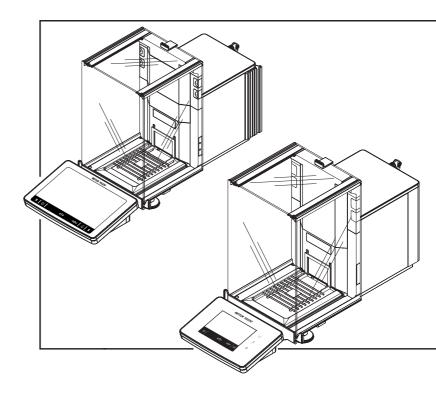
# **Analytical Balances and Comparators**

XPR & XSR





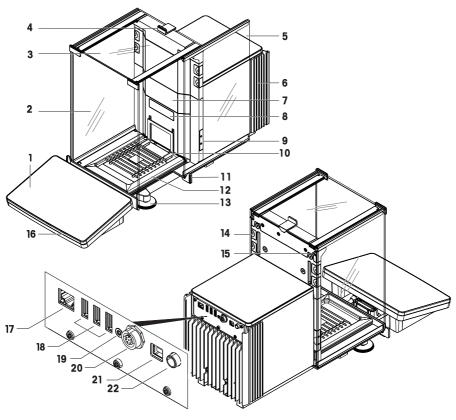


This User Manual is a brief instruction that provides information to handle with the first steps of the instrument in a safe and efficient manner. Personnel must have carefully read and understood this manual before performing any tasks.

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

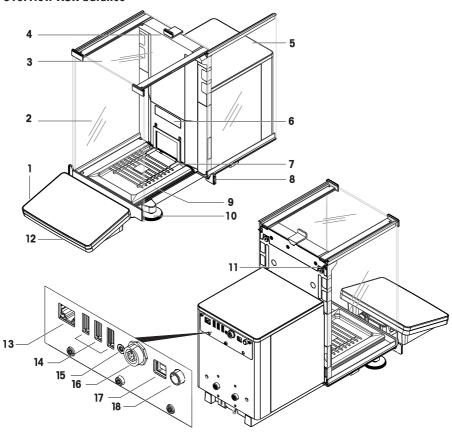
- ▶ www.mt.com/XPR-analytical-RM
- ▶ www.mt.com/XSR-analytical-RM

# Overview XPR balance



1	Terminal	12	Drip tray
2	Front panel draft shield	13	Leveling feet
3	Top door draft shield	14	Removable clips
4	Handle for top door	15	Side door release lever
5	Side door draft shield (right/left)	16	Status light
6	Cooling unit	17	Ethernet port
7	Slot for the installation of an internal module e.g. lonizer module	18	USB-A ports (to device)
8	Balance type designation plate	19	Service seal
9	Optical sensor SmartSens	20	Socket for terminal connection cable
10	Weighing pan	21	USB-B port (to host)
11	Door handle	22	Socket for power adapter

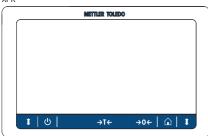
# Overview XSR balance

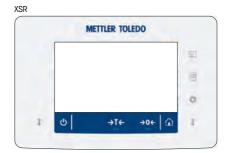


1	Terminal	10	Leveling feet
2	Front panel draft shield	11	Side door release lever
3	Top door draft shield	12	Status light
4	Handle for top door	13	Ethernet port
5	Side door draft shield (right/left)	14	USB-A ports (to device)
6	Balance type designation plate	15	Service seal
7	Weighing pan	16	Socket for terminal connection cable
8	Door handle	17	USB-B port (to host)
9	Drip tray	18	Socket for power adapter

# Overview terminal







ψ	→T←	<b>→0</b> ←	<b>û</b>	<b>‡</b>
ON/OFF	Tare	Zero	Home	Open/close door

# Only for XSR-Terminal



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# 1 Introduction

#### **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

This document is available in other languages online.

▶ www.mt.com/xpr-analytical

▶ www.mt.com/xsr-analytical

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 Acronyms and abbreviations

Original term	Explanation
ASTM	American Society for Testing and Materials
EMC	Electromagnetic Compatibility
FCC	Federal Communications Commission
GWP	Good Weighing Practice
ID	Identification
LPS	Limited Power Source
MT-SICS	METTLER TOLEDO Standard Interface Command Set
NA	Not Applicable
OIML	Organisation Internationale de Métrologie Légale (International Organization of Legal Metrology)
RFID	Radio-frequency identification
RM	Reference Manual
RS (RS232C)	Recommended Standard (RS232C)
sd	Standard deviation
SELV	Safety Extra Low Voltage
SOP	Standard Operating Procedure
UM	User Manual
USB	Universal Serial Bus
USP	United States Pharmacopeia

# 1.3 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



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

▶ www.mt.com/XPR-analytical-RM

# 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.



Electrical shock



Notice

# 2.2 Product-specific safety information

#### 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 assumes that the instrument owner trains users to safely use the instrument in their workplace and deal with potential hazards. METTLER TOLEDO assumes that the instrument owner provides the necessary protective gear.

#### Safety notes



# **MARNING**

# 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 supply cable and AC 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 damaged cables and power plugs.



# **NOTICE**

# Damage to the instrument due to the use of unsuitable parts

Using unsuitable parts with the instrument can damage the instrument or cause it to malfunction.

- 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.

# 3 Design and Functions



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

- ▶ www.mt.com/XPR-analytical-RM
- ▶ www.mt.com/XSR-analytical-RM

# 3.1 Overview

See the sections "Overview" (graphics and legend) at the very beginning of this manual.

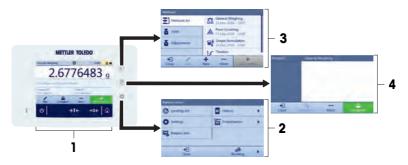
# 3.2 User interface

# 3.2.1 Main sections at a glance

The main weighing screen (1) is the central navigation point where all the menus and settings can be found. The **Balance menu** (2), **Methods** (3) and **Protocol** (4) open when tapping the drawers along the main weighing screen (XPR) or when pressing the symbols on the terminal (XSR).

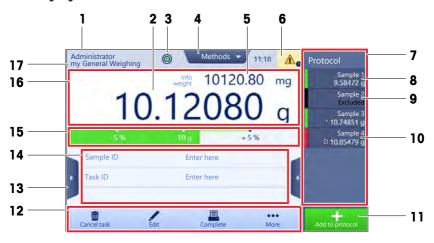


Main sections XPR



Main sections XSR

# 3.2.2 Main weighing screen XPR



	Name	Description		
1	User name	Shows the name of the current user.		
2	Weighing value field	Shows the current weighing value.		
3	Level indicator	Indicates if the balance is leveled (green) or not (red).		
4	Methods menu	Accesses the user-defined list of methods, tests, and alignments.		
5	Info weight	Shows the current weighing value in another unit.		
6	Warning and error message area	Shows current warning and/or error messages.		
7	Drawer <b>Protocol</b>	Shows the recent weighing results.		
8	Sample status <b>OK</b>	Result status indicator green: indicates that the result fulfills a set of criteria. For example:		
		The balance is in level.		
		The internal adjustment was performed and ok.		
		<ul> <li>The weighing result is within the defined tolerance range (only if tolerance is defined).</li> </ul>		
9	Sample status <b>Excluded</b>	Result status indicator black: indicates that the result was excluded from the protocol.		
10	Sample status <b>Not OK</b>	Result status indicator red: indicates that the result criteria are not fulfilled, e.g., "The weighing result was out of the defined tolerances".		
11	Button Add to protocol	Adds the result to the protocol.  Depending on the selected method, the button can have different functions.		
12	Weighing action field	Contains actions referring to the current task.		
13	Balance menu	Accesses the balance properties.		
14	Method information area	Contains information about the sample, method or task IDs.		
15	SmartTrac	Used as a weighing aid to define a target weight with upper and lower tolerances.		
16	Weighing value area	Shows the results of the current weighing process.		
17	Method name	Shows the name of the current method.		

# 3.2.3 Main weighing screen XSR



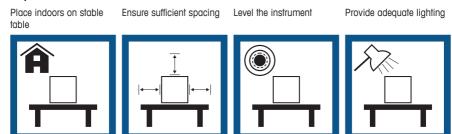
	Name	Description
1	Weighing value field	Shows the current weighing value.
2	Level indicator	Indicates if the balance is leveled (green) or not (red).
3	Warning and error message area	Shows current warning and/or error messages.
4	Button Add to protocol	Adds the result to the protocol.  Depending on the selected method, the button can have different functions.
5	Weighing action field	Contains actions referring to the current task.
6	Method information area	Contains information about the sample, method or task IDs.
7	SmartTrac	Used as a weighing aid to define a target weight with upper and lower tolerances.
8	Weighing value area	Shows the results of the current weighing process.
9	Method name	Shows the name of the current method.

# 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



Avoid direct sunlight

Avoid vibrations

Avoid strong drafts

Avoid temperature fluctuations

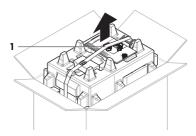
Sufficient spacing for balances: > 15 cm all around the instrument Take into account the environmental conditions. See "Technical Data".

# 4.2 Unpacking the balance

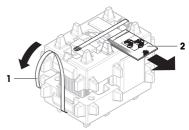
Check the package, the packaging elements and the delivered components for damages. If any components are damaged, please contact your METTLER TOLEDO service representative.

Depending on the balance model, the components may look different. The procedure is always the same.

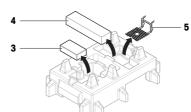
1 Open the box and lift the package out using the lifting strap (1).



2 Open the lifting strap (1) and remove the User Manual (2).



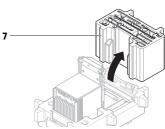
3 Remove the upper part of the package and remove the set with the AC adapter and power cable (3), the box containing several accessories (4), and the weighing pan (5).



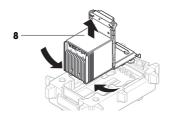
4 Carefully remove the terminal (6).



5 Carefully remove the package set with the draft shield doors and the display holder (7).



- 6 Carefully remove the weighing unit (8) from the bottom packaging.
- 7 Remove the protective bag.
- 8 Store all parts of packaging in a safe place for future use.
- ⇒ The weighing unit is ready for assembling.



# 4.3 Scope of delivery

# **Balance**

- · Weighing unit
- · Draft shield
- · Drip tray and weighing pan

# Documentation

- User Manual
- · Production certificate

#### Accessories

- · ErgoClip basket
- SmartPrep, 2 pcs

# 4.4 Installation

# 4.4.1 Attaching the terminal



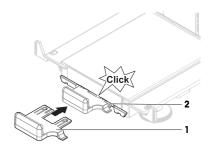
# NOTICE

Damage to the cables due to careless handling

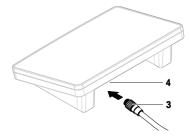
Do not kink or twist the cables.

- Terminal with terminal holder and terminal connection cable
- · AC/DC adapter with country-specific power cable
- MC Link Software (only comparators)
- Declaration of Conformity
- Brush

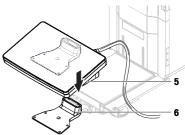
 Insert the slides of the display holder (1) into the front of the weighing unit (2).



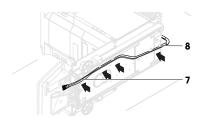
2 Connect the terminal cable (3) with the terminal (4). Consider the pin assignment.



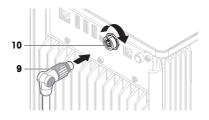
3 Place the terminal (5) onto the display holder (6).



- 4 Carefully tilt the balance to its side.
- 5 Lead the cable (7) through the cable channel (8).
- 6 Carefully put the balance back on its feet.



- 7 Insert the terminal cable (9) into the socket of the balance (10). Consider the pin assignment.
- ⇒ The terminal is ready.



# 4.4.2 Assembling the balance



# **CAUTION**

# Injury due to sharp objects or broken glass

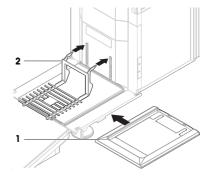
Instrument components, e.g., glass, can break and lead to injuries.

- Always proceed with focus and care.

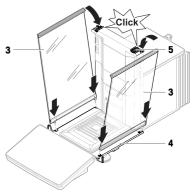


Depending on the balance model, the components may look different. The procedure is always the same.

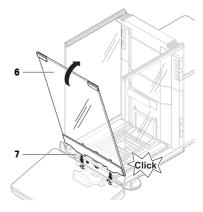
- 1 Insert the drip tray (1).
- 2 Carefully mount the weighing pan (2).



3 Place the side doors (3) into the grooves of the door slides (4) and till them up until they engage with the door lever (5). Consider the marks on the bottom frames (L = left / R = right).



- 4 Insert the front panel (6) into the grooves (7) and tilt it up until it engages.
- 5 Open the side doors.



- 6 Fit the top door (8) along the top frame of the side doors and into the rails of the back wall (9).
- 7 Push the top door (8) towards the front.
- 8 Close the side doors.
- ⇒ The balance is assembled and ready to be put into operation.



# 4.5 Putting into operation

#### 4.5.1 Connecting the balance



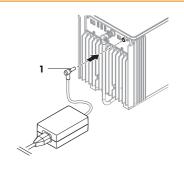
# **MARNING**

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

- 1 Only use the METTLER TOLEDO power supply cable and AC adapter designed for your instrument.
- 2 Connect the power cable to a grounded power outlet.

Death or serious injury due to electric shock

- 3 Keep all electrical cables and connections away from liquids and moisture.
- 4 Check the cables and the power plug for damage and replace damaged cables and power plugs.
- 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.
- ⇒ After connecting the balance to power, the side doors open and close slowly for initialization.





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

# **EULA (End User License Agreement)**

When the balance is switched on the first time, the EULA (End User License Agreement) appears on the screen.

- 1 Read the conditions.
- 2 Tap I accept the terms in the license agreement, and confirm with **JOK**.

#### Warming up

Before the balance gives reliable results, it must warm up. This takes at least 120 minutes after connecting the balance. When the balance is switched on from standby, it is ready immediately.

- The balance has warmed up.
- Press (<sup>1</sup>).
  - ⇒ The main weighing screen appears.

When the balance is switched on, the main weighing screen appears. The display will always show the screen of the method last used before switching it off.

#### 4.5.3 Leveling the balance

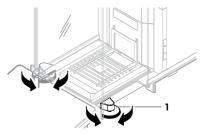
Exact horizontal and stable positioning are essential for repeatable and accurate weighing results.

If the message Balance is out of level appears:

- 1 Tap Level the balance.
  - $\Rightarrow$  The **Leveling aid** opens.
- 2 Turn both leveling feet (1) as instructed on the display until the dot is in the center of the level indicator

The leveling aid can also be accessed through the balance menu:

Navigation: ▶ Balance menu > **③** Leveling aid



# 4.5.4 Performing an internal adjustment

- The adjustment Strategy is set to Internal adjustment.
- 1 Open the **Methods** section, tap ₹, select the adjustment, and tap ► **Start**

from the main weighing screen, tap ••• More and tap Start adjustment.

- ⇒ Internal adjustment is being executed.
- ⇒ When the adjustment has been completed, an overview of the adjustment results appears.
- 2 Tap Print if you want to print the results.
- 3 Tap J Finish adjustment.
- ⇒ The balance is ready.



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

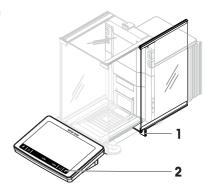
- www.mt.com/XPR-analytical-RM
- ▶ www.mt.com/XSR-analytical-RM

# 4.6 Performing a simple weighing

#### 4.6.1 Opening and closing the draft shield doors

 Open the door manually with the door handle (1) or touch the key \$\mathbf{1}\$ on the terminal (2).

The doors can be configured to open and close in different ways.



# 4.6.2 Zeroing the balance

- 1 Open the draft shield.
- 2 Clear the weighing pan.
- 3 Close the draft shield.
- 4 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- ⇒ The balance is zeroed.

# 4.6.3 Taring the balance

If a sample vessel is used, the balance must be tared.

- 1 Open the draft shield.
- 2 Clear the weighing pan.
- 3 Close the draft shield.
- 4 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- 5 Open the draft shield.
- 6 Place the sample vessel (1) on the weighing pan (2).
- 7 Close the draft shield.
- 8 Press  $\rightarrow$ **T** $\leftarrow$  to tare the balance.
- ⇒ The balance is fared. The icon Net appears.

# 1 2

#### 4.6.4 Performing a weighing

- 1 Open the draft shield.
- 2 Place the weighing object into the sample vessel.
- 3 Close the draft shield.
- 4 Tap + Add to protocol if you want to report the weighing result.
- ⇒ The weight value is listed in the **Protocol**.

# 4.6.5 Completing the weighing

- 1 To save the weighing protocol, tap **Example 1**.
  - ⇒ The window Complete task opens.
- 2 Select an option to save or print the protocol.
  - ⇒ The respective menu window opens.
- 3 Follow the instructions of the wizard.

#### 4 Tap <a href="#">Complete</a>

⇒ The **Protocol** is saved/printed and then cleared.

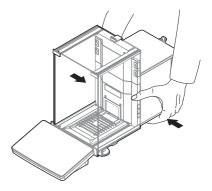
# 4.7 Transporting, packing and storing

# 4.7.1 Transporting the balance over short distances

- Disconnect the AC/DC adapter and unplug all interface cables.
- 2 Hold the weighing platform with both hands and carry the balance in horizontal position to the target location. Consider the requirements of the location.

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

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



# 4.7.2 Transporting the balance over long distances

METTLER TOLEDO recommends using the original packaging for transportation or shipment of the balance or balance components over long distances. The elements of the original packaging are developed specifically for the balance and its components and ensure maximum protection during transportation.

#### See also

Unpacking the balance ▶ Page 9

# 4.7.3 Packing and storing

#### Packing the balance

Store all parts of packaging in a safe place. The elements of the original packaging are developed specifically for the balance and its components, and ensures maximum protection during transportation and storage.

#### Storing the balance

Only store the balance under the following conditions:

- · Indoor and in the original packaging
- According to the environmental conditions, see "Technical Data"



When storing for longer than 6 months, the rechargeable battery may become empty (only date and time get lost).

#### See also

Technical data ▶ Page 20

#### 5 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.



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

▶ www.mt.com/XPR-analytical-RM

# 5.1 Maintenance tasks

Maintenance action	Recommended interval	Remarks
Performing an internal adjustment	Daily     After cleaning     After leveling     After changing the location	see "Performing an internal adjustment"
Performing routine tests (eccentricity test, repeata- bility test, sensitivity test). METTLER TOLEDO recommends to at least perform a sensitivity test.	After cleaning     After assembling the balance     After a software update     Depending on your internal regulations (SOP)	see "Tests" in the Reference Manual
Cleaning	After every use     After changing the substance     Depending on the degree of pollution     Depending on your internal regulations (SOP)	see "Cleaning"
Updating the software	Depending on your internal regulations (SOP).      After a new software release.	see "Software update" in the Reference Manual

# See also

- Performing an internal adjustment ▶ Page 14
- Cleaning ▶ Page 17

# 5.2 Cleaning

# 5.2.1 Disassembling for cleaning

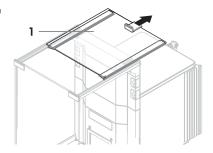


# **⚠** CAUTION

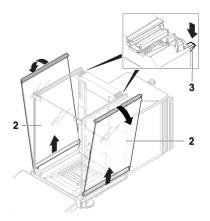
# Injury due to sharp objects or broken glass

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

- Always proceed with focus and care.
- 1 Open the top door (1) and pull it all the way back, outside of the rails of the side doors. Shortly before the top panel drops out, you can feel a slight resistance. Just keep pulling a little bit tighter.



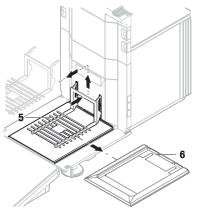
- 2 Hold the side doors (2) and push down the lever (3) to release them.
- 3 Carefully remove both side doors (2).



4 Tilt the front panel (4) to the front and remove it.



- 5 Carefully lift the weighing pan (5) to unhook it and pull it out.
- 6 Remove the drip tray (6).
- 7 Store all removed components in a safe place.
- $\Rightarrow$  The balance is ready for cleaning.



#### 5.2.2 Cleaning the balance



#### **↑** WARNING

# 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.



# 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 terminal

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

#### Cleaning the removable parts

 Clean the removed part with a damp cloth or a tissue and a mild cleaning agent or clean in a dishwasher up to 80 °C.

# Cleaning the weighing unit

- 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 with a disposable tissue first.
- 4 Remove sticky substances with a damp lint-free cloth and a mild solvent, e.g., isopropanol or ethanol 70%.



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

# 5.2.3 Putting into operation after cleaning

- 1 Reassemble the balance.
- 2 Check that the draft shield doors (top, sides) open and close normally.
- 3 Check if the terminal is connected to the balance.
- 4 Reconnect the balance to the AC/DC adapter.
- 5 Check the level status, level the balance if necessary.
- 6 Respect the warm-up time specified in the "Technical Data".
- 7 Perform an internal adjustment.
- 8 Perform a routine test according to the internal regulations of your company. METTLER TOLEDO recommends to perform a sensitivity test after cleaning the balance.
- 9 Press  $\rightarrow 0 \leftarrow$  to zero the balance.
- ⇒ The balance is ready to be used.

#### See also

- Leveling the balance ▶ Page 14
- Technical data ▶ Page 20

# 6 Technical data

# 6.1 General data

# **Power supply**

AC/DC adapter: Primary: 100 – 240 V~, 50/60 Hz

Secondary: 12 V DC, 5 A, LPS, SELV

Cable for AC/DC adapter: 3-core, with country-specific plug

Balance power consumption: 12 V DC  $\pm$  10%, 2.25 A

#### Protection and standards

Overvoltage category: II
Degree of pollution: 2

Standards for safety and EMC: See Declaration of Conformity
Range of application: Use only indoors in dry locations

#### **Environmental conditions**

The limit values apply when the balance is used under the following environmental conditions:

Height above mean sea level: Up to 5000 m Ambient temperature: +10 - +30 °C

Temperature change, max.: 5 °C/h

Relative air humidity: 30 – 70%, non-condensing

Warm-up time: At least 120 minutes after connecting the balance to the power

supply. When switched on from standby, the instrument is ready

for operation immediately.

The balance can be used under the following environmental conditions. However, the weighing performances of the balance may be outside the limit values:

Ambient temperature:  $+5 - +40 \,^{\circ}\text{C}$ 

Relative air humidity: 20% to max. 80% at 31 °C, decreasing linearly to 50% at

40 °C, non-condensing

The balance can be disconnected and stored in its packaging under the following conditions:

Ambient temperature:  $-25 - +70 \,^{\circ}\text{C}$ 

Relative air humidity: 10 – 90%, non-condensing

# **Environmental conditions for comparators**

Comparators need to be used under the following environmental conditions to reach the specified performances:

Air speed, max.: 0.15 m/s

# 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.



Good Weighing Practice™

 $\mathsf{GWP}^{\text{\tiny{(0)}}}$  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/excellence-analyti	ca	I
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For more information

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