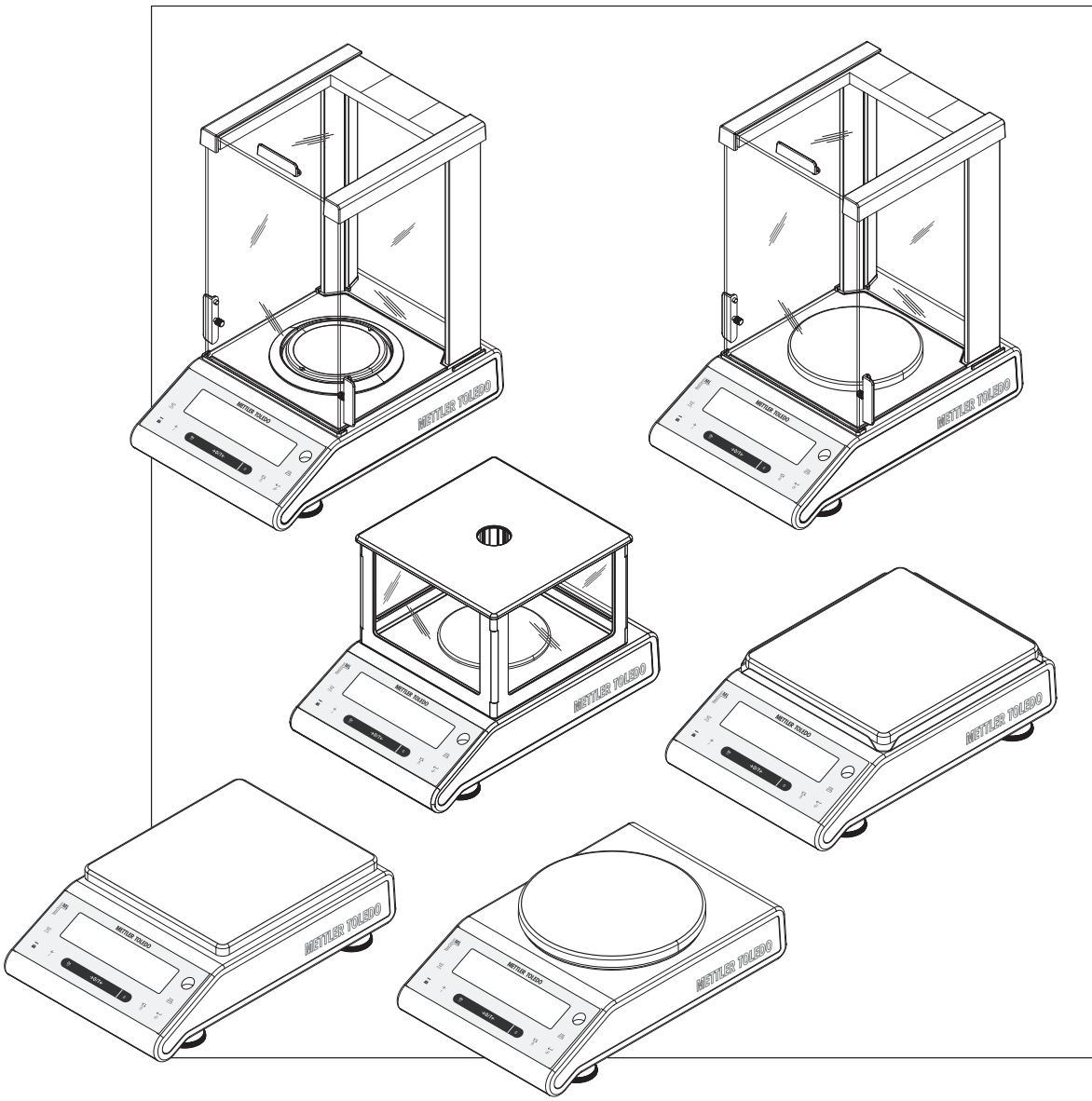
Start-up Instructions

NewClassic Balances

ML Models



METTLER TOLEDO

Table of contents

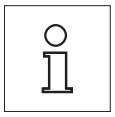
1 Introduction

Thank you for choosing a METTLER TOLEDO balance.

The precision balances of the NewClassic line combine a large number of weighing possibilities with easy operation.

These operating instructions apply to all balance models ML in the NewClassic line. However, the different models have different charcteristics regarding equipment and performance. Special notes in the text indicate where this makes a difference to operation.

1.1 Finding More Information



- See your detailed balance operating instructions on the CD.
- Quick Guide with menu map.
- Internet: **www.mt.com/newclassic**

1.2 Conventions and Symbols Used in These Operating Instructions

Key designations are indicated by double angular brackets (e.g. «  »).

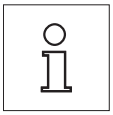
This symbol indicates press key briefly (less than 1.5 s).

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

This symbol indicates a flashing display.

▼ This symbol indicates an automatic sequence.

These symbols indicate safety notes and hazard warnings which, if ignored, can cause personal danger to the user, damage to the balance or other equipment, or malfunctioning of the balance.



This symbol indicates additional information and notes. These make working with your balance easier, as well as ensuring that you use it correctly and economically.

2 Safety Precautions

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

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

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

For use only in dry interior rooms.

Do not use sharply pointed objects to operate the keyboard of your balance! Although your balance is very ruggedly constructed, it is nevertheless a precision instrument. Treat it with corresponding care.

Do not open the balance: It does not contain any parts which can be maintained, repaired, or replaced by the user. If you ever have problems with your balance, contact your METTLER TOLEDO dealer.

Use only balance accessories and peripheral devices from METTLER TOLEDO; they are optimally adapted to your balance.

Use only the original universal AC adapter delivered with your balance.

Disposal

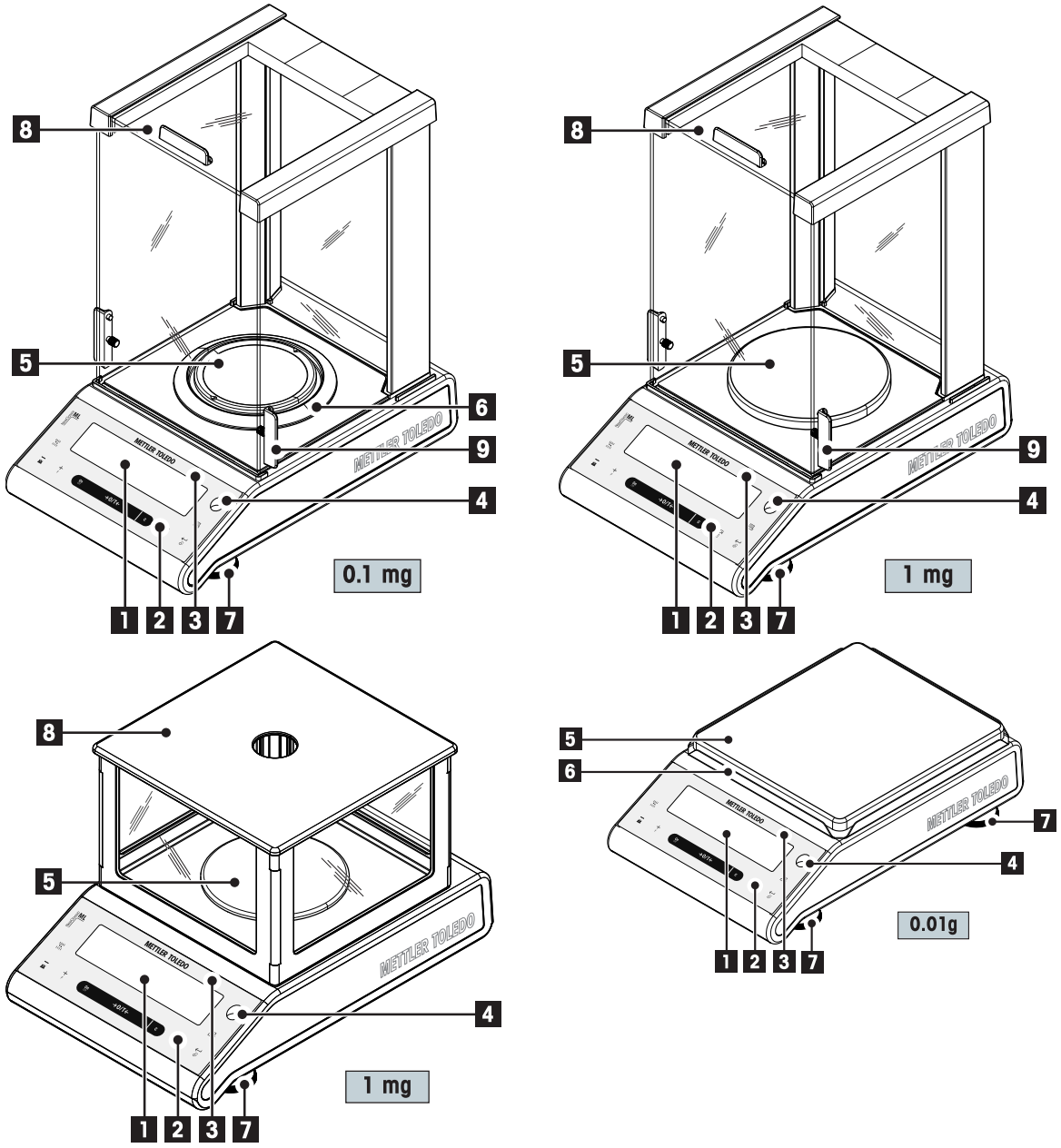
In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

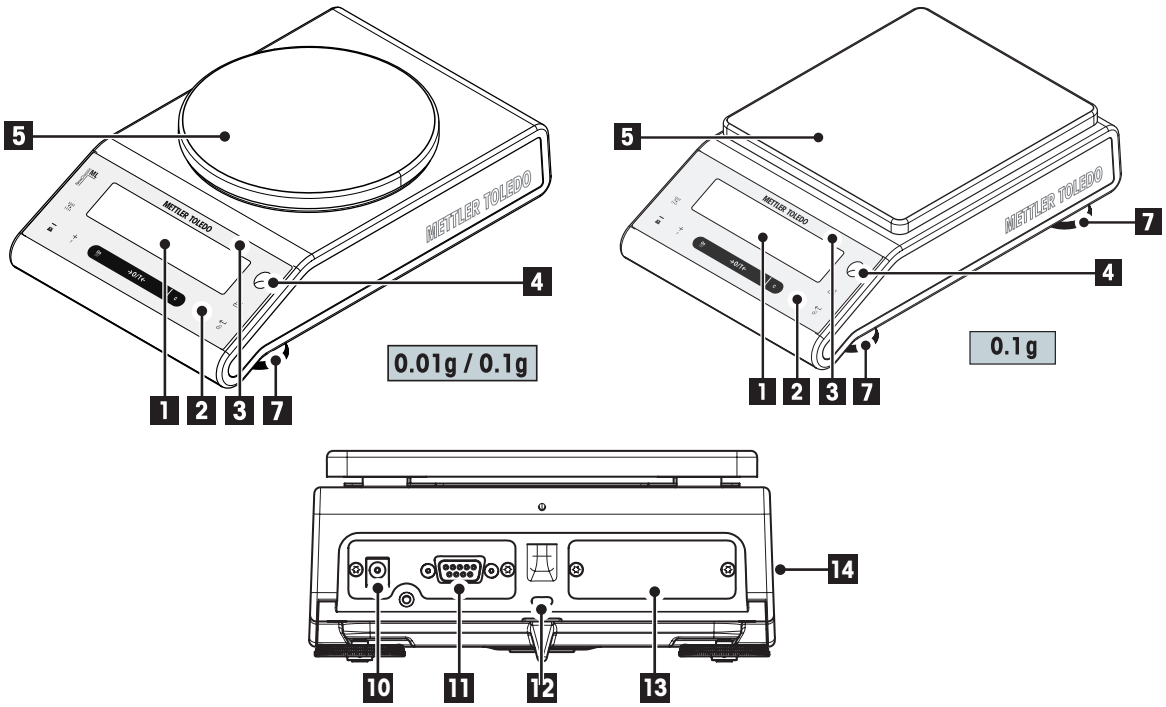
Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device. Should this device be passed on to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

Thank you for your contribution to environmental protection.

3 Overview

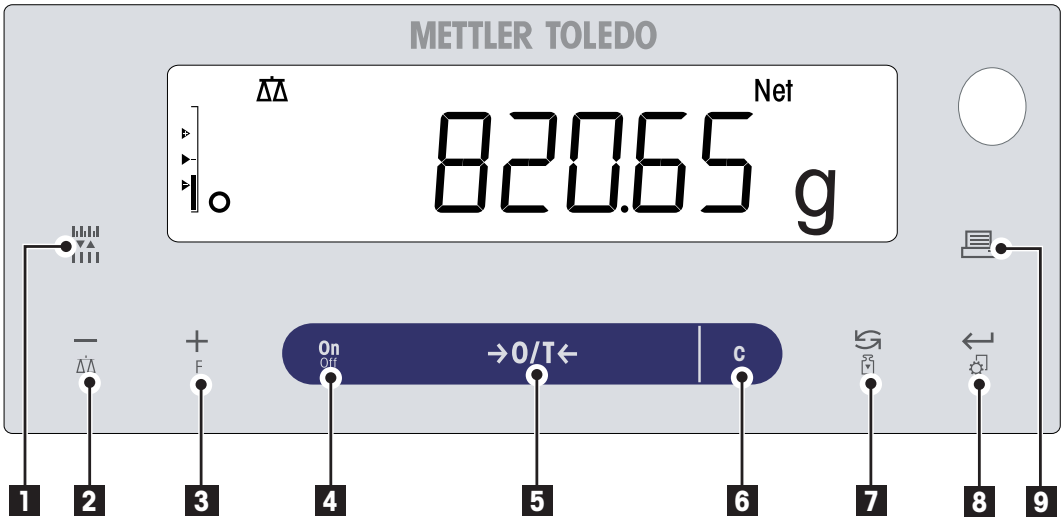
3.1 Components





Name and Function of Components			
1	Display	**8**	Glass draftshield
2	Operation keys	**9**	Handle for operation of the draft-shield door
3	Model sticker (with approved models only)	**10**	Socket for AC Adapter
4	Level indicator	**11**	RS232C serial interface
5	Weighing pan	**12**	Kensington slot for anti-theft purposes
6	Draft shield element	**13**	Slot for second interface (optional)
7	Leveling foot	**14**	Product label

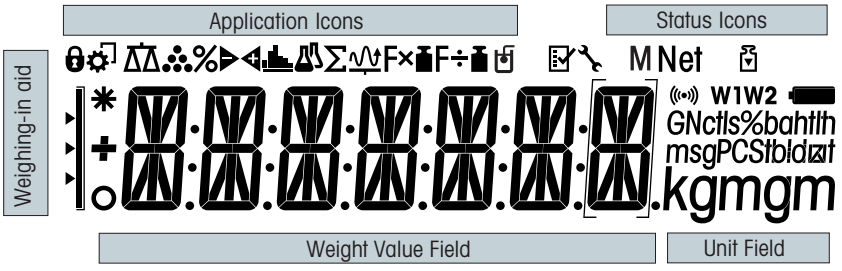
3.2 Operation Keys



Key Functions

No.	Key	Press briefly (less than 1.5 s)	Press and hold (longer than 1.5 s)
1		• To change display resolution (1/10d function) while application is running	no function
2		• To navigate back (scroll up) within menu topics or menu selections • Decrease (numerical) parameters within menu and in applications	• To select the weighing application • Decrease (numerical) parameters quickly within menu and in applications
3	F	• To navigate forward (scroll down) within menu topics or menu selections • Increase (numerical) parameters within menu and in applications	• To select assigned application and entering the parameter settings of application. • Default application assignment: Piece counting • Increase (numerical) parameters quickly within menu and in applications
4	**ON/**/OFF	• Switch on	• Switch off
5	→0/T←	• Zero/Tare	• Switch off
6	**C**	• Cancel and to leave menu without saving (one step back in the menu).	no function
7		• With entries: scroll down • To navigate through menu topics or menu selections • To toggle between unit 1, recall value (if selected), unit 2 (if different from unit 1) and the application unit (if any)	• Execute predefined adjusting (calibration) procedure
8		• To enter or leave menu selection (from / to menu topic) • To enter application parameter or switch to next parameter • To store parameter	• Enter or leave menu (Parameter settings)
9		• Printout display value • Printout active user menu settings • Transfer data	

3.3 Display Panel



Application Icons			
	Menu locked		Application "Formulation / Net-Total"
	Menu setting activated		Application "Totaling"
	Application "Weighing"		Application "Dynamic weighing"
	Application "Piece counting"	F×	Application "Multiplication factor"
%	Application "Percent weighing"	F÷	Application "Division factor"
	Application "Check weighing"		Application "Density"
	Application "Statistics"		

Status Icons			
M	Indicates stored value (Memory)		Acoustic feedback for pressed keys activated
Net	Indicates Net weight values	**W1**	Weighing range 1 (Dual Range models only)
	Adjustments (calibration) started	**W2**	Weighing range 2 (Dual Range models only)
	Applications "Diagnostics" and "Routine Test"		Charge of battery: full, 2/3, 1/3, discharged (Battery operated models only)
	Service reminder		

Weight Value Field and Weighing-in aid			
−	Indicates negative values	[ ]	Brackets to indicate uncertified digits (approved models only)
o	Indicates unstable values		Marking of nominal or target weight
*	Indicates calculated values	+	Marking of tolerance limit T+
		−	Marking of tolerance limit T-

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

4 Setting up the Balance

The balance must be disconnected from the power supply when carrying out all setup and mounting work.

4.1 Unpacking and Delivery Inspection

a) Open the packaging and carefully remove all components.

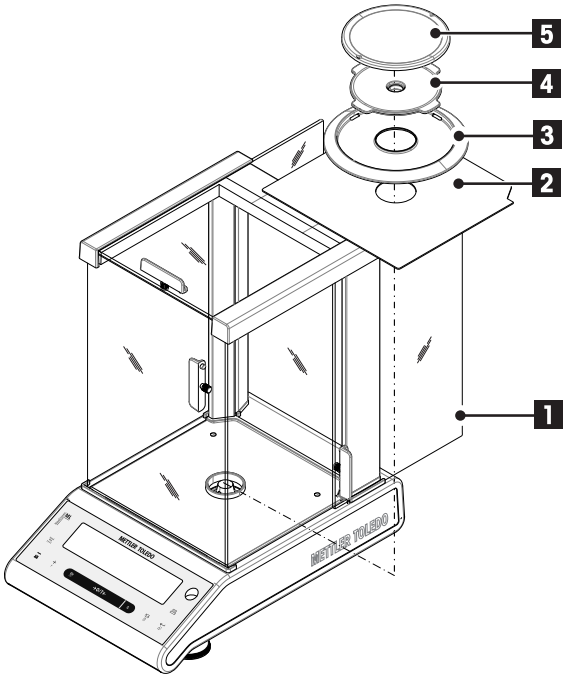
b) Check the delivered items.

The standard scope of delivery contains the following items:

Components		**Balances with round weighing pan**					**Balances with square weighing pan**	
		0.1 mg	**1 mg**		**0.01 g**	**0.1 g**	**0.01 g**	**0.1 g**
Draft shield	235 mm	✓	✓	–	–	–	–	–
Flex draft shield	105 mm	–	–	✓	–	–	–	–
Weighing pan	Ø 90 mm	✓	–	–	–	–	–	–
	Ø 120 mm	–	✓	✓	–	–	–	–
	Ø 160 mm	–	–	–	✓	✓	–	–
	170 x 190 mm	–	–	–	–	–	✓	✓
Draft shield element		✓	–	–	–	–	✓	–
Pan support		✓	✓	✓	✓	✓	✓	✓
Bottom plate		✓	✓	–	–	–	–	–
Protective cover		✓	✓	✓	✓	✓	✓	✓
Universal AC adapter (country specific)		✓	✓	✓	✓	✓	✓	✓
Start-up or Operating Instructions [1)]		✓	✓	✓	✓	✓	✓	✓
Quick Guide		✓	✓	✓	✓	✓	✓	✓
CD-ROM [1)]		✓	✓	✓	✓	✓	✓	✓
EC declaration of conformity		✓	✓	✓	✓	✓	✓	✓

[1)] depending on selected countries

4.2 Installing the Components

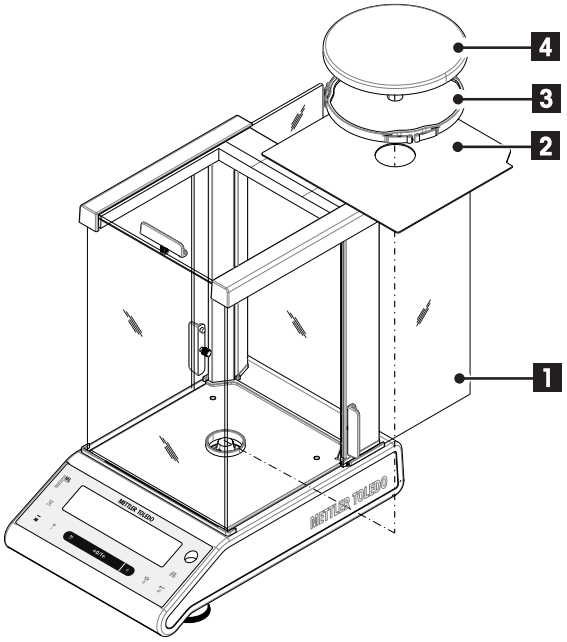


Balances with readability of 0.1 mg, with draft shield (235 mm)

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

Note: Push the side glass door (1) back as far as will go.

- Bottom plate (2)
- Draft shield element (3)
- Pan support (4)
- Weighing pan (5)

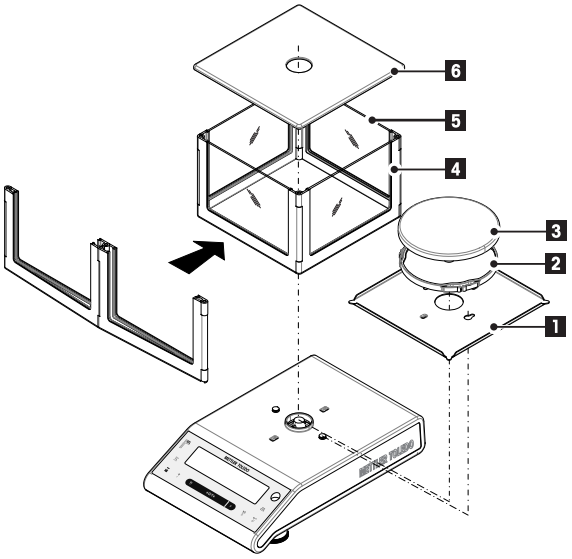


Balances with readability of 1 mg, with draft shield (235 mm)

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

Note: Push the side glass door (1) back as far as will go.

- Bottom plate (2)
- Pan support (3)
- Weighing pan (4)



Balances with readability of 1 mg, with flex draft shield (105 mm)

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

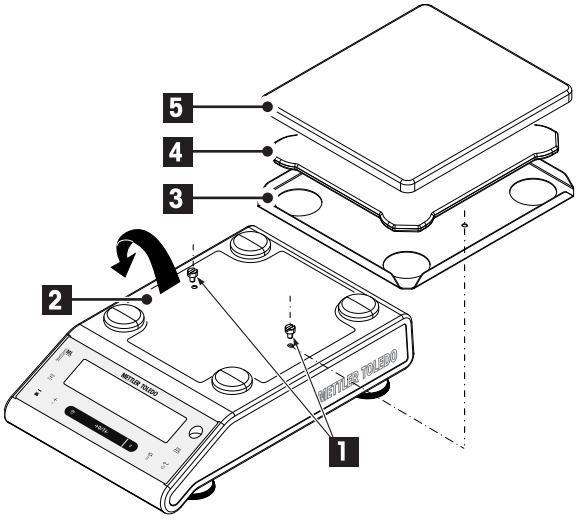
a) Place bottom plate (1) (push and turn)

b) Place pan support (2) with weighing pan (3).

c) Unfold the draft shield frame (4) and place it correctly.

d) Insert the glass panels (5) into the draft shield frame.

e) Place draft shield top (6)



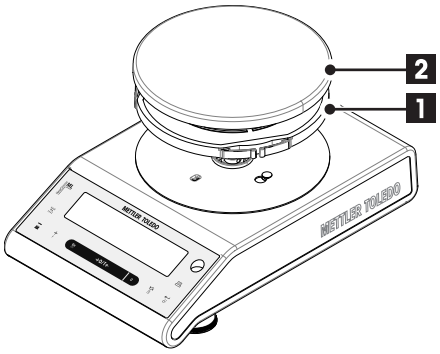
Balances with readability of 10 mg with square weighing pan and draft shield element

a) Remove the two screws (1)

b) Remove the plate (2) and retain it.

c) Place draft shield element (3) and fix it with the two screws.

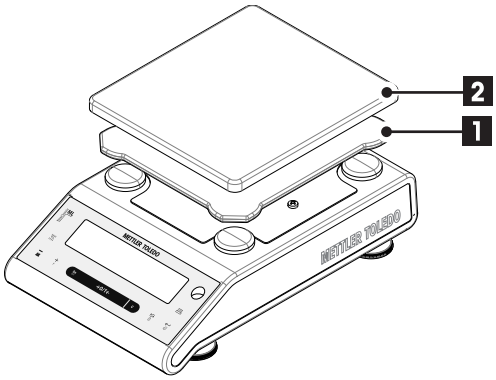
d) Place pan support (4) with weighing pan (5).



Balances with readability of 0.01 g / 0.1 g with round weighing pan

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

- Pan support (1)
- Weighing pan (2)



Balances with readability of 0.1 g with square weighing pan

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

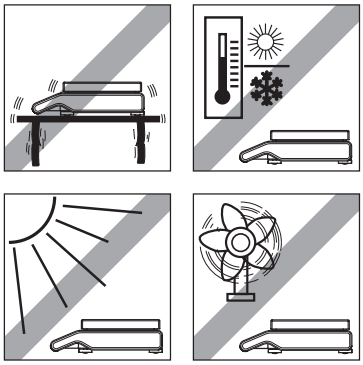
- Pan support (1)
- Weighing pan (2)

4.3 Selecting the Location and Leveling the Balance

Your balance is a precision instrument and will thank you for an optimum location with high accuracy and dependability.

4.3.1 Selecting the Location

Select a stable, vibration-free position that is as horizontal as possible. The surface must be able to safely carry the weight of a fully loaded balance.

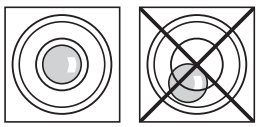


Observe ambient conditions (see Technical Data).

Avoid the following:

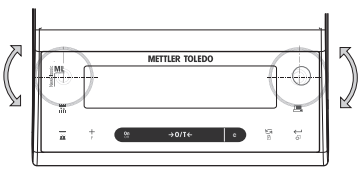
- Direct sunlight
- Powerful drafts (e.g. from fans or air conditioners)
- Excessive temperature fluctuations

4.3.2 Leveling the Balance



The balances have a level indicator and two or four adjustable leveling feet to compensate for slight irregularities in the surface of the weighing bench. The balance is exactly horizontal when the air bubble is in the middle of the level glass.

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



Balances with 2 leveling feet

Adjust the two front leveling feet appropriately until the air 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

Balances with 4 leveling feet

a) First turn the two **rear** leveling feet all the way in.

b) Adjust the two **front** leveling feet as previously described.

c) Turn the **rear** leveling feet down onto the surface for extra stabilizing safety, so the balance cannot tilt over under eccentric loads.

4.4 Power Supply

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

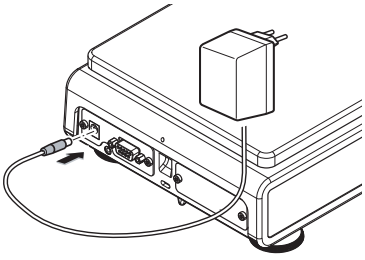
4.4.1 AC Operation

Your balance is supplied with an country-specific AC adapter or 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 exact specifications, see section "technical data").

First, check the local line voltage is in the range 100 - 240 VAC, 50/60 Hz and whether the power plug fits your local power supply connection. **If this is not the case, on no account connect the balance or the AC adapter to the power supply**, but contact the responsible METTLER TOLEDO dealer.

Important:

- Before operating, check all cables for damage.
- Guide the cables so that they cannot become damaged or interfere with the weighing process!
- Take care that the AC adapter cannot come into contact with liquids!
- The power plug must be always accessible.



Connect the AC adapter to the connection socket on the back of your balance (see figure) and to the power line.

4.4.2 Battery Operation

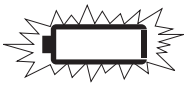
The Balance can also operates with batteries. Under normal operation conditions, the balance works independently of the AC power line for about 8 to 15 hours (using alkaline batteries). Immediately after the AC power supply is interrupted e.g. by withdrawing the power plug or if there is a power failure, the balance switches automatically to battery operation. Once the AC power supply is restored, the balance reverts automatically to AC operation.

Note: It is also possible to use rechargeable batteries. Charging batteries inside the balance is not possible.

battery fully

2/3 full

1/3 full



battery empty

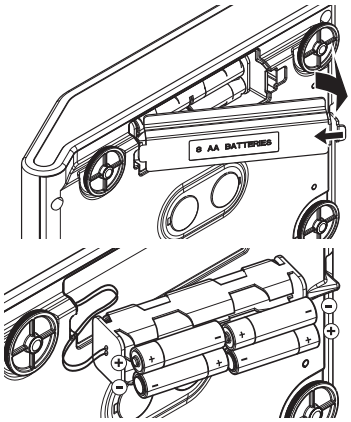
When the balance is operating on its batteries, the battery symbol in the display lights up. The number of segments that are lit is an indicator of battery condition (3 = fully charged, 0 = discharged). When the batteries are almost completely discharged, the battery symbol flashes.

Inserting / Replacing Batteries

The balance must be disconnected from the power supply when carrying out all setup and mounting work.

- Make sure that the balance is off before removing or inserting batteries.
- **Do not place the balance on the pan support location bolt.**
- **Battery Warnings:** Read and follow all warnings and instructions supplied by the battery manufacturer.
- Do not mix different types or brands of batteries. Performance of batteries can vary very greatly depending on the manufacturer.
- If you don't operate the balance with batteries for an extended period, it is recommended to remove the batteries from the balance.
- Batteries must be disposed of in an environmentally responsible manner. No attempt must be made to incinerate or disassemble item.

Your balance uses 8 standard AA (LR6) batteries (alkaline batteries preferred)



a) Remove weighing pan, pan support and draft shield element or draft shield "100 mm" if present.

b) Turn the balance carefully on its side.

c) Open and remove the battery-chamber cover.

d) Insert / replace the batteries with the correct polarity as shown in the battery holder.

e) Insert and close the battery-chamber cover.

f) Turn the balance carefully to its normal position.

g) Reinstall all components in the reverse order.

4.5 Adjustment (Calibration)

To obtain accurate weighing results, the balance must be adjusted to match the gravitational acceleration at its location. Adjusting is necessary:

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

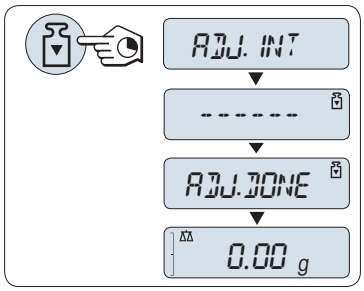
4.5.1 Adjustment with Internal Weight

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

To obtain accurate results, the balance must be connected to the power supply for approximately,

- 30 minutes for balances with redability of 1 mg to 5 g
- 60 minutes for balances with redability of 0.01 mg to 0.1 mg

in order to reach operating temperature before adjusting.



Requirement: To carry out this operation, in the menu topic "CAL" (Adjustment) of advanced menu "ADJ.INT" must be selected.

a) Unload weighing pan

b) Press and hold «⍓» to execute "Internal Adjustment".

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

Sample adjustment printout using internal weight:

```
- Internal Adjustment --
21.Jan 2009         12:56

METTLER TOLEDO

Balance Type       ML4002
SNR           1234567890

Temperature       22.5 °C
Diff                3 ppm

Adjustment done
-----------------------
```

4.5.2 Adjustment with External Weight

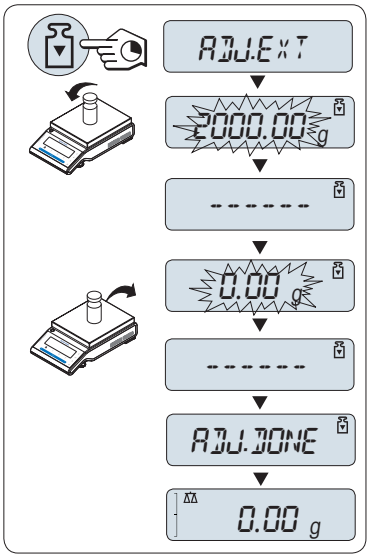
Note: Because of certification legislation, the approved models cannot be adjusted with an external weight * (depend on selected countries' certification legislation).

* except OIML accuracy class I approved models.

To obtain accurate results, the balance must be connected to the power supply for approximately,

- 30 minutes for balances with redability of 1 mg to 5 g
- 60 minutes for balances with redability of 0.01 mg to 0.1 mg

in order to reach operating temperature before adjusting.



Requirement: To carry out this operation, in the menu topic "CAL" (Adjustment) " of advanced menu ADJ.EXT" must be selected.

a) Have required adjustment weight ready.

b) Unload weighing pan.

c) Press and hold «⍐» to execute "External Adjustment". The required (predefined) adjustment weight value flashes in the display.

d) Place adjustment weight in center of pan. The balance adjusts itself automatically.

e) When "0.00 g" flashes, remove adjustment weight.

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

Sample adjustment printout using external weight:

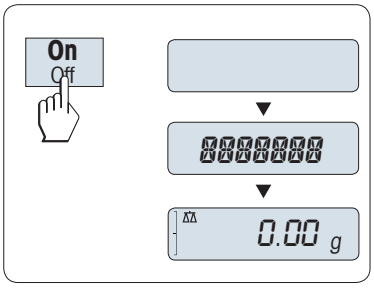
```
- External Adjustment --
21.Jan 2009        12:56

METTLER TOLEDO

Balance Type       ML4002
SNR           1234567890

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

Adjustment done

Signature


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

5 Weighing Made Simple

This section shows you how to perform simple weighings and how you can accelerate the weighing process.

5.1 Switching the Balance On and Off

This section shows you how to perform simple weighings and how you can accelerate the weighing process.



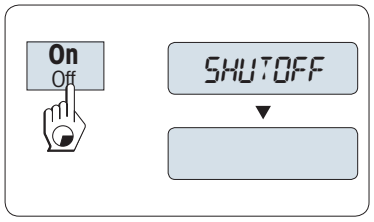
Switching On

a) Remove any load from weighing pan.

b) Press «**On**».

The balance performs a display test (all segments in the display light up briefly), "WELCOME", Software version, Maximum load and Readability appears briefly. (Startup "FULL" mode only)

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



Switching Off

Press and hold the «**Off**» key until "SHUTOFF" appears on the display. Release the key.

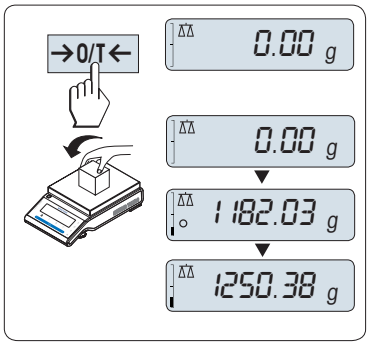
When Quickstart is selected (Advanced menu, topic "STARTUP" > "QUICK"): Once your balance has been switched off, it is in standby mode. In this case your balance needs no warm-up time in the standby mode and is immediately ready for weighing. If you wish to perform a weighing, you now only need to place the sample on the weighing pan and the balance immediately displays the result. There is no need to switch it on with the «**On/Off**» key.

- If your balance has been switched off after a preselected time, the display is dimly lit and shows date, time, maximum load and readability.
- If your balance has been switched off manually, the display is off.

Note:

- Quickstart is not possible with approved balances (only available in selected countries).
- Standby mode is available on line powered balances only.

5.2 Performing a Simple Weighing



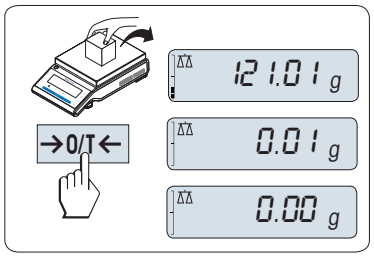
a) Press «→0/T←» to zero the balance.
Note: If your balance is not in the weighing mode, first press and hold the «⚖» key until "WEIGH" appears in the display. Release the key. Your balance is in the weighing mode.

b) Place weighing sample on the weighing pan.

c) Wait until the instability detector "○" disappears and the stability beep sounds.

d) Read the result.

5.3 Zero Setting / Taring

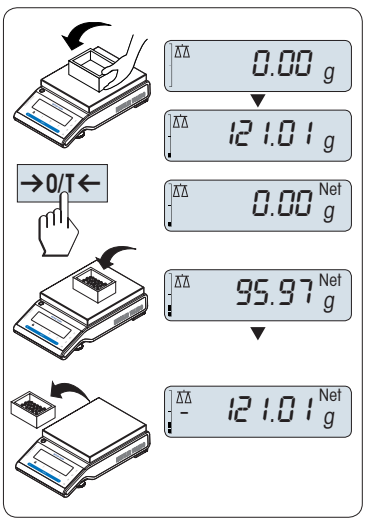


Zero setting

a) Unload the balance.

b) Press «→0/T←» to set the balance to zero. All weight values are measured in relation to this zero point (see menu topic "ZERO.RNG").

Note: Use the «→0/T←» zeroing key before you start with a weighing.



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

a) Place empty container on the balance. The weight is displayed.

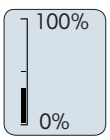
b) Press «→0/T←» to tare the balance.

"0.00 g" and "**Net**" appears in the display. "**Net**" indicates that all weight values displayed are net values.

Note:

- 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 «→0/T←» key is pressed again or the balance is switched off.

5.4 Weighing with the Weighing-in Aid



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

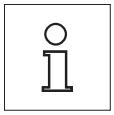
6 Cleaning and Service

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

Please observe the following notes:

- The balance must be disconnected from the power supply
- Ensure that no liquid comes into contact with the balance or the AC adapter.
- Never open the balance or AC adapter – they contain no components, which can be cleaned, repaired or replaced by the user.

- On no account use cleaning agents which contain solvents or abrasive ingredients, as this can result in damage to the operation panel overlay.
- Do not use wet, but only damp cloth for cleaning.



Please contact your METTLER TOLEDO dealer for details of the available service options. Regular servicing by an authorized service engineer ensures constant accuracy for years to come and prolongs the service life of your balance.

7 Technical Data

7.1 General Data

Power Supply

• AC operation:	AC/DC Adapter Primary: 100V–240V, 50/60Hz, 0.3 A Secondary: 12VDC, 0.84A (with electronic overload protection) Power supply to the balance: 8–20VDC, 10W ⚠ Use only with a tested AC Adapter with SELV output current. Ensure correct polarity ⊖—●—⊕
• Battery operation:	8 standard AA (LR6) batteries (alkaline) for 8–15 hours of use.

Protection and Standards

• Overvoltage category:	Class III
• Degree of pollution:	2
• Degree of Protection:	Protected against dust and water: IP54 in use with weighing pan.
• Standards for safety and EMC:	See Declaration of Conformity
• Range of application:	For use only in dry interior rooms

Environmental conditions

• Height above mean sea level:	up to 4000 m
• Ambient temperature range:	10 to 30 °C
• Relative air humidity:	10% to 80 % at 31 °C, linearly decreasing to 50 % at 40 °C, non-condensing

Materials

• Housing:	Top Housing: Plastic (ABS) Bottom housing: Die-cast aluminum, lacquered
• Weighing pan:	Stainless steel X2CrNiMo 17-12-2 (1.4404)
• Draft shield element:	with 0.1 mg models: Stainless steel X2CrNiMo 17-12-2 (1.4404)
• Draft shield:	Plastic (ABS), glass
• In-use-cover:	Plastic (ABS)

GWP® – Good Weighing Practice™

The global weighing guideline GWP® reduces risks associated with your weighing processes and helps to

- choose the appropriate balance
- reduce costs by optimizing testing procedures
- comply with the most common regulatory requirements

▶ www.mt.com/GWP

www.mt.com/newclassic

For more information

Mettler-Toledo AG, Laboratory & Weighing Technologies
CH-8606 Greifensee, Switzerland
Tel. +41 (0)44 944 22 11
Fax +41 (0)44 944 30 60
www.mt.com

11781327D 2.12

* 1 1 7 8 1 3 2 7 *