field. Other shortcuts may be available to use depending on the application.

Every setting that can be changed directly via shortcut, can also be changed in the main configuration settings for that application.



3.5.3 Application home screen

The application home screen appears after switching the balance on. It always displays the last application that was in use before the balance was switched off. The application home screen is the main screen of the balance. Every function can be accessed from here. You can return to the application home screen at any time by pressing the home button  in the lower right corner of the screen.



Information and work bars

	Name	Description
1	Weighing information bar	Displays the weighing-in aid and general balance information.
2	Work title bar	Displays information about the current activity.
3	Value bar	Displays information about the current weighing process.
4	Main navigation	Work-related functions.

Information fields

	Name	Description
5	Weighing-in aid	A dynamic graphic indicator displays how much of the total weighing range is in use.
6	Short balance information	Readability and capacity of the balance.*
7	Weighing value field	Displays the value of the current weighing process (model-specific).
8	Coach text field	Displays instructions for the current weighing process.

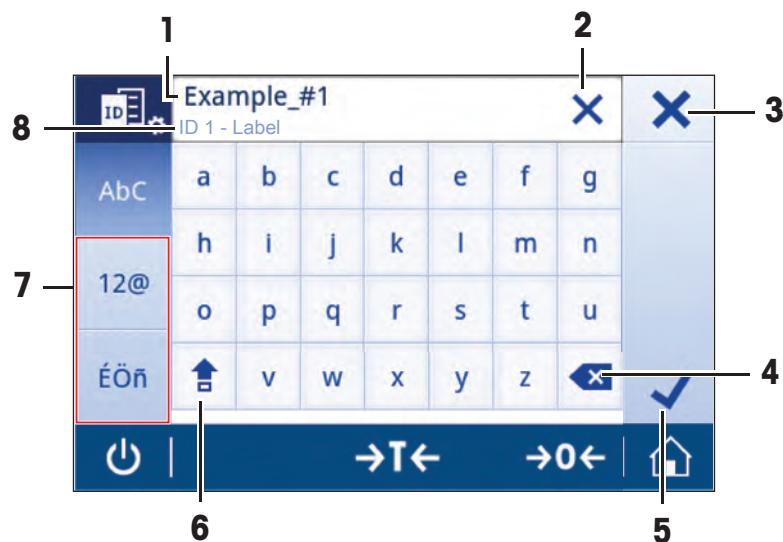
* For legal-for-trade approved balances: **Min** (minimum capacity) and **e** (verification of scale interval) are shown in the upper left corner.

Action buttons

	Name	Description
9	Activity configuration	To configure the current application, e.g., Weighing .
10	Balance information	Displays detailed technical data about the balance.
11	Weighing unit	Displays the unit of the current weighing process (model- and country-specific).
12	Activities	Opens the activities selection.
13	Print	Prints out or transfers results and/or settings (printer required).
14	Settings	Configures balance and user settings/preferences (application independent).
15	Status information field	Displays information about the system status.

3.5.4 Entering characters and numbers

The keyboard allows the user to enter characters, including letters, numbers and a range of special characters. If a barcode reader is connected to your balance and your sample provides a barcode, scan the product barcode instead of entering the designation manually (e.g. the ID can be scanned via barcode reader to ensure that the sample is clearly assigned to the corresponding product). Additionally, it is possible to connect a USB keyboard to enter the information.

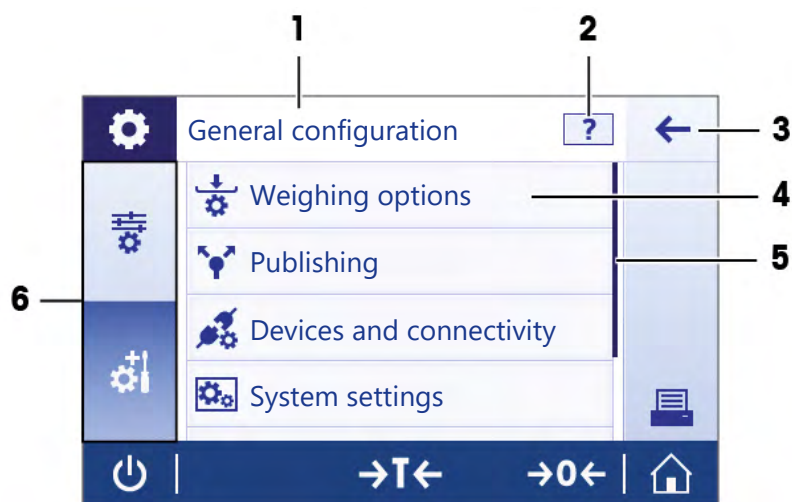


	Name	Description
1	Input field	Displays all characters that have been entered.
2	Delete all	Deletes all entered characters.
3	Discard	Discards the entered data and exits the dialog.
4	Delete	Deletes the last character.
5	Confirm	Confirms the data entered.
6	Shift	Switches between lower and upper case letters.
7	Specialized tabs	Switches keyboard mode for entering letters, numbers or special characters.
8	Explanation field	Extra information about the value to be entered.

3.5.5 Lists and tables

Navigation: ⚙️ > 🏠 General configuration

The basic elements in a simple list include a content title and a list of sub-elements. Tapping an element opens a list of sub-elements or an input dialog.



	Name	Description
1	List title	Title of the current list.
2	Contextual help	Additional information about the current process
3	Back button	Moves go one step back.
4	List element title	Title of the list element.
5	Scroll position	Scrolls through the list.
6	Selection tabs	Tabs of the selectable sub-categories.

3.5.6 Detailed balance information

- Tap **i** to open the general balance information menu.

Balance identification

The balance identification section contains identification data for both hardware and software.

- Tap **🏠** to display **Balance identification**.
- ➔ The display shows the **Balance identification** as defined by the user. See [System settings ▶ Page 38].

Balance support information

The balance support information section contains information about last and next service checks and provides support contact information.

– Tap  to display **Support and service**.

➔ The display shows the **Service information**, **Support information**, and **Quick support request**.

Quick support request

The **Quick support request** option contains a unique QR (Quick Response) code. If you have a QR code reader application on your smart phone, scan the QR code on the balance screen. The smartphone will automatically create an email with all relevant service information.



Note

Make sure that the QR code can be identified by the smart phone. A program to read the QR codes must be installed. Make sure that there are no access restrictions, which could block your email program in some way.

4 Installation and Putting into Operation

4.1 Selecting the location

A balance is a sensitive precision instrument. The location where it is placed will have a profound effect on the accuracy of the weighing results.

Requirements of the location

Place indoors on stable table

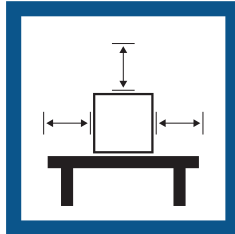
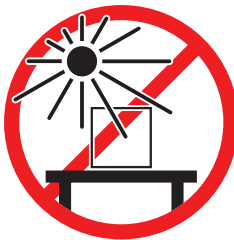
Ensure sufficient spacing

Level the instrument

Provide adequate lighting



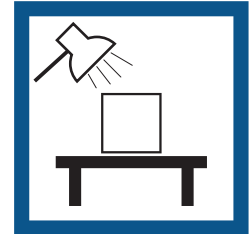
Avoid direct sunlight



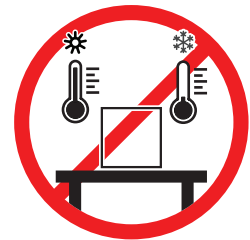
Avoid vibrations



Avoid strong drafts



Avoid temperature fluctuations



Sufficient spacing for balances: > 15 cm all around the instrument

Take into account the environmental conditions. See "Technical Data".

See also

 Technical Data ▶ Page 87

4.2 Unpacking the balance

Check the package, the packaging elements and the delivered components for damages. If any components are damaged, please contact your METTLER TOLEDO service representative.

Retain all parts of the packaging. This packaging offers the best possible protection for transporting the balance.

4.3 Scope of delivery

Components		Model		
		0.1 mg	1 mg	10 mg / 100 mg
Draft shield	high, 235 mm	✓	–	–
	low, 170 mm	–	✓	–
Weighing pan	∅ 90 mm	✓	–	–
	∅ 120 mm	–	✓	–
	180 × 180 mm	–	–	✓
Draft shield element		✓	–	✓
Pan support		✓	–	✓
Protective cover		✓	✓	✓
Universal AC/DC adapter		✓	✓	✓
User Manual		✓	✓	✓
Declaration of Conformity		✓	✓	✓

4.4 Installation



CAUTION

Injury due to sharp objects or broken glass

Instrument components, e.g., glass, can break and lead to injuries.

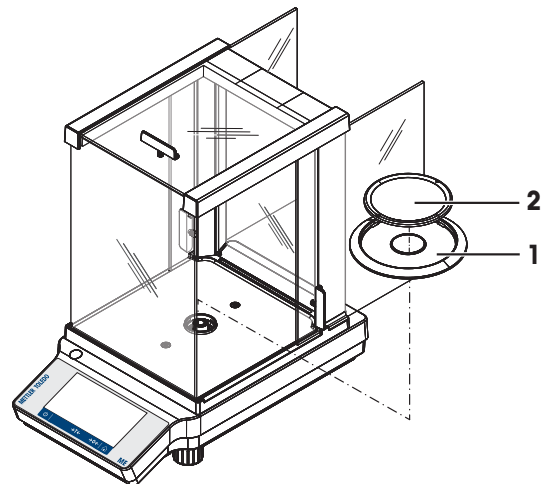
- Always proceed with focus and care.

4.4.1 Assembling the balance

Assembling balances with a readability of 0.1 mg

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

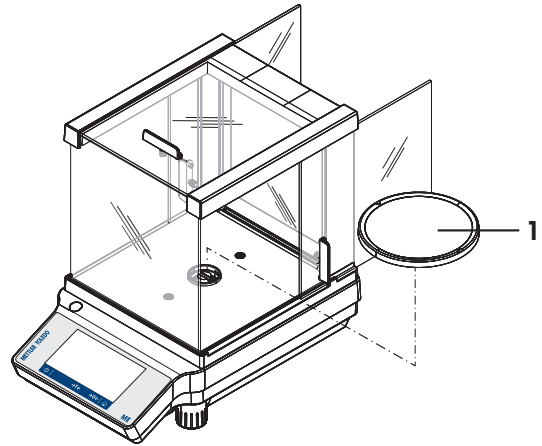
- 1 Push the side glass doors back as far as they will go.
- 2 Insert the draft shield element (1).
- 3 Insert the weighing pan (2).



Assembling balances with a readability of 1 mg

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

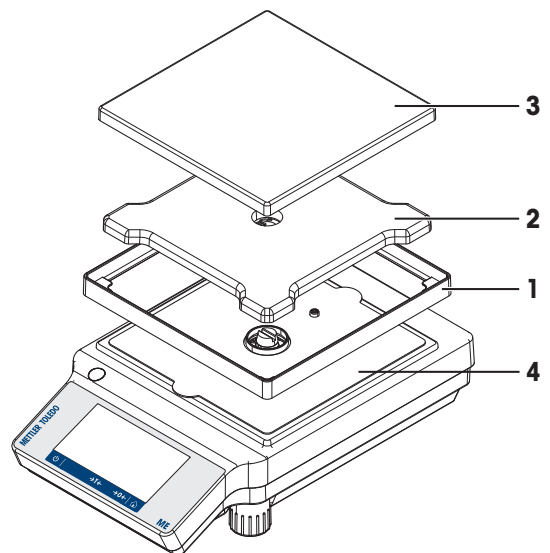
- 1 Push the side glass doors back as far as they will go.
- 2 Insert the weighing pan (1).



Assembling balances with a readability of 10 mg / 100 mg

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

- 1 Place the draft shield element (1).
- 2 Carefully pull apart the draft shield element to fix it under the retaining plate (4).
- 3 Place the pan support (2).
- 4 Place the weighing pan (3).



4.4.2 Installing the protective cover



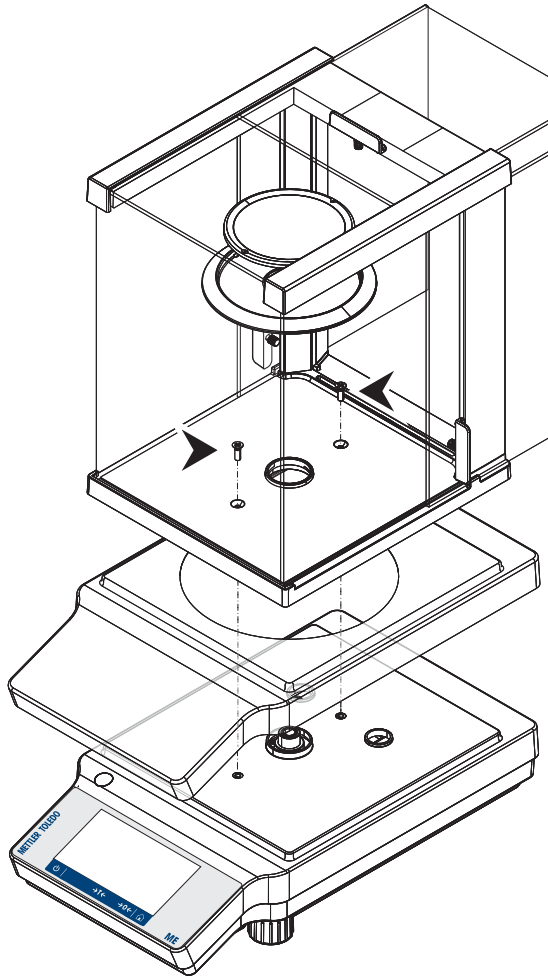
NOTICE

Damage to the instrument or malfunction due to the use of unsuitable parts

- Only use parts from METTLER TOLEDO that are intended to be used with your instrument.

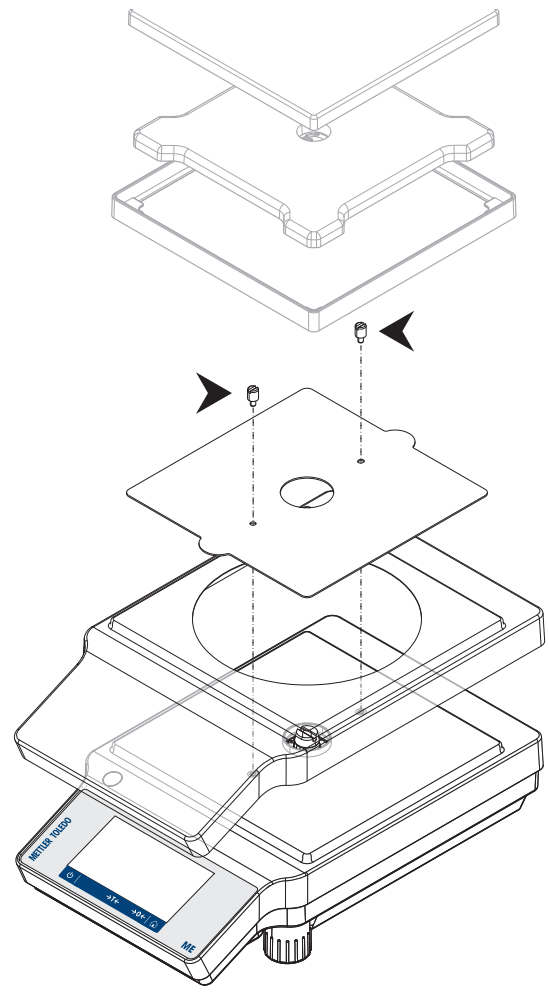
Balances with draft shield

Install the protective cover according to the illustrations below, using a screwdriver.



Balances without draft shield

Install the protective cover according to the illustrations below, using a screwdriver.



4.5 Putting into operation

4.5.1 Connecting the balance



WARNING

Death or serious injury due to electric shock

Contact with parts that carry a live current can lead to death or injury.

- 1 Only use the METTLER TOLEDO power cable and AC/DC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.
- 3 Keep all electrical cables and connections away from liquids and moisture.
- 4 Check the cables and the power plug for damage and replace them if damaged.



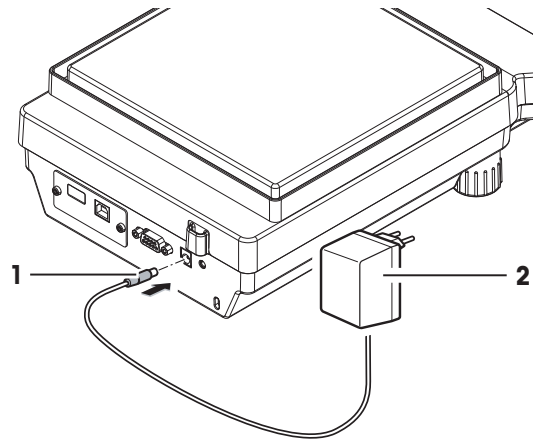
NOTICE

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 will overheat.

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

- 1 Install the cables in such a way that they cannot be damaged or interfere with operation.
 - 2 Connect the AC/DC adapter (1) to the connection socket on the back of your balance.
 - 3 Connect the power cable (2) to the power socket.
 - 4 Insert the plug of the power cable into a grounded power outlet that is easily accessible.
- ➔ The balance is ready to be used.




Note

Always connect the AC/DC adapter to the balance before connecting to the power.

Do not connect the instrument to a power outlet controlled by a switch. After switching on the instrument, it must warm up before giving accurate results.

4.5.2 Switching on the balance

Before using 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 (60 minutes for 0.1 mg models).

- The balance is connected to the power supply.
- The balance is warmed up.
- Press .
- ➔ After the start screen has disappeared, the application home screen will open.

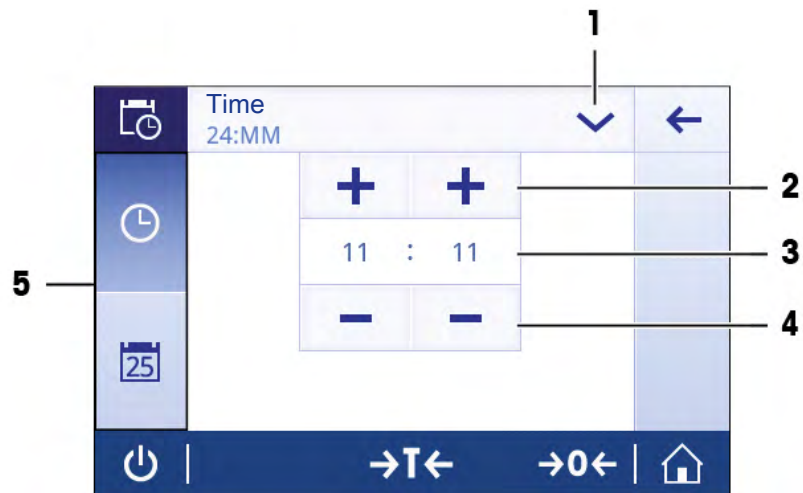
When the balance is switched on for the first time, the **Weighing** application home screen will open. If the balance is switched on again, it will always start with the screen of the application last used before switching it off.

4.5.3 Changing the date and time

Navigation: ⚙️ > ⚙️ Quick settings > 📅 Date and Time

The dialog (Picker view) allows the user to set the date and time.

Tap 🕒 for **Time** and 📅 for **Date**. The format can be selected by tapping ▾.



	Name	Description
1	Change date/time format	Various date/time formats can be selected.
2	Pick button	Increment.
3	Picker field	Displays the defined time/date.
4	Pick button	Decrement.
5	Selection tabs	Tabs of the selectable sub-categories.

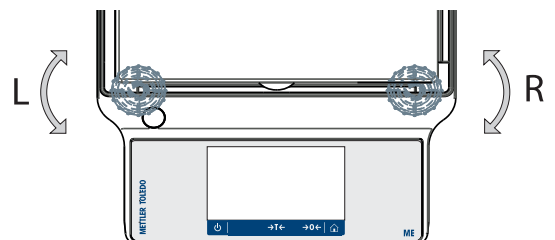
4.5.4 Leveling the balance

Exact horizontal and stable positioning are essential for repeatable and accurate weighing results.

There are two adjustable leveling feet to compensate for slight irregularities in the surface of the weighing bench.

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

- 1 Position the balance at the selected location.
- 2 Align the balance horizontally.



- 3 Turn the two front leveling feet of the housing until the air bubble is in the middle of the glass.



Example

Air bubble at 12 o'clock:



turn both feet clockwise.



Air bubble at 3 o'clock:



turn left foot clockwise, right foot counterclockwise.



Air bubble at 6 o'clock:



turn both feet counterclockwise.



Air bubble at 9 o'clock:



turn left foot counterclockwise, right foot clockwise.



4.5.5 Adjusting the balance

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location. This is also dependent on the ambient conditions. After reaching the operating temperature, it is important to adjust the balance in the following cases:

- Before the balance is used for the first time.
- If the balance has been disconnected from the power supply or in the event of power failure.
- After significant environmental changes, e.g., temperature, humidity, air draft or vibrations.
- At regular intervals during weighing service.

See also

Activities - Adjustments and tests ▶ Page 65

4.5.6 Switching off the balance

Switching off

- 1 Press and hold until the dialog **Switch-off** appears.
- 2 Tap to confirm.
 - ➔ The balance switches off and enters standby mode.
- After switching on from standby mode, the balance does not need to warm up. It is immediately ready to start weighing.
- If the balance has been switched off manually, the display will also be off.
To switch off the balance fully, it must be disconnected from the power supply.

4.6 Performing a simple weighing

Navigation: > **Activities - Weighing applications** > **Weighing**

- 1 Press **0** to zero the balance.
 - ➔ The application home screen appears.
- 2 Place the sample on the weighing pan.
 - ➔ The instability symbol appears and the value in the weighing value field becomes **light blue**.
- 3 Wait until the instability symbol disappears and the value in the weighing value field becomes **dark blue** again.
 - ➔ The weighing process is complete.
 - ➔ The results are now displayed.

4.6.1 Weighing

Zeroing

Use the →0← zeroing key before starting to weigh anything.

- 1 Unload the balance.
 - 2 Press →0← to zero the balance.
- All weight values are measured in relation to this zero point.

Taring


If you are working with a weighing container, tare the balance.


- 1 Place a container on the weighing pan.
 - The weight is displayed.
- 2 Press →T← to tare the balance.
 - **0.000 g** and **Net** appears in the display. **Net** indicates that all weight values displayed are net values.

Weighing

- Place the sample in the container.
 - The results are now displayed.
- If the container is removed from the balance, the tare weight will be shown as a negative value.
- The tare weight remains stored until the →T← key is pressed again or the balance is switched off.

Print / transmit data

The balance can send data to a printer or a PC. Press the  key to transmit the weighing results or settings via the interface. The procedure for activating and configuring a printer is described in "Publishing" and "Devices and connectivity".

- Printer is connected to the balance.
- Printer is switched on.
- Printer is activated and configured.
- Tap .
- The data are transmitted.

See also

-  Publishing ▶ Page 34
-  Devices and connectivity ▶ Page 36

4.6.2 Changing the readability

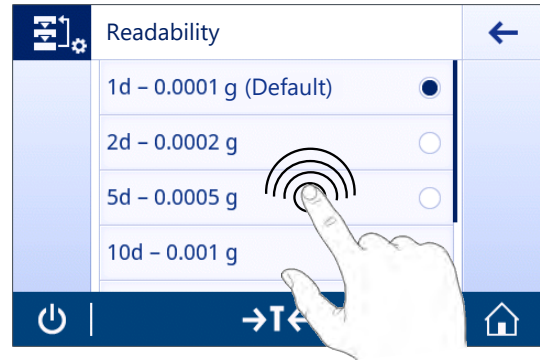
Changing the readability

There are several readabilities available. The default readability (d) is model-specific.

- 1 Tap the weighing value field.



- 2 Tap **10d - 0.001 g**.
 - 3 Confirm the selected readability by tapping ✓.
- ➔ The readability has now been changed.



4.6.3 Switching weight units

Switching weight units

There are several weighing units available. The default value is country-specific.

The weighing unit can be selected using the main configuration of the current application or via shortcut. This example describes how to change the weighing unit via shortcut.

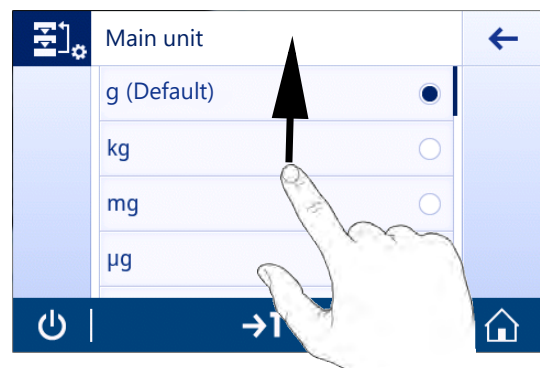
Legal-for-trade

With approved balances, the menu topic has a fixed setting and cannot be changed.

- 1 Tap the weighing process unit (shortcut) **gram (g)**.
- ➔ The screen **Main unit** appears.



- 2 Place your finger somewhere on the list and swipe up to scroll down.
 - 3 Select another weighing unit (e.g. **ounce (oz)**) by tapping it.
 - 4 Tap ✓ to confirm.
- ➔ The weighing unit **gram (g)** has now been changed to **ounce (oz)**.

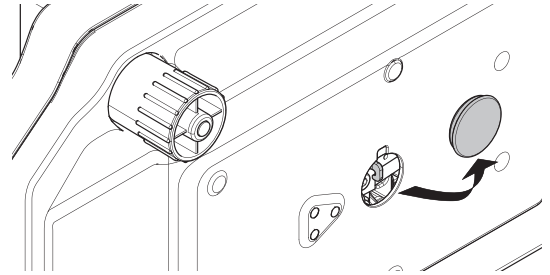


4.7 Weighing below the balance

Your balance is equipped with a weighing hook for performing weighing operations below the work surface (weighing below the balance).

- 1 Press and hold the ⏻ key.
- 2 Disconnect the balance from the AC/DC adapter.
- 3 Disconnect all interface cables.

- 1 If present, carefully remove all glass draft shields.
 - 2 Remove the weighing pan, pan support and, if present, the draft shield element.
 - 3 Carefully turn the balance onto its side.
 - 4 Remove the weighing cap of the weighing hook. Keep it for later use.
 - 5 Put the balance upright again and reinstall all components in reverse order.
- ➔ You can now perform weighings under the balance.



4.8 Transporting, packing and storing



⚠ CAUTION

Injury due to sharp objects or broken glass

Instrument components, e.g., glass, can break and lead to injuries.

- Always proceed with focus and care.

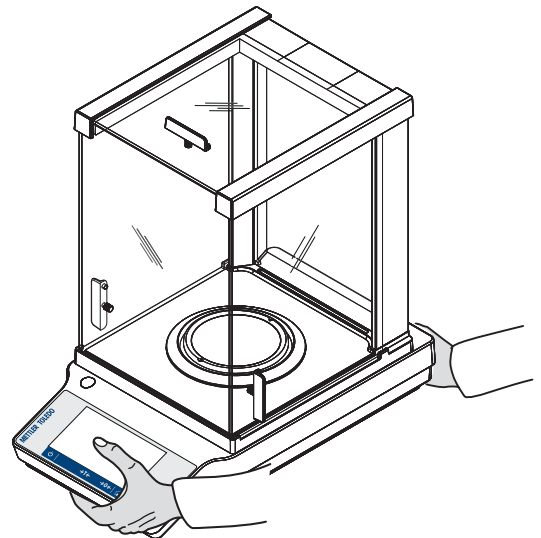
4.8.1 Transporting over short distances

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

- 1 Disconnect the balance from the AC/DC adapter.
- 2 Disconnect all interface cables.
- 3 Hold the balance with both hands as shown.
- 4 Carefully lift the balance and carry it to its new location.

If you wish to put the balance into operation, proceed as follows:

- 1 Connect in reverse order.
- 2 Level the balance.
- 3 Perform an internal or an external adjustment.



4.8.2 Transporting over long distances

To transport the balance over long distances, always use the original packaging.

4.8.3 Packing and storing

Packing

Store all parts of the packaging in a safe place. The elements of the original packaging are developed specifically for the balance and its components to ensure maximum protection during transportation or storing.

Storing

Store the balance under following conditions:

- Indoor and in the original packaging.
- According to the environmental condition, see "Technical data".
- When storing for longer than six months, the rechargeable battery may be down (date and time get lost).

See also

 [Technical Data ▶ Page 87](#)

5 General Settings

Navigation:

This section describes the procedure for adapting the balance to suit specific requirements. The settings apply to the entire weighing system and therefore to all applications.

The section **Settings** is divided into two sub-sections:

-  **Quick settings**
-  **General configuration**

Printing settings

All settings and configuration data can be printed out.

- Printer is connected and configured.

1 Tap .

➔ The screen **Print and export report** appears.

2 Select the settings, e.g., **Quick settings/Preferences** and **Weighing options** for printing and confirm with .

➔ A list of the selected settings will be printed.








Parameter	Description	Values
Print	Select the settings for printing.	Quick settings* General configuration* Publishing* Devices and connectivity* System settings* Access protection* ISO-Log

* Factory setting

5.1 Quick settings




Navigation: > **Quick settings**

The following options are available:

-  **Date and Time**, see [Date and time ▶ Page 29]
-  **Brightness**, see [Brightness ▶ Page 30]
-  **Sound**, see [Sound ▶ Page 30]
-  **Language**, see [Language ▶ Page 30]
-  **Glove mode**, see [Glove mode ▶ Page 31]
-  **Quick adjustment**, see [Quick adjustment ▶ Page 31]
-  **Date/Time widget**, see [Date/Time widget ▶ Page 31]

5.1.1 Date and time

Navigation: > **Quick settings** > **Date and Time**

This menu item can be used to set the date and time. Tap  for **Time** and  for **Date**. The format can be selected by tapping .

Parameter	Description	Values
Time format	Sets the time format.	24:MM* 12:MM 24.MM 12.MM
Time	Sets the time. The time can be set with the pick buttons.	Hours Minutes

Date format	Sets the date format.	DD.MM.YYYY* D.MMM YYYY MM/DD/YYYY MMM DD YYYY YYYY- MM-DD
Date	Sets the date. The date can be set with the pick buttons.	Day Month Year

* Factory setting

5.1.2 Brightness

Navigation:  >  **Quick settings** >  **Brightness**

This menu item can be used to adjust the display brightness. Each time you tap the bar, the brightness adjusts in increments of 10%.

The following options can be set:

Parameter	Description	Values
Brightness	Sets the brightness of the display (in 10% increments).	10...100% (50%*)

* Factory setting

5.1.3 Sound

Navigation:  >  **Quick settings** >  **Sound**

This menu item can be used to adjust the sound and the sound volume.

The following options can be set:

Parameter	Description	Values
Stability beep	Indicates when an unstable weight becomes stable.	OFF Low* Medium High
Workflow feedback beep	Provides additional feedback in the event of input errors, messages and status notifications.	OFF Low* Medium High
Touch beep	Notifies every touch of the interactive elements on the touch display and zero/tare bar.	OFF* Low Medium High

* Factory setting

5.1.4 Language

Navigation:  >  **Quick settings** >  **Language**

This menu item can be used to set the dialog language. The language changes immediately. All windows and messages are displayed in the selected language.

The following options can be set:

Parameter	Description	Values
Language	Sets the preferred language. The language is normally preset for the country of use.	English Deutsch Français Español Italiano Русский Polski Český Magyar Nederlands Português PT. Português BRA. Türkçe 中文 日本語 한국어

5.1.5 Glove mode

Navigation:  >  **Quick settings** >  **Glove mode**

If **Glove mode** is activated, the touch screen becomes more sensitive and easier to navigate when wearing gloves.


The following options can be set:

Parameter	Description	Values
Glove mode	Activates or deactivates the function Glove mode .	ON OFF*

* Factory setting

5.1.6 Quick adjustment

Navigation:  >  **Quick settings** >  **Quick adjustment**

If **Quick adjustment** is activated, the symbol  appears in the main navigation of the application. You can start the adjustment directly from the work area.

The following options can be set:

Parameter	Description	Values
Quick adjustment	Activates or deactivates Quick adjustment .	ON* OFF
	Starts the adjustment directly from work area.	Internal adjustment (model-specific) External adjustment

5.1.7 Date/Time widget

Navigation:  >  **Quick settings** >  **Date/Time widget**

This option can be activated to permanently display the current date and time in the work area in the value bar above the weighing value field.

The following options can be set:







Parameter	Description	Values
Date/Time widget	Activates or deactivates the permanent display of the current date and time in the work area.	ON OFF*

* Factory setting

5.2 General configuration

Navigation:  >  General configuration

The following options are available:

-  **Weighing options**, see [Weighing options ▶ Page 32]
-  **Publishing**, see [Publishing ▶ Page 34]
-  **Devices and connectivity**, see [Devices and connectivity ▶ Page 36]
-  **System settings**, see [System settings ▶ Page 38]
-  **Access protection**, see [Access protection ▶ Page 39]
-  **ISO-Log**, see [ISO-Log ▶ Page 39]

5.2.1 Weighing options

Navigation:  >  General configuration >  Weighing options

This menu item can be used to adapt the balance to suit specific requirements.

5.2.1.1 Weighing mode

Navigation:  >  General configuration >  Weighing options > Weighing mode

This setting can be used to configure the balance to the weighing mode.

The following options can be set:

Parameter	Description	Values
Weighing mode	Sets the weighing mode. Universal = for all standard weighing applications. Dosing = for dosing liquid or powdery samples.	Universal* Dosing

* Factory setting

5.2.1.2 Environment

Navigation:  >  General configuration >  Weighing options > Environment

This setting is used to adapt the balance optimally to the ambient conditions at specific locations.

The following options can be set:

Parameter	Description	Values
Environment	Sets the ambient conditions.	Stable Standard* Unstable Very unstable

* Factory setting

5.2.1.3 Autozero

Navigation:  >  General configuration >  Weighing options > Autozero

This menu item can be used to switch the automatic zero correction **ON** or **OFF**. It corrects the zero deviation, that may occur, e.g., due to slight fouling of the weighing pan.

Legal-for-trade

The **Autozero** cannot be deactivated for approved balances (except for some selected countries).

The following options can be set:

Parameter	Description	Values
Autozero	Activates or deactivates the automatic zero correction.	ON* OFF

* Factory setting

5.2.1.4 Auto tare

Navigation:  >  **General configuration** >  **Weighing options** > **Auto tare**

Tare automatically the first weight loaded on the empty weighing pan (zeroed). This function applies to all applications except **Formulation** and **Back-weighing**.

The following options can be set:

Parameter	Description	Values
Auto tare	Activates or deactivates the auto tare function.	ON OFF*

* Factory setting

5.2.1.5 Auto clear tare

Navigation:  >  **General configuration** >  **Weighing options** > **Auto clear tare**

If the function **Auto clear tare** is activated, the current tare is automatically cleared after removing all loaded weight from the weighing pan. This function applies to all applications except **Formulation** and **Back-weighing**.

The following options can be set:

Parameter	Description	Values
Auto clear tare	Activates or deactivates the auto clear tare function.	ON OFF*

* Factory setting

5.2.1.6 Recall

Navigation:  >  **General configuration** >  **Weighing options** > **Recall**

To retain and recall the last stable weight.

The following options can be set:

Parameter	Description	Values
Recall	Activates or deactivates recall.	ON OFF*

* Factory setting

5.2.2 Publishing

Navigation: ⚙️ > 🏠 General configuration > 🖨️ Publishing

In this section, the print and output options can be set.

The available options may vary depending on the peripheral device connected and configured in "Devices and connectivity". Not every option described is available for the selected peripheral device.

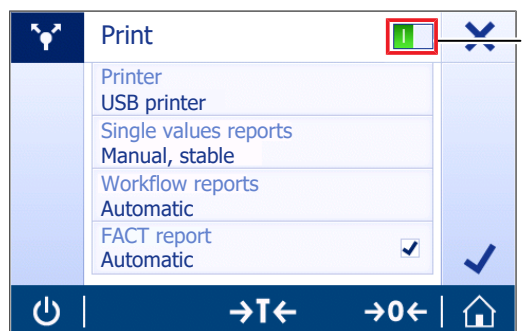
See also

- 📖 Devices and connectivity ▶ Page 36
- 📖 Communication with Peripheral Devices ▶ Page 69

5.2.2.1 Publishing

5.2.2.1.1 Print

- 1 Tap **Print**.
 - ➔ The screen **Print** appears.
- 2 If the selection is grayed out, enable changes to the factory settings by tapping the activation button (1) in the upper right corner.
 - ➔ The button turns green and the settings are now changeable.
- 3 Tap the parameter you want to change, e.g., **Printer**.
- 4 Select the desired value, e.g., **USB printer**.
- 5 Tap ✓ to confirm.
- 6 Tap ⬅️ to return to the previous screen.



The following options can be set:

Parameter	Description	Values
ON* OFF	Activates or deactivates the option.	
Printer	Defines to which printer the data will be sent. The printer is configured as set out in "Devices and connectivity". Print to file = save data to a USB stick.	Serial printer USB printer Print to file
Single values reports	Sets the behaviour of the printer for single values.	Manual, stable* Manual, all values Automatic, stable Automatic, stable (zero included)
Workflow reports	Sets the workflow for the reports. Automatic = the report is printed at the end of the workflow automatically. Manual = the report is printed at will.	Automatic* Manual
FACT report	Defines whether the FACT report is being printed automatically.	Automatic* OFF

* Factory setting

See also

- 📖 Devices and connectivity ▶ Page 36

5.2.2.1.2 Send value

The values can either be transmitted via RS232 (Serial) or USB (USB-B) interface.

For more information about the different interfaces, see "Devices and connectivity".

The following options can be set:

Parameter	Description
ON* OFF	Activates or deactivates the option.
Manual, stable*	Send next stable weight at will
Manual, all values	Send any stable or unstable weight at will
Automatic, stable	Send next stable weight automatically The next stable weight is sent after a minimal deviation, see table relationship between readability and deviation below.
Automatic, continuous	Send any stable or unstable weight automatically

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

See also

 Devices and connectivity ▶ Page 36

5.2.2.2 Advanced options

Navigation:  >  General configuration >  Publishing > Advanced options

The following options can be set:

Parameter	Description	Values
Adjustments/Tests – Reports configuration	Defines the Header and Footer for the adjustment and test reports.	Header Footer
Autopublish	Activates or deactivates the publishing time interval.	ON OFF*
	Sets the publishing time interval of single values. Please be aware that exporting a file to a USB memory stick or a FTP server takes some time and we therefore do not recommend to set this value in these cases below 10 seconds.	numerical values (1... 65535 seconds)
Commands options	Activates or deactivates the function Print and tare . The balance will tare automatically after publishing.	ON OFF*

* Factory setting


5.2.3 Devices and connectivity

Navigation:  >  **General configuration** >  **Devices and connectivity**

Add and configure the connections to peripheral devices.

Only one device set up per interface is possible. On creating a new device connection, the existing will be replaced. The last saved configuration of the replaced device will be used as default when the same device type is added again at a later time.

The following devices can be added and configured via the different interfaces.

Parameter	Description	Values
P-20	Connect to a Standard lab printer.	RS232
P-50	Connect to a Standard lab printer.	RS232
Printer	Connect to a custom printer.	RS232
Barcode reader	Connect to a barcode reader.	RS232
Host	Establish the Command host service to communicate with the balance via MT-SICS.	RS232 USB Device*
Second display	Connect a auxiliary weight display.  Note: If you select Second display make sure that no other device is connected at RS232. Other devices could be damaged because of the voltage.	RS232
PC-Direct	Establishes a service to send the weight value to a PC. E.g., to Microsoft Excel by placing the cursor in the required cell. PC-Direct sends the weight value like a numeric keypad. Please make sure the NumLock is on. Via the USB device interface there is no additional software on the PC needed except a METTLER TOLEDO USB driver.	RS232 USB Device

* Factory setting

Configuring devices and connections

- 1 Tap the connection you want to set a new device for, e.g., **RS232**.
➔ The parameter selection for the corresponding connection appears.
- 2 Select the parameter you want to configure, e.g., **Baudrate**.
➔ The screen for the corresponding parameter, e.g., **Baudrate** appears.
- 3 Select the desired parameter values.
- 4 Tap ✓ to return to the **RS232** screen.
- 5 If necessary, change the other settings.
- 6 Tap ✓ to return to the **Devices and connectivity** screen.

5.2.3.1 RS232 (Serial)

The following options can be set:

Parameter	Description
Device type	P-20* P-50 Printer Host PC-Direct Second display Barcode reader
Baudrate	600 1200 2400 4800 9600* 19200 38400 57600 115200 (available values are device-specific)
Bit/Parity	8/No* 7/No 7/Mark 7/Space 7/Even 7/Odd
Character set	IBM/DOS ANSI/WIN UTF-8* UTF-8 = is a character encoding capable of encoding all possible characters, or code points, defined by unicode (device-specific).
Command set	MT-SICS* MT-PM Sartorius 22 Sartorius 16 MT-SICS = MT-SICS data transfer format is used. MT-PM = emulates the data format of PM balances. Sartorius 22/Sartorius 16 = emulates the data format of Sartorius balances.
End of line	<CR><LF>* <CR> <LF> <TAB> <CR><LF> = writes in the same column, e.g., in Excel. <TAB> = writes in the same row, e.g., in Excel.
Handshake	Xon/Xoff* RTS/CTS None
Stop bits	1 bit* 2 bits

* Factory setting

5.2.3.2 USB Device (USB B)

The following options can be set:

Parameter	Description
Device type	Host* PC-Direct
Character set	ANSI/WIN UTF-8 Cannot be changed (device-specific).
Command set	MT-SICS* MT-PM Sartorius 22 Sartorius 16 MT-SICS = MT-SICS data transfer format is used. MT-PM = emulates the data format of PM balances. Sartorius 22/Sartorius 16 = emulates the data format of Sartorius balances.
End of line	<CR><LF>* <CR> <LF> <TAB> <CR><LF> = writes in the same column, e.g., in Excel. <TAB> = writes in the same row, e.g., in Excel.

* Factory setting

5.2.3.3 USB Host (USB A)

The following options can be set:

Parameter	Description
Device type	not selectable
Character set	IBM/DOS ANSI/WIN UTF-8* UTF-8 = is a character encoding capable of encoding all possible characters, or code points, defined by unicode (device-specific).
End of line	<CR><LF>* <CR> <LF>

* Factory setting

5.2.4 System settings

Navigation:  >  **General configuration** >  **System settings**

This section describes the procedure for adapting the balance to suit specific requirements.

The following options can be set:

Parameter	Description	Values
Balance identification	Defines a balance identification. By default the balance identification consists of the balance model and the serial number.	Values can be defined individually.
Sleep mode	Activates or deactivates the screen saver.	ON* OFF
	Determines when the screen saver appears with date and time. Tap on the screen to exit the screen saver.	After 30 seconds After 1 minute After 2 minutes After 5 minutes After 10 minutes*
Backlight OFF	Activates or deactivates the display turns off.	ON OFF*
	Determines when the display turns off. Tap the screen to end Backlight OFF mode.	After 30 seconds After 1 minute After 2 minutes After 5 minutes After 10 minutes
Quick wake up	Terminates Sleep mode and/or Backlight OFF . By placing the sample on the weighing pan, the Sleep mode and/or Backlight OFF will be terminated.	ON* OFF
Service due notification	Activates or deactivates the function Service due notification .	ON* OFF

* Factory setting

If **Sleep mode** and **Backlight OFF** have the same value, the screen saver briefly appears before the backlight switches off.

System management

The following options can be set:

Parameter	Description
Touch screen adjustment	The balance performs a screen adjustment.
Reset balance...	Resets the balance to factory settings.
Backup and restore balance settings...	Generates a backup of the current balance settings (excluding MinWeigh, service due notification and ISO-Log). To execute a backup, an external storage device (USB memory stick, FAT32) must be connected to the USB host (type A). Additionally, if an external storage device (USB memory stick, FAT32) is attached with a back-up file, it can be restored. We do not recommend to back-up/restore balance settings between approved and non-approved balance models.



Note

By resetting the balance, any changes to the general settings and contextual settings that have been made along with any temporary collected data, e.g., paused applications or statistics will be lost.

5.2.5 Access protection

Navigation:  >  **General configuration and data** >  **Access protection**

The function **Access protection** enables certain functionalities of the balance to be protected by a numerical passcode.

The following options can be set:

Parameter	Description	Values
Applications	Activates or deactivates application protection.	ON OFF*
Adjustments and tests	Activates or deactivates the protection of the adjustments and tests.	ON OFF*
Settings	Activates or deactivates the protection of all settings.	ON OFF*
Passcode	Defines the passcode by the user.	1...9 (1-12 digits)




* Factory setting

User passcode

The user passcode can be defined by the user. The default value is 12345678. The length of the configurable user passcode is restricted to 12 digits.

Passcode and access options are not affected by a balance reset.

What if you forget the password?

If you have forgotten or lost your password, ask the user with administrator rights to provide you with a new password. If the administrator's password is not available either, please contact a METTLER TOLEDO representative. To provide all the required information, please tap on  on the balance home screen, then tap on . Find the instructions by tapping the  icon.

5.2.6 ISO-Log

Navigation:  >  **General configuration** >  **ISO-Log**

The ISO-Log provides detailed information about adjustments already performed, the intensity of use and settings. The ISO-log can store up to 999 events until the oldest one is overwritten by the newest.

The following options can be set:

Parameter	Description
ISO-Log – Adjustments	Displays detailed information about adjustments already performed.
ISO-Log – Balance	Displays detailed information about the balance history.
ISO-Log – Settings and status	Displays detailed information about setting changes.

6 Application Settings

Each application can be defined manually via its application settings. Select the application and tap the application settings symbol in the upper left corner to define the application, e.g.,  in the application **Percent weighing**.

The application settings can only be changed if no measurement is in progress.

The available options may differ depending on the application. Most applications have the following options:

-  **Main configuration**
-  **Reports configuration**
-  **Statistics**

6.1 Main configuration

Navigation (example):  >  **Activities - Weighing applications** >  **Weighing** >  >  **Main configuration**

In this section, the current application can be defined individually. The available options may vary depending on the application.

More information about the available options can be found in the activities section.

See also

 Activities ▶ Page 45

6.2 Reports configuration

Navigation (example):  >  **Activities - Weighing applications** >  **Weighing** >  >  **Reports configuration**

In this section, the report content can be configured. By default only the weighing value and the weight unit is published. Any additional information can be configured by the user.

The available options are model and country-specific and may vary depending on the application. The report configuration is valid independently of the report type. As far as possible the same content is published as CSV or TXT file or when printed on the strip printer. However, each report type has certain limitations.


6.2.1 Working with IDs

Identifications (IDs) contain descriptive text for measurements, enabling samples to be easily allocated to specific tasks or customers. This feature defines identifications in order to be able comment on measurements, such as company ID, batch ID or sample ID.

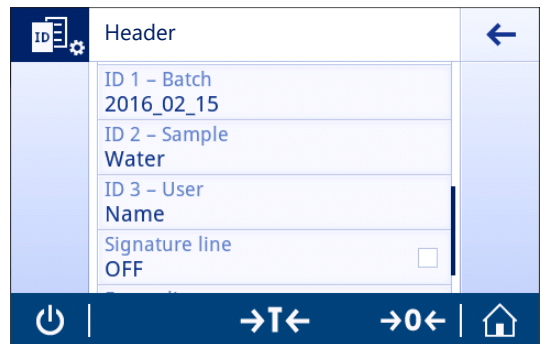
Identifications must be defined under the application settings in **Reports configuration**. Usage and definition of the ID differ depending on the application for which the ID is used.

6.2.2 Defining an ID

The maximum length of an ID is 12 characters.

- 1 Open an application, e. g., **Weighing**.
- 2 Tap the application settings symbol in the upper left corner.
- 3 Tap  **Reports configuration**.
- 4 Tap, e.g., **Header**.
- 5 Tap **ID 1**.
 - ➔ The input dialog **ID 1** appears. The input dialog is inactive.
- 6 Activate **ID 1** with the switch in the title bar.
 - ➔ The input dialog **ID 1** is activated.
- 7 Define **ID Label**.
- 8 Tap ✓ to confirm.

- 9 Define **ID Value**.
- 10 Tap ✓ to confirm.
 - ➔ The screen **ID 1** shows the definitions for **ID Label** and **ID Value**.
- 11 Tap ✓ to accept.
 - ➔ The screen **Header** appears.
- 12 Tap ✓ to confirm.
 - ➔ The screen **Reports configuration** appears.
- 13 Tap ✓ to confirm.



6.2.3 Workflow handling options

The workflow handling options differ depending on the application in which they are used. The following functions are available:

- **Autoincrement**
- **Input prompt**

Autoincrement

The function **Autoincrement** specifies that the last part of the ID is incremented with each use of that ID. There are two basic functions depending on how the ID is defined:

- If there is no counter in the ID, the system automatically adds a counter to the ID starting with 1 (e.g., the ID **Process 1** will be **Process 1** in the next use).
- If a counter is part of the ID, the system automatically increments the ID starting at that counter (e.g., the ID **Process 1** will be **Process 2** in the next use).
- The counter must be set at the end of the ID, otherwise the system doesn't recognize the number as a counter (e.g., in **567Apple** the system doesn't recognize **567** as a counter).
- If the ID has no counter and a maximum length of 12 characters, the last few characters will be overwritten by the counter.

Assign to sample

If the option **Assign to sample** is activated, the ID will be used for each sample.

Input prompt

The **Input prompt** function can be used for every ID. If **Input prompt** is activated, the ID will be prompted on the display before it is used. The user can decide whether to use the default value that has been defined with the ID or define an individual value. The value can either be defined via touch screen, by reading in the information with a barcode reader or by attaching an external keyboard to the balance. For more information please refer to "Devices and connectivity".

See also

📄 Devices and connectivity ▶ Page 36

6.2.4 Settings

Header

The following options can be set:

Parameter	Description	Values
Date, time	Defines if the date and time appears on the report.	ON OFF*
Balance type	Defines if the balance type appears on the report.	ON OFF*

Serial number (SNR)	Defines if the serial number appears on the report.	ON OFF*
Balance ID	Defines if the balance ID ** appears on the report. ** Balance identification can be defined in the system settings.	ON OFF*
ID 1	Defines if ID 1 appears on the report.	ON OFF*
ID 2	Defines if ID 2 appears on the report.	ON OFF*
ID 3	Defines if ID 3 appears on the report.	ON OFF*
Signature line	Defines if the signature line appears on the report.	ON OFF*
Empty lines	Defines the number of empty lines on the report (1...99).	ON OFF*

* Factory setting

Sample

The following options can be set:

Parameter	Description	Values
ID 4	Defines if ID 4 (Sample ID) appears on the report.	ON OFF*
Gross/Tare	Defines if Gross/Tare appears on the report.	ON OFF*
Additional unit	Defines if an additional unit appears on the report.	ON OFF*

* Factory setting

Footer

The following options can be set:

Parameter	Description	Values
Date, time	Defines if date and time is appears on the report.	ON OFF*
Signature line	Defines if the signature line appears on the report.	ON OFF*
Empty lines	Defines the number of empty lines on the report (1...99).	ON OFF*

* Factory setting

6.3 Statistics

Navigation (example):  >  **Activities - Weighing applications** >  **Weighing** >  >  **Statistics**




The **Statistics** function generates statistics for a series of results. The **Statistics** function is not available for the applications **Totaling** and **Formulation**.

The **Automatic** setting is used to automatically transfer the result to the statistics. If using the **Manual** setting, the **+** key must be pressed to transfer the result.

If statistics are activated, the following options are available during the weighing process:

- Finish
- Pause
- Discard
- View result

Defining statistics

- 1 Open an application, e.g., **Weighing**.
- 2 Tap the main configuration symbol of the application, e.g., .
→ The main configuration screen appears.
- 3 Tap .
→ The screen **Statistics** appears.
- 4 Activate the **Statistics**.
- 5 Define the available options.
- 6 Tap  to confirm.

Statistics configuration

The following options can be set:

Parameter	Description	Values
Acceptance range	Defines the acceptable deviation in relation to the average value.	1%...100% (30%*)
Accepting mode	Defines if a weight sample is added automatically to the result.	Automatic Manual*



* Factory setting

Stability criteria: Relationship between readability and deviation


Readability	Min. deviation
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

Discard value

If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap .
→ The dialog screen **Confirm discard** appears. An overview with all values within the current weighing process is displayed.
- 2 Tap  to discard the last value from the result.
→ The incorrect value has been deleted. The weighing process can be continued.

Terminate the application

- 1 Tap .
→ A dialog screen appears.

2 Tap ✓ **Finish and publish**.

- ➔ The results are published according to the publishing configurations and the data are deleted.
- ➔ The application home screen appears.

Discard

All results are deleted.

1 Tap ■.

- ➔ A dialog screen appears.

2 Tap ✕ **Discard**.

- ➔ All data are deleted.
- ➔ The application home screen appears.

View result

1 Tap ■.

- ➔ A dialog screen appears.

2 Tap 📄 **View result**.

- ➔ The results are now displayed.

3 Tap 📄 to publish the results according to the configurations.

4 Tap ← to return to the previous screen.

7 Activities

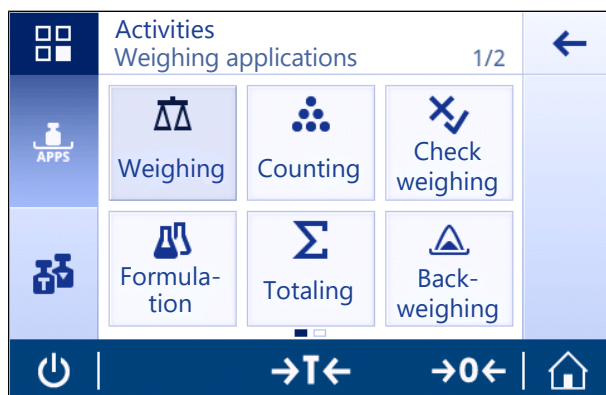
Navigation: 

The **Activities** section includes the following two sub-sections:

-  **Activities - Weighing applications**
-  **Activities - Adjustments and tests**











7.1 Activities - Weighing applications

Navigation:  >  **Activities - Weighing applications**



The landing screen does not show all applications. Scroll horizontally to reach the applications on the second page.

Activities - Weighing applications includes the following applications:

-  **Weighing**, see [Weighing ▶ Page 46] and [Performing a simple weighing ▶ Page 24]
-  **Counting**, see [Counting ▶ Page 47]
-  **Check weighing**, see [Check weighing ▶ Page 51]
-  **Formulation**, see [Formulation ▶ Page 54]
-  **Totaling**, see [Totaling ▶ Page 56]
-  **Back-weighing**, see [Back-weighing ▶ Page 58]
-  **Dynamic weighing**, see [Dynamic weighing ▶ Page 60]
-  **Percent weighing**, see [Percent weighing ▶ Page 61]
-  **Density**, see [Density ▶ Page 62]
-  **Factor weighing**, see [Factor weighing ▶ Page 64]

7.1.1 Weighing

Navigation

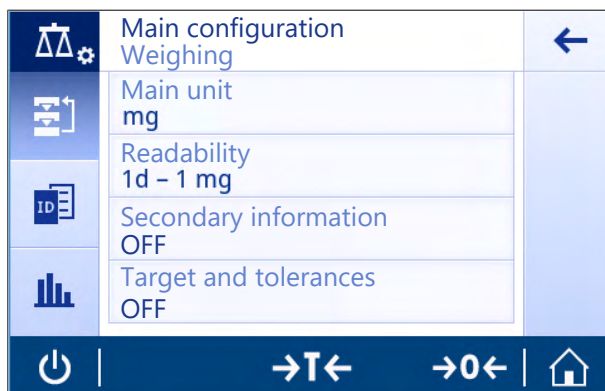
 **Activities** >  **Activities - Weighing applications** >  **Weighing**

The **Weighing** application allows the user to perform simple weighing operations.

For more information about the basic weighing functions, see "Performing a simple weighing".

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

Weighing – Main configuration



Parameter	Description	Values
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tih tis tit tola baht lb:oz
Secondary information	Activates or deactivates the secondary information displayed on screen. Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific. Current tare Current tare weight.	ON OFF*
Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* 2d - 0.0002 g 5d - 0.0005 g 10d - 0.001 g 100d - 0.01 g 1000d - 0.1 g

Target and tolerances	<p>Defines the target weight and tolerances.</p> <p>Target weight Predefines a target weight. The value can be selected manually or by weighing.</p> <p>Upper tolerance Defines the upper tolerance.</p> <p>Lower tolerance Defines the lower tolerance.</p> <p>If the value for Target weight, Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.</p>	ON OFF* Numerical value (depending on the balance type)
-----------------------	--	--

* Factory setting

See also

📄 Performing a simple weighing ▶ Page 24

7.1.2 Counting

Navigation: 🏠 Activities > 📱 Activities - Weighing applications > ⚙️ Counting



The **Counting** application determines a specific number of pieces based on a predetermined reference piece weight.

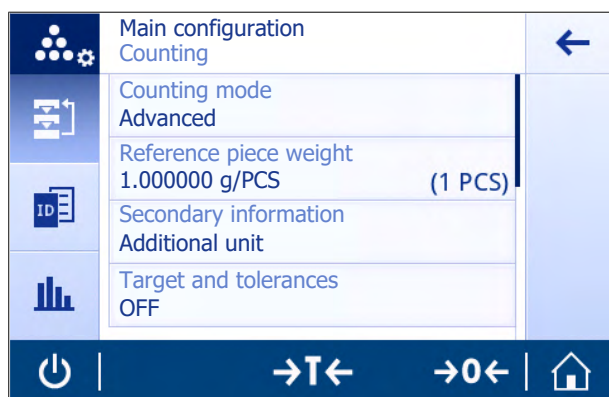
There are two counting modes available: **Advanced** and **Standard**. With the additional features of **Advanced** mode, the entire process is more comfortable and more secure due to an automatic workflow. The mode can be changed in the section **Counting – Main configuration**. Default mode: **Advanced**.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

Legal-for-trade

A fixed minimum reference piece number of 10 and inactive reference weight options are predetermined for approved balances for selected countries.

7.1.2.1 Counting - Main configuration



The following options can be set:

Parameter	Description	Values
Counting mode	Select the Counting mode .	Advanced* Standard
Reference piece weight	Sets the number and weight of the reference piece(s).	1...999 (10*)
Secondary information	Activates or deactivates the secondary information displayed on screen. Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific. Current tare Current tare weight.	ON* OFF
Target and tolerances	Defines the target weight and tolerances. Target weight Predefines a target weight. The value can be selected manually or by weighing. Upper tolerance Defines the upper tolerance. Lower tolerance Defines the lower tolerance. If the value for Target weight , Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.	ON OFF* Numerical value (depending on the balance type)

* Factory setting

Advanced mode options

The following options can be set:

Parameter	Description	Values
Reference mode	Selects the Reference mode . Automatic The next stable weight is automatically accepted as a reference weight according to the defined piece number. Manual The reference can be defined manually.	Automatic* Manual

Auto clear reference	Activates or deactivates the Auto clear reference . The current value of the option Reference piece weight will be automatically deleted after zeroing or removing all loaded weights from the weighing pan.	ON OFF*
Reference optimization	Activates or deactivates the Reference optimization . The current reference will be continuously optimized during operation by accepting additional pieces automatically or manually.	ON OFF*
Reference check	Activates or deactivates the Reference check .	ON OFF*
Accuracy information	Activates or deactivates the Accuracy information . Counting accuracy can be shown in percent (default mode) or piece(s).	ON OFF*

* Factory setting

7.1.2.2 Defining reference piece weight in standard mode

To define the **Reference piece weight**, the **Reference piece number** and **Reference weight** must be successively defined. The system will automatically navigate from one option to the other.

Defining reference piece number

The reference piece number must be a number between 1 and 999.

- Counting mode **Standard** is activated.

- 1 Tap **1 piece** in the work title bar.
 - ➔ A dialog screen appears.
- 2 Tap **x** to delete the value.
- 3 Enter the number of reference pieces.
- 4 Tap **✓** to confirm.
 - ➔ The defined value for the option **Reference piece number** appears in the work title bar.




Defining the reference weight

There are two ways to define the reference weight. The reference weight can be defined manually by entering the value or weighing the reference weight.

Defining reference weight manually

- 1 Tap **x** to delete the value.
- 2 Enter the new reference weight.
- 3 Tap **✓** to confirm.
 - ➔ The reference piece weight has been defined.
- 4 Tap **✓** to confirm.

Defining the reference weight by weighing

- 1 Tap .
➔ A dialog screen appears.
- 2 Place the reference weight on the weighing pan.
- 3 Tap ✓ to confirm.
➔ The screen **Reference weight** appears.
- 4 Tap ✓ to confirm.
➔ The screen **Counting – Main configuration** appears.
- 5 Tap ✓ to confirm the configuration.

7.1.2.3 Defining reference piece weight in advanced mode

To define the **Reference piece weight**, the **Reference piece number** and **Reference weight** can be defined directly via the shortcuts.

Defining the reference piece number

The reference piece number must be a number between 1 and 999.

- Counting mode **Advanced** is activated.
- 1 Tap **1 piece** in the work title bar.
➔ A dialog screen appears.
 - 2 Tap **Piece number** in the work title bar.
 - 3 Tap ✕ to delete the value.
 - 4 Enter the number of reference pieces.
 - 5 Tap ✓ to confirm.
➔ The defined value for the option **Reference piece number** appears in the work title bar.



Defining the reference piece weight manually

- 1 Tap **Piece weight** in the work title bar.
➔ The screen **Reference piece weight** appears.
- 2 Tap ✕ to delete the value.
- 3 Enter the new value.
- 4 Tap ✓ to confirm.
➔ The defined value for the option **Reference piece weight** appears in the work title bar.

Defining reference piece weight by weighing

If no reference weight has been defined yet, the work title bar shows **Piece weight Not defined**.

- 1 Place the reference sample weight on the weighing pan.
- 2 Depending on whether the option **Reference mode** is set to **Automatic (Default)** or **Manual**, the value will be automatically accepted or must be confirmed.
➔ The balance returns to the application main screen and shows the defined value for the option **Reference piece weight** in the work title bar.

Once the reference weight has been defined in **Advanced** mode, it appears on the right side of the work title bar. The reference weight can be changed in **Main configuration** under **Reference piece weight** or using the shortcut on the left side of the work title bar.

Counting with reference weight check

The reference weight check ensures that the reference weight is high enough for the resulting counting accuracy to fit the customer process tolerance. Activate a reference weight check and define the process tolerance in percent. The percentage factor range is 0.01 - 30.00%. The higher the factor, the smaller the required minimum reference weight. Factory setting: 2%. The minimum reference weight is equal to d / factor .

Example

$d = 0.1 \text{ g}$

Factor = 20%

Minimum reference weight = $0.1 \text{ g} / 20\% = 0.5 \text{ g}$

If the reference calculation is activated manually or automatically, the minimum reference weight is checked to ensure the desired accuracy. If it is not sufficient, the user is prompted to add the number of additional parts needed. The number of additional parts needed is reduced to zero, after which the user adds additional parts. At zero, the reference calculation is activated automatically. If too many parts are added, the user is prompted to remove the number of parts until zero is reached.

7.1.3 Check weighing

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Check weighing**

The **Check weighing** application allows the user to check the deviation of a sample weight within a tolerance limit against a reference target weight. The target weight can be determined manually or by weighing; the tolerance limit must be defined manually.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

7.1.3.1 Check Weighing - Main configurations

Legal-for-trade

For approved balances, this menu item has fixed settings and cannot be changed.

The following options can be set:

Parameter	Description	Values
Target and tolerances	<p>Defines the target weight and tolerances.</p> <p>Target weight Predefines a target weight. The value can be selected manually or by weighing.</p> <p>Upper tolerance Defines the upper tolerance.</p> <p>Lower tolerance Defines the lower tolerance.</p> <p>If the value for Target weight, Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.</p>	<p>Target weight Upper tolerance Lower tolerance Numerical value (depending on the balance type)</p>
Tolerance threshold	<p>Defines the tolerance threshold. Values below the defined threshold are not checked.</p>	1%...100% (1%*)
Within tolerance beeps	<p>Activates or deactivates the acoustic signal. Gives an acoustic signal when the result is within tolerance.</p>	ON OFF*
Main unit	<p>Sets the main unit of the weighing process. The available units are model- and country-specific.</p>	<p>g* kg mg µg ct N lb oz ozt GN dwt mom msg tth tls tft tola baht lb:oz</p>

Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* l 2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g
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

* Factory setting

7.1.3.2 Before performing check weighing






Before performing a check weighing operation, the following options can be set:

- **Target weight**
- **Upper tolerance limit**
- **Lower tolerance limit**
- **Tolerance threshold**





Defining the target weight manually by entering the nominal weight

- 1 Tap .
 - ➔ The screen **Check weighing - Main configuration** appears.
- 2 Tap **Target and tolerances**.
 - ➔ The dialog screen **Target weight in g** appears.
- 3 Tap  to delete the value.
- 4 Enter the value of the target weight.
- 5 Tap  to confirm.
 - ➔ The screen **Check weighing - Main configuration** appears.
- 6 Tap  to confirm, and return to the application screen.

Defining the target weight by weighing

- 1 Tap .
 - ➔ The screen **Check weighing - Main configuration** appears.
- 2 Tap **Target and tolerances**.
 - ➔ The dialog screen **Target weight in g** appears.
- 3 Tap .
 - ➔ The dialog screen **Target weight in g** appears.
- 4 Place the reference weight on the weighing pan.
- 5 Tap  to confirm.
 - ➔ The dialog screen **Target weight in g** appears.
- 6 Tap  to confirm.
 - ➔ The screen **Check weighing - Main configuration** appears.
- 7 Tap  to confirm, and return to the application screen.

Defining the lower and upper limits manually by entering a percentage value or weight

- 1 Tap .
 - ➔ The screen **Check weighing - Main configuration** appears.
- 2 Tap **Target and tolerances**.
 - ➔ The dialog screen **Target weight in g** appears.
- 3 Tap  **Upper tolerance limit** or tap  **Lower tolerance limit**.
 - ➔ The dialog screen **Upper tolerance in g** or **Lower tolerance in g** appears.
- 4 Activate the option using the switch at the upper right.
- 5 Tap  to delete the value.

- 6 Enter the tolerance limit.
- 7 Tap ✓ to confirm.
 - ➔ The screen **Check weighing - Main configuration** appears.
- 8 Tap ✓ to confirm, and return to the application screen.

Defining tolerance threshold

With the option **Tolerance threshold** a value limit can be set using the **Tolerance threshold** option. If the value of the check weight is below the defined threshold, it will not be checked.

- 1 Tap ✕⚙️.
 - ➔ The screen **Check weighing - Main configuration** appears.
- 2 Tap **Tolerance threshold**.
 - ➔ The dialog screen **Tolerance threshold in %** appears.
- 3 Activate the option using the switch at the upper right.
- 4 Tap ✕ to delete the value.
- 5 Enter the value for the **Tolerance threshold**.
- 6 Tap ✓ to confirm.
 - ➔ The screen **Check weighing - Main configuration** appears.
- 7 Tap ✓ to confirm, and return to the application screen.

The **Tolerance threshold** option always refers to the lower tolerance limit.

7.1.3.3 Performing check weighing

After defining the target weight and tolerance limits, the **Check weighing** application can be performed. The color weighing-in aid bar at the top bar indicates whether the weight sample is within the defined tolerances.

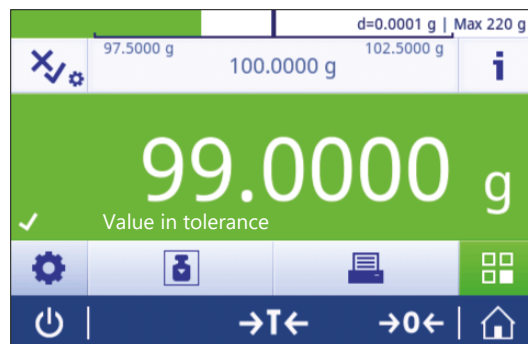
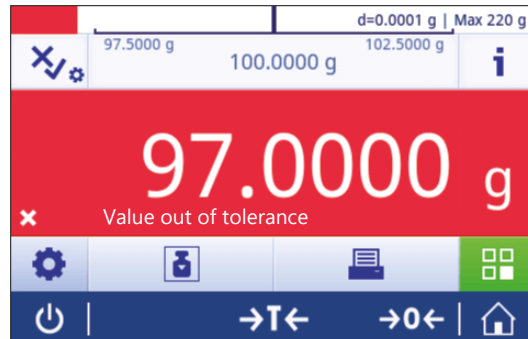
Example: the defined target weight is 100.0000 g and the tolerance limit is $\pm 2.5\%$. The sample weight is 97.0000 g.

- Place the sample weight on the weighing pan.
 - ➔ The weight is stable and the unstability symbol ○ disappears.
 - ➔ The value is out of tolerance, and the weighing-in aid bar and weighing value field are red.

Example: the defined target weight is still 100.0000 g and the tolerance limit is $\pm 2.5\%$. The sample weight is 99.0000 g.

- Place the sample weight on the weighing pan.
 - ➔ The weight is stable and the unstability symbol ○ disappears.
 - ➔ The value is within the tolerance limit, and the weighing-in aid bar and weighing value field are green.

If the weight is below a defined tolerance threshold, the background color of the screen does not change.



7.1.4 Formulation

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Formulation**

The **Formulation** application allows the user to:

- Weigh-in (add and store) up to 999 individual component weights without tare container and display the total.
- Tare/pre-tare and store up to 799 container weights and display the total.
- If tare containers need to be stored, the maximum number of permitted tares is 200.
- Fill up the sum of all component net weight values by adding a further component to a higher value.

Formulation – Main configuration

The following options can be set:

Parameter	Description	Values
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tih tils tlt tola baht lb:oz
Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* 2d - 0.0002 g 5d - 0.0005 g 10d - 0.001 g 100d - 0.01 g 1000d - 0.1 g




* Factory setting

Performing formulation

- 1 Press **→0←** to zero the balance.
- 2 If using a container: place container on the weighing pan and press **→T←** to tare the balance.
 - ➔ The status information field displays **Net**.
- 3 Place the first component weight.
 - ➔ The weighing value field displays the value of the first component weight.
- 4 Tap **+** to add the first component weight.
- 5 Place the second component weight.
 - ➔ The weighing value field displays the value of the second component weight.
- 6 Tap **+** to add the second component weight.
- 7 Continue adding components until all components are weighed.

Defining fill up function

Fill up sample allows an additional component weight to be added to the total weight of all components in order to reach a desired target weight.



- The weighing value field displays the total net weight.
- 1 Tap .
 - ➔ A dialog screen appears.
 - 2 Place the fill up sample.
 - ➔ The weighing value field displays the total weight.
 - 3 Tap  to confirm.
 - 4 Tap  to exit the application or to view the result.

The following options are available during the weighing process:



- Finish
- Pause
- Discard
- View result

Discard value




If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap .
 - ➔ The dialog screen **Confirm discard** appears. An overview with all values within the current weighing process is displayed.
- 2 Tap  to discard the last value from the result.
 - ➔ The incorrect value has been deleted. The weighing process can be continued.





Terminate the application

- 1 Tap .
 - ➔ A dialog screen appears.
- 2 Tap  **Finish and publish**.
 - ➔ The results are published according to the publishing configurations and the data are deleted.
 - ➔ The application home screen appears.

Pause the application



- 1 Tap .
 - ➔ A dialog screen appears.
- 2 Tap  **Pause**.
 - ➔ The application is paused and another application can be used in the meantime.
 - ➔ The application home screen appears.
- 3 Open the application again.
- 4 Tap .
 - ➔ The process can be continued.

View result

- 1 Tap .
 - ➔ A dialog screen appears.
- 2 Tap  **View result**.
 - ➔ The results are now displayed.
- 3 Tap  to publish the results according to the configurations.
- 4 Tap  to return to the previous screen.

Discard

All results are deleted.

- 1 Tap .
 - ➔ A dialog screen appears.
- 2 Tap  **Discard**.
 - ➔ All data are deleted.
 - ➔ The application home screen appears.

7.1.5 Totaling

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Totaling**

The **Totaling** application allows the user to weigh different samples, add their weight values and totalize them.

The application allows the user to:

- Tare/pre-tare and store up to 799 container weights and display the total.
- If tare containers need to be stored, the maximum number of permitted tare values is 200.

Totaling – Main configuration

The following options can be set:

Parameter	Description	Values
Accepting mode	Defines if a weight sample is added automatically to the result.	Automatic Manual*
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tih tils tlt tola baht lb:oz
Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* 2d - 0.0002 g 5d - 0.0005 g 10d - 0.001 g 100d - 0.01 g 1000d - 0.1 g

* Factory setting

Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

Performing totaling

- 1 Press **→0←** to zero the balance.
- 2 If using a container, place container on the weighing pan and press **→T←** to tare the balance.
- 3 Place the first sample on the weighing pan.
- 4 Wait until the unstability symbol **○** disappears.
 - ➔ When the balance is stable, the weighing value becomes dark blue.
- 5 Tap **+** to accept the weight and start the procedure.
- 6 Place the next sample.
- 7 Tap **+** to accept the second sample weight.
 - ➔ The work title bar shows the number of samples (2 samples) and the total weight of the samples, e.g., $\Sigma = 30.0000$ g.

The following options are available during the weighing process:

- Finish
- Pause
- Discard
- View result

Discard value

If a weighing value was incorrect, it can be discarded from the result. Discard is only possible up to the last time the balance was tared.

- 1 Tap **—**.
 - ➔ The dialog screen **Confirm discard** appears. An overview with all values within the current weighing process is displayed.
- 2 Tap **✓** to discard the last value from the result.
 - ➔ The incorrect value has been deleted. The weighing process can be continued.

Terminate the application

- 1 Tap **■**.
 - ➔ A dialog screen appears.
- 2 Tap **✓ Finish and publish**.
 - ➔ The results are published according to the publishing configurations and the data are deleted.
 - ➔ The application home screen appears.

Pause the application


- 1 Tap **■**.
 - ➔ A dialog screen appears.
- 2 Tap **|| Pause**.
 - ➔ The application is paused and another application can be used in the meantime.
 - ➔ The application home screen appears.
- 3 Open the application again.
- 4 Tap **▶**.
 - ➔ The process can be continued.

View result

- 1 Tap **■**.
 - ➔ A dialog screen appears.
- 2 Tap **📄 View result**.
 - ➔ The results are now displayed.
- 3 Tap **📄** to publish the results according to the configurations.
- 4 Tap **←** to return to the previous screen.

Discard

All results are deleted.

- 1 Tap .
 - ➔ A dialog screen appears.
- 2 Tap **×** **Discard**.
 - ➔ All data are deleted.
 - ➔ The application home screen appears.

7.1.6 Back-weighing

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Back-weighing**

The balance displays and prints the automatically calculated difference of 2 measured weights. Automatic (default) and manual modes are possible. The use of a tare container can be activated (default) or deactivated. As result, the tare, initial weight, final weight and difference can be displayed and printed. The difference can be displayed and printed as absolute values (in main units), percentage (%), percentage (Abs. %), Atro AM, or Atro AD.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

If there are no function statistics, the following options are available during the weighing process:

- Finish
- Pause
- Discard
- View result

Back-weighing – Main configuration

The following options can be set:

Parameter	Description	Values
Accepting mode	Defines if a weight sample is added automatically to the result. The next stable weight of at least 10 * readability is accepted following minimal deviation; see relationship between readability and deviation in the table below.	Automatic* Manual
Use tare container	Activates or deactivates the use of a tare vessel.	ON* OFF
Result value as...	Select the result view for the calculated difference. Percentage = Reports the difference between back-weighing and initial weighing as a percentage of the initial weight. Absolute percentage = Reports the back-weighing as a percentage of the initial weight. Moisture content = Reports the moisture content of the sample as a percentage of the dry weight. Dry content = Reports the wet weight of the sample as a percentage of the dry weight.	Weight (Default)* Percentage Absolute percentage Moisture content Dry content
Result decimals	Defines the number of decimal places of the percentage (option only available if % result is activated).	1 2 3* 4 5
Show difference...	Displays the calculated difference in work area and result view. Signed (Default) = Displays the value via algebraic sign. Unsigned = Displays the absolute value.	Signed (Default)* Unsigned
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tfl tfs tft tola baht lb:oz






Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* l 2d - 0.0002 g l 5d - 0.0005 g l 10d - 0.001 g l 100d - 0.01 g l 1000d - 0.1 g
-------------	---	---

* Factory setting


Stability criteria: Relationship between readability and deviation

Readability	Min. deviation
0.1 mg	0.1 g
0.001 g	1 g
0.01 g	1 g
0.1 g	1 g
1 g	5 g

Setting up the back-weighing application

- 1 Tap .
 - ➔ The screen **Back-weighing – Main configuration** appears.
- 2 Tap **Accepting mode**.
 - ➔ The screen **Accepting mode** appears.
- 3 Select **Automatic (Default)** or **Manual** and confirm with .
- 4 Activate the option **Use tare container** if required.
- 5 Tap **Result value as...**.
 - ➔ The screen **Result value as...** appears.
- 6 Select the values for the result view, e.g., **Percentage (%)** and the print-out.
- 7 Tap  to confirm.
- 8 Tap **Result decimals** after percent value.
 - ➔ The screen **Result decimals** appears.
- 9 Select the number of decimals for the difference in % and confirm with .
- 10 Tap  to return to the application screen.

Performing back-weighing with automatic accept mode and using a tare container

- **Use tare container** is activated.
 - **Accepting mode Automatic** is selected.
- 1 Place a container on the weighing pan.
 - ➔ The tare weight appears in the work title bar.
 - 2 Place the initial sample in the container.
 - ➔ The initial weight appears in the value bar.
 - 3 Remove the container with the sample.
 - 4 Place the container with the treated sample on the weighing pan.
 - ➔ The final weight appears in the value bar.
 - 5 Remove the container with the sample.
 - ➔ The back-weighing result will be displayed and can be published according to the publishing configurations.
 - 6 Tap  to return to the application screen.

Performing back-weighing with manual accept mode without using a tare container

- **Use tare container** is deactivated.
 - **Accepting mode Manual** is selected.
- 1 Place the initial sample on the weighing pan.
 - ➔ The initial weight appears in the value bar.
 - 2 Tap ✓ to confirm.
 - 3 Remove the sample to continue.
 - 4 Place the treated sample on the weighing pan.
 - ➔ The final weight appears in the value bar.
 - 5 Tap ✓ to confirm.
 - 6 Push checkmark to access the result report.
 - ➔ The back-weighing result will be displayed and can be published according to the publishing configurations.
 - 7 Tap ✓ to return to the application screen.

7.1.7 Dynamic weighing

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Dynamic weighing**

The **Dynamic weighing** application determines the weights of unstable samples or when the weighing process is being executed under unstable ambient conditions. The balance calculates the weight as an average of a number of weighing operations over a defined time.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

The displayed measuring time on the application home screen can be used as shortcut to define the measuring time.


Dynamic weighing – Main configuration

The following options can be set:


Parameter	Description	Values
Measuring time	Defines the measuring time in seconds.	3 ... 120 (3 seconds*)
Start mode	Defines the Start mode .	Automatic* Manual
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tih tils tit tola baht lb:oz
Readability	Defines the readability (d) of the weighing process. The available readabilities are model-specific.	1d - 0.0001 g* 2d - 0.0002 g 5d - 0.0005 g 10d - 0.001 g 100d - 0.01 g 1000d - 0.1 g
Secondary information	Activates or deactivates the secondary information displayed on screen. Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific. Current tare Current tare weight.	ON OFF*

* Factory setting

Defining measuring time

- 1 Tap .
 - ➔ The screen **Dynamic weighing – Main configuration** appears.
- 2 Tap **Measuring time**.
 - ➔ The dialog screen **Measuring time in seconds** appears.
- 3 Tap **x** to delete the value.
- 4 Enter a value between 3 and 120 seconds.
- 5 Tap **✓** to confirm.
 - ➔ The screen **Dynamic weighing – Main configuration** appears.
- 6 Tap **✓** to confirm.

Defining start mode

- 1 Tap .
- 2 Tap **Start mode**.
- 3 Select **Automatic** or **Manual**.
- 4 Tap **✓** to confirm.
- 5 Tap **✓** to return to the application screen.

Performing dynamic weighing

When the measuring time and the start mode have been defined, the dynamic weighing process can be started. The weighing process will automatically be aborted when an overload or underload is detected.

- 1 Press **→0←** to zero the balance.
 - 2 If using a container: place container on the weighing pan and press **→T←** to tare the balance or use the "Weighing option" menu Auto tare.
 - 3 Place sample weight.
 - ➔ If **Start mode** is set to **Automatic**, the weighing process starts automatically with relative stability.
 - ➔ If **Start mode** is set to **Manual**, tap **▶** to start the weighing process.
 - ➔ The weighing process starts. The defined measuring time in the work title bar is counting down.
- ➔ The result is displayed in a blue weighing value field.

7.1.8 Percent weighing

Navigation:  **Activities** >  **Activities - Weighing applications** > **% Percent weighing**

Percent weighing allows a sample weight to be checked as a percentage of a reference target weight. The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

Percent weighing – Main configuration

The following options can be set:

Parameter	Description	Values
Reference weight	Defines the reference weight manually or by weighing.	Available range is model-specific.
Secondary information	Activates or deactivates the secondary information displayed on screen. Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific. Current tare Current tare weight.	ON* OFF

* Factory setting

Defining the reference weight

There are two ways to define the reference weight. The reference weight can be defined manually by entering the value or weighing the reference weight.

Defining the reference weight by weighing

- 1 Tap .
→ The screen **Percent weighing – Main configuration** appears.
- 2 Tap **Reference weight**.
→ The screen **Reference weight** appears.
- 3 Tap .
- 4 Press **→0←** to zero the balance.
- 5 Place the reference weight on the weighing pan.
- 6 Tap to confirm.
→ The screen **Reference weight** appears.
- 7 Tap to confirm.
- 8 Tap to return to the application screen.

Defining the reference weight manually

- 1 Tap .
→ The screen **Percent weighing – Main configuration** appears.
- 2 Tap **Reference weight**.
→ The screen **Reference weight** appears.
- 3 Tap to delete the value.
- 4 Enter the value of the reference weight and confirm with .
- 5 Tap to return to the application screen.

7.1.9 Density

Navigation: **Activities** > **Activities - Weighing applications** > **Density**

Density allows the density of solid bodies and liquids to be determined.

The density is determined via the 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 using the optional density kit, which contains all attachments and aids needed for convenient and precise density determination. To determine the density of liquids, a sinker is also required. This can be obtained from your METTLER TOLEDO dealer.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].

Density – Main configuration

The following options can be set:

Parameter	Description	Values
Method	Depending if the weight type is solid or liquid.	Solid* Liquid
Auxiliary liquid	Select the auxiliary liquid.	H2O* Ethanol Free...
Sinker volume	This option is only available when Liquid is active.	(0.1...500.0 cm ³)
Main unit	Sets the main unit of the weighing process. The available units are model- and country-specific.	g* kg mg µg ct N lb oz ozt GN dwt mom msg tih tils tlf tola baht lb:oz


* Factory setting

Determination of density of solids


- 1 Tap .

- ➔ The screen **Density – Main configuration** appears.
- 2 Tap **Method**.
 - ➔ When **Solid** has been activated (default value), the **Auxiliary liquid** appears in the list.
- 3 Tap **Auxiliary liquid**.
 - ➔ The screen **Auxiliary liquid** appears.
- 4 Define the **Auxiliary liquid** that is used. Select between **H2O** for distilled water, **Ethanol** or **Free...** for a freely definable auxiliary liquid.
- 5 Tap ✓ to confirm.
 - ➔ The selected **Auxiliary liquid** defines the next steps:
 - ➔ The dialog screen **Temperature in °C** appears.
- 6 Enter the **Temperature in °C** for **Ethanol** and **H2O**.
- 7 **Auxiliary liquid name** and **Density in g/cm³** must be defined for the option **Free...**
- 8 Tap ✓ to confirm.
 - ➔ The screen **Density – Main configuration** appears.
- 9 Tap ✓ to return to the application screen.
 - ➔ The balance is prepared for determining the density of solids.

Determining the density for solids


- The balance has been configured to determine the density of solids.
- 1 Tap ▶ to start the process.
 - ➔ The dialog screen **Sample weight in air** appears.
- 2 Place the solid mass on the weighing pan.
- 3 Tap ✓ to confirm.
 - ➔ The dialog screen **Sample weight in liquid** appears.
- 4 Immerse solid in the liquid.
- 5 Tap ✓ to confirm.
 - ➔ The results are now displayed.
- 6 Tap  to publish the results according to the configurations.
- 7 Tap ✓ to return to the application screen.

Determination of density for liquids

- 1 Tap  .
 - ➔ The screen **Density – Main configuration** appears.
- 2 Tap **Method**.
- 3 Tap **Liquid**.
- 4 Tap ✓ to confirm.
 - ➔ When **Liquid** has been activated, **Sinker volume** appears in the list.
- 5 Tap **Sinker volume**.
 - ➔ The dialog screen **Sinker volume in cm³** appears.
- 6 Tap ✕ to delete the value.
- 7 Enter the volume of the sinker.
- 8 Tap ✓ to confirm.
 - ➔ The screen **Density – Main configuration** appears.
- 9 Tap ✓ to return to the application screen.

Determining the density of liquids

- The balance has been configured to determine the density of liquids.
- 1 Tap ▶ to start the process.

- ➔ The dialog screen **Sinker in air** appears.
- 2 Place the sinker on the weighing pan.
- 3 Tap ✓ to confirm.
 - ➔ The dialog screen **Sinker in liquid** appears.
- 4 Immerse the sinker.
- 5 Tap ✓ to confirm.
 - ➔ The results are now displayed.
- 6 Tap  to publish the results according to the configurations.
- 7 Tap ✓ to return to the application screen.

7.1.10 Factor weighing

Navigation:  **Activities** >  **Activities - Weighing applications** >  **Factor weighing**

The application **Factor weighing** multiplies or divides a pre-defined factor by the measured weight value (in grams) and calculates it to a predefined number of decimal places.

The permitted range for the steps depends on the pre-defined factor and the resolution of the balance.

The statistics function can be activated; information on this topic can be found in [Statistics ▶ Page 43].



Factor weighing – Main configuration


The following options can be set:

Parameter	Description	Values
Factor, step	Defines the factor and the step.	Factor Step
Secondary information	Activates or deactivates the secondary information displayed on screen. Additional unit* Selects the secondary information displayed on screen. The available units are model- and country-specific. Current tare Current tare weight.	ON* OFF
Target and tolerances	Defines the target weight and tolerances. Target weight Predefines a target weight. The value can be selected manually or by weighing. Upper tolerance Defines the upper tolerance. Lower tolerance Defines the lower tolerance. If the value for Target weight , Upper tolerance or Lower tolerance has been defined, the option title Target and tolerances will be replaced by the defined values.	ON OFF* Numerical value (depending on the balance type)

* Factory setting

Defining factor and step

- 1 Tap .
 - ➔ The screen **Factor weighing – Main configuration** appears.
- 2 Tap **Factor, step**.
 - ➔ The dialog screen **Factor – Multiplication** appears.
- 3 Tap ✕ to delete the value.
- 4 Define **Factor**.
- 5 Tap  to change the operation from **Multiplication** to **Division** or vice versa.

- 6 Tap ✓.
- 7 Tap .
 - ➔ The dialog screen **Step** appears.
- 8 Define **Step**.
- 9 Tap ✓ to confirm.
 - ➔ The screen **Factor weighing – Main configuration** appears.
- 10 Tap ✓ to return to the application screen.







7.2 Activities - Adjustments and tests

Navigation:  >  **Activities - Adjustments and tests**

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.
- when the balance was disconnected from the power or in case of power failure.
- after a change of the location.
- at regular intervals during weighing service.

Activities - Adjustments and tests consists of the following elements:

-  **FACT**, see [Fully automatic adjustment (FACT) ▶ Page 65]
-  **Internal Adjustment**, see [Internal adjustment ▶ Page 66]
-  **External Adjustment**, see [External adjustment ▶ Page 66]
-  **Fine adjustment**, see [Fine adjustment (model-dependent) ▶ Page 66]
-  **Routine test**, see [Routine test ▶ Page 67]
-  **Repeatability test**, see [Repeatability test (model-dependent) ▶ Page 68]

7.2.1 Fully automatic adjustment (FACT)

Navigation:  **Activities** >  **Activities - Adjustments and tests** >  **FACT**

FACT is activated as a default value. If the **FACT** function is not activated, all functionalities, such as temperature and time, are inactive.

FACT means that the balance adjusts itself based on the following criteria:

- if the conditions change (temperature difference min. 2 °C), which may lead to a noticeable deviation in the measurement.
- on a predefined date and time programmed by the user.

Defining FACT

The date and time of FACT can be defined as follows:

- 1 Tap **FACT**.
- 2 Activate **Fully automatic adjustment (FACT)**.
 - ➔ The dialog screen **Fully automatic adjustment (FACT)** appears.
- 3 Select the time (hours : minutes) using the pick buttons.
- 4 Tap ✓ to confirm.
 - ➔ The time underneath **FACT** has been updated and displays the time of the daily adjustment.
- 5 Tap ← to return to the application screen.

When setting the time, hold the pick button to scroll faster.



If a predefined criterion is due, the flashing FACT status icon appears in the display. The balance indicates that it wishes to perform a FACT adjustment.

- 1 Unload the balance.
- 2 Do not select any key.
 - ➔ Adjustment starts automatically.
- ➔ The status icon extinguishes after successful adjustment.



7.2.2 Internal adjustment

Navigation:  **Activities** >  **Activities - Adjustments and tests** >  **Adjust internal**

The function **Internal adjustment** is available for models with internal weight only.

If the balance is configured and connected to a printer, the results of the adjustment process will be printed.

Perform an internal adjustment manually





- 1 Unload the balance.
- 2 Tap  **Adjust internal**.
 - ➔ The internal adjustment procedure will start. The screen displays **Adjustment ongoing...**
 - ➔ When the internal adjustment procedure is successfully completed, the results of the internal adjustment will appear.
- 3 Tap ✓ to confirm.
 - ➔ The screen **Activities - Adjustments and tests** appears.
- 4 Tap  to return to the application screen.

7.2.3 External adjustment

Navigation:  **Activities** >  **Activities - Adjustments and tests** >  **Adjust external**

Legal-for-trade

Because of certification legislation, approved balances cannot be adjusted with an external weight (depending on the certification legislation of the selected country).

- 1 Tap  **Adjust external**.
 - ➔ The dialog screen **Adjustment weight** appears.
- 2 Tap  to define the adjustment weight according to the weight certificate.
- 3 Tap ✕ to delete the value.
- 4 Enter the new value and confirm with ✓.
- 5 Prepare the adjustment weight and tap  to start the adjustment process.
- 6 Load the adjustment weight in the center of the weighing pan.
- 7 Unload the adjustment weight from the weighing pan.
 - ➔ When the external adjustment procedure is successfully completed, the result will appear.
- 8 Tap ✓ to confirm.
 - ➔ The screen **Activities - Adjustments and tests** appears.
- 9 Tap  to return to the application screen.

7.2.4 Fine adjustment (model-dependent)

Navigation:  >  **Activities - Adjustments and tests** >  **Adjust fine**

The value of the internal adjustment weight can be individually adjusted in a very small range via the **Fine adjustment** function.








- This option is only available for models with internal weights.
- Use only certificated weights.
- Make sure that the environmental conditions are correct.
- The balance must be leveled.
- Balance and test weights must observe the operating temperature.

- For fine adjustments, we recommend contacting a balance expert or a METTLER TOLEDO representative.

Legal-for-trade

Approved models are not able to be adjusted with this function.

Performing fine adjustment

- Adjusting weight is prepared.
 - 1 Tap  **Adjust fine**.
 - ➔ The dialog screen **Reference weight** appears.
 - 2 Tap  to delete the value.
 - 3 Enter the weight value according to the certificate.
 - 4 Tap  to confirm.
 - 5 Tap  to start the process.
 - 6 Place the adjustment weight in the center of the weighing pan.
 - 7 Remove the adjustment weight.
 - ➔ The result will appear once the fine adjustment procedure is successfully completed.
 - 8 Tap  to confirm.
 - ➔ The screen **Activities - Adjustments and tests** appears.
 - 9 Tap  to return to the application screen.
- Tap  to reset the defined reference weight back to the default value.

7.2.5 Routine test

Navigation:  **Activities** >  **Activities - Adjustments and tests** >  **Routine test**

The **Routine test** function allows the sensitivity of the balance to be set for periodic tests.

The set values appear at the top of the screen in the weighing information bar. The bar works as a shortcut.




Routine test – Main configuration

The following options can be set:

Parameter	Description	Values
Test weight in g	Defines the test weight.	Numerical value (depending on the balance type)
± Control limit in g	Defines the control limit.	Numerical value (depending on the balance model)
± Warning limit in g	Activates or deactivates the warning limit.	ON* numerical value (depending on the balance model) OFF
Use tare container	Activates or deactivates the use of a tare vessel.	ON OFF*

* Factory setting

Setting the test weight, control limits and warning limits

- 1 Tap .
 - ➔ The screen **Routine test – Main configuration** appears.
- 2 Tap **Test Weight**.
 - ➔ The dialog screen **Test weight in g** appears.
- 3 Tap  to delete the value.
- 4 Enter the new value.
- 5 Tap .
 - ➔ The dialog screen **± Control limit in g** appears.

- 6 Tap **x** to delete the value.
- 7 Enter the new value.
- 8 Tap **!**.
 - ➔ The dialog screen **± Warning limit in g** appears.
- 9 Tap **x** to delete the value.
- 10 Enter the new value and confirm with **✓**.
- 11 Activate or deactivate the option **Use tare container** if required.
- 12 Tap **✓** to confirm.
- 13 Tap **←** to return to the application screen.

Performing a routine test

- The routine test options **Test weight in g**, **± Control limit in g** and **± Warning limit in g** are defined.
 - The test weight is prepared.
- 1 Tap **▶** to start the process.
 - 2 Place the test weight in the center of the weighing pan.
 - ➔ During the test, the screen shows **Waiting for stable weight...**
 - ➔ When the test is finished, the screen shows **Please unload weight.**
 - 3 Remove the test weight from the weighing pan.
 - ➔ When the routine test is successfully completed, the result appears.
 - 4 Tap **✓** to confirm.
 - 5 Tap **←** to return to the application screen.

7.2.6 Repeatability test (model-dependent)

Navigation:  **Activities** >  **Activities - Adjustments and tests** >  **Repeatability test**

The function **Repeatability test** works only for models with internal weights.

A specific number of internal weight tests can be defined via the **Repeatability test** function.

The set number of tests appears at the top of the screen in the weighing information bar. The bar works as a shortcut.

Setting the number of repetitions

- 1 Tap **ⓘ**.
 - ➔ The dialog screen **Repeatability test - Repetitions** appears.
- 2 Tap **x** to delete the value.
- 3 Enter the number of repetitions. The number must be between 5 and 100.
- 4 Tap **✓** to confirm the number of repetitions.
- 5 Tap **▶** to start the process.
 - ➔ The balance executes the defined number of tests. The message **Test ongoing, please wait...** appears on the display during the process. The process can be aborted by tapping **x**.
 - ➔ After the test is finished, an overview with the test results appears on the screen.
- 6 Tap **✓** to confirm.
- 7 Tap **←** to return to the application screen.

8 Communication with Peripheral Devices

This section lists some typical examples of where the balance can communicate with peripheral devices.

8.1 USB - interface and installation

Before connecting the balance via the USB device interface and using either the **HOST** or **PC-Direct** function, the appropriate METTLER TOLEDO USB driver has to be assigned to the PC first. The USB driver can be found on www.mt.com/labweighing-software-download. If you have any questions, please contact a METTLER TOLEDO representative.



Note

If you connect the balance via USB to the PC before installing the METTLER TOLEDO USB driver, Windows will automatically install the wrong driver.

Requirements

- Balance with USB device interface
- PC with one of the following Microsoft Windows® 32-bit/64-bit operating systems: Win 7 (SP1), Win 8 or Win 10
- Administrator rights for installing software
- USB connection cable to connect PC to balance

Download USB driver

- 1 Connect to the internet.
- 2 Go to the site www.mt.com/labweighing-software-download.
- 3 Click **Download driver** in section **USB driver for laboratory balances**.
 - ➔ A pop-up window with interactions appears.
- 4 Click, e.g., **Open**.
 - ➔ The extract screen appears.
- 5 Extract the file **MT_Generic_USB_Serial_Port_Driver_SW_en_vx.xx.x.x.zip** to your specified location.
- 6 Right-click on the downloaded installation program **MT_Generic_USB_Serial_Port_Driver_vx.xx.x.x_Setup.exe** and select **Run as Administrator**.
- 7 If a safety warning appears, confirm windows to perform the installation.
- 8 Click **Next** and follow the installer's instructions.

Installing the balance

- 1 Switch the balance **off**.
- 2 Connect the balance to the preferred USB port on the PC.
- 3 Switch the balance **on**.

8.2 Send weight value via USB or RS232C to a PC using PC-Direct

The PC-Direct function of the balance allows you to transfer weight values from the balance to a Windows application. The weight value displayed on the balance is transferred to the cursor position in, e.g., Excel or Word.

The data is transferred via USB or via the serial RS232C interface.

The weight value is transferred without the unit.

Requirements

- PC with one of the following Microsoft Windows® 32-bit/64-bit operating systems: Win 7 (SP1), Win 8 or Win 10
- Serial interface RS232C or USB
- Administrator rights for installing the SerialPortToKeyboard software (if data transfer is via RS232C)
- Windows application, e.g., Excel
- Connection between balance and PC via RS232C or USB cable

8.2.1 PC-Direct via USB

The balance can send data (as a keyboard) to the PC used for PC applications, e.g., Excel. The balance sends the weight value without the unit to the PC.

Use the USB connection cable to connect the balance with the PC. Connect the USB cable to the USB device (type B) on the balance.

- The balance must be disconnected from the PC.

1 Tap .

2 Tap  **General configuration**.

3 Tap  **Publishing**.

➔ The screen **Publishing** appears.

4 Tap **Send value**.

➔ The screen **Send value** appears.

5 Activate the option by tapping **ON**.

6 Select the transmission mode, e.g., **Manual, stable** and confirm with ✓.

7 Tap ✓ to return to the previous screen.

8 Tap  **Devices and connectivity**.

➔ The screen **Devices and connectivity** appears.

9 Tap **USB Host**.

➔ The screen **USB Host** appears.

10 Tap **Device type**.

➔ The screen **Device type** appears.

11 Select **PC-Direct** and confirm with ✓.


12 If necessary, change the other settings, e.g., **End of line** and confirm with ✓.

13 Tap ✓ to return to the **Devices and connectivity** screen.

14 Tap  to return to the previous screen.

15 **Connect the balance to the PC.**

16 Place the sample on the weighing pan.

17 Press , the next stable weight will be sent to the cursor position of your application.

8.2.2 PC-Direct via RS232C

8.2.2.1 Installing SerialPortToKeyboard software

The operation of PC-Direct via serial port RS232C requires the installation of **SerialPortToKeyboard** on your host computer. The file **SerialPortToKeyboard** can be found on www.mt.com/labweighing-software-download. If you have any questions, please contact a METTLER TOLEDO representative.

Download SerialPortToKeyboard

- 1 Connect to the internet.
- 2 Go to the site www.mt.com/labweighing-software-download.
- 3 Click **Download Software and Instructions** in section **SerialPortToKeyboard software for Advanced and Standard level laboratory balances**.
 - ➔ A pop-up window with interactions appears.
- 4 Click, e.g., **Open**.
 - ➔ The extract screen appears.
- 5 Extract the file **SerialPortToKeyboard_V_x.xx_installer_and_instructions.zip** to your specified location.
- 6 Right-click on the downloaded installation program **SerialPortToKeyboard_V_x.xx.exe** and select **Run as Administrator**.
- 7 If a safety warning appears, confirm windows to perform the installation.
- 8 Click **Next** and follow the installer's instructions.

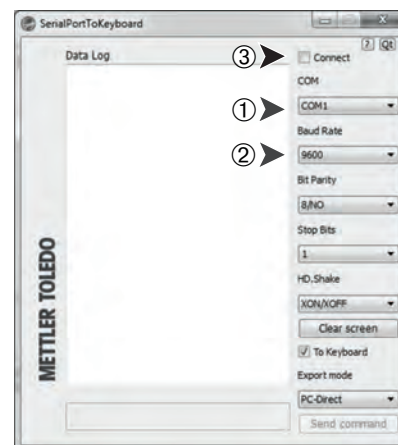
Checking operation

- 1 Start **SerialPortToKeyboard** (RS232C)
- 2 Start Excel (or another application) on the computer.
- 3 Activate a cell in Excel.

Settings on the PC







Settings for SerialPortToKeyboard

- 1 Select the serial port **COM** for the connection with the balance.
- 2 Set the **Baud Rate** to **9600**.
- 3 Activate **Connect**.
 - Closing the window terminates the session.



According to your selected **End of line** option, the displayed values will appear, e.g., in the column one after the other one in the different rows.

8.2.2.2 Settings on the balance

- The balance is connected to the computer via a RS232 cable.
- 1 Tap .
- 2 Tap  **General configuration**.
- 3 Tap  **Devices and connectivity**.
 - ➔ The screen **Devices and connectivity** appears.
- 4 Tap **RS232 (Serial)**.
- 5 Tap **Device type**.
- 6 Select **PC-Direct** and confirm with ✓.
 - ➔ The screen **RS232 (Serial)** appears.
- 7 If necessary, change the other settings, e.g., **End of line** and confirm with ✓.
- 8 Tap ✓ to confirm.
- 9 Tap  to return to the previous screen.
- 10 Tap  **Publishing**.
 - ➔ The screen **Publishing** appears.
- 11 Tap **Send value – PC-Direct (Serial)**.
 - ➔ The screen **Send value** appears.
- 12 Select the transmission mode for single values and result values, e.g., **Automatic, stable** and confirm with ✓.
- 13 Tap ✓ to confirm.
 - ➔ The screen **Publishing** appears.
- 14 Tap  to return to the previous screen.
- 15 Place the sample on the weighing pan.
 - ➔ The next stable weight will be sent automatically to the cursor position of your application.

8.3 Collecting measurement results and balance details with EasyDirect Balance


EasyDirect Balance from METTLER TOLEDO is a computer software to collect, analyze, store and export measurement results and balance details from up to 10 balances. EasyDirect Balance supports all Advanced and Standard Level Laboratory Balances and many legacy models from METTLER TOLEDO. For more information and to download a trial version of the software, please refer to www.mt.com/EasyDirectBalance.

The balance can only be connected via RS232. The balance's USB port should not be used for this purpose. When using a RS232 connection, only a limited set of data can be collected by EasyDirect Balance. Please refer to the table "Data available to EasyDirect Balance" for more details.

Connecting the balance to EasyDirect Balance

- The balance is connected to the computer via a RS232 cable.
 - The correct driver for the RS232 cable is installed on your computer.
 - EasyDirect Balance is installed on your computer.
- 1 Open EasyDirect Balance on your computer.
 - 2 In the program, click the "Help"-button.
 - ➔ The EasyDirect Balance Reference Manual opens.
 - 3 Search the EasyDirect Balance Reference Manual for your balance type.
 - 4 Configure the settings on the balance as described.
 - 5 Follow the instructions on how to add the balance to EasyDirect Balance.
 - ➔ The balance connects to EasyDirect Balance.

Collecting measurement results

- If the setting **Single values report** is set to **Automatic**, the weighing result is automatically sent to EasyDirect Balance.
- If the setting **Single values report** is set to **Manual**, tap  to send your result to EasyDirect Balance.

Data available to EasyDirect Balance













		RS232
Balance details	Balance model	✓
	Balance ID	✓
	Balance serial number	✓
	Balance capacity	✓
	Balance readability	–
	Adjustment status	–
	Service status	–
Measurement results	Gross/Tare/Net weight	✓
	Unit 1 and Unit 2 (incl. pcs, %)	✓
	Stability condition	✓
	Date and Time	✓
	Sample and task IDs	✓
	Target and tolerances	–
	Application specific results and parameters	–
Supported activities	Weighing	✓
	Counting	✓
	Percent weighing	✓
	Factor weighing	✓
	Check weighing	–
	Dynamic weighing	–
	Formulation	–
	Totaling	–
	Back-weighing	–
	Density	–
	Adjustments	–
	Routine test	–
	Repeatability test	–

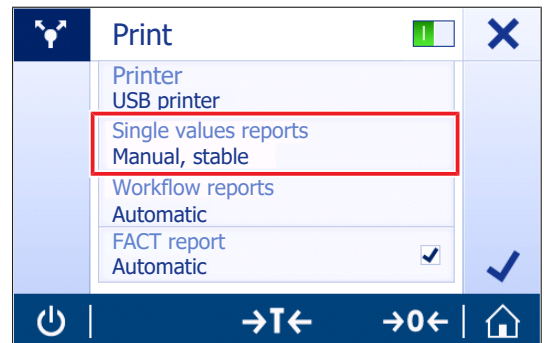
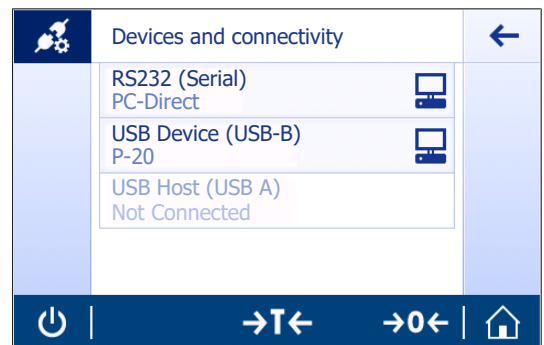
8.4 Connect via USB to a printer and print weighing results

Prerequisite

- The printer is connected to the power supply.
- Printer is switched on.
- The printer is connected to the balance via USB cable. Do not connect the printer with the balance, before it is correctly powered on.

The following example shows the option to automatically print the next stable value.

- 1 Tap .
- 2 Tap  **General configuration**.
- 3 Tap  **Devices and connectivity**.
 - ➔ The screen **Devices and connectivity** appears.
- 4 The connected USB device appears automatically.
- 5 Tap the connected printer, e.g., **P-20** and confirm with .
- 6 Tap  to confirm.
- 7 Tap  to return to the previous screen.
 - ➔ The screen **Device/service type** appears.
- 8 Tap  to return to the **General configuration** screen.
- 9 Tap  **Publishing**.
 - ➔ The screen **Publishing** appears.
- 10 Tap **Print**.
 - ➔ The screen **Print** appears.
- 11 Tap  **Single values reports**.
 - ➔ The screen **Single values reports** appears.
- 12 Select the transmission mode, e.g., **Automatic, stable** and confirm with .
- 13 Tap  to confirm.
- 14 Tap  to return to the previous screen.
- 15 Place the sample on the weighing pan.
 - ➔ The next stable weight will be sent automatically.



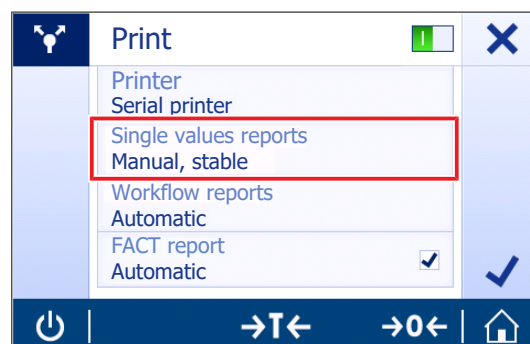
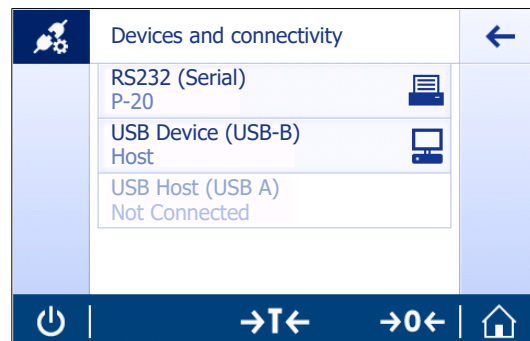
8.5 Connect via RS232 to a printer and print weighing results

Prerequisite

- The printer is connected to the power supply.
- Printer is switched on.
- The printer is connected to the balance via RS232 cable. Do not connect the printer with the balance, before it is correctly powered on.

The following example shows the option to automatically print the next stable value.

- 1 Tap .
- 2 Tap **General configuration**.
- 3 Tap **Devices and connectivity**.
 - ➔ The screen **Devices and connectivity** appears.
- 4 Tap **RS232 (Serial)**.
- 5 Tap **Device type**.
- 6 Tap the connected printer, e.g., **P-20** and confirm with .
- 7 Tap to confirm.
- 8 If necessary, change the other settings, e.g., **End of line** and confirm with .
- 9 Tap to return to the **General configuration** screen.
- 10 Tap **Publishing**.
 - ➔ The screen **Publishing** appears.
- 11 Tap **Print**.
 - ➔ The screen **Print** appears.
- 12 Tap **Printer**.
- 13 Tap **Serial printer**.
- 14 Tap to confirm.
- 15 Tap **Single values reports**.
 - ➔ The screen **Single values reports** appears.
- 16 Select the transmission mode, e.g., **Automatic, stable** and confirm with .
- 17 Tap to confirm.
- 18 Tap to return to the previous screen.
- 19 Place the sample on the weighing pan.
 - ➔ The next stable weight will be sent automatically.



8.6 Connect a USB barcode reader and scan the barcode

The following example shows how to scan the sample ID via a barcode reader.

Use the USB connection cable to connect the barcode reader to a balance.




Only the balance settings are changed for this menu item.










Refer to your barcode reader's documentation for information about the barcode reader settings.

The barcode reader must be configured as USB keyboard (with standard key encoding).

Settings on the balance





- The barcode reader is connected to the power supply (if necessary).
 - The barcode reader is connected via USB cable to the balance USB host (type A).
- 1 Tap .
 - 2 Tap  **General configuration**.
 - 3 Tap  **Devices and connectivity**.
 - ➔ The screen **Devices and connectivity** appears.
 - 4 Tap **USB Host**.
 - ➔ The input device **USB barcode-/keyboard** appears.
 - 5 Check the **End of line** setting. The setting must be the same as the barcode reader.

Typical setup to use the barcode reader

- 1 Tap .
- 2 Select an application, e.g.,  **Weighing**
- 3 Tap .
 - ➔ The screen **Weighing – Main configuration** appears.
- 4 Tap .
 - ➔ The screen **Weighing - reports configuration** appears.
- 5 Tap **Identifications**.
 - ➔ The screen **Identifications** appears.
- 6 Tap **ID 4**.
- 7 Activate **ID 4**.
- 8 Select **Input prompt** and confirm with .
- 9 Tap  to return to the previous screen.
- 10 Place the sample on the weighing pan.
- 11 Tap .
 - ➔ The screen **Sample ID** appears.
- 12 Scan the sample ID with the barcode reader.
 - ➔ The sample ID is entered on the **Sample ID** screen and the screen is then closed.

8.7 Export measurement results to a USB memory stick

Connect a USB memory stick (FAT32 formatted, high quality, if possible empty) to the USB host interface. The USB memory stick appears automatically as a new device in the Menu > **General configuration** > **Devices**.

- 1 Tap .
- 2 Tap  **General configuration**.
- 3 Tap  **Publishing**.
 - ➔ The screen **Publishing** appears.
- 4 Tap **Print**.
 - ➔ The screen **Print** appears.
- 5 Tap **Printer**.
- 6 Select **Print to file**.
- 7 Tap ✓ to confirm.
- 8 Tap **Single values reports**.
 - ➔ The screen **Single values reports** appears.
- 9 Select the transmission mode, e.g., **Automatic, stable** and confirm with ✓.
- 10 Tap ✓ to confirm.
 - ➔ The screen **Publishing** appears.
- 11 Tap ✓ to confirm.
- 12 Tap  to return to the application screen.

View exported data

- 1 Connect memory stick to PC.
- 2 Open the METTLER TOLEDO folder and then the "Reports folder".
- 3 Open the file with your relevant measurement results.

8.8 Connect an auxiliary display

Use the RS232 connection cable to connect the auxiliary display to the balance.

Settings on the balance









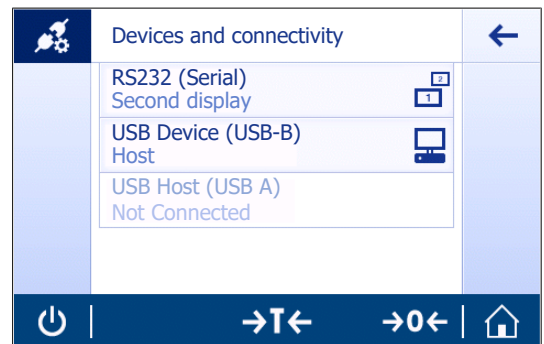
NOTICE

Damage to external device due to unsuitable voltage

Having another device than the auxiliary display connected via RS232 can damage the external device.

- Make sure that no other device than the auxiliary display is connected to the RS232 interface of the balance.

- The second display is connected to the balance.
- 1 Tap .
 - 2 Tap  **General configuration**.
 - 3 Tap  **Devices and connectivity**.
 - ➔ The screen **Devices and connectivity** appears.
 - 4 Tap **RS232 (Serial)**.
 - 5 Tap **Device type**.
 - 6 Tap  **Second display**.
 - 7 Tap  to confirm.
 - 8 Tap  to return to the previous screen.
- ➔ The weighing value is displayed on the auxiliary display.



9 Maintenance

To guarantee the functionality of the balance and the accuracy of the weighing results, a number of maintenance actions must be performed by the user.

9.1 Maintenance tasks

Maintenance action	Recommended interval	Remarks
Performing an adjustment	<ul style="list-style-type: none">• Daily• After cleaning• After leveling• After changing the location	see "Activities - Adjustments and tests"
Cleaning	<ul style="list-style-type: none">• After every use• After changing the substance• Depending on the degree of pollution• Depending on your internal regulations (SOP)	see "Cleaning"
Performing routine test / repeatability test.	<ul style="list-style-type: none">• After cleaning• After assembling the balance• Depending on your internal regulations (SOP)	see "Activities - Adjustments and tests"

See also

 Activities - Adjustments and tests ▶ Page 65

 Cleaning ▶ Page 80

9.2 Cleaning

The appropriate maintenance interval depends on your standard operating procedure (SOP).

Please contact your METTLER TOLEDO representative for details about the available service options. Regular servicing by an authorized service technician ensures constant accuracy for years to come and prolongs the service life of your instrument.

9.2.1 Disassembling balances with draft shield for cleaning



CAUTION

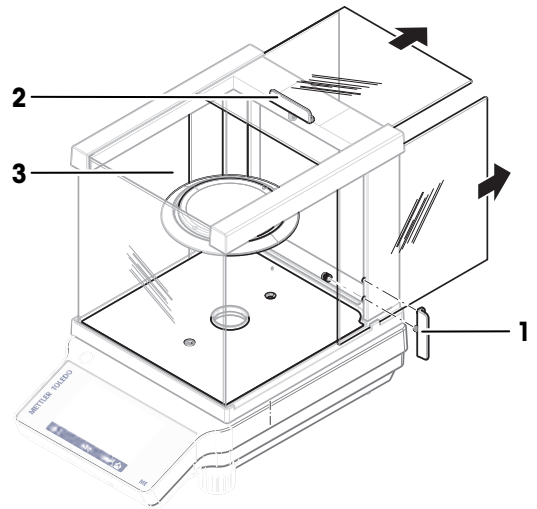
Injury due to sharp objects or broken glass

Instrument components, e.g., glass, can break and lead to injuries.

- Always proceed with focus and care.

- 1 On both side glass doors, unscrew the handles (1) and dismount them.
- 2 Push the side glass doors all the way back and dismount them.
- 3 On the top glass doors, unscrew the handle (2) and dismount it.
- 4 Push the top glass doors all the way back and dismount it.
- 5 Remove weighing pan (3).

After cleaning, reinstall all components in the reverse order. For balance mounting, refer to Assembling the balance.



9.2.2 Cleaning the balance



NOTICE

Damage due to improper cleaning

Improper cleaning can damage the load cell or other essential parts.

- 1 Do not use any cleaning agents other than the ones specified in the "Reference Manual" or "Cleaning Guide".
- 2 Do not spray or pour liquids on the instrument. Always use a moistened lint-free cloth or a tissue.
- 3 Always wipe out from inside to outside of the instrument.

Cleaning around the balance

- Remove any dirt or dust around the balance and avoid further contaminations.




Cleaning the removable parts

- Clean the removed part with a damp cloth or a tissue and a mild cleaning agent.

Cleaning the balance

- 1 Disconnect the balance from the AC/DC adapter.
- 2 Use a lint-free cloth moistened with a mild cleaning agent to clean the surface of the balance.
- 3 Remove powder or dust at first with a disposable tissue.
- 4 Remove sticky substances with a damp lint-free cloth and a mild solvent.

9.2.3 Putting into operation after cleaning

- 1 Reassemble the balance.
 - 2 If applicable: Check smooth movement of the draft shield.
 - 3 Press  to switch on the balance.
 - 4 Warm up the balance. Wait for the acclimatization before starting the tests.
 - 5 Check the level and level the balance if necessary.
 - 6 Perform an internal adjustment.
 - 7 Perform a routine test according to the internal regulations of your company. METTLER TOLEDO recommends to perform a repeatability test after cleaning the balance.
 - 8 Press   to zero the balance.
- ➔ The balance has been put into operation and is ready to use.

10 Troubleshooting

Possible errors with their cause and remedy are described in the following chapter. If there are errors that cannot be corrected through these instructions, contact METTLER TOLEDO.

10.1 Error messages

Error message	Possible cause	Diagnostic	Remedy
NO STABILTY	Vibrations at the workplace.	Place beaker with tap water on the weighing table. Vibrations cause ripples on the water surface.	<ul style="list-style-type: none"> Protect weighing location against vibrations (vibration absorber, etc.). Set weighing parameters coarser (change Environment from Stable to Standard or even Unstable). Find a different weighing location (by agreement with customer).
	Draft due to untight draft shield and /or open window.	Make sure draft shield or window is closed.	<ul style="list-style-type: none"> Close draft shield or window. Set weighing parameters coarser (change Environment from Stable to Standard or even Unstable).
	The location is not suitable for weighing.	–	Check and observe the requirements for the location, refer to "Selecting the location".
	Something is touching the weighing pan.	Check for touching parts or dirt.	Remove touching parts or clean the balance.
Adjustment aborted Weight out of range.	Wrong adjustment weight.	Check weight.	Place correct weight on the weighing pan.
EEPROM error.	Data in EEPROM damaged.	–	Please contact your METTLER TOLEDO-Support representative.
Wrong cell data.	Defect load cell data.	–	Please contact your METTLER TOLEDO-Support representative.
No standard adjustment.	–	–	Please contact your METTLER TOLEDO-Support representative.
Program memory defect.	–	–	Please contact your METTLER TOLEDO-Support representative.

Error message	Possible cause	Diagnostic	Remedy
Temperature sensor defect.	AC/DC adapter connected to power before connecting to the balance. Temperature sensor of load cell defect.	–	Remove the AC/DC adapter from the power and connect first to the balance before connecting to the power if persist please contact your METTLER TOLEDO-Support representative.
Wrong load cell brand.	Wrong load cell installed.	–	Please contact your METTLER TOLEDO-Support representative.
Wrong type data set.	Wrong type data set.	–	Please contact your METTLER TOLEDO-Support representative.
Memory full	Memory full.	–	Clear the memory by finishing all applications where a measurement is ongoing.
A problem occurred while starting the balance. Some data could not be read correctly from memory. Please proceed and check date and time settings. Please contact your MT-Support representative if the problem persists.	Some data could not be read correctly from memory.	Check date and time settings.	Please contact your METTLER TOLEDO-Support representative if the problem persists.
A problem occurred while starting the balance. Some data could not be read correctly from memory. The instrument will reset and restart. Please contact your MT-Support representative if the problem persists.	Some data could not be read correctly from memory.	–	Please contact your METTLER TOLEDO-Support representative.
Weight out of initial zero range	Wrong weighing pan. Pan is missing. Pan is not empty.	Check weighing pan.	Mount correct weighing pan or unload weighing pan.
Weight out of zero range	Zero range limit overrun or underrun.	–	Reduce / increase weight on weighing pan.
Weight out of tare range	Tare range limit overrun or underrun.	–	Reduce / increase weight on weighing pan.
Battery backup lost	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 (full capacity after 2 days of charging).	If battery cannot be recharged, contact your METTLER TOLEDO-Support representative.

Error message	Possible cause	Diagnostic	Remedy
USB device is not recognized when connected to balance	Fluctuation in the external electric grid. Interference from power line.	–	Restart balance.


10.2 Error symptoms


Error symptom	Possible cause	Diagnostic	Remedy
Display is dark	Instrument is switched off.	–	Switch on the instrument.
	Power plug not connected.	Check	Connect power cable to power supply.
	Power supply not connected to balance.	Check	Connect power supply.
	Power supply is faulty.	Check/test	Replace power supply.
	Wrong power supply.	Check that input data on type plate match the power supply values.	Use proper power supply.
	Balance must be restarted.	–	Restart balance.
	Connector socket on balance is corroded or faulty.	Check	Please contact your METTLER TOLEDO-Support representative.
Touch display is not responding	Display is faulty.	Replace display.	Please contact your METTLER TOLEDO-Support representative.
	Touch display is faulty.	Replace display.	Please contact your METTLER TOLEDO-Support representative.
Touch display is partly not responding	Touch display is not correctly adjusted.	–	Perform touch screen adjustment. Reset balance (factory reset).
The value drifts into plus or minus	Room, environment not suitable.	–	Environmental recommendations <ul style="list-style-type: none"> • Windowless, non air-conditioned room, e.g., basement. • Only one person in the weighing room. • Sliding doors. Standard doors cause pressure changes. • No draft in weighing room (check with suspended threads). • No air conditioning (temperature oscillates, draft). • Acclimatize balance, take dummy measurements.

Error symptom	Possible cause	Diagnostic	Remedy
			<ul style="list-style-type: none"> Instrument uninterruptedly connected to the power supply (24h per day).
	Direct sunlight or other heat source.	Is any sun shade (blinds, curtains, etc.) available?	Select location according to "Selecting the location" (customer responsibility).
	Weighing sample absorbs moisture or evaporates moisture.	<ul style="list-style-type: none"> Is the weighing result with a test weight stable? Sensitive weighing samples, e.g., paper, cardboard, wood, plastic, rubber, liquids. 	<ul style="list-style-type: none"> Use aids. Cover weighing sample.
	Weighing sample is electrostatically charged.	<ul style="list-style-type: none"> Is the weighing result with a test weight stable? Sensitive weighing samples, e.g., plastic, powder, insulating materials. 	<ul style="list-style-type: none"> Increase air humidity in weighing chamber (45% - 50%). Use ionizer.
	Weighing sample is hotter or colder than the air in the weighing chamber.	Weighing operation with test weight does not show this effect.	Bring weighing sample to room temperature before weighing.
	Instrument has not yet reached thermal equilibrium.	<ul style="list-style-type: none"> Was there a power outage? Was power supply disconnected? 	<ul style="list-style-type: none"> Acclimatize instrument for at least 1 hour. Depending on climatic conditions, extend this period accordingly. Instrument switched on for at least 1 hour, refer to "General data"
Display shows overload or underload	The weight on the weighing pan exceeds the weighing capacity of the instrument.	Check weight.	Reduce the weight on the weighing pan.
	Wrong weighing pan.	Slightly lift or press weighing pan. The weight display appears.	Use proper weighing pan.
	No weighing pan.	–	Install weighing pan.
	Incorrect zero point at switch-on.	–	<ul style="list-style-type: none"> Switch off balance. Disconnect and reconnect power cable.

10.3 Status messages/Status icons

The status icons indicate the following:

Icon	Status description	Diagnostic	Remedy
	Automatic FACT adjustment is currently not possible.	Instrument is busy.	<ul style="list-style-type: none"> Unload the balance. Do not press any key for 2 minutes. The display stabilizes.

Icon	Status description	Diagnostic	Remedy
	Service due.	–	Please contact your METTLER TOLEDO-Support representative.

10.4 Putting into operation after fixing an error


After fixing an error, perform the following steps to put the balance into operation:

- Ensure that the balance is completely reassembled and cleaned.
- Reconnect the balance to the AC/DC adapter.


11 Technical Data

11.1 General data

Standard power supply

AC/DC adapter:	Input: 100 – 240 V AC \pm 10%, 50 – 60 Hz, 0.5 A, 24 – 34 VA Output: 12 V DC, 1.0 A, LPS (Limited Power Source)
Polarity:	
Balance power consumption:	12 V DC, 0.6 A
Mean sea level:	Can be used up to 2000 m above mean sea level If the balance is used above 2000 m mean sea level, the optional power supply must be used.

Optional power supply

AC/DC adapter:	Input: 100 – 240 V AC \pm 10%, 50 – 60 Hz, 0.8 A, 60 – 80 VA Output: 12 V DC, 2.5 A, LPS (Limited Power Source)
Cable for AC/DC adapter:	3-core, with country-specific plug
Polarity:	
Balance power consumption:	12 V DC, 0.6 A
Mean sea level:	Can be used up to 4000 m 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:	Use only indoors in dry locations

Environmental conditions

Height above mean sea level:	Up to 2000 m (standard power supply) Up to 4000 m (optional power supply)
Ambient temperature:	Operating conditions for ordinary lab application: +10 °C to +30 °C (operability guaranteed between +5 °C and +40 °C)
Relative air humidity:	Max. 80% up to 31 °C, linearly decreasing to 50% at 40 °C, non-condensing
Warm-up time:	At least 30 minutes (60 minutes for 0.1 mg models) after connecting the balance to the power supply. When switched on from standby, the instrument is ready for operation immediately.

Materials

Housing:	Top Housing: ABS Bottom housing: Die-cast aluminum
Weighing pan:	∅ 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:	ABS, glass
Protective cover:	PET
TFT touch screen surface:	Glass

11.2 Model-specific data

11.2.1 Balances with a readability of 0.1 mg with draft shield

	ME54T	ME54TE
Limit values		
Capacity	52 g	52 g
Nominal load	50 g	50 g
Readability	0.1 mg	0.1 mg
Repeatability (at 5% load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Eccentricity deviation (at test load)	0.4 mg (20 g)	0.4 mg (20 g)
Sensitivity offset (at nominal load) ¹⁾	0.8 mg	0.8 mg
Sensitivity temperature drift ²⁾	0.0002%/°C	0.0002%/°C
Typical values		
Repeatability (at 5% load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Eccentricity deviation (at test load)	0.12 mg (20 g)	0.12 mg (20 g)
Sensitivity offset (at nominal load) ¹⁾	0.16 mg	0.16 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	160 mg	160 mg
Minimum weight (tolerance = 1%) ³⁾	16 mg	16 mg
Settling time	2 s	2 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan diameter	90 mm	90 mm
Usable height of draft shield	238 mm	238 mm
Balance weight	5.6 kg	5.3 kg
Weights for routine testing		
Weights (OIML class)	2 g (F2)/ 50 g (F2)	2 g (F2)/ 50 g (F2)
Weights (ASTM class)	2 g (ASTM 1)/ 50 g (ASTM 1)	2 g (ASTM 1)/ 50 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME104T	ME104TE
Limit values		
Capacity	120 g	120 g
Nominal load	100 g	100 g
Readability	0.1 mg	0.1 mg
Repeatability (at 5% load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Eccentricity deviation (at test load)	0.4 mg (50 g)	0.4 mg (50 g)
Sensitivity offset (at nominal load) ¹⁾	0.8 mg	0.8 mg
Sensitivity temperature drift ²⁾	0.0002%/°C	0.0002%/°C
Typical values		
Repeatability (at 5% load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Eccentricity deviation (at test load)	0.12 mg (50 g)	0.12 mg (50 g)
Sensitivity offset (at nominal load) ¹⁾	0.2 mg	0.2 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	160 mg	160 mg
Minimum weight (tolerance = 1%) ³⁾	16 mg	16 mg
Settling time	2 s	2 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan diameter	90 mm	90 mm
Usable height of draft shield	238 mm	238 mm
Balance weight	5.6 kg	5.3 kg
Weights for routine testing		
Weights (OIML class)	5 g (F2)/ 100 g (F2)	5 g (F2)/ 100 g (F2)
Weights (ASTM class)	5 g (ASTM 1)/ 100 g (ASTM 1)	5 g (ASTM 1)/ 100 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME204T	ME204TE
Limit values		
Capacity	220 g	220 g
Nominal load	200 g	200 g
Readability	0.1 mg	0.1 mg
Repeatability (at 5% load)	0.1 mg	0.1 mg
Linearity deviation	0.2 mg	0.2 mg
Eccentricity deviation (at test load)	0.4 mg (100 g)	0.4 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	1 mg	1 mg
Sensitivity temperature drift ²⁾	0.0002%/°C	0.0002%/°C
Typical values		
Repeatability (at 5% load)	0.08 mg	0.08 mg
Linearity deviation	0.06 mg	0.06 mg
Eccentricity deviation (at test load)	0.12 mg (100 g)	0.12 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	0.24 mg	0.24 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	160 mg	160 mg
Minimum weight (tolerance = 1%) ³⁾	16 mg	16 mg
Settling time	2 s	2 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 344 × 344 mm	210 × 344 × 344 mm
Weighing pan diameter	90 mm	90 mm
Usable height of draft shield	238 mm	238 mm
Balance weight	5.6 kg	5.3 kg
Weights for routine testing		
Weights (OIML class)	10 g (F2)/ 200 g (F2)	10 g (F2)/ 200 g (F2)
Weights (ASTM class)	10 g (ASTM 1)/ 200 g (ASTM 1)	10 g (ASTM 1)/ 200 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

11.2.2 Balances with a readability of 1 mg with draft shield

	ME103T	ME103TE
Limit values		
Capacity	120 g	120 g
Nominal load	100 g	120 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (50 g)	4 mg (50 g)
Sensitivity offset (at nominal load) ¹⁾	9 mg	9 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (50 g)	1.5 mg (50 g)
Sensitivity offset (at nominal load) ¹⁾	3 mg	3 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	5 g (F2)/ 100 g (F2)	5 g (F2)/ 100 g (F2)
Weights (ASTM class)	5 g (ASTM 1)/ 100 g (ASTM 1)	5 g (ASTM 1)/ 100 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME203T	ME203TE
Limit values		
Capacity	220 g	220 g
Nominal load	200 g	200 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (100 g)	4 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	12 mg	12 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (100 g)	1.5 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	4 mg	4 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	10 g (F2)/ 200 g (F2)	10 g (F2)/ 200 g (F2)
Weights (ASTM class)	10 g (ASTM 1)/ 200 g (ASTM 1)	10 g (ASTM 1)/ 200 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME303T	ME303TE
Limit values		
Capacity	320 g	320 g
Nominal load	300 g	300 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (100 g)	4 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	15 mg	15 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (100 g)	1.5 mg (100 g)
Sensitivity offset (at nominal load) ¹⁾	5 mg	5 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	10 g (F2)/ 200 g (F2)	10 g (F2)/ 200 g (F2)
Weights (ASTM class)	10 g (ASTM 1)/ 200 g (ASTM 1)	10 g (ASTM 1)/ 200 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME403T	ME403TE
Limit values		
Capacity	420 g	420 g
Nominal load	400 g	400 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (200 g)	4 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	15 mg	15 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (200 g)	1.5 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	5 mg	5 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	20 g (F2)/ 200 g (F2)	20 g (F2)/ 200 g (F2)
Weights (ASTM class)	20 g (ASTM 1)/ 200 g (ASTM 1)	20 g (ASTM 1)/ 200 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME503T	ME503TE
Limit values		
Capacity	520 g	520 g
Nominal load	500 g	500 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (200 g)	4 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	15 mg	15 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (200 g)	1.5 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	8 mg	8 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	20 g (F2)/ 500 g (F2)	20 g (F2)/ 500 g (F2)
Weights (ASTM class)	20 g (ASTM 1)/ 500 g (ASTM 1)	20 g (ASTM 1)/ 500 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME603T	ME603TE
Limit values		
Capacity	620 g	620 g
Nominal load	600 g	600 g
Readability	1 mg	1 mg
Repeatability (at 5% load)	1 mg	1 mg
Linearity deviation	2 mg	2 mg
Eccentricity deviation (at test load)	4 mg (200 g)	4 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	15 mg	15 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	0.7 mg	0.7 mg
Linearity deviation	0.6 mg	0.6 mg
Eccentricity deviation (at test load)	1.5 mg (200 g)	1.5 mg (200 g)
Sensitivity offset (at nominal load) ¹⁾	8 mg	8 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	1.4 g	1.4 g
Minimum weight (tolerance = 1%) ³⁾	140 mg	140 mg
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	210 × 319 × 289 mm	210 × 319 × 289 mm
Weighing pan diameter	120 mm	120 mm
Usable height of draft shield	172.6 mm	172.6 mm
Balance weight	5.2 kg	5 kg
Weights for routine testing		
Weights (OIML class)	20 g (F2)/ 500 g (F2)	20 g (F2)/ 500 g (F2)
Weights (ASTM class)	20 g (ASTM 1)/ 500 g (ASTM 1)	20 g (ASTM 1)/ 500 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

11.2.3 Balances with a readability of 10 mg / 100 mg

	ME1002T	ME1002TE
Limit values		
Capacity	1200 g	1200 g
Nominal load	1000 g	1200 g
Readability	10 mg	10 mg
Repeatability (at 5% load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	30 mg (500 g)	30 mg (500 g)
Sensitivity offset (at nominal load) ¹⁾	60 mg	60 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	10 mg (500 g)	10 mg (500 g)
Sensitivity offset (at nominal load) ¹⁾	30 mg	30 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	50 g (F2)/ 1000 g (F2)	50 g (F2)/ 1000 g (F2)
Weights (ASTM class)	50 g (ASTM 1)/ 1000 g (ASTM 1)	50 g (ASTM 1)/ 1000 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME2002T	ME2002TE
Limit values		
Capacity	2.2 kg	2.2 kg
Nominal load	2 kg	2 kg
Readability	10 mg	10 mg
Repeatability (at 5% load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	30 mg (1000 g)	30 mg (1000 g)
Sensitivity offset (at nominal load) ¹⁾	60 mg	60 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	10 mg (1000 g)	10 mg (1000 g)
Sensitivity offset (at nominal load) ¹⁾	40 mg	40 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	100 g (F2)/ 2000 g (F2)	100 g (F2)/ 2000 g (F2)
Weights (ASTM class)	100 g (ASTM 1)/ 2000 g (ASTM 1)	100 g (ASTM 1)/ 2000 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME3002T	ME3002TE
Limit values		
Capacity	3.2 kg	3.2 kg
Nominal load	3 kg	3 kg
Readability	10 mg	10 mg
Repeatability (at 5% load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	40 mg (1000 g)	40 mg (1000 g)
Sensitivity offset (at nominal load) ¹⁾	60 mg	60 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	15 mg (1000 g)	15 mg (1000 g)
Sensitivity offset (at nominal load) ¹⁾	40 mg	40 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	100 g (F2)/ 2000 g (F2)	100 g (F2)/ 2000 g (F2)
Weights (ASTM class)	100 g (ASTM 1)/ 2000 g (ASTM 1)	100 g (ASTM 1)/ 2000 g (ASTM 1)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME4001T	ME4001TE
Limit values		
Capacity	4.2 kg	4.2 kg
Nominal load	4 kg	4 kg
Readability	100 mg	100 mg
Repeatability (at 5% load)	100 mg	100 mg
Linearity deviation	200 mg	200 mg
Eccentricity deviation (at test load)	100 mg (2000 g)	100 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	160 mg	160 mg
Sensitivity temperature drift ²⁾	0.0005%/°C	0.0005%/°C
Typical values		
Repeatability (at 5% load)	70 mg	70 mg
Linearity deviation	70 mg	70 mg
Eccentricity deviation (at test load)	250 mg (2000 g)	250 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	80 mg	80 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	140 g	140 g
Minimum weight (tolerance = 1%) ³⁾	14 g	14 g
Settling time	1 s	1 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	200 g (F2)/ 2000 g (F2)	200 g (F2)/ 2000 g (F2)
Weights (ASTM class)	200 g (ASTM 4)/ 2000 g (ASTM 4)	200 g (ASTM 4)/ 2000 g (ASTM 4)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME4002T	ME4002TE
Limit values		
Capacity	4.2 kg	4.2 kg
Nominal load	4 kg	4 kg
Readability	10 mg	10 mg
Repeatability (at 5% load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	40 mg (2000 g)	40 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	80 mg	80 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	15 mg (2000 g)	15 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	50 mg	50 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	200 g (F2)/ 2000 g (F2)	200 g (F2)/ 2000 g (F2)
Weights (ASTM class)	200 g (ASTM 4)/ 2000 g (ASTM 4)	200 g (ASTM 4)/ 2000 g (ASTM 4)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME5002T	ME5002TE
Limit values		
Capacity	5.2 kg	5.2 kg
Nominal load	5 kg	5 kg
Readability	10 mg	10 mg
Repeatability	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	40 mg (2000 g)	40 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	100 mg	100 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	15 mg (2000 g)	15 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	80 mg	80 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	200 g (F2)/ 5000 g (F2)	200 g (F2)/ 5000 g (F2)
Weights (ASTM class)	200 g (ASTM 4)/ 5000 g (ASTM 4)	200 g (ASTM 4)/ 5000 g (ASTM 4)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

³⁾ determined at 5% load, k = 2

	ME6002T	ME6002TE
Limit values		
Capacity	6.2 kg	6.2 kg
Nominal load	6 kg	6 kg
Readability	10 mg	10 mg
Repeatability (at 5% load)	10 mg	10 mg
Linearity deviation	20 mg	20 mg
Eccentricity deviation (at test load)	60 mg (2000 g)	60 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	100 mg	100 mg
Sensitivity temperature drift ²⁾	0.0003%/°C	0.0003%/°C
Typical values		
Repeatability (at 5% load)	7 mg	7 mg
Linearity deviation	6 mg	6 mg
Eccentricity deviation (at test load)	20 mg (2000 g)	15 mg (2000 g)
Sensitivity offset (at nominal load) ¹⁾	80 mg	80 mg
Minimum weight (USP, tolerance = 0.10%) ³⁾	14 g	14 g
Minimum weight (tolerance = 1%) ³⁾	1.4 g	1.4 g
Settling time	1.5 s	1.5 s
Adjustment	Internal / FACT	External
Dimensions & other specifications		
Balance dimensions (W × D × H)	200 × 319 × 100 mm	200 × 319 × 100 mm
Weighing pan dimensions	180 × 180 mm	180 × 180 mm
Balance weight	3.7 kg	3.4 kg
Weights for routine testing		
Weights (OIML class)	200 g (F2)/ 5000 g (F2)	200 g (F2)/ 2000 g (F2)
Weights (ASTM class)	200 g (ASTM 4)/ 5000 g (ASTM 4)	200 g (ASTM 4)/ 2000 g (ASTM 4)

¹⁾ after sensitivity adjustment

²⁾ In the temperature range +10 °C – +30 °C

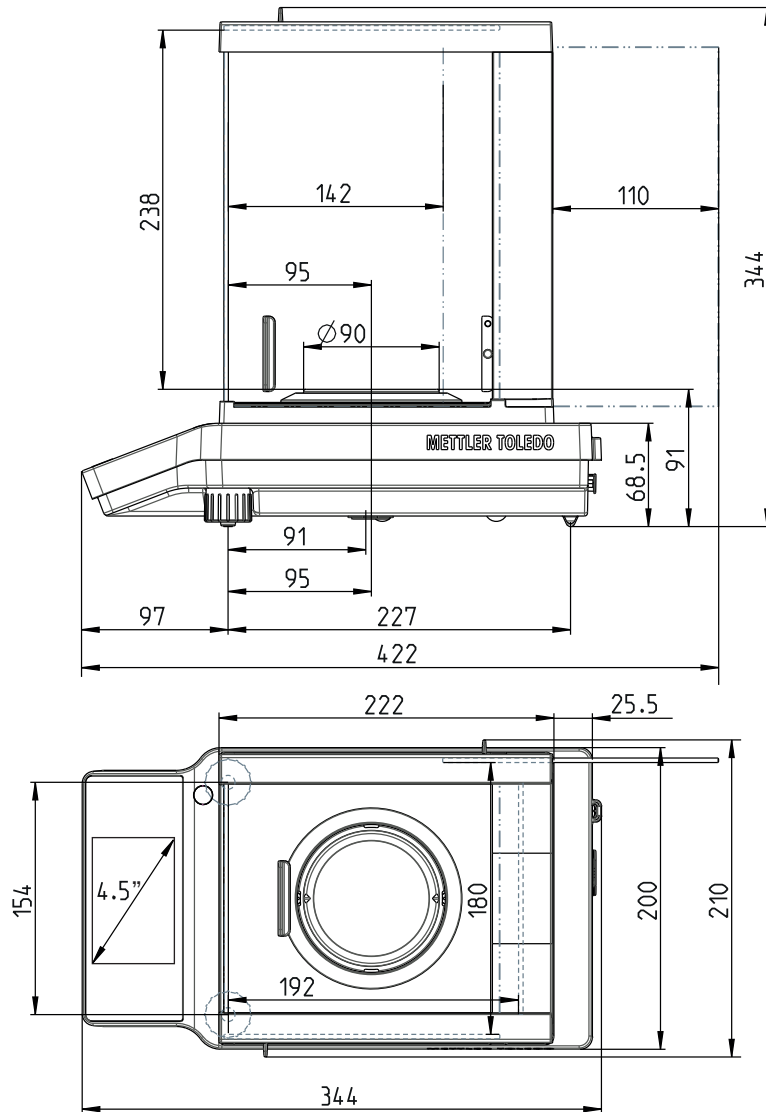
³⁾ determined at 5% load, k = 2

11.3 Dimensions

11.3.1 Balances with a readability of 0.1 mg with draft shield high

Models:

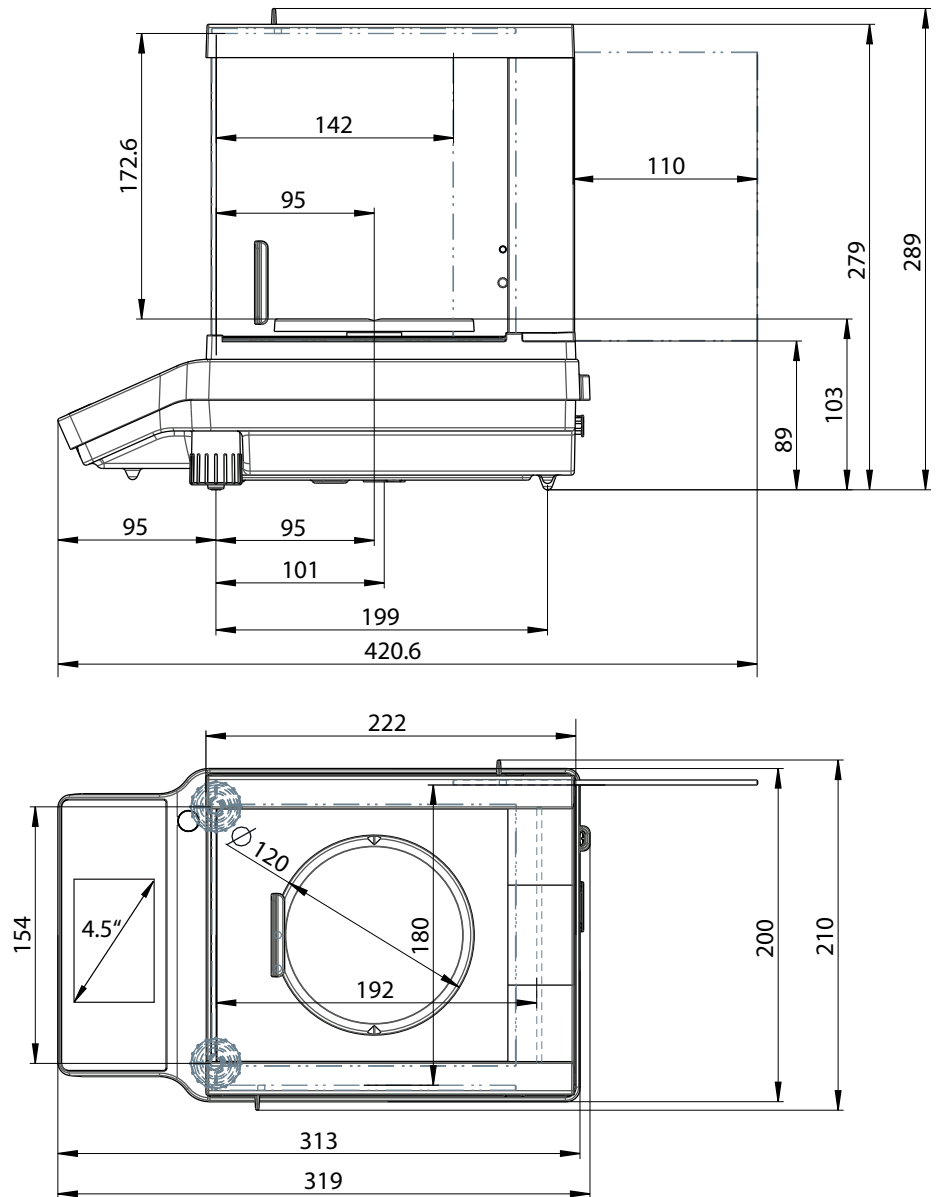
ME54T
ME54TE
ME104T
ME104TE
ME204T
ME204TE



11.3.2 Balances with a readability of 1 mg with draft shield low

Models:

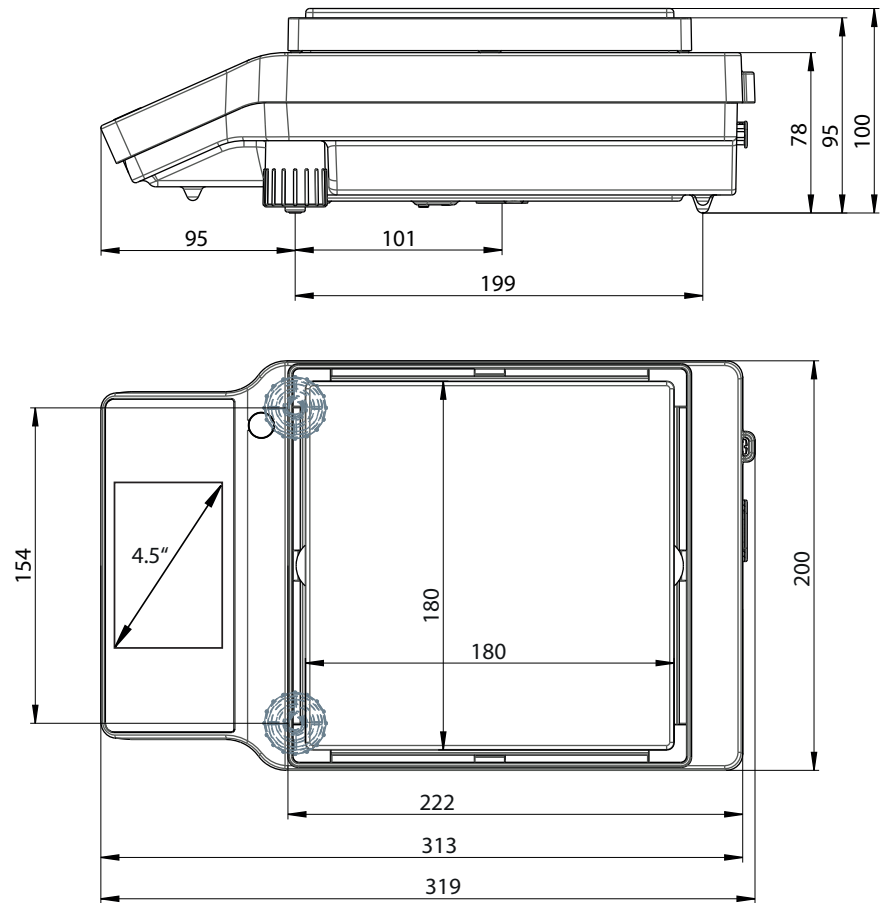
- ME103T
- ME103TE
- ME203T
- ME203TE
- ME303T
- ME303TE
- ME403T
- ME403TE
- ME503T
- ME503TE
- ME603T
- ME603TE



11.3.3 Balances with a readability of 10 mg / 100 mg

Models:

- ME1002T
- ME1002TE
- ME2002T
- ME2002TE
- ME3002T
- ME3002TE
- ME4001T
- ME4001TE
- ME4002T
- ME4002TE
- ME5002T
- ME5002TE
- ME6002T



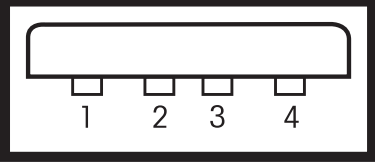
11.4 Interface specifications

11.4.1 RS232C interface

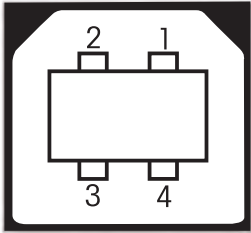
Each balance is equipped with a RS232C Interface as standard for the attachment of a peripheral device, e.g., a printer or a computer.

Schematic	Item	Specification
	Interface type	Voltage interface according to EIA RS232C/ 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)

11.4.2 USB-A port

Schematic	Item	Specification	
	Standard	In conformity with USB specifications revision 2.0	
	Speed	Full-speed 12 Mbps (requires shielded cable)	
	Power usage	Max. 500 mA	
	Connector	Type A	
	Pin assignment	1	VBUS (+5 V DC)
		2	D- (Data -)
3		D+ (Data +)	
4		GND (Ground)	
Shell	Shield		

11.4.3 USB-B port

Schematic	Item	Specification										
 <table border="1" data-bbox="357 1034 643 1200"> <tr> <td>1</td> <td>VBUS (+5 VDC)</td> </tr> <tr> <td>2</td> <td>D- (Data -)</td> </tr> <tr> <td>3</td> <td>D+ (Data +)</td> </tr> <tr> <td>4</td> <td>GND (Ground)</td> </tr> <tr> <td>Shield</td> <td>Shield</td> </tr> </table>	1	VBUS (+5 VDC)	2	D- (Data -)	3	D+ (Data +)	4	GND (Ground)	Shield	Shield	Standard	In conformity with USB specifications revision 2.0
	1	VBUS (+5 VDC)										
	2	D- (Data -)										
	3	D+ (Data +)										
	4	GND (Ground)										
	Shield	Shield										
Speed	Full-speed 12 Mbps (requires shielded cable)											
Function	CDC (Communication Device Class) serial port emulation											
Power usage	Suspended device: Max 10 mA											
Connector	Type B											

11.4.4 MT-SICS interface commands and functions

Many of the instruments and balances used have to be able to integrate into a complex computer or data acquisition system.

To easily integrate a balance into a system and utilize its capacity to the full extent, most balance functions are also available as corresponding commands via the data interface.

All new METTLER TOLEDO balances launched on the market support "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.








Refer to the MT-SICS Reference Manual.

► www.mt.com/library


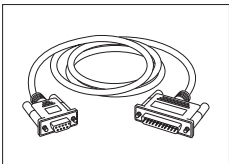
12 Accessories and Spare Parts

12.1 Accessories

	Description	Order no.
Printers		
	RS-P25 printer with RS232C connection to instrument	30702967
	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-P26/01 (EMEA) printer with RS232C 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-P26/02 (Asia-Pacific) printer with RS232C connection to instrument (with date and time)	11124313
	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-P26/03 (Northern America) printer with RS232C connection to instrument (with date and time)	11124323
	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-P28/01 (EMEA) printer with RS232C 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
	RS-P28/02 (Asia-Pacific) printer with RS232C connection to instrument (with date, time and applications)	11124314
	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-P28/03 (Northern America) printer with RS232C connection to instrument (with date, time and applications)	11124324
	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
	USB-P25 printer with USB connection to instrument	30702998
	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
	P-52RUE dot matrix printer RS232C, USB and Ethernet connections, simple print-outs	30237290
	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
	P-56RUE thermal printer with RS232C, USB and Ethernet connections, simple print-outs, date and time	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
	P-58RUE thermal printer with RS232C, USB and Ethernet connections, simple print-outs, date and time, label printing, balance applications, e.g., 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
	Dimension of the label 56×18 mm	

Cables for RS232C interfaces

	RS9 connection cable (to connect the instrument to a PC) Length: 1 m	11101051
	RS9 – RS25 (m/f): connection cable for PC, length = 2 m	11101052



USB-RS232 cable (to connect a balance via RS232C to a USB port)

64088427

Cables for USB interface



USB 2.0 High-speed cable to connect balance with PC (USB A to USB B), length = 1 m

30241476

Wireless interfaces



Bluetooth RS232C serial adapter ADP-BT-S

30086494

For wireless connection between:

- instrument and computer (depending on the instrument model)
- printer and instrument



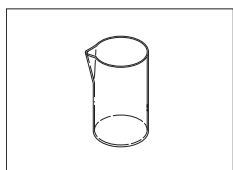
Bluetooth RS232C serial adapter ADP-BT-P, set of 2 pcs

30086495

For wireless connection between:

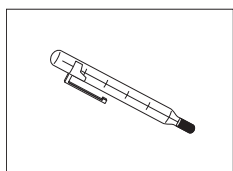
- Instrument and PC (depending on the instrument model)
- Printer and instrument

Density determination



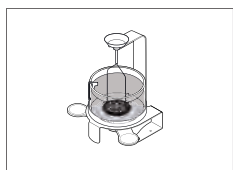
Glass beaker, height 100 mm, \varnothing 60 mm

00238166



Calibrated thermometer with certificate

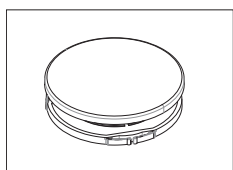
11132685



Density Kit Advanced & Standard for balance models with a readability of 0.1 mg / 1 mg

30535760

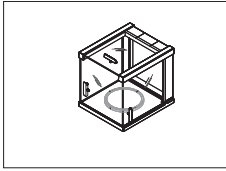
Weighing pans



Set of weighing pan \varnothing 160 mm with pan support for balances with readability of 10 mg and 100 mg using draft shield

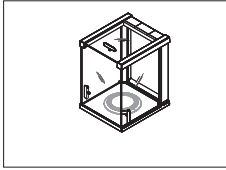
30042896

Draft shields



- Draft shield low with sliding doors, usable height 170 mm.
- for balances 0.1 mg or 1 mg
 - for balances 10 mg or 100 mg, weighing pan \varnothing 160 mm is needed (#30042896)

30042884



- Draft shield high with sliding doors, usable height 235 mm
- for balances 10 mg or 1 mg
 - for balances 10 mg or 100 mg, weighing pan \varnothing 160 mm is needed (#30042896)

30037731

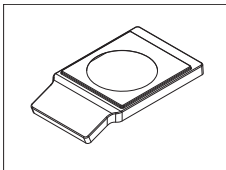
Auxiliary displays



RS232C auxiliary display AD-RS-M7

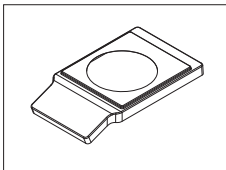
12122381

Protective covers



Protective cover for models with readability of 0.01 mg / 0.1 mg

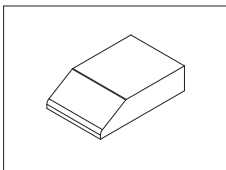
30241549



Protective cover for models with readability of 1 mg ...0.1 g

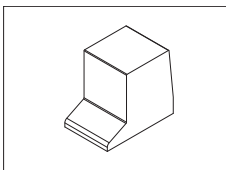
30241560

Dust covers



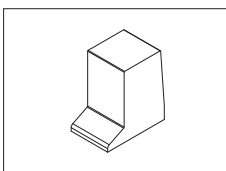
Dust cover for models without draft shield

30029051



Dust cover for models with draft shield low (170 mm)

30029050



Dust cover for models with draft shield high (235 mm)

30029049

Anti-theft devices



Anti-theft cable with lock

11600361

Software



EasyDirect Balance is an application software to collect, analyze, store and export balance measurement and device data on PC.

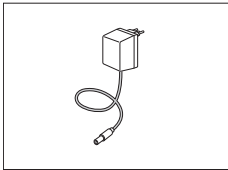
License EasyDirect Balance for 10 Instruments

30540473

License EasyDirect Balance for 3 Instruments

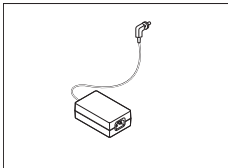
30539323

Various



AC/DC universal adapter (EU, USA, AU, UK) 100–240 VAC, 50/60 Hz, 0.5 A, 12 VDC 1 A

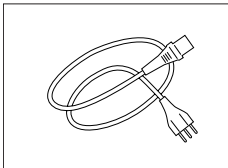
11120270



AC/DC adapter (without power cable)

11107909

- Input: 100 – 240 V AC, 50/60 Hz, 0.8 A
- Output: 12 V DC, 2.5 A



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

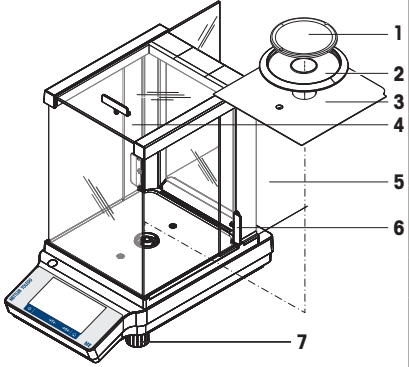
Adjustment weights



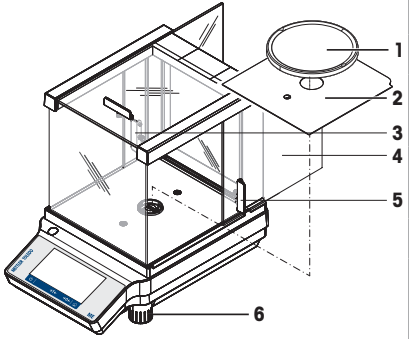
OIML / ASTM Weights (with calibration certificate)
see www.mt.com/weights

12.2 Spare parts

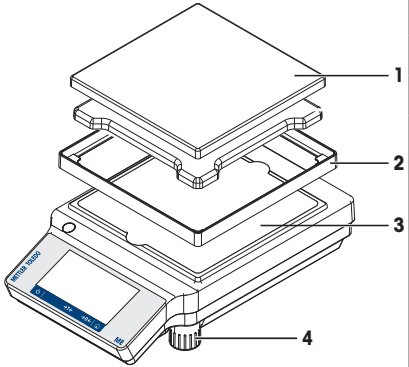
Balances with readability of 0.1 mg, with draft shield (235 mm)

Drawing	Pos	Description	Part No.
	1	Weighing pan \varnothing 90 mm	30037737
	2	Draft shield element	12122043
	3	Bottom plate	30037739
	4	Top glass door (for draft shield high or low)	30037733
	5	Side glass door (pair with mounted handles)	30037732
	6	Pair of handles	30037736
	7	Leveling foot	30037744

Balances with readability of 1 mg, with draft shield (170 mm)

Drawing	Pos	Description	Part No.
	1	Weighing pan \varnothing 120 mm	30042889
	2	Bottom plate	30037739
	3	Top glass door (for draft shield high or low)	30037733
	4	Side glass door (pair with mounted handles)	30042885
	5	Pair of handles	30037736
	6	Leveling foot	30037744

Balances with readability of 10 mg and 100 mg with square weighing pan and draft shield element

Drawing	Pos	Description	Part No.
	1	Weighing pan 180 x 180 mm	30535713
	2	Draft shield element 180 x 180 mm	30042897
	3	Bottom plate	30042901
	4	Leveling foot	30037744

13 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, the content of this regulation must also be related.

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GWP®

Good Weighing Practice™

GWP® is the global weighing standard, ensuring consistent accuracy of weighing processes, applicable to all equipment from any manufacturer. It helps to:

- Choose the appropriate balance or scale
- Calibrate and operate your weighing equipment with security
- Comply with quality and compliance standards in laboratory and manufacturing

 www.mt.com/GWP

www.mt.com/balances

For more information

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www.mt.com/contact

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