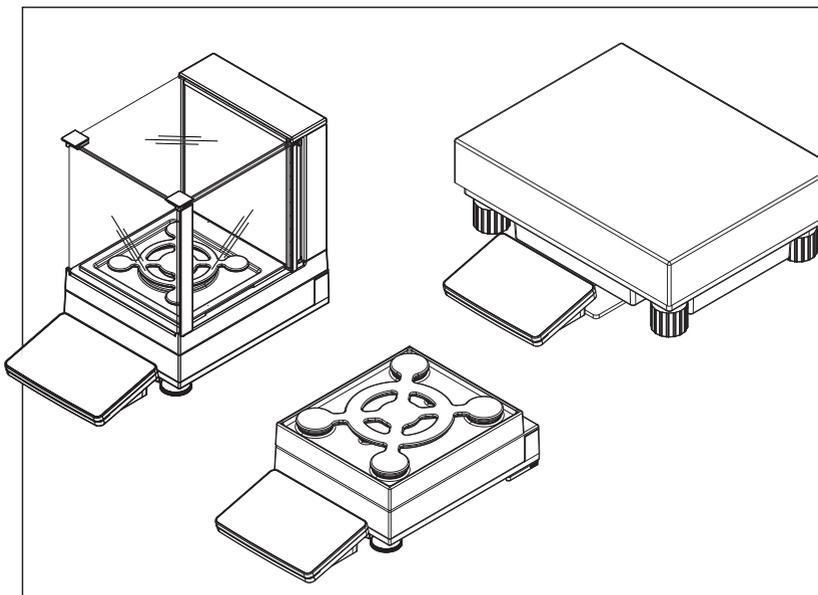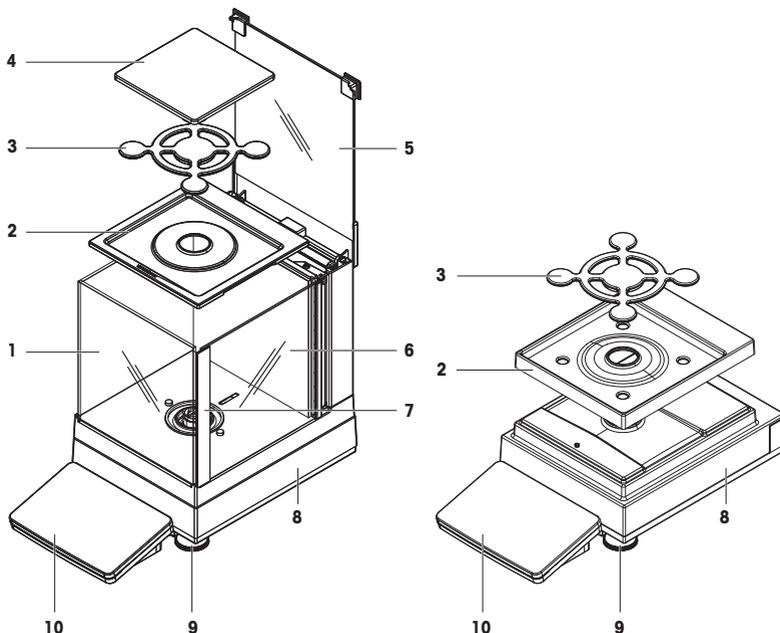User Manual

Precision Balances

XSR models

METTLER **TOLEDO**

Overview balances with S weighing platform

Legend balances with S weighing platform

| 1	MagicCube Draft Shield	6	MagicCube Draft Shield side door
2	DripTray	7	MagicCube Draft Shield side door handler
3	SmartPan weighing pan	8	Weighing platform with protective cover
4	Weighing pan	9	Leveling foot
5	MagicCube Draft Shield top door	10	Terminal with protective cover

Overview interface board S weighing platform
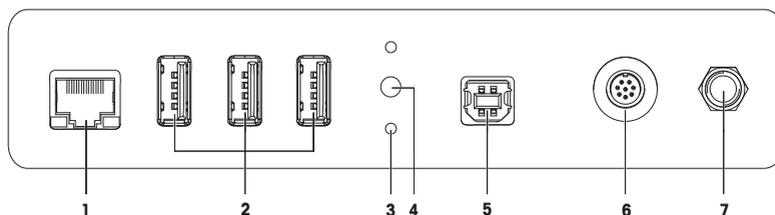
Legend interface board S weighing platform

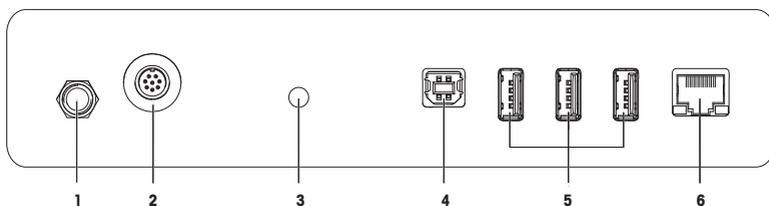| 1	Ethernet port	5	USB host port
2	USB device ports	6	Socket for terminal connection cable
3	Fixations for optional terminal stand	7	Socket for AC/DC adapter
4	Service seal		

Overview balances with L weighing platform
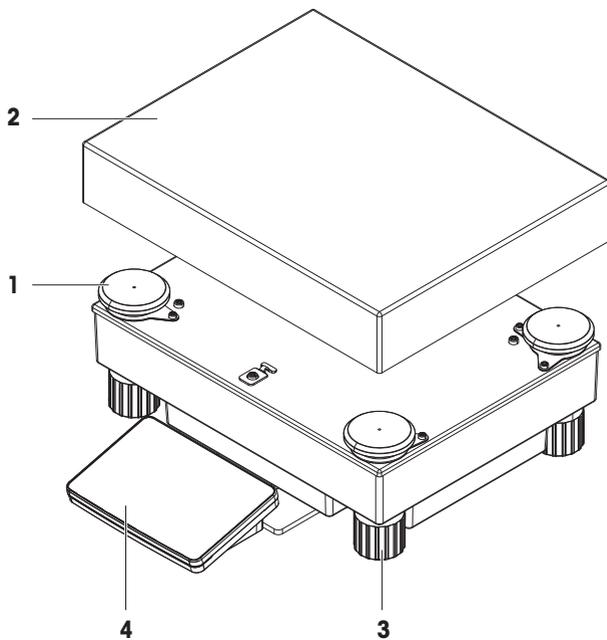
Legend balances with L weighing platform

1	Weighing pan support cap	**3**	Leveling foot
2	Weighing pan	**4**	Terminal with protective cover

Overview interface board L weighing platform

Legend interface board L weighing platform

1	Socket for AC/DC adapter	**4**	USB host port
2	Socket for terminal connection cable	**5**	USB device ports
3	Service seal	**6**	Ethernet port

Overview terminal
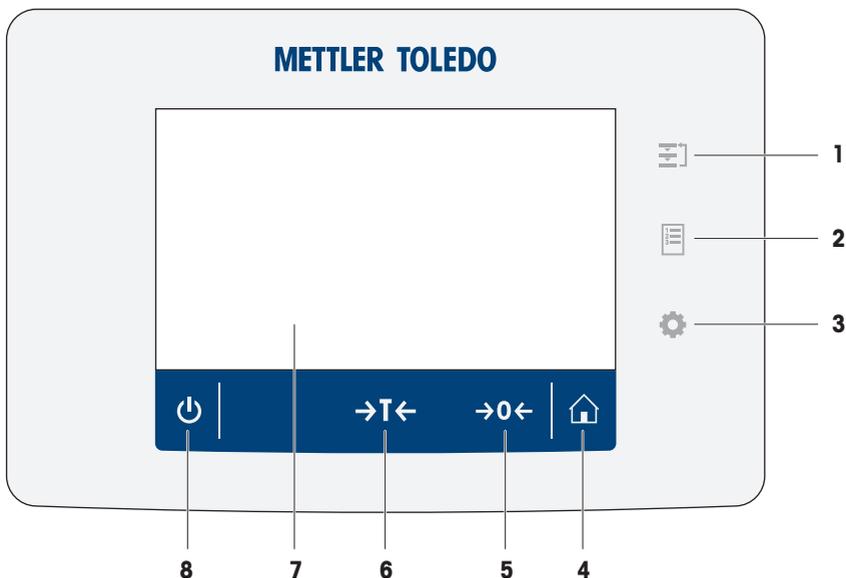
Legend Terminal

No.	Key	Name	Explanation
1	⊒⊐	**Methods**	Opens the section **Methods**.
2	₁₂₃≡	**Protocol**	Opens the section **Protocol**.
3	⚙	**Balance menu**	Opens the section **Balance menu**.
4	🏠	Home	To return from any menu level to the method work screen.
5	→0←	Zero	Zeroes the balance. The balance must always be zeroed before starting the weighing process. After zeroing, the balance sets a new zero point.
6	→T←	Tare	Tares the balance. This function is used when the weighing process involves containers. After taring the balance, the screen shows Net which indicates that all displayed weights are net.
7	-	4.3 inch capacitive TFT touchscreen	The touchscreen shows information about the current weighing process.
8	⏻	ON/OFF	Switches the balance on/off. By tapping on the button ⏻, the balance is not completely switched off but goes into standby mode. To switch the balance completely off, it must be unplugged from the power supply. **Note** Do not disconnect the balance from the power supply unless the balance is not used for an extended period of time.

1 Safety Information

- Read and understand the instructions in this manual before using the balance.
- Keep this manual for future reference.
- Include this manual if you pass on the balance to other parties.

If the balance is not used according to the instructions in this manual or if it is modified, the safety of the balance may be impaired and Mettler-Toledo GmbH assumes no liability.

Finding more information

Additional information about this balance can be found in the Operating Instructions on the CD-ROM or online.

▶ www.mt.com/XSR-precision-OI

▶ www.mt.com/library

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 death or severe injury if not avoided.

CAUTION for a hazardous situation with low risk, resulting in minor or moderate injury if not avoided.

NOTICE for a hazardous situation with low risk, resulting in damage to the instrument, other material damage, malfunctions and erroneous results, or loss of data.

General hazard   Electrical shock

1.2 Product safety information

Intended use

This balance is designed to be used in laboratories by trained staff. The balance is intended for weighing purposes.

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.

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 document. The instructions for setting up your new instrument must be strictly observed.

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

Staff safety

This printed document must be read and understood before using the balance. This printed document 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

> ⚠ **WARNING**
>
> **Danger of death or serious injury due to electric shock!**
>
> Contact with parts that contain a live current can lead to injury and death. If the balance cannot be shut down in an emergency situation, people can be injured or the balance can be damaged.
>
> 1 Only use the original universal AC/DC adapter delivered with your balance.
> 2 Check that the voltage printed on the balance is the same as your local power supply voltage.
>   ⇨ If this is not the case, under no circumstances connect the AC/DC adapter to the power supply, but contact a METTLER TOLEDO representative.
> 3 Only plug the adapter into a socket which is grounded.

> **NOTICE**
>
> **Damage to the balance due to wrong usage.**
>
> 1 Only use indoors in dry locations.
> 2 Do not use pointed objects to operate the touchscreen.
> 3 Only use original METTLER TOLEDO accessories and peripheral devices.
> 4 Do not open the balance housing. It contains no user-serviceable parts. Contact a METTLER TOLEDO representative in case of any issue.

2 Basic Navigation

2.1 Main sections at a glance

The method work screen shows information about the current weighing process and the selected method (the picture shows the method work screen of the method **General Weighing**). The sections **Methods**, **Protocol** and **Balance menu** can be opened by tapping on the corresponding button on the right hand side of the touch screen.

No.	Section	Name	Explanation
1	亖]	**Methods**	In the section **Methods** new methods can be defined or existing methods can be edited. Furthermore, routine tests to check the accuracy of the balance and adjustment procedures can be defined and started.
2	≡	**Protocol**	In the section **Protocol** the stored weighing results for the currently active method are shown.
3	⚙	**Balance menu**	In the section **Balance menu** system settings can be adjusted and information about the balance and precedent tasks are shown. Furthermore, the menu provides a procedure to level the balance.

2.2 Method work screen

The method work screen is the basic screen that appears when working with the balance. Depending on the method, the method work screen can slightly differ, but the basic elements appear for all methods.

| No.	Name	Explanation
1	**Method name**	Shows the name of the current method.
2	Level indicator	Indicates if the balance is leveled.
3	Weighing value field	Shows the current weighing value.
4	Button **Add to protocol**	Adds the result to the protocol. Depending on the selected method the button can have a different functions.
5	Weighing action field	This field contains actions referring to the current task.
6	Method information area	Contains information about sample IDs, method IDs or task IDs.
7	Weighing-in aid	Defines a target weight with upper und lower tolerances.
8	Weighing value area	In this area the value of the current weighing process is shown.

2.3 Opening a section/function

A menu item or a function can be selected or activated by tapping it.

2.4 Scrolling

If a list of available options or results is longer than the size of the screen, a scroll bar appears on the right side of the list. Place the finger on the list and move the finger up and down to scroll through the list.
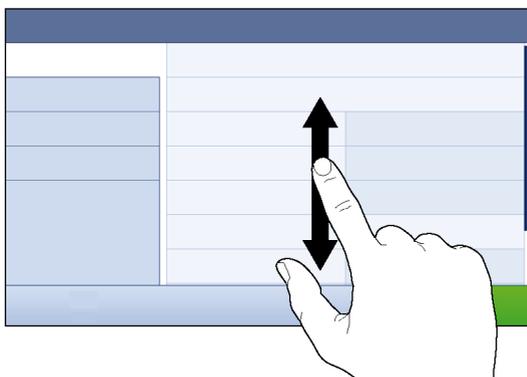
3 Installation and Putting into Operation

Finding more information

Additional information about this balance can be found in the Operating Instructions on the CD-ROM or online.

> ⚠ **WARNING**
>
> **Risk of electric shock**
> The balance must be disconnected from the power supply before performing all setup and assembly work.

3.1 Unpacking the balance

Open the balance packaging and check for transportation damage or missing parts. Please inform a METTLER TOLEDO representative in the event of missing or defective parts.

We recommend retaining the original box with its packaging elements. The packaging elements are designed to protect the balance. Use the packaging elements and the original box to store and transport the balance.

3.2 Scope of delivery

> ⚠ **NOTICE**
>
> **Risk of 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.

3.2.1 Balances with S weighing platform

Components	1 mg with MagicCube Draft Shield	1 mg without MagicCube Draft Shield	10 mg	0.1 g
Weighing platform with protective cover	✓	✓	✓	✓
Terminal with protective cover	✓	✓	✓	✓
Terminal support	✓	✓	✓	✓
Terminal connection cable (pre-assembled)	✓	✓	✓	✓
MagicCube Draft Shield with additional draft shield door and DripTray	✓	–	–	–
Weighing pan 127 × 127 mm	✓	–	–	–
Weighing pan 172 × 205 mm	–	–	✓	–
Weighing pan 190 × 223 mm	–	–	–	✓
SmartPan weighing pan	✓	✓	✓	–
Weighing pan support	–	–	–	✓
DripTray	✓	✓	✓	–

Components	1 mg with MagicCube Draft Shield	1 mg without MagicCube Draft Shield	10 mg	0.1 g
Weighing hook for below-the-balance weighing	✓	✓	✓	✓
AC/DC adapter	✓	✓	✓	✓
Power cable (country-specific)	✓	✓	✓	✓
Operating instructions or user manual; printed or on CD-ROM (country-specific)	✓	✓	✓	✓
Production certificate	✓	✓	✓	✓
CE declaration of conformity	✓	✓	✓	✓

3.2.2 Balances with L weighing platform

| Components	0.1 g	1 g
Weighing platform	✓	✓
Terminal with protective cover	✓	✓
Terminal support (pre-assembled)	✓	✓
Terminal connection cable	✓	✓
Weighing pan	✓	✓
Power cable (country-specific)	✓	✓
Operating instructions and user manuals printed or on CD-ROM (country-specific)	✓	✓
Production certificate	✓	✓
CE declaration of conformity	✓	✓

3.3 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.

- Choose a solid table that is as horizontal as possible. Choose the table according to the maximum capacity of the balance.
- The balance must only be used indoors and up to a maximum altitude of 4,000 m above sea level.
- Before switching on the balance, wait until all parts are at room temperature (+10 °C to +30 °C). The humidity must be between 10% and 80% non-condensing.
- The power plug must be accessible.
- Vibration-free location
- No direct sunlight
- No excessive temperature fluctuations
- No strong drafts
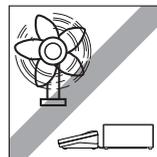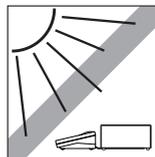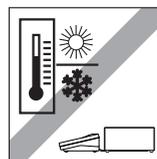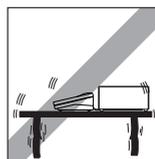
3.4 Assembling balances with S weighing platform

3.4.1 Attaching the terminal to the S weighing platform

The terminal is usually placed in front of the weighing platform on the terminal support. The terminal can also be placed individually, e.g. beside the weighing platform or it can be fixed on an additional terminal stand.


NOTICE

Damage to the balance

The weighing platform and the terminal are not safely fixed by the terminal support and may fall off when carrying.

– Remove the terminal from the weighing platform and place it on the weighing pan when carrying the balance.


1　Place the weighing platform on a flat surface.

2　Position the terminal support (1) in front of the weighing platform. The plug of the pre-mounted terminal connection cable (2) must lie between the terminal support (1) and the weighing platform.
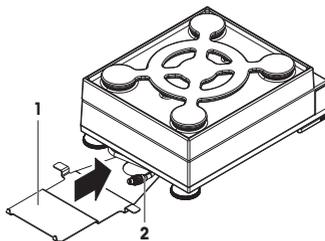
3　Push the terminal support (3) towards the weighing platform. The far end of the terminal support (3) must be pushed into the lock element (4) at the bottom of the weighing platform.

4　Use the terminal connection cable to connect the terminal to the weighing platform.
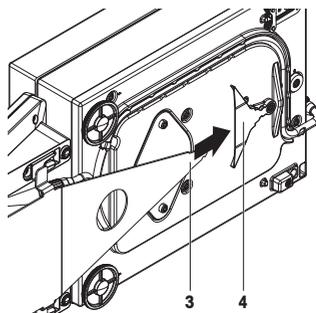
5　Place the terminal on top of the terminal support.

6　Push the terminal towards the weighing platform until the terminal locks into the terminal support.

⇨　The terminal is mounted and connected to the weighing platform.
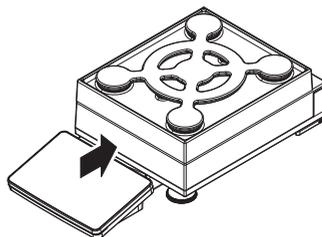
### 3.4.2 Balances 1 mg with MagicCube Draft Shield and SmartPan weighing pan

> **NOTICE**
>
> **Damage to weighing platform and the MagicCube Draft Shield when carrying**
> The U-shaped MagicCube Draft Shield glass is not fixed to the MagicCube Draft Shield housing.
> 1 Always close the cover before carrying the MagicCube Draft Shield.
> 2 Always hold the MagicCube Draft Shield on the housing underneath the glass. Always hold the MagicCube Draft Shield with both hands and on both sides and keep it in a horizontal position.

1 Place the MagicCube Draft Shield on top of the weighing platform.
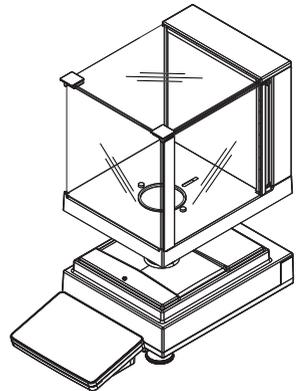
2 Open the MagicCube Draft Shield top door.
3 Place the DripTray (1) into the MagicCube Draft Shield.
4 Place the SmartPan weighing pan (2) into the MagicCube Draft Shield on top of the DripTray (1).
5 The weighing pan (3) is optional and can be placed into the MagicCube Draft Shield on top of the SmartPan weighing pan (2).
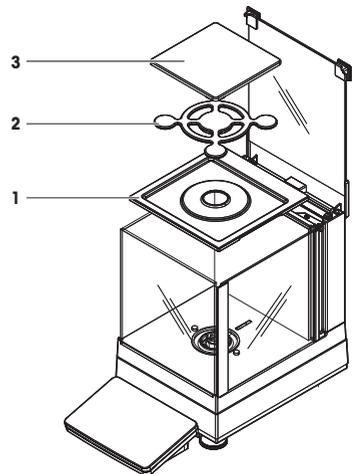
3.4.3 Balances 1 mg with SmartPan weighing pan

1 Place the DripTray (1) on top of the weighing platform.
2 Place the SmartPan weighing pan (2) on top of the DripTray (1).
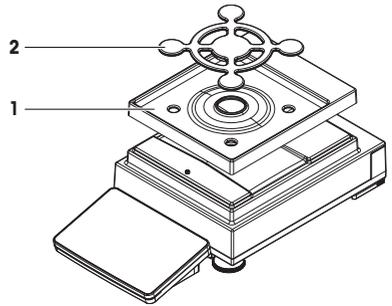
3.4.4 Balances 10 mg with SmartPan weighing pan

1 Place the 4 weighing pan support caps (1) on top of the weighing platform.
2 Place the DripTray (2) on top of the weighing platform.
3 Place the SmartPan weighing pan (3) on top of the 4 weighing pan support caps (1).
4 The weighing pan (4) is optional and can be placed on top of the SmartPan weighing pan (3).
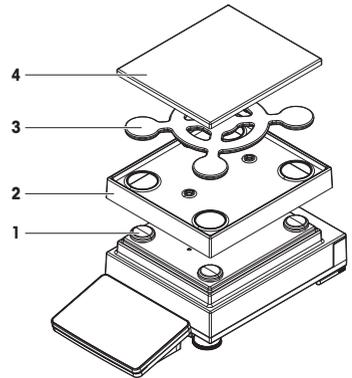
3.4.5 Balances 0.1 g

1 Place the 4 weighing pan support caps (1) on top of the weighing platform.
2 Place the weighing pan support (2) on top of the 4 weighing pan support caps (1).
3 Place the weighing pan with the protective cover (3) on top of the weighing pan support (2).
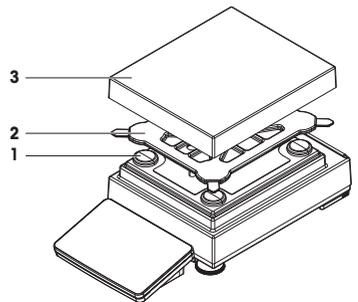
## 3.5 Assembling balances with L weighing platform

3.5.1 Attaching the terminal to the weighing platform

The terminal can be attached to the long side or to the short side of the L weighing platform.

1. Turn the weighing platform upside down.
2. Dismantle the screws (1) on the long side or the screws (2) on the short side of the weighing platform.
3. Connect the terminal to the weighing platform with the terminal connection cable.
4. Attach the terminal support to the long side or to the short side of the weighing platform. Fix the terminal support with the screws from the weighing platform.
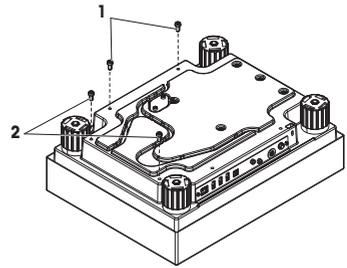
5. Insert the terminal connection cable (3) into the cable channel.
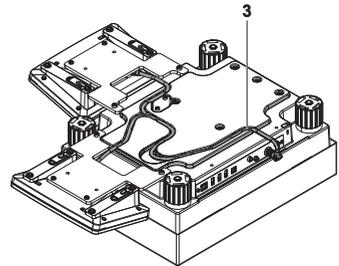
Note

When inserting the terminal connection cable into the cable channel, the terminal connection cable must be inserted simultaneously from both directions. The terminal connection cable must not have any play between the plug and the cable channel (see picture).

6. Turn the weighing platform.

3.5.2 Balances 0.1 g and 1 g

1. Place the weighing pan support caps (1) on top of the weighing platform.
2. Place the weighing pan (2) on top of the weighing pan support caps (1).
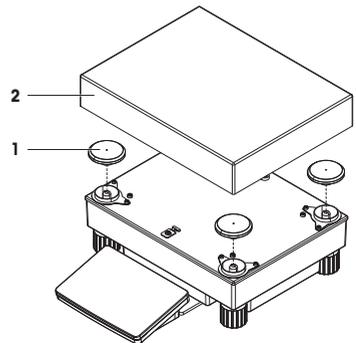
3.6 Connecting the balance to the mains

⚠️ **WARNING**

Danger of death or serious injury due to electric shock.

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

1 To connect the balance, only use the supplied three-core power cable with equipment grounding conductor.
2 Only use a three-pin power socket with earthing contact.
3 Only use standardized extension cable with equipment grounding conductor.
4 Do not disconnect the equipment grounding conductor.

NOTICE

Damage to the balance due to short circuit!

Damage to the insulation on the AC/DC adapter can result in a short circuit and damage the balance.

1 Only use the original AC/DC adapter supplied with your balance.
2 Route the cable so that it cannot be damaged by external influences.
3 Make sure that the power plug is always accessible.

📝 **Note**

The balance is supplied with an AC/DC adapter and a country-specific power cable. The AC/DC adapter is suitable for use with the following voltage range:
100 – 240 V AC, 50/60 Hz.

Connect the balance to the mains as follows:

1 Check whether your local power supply falls within the range of the delivered AC/DC adapter. If this is not the case, under no circumstances connect the AC/DC adapter to the power supply, but contact a METTLER TOLEDO representative.
2 Connect the AC/DC adapter (2) to the AC/DC socket (1).
3 Use the power cable to connect the AC/DC adapter to the mains.
⇨ The balance performs a self-test after connection to the power supply and is then ready to use.
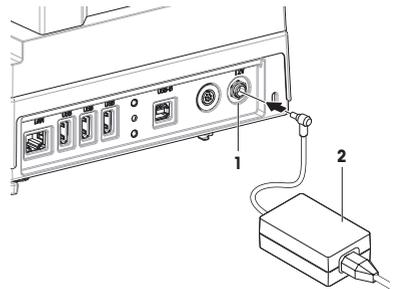
3.7 Setting up the Balance

3.7.1 Switching on the balance

When the balance is connected to the mains it starts automatically.

EULA (End User License Agreement)

When the balance is switched on for the first time, the EULA (**E**nd **U**ser **L**icense **A**greement) appears on the screen. Read the conditions, tap **I accept the terms in the license agreement.** and tap ✔ **OK**.

📝 **Note**

Before the balance can be used, it must warm up first. The warm-up time is at least 30 minutes after connecting the balance to the power supply. When the balance was switched on from standby-mode, the balance is ready for operation immediately.

3.7.2 Leveling the balance

When the balance is switched on for the first time or when it is switched on after the location of the balance has been changed, the message **Balance is out of level** appears. By tapping ▶ the function **Leveling aid** opens. Follow the instructions on the screen to level the balance.

📝 **Note**

A leveled balance and a stable installation are prerequisites for accurate weighing results.

Navigation: ▸ **Balance menu** > ◉ **Leveling aid**

3.7.3 Performing a simple weighing

When the balance is switched on for the first time, the method work screen of the method **General Weighing** opens (the method work screen is described in more detail in the section Method work screen).

3.7.3.1 Taring

If a weighing container is used, the balance must be tared.

1 Clear the weighing pan.
2 Close the weighing chamber if a draft shield is being used.
3 Tap →0← to zero the balance.
4 Open the weighing chamber if a draft shield is being used.
5 Place the container on the weighing pan.
6 Close the weighing chamber if a draft shield is being used.
7 Tap →T← to tare the balance.
⇨ The balance is tared.

3.7.3.2 Zeroing

1 Open the weighing chamber.
2 Clear the weighing pan.
3 Close the weighing chamber.
4 Tap →0← to zero the balance.

3.7.3.3 Performing General Weighing

1 Place the weight on top of the weighing pan and wait until the weight value is stable.
2 Tap ✚ **Add to protocol**.
⇨ The weighing process was successfull. The weight value has been transferred to the section **Protocol**.

3.7.4 Setting the balance to standby mode

The balance can be set to standby mode by holding ⏻. The standby mode can be finished by holding ⏻ again.

3.7.5 Switching off the balance

To completely switch off the balance it must be disconnected from the mains. By holding ⏻ the balance goes only into standby mode.

📝 **Note**

When the balance was completely switched off for some time, it must be warmed up for at least 30 minutes before it can be used.

4 Maintenance

4.1 Cleaning

We recommend periodically cleaning the draft shield, the weighing platform, and the terminal. For cleaning the weighing chamber use the brush supplied with it. The maintenance interval depends on your standard operating procedure (SOP). The balance is made of high-quality, resistant materials and can therefore be cleaned with a commercially available, mild cleaning agent.

⚠ **WARNING**

Danger of death or serious injury due to electric shock!

Contact with parts that contain a live current can lead to injury and death. If the device cannot be shut down in an emergency situation, people can be injured or the device can be damaged.

1　Disconnect the device from the power supply prior to cleaning and maintenance.
2　Only use METTLER TOLEDO power cables, if these need to be replaced.
3　Make sure that no liquid enters the device or AC/DC adapter.
4　Do not open the device or AC/DC adapter. These do not contain any user-serviceable parts.

NOTICE

Damage of the balance due to the use of inappropriate cleaning agents!

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

📝 **Note**

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 life of your balance.

4.2 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 (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

5 Technical Data

FCC Rules

This device complies with Industry Canada licence-exempt RSS standard(s) and part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

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

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

5.1 Balances with S weighing platform

Power supply

AC adapter:	Primary: 100 – 240 V AC, 50/60 Hz
	Secondary: 12 V DC ±3%, min. 2.5 A, max. 6.0 A (with electronic overload protection)
Cable for AC adapter:	3-core, with country-specific plug
Balance power supply:	12 V DC ±3%, 2.25 A, maximum ripple: 80 mVpp

Protection and standards

Overvoltage category:	II
Degree of pollution:	2
Protection:	Only use indoors in dry locations
Standards for safety and EMC:	See Declaration of Conformity
Range of application:	For use only in closed interior rooms

Environmental conditions

Height above mean sea level:	Up to 5000 m
Ambient temperature:	5–40 °C
Relative air humidity:	Max. 80% up to 31 °C, linearly decreasing to 50% at 40 °C, noncondensing
Warm-up time:	At least **30** minutes after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately

Materials

Housing:	Die-cast aluminum, lacquered, plastic and chrome steel
Terminal:	Die-cast zinc, chromed and plastics
Weighing pan:	Chrome-nickel steel X2CrNiMo-17-12-2
SmartPan with drip tray	Die-cast zinc, chromed (5 mg and 10 mg models)
Draft shield:	Aluminum, plastic, chrome steel and glass
Draft shield element:	Chrome steel X2CrNiMo-17-13-2 (0.1 mg models)

5.2 Balances with L weighing platform

Power supply

AC/DC adapter:	Primary: 100 – 240 V AC, 50/60 Hz
	Secondary: 12 V DC ± 3%, min. 2.5 A
Balance power supply:	12 V DC ± 3%, min. 2.5 A
Cable for AC/DC adapter:	3-core, with country-specific plug

Protection and standards

Overvoltage category:	II
Degree of pollution:	2
Protection:	Only use indoors in dry locations
Standards for safety and EMC:	See Declaration of Conformity
Range of application:	For use only in closed interior rooms

Environmental conditions

Height above mean sea level:	Up to 5000 m
Ambient temperature:	5–40 °C
Relative air humidity:	Max. 80% up to 31 °C, linearly decreasing to 50% at 40 °C, noncondensing
Warm-up time:	At least **30** minutes after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately

Materials

Housing:	Sheet aluminum, die cast, lacquered, plastic and chrome steel
Terminal:	Die-cast zinc, chromed and plastics
Weighing pan:	Chrome-nickel steel X2CrNiMo-17-12-2
SmartPan with drip tray	Die-cast zinc, chromed (10 mg models)

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