Operating Instructions

Excellence Plus Micro Balances
XP56/XP26 Models – Part 1
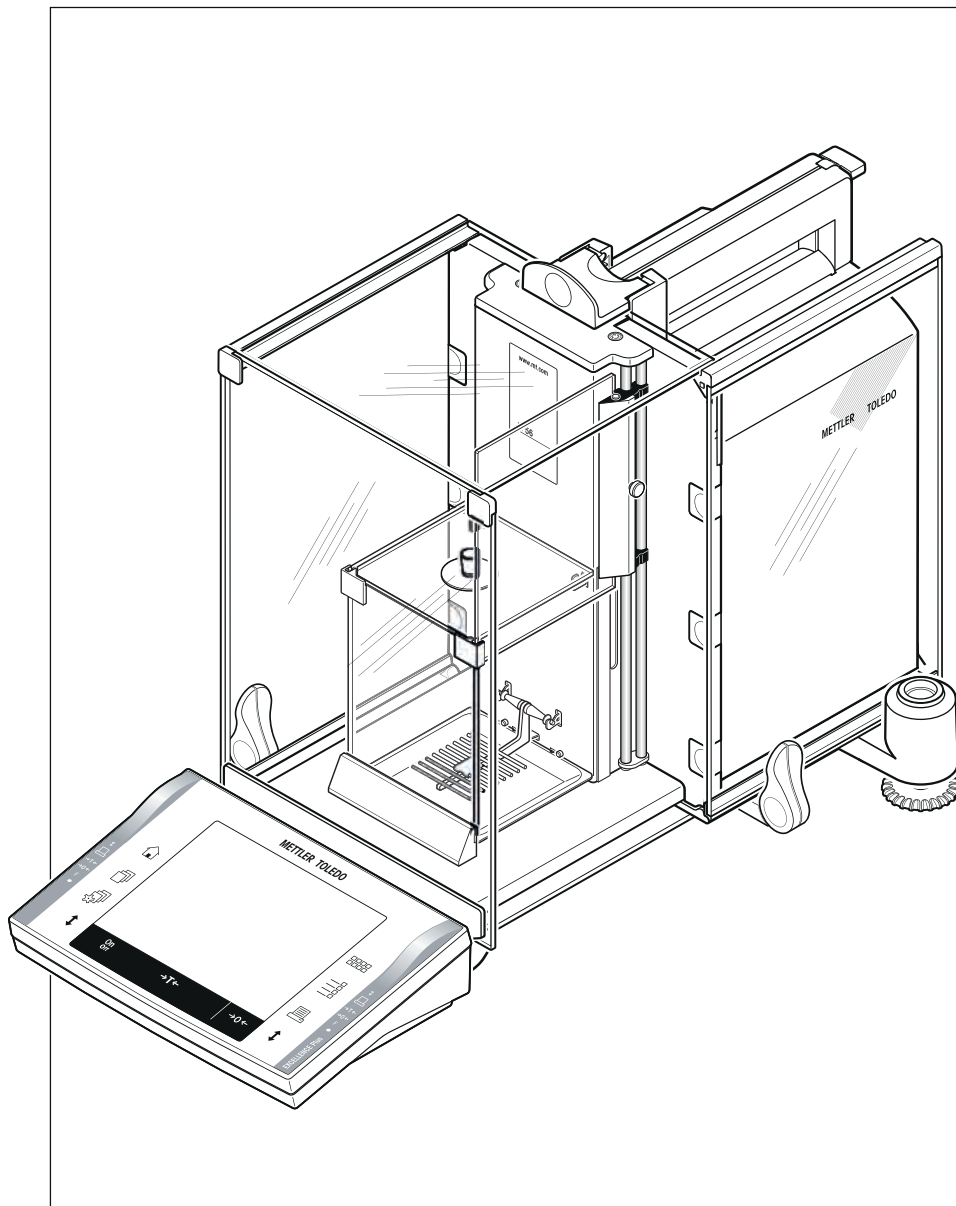
METTLER TOLEDO

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 drive and inner glass draft shield 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

Internet http://www.mt.com/excellence

1.1 Symbols and presentations used

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

Key and button designations are indicated by a picture or text in square brackets (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 Definition of signal 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

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 cirmumstances. 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 or constructional alterations to the instrument and use only original spare parts and optional equipment from METTLER TOLEDO.

CAUTION

Damage of device

− For use only in dry interior rooms.

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

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

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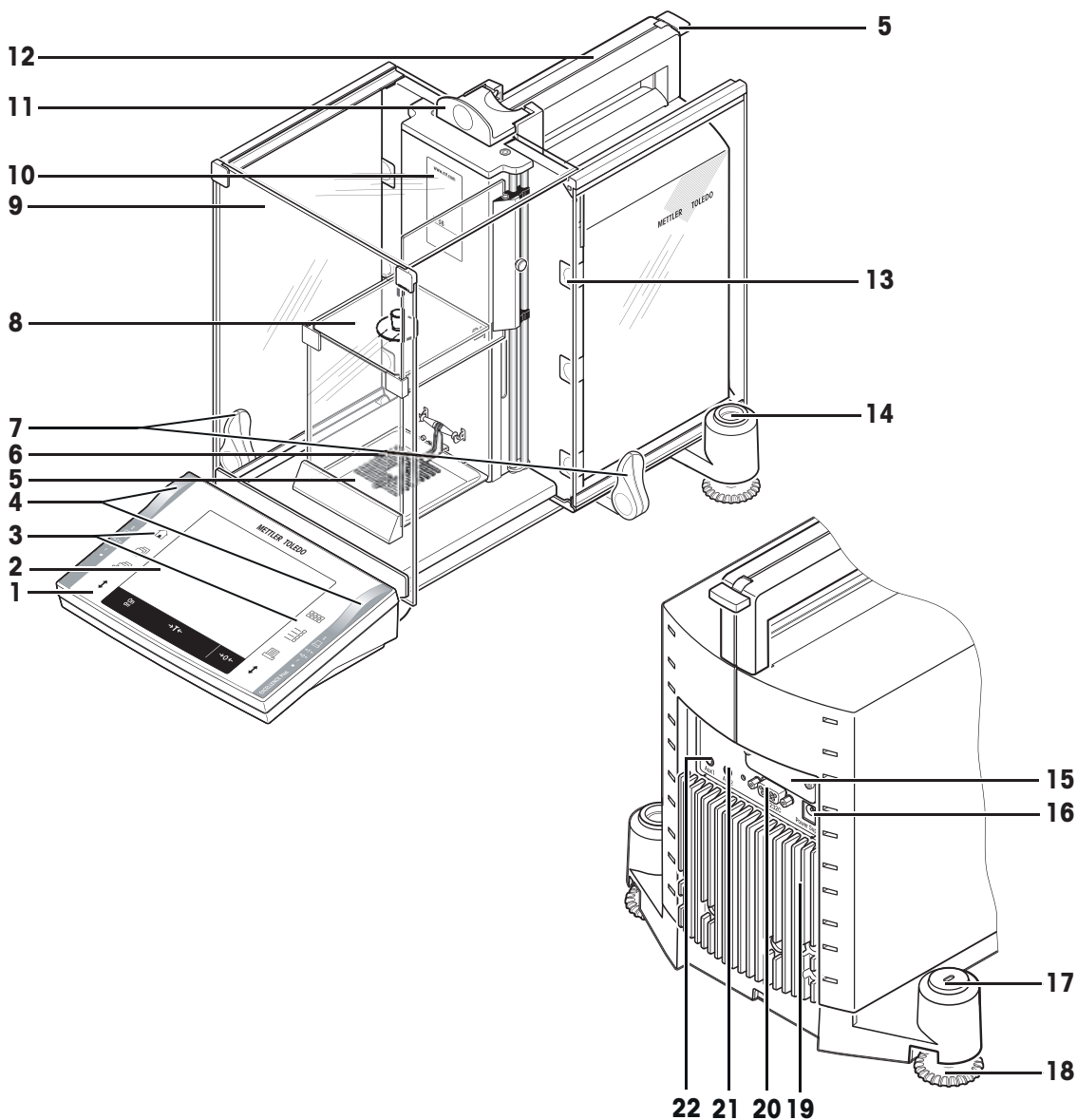
CAUTION

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.

3 Overview of XP56/XP26 Micro Balances

Overview

1	Terminal (details **see** Operating Instructions – Part 2)	**2**	Display (Touch-sensitive "Touch screen")
3	Operating keys	**4**	SmartSens sensors
5	Drip tray	**6**	Grid weighing pan
7	Handle/Coupling element for the operation of the outer draft-shield doors	**8**	Inner glass draft shield
9	Outer glass draft shield	**10**	Type name
11	Handle for operation of the outer draft-shield top door	**12**	Guide for top door of draft shield and handle for transport
13	Removable clips for feeding cables or hoses	**14**	Level indicator / Level sensor
15	Slot for second interface (optional)	**16**	Socket for AC adapter
17	Fastening point for anti-theft device	**18**	Foot screw
19	Cooling element (based on model)	**20**	RS232C serial interface
21	Aux 2 (connection for "ErgoSens", hand- or foot-switch)	**22**	Aux 1 (connection for "ErgoSens", hand- or foot-switch)

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 and checking the delivered items

4.1.1   Unpacking the balance

1   Open the outer packaging box.

2   Remove it from the packaging the Unpacking and packing instructions.
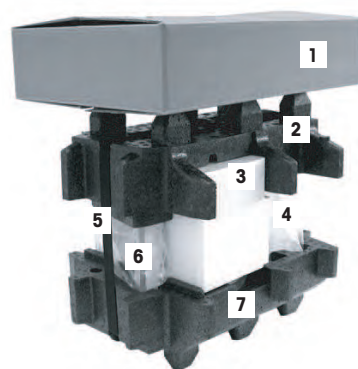
3   Lift the cardboard box (1) out of the packaging.

Overview

1   Cardboard box with 2 sets (see next 2 pictures)

2   Top packing cushion

3   Set with inner draft shield, drip tray, and grid weighing pan micro

4   Balance

5   Lifting strap

6   Terminal

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

7   Bottom packing cushion

–   Take out the Operating Instructions and other documents (8) that explain the further procedure for unpacking and assembling your balance.
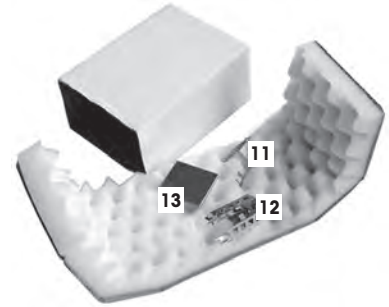
1   Pull out set (9) with AC adapter, power supply cable, tweezers, and the set containing ErgoClip basket micro and grid weighing pan cover micro.

2   Pull out set (10) with outer draft shield doors and terminal support.
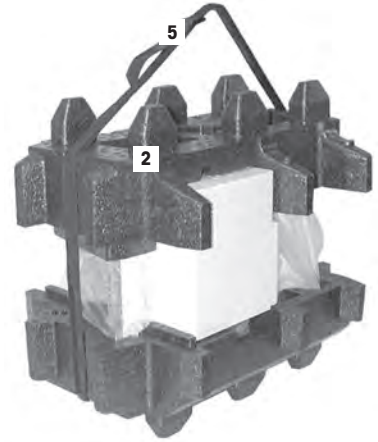
Set with:

- ErgoClip basket micro
  - Support (11)
  - Basket (12)

- Grid weighing pan cover micro (13).

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

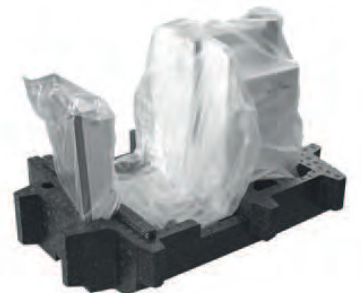1 Unfasten lifting strap (5).

2 Remove top packing cushion (2).

– Pull out set (3) with inner draft shield etc.

– 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.

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

See Transporting the balance (page 20).

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 outer draft shield and terminal support

- Set with inner draft shield, drip tray and grid weighing pan micro

- Set with:
  - Ergo Clip basket micro with support
  - Grid weighing pan cover micro (attachment for grid weighing pan)

- Protective cover for the terminal

- AC adapter with country-specific power cable

- Tweezers

- Cleaning brush

- 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 Selecting a location

Choose a position which is stable, free from vibration, and as nearly horizontal as possible. The supporting surface must be able to bear the weight of the fully loaded balance safely.

Avoid the following:

- Direct sunlight
- Draft (e.g. from fans or air conditioning)
- Excessive fluctuations in temperature.

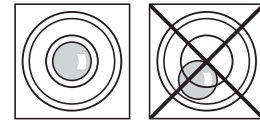Further information can be found in Weighing the Right Way.
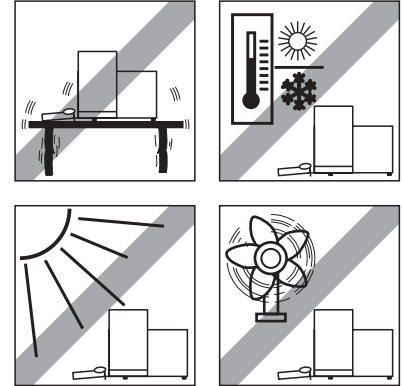
Observe ambient conditions.

See Technical Data (page 29).

Note
If the balance is not horizontal from the beginning, it will have to be leveled during initial operation.
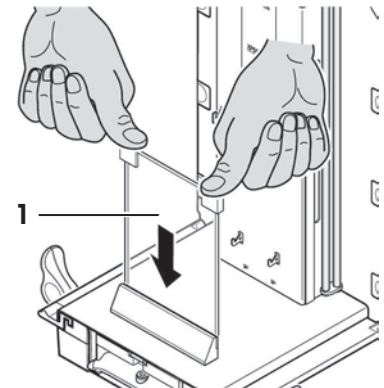
**See** Leveling the balance (page 26).

4.4 Assembling the balance

4.4.1 Inner draft shield
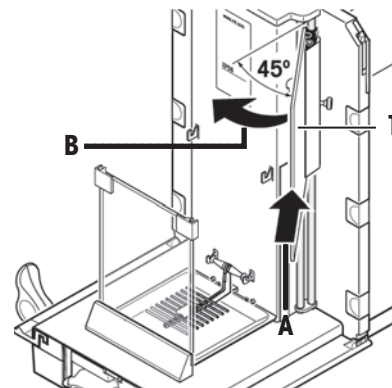
1 Insert the front glass (1) of the inner draft shield.
2 Ensure the glass is centered and pushed in as far as the stop.

1   Insert the drip tray (1) from the side under the upper 2 pins. The notches must be positioned by the springs.

2   Insert the grid weighing pan (2) from above.

3   Check that the grid weighing pan is correctly hooked in on both sides.
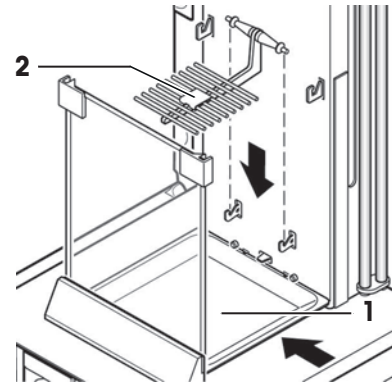
1   Insert the side window (1) of the inner draft shield.
    At an angle of approximately 45 degrees to the final position, place the 2 black clips on the back guide shaft.

2   Push the window up until you can swivel it in over the front glass.

1   Insert the window (1) of the inner draft shield into the guide of the front glass and lower it to the floor.

2   The window must run easily.

3   Press the coupling pins (2) toward the inside.

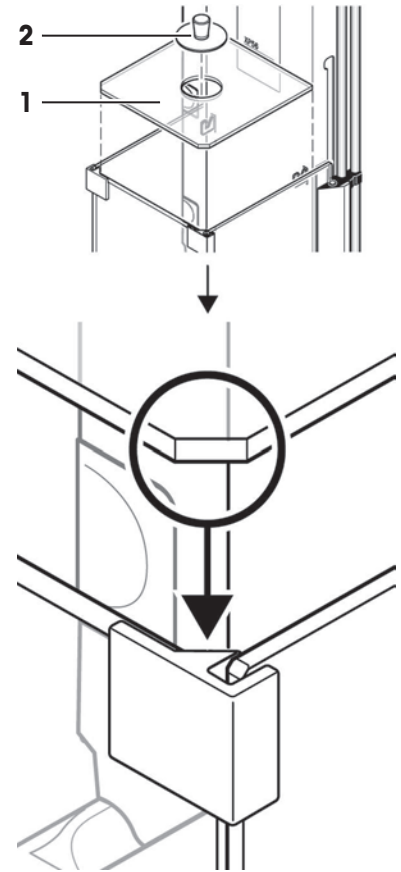4   Now insert the window on the other side of the inner draft shield. The procedure is the same.
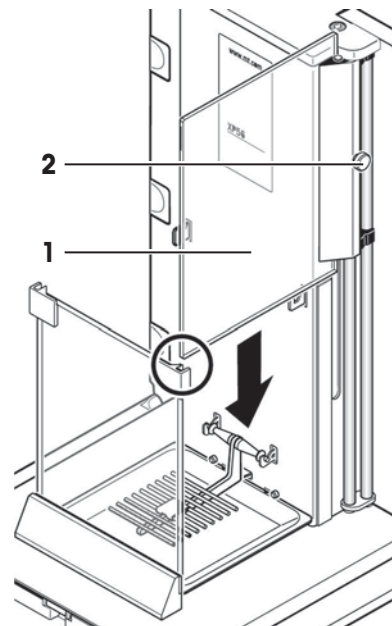
1   Put the top glass (1) on.

2   Insert the sealing cover (2).

Note

The sealing cover closes the opening in the top glass through which you can pipette into a high container.
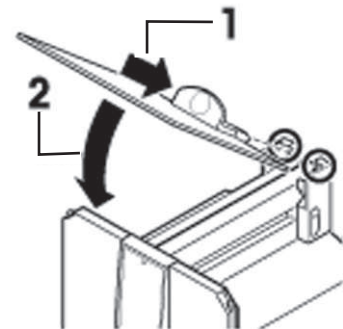
Attention

Do not use the sealing cover to lift the top glass of the draft shield!

4.4.2 Outer draft shield

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.
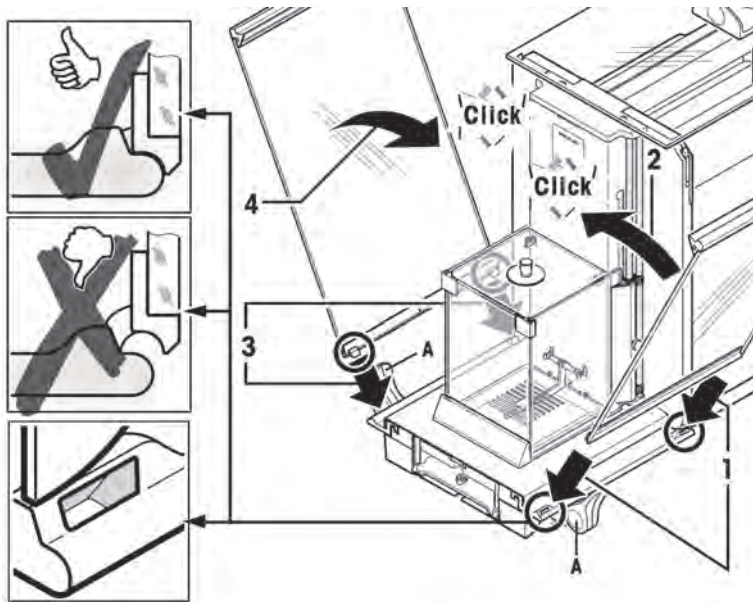
1 Insert the front glass (2) of the draft shield.

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.
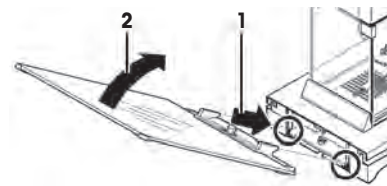
1 Insert the terminal support.

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.
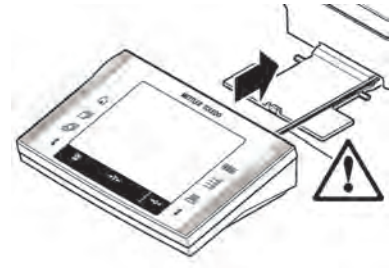
Attention

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 20).

Note

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

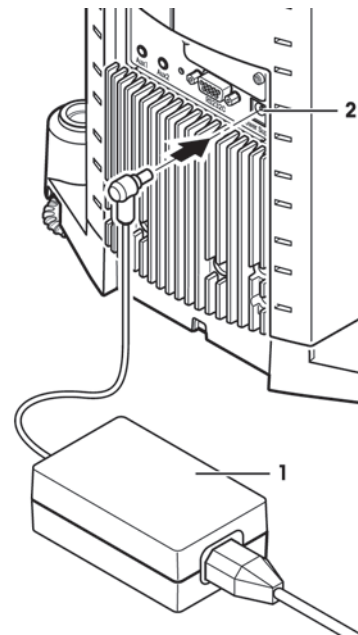## 4.5 Power supply

WARNING

Risk of electric shock

– Ensure that the AC power pack for the balance is only used in accordance with the specifications listed in chapter General Data.

– Your instrument is supplied with a 3-pin power cable with an equipment grounding conductor. Only extension cables which meet this relevant standards and also have an equipment grounding conductor may be used. Intentional disconnection of the equipment grounding conductor is prohibited.

- Your balance is delivered complete with an AC adapter and a country-specific power supply cable. The AC adapter is suitable for all power supply voltages in the range of: 100 – 240 VAC, 50/60 Hz, for exact specifications.

See Technical Data (page 29).

- First, check whether the voltage of the power supply matches your local line voltage. If this is not the case, on no account connect the balance to the power, but contact your METTLER TOLEDO sales representative or dealer.
- Guide the cables so that they cannot become damaged and will not be in your way during your daily work! Take care that the AC adapter cannot come into contact with liquids!
- The power plug must be always accessible.
- Before operating, check all cables for damage.

– Plug the AC adapter (1) into the socket (2) in the back of your balance and into the power supply.

⇨ After the balance has been connected to the power supply, it carries out a self test and is then ready for operation.

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.
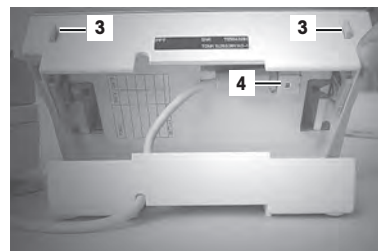
## 4.6   Operating of the outer draft shield and the inner draft shield

4.6.1   Outer draft shield

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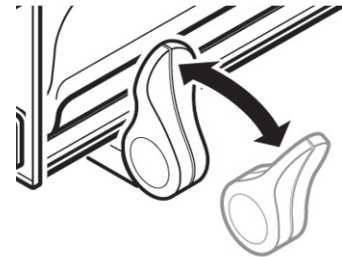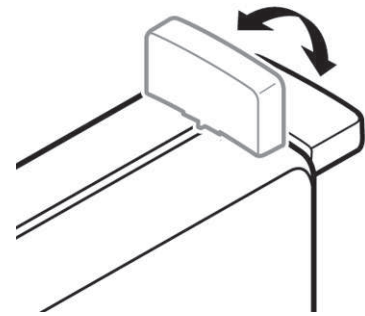
Note
It is best to make connections when the draft shield is closed.

4.6.2 Inner draft shield

– For **motorized operation** of the inner draft shield the coupling bolts (1) must be pressed **inward**.

   ⇨ The two side doors can be controlled separately.

You can also open the side doors of the inner draft shield only part-way, with a choice of 25 %, 50 % or 75 %, **see** Operating Instructions – Part 2.
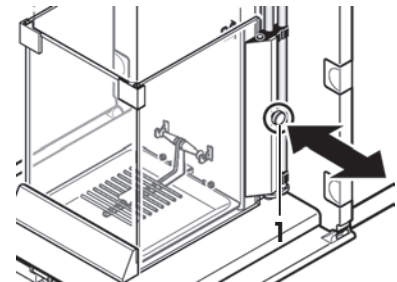
4.7 Setting the reading angle and positioning the terminal

4.7.1 Setting the reading angle

1   Press in the two buttons (1) 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.
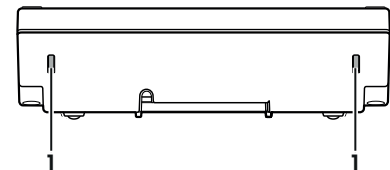
### 4.7.2 Remove terminal and place close to the balance

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.
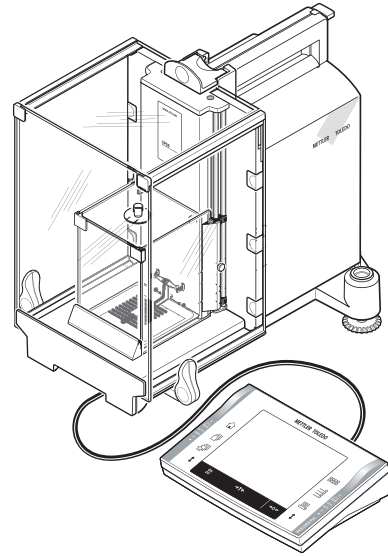
4.8   Transporting the balance

1   Switch off the balance.

2   The balance must be disconnected from the power supply.

3   Remove any interface cable from the balance.

4.8.1   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.
    See Selecting a location (page 13).
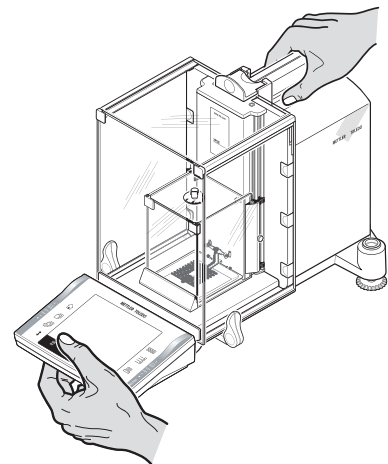
4.8.2 Transporting over long distances

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 outer draft shield away from the balance.

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

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

6 Remove the sealing cover (7).

7 Lift the top glass (8) of the inner draft shield off.

8 Pull both side doors (9 + 10) off. Pull up, turn to the side, and pull away.

9 Lift the grid weighing pan (11) and lift it out of the guides.

10 Pull the drip tray (12) out at the side.
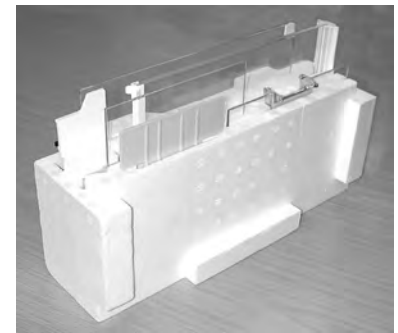
11 Pull the front glass (13) up and away.
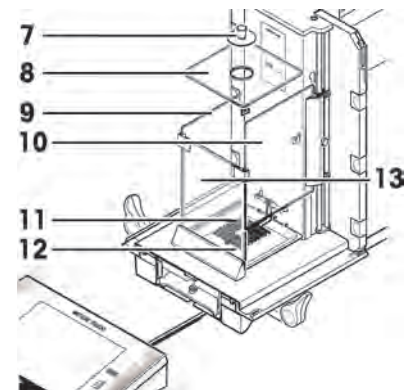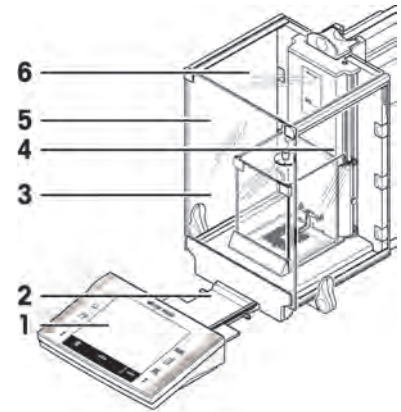
Pack the outer draft shield and the terminal support (Pos. 3-6 and 2)

– 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.
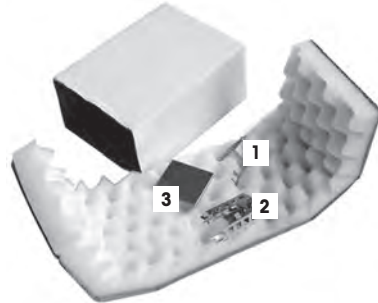
Pack the inner draft shield, the drip tray, and the grid weighing pan (Pos. 7-13)

– Place these parts in the special compartments provided in the original packaging.

Pack the set with

- ErgoClip basket micro
  - Support (1)
  - Basket (2)

- Grid weighing pan cover micro (3).

Pack the 2 sets (1 + 2)

- Set (1) with AC adapter, power cable, tweezers, and the set with the ErgoClip Basket micro and grid weighing pan cover micro.
- Set (2) with the outer draft shield and terminal support.
- The Operating Instructions and other documents.
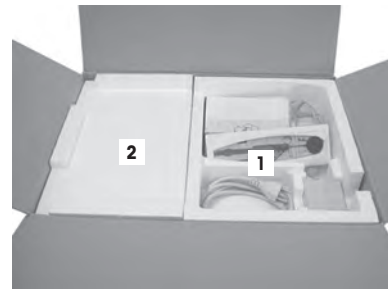
CAUTION

Damage of device

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

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1 Push the guide of the upper draft shield door right to the front.
2 Push the guide of the draft shield side doors right to the front.
3 Fold the handles of the guides up/in.

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.

– Place the set in the packing cushion along with the inner draft shield, **see** illustration.

– 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.

– Place the packaging with the outer draft shield and AC adapter sets on the balance in the transportation carton.

4.9 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.

2 Unplug the cable of the AC adapter from the back of the balance.

3 Also remove any interface cables.

4 Push all the doors of the glass draft shield completely to the back.

5 Lift the terminal off the terminal support.

6 Open the terminal and carefully pull the connecting cable out, **see** Power supply (page 17).

7 Put the terminal down at the side of the balance.

8 Pull the balance over the table edge just far enough that you see the opening from below, **see** figure 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. You must now fasten the cover plate in the new position by tightening the screw, **see** figure right.

⇨ Your balance is now ready for mounting your equipment for below-the-balance weighings.
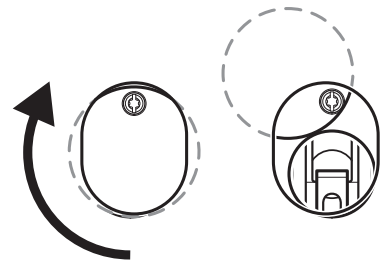
4.10 Installing the ErgoClip

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 grid weighing pan (SmartGrid) from the balance.

2 Insert the support (1) for the "ErgoClip Basket micro".

3 Place the basket (2) on the guide (3) of the support.

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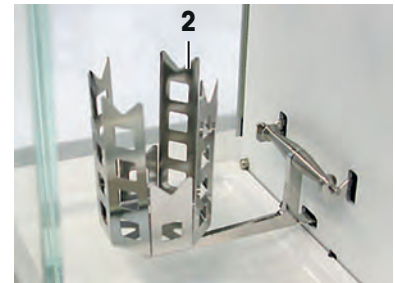
Important to know!
If you do not switch the balance off before you do the installation, the ProFACT function is not activated.

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.

4.11 Installing the grid weighing pan 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!

Attention
With installed grid weighing pan cover, the balance does not switch to "Standby" mode!

1 For the installation, remove the grid weighing pan from the weighing chamber.

2 Gently press the cover onto the grid weighing pan.

3 Replace the grid weighing pan with the installed grid weighing pan cover.
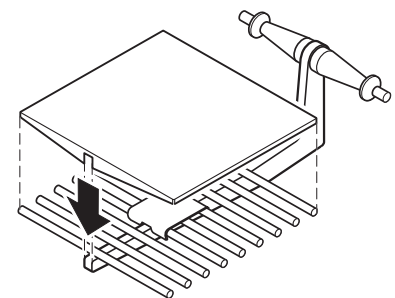
5 First Steps

5.1 Switching on / off

Switching on

– Press [**On/Off**].

⇨ The display appears.

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.

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.
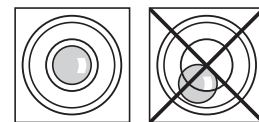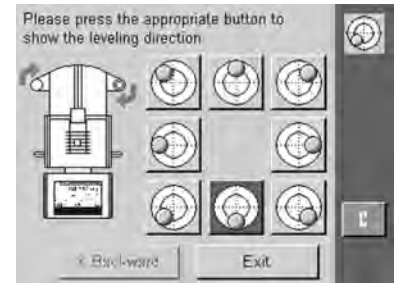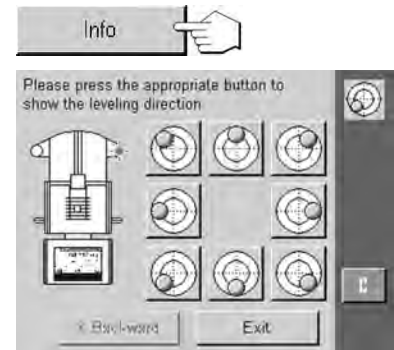
6 Maintenance

6.1 Cleaning

Periodically clean the weighing chamber, 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

- The balance must be disconnected from the power supply.

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

- Never open the balance, terminal or AC adapter – they contain no components, which can be cleaned, repaired or replaced by the user.

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 shields (inner and outer draft shield) away from the balance and pull them out of their fastenings.
It may be necessary to turn the weighing pan slightly to remove it.

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

Power supply connector with AC/DC adapter:	11107909 Primary: 100-240 VAC, -15%/+10%, 50/60 Hz Secondary: 12 VDC ±3%, 2.0 A (with electronic overload protection)
Cable to AC adapter:	Design: 3-core, with country-specific plug **Note** Make sure the power supply plug is freely accessible
Power supply to the balance:	12 VDC ±3%, 2.0 A, maximum ripple: 80 mVpp

Protection and standards

Overvoltage category:	Class 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% at 31 °C, linearly decreasing to 50% at 40 °C, non-condensing
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
Grid weighing pan:	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.

Equivalent circuit diagram
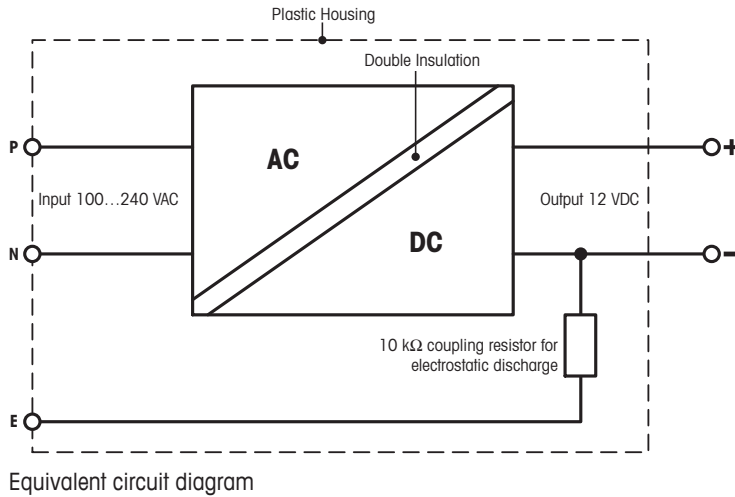
7.3 Model-specific data

		XP26	XP26DR
Limit values			
Maximum capacity		22 g	22 g
Readability		0.001 mg	0.01 mg
Tare range (from…to)		0 … 22 g	0 … 22 g
Maximum capacity, fine range		–	5.1 g
Readability, fine range		–	0.002 mg
Repeatability (at nominal load)	sd	0.0025 mg (20 g)	0.008 mg (20 g)
Repeatability (at low load)	sd	0.0015 mg (1 g)	0.005 mg (1 g)
Repeatability, fine range (at low load)	sd	–	0.002 mg (1 g)
Linearity deviation		0.004 mg	0.01 mg
Eccentricity deviation (test load)		0.02 mg (10 g)	0.025 mg (10 g)
Sensitivity offset (test weight) [2]		0.08 mg (20 g)	0.1 mg (20 g)
Sensitivity temperature drift		0.0001%/°C	0.0001%/°C
Sensitivity stability		0.0001%/a	0.0001%/a
Typical values			
Repeatability	sd	0.0007 mg	0.004 mg
Repeatability, fine range	sd	–	0.0012 mg
Linearity deviation		0.003 mg	0.0048 mg
Eccentric deviation (test load)		0.006 mg (10 g)	0.008 mg (10 g)
Sensitivity offset (test load) [2]		0.04 mg (20 g)	0.048 mg (20 g)
Minimum sample weight (according to USP) [1]		2.1 mg	12 mg
Minimum sample weight (according to USP), fine range [1]		–	3.6 mg
Minimum sample weight (U=1%, k=2) [1]		0.14 mg	0.8 mg
Minimum sample weight (U=1%, k=2), fine range [1]		–	0.24 mg
Settling time		3.5 s	2.5 s
Settling time, fine range		–	3.5 s
Dimensions			
Balance dimensions (WxDxH)		263x487x322 mm	263x487x322 mm
Weighing pan dimensions		40x40 mm (WxD)	40x40 mm (WxD)
Typical uncertainties and supplementary data			
Repeatability [1]	sd	0.0007mg+0.000004%·Rgr	0.004mg+0.000005%·Rgr
Repeatability, fine range [1] [3]	sd	–	0.0012mg+0.00001%·Rgr

		XP26	XP26DR
Differential linearity deviation	sd	$\sqrt{(0.12\text{pg}\cdot\text{Rnt})}$	$\sqrt{(0.3\text{pg}\cdot\text{Rnt})}$
Differential eccentric load deviation	sd	0.00003%·Rnt	0.00004%·Rnt
Sensitivity offset [2]	sd	0.0001%·Rnt	0.00012%·Rnt
Minimum sample weight (according to USP) [1]		2.1mg+0.012%·Rgr	12mg+0.015%·Rgr
Minimum sample weight (according to USP), fine range [1]		–	3.6mg+0.03%·Rgr
Minimum sample weight (U=1%, k=2) [1]		0.14mg+0.0008%·Rgr	0.8mg+0.001%·Rgr
Minimum sample weight (U=1%, k=2), fine range [1]		–	0.24mg+0.002%·Rgr
Weighing time		18 s	14 s
Weighing time, fine range		–	18 s
Interface update rate		23 /s	23 /s
Weight of balance		11.5 kg	11.5 kg
Number of built-in reference weights		2	2
Weights for routine testing			
OIML CarePac		20 g F1, 1 g E2	20 g F1, 1 g E2
Weights		#11123006	#11123006
ASTM CarePac		20 g 1, 1 g 1	20 g 1, 1 g 1
Weights		#11123106	#11123106

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 gross load

		XP56	XP56DR
Limit values			
Maximum capacity		52 g	52 g
Readability		0.001 mg	0.01 mg
Tare range (from…to)		0 … 52 g	0 … 52 g
Maximum capacity, fine range		–	11 g
Readability, fine range		–	0.002 mg
Repeatability (at nominal load)	sd	0.006 mg (50 g)	0.014 mg (50 g)
Repeatability (at low load)	sd	0.0015 mg (1 g)	0.006 mg (1 g)
Repeatability, fine range (at low load)	sd	–	0.002 mg (1 g)
Linearity deviation		0.2 mg	0.03 mg
Eccentricity deviation (test load)		0.03 mg (20 g)	0.035 mg (20 g)
Sensitivity offset (test weight) [2]		0.125 mg (50 g)	0.15 mg (50 g)
Sensitivity temperature drift		0.0001%/°C	0.0001%/°C
Sensitivity stability		0.0001%/a	0.0001%/a
Typical values			
Repeatability	sd	0.0007 mg	0.004 mg
Repeatability, fine range	sd	–	0.0012 mg
Linearity deviation		0.01 mg	0.015 mg
Eccentric deviation (test load)		0.012 mg (20 g)	0.016 mg (20 g)
Sensitivity offset (test load) [2]		0.06 mg (50 g)	0.08 mg (50 g)
Minimum sample weight (according to USP) [1]		2.1 mg	12 mg
Minimum sample weight (according to USP), fine range [1]		–	3.6 mg
Minimum sample weight (U=1%, k=2) [1]		0.14 mg	0.8 mg
Minimum sample weight (U=1%, k=2), fine range [1]		–	0.24 mg
Settling time		3.5 s	2.5 s
Settling time, fine range		–	3.5 s
Dimensions			
Balance dimensions (WxDxH)		263x487x322 mm	263x487x322 mm
Weighing pan dimensions		40x40 mm (WxD)	40x40 mm (WxD)
Typical uncertainties and supplementary data			

		XP56	XP56DR
Repeatability [1]	sd	0.0007mg+0.000006%·Rgr	0.004mg+0.000006%·Rgr
Repeatability, fine range [1] [3]	sd	–	0.0012mg+0.00001%·Rgr
Differential linearity deviation	sd	$\sqrt{(0.5\text{pg}\cdot\text{Rnt})}$	$\sqrt{(1.2\text{pg}\cdot\text{Rnt})}$
Differential eccentric load deviation	sd	0.00003%·Rnt	0.00004%·Rnt
Sensitivity offset [2]	sd	0.00006%·Rnt	0.00008%·Rnt
Minimum sample weight (according to USP) [1]		2.1mg+0.018%·Rgr	12mg+0.018%·Rgr
Minimum sample weight (according to USP), fine range [1]		–	3.6mg+0.03%·Rgr
Minimum sample weight (U=1%, k=2) [1]		0.14mg+0.0012%·Rgr	0.8mg+0.0012%·Rgr
Minimum sample weight (U=1%, k=2), fine range [1]		–	0.24mg+0.002%·Rgr
Weighing time		18 s	14 s
Weighing time, fine range		–	18 s
Interface update rate		23 /s	23 /s
Weight of balance		11.5 kg	11.5 kg
Number of built-in reference weights		2	2
Weights for routine testing			
OIML CarePac		50 g F2, 2 g E2	2 g E2, 0.1 g E2
	Weights	#11123003	#11123004
ASTM CarePac		50 g 1, 2 g 1	2 g 1, 0.1 g 1
	Weights	#11123103	#11123104

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 gross load
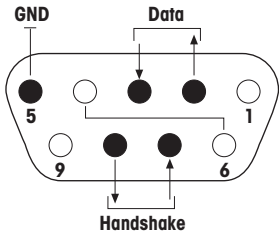
7.4 Dimensions

Dimensions in mm.
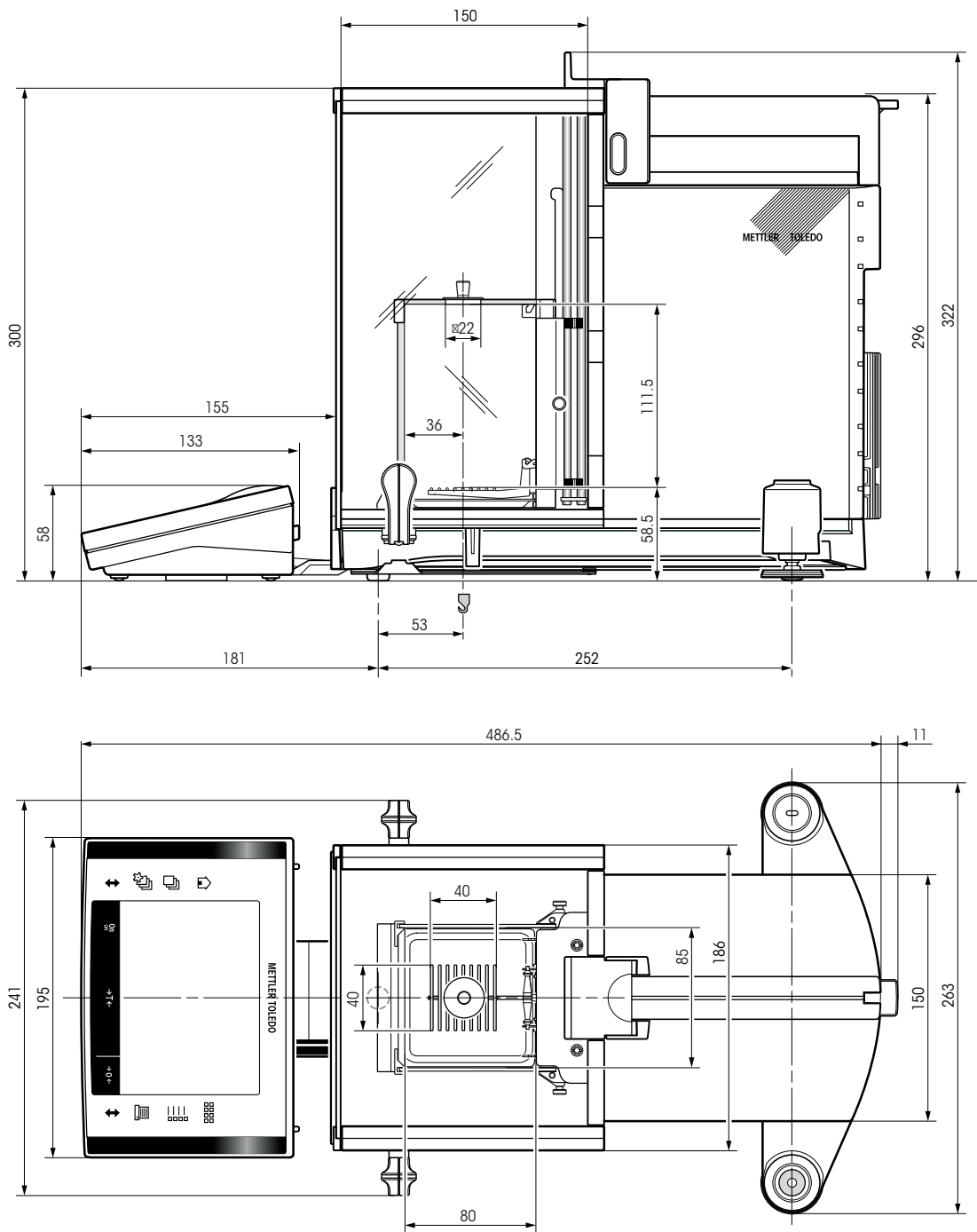
7.5 Interfaces

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:	Inputs:
	+5 V … +15 V (RL = 3 – 7 kΩ)	+3 V … 25 V
	−5 V … −15 V (RL = 3 – 7 kΩ)	−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
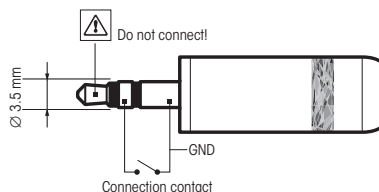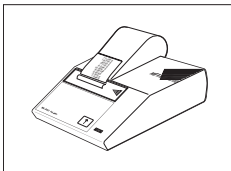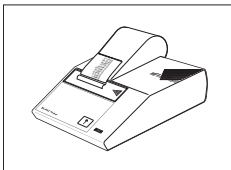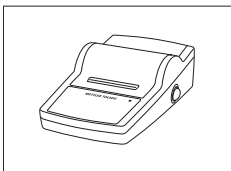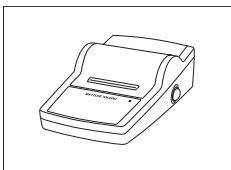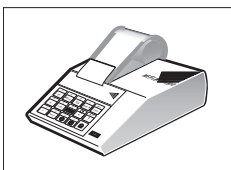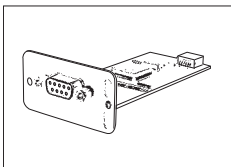
8 Accessories and Spare Parts

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
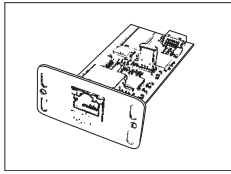
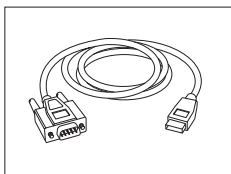|		
	Ethernet Interface for connection to an Ethernet network	11132515
	BT option: Bluetooth Interface for multipoint connection for up to 6 Bluetooth devices	11132530
	BTS option: Bluetooth Interface, single-point connection	11132535
	PS/2 option: Interface for connecting commercial keyboards and barcode 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
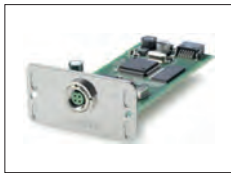
Cables for RS232C interface
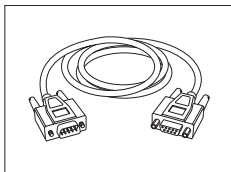
	RS9 – RS9 (m/f): connection cable for PC, length = 1 m	11101051
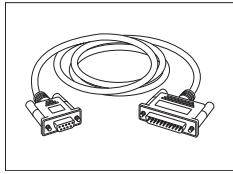
| | RS9 − RS25 (m/f): connection cable for PC, length = 2 m | 11101052 |

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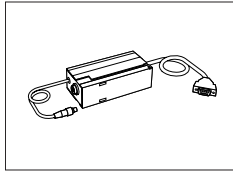
| | LC − RS9: Cable for connecting a PC with RS232C, 9-pin (f), lenght = 2 m | 00229065 |

| | 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 |
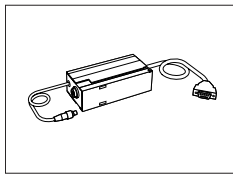
Cables for MiniMettler interface
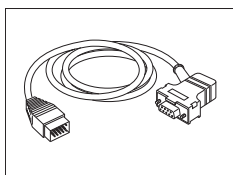
| | MM − RS9f: RS232C connection cable to MiniMettler interface, length = 1.5 m | 00229029 |

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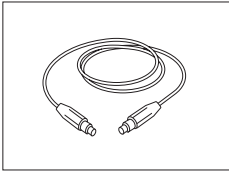
| | Terminal extension cable, length = 4.5 m | 11600517 |

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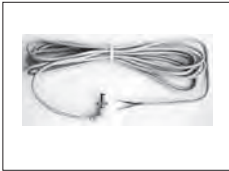
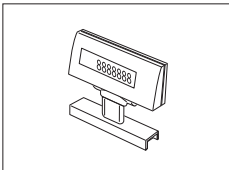| | Cable between balance and AC adapter, length = 4 m | 11132037 |

Auxiliary displays
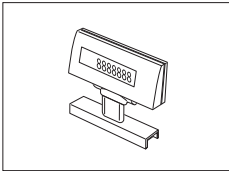
| | BT-BLD Bluetooth auxiliary display for table mounting, 168 mm, LCD display with backlighting | 11132555 |

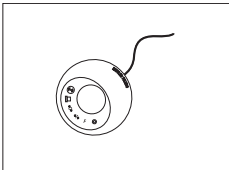| | LC/RS-BLD auxiliary display on bench stand, backlit (incl. RS cable and separate AC adapter) | 00224200 |

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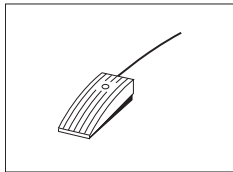
	Footswitch with selectable function for balances (Aux 1, Aux 2)	11106741
	LC-FS foot switch with selectable function for balances with LocalCAN interface	00229060

AntiStatic kit integrable point-electrode

	Integrable antistatic kit incl. 1 point-electrode and power supply	11107761
	Optional: Second point-electrode*	11107762
	Optional: U-electrode*	11107764
	* Regulated power supply for optional, second point-electrode 11107762, or the optional U-electrode 11107764	11107763

Universal AntiStatic kit

	Universal antistatic kit complete U-shaped, including electrode and power supply	11107767
	Optional: Second U-electrode*	11107764
	Optional: Point-electrode*	11107765
	* Power supply for optional, second U-elektrode 11107764, or for optional point-electrode 11107765	11107766

ErgoClips

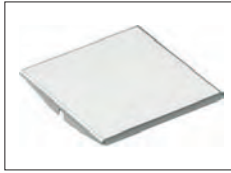|		
	ErgoClip "Basket micro" (basket for small weighing objects)	11107889
	ErgoClip "Flask micro" (for volumetric flask)	11107879
	ErgoClip "Stand micro" (Holder to store up to 3 ErgoClips)	11140175

	ErgoClip "Solution Kit micro"	11140253
	SmardGrid Cover, chromium-nickel steel	11106262
	Single-use weighing boats, 500 units, 41 x 56 x 8 mm	11106712
	MinWeigh Door micro ideal for use with ErgoClip "Flask micro"	11107869

XP-SE kit

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

Pipette calibration

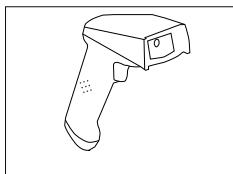|		
	Evaporation Trap micro	11140041
	1-channel suction pump complete	11138268
	Hose 2 m for suction pump	11138132
	Reagent reservoirs, 5 pcs.	11600616
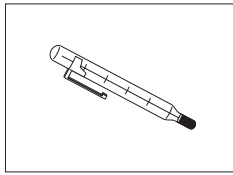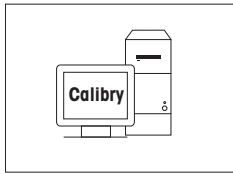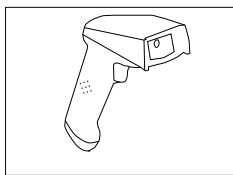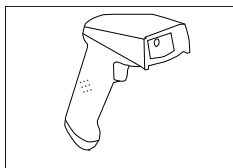
Barometer	11600086

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

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
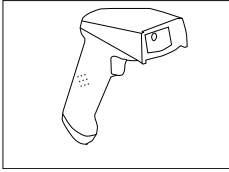
PS/2Y Barcode Reader, without cable   21901297

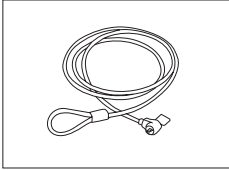PS/2 wedge twin (Y) cable   21901308

Anti-theft devices

Steel cable   11600361

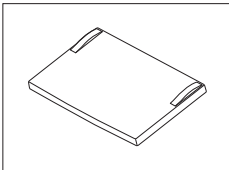### Transport cases

Transport case   11106729

Protective covers

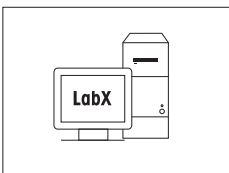Protective cover for XP terminal   11132570

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.
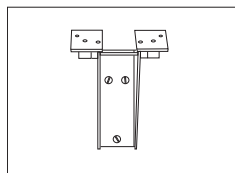Visit www.mt.com/one-click-weighing for more information
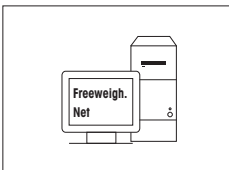
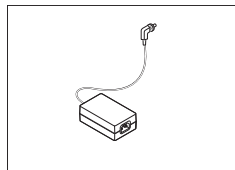Freeweigh.Net   21900895

Various

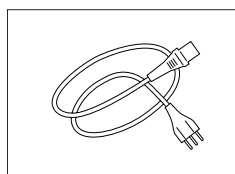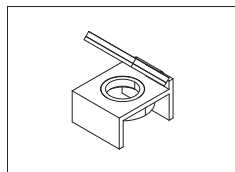|	Terminal and printer stand, mounting on balance	11106730
	Wall fixture for terminal	11132665
	AC/DC adapter (without power cable) 100–240 VAC, 50/60 Hz, 0.3 A, 12 VDC 2.25 A	11107909

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
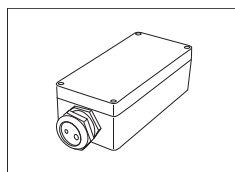
	IP54 protective housing for AC adapter	11132550
	Level bubble mirror	11140150
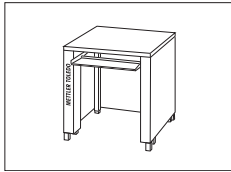
	Weighing table	11138042

8.2 Spare parts

	Pos	Description	Part No.
	1	Front glass outer draft shield (IR protection)	11107994
	2	Side outer draft shield door	11106841
	3	Top outer draft shield door	11106842
	4	Intermediate shelf	11106803
	5	Clip	11106511
	6	Foot screw	11106323
	7	Terminal support	11106540
	8	Drip tray	11106687
	9	Grid weighing pan	11106403
	10	Grid weighing pan cover	11106262
	11	Front glass inner draft shield	11107996
	12	Side glass inner draft shield	11107995
	13	Sealing cover inner draft shield	11106690
	14	Glass cover inner draft shield	11106689
	15	XP Terminal complete with firmware	11130692
		Packaging complete	11107998

	Pos	Description	Part No.
		Export box	11106657

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

▶ http://www.mt.com/micro

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 (0z, 0zt 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.

10 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 0 8 4 1