



EULA

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



This User Manual is a brief instruction that provides information to handle with the first steps of the instrument in a safe and efficient manner. Personnel must have carefully read and understood this manual before performing any tasks.

For full information, always consult the Reference Manual (RM).

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Overview balance





1	Display	2	Level indicator
3	Weighing pan	4	Leveling foot
5	Operation keys	6	Model sticker (with approved models only)
7	Security slot for anti-theft purposes	8	Product label
9	Socket for AC adapter	10	RS232C serial interface
11	USB device interface		

Overview operation keys



Legend key functions

No.	Key	Press briefly (less than 1.5 s)	Press and hold (longer than 1.5 s)
1	Δ̈́Δ	 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

No.	Key	Press briefly (less than 1.5 s)	Press and hold (longer than 1.5 s)	
2	-∔ F1	 To navigate forward (scroll down) within menu topics or menu selections Increase (numerical) parameters within menu and in applications 	 To select assigned F1 application and entering the parameter settings of appli- cation. Default F1 application assignment: Piece counting Increase (numerical) parameters quickly within menu and in applications 	
3	0n/Off →0/T←	Switch onZero	Switch off	
4	F2	 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) 	 To select assigned F2 application and entering the parameter settings of appli- cation. Default F2 application assignment: Percent weighing 	
5	F3	 To enter or leave menu selection (from / to menu topic) To enter application parameter or switch to next parameter To confirm parameter 	 To select assigned F3 application and entering the parameter settings of appli- cation. Default F3 application assignment: Formulation 	
6	С	Cancel and to leave menu without saving (one step back in the menu).	no function	
7	<u> </u>	Printout display valuePrintout active user menu settingsTransfer data	no function	
8	ۍ ▼	Execute predefined adjusting (calibration) procedure	no function	
9	Ċ.	Enter or leave menu (Parameter settings)Save parameters	no function	
10		 To change display resolution (1/10d function) while application is running Mote: not available with approved models in selected countries. 	no function	

1 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.

1.1 Further applicable documents



This User Manual is a brief instruction that provides information to handle with the first steps of the instrument in a safe and efficient manner. Personnel must have carefully read and understood this manual before performing any tasks.

For full information, always consult the Reference Manual (RM).

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1.2 Definitions of signal warnings 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.



Electrical shock



1.3 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



1

🗥 WARNING

Death or serious injury due to electric shock

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

- 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.

A list of spare parts and accessories can be found in the Reference Manual.

2 Design and Function

2.1 Display



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

Status icons								
Μ	Indicates	s stored v	value (Memory)		٦	Service remind	er	
2	Adjustme	ents (cal	ibration) started		(((•)))	Acoustic feedbo	ack for p	ressed keys activated
FACT	FACT activated				W1	Weighing range 1 (Dual Range models only)		
V	Applications diagnostics and routine Test			est	W2	Weighing rang	e 2 (Duc	Il Range models only)
Weight	value fie	ld and w	eighing-in aid					
	Indicates negative values					Brackets to indicate uncertified digits (approved models only)		
0	Indicates unstable values					Marking of nominal or target weight		
*	Indicates calculated values				÷	Marking of tolerance limit T+		
						Marking of tole	rance lin	nit T-
Unit field								
g gram ozt		troy o	unce	tls	Singapore taels			
kg kilogram GN mg milligram dwt		grain		tit	Taiwan taels			
		dwt	penny	/weight	tola	tola		
		ct	carat	mom	mom	me	baht	baht

3 Installation and Putting into Operation

pound

ounce

lb

οz

3.1 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.

msg

tlh

mesghal

Hong Kong taels

Requirements of the location

Place indoors on stable Ensure sufficient spacing Level the instrument Provide adequate lighting table





Sufficient spacing for balances: > 15 cm all around the instrument Take into account the environmental conditions. See "Technical Data".

3.2 Scope of delivery

- Weighing pan 246 × 351 mm
- Protective cover
- AC/DC adapter with country-specific power cable
- User Manual
- Declaration of conformity

3.3 Unpacking

Open the balance packaging. Check the balance for transport damage. Immediately inform a METTLER TOLEDO representative in the event of complaints or missing accessories.

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

3.4 Installing the components

- Place the following components on the balance in the specified order:
- Place the weighing pan (1) on the balance.



3.5 Connecting the balance



🗥 WARNING

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- 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 Insert the plug of the AC/DC adapter (1) in the power inlet of the instrument.
- 3 Secure the plug by firmly tightening the knurled nut.
- 4 Insert the plug of the power cable into a grounded power outlet that is easily accessible.
- \Rightarrow The balance is ready for use.



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.

3.6 Setting up the balance

3.6.1 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 acclimatized and connected to the power supply for at least 30 minutes.

3.6.2 Leveling the balance

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

There are four 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 Turning the leveling feet of the housing until the air bubble is in the middle of the glass.



4 In this example, turn the left leveling feet counterclockwise.



Example



3.6.3 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.

For further information, consult the Reference Manual (RM).



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3.7 Performing a simple weighing



The weighing application allows you to perform simple weighings and how you can accelerate the weighing process.

If your balance is not in the weighing mode, press and hold the AA key down until **WEIGHING** appears in the display. Release the key. Your balance is in the weighing mode and set to zero.

- 1 Press $\rightarrow 0 \leftarrow$ to zero the balance.
- 2 Place the sample on the weighing pan.
- 3 Wait until the instability detector O disappears.
- 4 Read the result.



Zeroing

Use the $\rightarrow 0/T \leftarrow$ zeroing key before you start with a weighing.

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



Taring

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

- 1 Place empty container on the weighing pan.
 - ⇒ The weight is displayed.
- 2 Press $\rightarrow 0/T \leftarrow$ to zero the balance.
 - ⇒ 0.00 g appears in the display.
- 3 Place the sample in the container.
 - \Rightarrow The result appears in the display.
- 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.



On

Off

Switching off

- Press and hold the Off key until SHUTOFF appears on the display. Release the key.
- ⇒ Balances switch into standby mode.
- After switching on from standby mode, your balance needs no warm-up time and is immediately ready for weighing.
- 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.
- To completely switch off mains operated balances, they must be disconnected from the power supply.

Legal-for-trade

Standby mode is not possible with approved balances (only available in selected countries).

For further information, consult the Reference Manual (RM).



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SHUTOFF

3.8 Transporting the balance

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

3.8.1 Transporting over short distances

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

- 1 Hold the balance with both hands as shown.
- 2 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 adjustment.



3.8.2 Transporting over long distances

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

3.8.3 Packaging and storage

Packaging

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

Storage

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 maybe down (date and time get lost).

4 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.

4.1 Maintenance table

Maintenance action	Recommended interval	Remarks
Performing an internal adjustment	 Daily After cleaning After leveling After changing the location 	see chapter "Fully automatic adjustment FACT"
Performing routine tests (sensitivity test, repeata- bility test).	After cleaning	see below
METTLER TOLEDO recommends to perform at least a sensitivity test.		
Cleaning	Depending on the degree of pollution or your internal regulations (SOP), clean the instrument:	see chapter "Cleaning the balance"
	After every use	
	After change of sample	

4.2 Performing routine tests

There are several routine tests. Depending on your internal regulations, specific routine test must be performed by the user.

METTLER TOLEDO recommend to perform an sensitivity test after cleaning and reassembling the balance. To perform a routine test, proceed how described in chapter "Application routine test".

For further information, consult the Reference Manual (RM).



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4.3 Cleaning



For further information, consult the Reference Manual (RM).

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Death or serious injury due to electric shock

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

- 1 Disconnect the instrument from the power supply prior to cleaning and maintenance.
- 2 Prevent liquid from entering the instrument, terminal or AC/DC adapter.

4.3.1 Cleaning the balance



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

NOTICE

- 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.

🖹 Note

Useful details to avoid soiling the instrument are described in the Mettler-Toledo GmbH "SOP for Cleaning a Balance".

4.3.2 Putting into operation after cleaning

- 1 Reassemble the balance.
- 2 Press **On**/Off to switch on the balance.
- 3 Warm up the balance. Wait 1h for the acclimatization, before starting the tests.

- 4 Check the level status, level the balance if necessary.
- 5 Perform an internal adjustment.
- 6 Perform a routine test due to the internal regulations of your company. METTLER TOLEDO recommends to perform an repeatability test after cleaning the balance.
- 7 Press $\rightarrow 0/T \leftarrow$ to zero the balance.
- \Rightarrow The balance has been putting into operation and is ready to use.

5 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.

5.1 Error messages

Error message	Possible cause	Diagnostic	Remedy
NO STABILITY	Vibrations at the workplace.	Place beaker with tap water on the weighing table. Vibrations cause ripples on the water surface.	 Protect weighing location against vibrations (vibration absorber, etc.). Set weighing parameters coarser (change ENVIRON. from STABLE to STANDARD or even UNSTABLE. Find a different weighing location (by agreement with customer).
	Draft due to open window or similar.	Make sure window is closed.	 Close window. Set weighing parameters coarser (change ENVIRON. 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 dirts.	Remove touching parts or clean the balance.
WRONG ADJUSTMENT WEIGHT	Wrong adjustment weight.	Check weight.	Place correct weight on the weighing pan.
REFERENCE TOO SMALL	Reference for piece counting too small.	_	Increase reference weight.
EEPROM ERROR - PLEASE CONTACT CUSTOMER SERVICE	Data in EEPROM damaged.	-	Please contact your METTLER TOLEDO customer service.
WRONG CELL DATA - PLEASE CONTACT CUSTOMER SERVICE	Defect load cell data.	-	Please contact your METTLER TOLEDO customer service.

Error message	Possible cause	Diagnostic	Remedy
NO STANDARD ADJUSTMENT - PLEASE CONTACT CUSTOMER SERVICE	_	-	Please contact your METTLER TOLEDO customer service.
PROGRAM MEMORY DEFECT - PLEASE CONTACT CUSTOMER SERVICE	_	_	Please contact your METTLER TOLEDO customer service.
TEMP SENSOR DEFECT - PLEASE CONTACT CUSTOMER SERVICE	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 customer service.
WRONG LOAD CELL BRAND - PLEASE CONTACT CUSTOMER SERVICE	Wrong load cell installed.	-	Please contact your METTLER TOLEDO customer service.
WRONG TYPE DATA SET - PLEASE CONTACT CUSTOMER SERVICE	Wrong type data set.	_	Please contact your METTLER TOLEDO customer service.
BATTERY BACKUP LOST - CHECK DATE TIME SETTINGS	Backup battery/capacitor is empty. This battery/ capacitor ensures that the date and time are not lost when the balance is disconnected from power.	The battery/capacitor provides enough power for approximately 2 days when having the balance not connected to the power supply.	Connect the balance to the power supply for charging the battery (e.g., during the night) or contact METTLER TOLEDO customer service.
INITIAL ZERO RANGE EXCEEDED	Wrong weighing pan. Pan is not empty.	Check weighing pan.	Mount correct weighing pan or unload weighing pan.
BELOW INITIAL ZERO RANGE	Wrong weighing pan. Pan is not empty.	Check weighing pan.	Mount correct weighing pan.
MEM FULL	Memory full.	-	Clear the memory by finishing all applications where a measurement is ongoing.
FACTOR OUT OF RANGE	Factor is outside the allow range.	-	Select a new factor.
STEP OUT OF RANGE	Step is outside the allow range.	-	Select a new step.
OUT OF RANGE	Sample weight is outside the allow range.	_	Unload the pan and load a new sample weight.

5.2 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.

Error symptom	Possible cause	Diagnostic	Remedy
	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.
	Connector socket on balance is corroded or faulty.	Check	Please contact your METTLER TOLEDO customer service.
	Display is faulty.	Replace display.	Please contact your METTLER TOLEDO customer service.
Operation Keys do not work	Keypad is defect.	Replace the keypad.	Please contact your METTLER TOLEDO customer service.
The value drifts into plus or minus	Room, environment not suitable.	-	Environmental recom- mendations
			 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. Instrument uninter- ruptedly 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.	 Is the weighing result with a test weight stable? Sensitive weighing samples, e.g., paper, cardboard, wood, plastic, rubber, liquids. 	 Use aids. Cover weighing sample.

Error symptom	Possible cause	Diagnostic	Remedy
	Weighing sample is electrostatically charged.	 Is the weighing result with a test weight stable? Sensitive weighing samples, e.g., plastic, powder, insulating materials. 	 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.	 Was there a power outage? Was power supply disconnected? 	 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.	-	 Switch off balance. Disconnect and reconnect power cable.
Display flashes 0.0000	Loose cables.	Check all cable connections.	Connect all cables. Please contact your METTLER TOLEDO customer service if the problem persists.
Taring not possible	Vibrations at the	Display unstable.	Press Tare again.
	workplace.	Place beaker with tap water on the weighing table. Vibrations cause ripples on the water surface.	 Protect weighing location against vibrations (vibration absorber, etc.). Set weighing parameters coarser (change ENVIRON. from STABLE to STANDARD or even UNSTABLE. Find a different weighing location (by agreement with customer).

5.3 Status messages/Status icons

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

lcon	Status description	Diagnostic	Remedy
3	Service due.	See menu topic SERV.ICON in chapter "Description of menu topic" -> "Advanced menu".	Please contact your METTLER TOLEDO-Support representative.

5.4 Putting into operation after fixing an error

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

|| 2

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

6 Technical Data

6.1 General data

Power supply

AC/DC adapter:

Cable for AC/DC adapter: Polarity: Balance power consumption:

Protection and standards

Overvoltage category:
Degree of pollution:
Protection:
Standards for safety and EMC:
Range of application:

Environmental conditions

Height above mean sea level: Ambient temperature: Storage condition: Relative air humidity:

Materials

Housing: Weighing pan: Protective cover: Protected against dust and water See Declaration of Conformity Use only indoors in dry locations

Up to 4000 m $+5\ ^\circ C$ – $+40\ ^\circ C$ -25 $^\circ C$ – $+70\ ^\circ C$ Max. 80% up to 31 $^\circ C$, linearly decreasing to 50% at 40 $^\circ C$, non-condensing

Die-cast aluminum, lacquered 245 × 351 mm: Stainless steel X5CrNiMo 18-10 (1.4301) PET

7 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.

 GWP^{\otimes} 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

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