

1 Safety Information

1.1 Definition of signal warnings and symbols

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

WARNING	for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.
CAUTION	for a hazardous situation with low risk, resulting in damage to the device or the property or in loss of data, or minor or medium injuries if not avoided.
Attention	(no symbol) for important information about the product.
Note	(no symbol) for useful information about the product.



General hazard



Electrical shock

1.2 Product safety information

Intended use

Your balance is used for weighing. Use the balance exclusively for this purpose. Any other type of use and operation beyond the limits of technical specifications without written consent from Mettler-Toledo GmbH, is considered as not intended.



It is not permitted to use the instrument in explosive atmosphere of gases, steam, fog, dust and flammable dust (hazardous environments).

General safety information

This balance complies with current industry standards and the recognized safety regulations; however, it can constitute a hazard in use. Do not open the balance housing: The balance contains no user-serviceable parts. In the event of problems, please contact a METTLER TOLEDO representative.

Always operate and use your instrument only in accordance with the instructions contained in this manual. The instructions for setting up your new instrument must be strictly observed.

If the instrument is not used according to these Operating Instructions, protection of the instrument may be impaired and METTLER TOLEDO assumes no liability.

Staff safety

These operating instructions must be read and understood before using the balance. These operating instructions must be retained for future reference.

The balance must not be altered or modified in any way. Only use METTLER TOLEDO original spare parts and accessories.

Safety notes



CAUTION

Damage to the balance

- 1 Only use indoors in dry locations.
- 2 Do not use pointed objects to operate the touch screen!
The balance is of a very sturdy design, but is still a precision instrument. It must be handled with care.
- 3 Do not open the balance:
The balance contains no user-serviceable parts. In the event of problems, please contact a METTLER TOLEDO representative.
- 4 Only use METTLER TOLEDO original accessories and peripheral devices for the balance.
These are specifically designed for the balance.



WARNING

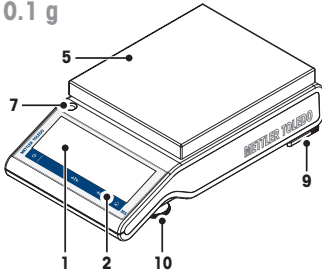
Risk of electric shock

Use only the original universal AC/DC adapter delivered with your balance, and check that the voltage printed on it is the same as your local power supply voltage. Only plug the adapter into a socket which is grounded.

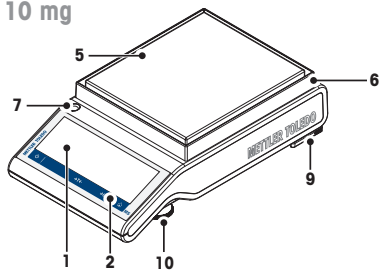
2 Design and Function

2.1 Overview

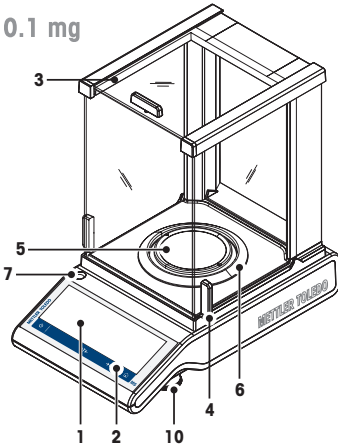
0.1 g



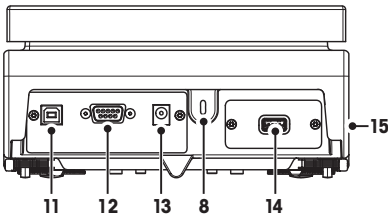
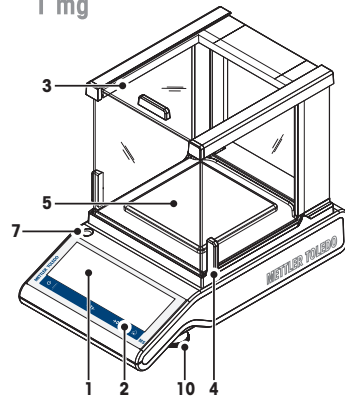
10 mg



0.1 mg

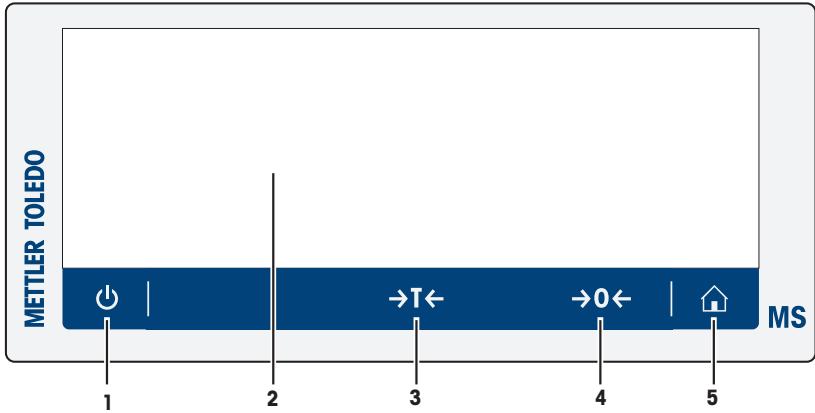






1 mg



- 1 Capacitive color TFT touch screen
- 2 Operation keys
- 3 Glass draft shield
- 4 Handle for operation of the draft shield door
- 5 Weighing pan
- 6 Draft ring element
- 7 Level indicator
- 8 Kensington slot for anti-theft purposes
- 9 Safety feet (10 mg and 0.1 g models)
- 10 Leveling foot
- 11 USB device connection
- 12 RS232 serial interface
- 13 Socket for AC/DC adapter
- 14 USB host connection
- 15 Product label

2.2 Operation keys



No.	Key	Name	Explanation
1		ON/OFF	To switch the instrument on or off.
2		Capacitive color TFT touch screen	General navigation
3		Tare	To tare the balance.
4		Zero	To zero the balance.
5		Home	To return from any menu level, or other window to the application home screen.

2.3 User Interface

The screen is a capacitive color TFT touch screen. The screen not only displays information, it also allows the user to enter commands by tapping on certain areas on its surface. You can choose the information displayed on the screen, change balance settings or perform certain operations on the instrument.

Only those elements which are available for the current dialog appear on the display.



CAUTION

Do not touch the touch screen with pointed or sharp objects!

This may damage the touch screen.

2.3.1 Application home screen

The application home screen appears after the startup of the instrument. It always shows the last application that was being used before the balance was switched off. The application home screen is the main screen of the balance, from where every function can be accessed. You can always return to the application home screen by pressing on the home button [🏠] in the lower right corner of the screen.



Information and work bars

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

Information fields

	Name	Explanation
5	Weighing-in aid	A dynamic graphic indicator shows the used amount of the total weighing range.
6	Short balance information	Readability and capacity of the balance.*
7	Weighing value field	Shows the value of the current weighing process.
8	Coach text field	Shows instructions for the current weighing process.

* For approved balances: **Min** (minimum capacity) and **e** (Verification scale interval) are shown in the left upper corner.

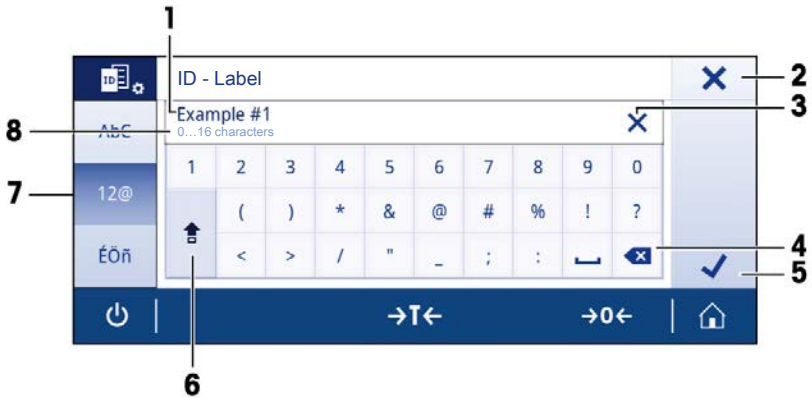
Action buttons

	Name	Explanation
9	Main activity configuration	To configure the current application (e.g. Weighing).
10	Detailed balance information	Shows detailed technical data about the balance.
11	Weighing unit	Shows the unit of the current weighing process.
12	Activities	To open the activities selection.
13	Print	To print out results and/or settings (printer required).
14	Settings/Preferences	To configure settings/preferences.
15	Status information field	Shows information about the system status.

2.3.2 Input Dialogs

2.3.2.1 Entering Characters and Numbers

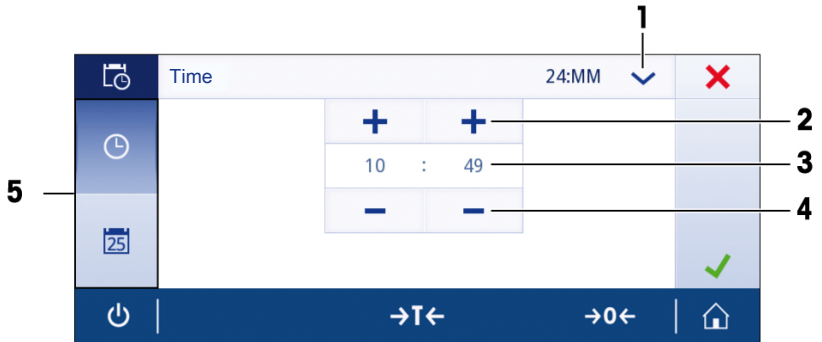
The keyboard dialog allows the user to enter characters including letters, numbers and a variety of special characters.



	Name	Explanation
1	Input field	Shows the characters that have been entered.
2	Discard	To discard the entered data and to exit the dialog.
3	Delete all	To delete all entered characters.
4	Delete	To delete the last entered character.
5	Confirm	To confirm the data entered.
6	Shift	To switch between lower or upper case letters.
7	Specialized tabs	To switch the keyboard mode for entering letters, numbers or special characters.
8	Explanation field	Extra information about the value to enter (e.g. the maximum number of characters available).

2.3.2.2 Changing the date and time

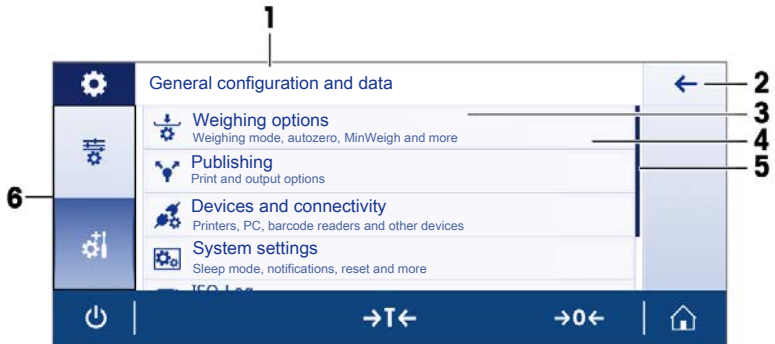
The dialog (Picker view) allows the user to set the date and time.



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

2.3.3 Lists and tables

Basic elements of a simple list include a content title and a list of sub-elements. Tapping on an element opens a list of sub-elements or an input dialog.



	Name	Explanation
1	List title	Title of the current list
2	Back button	To go one step back.
3	List element title	Title of the list element
4	List element description	Shows the sub-elements.
5	Scroll position	The list can be scrolled.
6	Selection tabs	Tabs of the selectable sub-categories.

3 Installation and Putting into Operation

This section describes how to put the new instrument into operation.

Finding more information

► www.mt.com/balances

3.1 Scope of delivery

Components		0.1 mg	1 mg	10 mg	0.1 g
Draft shield	236 mm	✓	–	–	–
	168 mm	–	✓	–	–
Weighing pan	Ø 90 mm	✓	–	–	–
	127 x 127 mm	–	✓	–	–
	170 x 200 mm	–	–	✓	–
	190 x 226 mm	–	–	–	✓
Draft shield element		✓	–	✓	–
Pan support		✓	✓	✓	✓
Bottom plate		✓	✓	–	–
ESD plate		–	–	✓	✓
Protective cover		✓	✓	✓	✓
Universal AC/DC adapter		–	✓	✓	✓
AC/DC adapter with country-specific power cable		✓	–	–	–
Operating instructions printed or on CD-ROM (country-specific)		✓	✓	✓	✓
User Manual		✓	✓	✓	✓
EC declaration of conformity		✓	✓	✓	✓



3.2 Installing the components

Balances with readability of 0.1 mg and draft shield (236 mm)

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

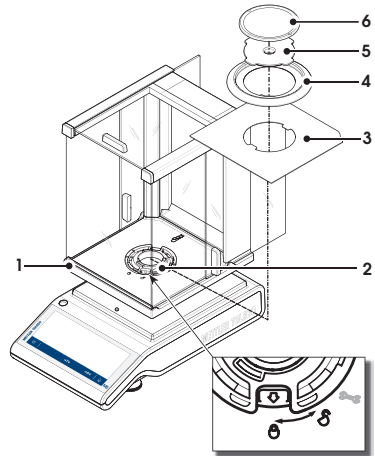
Note

Push the side glass back as far as it will go and hold the draft shield (1) with both hands on the bars at the top.

- 1 Turn draft shield lock (2) to position  (unlock).
- 2 Place draft shield on the balance.
- 3 Turn draft shield lock to  (lock) and place bottom plate (3).
- 4 Place draft ring element (4) and weighing pan (6) with pan support (5).

Note



For cleaning the draft shield see section [Cleaning the glass draft shield (0.1 mg and 1 mg models) ▶ 27].



Balances with readability of 1 mg and draft shield (168 mm)

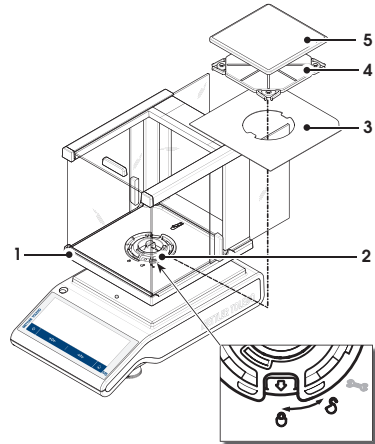
Place the following components on the balance in the specified order:

Note: Push the side glass back as far as it will go and hold the draft shield (1) with both hands on the bars at the top.

- 1 Turn draft shield lock (2) to position  (unlock).
- 2 Place draft shield on the balance.
- 3 Turn draft shield lock to  (lock) and place bottom plate (3).
- 4 Place weighing pan (5) with pan support (4).

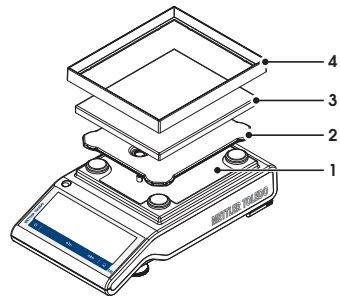
Note

For cleaning the draft shield see section [Cleaning the glass draft shield (0.1 mg and 1 mg models) ▶ 27].



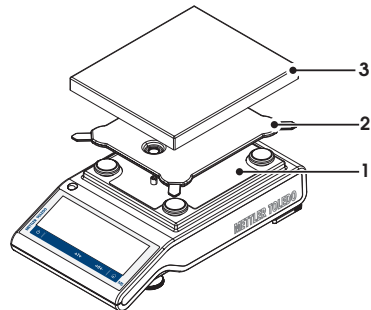
Balances with readability of 10 mg

- Place the following components on the balance in the specified order:
 - ESD plate (1)
 - Pan support (2)
 - Weighing pan (3)
 - Draft ring element (4)



Balances with readability of 0.1 g

- Place the following components on the balance in the specified order:
 - ESD plate (1)
 - Pan support (2)
 - Weighing pan (3)



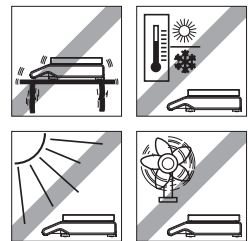
3.3 Selecting the location

Your balance is a sensitive precision instrument; the location where it is placed will have a profound effect on the repeatability and accuracy of weighing results. Choose a stable surface that is as horizontal as possible. The surface must be able to safely carry the weight of a fully loaded balance.

Observe ambient conditions (see Technical Data).

Avoid the following:

- Direct sunlight
- Air drafts (e.g. from fans or air conditioners)
- Temperature fluctuations
- Vibrations



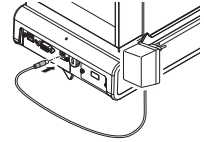
3.4 Connecting the instrument

The balance is supplied with a universal AC/DC adapter or with an AC/DC adapter with a country-specific power cable. The power supply is suitable for all line voltages in the range: 100 - 240 VAC, 50/60 Hz. For detailed specifications, see the section Technical Data.

Note

Allow the balance to warm up for 30 minutes (0.1 mg models need 60 minutes) to adapt itself to the ambient conditions.

Connect the AC/DC adapter to the connection socket on the back of your balance and to the power line.



Attention

- Check if the local power supply falls within this range. If this is not the case, under no circumstances connect the AC/DC adapter to the power supply, but contact a METTLER TOLEDO representative.
- The power plug must be accessible at all times.
- Prior to use, check the power cable for damage.
- Route the cable in such a way that it cannot be damaged or cause a hindrance when working.
- Ensure that no liquid ever comes into contact with the AC/DC adapter.

3.5 Leveling the balance

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

Note

To compensate for small irregularities or inclinations ($\pm 2\%$), the instrument must be leveled and adjusted each time it is moved to a new location.

The balance can be levelled with the leveling assistant and/or with the level indicator on top of the terminal. There are two adjustable leveling feet to compensate for slight irregularities in the surface of the weighing bench.

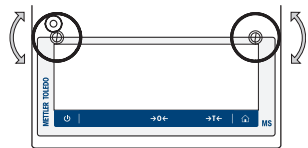
3.5.1 Leveling the balance with the level indicator

All balances have a level indicator with an air bubble to level the balance manually.

Leveling balances with readability of 0.1 mg and 1 mg

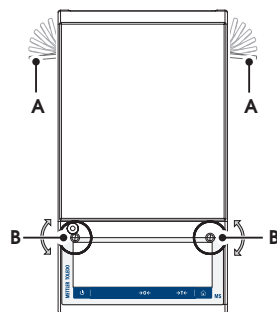
- Adjust the two leveling feet until the bubble comes to rest exactly in the middle of the glass:

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.





Leveling balances with readability of 0.01 g and 0.1 g

- 1 Remove the clamps (A) for the safety feet by turning them outwards.
- 2 Turn the clamps (A) outwards as far as they will go ($\sim 90^\circ$), so that the safety feet can move freely.
- 3 Now level the balance by turning both leveling screws (B) until the bubble is in the inner circle of the level indicator (see procedure above).
- 4 Secure the safety feet by turning the clamps (A) inwards as far as they will go.



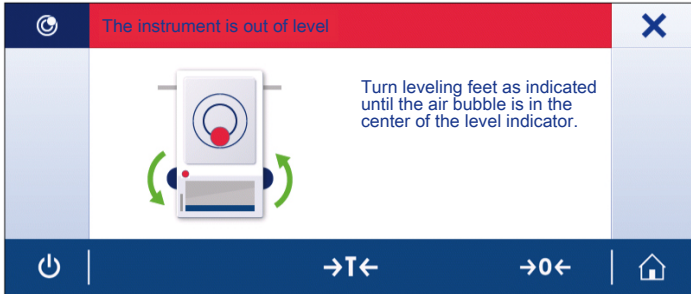
3.5.2 Leveling the balance using the leveling assistant

When the balance is switched on at its new location, the symbol  **The instrument is out of level** appears in the status information field at the left side of the screen.

- 1 Tap on .
⇒ The screen **Notifications** opens.
- 2 Select **The instrument is out of level**.
⇒ The function **Leveling assistant** opens.


The function **Leveling assistant** is a step-by-step guidance that helps in leveling the balance.

Navigation:  **Quick settings/Preferences** >  **Leveling assistant**



After following the instructions, the leveling assistant will show the next steps. Follow the steps until the balance is levelled.

Note

Always use the physical air bubble of the level indicator as a reference. If the physical air bubble is centered but the symbol  **The instrument is out of level** still appears on the screen, please consider to execute a level indicator center adjustment, **see** System settings Intro.

3.6 Switching on the balance

Switching on the balance for the first time

- 1 Remove any load from the weighing pan.
- 2 Connect the balance using the AC/DC adapter to the mains.
 - ⇒ After the start screen has disappeared, the balance starts with the application home screen.

After the balance has switched on for the first time, it can be switched on by pressing long on [ON].

Note

When the balance is switched on for the first time, the home screen of the application **Weighing** opens. If the balance is switched on again, it always starts with the home screen of the application that was last used before switching off.

3.7 Switching off the balance

- 1 Press on [OFF] and hold until the dialog **Switch-off** appears.
- 2 Tap on [✓].
 - ⇒ the balance switches off and goes into standby mode.

Note

- After switching on from standby mode, the balance needs no warm-up time and is immediately ready for weighing.
- If the balance has been switched off manually, the display is off.
 - To completely switch off the balance, it must be disconnected from the power supply.

3.8 Zeroing

- 1 Unload the balance.
- 2 Press [→0←] to set the balance to zero.

All weight values are measured in relation to the zero point.

Note

Press [→0←] before starting the weighing process.

3.9 Taring

- 1 Tap on [→0←] to set the balance to zero.
- 2 Place the empty container on the balance.
 - ⇒ The weight is displayed.
- 3 Press [→T←] to tare the balance.
 - ⇒ The status information field on the left side of the screen shows **Net** and the weighing value field shows **0.000 g**.

3.10 Transporting the balance

Switch off the balance and remove the power cable and any interface cable from the balance. Refer to the notes in section [Selecting the location ▶ 13] regarding the choice of an optimal location.

Transporting over short distances



⚠ CAUTION

For balances with a draft shield:

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

Transporting over long distances



⚠ CAUTION

If you would like to transport or ship your balance over long distances, **use the complete original packaging**.

Note

For transporting the balance over a long distance, we recommend to use the transport case, **see** Accessories and Spare parts.

3.11 General requirements

3.11.1 Warming up the balance

Before working with the balance, it must be warmed up in order to obtain accurate weighing results. To reach operating temperature, the balance must be connected to the power supply for at least:

- 30 minutes for balances with a readability of 1 mg to 5 g.
- 60 minutes for balances with a readability of 0.1 mg and higher.

3.11.2 Adjusting the balance

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

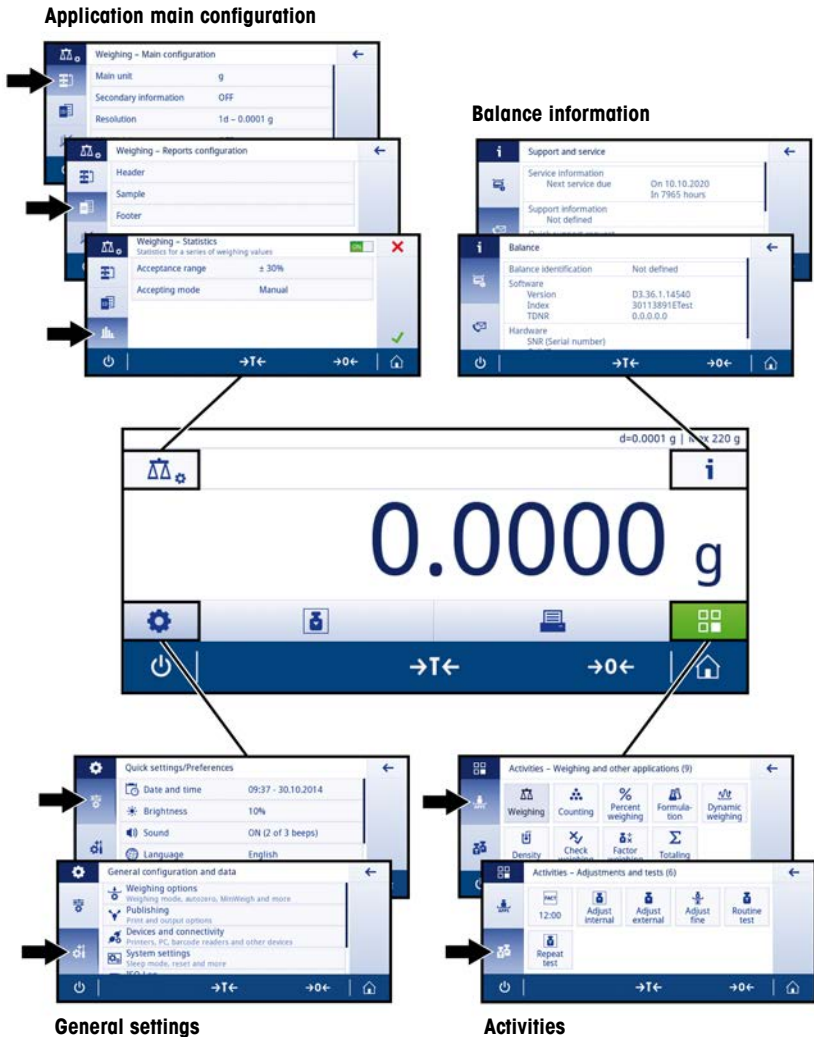
- Before the balance is used for the first time.
- After reaching the operating temperature (only for balances with FACT).
- When the balance was disconnected from the power or in case of power failure.
- After significant environmental changes (e. g. temperature, humidity, air draft or vibrations)
- At regular intervals during weighing service.

4 Weighing Made Simple

This section describes how to perform a simple weighing. In addition, the basic concept of the navigation and the basic functions of the balance are explained.

4.1 Main settings and activities at a glance


The diagram below provides an overview of the main settings of an application (in this example, **Weighing**). Depending on the application, the selectable options and their content can differ. Every application is based on this concept.

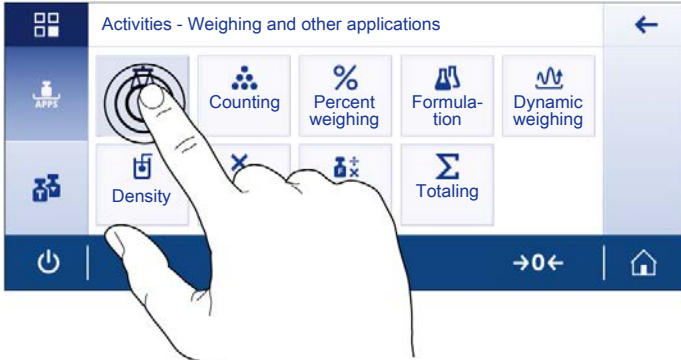


4.2 Navigation on the touch screen

To interact with the balance, use the screen and the operating keys at the bottom of the screen. The navigation on the screen is similar to the navigation on a smart phone or tablet PC.

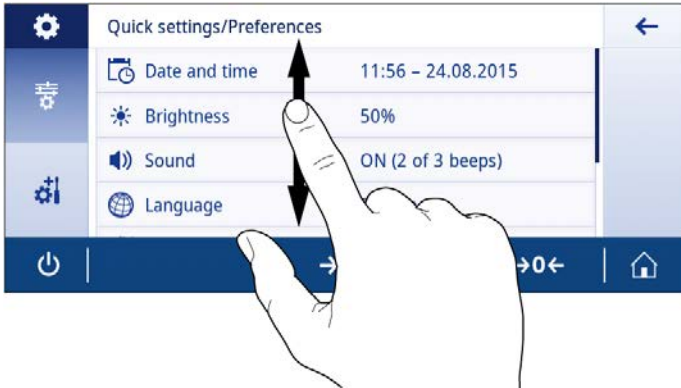
4.2.1 Opening an application

To open settings or applications, tap with your finger on the symbol of the application (e.g. [] Weighing).



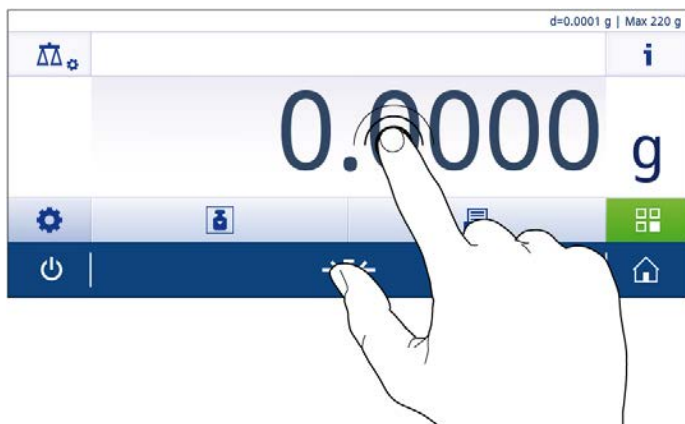
4.2.2 Scrolling

When the options are too numerous to be shown on one screen, a blue bar on the right side appears. This means that the user can scroll up and down. For scrolling, simply place your finger somewhere in the list and drag it up or down.



4.2.3 Using shortcuts

To simplify navigation on the capacitive color TFT touch screen, there are a few shortcuts that allow quick access to the most important areas of the balance. The weighing value field on the application home screen for example works as a shortcut (see diagram below), so does the weighing unit next to the weighing value field. Depending on the application, there may be other shortcuts that can be used.

**Note**



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

4.3 Performing a simple weighing


When you switch on the balance for the first time, the home screen of the application **Weighing** opens automatically. If the balance was used already, the last used application before the balance was switched off opens. If another application is running, switch to the application **Weighing**.

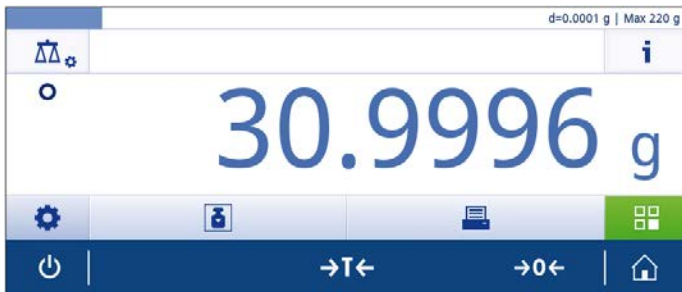
Navigation:


[] > [] **Activities - Weighing and other applications** > [] **Weighing**

- 1 Press [] to zero the balance or [] to tare the balance.
⇒ The initial screen looks like this:



- 2 Place a sample on the weighing pan.
⇒ The instability symbol  appears and the value in the weighing value field becomes **light blue**.



- ⇒ After a short period of time, the weighing pan is stable. The instability symbol  disappears and the value in the weighing value field becomes **dark blue** again.



- ⇒ The weighing process is finished. The result appears on the screen.

4.4 Switching the weighing unit

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

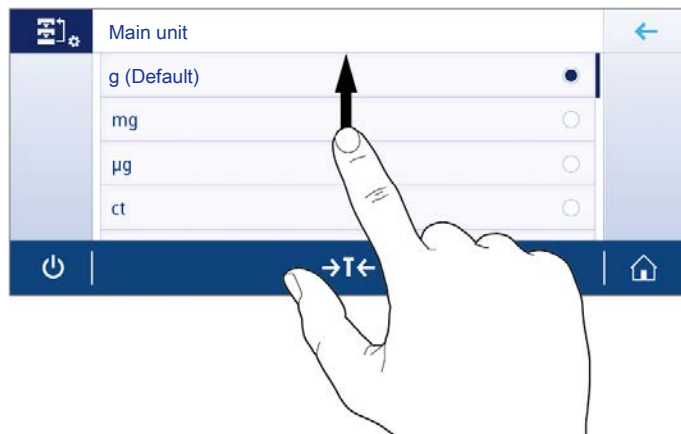
The weighing unit can be chosen via the main configuration of the current application or via shortcut. This example describes how to change the weighing unit via shortcut.

- 1 Tap on the weighing process unit (shortcut) **gram (g)**.



⇒ the screen **Main unit** opens.

- 2 Put your finger somewhere in the list and drag up to scroll down.



- 3 Choose another weighing unit (e.g. **ounce (oz)**) by tapping on it.

4 Tap on [✓] to confirm the chosen weighing unit.



⇒ The weighing unit **gram (g)** has been changed to **ounce (oz)**.

Note

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

4.5 Changing the resolution

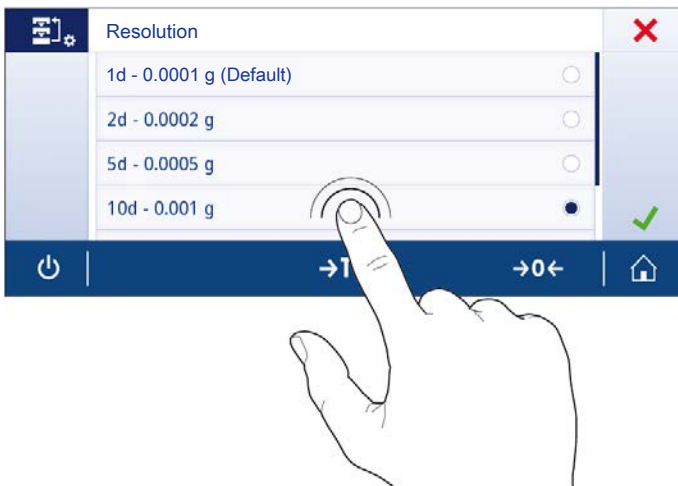
There are several resolutions available. The default resolution is instrument-specific.

The resolution can be changed as follows:

- 1 Tap on the weighing value field.



- 2 Tap on **10d - 0.001 g**.



3 Confirm the chosen resolution by tapping on [✓].



⇒ The resolution has been changed.

5 Maintenance



⚠ WARNING

Risk of electric shock

- The instrument must be disconnected from the power supply, before cleaning or other maintenance work to be performed.
- Use only the power cord from METTLER TOLEDO, if it needs replacing.

Please observe the following notes:

Note

On no account use cleaning agents which contain solvents or abrasive ingredients, as this can result in damage to the touch screen.

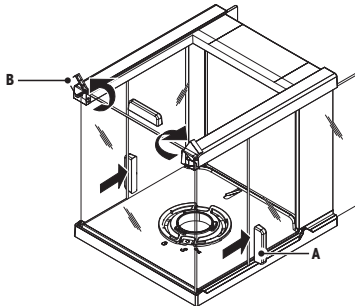
5.1 Cleaning the glass draft shield (0.1 mg and 1 mg models)

1

Remove the following parts:

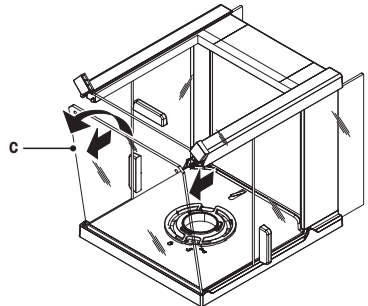
- 1 Remove weighing pan, draft shield element and pan support.
- 2 Remove the bottom plate.
- 3 Unlock the draft shield, lift it off the balance and place it on a clean surface.

2



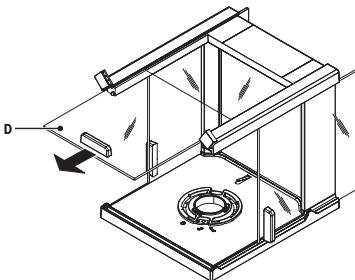
- 1 Push the **glass doors (A)** back.
- 2 Turn the two **lock covers (B)** on the front as far as they will go.

3



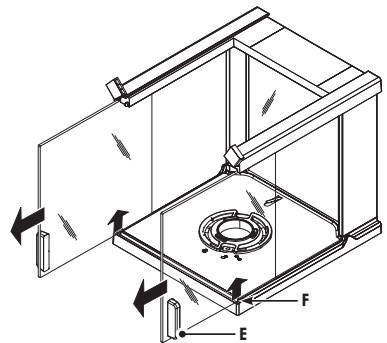
- 1 Tilt the **front glass (C)** forward.
- 2 Remove the front glass.

4



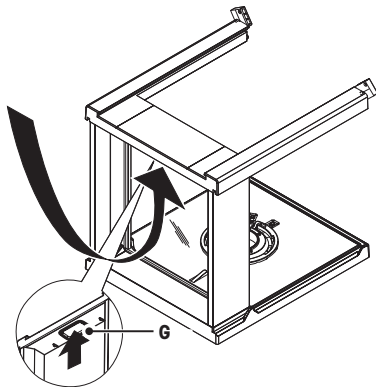
- Pull the **top glass door (D)** out from the front.

5



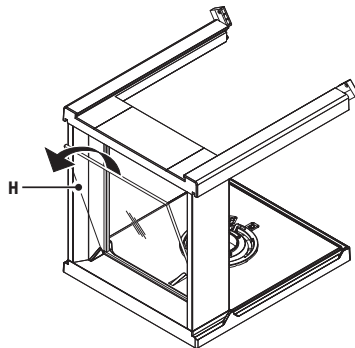
- Lift the **side glass doors (E)** at (F) and pull them out from the front.

6



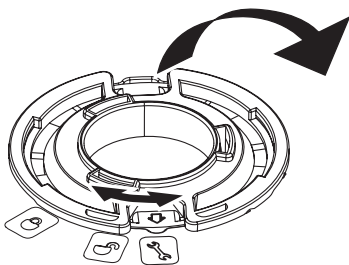
- Push the lock button (**G**) to release the **rear glass**.


7



- Remove the rear glass (**H**).

8



- 1 Turn the **draft shield lock** to the  (Service) position.
- 2 Remove the draft shield lock.

After cleaning reinstall all components in the reverse order. For balance mounting see section [Installing the components ▶ 12].

5.2 Disposal

In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

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

Thank you for your contribution to environmental protection.




6 Technical Data

6.1 General data

Power supply for 0.1 mg balances

- AC adapter
Primary: 100 – 240 V AC, -15%/+10%, 50/60 Hz
Secondary: 12 V DC $\pm 3\%$, 2.5 A (with electronic overload protection)
- Cable for AC adapter
3-core, with country-specific plug
- Balance power supply
12 V DC $\pm 3\%$, 2.25 A, maximum ripple: 80 mVpp
Can be used up to 4000 m height above mean sea level.

Power supply for all other balances

- AC/DC Adapter
Primary: 100 V–240 V, $\pm 10\%$, 50/60 Hz, 0.3 A
Secondary: 12 V DC, 0.84 A (with electronic overload protection)
- Balance power supply
12 V DC, 0.84 A
Use only with a tested AC Adapter with SELV output current.
Ensure correct polarity 
Can be used up to 2000 m height above mean sea level.

Note

If the balance is used above 2000 m mean sea level, the power supply for 0.1 mg balances must be used.

Protection and standards

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

Environmental conditions

- Height above mean sea level Depending on the power adapter (2000 - 4000 m)
Except for China: max. 2000 m
- Ambient temperature range 10 to 30 °C
- Relative air humidity 10% up to 80% at 31 °C, linearly decreasing to 50% at 40 °C, noncondensing
- Warm-up time After connecting the balance to the power supply at least
 - 30 minutes on balances with a readability of 1 mg to 5 g.
 - 60 minutes on balances with a readability of 0.1 mg and better.

Materials

- Housing Die-cast aluminum, lacquered
- Weighing pan Stainless steel X2CrNiMo 17-12-2 (1.4404)
245 x 351 mm: Stainless steel X5CrNiMo 18-10 (1.4301)
with 0.1 mg models: Stainless steel X2CrNiMo 17-12-2 (1.4404)
with 10 mg models: Plastic (PBT)
- Draft shield element Plastic (PBT), glass
- Draft shield Plastic (PBT), glass
- In-use-cover Plastic (PET)
- TFT touch screen surface Glass

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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