Operating Instructions

Excellence Plus Analytical Balances

XP Models – Part 1
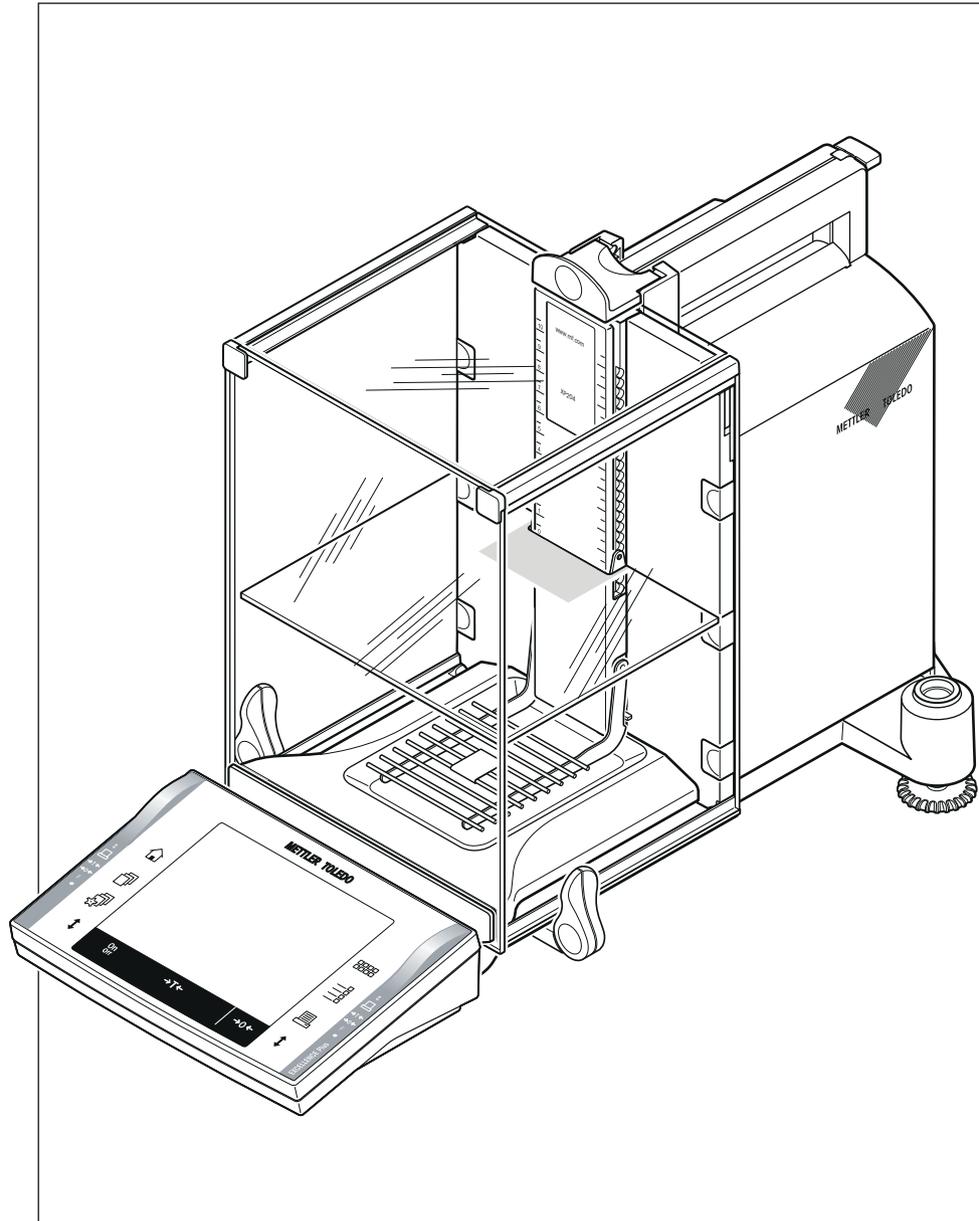
METTLER TOLEDO

Table of Contents

1 Introduction

Thank you for choosing a METTLER TOLEDO balance.

The balances of the XP line combine a large number of weighing and adjustment possibilities with exceptionally convenient operation.

In this chapter you will be given basic information about your balance. Please read right through this chapter carefully even if you already have experience with METTLER TOLEDO balances. Please pay special attention to the safety warnings!

The different models have different characteristics regarding equipment and performance. Special notes in the text indicate where this makes a difference to operation.

The XP line comprises a range of balances which differ from each other in relation to their weighing range and resolution.

The following features are common to all models of the XP lines:

- Glass draft shield with motorized opening for precise weighing even in unstable environments.
- Fully automatic adjustment "ProFACT" using internal weights.
- Built-in level sensor, illuminated level indicator and Leveling Assistant for fast and easy leveling.
- Built-in applications for normal weighing, statistics, formulation, piece counting, percent weighing, density, differential weighing and LabX Client.
- Integral RS232C interface.
- Slot for second interface (optional).
- Touch-sensitive graphics terminal ("Touch screen") with color display.
- Two programmable sensors for hands-off operation ("SmartSens") to speed up frequently recurring tasks.

A brief word about standards, guidelines, and methods of quality assurance: The balances comply with usual standards and guidelines. They support standard procedures, specifications, working methods, and reports according to **GLP** (**G**ood **L**aboratory **P**ractice). In this connection, records of working procedures and adjustments become very important; for this purpose we recommend you to use a printer from the METTLER TOLEDO range, since these are optimally adapted to your balance. The balances conform to the applicable standards and guidelines and possess a EC declaration of conformity. METTLER TOLEDO is certified as manufacturer according to ISO 9001 and ISO 14001.

The operating instructions for the XP balances consist of 3 separate documents, whose contents are listed below.

Part 1, this document
Contents

- Introduction
- Safety information
- Installation and putting into operation
- Leveling the balance
- Cleaning and service
- Technical data
- Accessories
- Spare parts
- Interface commands and MT-SICS functions

Part 2, separate document

Contents: Terminal, System, and Applications

- Basic principles for using the terminal and the firmware
- System settings
- User-specific settings
- Applications
- Firmware (Software) updates
- Error and status messages
- Conversion table for weight units
- Recommended printer settings

Part 3, separate document

Contents: Adjustments, and Tests

- Adjustments
- Tests

Finding more information

▶ www.mt.com/excellence

Firmware version

The operating instructions are based on the initially installed terminal firmware (software) version V 3.01.

1.1 Symbols and presentations used

The following conventions apply to the operating instructions: part 1, part 2 and part 3.

Key designations are indicated by a picture or text in double angular parentheses (e.g. «≡▮» or «**On/Off**»).

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

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

These symbols indicate an instruction:

▶   prerequisites

1   steps

2 …

⇨   results

2 Safety Information

2.1 Explanation of warnings and symbols

Safety notes are indicated by signal words and warning symbols and contain warnings and information about safety issues. Ignoring safety notes can lead to personal injury, damage to the instrument, malfunctions and erroneous results.

Signal words

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

Warning symbols

General hazard   Electrical shock

Mandatory signs

Gloves must be worn

2.2 Product specific safety notes

Intended use

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

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

General safety information

Your instrument meets the state of the art technology and complies with all recognized safety rules, however, certain hazards may arise in extraneous circumstances. Do not open the housing of the instrument: It does not contain any parts which can be maintained, repaired or replaced by the user. If you ever have problems with your instrument, contact your authorized METTLER TOLEDO dealer or service representative.

Always operate and use your balance only in accordance with the operating instructions part 1, part 2 and part 3.

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

If the instrument is not used according to the manufacturer's operating instructions (part 1, part 2 and part 3), protection of the instrument may be impaired.

Staff safety

In order to use the instrument, you must have read and understood the operating instructions. Keep the operating instructions for further reference.

Never make any modifications to the instrument and use only original spare parts and optional equipment from METTLER TOLEDO.

Safety notes

WARNING

Risk of electric shock

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

CAUTION

Damage to the balance

a) Only use indoors in dry locations.

b) Do not use pointed objects to operate the keyboard!
The balance is of a very sturdy design, but is still a precision instrument. It must be handled with care.

c) Do not open the balance:
The balance contains no user-serviceable parts. In the event of problems, please contact a METTLER TOLEDO representative.

d) Only use METTLER TOLEDO original accessories and peripheral devices for the balance. These are specifically designed for the balance.

3 Overview XP Analytical Balance
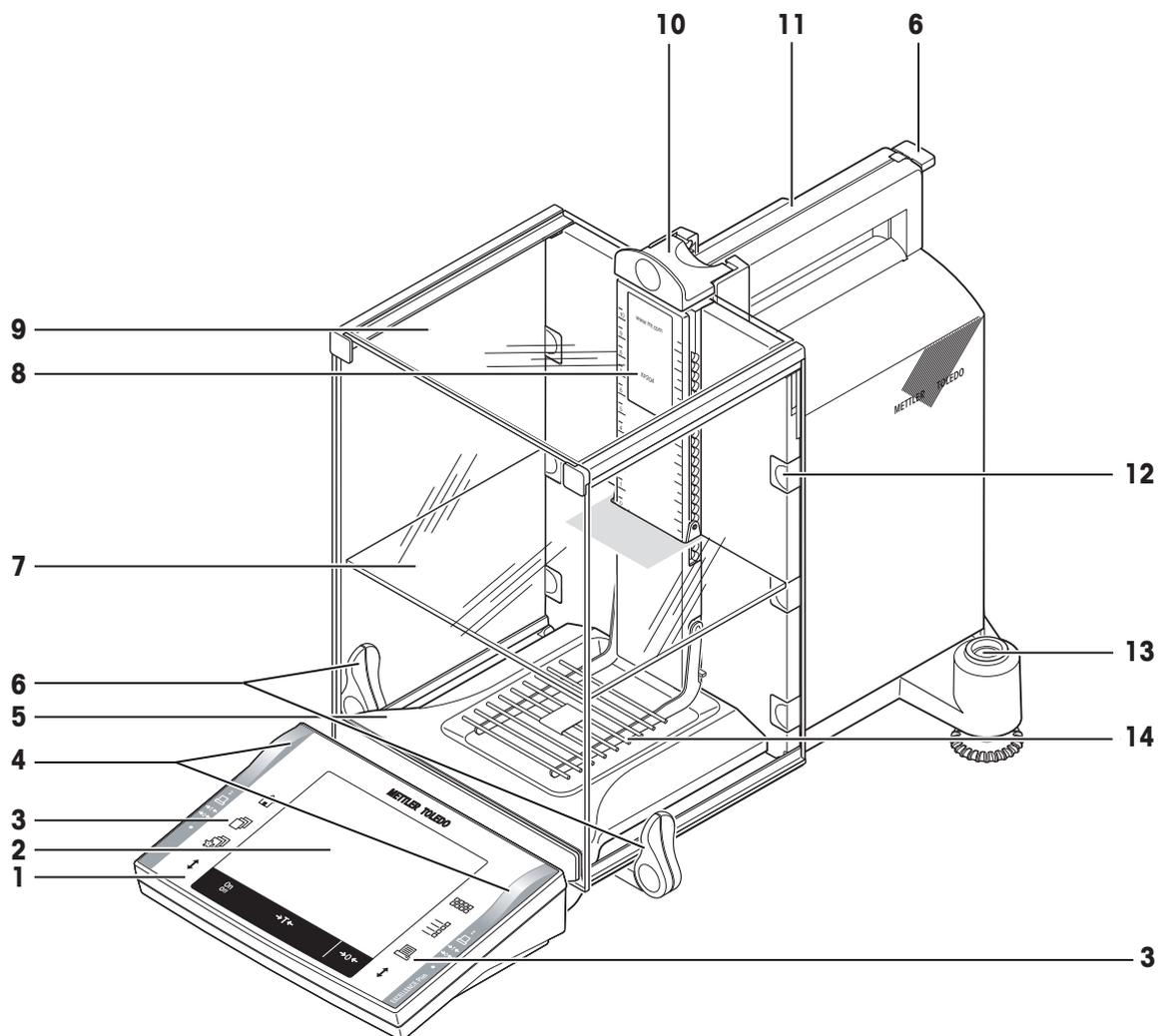
1	Terminal (details **see** Operating Instructions – Part 2)	2	Display (Touch-sensitive "Touch screen")
3	Operating keys	4	SmartSens sensors
5	Drip tray	6	Handle/Coupling element for the operation of the draft-shield doors
7	Intermediate shelf	8	Type name
9	Glass draft shield	10	Handle for operation of the draft-shield top door
11	Guide for top door of draft shield and handle for transport	12	Removable clips for feeding cables or hoses
13	Level indicator / Level sensor	14	SmartGrid weighing pan
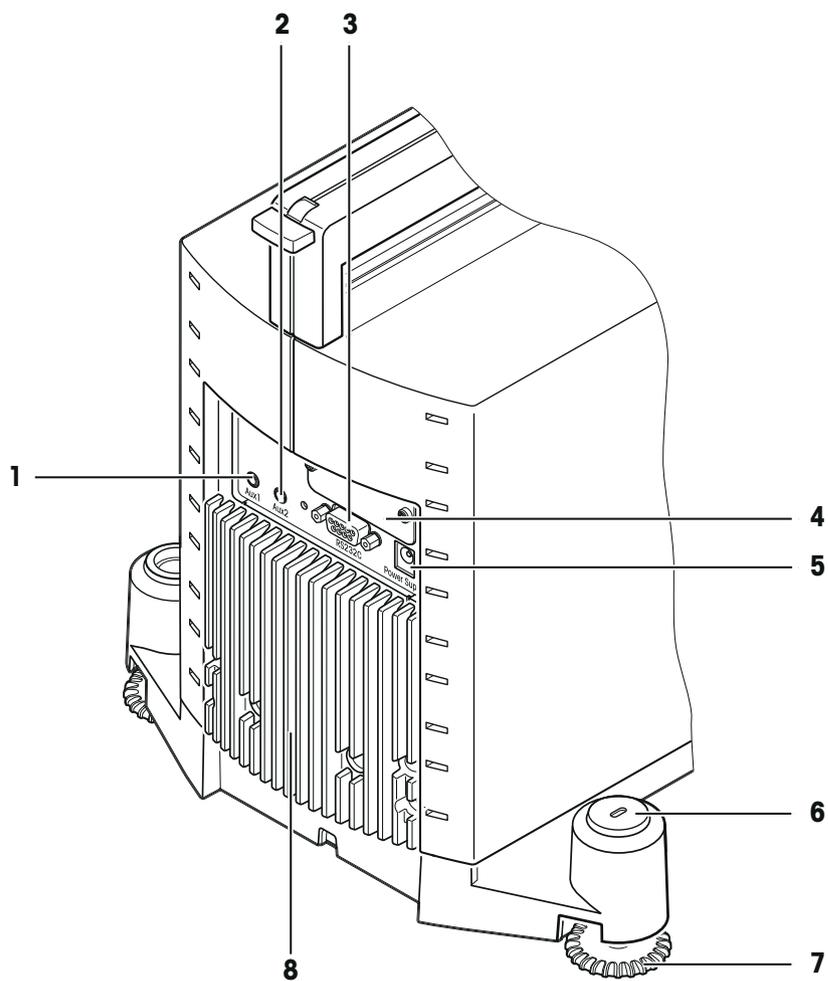
Rear

1	Aux 1 (connection for "ErgoSens", hand- or foot-switch)	2	Aux 2 (connection for "ErgoSens", hand- or foot-switch)
3	RS232C serial interface	4	Slot for second interface (optional)
5	Socket for AC adapter	6	Fastening point for anti-theft device
7	Foot screw	8	Cooling element (based on model)

4   Installation and Putting into Operation

This chapter explains how to unpack your new balance, and how to set it up and prepare it for operation. When you have carried out the steps described in this chapter, your balance is ready for operation.

4.1   Unpacking

Use the lifting strap to lift the balance out of the packaging carton.

Overview

1   Lifting strap

2   Top packing cushion

3   Operating Instructions and other important documents

4   Balance

5   Set with draft-shield doors, intermediate shelf and terminal support

6   Set with AC adapter, power supply cable, drip tray, SmartGrid, SmartGrid cover, set of single-use pans and ErgoClip "Basket" (basket for small weighing objects)
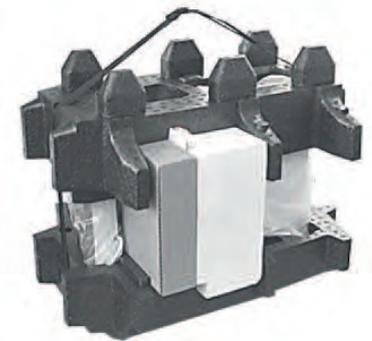
7   Terminal

Note
The terminal is connected to the balance by a cable!

8   Bottom packing cushion
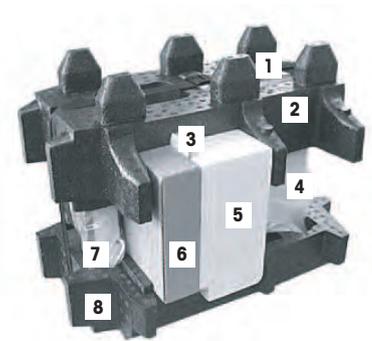
1   Unfasten lifting strap (1).

2   Remove top packing cushion (2).

1   Pull out Operating Instructions (3).

2   Remove set with AC adapter etc. (4).

3   Remove set with draft-shield doors etc. (5).

– Carefully pull the terminal out of the bottom packing cushion and remove the protective cover.

Note

The terminal is connected to the balance by a cable, so only pull the terminal just far enough out of the packing cushion to remove the protective cover.

1   Place the terminal on the front of the balance.

2   Hold the balance by the guide or handle, hold the terminal firmly with your other hand, and pull the balance and terminal together out of the bottom packing cushion.

1   Place the balance with the terminal in the place where the balance will be used for weighing.

2   Remove the cover from the balance.

3   Pull the transport protection (9) of the weighing pan support toward the front and off.

Note

Please keep all parts of the packaging. This packaging guarantees best possible protection of your balance for transportation,

4.2 Scope of delivery

The standard scope of delivery contains the following items:

- Balance with terminal
  - RS232C interface
  - Slot for second interface (optional)
  - Feedthroughs for below-the-balance weighing and for antitheft device

- Set with draft-shield doors, intermediate shelf and terminal support

- SmartGrid

- SmartGrid cover, chromium-nickel steel

- Set of single-use aluminum weighing pans (10 pans) for mounting on SmartGrid

- Drip tray

- AC adapter with country-specific power cable
- Protective cover for the terminal
- Cleaning brush
- ErgoClip "Basket" (basket for small weighing objects)
- Production certificate
- CE declaration of conformity
- Operating instructions part 1 (this document), part 2 and part 3
- Instructions for unpacking, re-packing, and setting up

4.3 Location

An optimal location will ensure accurate and reliable operation of the balance. The surface must be able to safely take the weight of the balance when fully loaded. The following local conditions must be observed:

Note
If the balance is not horizontal at the outset, it must be leveled during commissioning.

- 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 (+5 to 40°C).
  The humidity must be between 10% and 80% non-condensing.
- The power plug must be accessible at all times.
- Firm, horizontal and vibration-free location.
- Avoid direct sunlight.
- No excessive temperature fluctuations.
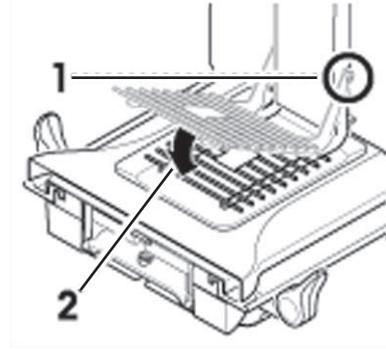- No strong drafts.
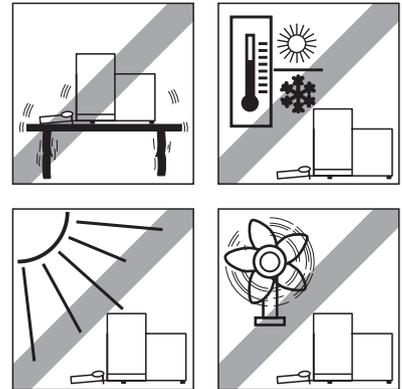
Further information can by found in Weighing the Right Way.

4.4 Assembling the balance

1 Remove the transport protection (1).

2 Insert the drip tray (2).

⇨ Push the tray in from the front over the bottom plate as far as the partition.
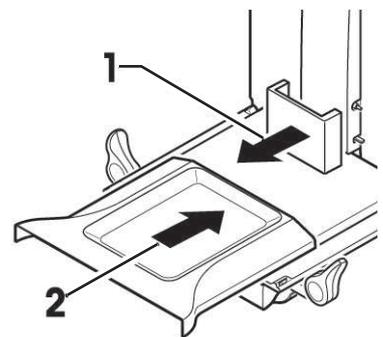
– Insert the SmartGrid from the front.

⇨ Check that the SmartGrid (1) (2) is correctly hooked in at both sides.


1 Insert the top door of the draft shield (1) at an angle (slightly less than 30 degrees) into the guide positioned at the **back**.

2 Swivel the draft-shield door (2) carefully down, **see** figure.
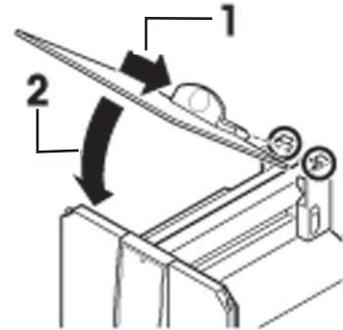
▶ The handles (A) must be turned toward the outside to allow installation of the side draft shield doors!

1 Insert the side doors of the draft shield according to the following instructions, **see** figure below.

2 Insert the side door at an angle of approx. 30° into the 2 openings, **see** figure.

3 Check that the side door is correctly inserted as shown!

4 Swivel the side door up against the balance until it engages with a click.

5 The side door must run easily, otherwise it is not correctly inserted.

6 Insert the second side door of the draft shield.

⇨ The procedure is identical.

7 Push the side doors completely to the back.
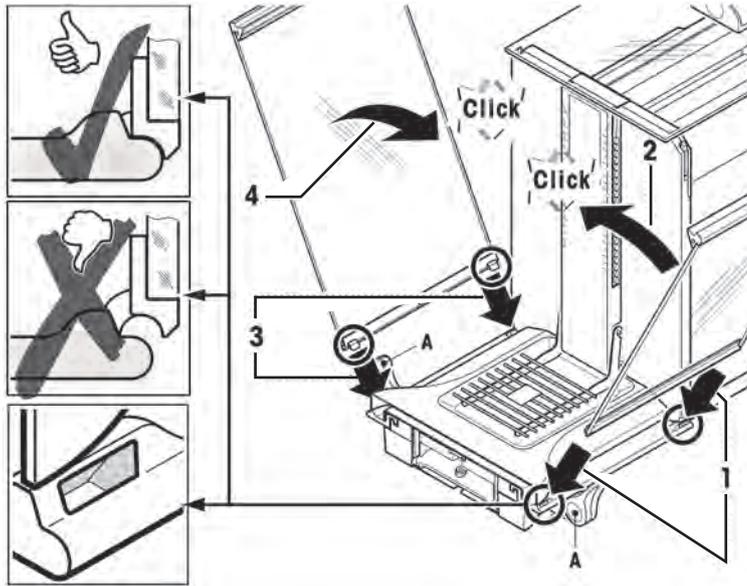
1. Insert the front glass (2) of the draft shield.
2. In the bottom part of the balance at the front, move at an angle from the top toward the bottom until the two hooks of the front glass of the draft shield lie on the rollers (1).
3. Swivel the front glass of the draft shield up until it engages.
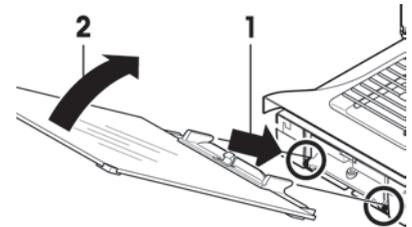
1. Insert the terminal support.
2. First lay the cable in the guide by the terminal support.
3. Insert the terminal support into the opening of the front glass of the draft shield.
   ⇨ The terminal support must engage with a click.
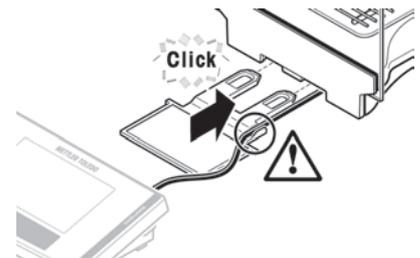
1. Mount the terminal.
2. Place the terminal in the center of the support.
3. Push it against the balance until it swivels slightly down at the front by the terminal support.
   ⇨ You can push the cable into the balance.
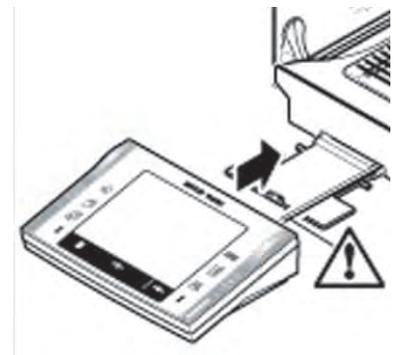
Attention
The balance and the terminal are not fastened together by the terminal support! When transporting by hand, always hold the balance and the terminal firmly, **see** Transporting the balance (page 19).

Note
You can also place the terminal free of the terminal support anywhere around the balance where the length of the cable allows.

4.5 Intermediate shelf draft shield

You can use the intermediate shelf to reduce the volume of the weighing chamber. So that the balance shows the result faster. You also have the option of acclimatizing the weighing material on the intermediate shelf.

Inserting the intermediate shelf

1 Open all draft shield doors.

2 Raise the front of the top draft shield door (1) and pull it out of the guide.

   ⇨ Lay the top draft shield door on a clean surface.
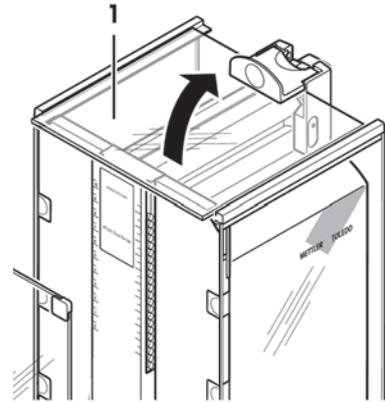
1 From the top, guide the intermediate shelf (2) into the guides of the middle guiderail.

2 Position it at the desired height (3).

3 Re-insert the top draft shield door (1), **see** Assembling the balance (page 13).
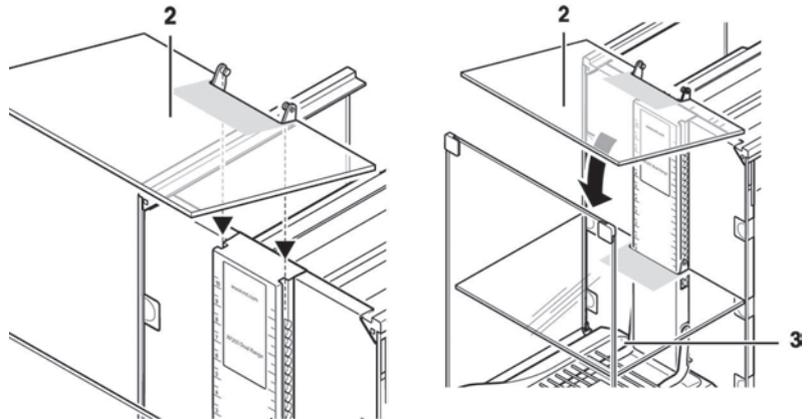
4.6 Connecting the balance

WARNING

Risk of electric shock

a) To connect the balance, only use the supplied three-core power cord with equipment grounding conductor.

b) Only connect the balance to a three-pin power socket with earthing contact.

c) Only standardized extension cable with equipment grounding conductor must be used for operation of the balance.

d) Intentional disconnection of the equipment grounding conductor is forbidden.

The balance is supplied with an AC adapter and country-specific power cord. The AC adapter is suitable for use with the following voltage range:

100 – 240 V AC, 50/60 Hz.

Attention

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

▶ Balance and terminal are at the final location.

1 Connect the AC adapter (1) to the connection socket (2) at the rear of the balance.

2 Connect the AC adapter (1) to the power supply.

⇨ The balance performs a self-test after connection to the power supply and is then ready to use.
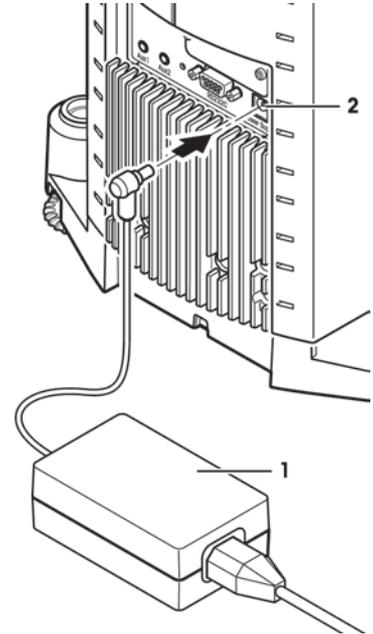
Note

If the display field remains dark, even though the power supply connection functions.

1 First disconnect the balance from the power supply.

2 Open the terminal.

3 Press both buttons (3) on the back of the terminal and open the upper part of the terminal.

4 Check that the plug for the terminal cable (4) is connected correctly inside the terminal.
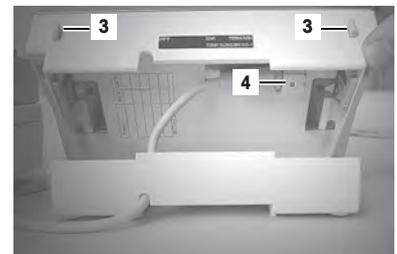
4.7 Operating of the glass draft shield

The glass draft shield of your balance can be adapted to the environmental conditions and your weighing style, as well as to the type of weighing and loading.

The doors of the glass draft shield can be opened and closed either by means of the «↕» key, the "SmartSens" sensors, or by hand, **see** Operating Instructions – Part 2.

Try various different combinations by moving the 3 external handles up/inside and down/outside. We recommend you to set up the glass draft shield so that it only opens on the side where the balance is loaded. Your balance then works faster, because there are fewer troublesome currents of air than when both doors of the draft shield are opened together.

1 For **motorized door operation** the handles must be connected.

⇨ Side doors: Handles turned toward the inside.

⇨ Top door: Handle down in horizontal position.

2 For **manual door operation** the handles must be disconnected:

⇨ Side doors: Handles turned toward the outside.

⇨ Top door: Handle up in vertical position.
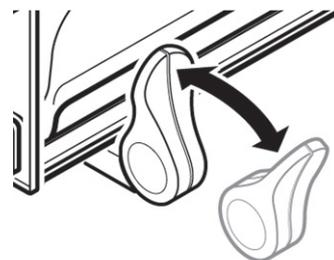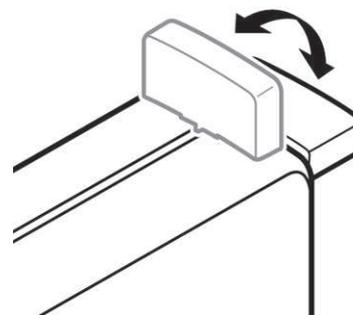
Note

It is best to make connections when the draft shield is closed.

4.8 Setting the reading angle and positioning the terminal

4.8.1 Optimise the readability of the terminal

Changing the reading angle

1 Press in the two buttons (3) on the back of the terminal.

⇨ The top of the terminal can then be pulled up or pushed down until it engages in the desired position. A total of 3 setting positions are available.

2 Move it in an appropriate position.
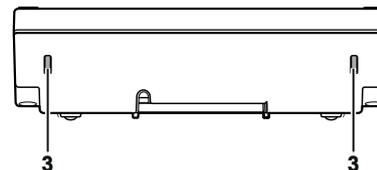
4.8.2 Remove terminal and place close to the balance

The terminal is connected to the balance by a cable. So you can arrange your workplace optimally, the terminal can be removed from the balance and placed separately.

Place the terminal separately

1 Switch the balance off.

2 Carefully lift the terminal off the terminal support.
   You can leave the terminal support on the balance or remove it.

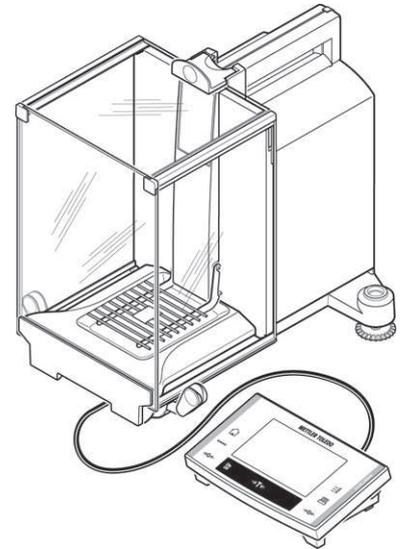3 Pull the cable carefully out from the balance as far as possible.

4 Place the terminal where you want it to be.

Note

The cable can also be led out of the back of the balance. If working this way would be convenient for you, call your METTLER TOLEDO dealer who will adapt the balance for you.

4.9 Transporting the balance

1 Switch off the balance.

2 The balance must be disconnected from the power supply.

3 Remove any interface cable from the balance.

4.9.1 Transporting over short distances

If you wish to move your balance over a short distance to a new location, proceed as follows.

⚠ **CAUTION**

Damage of device

Never lift the balance by the glass draft shield or the cooling element, as this can cause damage!

1 With one hand, hold the balance by the guide for the top door of the draft shield.

2 With your other hand, hold the terminal. The terminal is not rigidly fastened to the balance, so you must always hold the balance with one hand and the terminal with the other.

3 Carefully lift the balance and carry it to its new location, observe the notes in chapter Location (page 13).
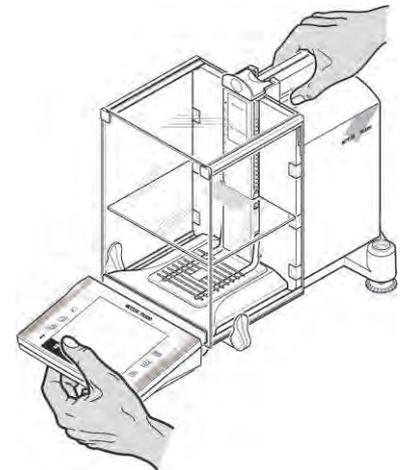
4.9.2 Transporting over long distances

If you want to transport or ship your balance over long distances, or if it is not certain that the balance will be transported upright, use the complete original packaging.

Disassemble the following parts

1 Lift the terminal (1) out of the terminal support and place it next to the support.

2 Pull the terminal support (2) off the balance.

3 Swivel the front glass (3) of the draft shield away from the balance.

4 Carefully fold the side doors (4+5) of the draft shield against the respective handles and pull the side doors out of the guide.

5 Swivel the front ot the top door (6) of the draft shield up and pull the door out of the guide.

6 Lift the front of the intermediate shelf (9) and pull it up and out.

7 Carefully raise the front of the SmartGrid (7) and lift it out of the guide.

8 Pull the drip tray (8) toward the front and out.
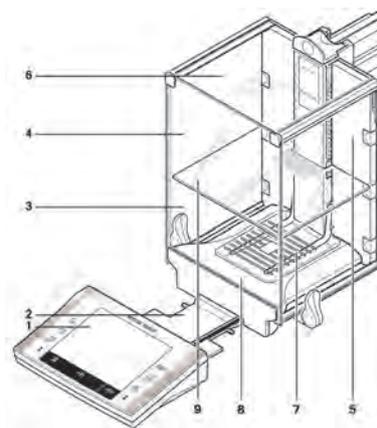
Pack the draft shield, the intermediate shelf and the terminal support (Pos. 2-6 and 9)

– Place these parts in the compartments provided in the original packaging.
Note
We advise you to place a sheet of paper between the sides glasses of the draft shield.
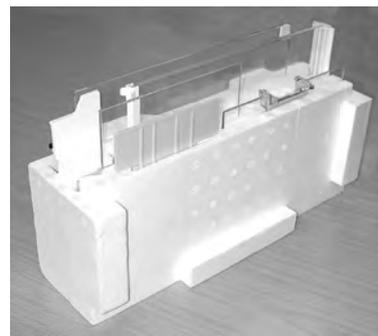
Pack the AC adapter, the power supply cable, and the individual parts

1 Place the AC adapter and the power supply cable in the packaging.

2 Place the drip tray (8) upside down in the packaging.

3 Place the SmartGrid (7) upside down on the drip tray.

4 Place the ErgoClip "Basket" in the packaging.

⚠ **CAUTION**

Damage of device

These instructions must be followed exactly, otherwise the balance may be damaged when inserting it into the packing cushions.

1   Push the transport protection over the weighing pan guide.

2   Push the guide of the top draft-shield door completely to the front.

3   Swivel the handle of the side door of the draft shield upward, and also push this door completely to the front.

Note

For packing both the balance and the terminal, you have a protective cover in which they were delivered. These are deliberately not shown in the illustrations so you can see better how the individual items must be positioned. However, we recommend you to use these protective covers.

1   Place the terminal on the balance (see illustration) and carefully insert the balance into the bottom packing cushion.

2   Take the terminal and place it in front of the packing cushion on the table.

–   Insert the packing set with the draft-shield glasses into the packing cushion, **see** illustration.

–   Place the set with the AC adapter in front of the set with the draft-shield glasses.

–   Insert the terminal into the packing cushion as shown in the illustration.

1   Now put the top packing cushion in place.

⇨ Taking care to position it correctly.

2   Pass the lifting strap around both packing cushions, **see** illustration.

3   Tighten it until it lies close against the packaging.

⇨ You can now lift the packed balance by the lifting strap and insert it into the transport carton.

4.10   Below-the-balance weighing

So that weighings can be carried out below the working surface (below-the-balance weighing), your balance is provided with a special hanger.

1   Switch off the balance with [**On/Off**].

2   Disconnect the AC adapter cable at the rear of the balance.

3   Disconnect any interface cables.

4   Push all glass draft shield doors back.

5   Lift the terminal off the terminal support.

6   Open the terminal and carefully pull the connecting cable out.

7   Place the terminal at the side of the balance.

8   Move the balance over the edge of the table until the opening is visible from below, **see** diagram on the left.

9   Slacken the screw until the cover plate can be turned to the side and the hanger for weighing below the balance is easily accessible.

10 Fix the cover plate in the new position with the screw, **see** diagram on the right.

11 Move the balance back to its original position.

12 Connect the terminal cable and close the terminal.

13 Place the terminal in the terminal support.

14 Move all glass draft shield doors to the front.

15 Fix any interface cables.

16 Plug the AC adapter into the power supply socket at the rear of the balance.

17 Switch on the balance with [**On/Off**].

⇨ The balance is now ready for mounting the below-the-balance weighing device.
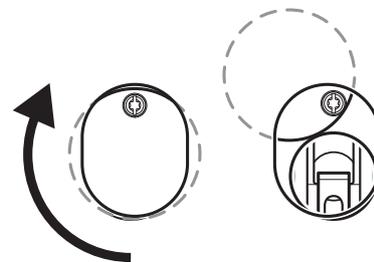
## 4.11   Installing the ErgoClip

Attention

Before you install an ErgoClip you must switch off the balance «**On/Off**» key.

To install the ErgoClip included in the delivery, or an optional ErgoClip, please proceed as follows:

1   Remove the SmartGrid from the balance.

2   Snap the ErgoClip onto the SmartGrid.

3   Replace the SmartGrid along with the installed ErgoClip.

   ⇨ The optional "Flask" or "Tube" ErgoClips can be inserted direct-
      ly, **see** Accessories (page 34).

4   Switch the balance on again «**On/Off**» key.
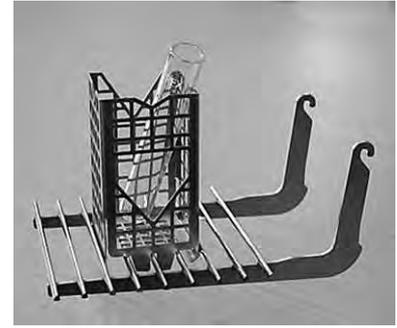
Important to know!
If you do not switch the balance off before you do the installation, the ProFACT function is not activated.

Reason
Addition of the ErgoClip causes the dead-load tolerance range of the balance to be exceeded. The balance therefore does not activate ProFACT, so as not to interrupt the **assumed** weighing operation.

When this status icon appears in the display, it means: "The balance wants to execute ProFACT" but cannot.

4.12   Installing the single-use aluminum weighing pan

Note
For standard operation with conventional tare containers, we do **not** recommend using this weighing pan. Its use may affect the stabilization time and degree of accuracy. The listed specifications are reached without a single-use weighing pan.
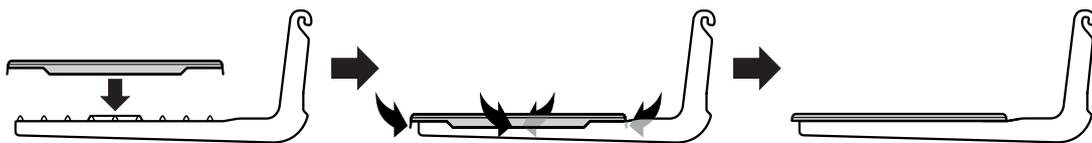
CAUTION

Hand injuries

Take care when handling the weighing pan, the corners and edges are extremely sharp!

–   Gloves must be worn.

–   To install the single-use aluminum weighing pan, remove the SmartGrid from the weighing chamber, **see** Assembling the balance (page 13).

⇨ Only to be used for weighing highly-specialized tare containers.

1   Place the single-use aluminum weighing pan onto the SmartGrid from above.

2   Fold the 4 side flaps under the bars of the SmartGrid.

4.13   Installing the SmartGrid cover

Note
For standard operation with conventional tare containers, we do **not** recommend using this weighing pan. Its use may affect the stabilization time and degree of accuracy. The listed specifications are reached without a weighing pan.

CAUTION

Hand injuries

Take care when handling the weighing pan, the corners and edges are extremely sharp!

– Gloves must be worn.

Attention
With installed SmartGrid cover, the balance does not switch to "Standby" mode!

1   For the installation, remove the SmartGrid from the weighing chamber.

2   Gently press the cover onto the SmartGrid.

3   Replace the SmartGrid with the installed SmartGrid cover.
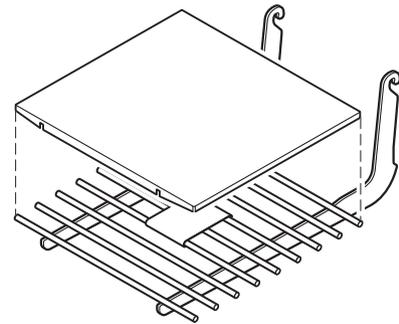
5 First Steps

5.1 Switching on / off

Switching on

– Press «**On/Off**».

⇨ The display appears.

On
Off

Weighing
Home   12 Jan 2005 15:06

0.0000 g

Adjust.Int   1/10d

Note
If the balance has not been set up exactly horizontally, a warning text will appear shortly after the balance is turned on, prompting you to level the balance.

Switching off

– Press «**On/Off**» until "Off" appears in the display.

On
Off

Note
Do not disconnect the balance from the power supply except if you will not be using the balance for an extended period.

5.2 Leveling the balance

Your balance has a built-in levelcontrol, that constantly checks the correct horizontal alignment.

When the levelcontrol detects that the level is incorrect, a warning will appear and a warning beep will sound. A status icon will also appear in the upper right-hand corner of the display.

1 To start the Leveling Assistent, tap «**Info**».

⇨ The Leveling Assistant will guide you step by step through the leveling process.

2 Watch the levelcontrol located of your balance and press the appropriate button of the current position.

⇨ The Leveling Assistant will show you with red arrows in which direction you need to turn the two footscrews on the back of the balance.

3 Screw the footscrew until the air bubble is in the inner circle.

4 Tap «**Exit**».

⇨ A message appears that advises you to adjust the balance.

5 Confirm with «**OK**».

⇨ Status icon will no longer appear and balance returns to normal operation.
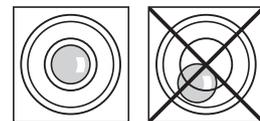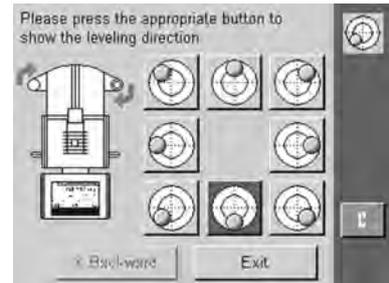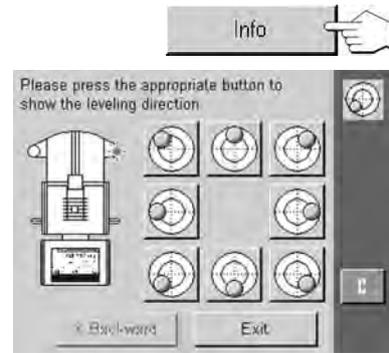
6 Maintenance

6.1 Cleaning

Periodically clean the weighing pan, the drip tray, the housing, and the terminal of your balance using the brush supplied with it. The maintenance interval depends on your standard operating procedure (SOP).

Please observe the following notes

WARNING

Risk of electric shock

a) Disconnect the balance from the power supply prior to cleaning and maintenance.

b) Only use METTLER TOLEDO power cords, if these need to be replaced.

c) Ensure that no liquid comes into contact with the balance, terminal or AC adapter.

d) Do not open the balance, terminal or AC adapter.
These contain no user-serviceable parts.

CAUTION

Damage of balance

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

Cleaning

Your balance is made from high quality, resistant materials and can therefore be cleaned with a commercially available, mild cleaning agent.

1 To clean the weighing chamber thoroughly, swivel the glasses of the draft shield (including the intermediate shelf) away from the balance and pull them out of their fastenings.

2 Carefully raise the front of the weighing pan and lift it out of the guide.

3 Pull the drip tray away from the balance.

4 When you replace these parts, make sure they are in the correct position.

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 service life of your balance.

6.2 Disposal

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

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

Thank you for your contribution to environmental protection.

7 Technical Data

7.1 General data

CAUTION

Use only with a tested AC Adapter with SELV output current.
Ensure correct polarity ⊖─(●)─⊕

Power supply

AC adapter:	Primary: 100 – 240 V AC, -15%/+10%, 50/60 Hz Secondary: 12 V DC ±3%, 2.5 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:	Protected against dust and water
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 4000 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 **120** minutes after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately

Materials

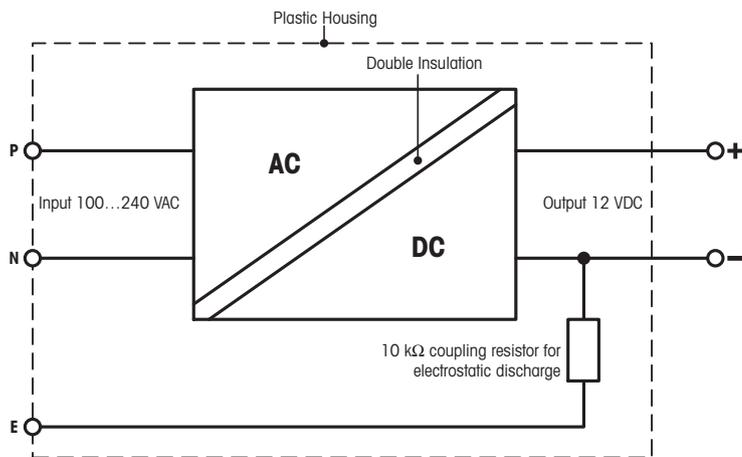|	
Housing:	Die-cast aluminum, plastic, chrome steel and glass
Terminal:	Die-cast zinc, chromed and plastics
SmartGrid:	Chrome-nickel steel X5CrNi18-10

7.2 Explanatory notes for the METTLER TOLEDO AC adapter

The certified external power supply which conforms to the requirements for Class II double insulated equipment is not provided with a protective earth connection but with a functional earth connection for EMC purposes. This earth connection IS NOT a safety feature. Further information about conformance of our products can be found in the brochure "Declaration of Conformity" which is coming with each product.

In case of testing with regard to the European Directive 2001/95/EC the power supply and the balance have to be handled as Class II double insulated equipment.

Consequently an earth bonding test is not required. Similarly it is not necessary to carry out an earth bonding test between the supply earth conductor and any exposed metalwork on the balance.

Because the balance are sensitive to static charges a leakage resistor, typically 10 kΩ, is connected between the earth connector and the power supply output terminals. The arrangement is shown in the equivalent circuit diagram. This resistor is not part of the electrical safety arrangement and does not require testing at regular intervals.

Plastic Housing

Double Insulation

P — Input 100…240 VAC

AC

DC

Output 12 VDC — +

N

10 kΩ coupling resistor for electrostatic discharge

E

Equivalent circuit diagram

7.3 Model-specific data

		XP105DR	XP205	XP205DR
Limit values				
Maximum capacity		120 g	220 g	220 g
Readability		0.1 mg	0.01 mg	0.1 mg
Tare range (from…to)		0 … 120 g	0 … 220 g	0 … 220 g
Maximum capacity, fine range		31 g	–	81 g
Readability, fine range		0.01 mg	–	0.01 mg
Repeatability (at nominal load)	sd	0.06 mg (100 g)	0.03 mg (200 g)	0.06 mg (200 g)
Repeatability (at low load)	sd	0.05 mg (10 g)	0.015 mg (10 g)	0.05 mg (10 g)
Repeatability, fine range (at low load)	sd	0.015 mg (10 g)	–	0.015 mg (10 g)
Linearity deviation		0.15 mg	0.1 mg	0.15 mg
Eccentricity deviation (test load) [1]		0.2 mg (50 g)	0.2 mg (100 g)	0.25 mg (100 g)
Sensitivity offset (test weight)		0.4 mg (100 g)	0.4 mg (200 g)	0.5 mg (200 g)
Sensitivity temperature drift [2]		0.0001%/°C	0.0001%/°C	0.0001%/°C
Sensitivity stability [3]		0.0001%/a	0.0001%/a	0.0001%/a
Typical values				
Repeatability (at low load)	sd	0.04 mg	0.007 mg	0.04 mg
Repeatability, fine range	sd	0.007 mg	–	0.007 mg
Linearity deviation		0.1 mg	0.065 mg	0.1 mg
Eccentric deviation (test load) [1]		0.1 mg (50 g)	0.1 mg (100 g)	0.1 mg (100 g)
Sensitivity offset (test weight)		1.2 mg (100 g)	0.2 mg (200 g)	0.32 mg (200 g)
Minimum weight (according to USP)		80 mg	14 mg	80 mg
Minimum weight (according to USP), fine range		14 mg	–	14 mg
Minimum weight (U=1%, k=2)		8 mg	1.4 mg	8 mg
Minimum weight (U=1%, k=2), fine range		1.4 mg	–	1.4 mg
Settling time		1.5 s	2.5 s	1.5 s
Settling time, fine range		2.5 s	–	2.5 s
Dimensions				
Balance dimensions (W × D × H)		263 × 487 x 322 mm	263 × 487 x 322 mm	263 × 487 x 322 mm
Weighing pan dimensions		78 × 73 mm (W × D)	78 × 73 mm (W × D)	78 × 73 mm (W × D)
Typical uncertainties and supplementary data				
Repeatability	sd	0.04 mg + 0.00001%·Rgr	0.007 mg + 0.000006%·Rgr	0.04 mg + 0.000005%·Rgr
Repeatability, fine range	sd	0.007 mg + 0.000015%·Rgr	–	0.007 mg + 0.000012%·Rgr
Differential linearity deviation	sd	$\sqrt{(25pg \cdot Rnt)}$	$\sqrt{(5pg \cdot Rnt)}$	$\sqrt{(12pg \cdot Rnt)}$
Differential eccentric load deviation	sd	0.0001%·Rnt	0.00005%·Rnt	0.00005%·Rnt
Sensitivity offset	sd	0.0006%·Rnt	0.00005%·Rnt	0.00008%·Rnt
Minimum weight (according to USP)		80 mg + 0.02%·Rgr	14 mg + 0.012%·Rgr	80 mg + 0.01%·Rgr

		XP105DR	XP205	XP205DR
Minimum weight (according to USP), fine range		14 mg + 0.03%·Rgr	–	14 mg + 0.024%·Rgr
Minimum weight (U=1%, k=2)		8 mg + 0.002%·Rgr	1.4 mg + 0.0012%·Rgr	8 mg + 0.001%·Rgr
Minimum weight (U=1%, k=2), fine range		1.4 mg + 0.003%·Rgr	–	1.4 mg + 0.0024%·Rgr
Weighing time		4 s	6 s	4 s
Weighing time, fine range		6 s	–	6 s
Interface update rate		23 /s	23 /s	23 /s
Usable height of draft shield		235 mm	235 mm	235 mm
Weight of balance		10 kg	10 kg	10 kg
Number of built-in reference weights		2	2	2
Weights for routine testing				
OIML CarePac		100 g F2, 5 g E2	200 g F2, 10 g F1	200 g F2, 10 g F1
	Weights	#11123002	#11123001	#11123001
ASTM CarePac		100 g 1, 5 g 1	200 g 1, 10 g 1	200 g 1, 10 g 1
	Weights	#11123102	#11123101	#11123101

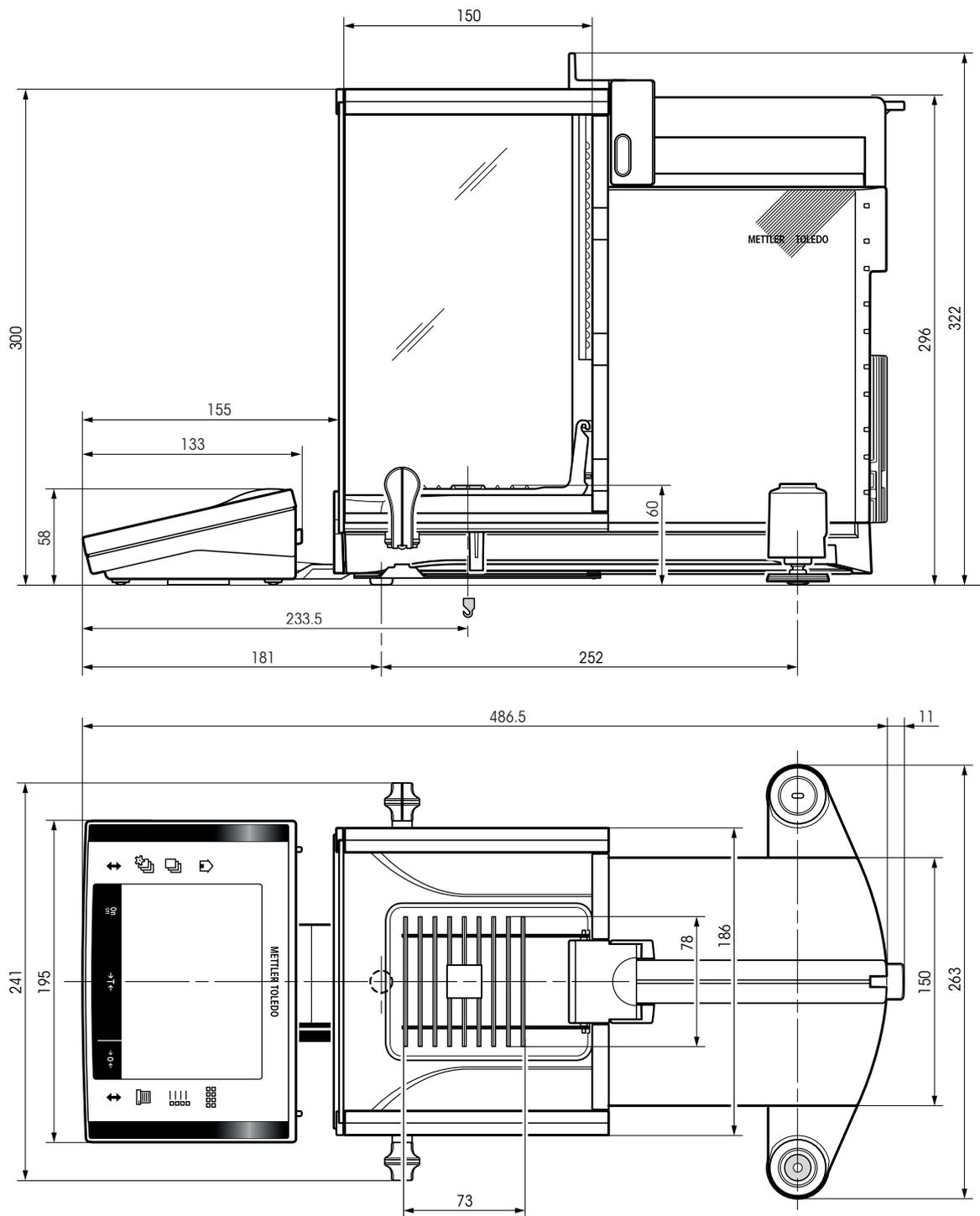|			
sd	=	Standard deviation	
Rgr	=	Gross weight	
Rnt	=	Net weight (sample weight)	
a	=	Year (annum)	

[1] Valid for compact objects

[2] After adjustment with built-in reference weight

[3] On DeltaRange models: fine range starts at zero load (gross)

		XP204	XP504	XP504DR
Limit values				
Maximum capacity		220 g	520 g	520 g
Readability		0.1 mg	0.1 mg	1 mg
Tare range (from…to)		0 … 220 g	0 … 520 g	0 … 520 g
Maximum capacity, fine range		–	–	101 g
Readability, fine range		–	–	0.1 mg
Repeatability (at nominal load)	sd	0.07 mg (200 g)	0.12 mg (500 g)	0.6 mg (500 g)
Repeatability (at low load)	sd	0.05 mg (10 g)	0.1 mg (10 g)	0.5 mg (10 g)
Repeatability, fine range (at nominal load)	sd	–	–	–
Repeatability, fine range (at low load)	sd	–	–	0.1 mg (10 g)
Linearity deviation		0.2 mg	0.4 mg	0.5 mg
Eccentricity deviation (test load) [1]		0.25 mg (100 g)	0.4 mg (200 g)	0.5 mg (200 g)
Sensitivity offset (test weight)		0.6 mg (200 g)	1.5 mg (500 g)	2 mg (500 g)
Sensitivity temperature drift [2]		0.0001%/°C	0.0001%/°C	0.0001%/°C
Sensitivity stability [3]		0.0001%/a	0.0001%/a	0.0001%/a
Typical values				
Repeatability (at low load)	sd	0.04 mg	0.04 mg	0.4 mg
Repeatability, fine range	sd	–	–	0.04 mg
Linearity deviation		0.13 mg	0.32 mg	0.4 mg
Eccentric deviation (test load) [1]		0.12 mg (100 g)	0.2 mg (200 g)	0.2 mg (200 g)
Sensitivity offset (test weight)		0.4 mg (200 g)	0.6 mg (500 g)	0.8 mg (500 g)
Minimum weight (according to USP)		0.8 g	80 mg	0.8 g
Minimum weight (according to USP), fine range		–	–	0.08 g
Minimum weight (U=1%, k=2)		8 mg	8 mg	80 mg
Minimum weight (U=1%, k=2), fine range		–	–	8 mg
Settling time		1.5 s	1.5 s	1.5 s
Settling time, fine range		–	–	1.5 s
Dimensions				
Balance dimensions (W × D × H)		263 × 487 x 322 mm	263 × 487 x 322 mm	263 × 487 x 322 mm
Weighing pan dimensions		78 × 73 mm (W × D)	78 × 73 mm (W × D)	78 × 73 mm (W × D)
Typical uncertainties and supplementary data				
Repeatability	sd	0.04 mg + 0.000005%·Rgr	0.04 mg + 0.000006%·Rgr	0.4 mg + 0.00002%·Rgr
Repeatability, fine range	sd	–	–	0.04 mg + 0.00002%·Rgr

		XP204	XP504	XP504DR
Differential linearity deviation	sd	$\sqrt{(20pg \cdot Rnt)}$	$\sqrt{(50pg \cdot Rnt)}$	$\sqrt{(80pg \cdot Rnt)}$
Differential eccentric load deviation	sd	$0.00006\% \cdot Rnt$	$0.00005\% \cdot Rnt$	$0.00005\% \cdot Rnt$
Sensitivity offset	sd	$0.0001\% \cdot Rnt$	$0.00006\% \cdot Rnt$	$0.00008\% \cdot Rnt$
Minimum weight (according to USP)		$0.08\ g + 0.01\% \cdot Rgr$	$80\ mg + 0.012\% \cdot Rgr$	$0.8\ g + 0.04\% \cdot Rgr$
Minimum weight (according to USP), fine range		–	–	$0.08\ g + 0.04\% \cdot Rgr$
Minimum weight (U=1%, k=2)		$8\ mg + 0.001\% \cdot Rgr$	$8\ mg + 0.0012\% \cdot Rgr$	$80\ mg + 0.004\% \cdot Rgr$
Minimum weight (U=1%, k=2), fine range		–	–	$8\ mg + 0.004\% \cdot Rgr$
Weighing time		4 s	4 s	3.5 s
Weighing time, fine range		–	–	4 s
Interface update rate		23 /s	23 /s	23 /s
Usable height of draft shield		235 mm	235 mm	235 mm
Weight of balance		10 kg	10 kg	10 kg
Number of built-in reference weights		2	2	2
Weights for routine testing				
OIML CarePac		200 g F2, 10 g F1	500 g F2, 20 g F1	500 g F2, 20 g F1
	Weights	#11123001	#11123007	#11123007
ASTM CarePac		200 g 1, 10 g 1	500 g 1, 20 g 1	500 g 1, 20 g 1
	Weights	#11123101	#11123107	#11123107

sd	=	Standard deviation	Rnt	=	Net weight (sample weight)
Rgr	=	Gross weight	a	=	Year (annum)

[1] Valid for compact objects   [2] After adjustment with built-in reference weight

[3] On DeltaRange models: fine range starts at zero load (gross)

7.4 Dimensions

Dimensions in mm.

7.5 Interfaces

7.5.1 Specifications of RS232C

Interface type:	Voltage interface according to EIA RS-232C/DIN 66020 (CCITT V24/V.28)	
Max. cable length:	15 m	
Signal level:	Outputs: +5 V ... +15 V (RL = 3 – 7 kΩ) −5 V ... −15 V (RL = 3 – 7 kΩ)	Inputs: +3 V ... 25 V −3 V ... 25 V
Connector:	Sub-D, 9-pole, female	
Operating mode:	Full duplex	
Transmission mode:	Bit-serial, asynchronous	
Transmission code:	ASCII	
Baud rates:	600, 1200, 2400, 4800, 9600, 19200, 38400[1] (firmware selectable)	
Bits/parity:	7-bit/even, 7-bit/odd, 7-bit/none, 8-bit/none (firmware selectable)	
Stop bits:	1 stop bit	
Handshake:	None, XON/XOFF, RTS/CTS (firmware selectable)	
End-of-line:	<CR><LF>, <CR>, <LF> (firmware selectable)	
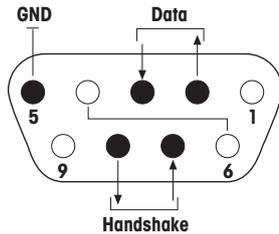
Pin 2: Balance transmit line (TxD)

Pin 3: Balance receive line (RxD)

Pin 5: Ground signal (GND)

Pin 7: Clear to send (hardware handshake) (CTS)

Pin 8: Request to send (hardware handshake) (RTS)

[1]   38400 baud is only possible in special cases, such as:

  • Weighing platform without terminal, or

  • Weighing platform with terminal, only via the optional RS232C interface.

7.5.2 Specifications of "Aux" connection

You can connect the METTLER TOLEDO "ErgoSens" or an external switch to sockets "Aux 1" and "Aux 2". This allows you to start functions such as taring, zeroing, printing and others.

External connection

|		
Connector:	3.5 mm stereo jack connector	
Electrical data:	Max. voltage	12 V
	Max. current	150 mA
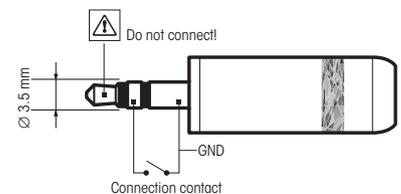
8 Accessories and Spare Parts

8.1 Accessories

You can increase the functionality of your balance with accessories from the METTLER TOLEDO range. The following options are available:

Description	Part No.
Printers	
BT-P42 printer with Bluetooth connection to instrument	11132540
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
RS-P42 printer with RS232C connection to instrument	00229265
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
RS-P25 printer with RS232C connection to instrument	11124300
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
RS-P26 printer with RS232C connection to instrument (with date and time)	11124303
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
LC-P45 application printer with additional functions	00229119
Paper roll, set of 5 pcs	00072456
Paper roll, self-adhesive, set of 3 pcs	11600388
Ribbon cartridge, black, set of 2 pcs	00065975
Optional interfaces	
Second RS232C Interface	11132500
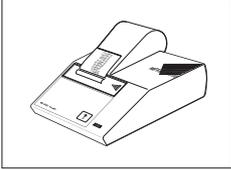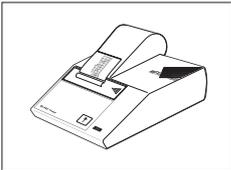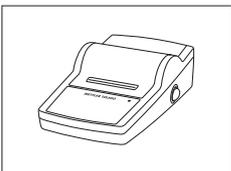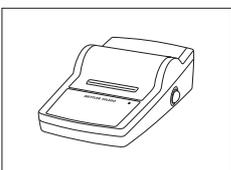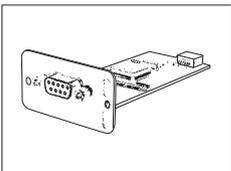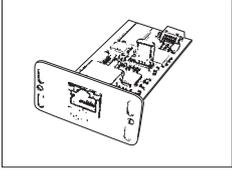
	Ethernet Interface for connection to an Ethernet network	11132515
	BT option: Bluetooth Interface for multipoint connection for up to 6 Bluetooth devices	11132530
	BTS option: Bluetooth Interface, single-point connection	11132535
	PS/2 option: Interface for connecting commercial keyboards and barcode readers	11132520
	LocalCAN option: Interface for connection of up to 5 LC (LocalCAN) instruments	11132505
	MiniMettler option: Interface MiniMettler, for connection to older (legacy) METTLER TOLEDO systems	11132510
	RS232 - USB converter cable – Cable with converter to connect a balance (RS232) to a USB port	64088427
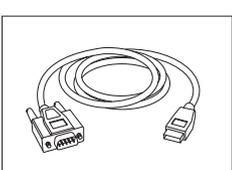
Cables for RS232C interface

	RS9 – RS9 (m/f): connection cable for PC, length = 1 m	11101051
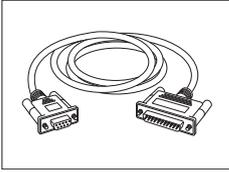
RS9 – RS25 (m/f): connection cable for PC, length = 2 m

11101052

Cables for LocalCAN interface
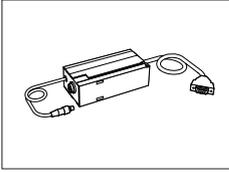
LC – RS9: Cable for connecting a PC with RS232C, 9-pin (f), lenght = 2 m
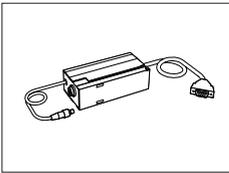
00229065

LC – RS25: Cable for connecting a printer or PC with RS232C, 25-pin (m/f), lenght = 2 m

00229050

LC – CL: Cable for connecting a device with METTLER TOLEDO CL interface (5-pin), length = 2 m

00229130

LC – LC2: Extension cable for LocalCAN, length = 2 m

00229115

LC – LC5: Extension cable for LocalCAN, length = 5 m

00229116

LC – LCT: Cable branch (T-connector) for LocalCAN

00229118

Cables for MiniMettler interface
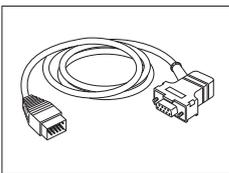
MM – RS9f: RS232C connection cable to MiniMettler interface, length = 1.5 m

00229029

Cables for terminal
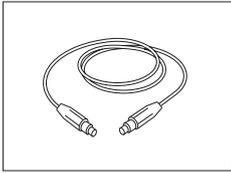
	Terminal extension cable, length = 4.5 m	11600517

Cable, one-sided open (2-pin)
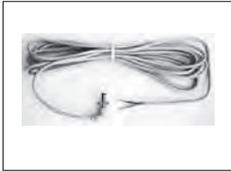
	Cable between balance and AC adapter, length = 4 m	11132037

Auxiliary displays
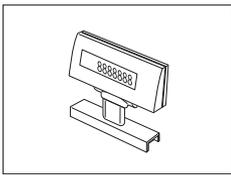
	BT-BLD Bluetooth auxiliary display for table mounting, 168 mm, LCD display with backlighting	11132555
	LC/RS-BLD auxiliary display on bench stand, backlit (incl. RS cable and separate AC adapter)	00224200
	RS/LC-BLDS auxiliary display for table or balance mounting, 480 mm, LCD display with backlighting	11132630
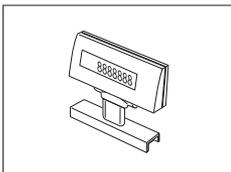
Sensors
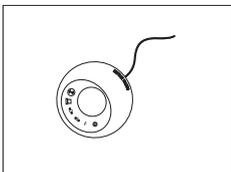
	ErgoSens, optical sensor for hands-free operation	11132601

LC-Switchbox

	For connection of up to 3 balances with LocalCAN interface to a printer	00229220

Footswitches
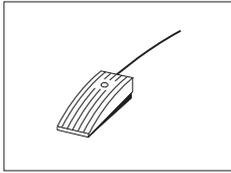
	Footswitch with selectable function for balances (Aux 1, Aux 2)	11106741
	LC-FS foot switch with selectable function for balances with LocalCAN interface	00229060

Filling-process control

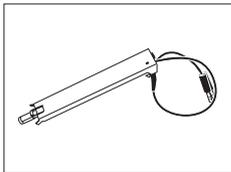|		
	LV11 automatic feeder for automatic loading of small items on the balance	21900608
	LV11 Draft shield door	11106715
	SQC14 filling process control	
	Compact instrument with printer for control of up to 16 articles	00236210
	Compact instrument with printer for control of up to 60 articles	00236211

AntiStatic kit

	Compact Antistatic Kit. Eliminates the build-up of electrostatic charges on containers and samples.	30090337
	Note For the operation of 2 compact Antistatic Kits, an additional AC adapter can be ordered, **see** Various accessories.	
	Universal AntiStatic Kit complete (U-shaped), including electrode and power supply	11107767
	Optional: Second U-electrode* for universal AntiStatic Kit	11107764
	* Power supply for optional, second U-elektrode (11107764)	11107766
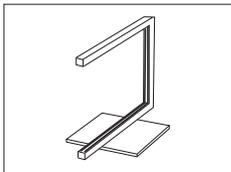
ErgoClips

Weighing kit for various weighing containers

	ErgoClip Weighing kit Delivery: 3 ErgoClips for Round-Bottom Flask, Weighing Boat and Tube, 20 Weighing Boat, 10 Single-use aluminium weighing pans.	11106707
	ErgoClip "Basket"	11106747

	ErgoClip "Titration Basket"	11106883
	ErgoClip "Weighing Boat"	11106748
	ErgoClip "Round-Bottom Flask"	11106746
	ErgoClip "small Flask"	11140180
	ErgoClip "Filter holder"	11140185
	ErgoClip "Stand"	11140170
	ErgoClip "Flask"	11106764
	ErgoClip "Tube"	11106784
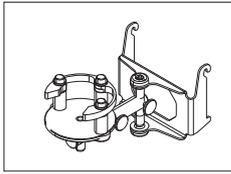
	ErgoClip for Quantos	11141570
	ErgoClip Syringe	30008288
	ErgoClip Solution Kit	11140251
	Single-use aluminium weighing pans, 10 units	11106711
	SmardGrid cover, chromium-nickel steel	11106709
	Single-use weighing boats, 500 units, 41 × 56 × 8 mm	11106712
	Grey drip tray	30038741
	MinWeigh door	11106749
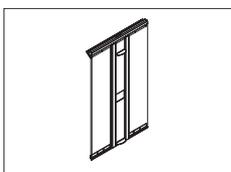
Filter kit

Filter kit for, until 110 mm		11140000

Density determination

Density kit		11106706
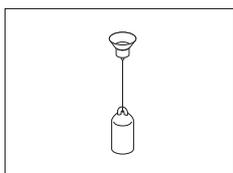
Sinker for density of liquids in conjunction with Density Kit		00210260
Calibrated (sinker + certificate)		00210672
Recalibrated (new certificate)		00210674
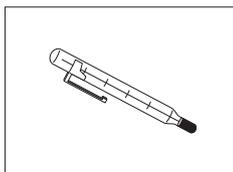
Calibrated thermometer with certificate		11132685

XP-SE kit

Separate electronics kit		11106743
	Extension cable 0.6 m	00211535
	Extension cable 5.0 m	00210688

Pipette calibration

Evaporation Trap, incl. adpater		11140043

Evaporation Trap large		11138440

1-channel suction pump complete		11138268
	Hose 2 m for suction pump	11138132

	Reagent reservoirs, 5 pcs.	11600616
	Barometer	11600086
	Precision thermometer with clip, not certified	00238767
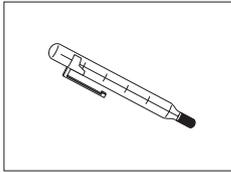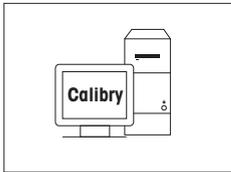
Calibry PC Software

Calibry Light; for single channel pipettes	11138423
Update	30007342
Calibry Single workstation; for calibration with one system MPC	11138419
Update	30007340
Calibry Network; Installation on several PC of the network accessing the same database	11138420
Update	30007341
Calibry Validation manual	11780959

RFID reader

RFID Reader for Pipette Calibration	17011964
Power User Option	30007309

Barcode reader
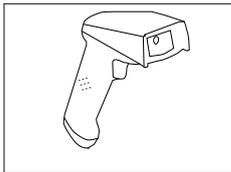
RS232C Barcode Reader   21901297

The following accessories are needed for operation (not included):

	RS232 F cable	21901305
	Null modem adapter	21900924
Plus one of the following:	AC adapter 5 V for EU	21901370
	AC adapter 5 V for US	21901372
	AC adapter 5 V for GB	21901371
	AC adapter 5 V for AU	21901370
		+ 71209966
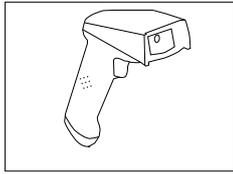
RS232C Barcode Reader – Cordless		21901299
The following accessories are needed for operation (not included):		
	Cradle	21901300
	RS232 F cable	21901305
	Null modem adapter	21900924
Plus one of the following:	AC adapter 12 V for EU	21901373
	AC adapter 12 V for US	21901375
	AC adapter 12 V for GB	21901374
	AC adapter 12 V for AU	21901373
		+ 71209966
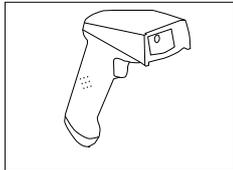
PS/2 Barcode Reader, without cable		21901297
PS/2 wedge single cable		21901307
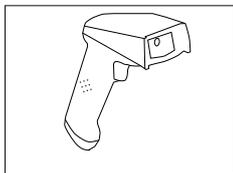
PS/2Y Barcode Reader, without cable		21901297
PS/2 wedge twin (Y) cable		21901308

Anti-theft devices

Steel cable — 11600361

Transport cases

Transport case for analytical balances — 11106869

Protective covers
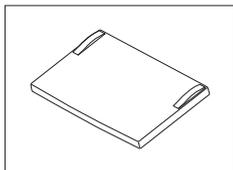
Protective cover for XP terminal — 11132570
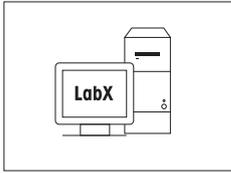
Dust covers

Dust cover — 30035838

## Software

LabX software for one click™ weighing solutions   on request
Enables you to perform One Click™ Standard Preparation, One
Click™ Loss on Drying, One Click™ Sieve Analysis and many
other applications.
Simply start the method with the One Click™ shortcut on the
balance touchscreen. LabX guides you step-by-step through
the SOP on the balance, performs your calculations automati-
cally, and takes care of saving all your data. The complete
solution can be tailored to match your process requirements.
Visit www.mt.com/one-click-weighing for more information
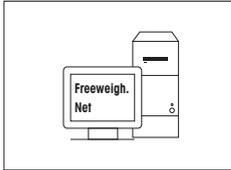
Freeweigh.Net   21900895

Various

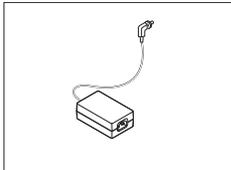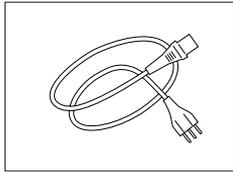Terminal and printer stand, mounting on balance   11106730
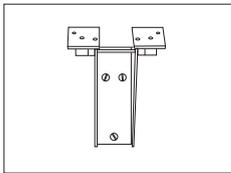

Wall fixture for terminal   11132665

AC/DC adapter (without power cable) 100–240 V AC, 0.8 A,   11107909
50/60 Hz, 12 V DC 2.5 A

Country-specific 3-Pin power cable with grounding conductor.

Power cable AU	00088751
Power cable BR	30015268
Power cable CH	00087920
Power cable CN	30047293
Power cable DK	00087452
Power cable EU	00087925
Power cable GB	00089405
Power cable IL	00225297
Power cable IN	11600569
Power cable IT	00087457
Power cable JP	11107881
Power cable TH, PE	11107880
Power cable US	00088668
Power cable ZA	00089728
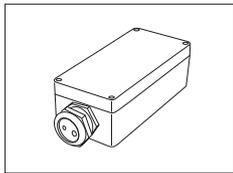
IP54 protective housing for AC adapter	11132550
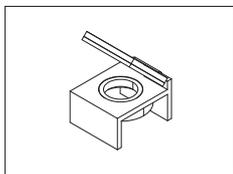
Level bubble mirror	11140150
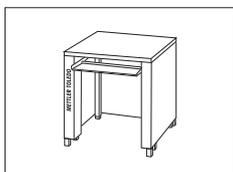
Weighing table	11138042

8.2 Spare parts

	Pos	Description	Part No.
	1	Side draft shield door	11106841
	2	Top draft shield door	11106842
	3	Front glass	11106843
	4	Intermediate shelf	11106803
	5	SmartGrid cover	11106709
	6	SmartGrid	11106333
	7	Clip	11106511
	8	Foot screw	11106323
	9	Terminal support	11106540
	10	Drip tray	11106449
		Brush	00071650
		XP Terminal complete with firmware	11130692
		Packaging complete	11106879

	Pos	Description	Part No.
		Export box	11106871

9 Appendix

9.1 MT-SICS interface commands and functions

Many of the instruments and balances used have to be capable of integration in a complex computer or data acquisition system.

To enable you to integrate balances in your system in a simple manner and utilize their capabilities to the full, most balance functions are also available as appropriate commands via the data interface.

All new METTLER TOLEDO balances launched on the market support the standardized command set "METTLER TOLEDO Standard Interface Command Set" (MT-SICS). The commands available depending on the functionality of the balance.

For further information please refer to the Reference Manual MT-SICS downloadable from the Internet under

▶ www.mt.com/xp-analytical

9.2 Procedure for certified balances

Preface
Certified balances are subject to the national, legal requirements of "non-automatic balances".

Switching on the balance
- **Switching on**
  - Immediately after being switched on, the balance displays 0.000.. g.
  - The balance is always started up with the "Factory setting" unit.

- **Switch-on range**
  - At maximum 20% of the type load, otherwise overload is displayed (OIML R76 4.5.1).

- **Stored value as switch-on zero point**
  - It is not permissible to use a stored value as a switch-on zero point; the MT-SICS M35 command is not available (OIML R76 T.5.2).

Display
- **Display of the weight value**
  - The "e" certification value is always shown in the display and is specified at the model designation plate (OIML R76 T.3.2.3 and 7.1.4).
  - If the display increment is lower than the "e" certification value, this is variably displayed for the net, gross and weighed tare. (Graying of the digits or certification brackets) (OIML R76 T.2.5.4 and 3.4.1).

- In accordance with guidelines, the tested display increment (certification value) is never lower than 1 mg (OIML R76 T.3.4.2).

- At balances with d = 0.1 mg, the digits below 1 mg are displayed in gray. These digits in brackets are printed. In accordance with legal metrology requirements, this illustration does not affect the accuracy of the weighing results.

- **Units of measurement**
  - The display and info unit are firmly set to g or mg (depending on the model).
  - The following applies for the "Custom unit":
    - No certification brackets.
    - The following names are blocked, this applies to upper and lower case letters.
      - All official units (g, kg, ct etc.).
      - c, ca, car, cm, crt, cart, kt, gr, gra, gram, grm, k, kilo, to, ton.
      - All names with "o" which can be replaced by a zero (Oz, Ozt etc.).

- **Identification of the weight display**
  - Gross, net, tare and other weight values are accordingly marked (OIML R76 4.6.5).
    - Net for net when a tare value has been used.
    - B or G for gross.
    - T for the weighed tare.
    - PT for the specified tare.
    - * or diff for the difference between the net or gross.

- **Info field**
  - The info weight value is handled metrologically in the same way as the weight value in the main display.

Printout (OIML R76 4.6.11)

- If a tare value is entered manually (PreTare), the PreTare value is always printed along with the net value (PT 123.45 g).

- The printed weight values are identified in the same way as the weight value on the display.

  I.e. N, B or G, T, PT, diff or *, with differentiation.

  Example:

  Single-range balance.

N	123.4[5] g
PT	10.00 g ➜ for PreTare
G	133.4[5] g

  DR balance with 100.00 g fine range.

N	80.4[0] g
T	22.5[6] g ➜ for weighed tare
G	102.9[ ] g

Balance functions

- **Reset to zero**
  - The zero range is limited to a maximum of ± 2% of the full load (OIML R76 4.5.1).

- **Tare**
  - No negative tare values are permitted.
  - Tare immediate (TI) is not permitted, the MT-SICS TI command is not available (OIML R76 4.6.4).

- **1/xd**
  - **e = d**

    The 1/xd switchover is not permitted (OIML R76 3.1.2).
  - **e = 10d**

    This is only permitted in the case of the 1/10d switchover.
  - **e = 100d**

    Only the 1/10d and 1/100d switchover are permitted.

Index

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/excellence

For more information

1 1 7 8 1 0 6 6