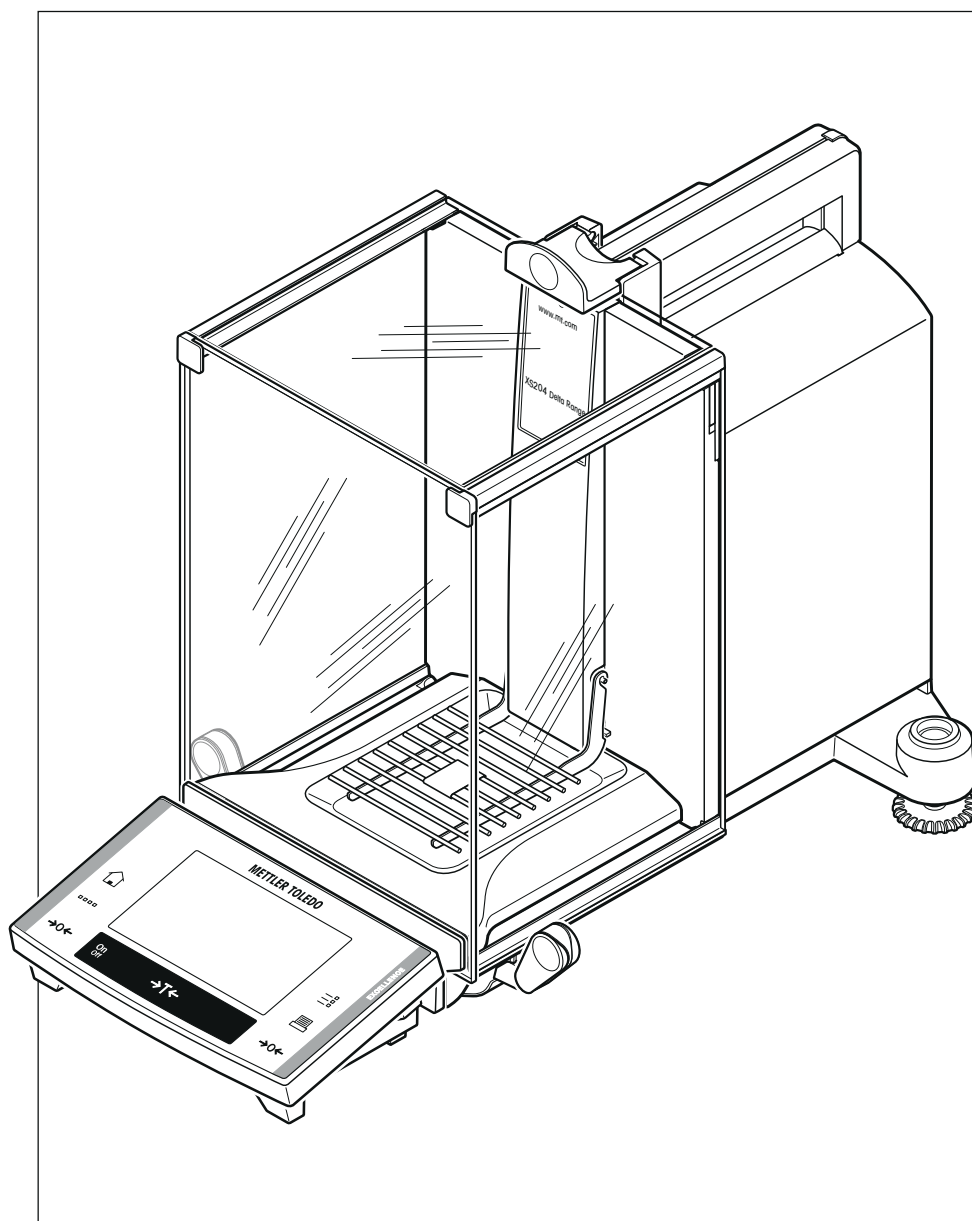


## Excellence Analytical Balances

### XS Models – Part 1



**METTLER TOLEDO**



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# 1 Introduction

Thank you for choosing a METTLER TOLEDO balance.

The balances of the XS 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 XS 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 XS lines:

- Fully automatic adjustment "FACT" using internal weight.
- Built-in applications for normal weighing, statistics, formulation, density, percent weighing, piece counting and LabX Client.
- Integral RS232C interface.
- Slot for second interface (optional).
- Touch-sensitive graphics terminal ("Touch screen") for easy, convenient operation.

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 (Good Laboratory Practice)**. 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 XS 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
- 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](http://www.mt.com/excellence)

#### **Firmware version**

The operating instructions are based on the initially installed terminal firmware (software) version V 1.02.

## **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

|                  |                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>WARNING</b>   | for a hazardous situation with medium risk, possibly resulting in severe injuries or death if not avoided.                                                |
| <b>CAUTION</b>   | 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. |
| <b>Attention</b> | (no symbol)<br>for important information about the product.                                                                                               |
| <b>Note</b>      | (no symbol)<br>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.

---



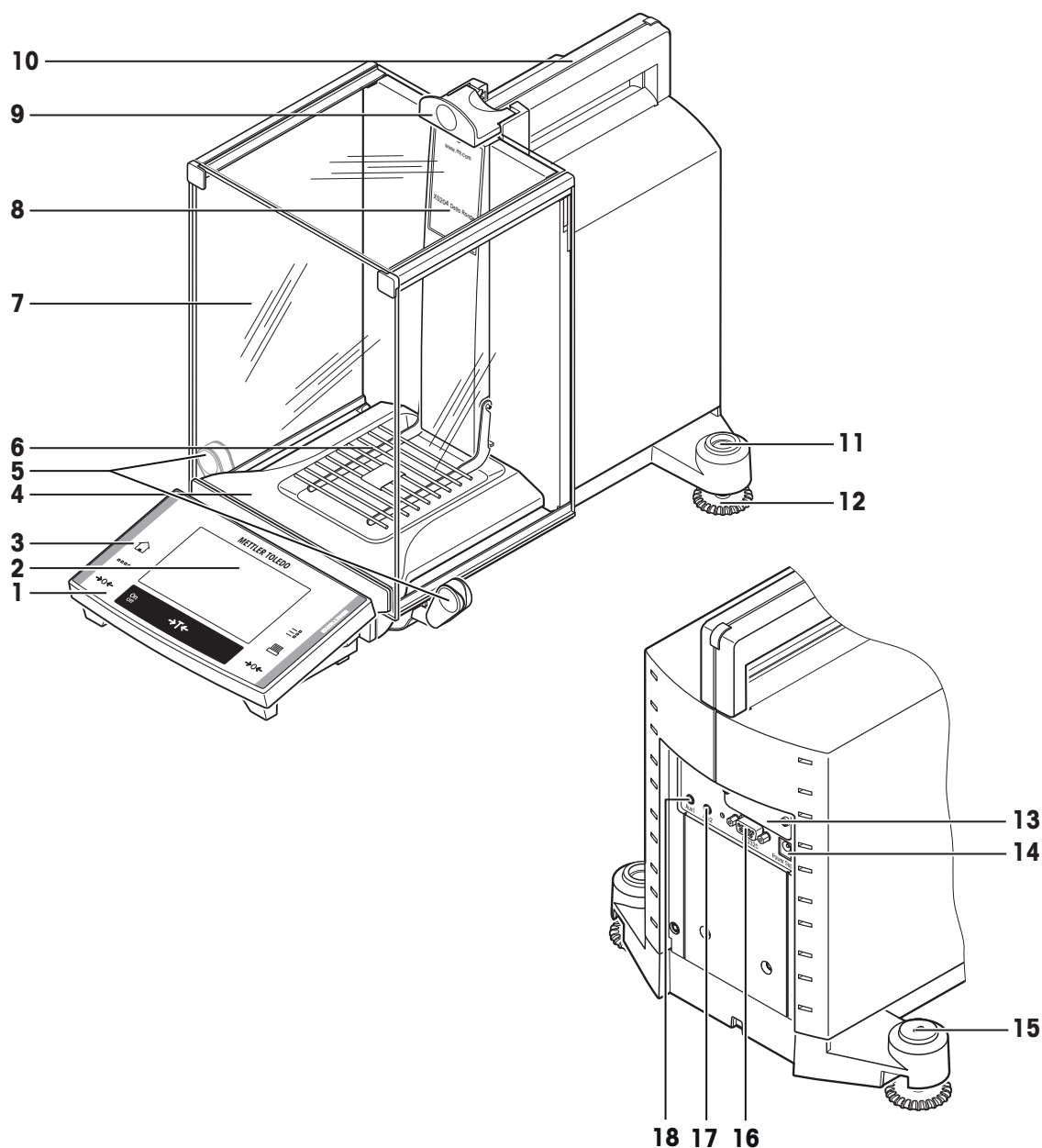
#### CAUTION

##### **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 XS Analytical Balance



Overview

|           |                                                               |           |                                                             |
|-----------|---------------------------------------------------------------|-----------|-------------------------------------------------------------|
| <b>1</b>  | Terminal (details <b>see</b> Operating Instructions – Part 2) | <b>2</b>  | Display (Touch-sensitive "Touch screen")                    |
| <b>3</b>  | Operating keys                                                | <b>4</b>  | Drip tray                                                   |
| <b>5</b>  | Handle for variable operation of the draft-shield side doors  | <b>6</b>  | SmartGrid weighing pan                                      |
| <b>7</b>  | Glass draft shield                                            | <b>8</b>  | Type name                                                   |
| <b>9</b>  | Handle for operation of the draft-shield top door             | <b>10</b> | Guide for top door of draft shield and handle for transport |
| <b>11</b> | Level indicator                                               | <b>12</b> | Foot screw                                                  |
| <b>13</b> | Slot for second interface (optional)                          | <b>14</b> | Socket for AC adapter                                       |
| <b>15</b> | Fastening point for anti-theft device                         | <b>16</b> | RS232C serial interface                                     |
| <b>17</b> | Aux 2 (connection for "ErgoSens", hand- or foot-switch)       | <b>18</b> | 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

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

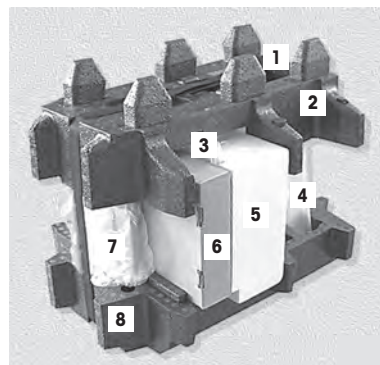
#### Overview

- 1 Lifting strap
- 2 Top packing cushion
- 3 Operating Instructions and other important documents
- 4 Balance
- 5 Set with draft-shield doors 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

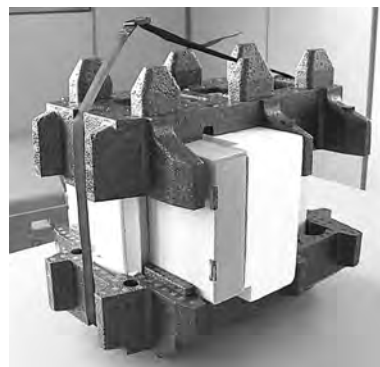
#### Note

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).



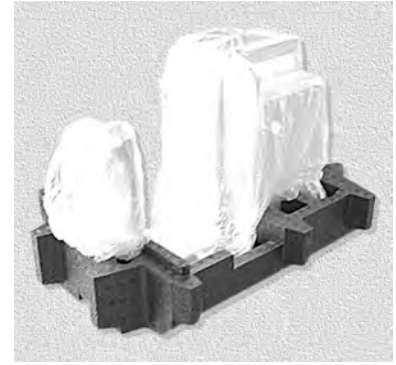
- 1 Pull out Operating Instructions (3).
- 2 Remove set with AC adapter etc. (4).
- 3 Remove set with draft-shield doors etc. (5).



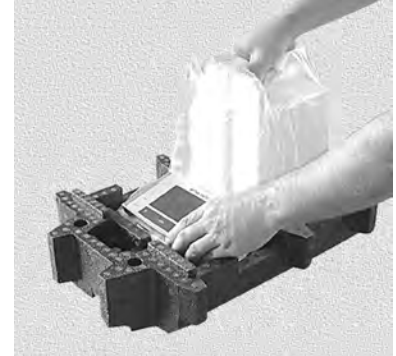
- Carefully pull the terminal out of the bottom packing cushion and remove the protective cover.

**Note**

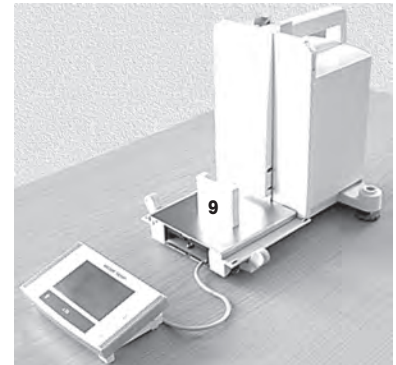
The terminal is connected to the balance by a cable, so only pull the terminal just far enough out of the packing cushion to remove the protective cover.



- 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 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 Selecting a location and leveling the balance

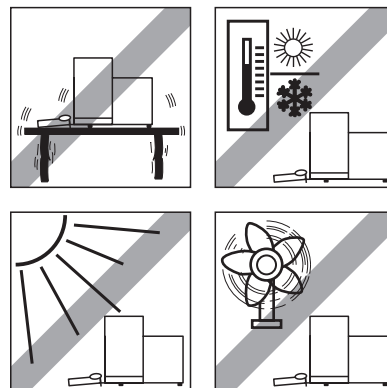
### 4.3.1 Location

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.

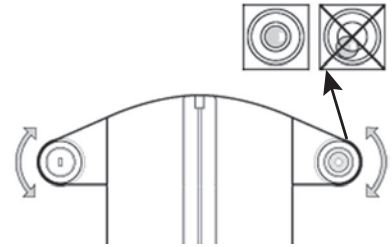


Further information can be found in Weighing the Right Way.

### 4.3.2 Leveling the balance

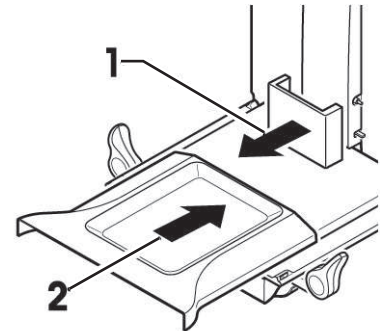
The balances have a level indicator and two adjustable leveling feet to compensate for slight irregularities in the surface of the weighing bench.

- The balance is exactly horizontal when the air bubble is in the middle of the level glass.
- 1 Adjust the two leveling feet appropriately until the air bubble comes to rest exactly in the middle of the glass:
  - Air bubble at "12 o'clock" turn both feet counterclockwise.
  - Air bubble at "3 o'clock" turn left foot clockwise, right foot counterclockwise.
  - Air bubble at "6 o'clock" turn both feet clockwise.
  - Air bubble at "9 o'clock" turn left foot counterclockwise, right foot clockwise.
- 2 The balance must be leveled and adjusted each time it is moved to a new location.

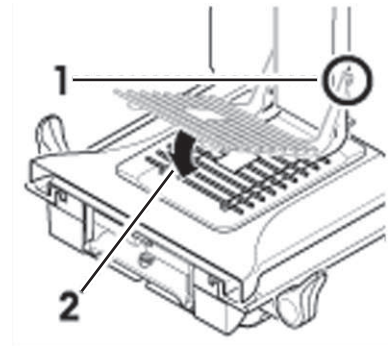


#### 4.4 Assembling the balance

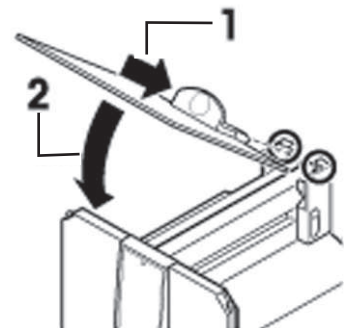
- 1 Remove the transport protection (1).
  - 2 Insert the drip tray (2).
- ⇒ Push the tray in from the front over the bottom plate as far as the partition.



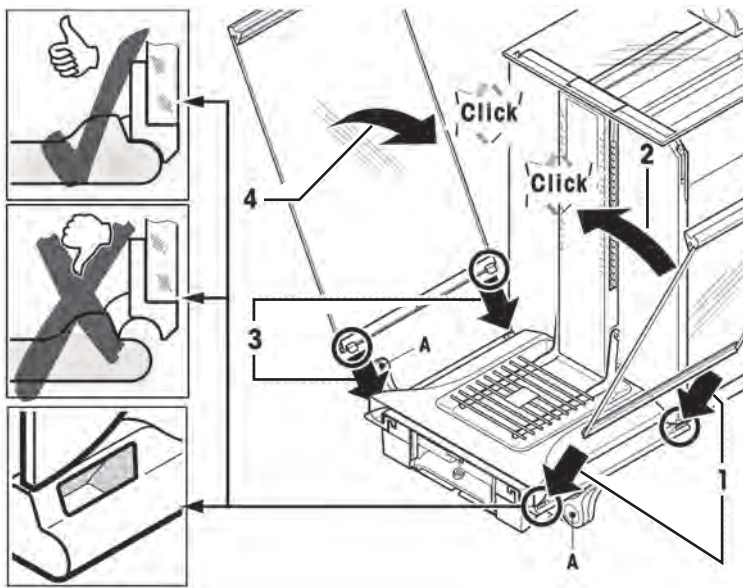
- Insert the SmartGrid from the front.
- ⇒ Check that the SmartGrid (1) (2) is correctly hooked in at both sides.



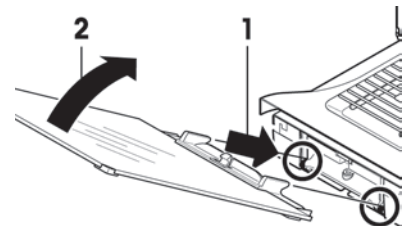
- 1 Insert the top door of the draft shield (1) at an angle (slightly less than 30 degrees) into the guide positioned at the **back**.
- 2 Swivel the draft-shield door (2) carefully down, **see** figure.



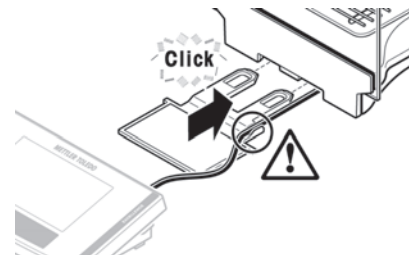
- The handles (A) must be turned toward the outside to allow installation of the side draft shield doors!
- 1 Insert the side doors of the draft shield according to the following instructions, **see** figure below.
  - 2 Insert the side door at an angle of approx. 30° into the 2 openings, **see** figure.
  - 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.



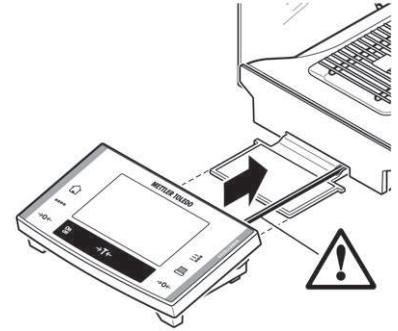
- 1 Insert the front glass (2) of the draft shield.
- 2 In the bottom part of the balance at the front, move at an angle from the top toward the bottom until the two hooks of the front glass of the draft shield lie on the rollers (1).
- 3 Swivel the front glass of the draft shield up until it engages.



- 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 17).

**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 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.

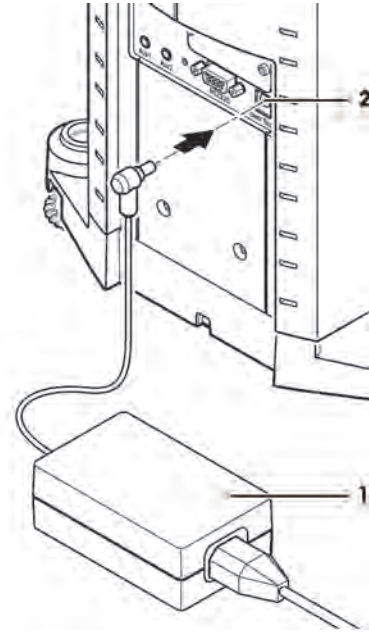
**Attention**

- 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.

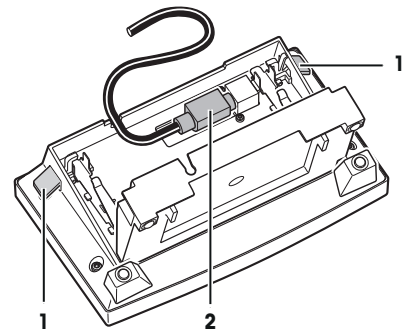
- 1 Connect the AC adapter (1) to the connection socket (2) at the rear of the balance.
  - 2 Connect the AC adapter (1) to the power supply.
- ⇒ The balance performs a self-test after connection to the power supply and is then ready to use.



#### 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 (1) on the back of the terminal and open the upper part of the terminal.
- 4 Check that the plug for the terminal cable (2) is connected correctly inside the terminal.

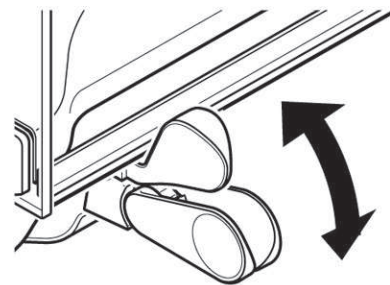


## 4.6 Left/right operating of the glass draft shield

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 position of the handles determines which door(s) of the draft shield (left, right, or both) is/are opened.

Try various different combinations by moving the external handles into the upper or lower position. 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.



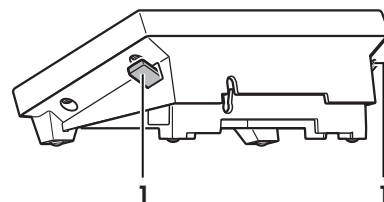


## 4.7 Setting the reading angle and positioning the terminal

### 4.7.1 Optimise the readability of the terminal

#### Changing the reading angle

- 1 For a steeper reading angle, pull both levers (1) at the side upward.  
⇒ You can then pull the upper part of the terminal slowly upward until it engages in the desired position. A total of 3 setting positions are available.
- 2 Move it in an appropriate position.
- 3 For a flatter reading angle, pull both levers (1) at the side upward, and press the lower part of the terminal downward.
- 4 Release both levers and the upper part of the terminal then engages in the desired position.



### 4.7.2 Remove terminal and place close to the balance

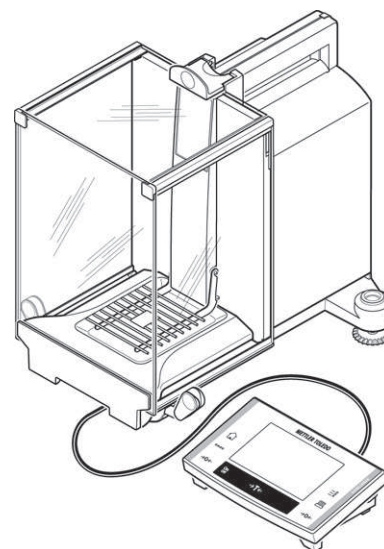
The terminal is connected to the balance by a cable. So you can arrange your workplace optimally, the terminal can be removed from the balance and placed separately.

#### 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.

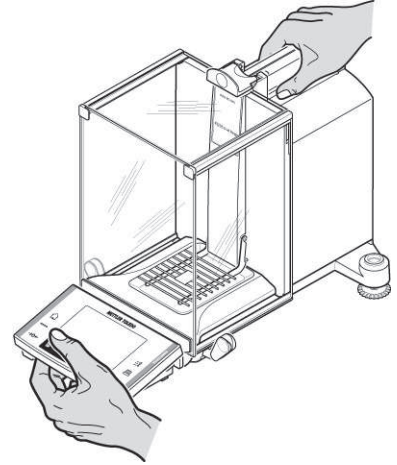


## CAUTION

### Damage of device

Never lift the balance by the glass draft shield, 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 12).

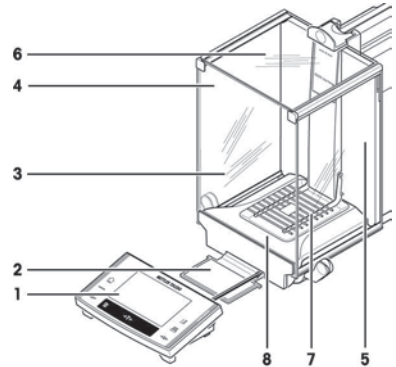


## 4.8.2 Transporting over long distances

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 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 of the top door (6) of the draft shield up and pull the door out of the guide.
- 6 Carefully raise the front of the SmartGrid (7) and lift it out of the guide.
- 7 Pull the drip tray (8) toward the front and out.

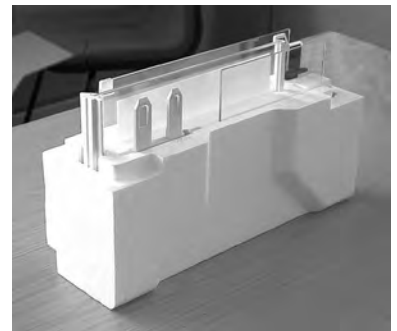


### Pack the draft shield, the intermediate shelf and the terminal support (Pos. 2-6)

- 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 (steps 7+8)

- 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.

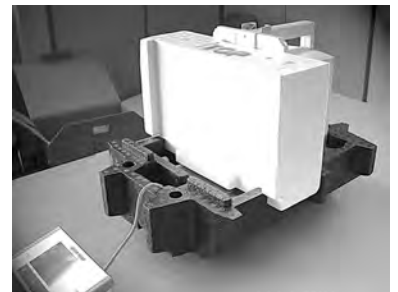
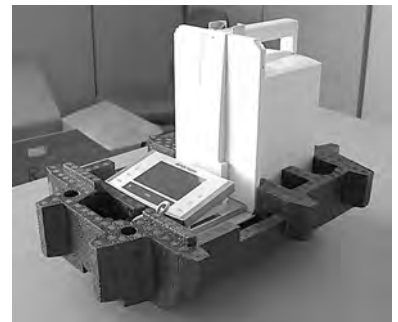
- 1 Push the transport protection over the weighing pan guide.
- 2 Push the guide of the top draft-shield door completely to the front.
- 3 Swivel the handle of the side door of the draft shield upward, and also push this door completely to the front.



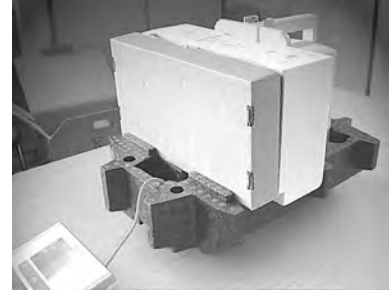
#### Note

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.

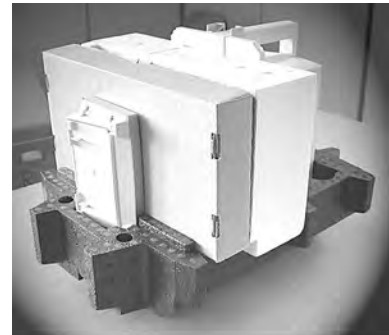
- 1 Place the terminal on the balance (see illustration) and carefully insert the balance into the bottom packing cushion.
  - 2 Take the terminal and place it in front of the packing cushion on the table.
- Insert the packing set with the draft-shield glasses into the packing cushion, **see** illustration.



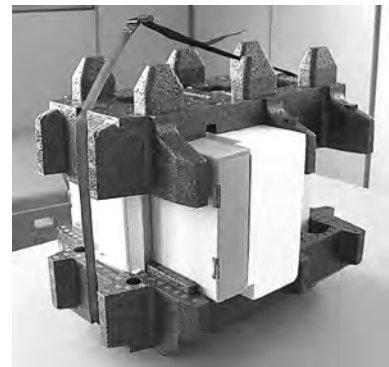
- Place the set with the AC adapter in front of the set with the draft-shield glasses.



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



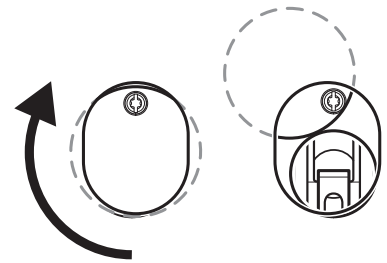
- 1 Now put the top packing cushion in place.  
⇒ Taking care to position it correctly.
- 2 Pass the lifting strap around both packing cushions, **see** illustration.
- 3 Tighten it until it lies close against the packaging.  
⇒ You can now lift the packed balance by the lifting strap and insert it into the transport carton.



## 4.9 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 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.



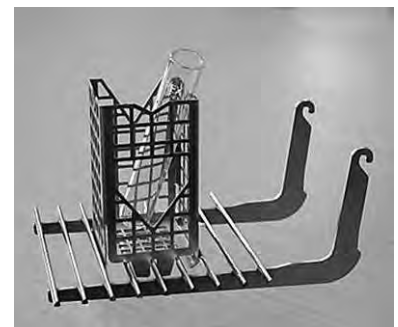
## 4.10 Installing the ErgoClip

### 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 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 directly, **see** Accessories (page 31).
- 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 FACT 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 FACT, so as not to interrupt the **assumed** weighing operation.

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



## 4.11 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

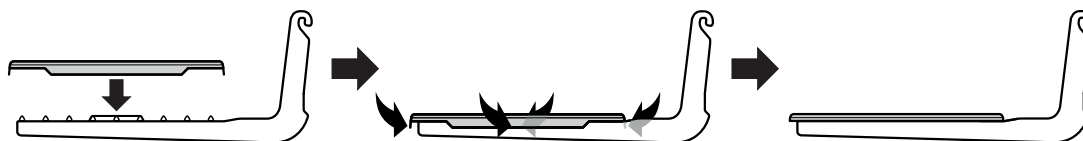
#### Hand injuries

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.

## 4.12 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

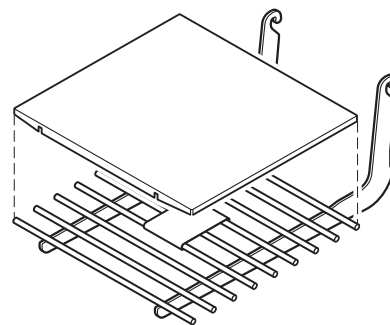
Take care when handling the weighing pan, the corners and edges are extremely sharp!

- 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 Maintenance

### 5.1 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 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.

### 5.2 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.



## 6 Technical Data

### 6.1 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<br>Secondary: 12 V DC $\pm 3\%$ , 2.5 A (with electronic overload protection) |
| Cable for AC adapter: | 3-core, with country-specific plug                                                                                         |
| Balance power supply: | 12 V DC $\pm 3\%$ , 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 <b>120</b> minutes after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately |

#### Materials

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

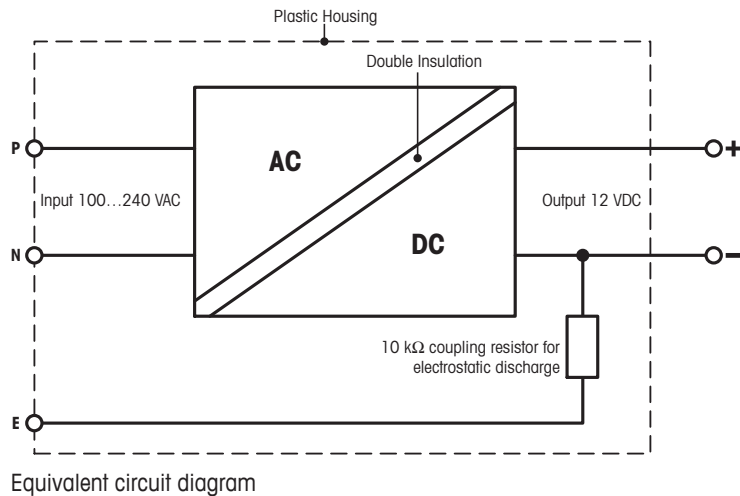
### 6.2 Explanatory notes for the METTLER TOLEDO AC adapter

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 k $\Omega$ , 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.



### 6.3 Model-specific data

|                                                     |    | XS64                       | XS104                     | XS204DR                   |
|-----------------------------------------------------|----|----------------------------|---------------------------|---------------------------|
| <b>Limit values</b>                                 |    |                            |                           |                           |
| Maximum capacity                                    |    | 61 g                       | 120 g                     | 220 g                     |
| Readability                                         |    | 0.1 mg                     | 0.1 mg                    | 1 mg                      |
| Tare range (from...to)                              |    | 0 ... 61 g                 | 0 ... 120 g               | 0 ... 220 g               |
| Maximum capacity, fine range                        |    | –                          | –                         | 81 g                      |
| Readability, fine range                             |    | –                          | –                         | 0.1 mg                    |
| Repeatability (at nominal load)                     | sd | 0.1 mg (60 g)              | 0.1 mg (100 g)            | 0.7 mg (200 g)            |
| Repeatability (at low load)                         | sd | 0.07 mg (10 g)             | 0.07 mg (10 g)            | 0.5 mg (10 g)             |
| Repeatability, fine range (at low load)             | sd | –                          | –                         | 0.1 mg (10 g)             |
| Linearity deviation                                 |    | 0.2 mg                     | 0.2 mg                    | 1 mg                      |
| Eccentricity deviation (test load) <sup>1)</sup>    |    | 0.15 mg (20 g)             | 0.3 mg (50 g)             | 0.3 mg (100 g)            |
| Sensitivity offset (test weight)                    |    | 0.9 mg (60 g)              | 1 mg (100 g)              | 1 mg (200 g)              |
| Sensitivity temperature drift <sup>2)</sup>         |    | 0.00015%/°C                | 0.00015%/°C               | 0.00015%/°C               |
| Sensitivity stability <sup>3)</sup>                 |    | 0.0002%/a                  | 0.0002%/a                 | 0.0002%/a                 |
| <b>Typical values</b>                               |    |                            |                           |                           |
| Repeatability (at low load)                         | sd | 0.04 mg                    | 0.04 mg                   | 0.4 mg                    |
| Repeatability, fine range                           | sd | –                          | –                         | 0.04 mg                   |
| Linearity deviation                                 |    | 0.1 mg                     | 0.13 mg                   | 0.3 mg                    |
| Eccentric deviation (test load) <sup>1)</sup>       |    | 0.06 mg (20 g)             | 0.15 mg (50 g)            | 0.16 mg (100 g)           |
| Sensitivity offset (test weight)                    |    | 1.2 mg (60 g)              | 0.6 mg (100 g)            | 0.8 mg (200 g)            |
| Minimum weight (according to USP)                   |    | 80 mg                      | 80 mg                     | 800 mg                    |
| Minimum weight (according to USP), fine range       |    | –                          | –                         | 80 mg                     |
| 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                     |
| <b>Dimensions</b>                                   |    |                            |                           |                           |
| Balance dimensions (W × D × H)                      |    | 263 × 453 × 322 mm         | 263 × 453 × 322 mm        | 263 × 453 × 322 mm        |
| Weighing pan dimensions                             |    | 78 × 73 mm (W × D)         | 78 × 73 mm (W × D)        | 78 × 73 mm (W × D)        |
| <b>Typical uncertainties and supplementary data</b> |    |                            |                           |                           |
| Repeatability                                       | sd | 0.04 mg<br>+ 0.000015%·Rgr | 0.04 mg<br>+ 0.00002%·Rgr | 0.4 mg + 0.00005%·Rgr     |
| Repeatability, fine range                           | sd | –                          | –                         | 0.04 mg<br>+ 0.00002%·Rgr |
| Differential linearity deviation                    | sd | √(40pg·Rnt)                | √(40pg·Rnt)               | √(120pg·Rnt)              |
| Differential eccentric load deviation               | sd | 0.00015%·Rnt               | 0.00015%·Rnt              | 0.00008%·Rnt              |
| Sensitivity offset                                  | sd | 0.001%·Rnt                 | 0.0003%·Rnt               | 0.0002%·Rnt               |
| Minimum weight (according to USP)                   |    | 80 mg + 0.03%·Rgr          | 80 mg + 0.04%·Rgr         | 800 mg + 0.1%·Rgr         |

|                                               | XS64              | XS104             | XS204DR           |
|-----------------------------------------------|-------------------|-------------------|-------------------|
| Minimum weight (according to USP), fine range | –                 | –                 | 80 mg + 0.04%·Rgr |
| Minimum weight (U=1%, k=2)                    | 8 mg + 0.003%·Rgr | 8 mg + 0.004%·Rgr | 80 mg + 0.01%·Rgr |
| Minimum weight (U=1%, k=2), fine range        | –                 | –                 | 8 mg + 0.004%·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                             | 9.1 kg            | 9.1 kg            | 9.1 kg            |
| Number of built-in reference weights          | 2                 | 2                 | 2                 |
| <b>Weights for routine testing</b>            |                   |                   |                   |
| OIML CarePac                                  | 50 g F2, 2 g E2   | 100 g F2, 5 g E2  | 200 g F2, 10 g F1 |
| Weights                                       | #11123003         | #11123002         | #11123001         |
| ASTM CarePac                                  | 50 g 1, 2 g 1     | 100 g 1, 5 g 1    | 200 g 1, 10 g 1   |
| Weights                                       | #11123103         | #11123102         | #11123101         |

sd = Standard deviation

Rnt = Net weight (sample weight)

Rgr = Gross weight

a = Year (annum)

<sup>1)</sup> In the temperature range 10...30 °C

|                                                     | XS204                                      | XS105DU                                 | XS205DU                                 |
|-----------------------------------------------------|--------------------------------------------|-----------------------------------------|-----------------------------------------|
| <b>Limit values</b>                                 |                                            |                                         |                                         |
| Maximum capacity                                    | 220 g                                      | 120 g                                   | 220 g                                   |
| Readability                                         | 0.1 mg                                     | 0.1 mg                                  | 0.1 mg                                  |
| Tare range (from...to)                              | 0 ... 220 g                                | 0 ... 120 g                             | 0 ... 220 g                             |
| Maximum capacity, fine range                        | –                                          | 41 g                                    | 81 g                                    |
| Readability, fine range                             | –                                          | 0.01 mg                                 | 0.01 mg                                 |
| Repeatability (at nominal load)                     | sd 0.1 mg (200 g)                          | 0.1 mg (100 g)                          | 0.1 mg (200 g)                          |
| Repeatability (at low load)                         | sd 0.07 mg (10 g)                          | 0.05 mg (10 g)                          | 0.05 mg (10 g)                          |
| Repeatability, fine range (at low load)             | sd –                                       | 0.02 mg (10 g)                          | 0.02 mg (10 g)                          |
| Linearity deviation                                 | 0.2 mg                                     | 0.2 mg                                  | 0.2 mg                                  |
| Eccentricity deviation (test load) <sup>1)</sup>    | 0.3 mg (100 g)                             | 0.3 mg (50 g)                           | 0.3 mg (100 g)                          |
| Sensitivity offset (test weight)                    | 1 mg (200 g)                               | 0.8 mg (100 g)                          | 0.8 mg (200 g)                          |
| Sensitivity temperature drift <sup>2)</sup>         | 0.00015%/°C                                | 0.00015%/°C                             | 0.00015%/°C                             |
| Sensitivity stability <sup>3)</sup>                 | 0.0002%/a                                  | 0.0002%/a                               | 0.0002%/a                               |
| <b>Typical values</b>                               |                                            |                                         |                                         |
| Repeatability (at low load)                         | sd 0.04 mg                                 | 0.04 mg                                 | 0.04 mg                                 |
| Repeatability, fine range                           | sd –                                       | 0.01 mg                                 | 0.01 mg                                 |
| Linearity deviation                                 | 0.13 mg                                    | 0.13 mg                                 | 0.13 mg                                 |
| Eccentric deviation (test load) <sup>1)</sup>       | 0.16 mg (100 g)                            | 0.15 mg (50 g)                          | 0.16 mg (100 g)                         |
| Sensitivity offset (test weight)                    | 0.8 mg (200 g)                             | 0.4 mg (100 g)                          | 0.6 mg (200 g)                          |
| Minimum weight (according to USP)                   | 80 mg                                      | 80 mg                                   | 80 mg                                   |
| Minimum weight (according to USP), fine range       | –                                          | 20 mg                                   | 20 mg                                   |
| Minimum weight (U=1%, k=2)                          | 8 mg                                       | 8 mg                                    | 8 mg                                    |
| Minimum weight (U=1%, k=2), fine range              | –                                          | 2 mg                                    | 2 mg                                    |
| Settling time                                       | 1.5 s                                      | 1.5 s                                   | 1.5 s                                   |
| Settling time, fine range                           | –                                          | 3 s                                     | 3 s                                     |
| <b>Dimensions</b>                                   |                                            |                                         |                                         |
| Balance dimensions (W × D × H)                      | 263 × 453 × 322 mm                         | 263 × 453 × 322 mm                      | 263 × 453 × 322 mm                      |
| Weighing pan dimensions                             | 78 × 73 mm (W × D)                         | 78 × 73 mm (W × D)                      | 78 × 73 mm (W × D)                      |
| <b>Typical uncertainties and supplementary data</b> |                                            |                                         |                                         |
| Repeatability                                       | sd 0.04 mg + 0.000015%·Rgr                 | 0.04 mg + 0.00002%·Rgr                  | 0.04 mg + 0.00002%·Rgr                  |
| Repeatability, fine range                           | sd –                                       | 0.01 mg + 0.00004%·Rgr                  | 0.01 mg + 0.00003%·Rgr                  |
| Differential linearity deviation                    | sd $\sqrt{(20\text{pg} \cdot \text{Rnt})}$ | $\sqrt{(40\text{pg} \cdot \text{Rnt})}$ | $\sqrt{(20\text{pg} \cdot \text{Rnt})}$ |
| Differential eccentric load deviation               | sd 0.00008%·Rnt                            | 0.00015%·Rnt                            | 0.00008%·Rnt                            |

|                                                |         | XS204                                 | XS105DU                               | XS205DU                               |
|------------------------------------------------|---------|---------------------------------------|---------------------------------------|---------------------------------------|
| Sensitivity offset                             | sd      | $0.0002\% \cdot R_{nt}$               | $0.0002\% \cdot R_{nt}$               | $0.00015\% \cdot R_{nt}$              |
| Minimum weight (according to USP)              |         | $80 \text{ mg} + 0.03\% \cdot R_{gr}$ | $80 \text{ mg} + 0.04\% \cdot R_{gr}$ | $80 \text{ mg} + 0.04\% \cdot R_{gr}$ |
| Minimum weight (according to USP), fine range  |         | –                                     | $20 \text{ mg} + 0.08\% \cdot R_{gr}$ | $20 \text{ mg} + 0.06\% \cdot R_{gr}$ |
| Minimum weight ( $U=1\%$ , $k=2$ )             |         | $8 \text{ mg} + 0.003\% \cdot R_{gr}$ | $8 \text{ mg} + 0.004\% \cdot R_{gr}$ | $8 \text{ mg} + 0.004\% \cdot R_{gr}$ |
| Minimum weight ( $U=1\%$ , $k=2$ ), fine range |         | –                                     | $2 \text{ mg} + 0.008\% \cdot R_{gr}$ | $2 \text{ mg} + 0.006\% \cdot R_{gr}$ |
| Weighing time                                  |         | 4 s                                   | 4 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                              |         | 9.1 kg                                | 9.1 kg                                | 9.1 kg                                |
| Number of built-in reference weights           |         | 2                                     | 2                                     | 2                                     |
| <b>Weights for routine testing</b>             |         |                                       |                                       |                                       |
| OIML CarePac                                   |         | 200 g F2, 10 g F1                     | 100 g F2, 5 g E2                      | 200 g F2, 10 g F2                     |
|                                                | Weights | #11123001                             | #11123002                             | #11123001                             |
| ASTM CarePac                                   |         | 200 g 1, 10 g 1                       | 100 g 1, 5 g 1                        | 200 g 1, 10 g 1                       |
|                                                | Weights | #11123101                             | #11123102                             | #11123101                             |

sd = Standard deviation

$R_{nt}$  = Net weight (sample weight)

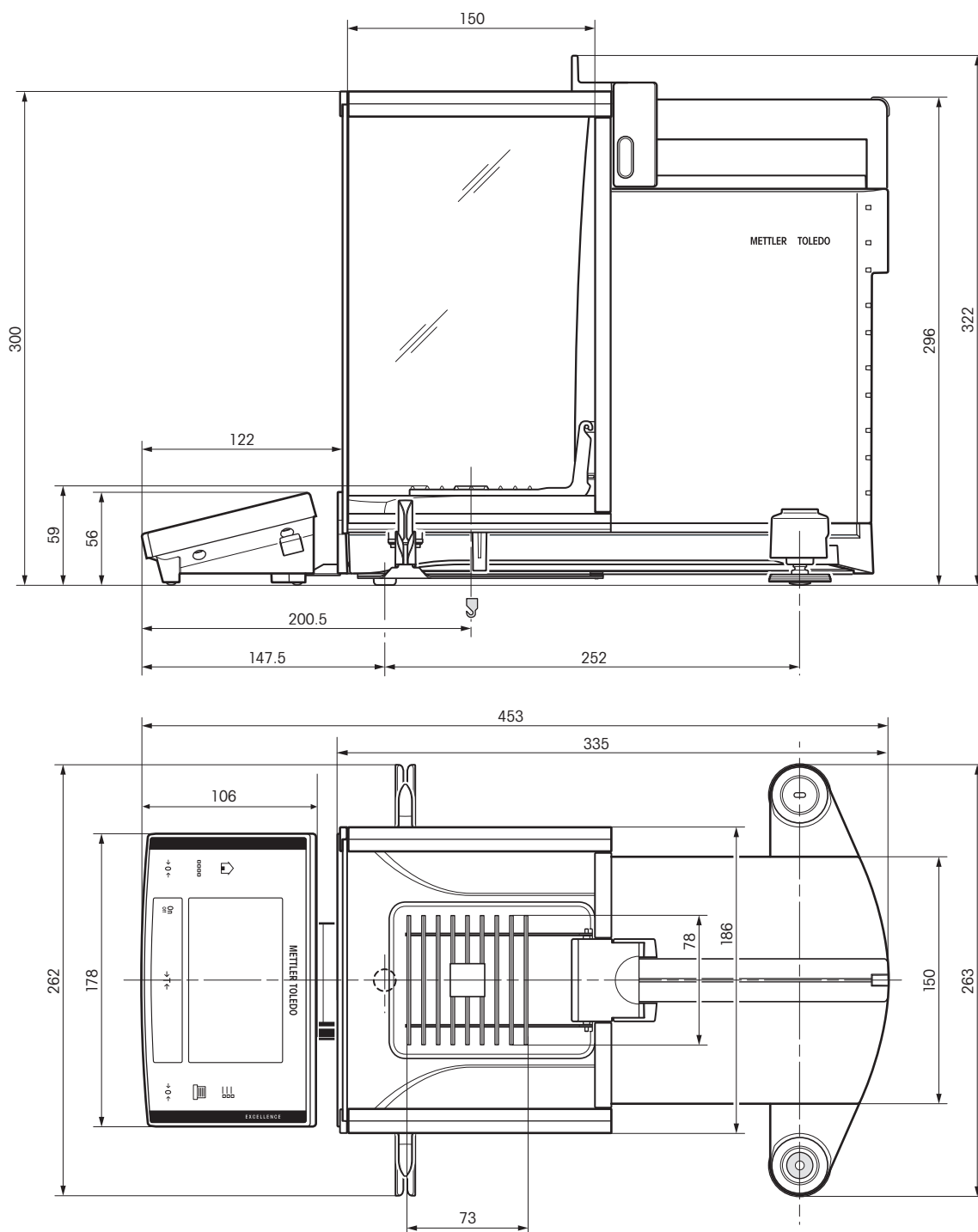
$R_{gr}$  = Gross weight

a = Year (annum)

1) In the temperature range 10...30 °C

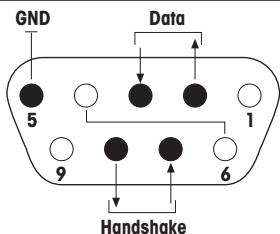
## 6.4 Dimensions

Dimensions in mm.



## 6.5 Interfaces

### 6.5.1 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:<br>+5 V ... +15 V (RL = 3 – 7 kΩ)<br>–5 V ... –15 V (RL = 3 – 7 kΩ)  | Inputs:<br>+3 V ... 25 V<br>–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 <sup>1)</sup> (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)                                    |                                           |
| <div></div> <div>Pin 2: Balance transmit line (TxD)<br/>Pin 3: Balance receive line (RxD)<br/>Pin 5: Ground signal (GND)<br/>Pin 7: Clear to send (hardware handshake) (CTS)<br/>Pin 8: Request to send (hardware handshake) (RTS)</div> |                                                                               |                                           |

<sup>1)</sup> 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.

### 6.5.2 Specifications of "Aux" connection

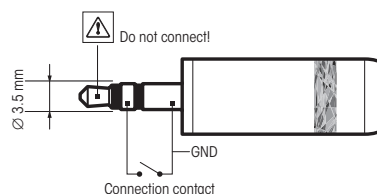
You can connect the METTLER TOLEDO "ErgoSens" or an external switch to sockets "Aux 1" and "Aux 2". This allows you to start functions such as taring, zeroing, printing and others.

#### External connection

Connector: 3.5 mm stereo jack connector

Electrical data: Max. voltage 12 V

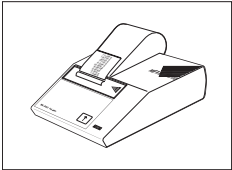
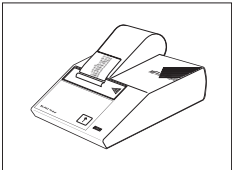
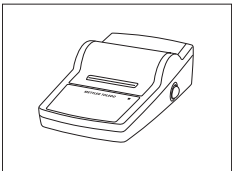
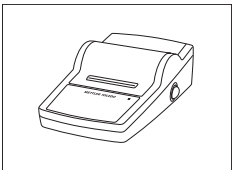
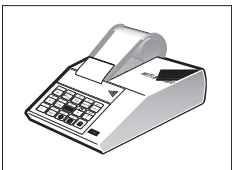
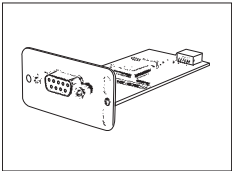
Max. current 150 mA

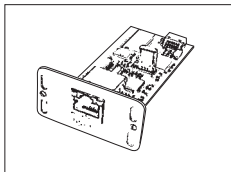


## 7 Accessories and Spare Parts

### 7.1 Accessories

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

|                                                                                     | Description                                                              | Part No. |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------|
| <b>Printers</b>                                                                     |                                                                          |          |
|    | 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 |
| <b>Optional interfaces</b>                                                          |                                                                          |          |
|  | 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



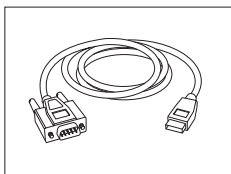
LocalCAN option: Interface for connection of up to 5 LC (LocalCAN) instruments

11132505



MiniMettler option: Interface MiniMettler, for connection to older (legacy) METTLER TOLEDO systems

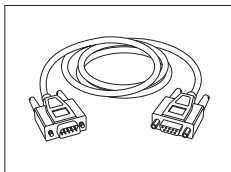
11132510



RS232 - USB converter cable – Cable with converter to connect a balance (RS232) to a USB port

64088427

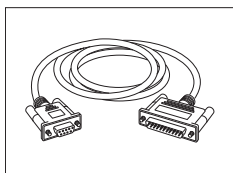
#### Cables for RS232C interface



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

11101051

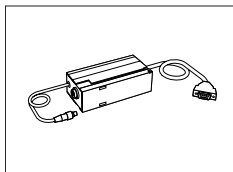




RS9 – RS25 (m/f): connection cable for PC, length = 2 m

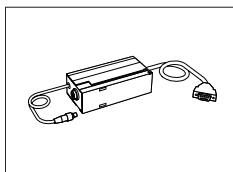
11101052

#### Cables for LocalCAN interface



LC – RS9: Cable for connecting a PC with RS232C, 9-pin (f), length = 2 m

00229065



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

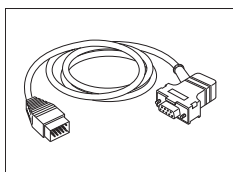
00229116



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

00229118

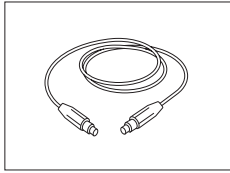
#### Cables for MiniMettler interface



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

00229029

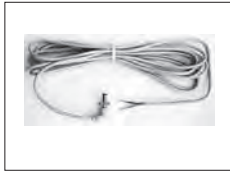
### Cables for terminal



Terminal extension cable, length = 4.5 m

11600517

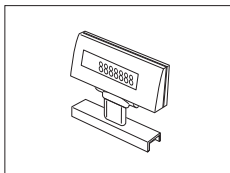
### Cable, one-sided open (2-pin)



Cable between balance and AC adapter, length = 4 m

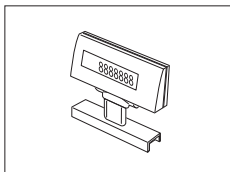
11132037

### 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)

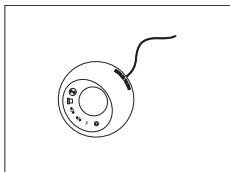
00224200



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

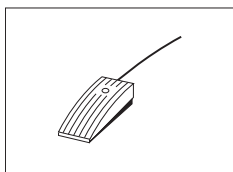
### LC-Switchbox



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

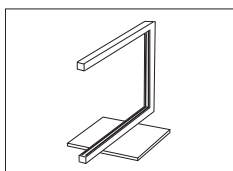
Compact instrument with printer for control of up to 16 articles

00236210

Compact instrument with printer for control of up to 60 articles

00236211

## AntiStatic kit



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-electrode (11107764)

11107766

## ErgoClips

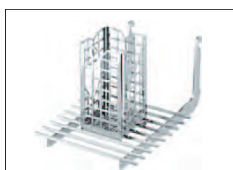
Weighing kit for various weighing containers



ErgoClip Weighing kit

11106707

Delivery: 3 ErgoClips for Round-Bottom Flask, Weighing Boat and Tube, 20 Weighing Boat, 10 Single-use aluminium weighing pans.



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



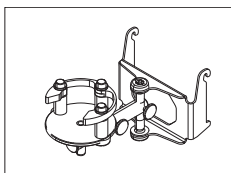
ErgoClip "Flask"

11106764



ErgoClip "Tube"

11106784



ErgoClip for Quantos

11141570



ErgoClip Syringe

30008288



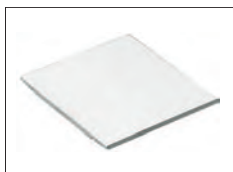
ErgoClip Solution Kit

11140251



Single-use aluminium weighing pans, 10 units

11106711



SmardGrid cover, chromium-nickel steel

11106709



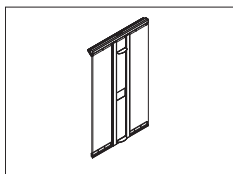
Single-use weighing boats, 500 units, 41 × 56 × 8 mm

11106712



Grey drip tray

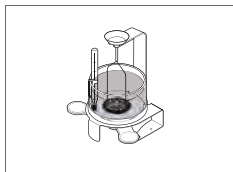
30038741



MinWeigh door

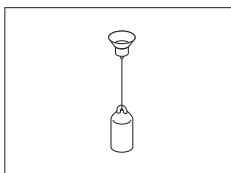
11106749

### Density determination



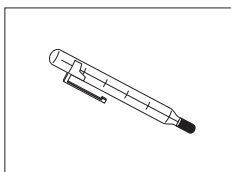
Density kit

11106706



Sinker for density of liquids in conjunction with Density Kit  
 Calibrated (sinker + certificate)  
 Recalibrated (new certificate)

00210260  
 00210672  
 00210674



Calibrated thermometer with certificate

11132685

### Pipette calibration



Evaporation Trap, incl. adapter

11140043



Evaporation Trap large

11138440



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

11138268  
 11138132



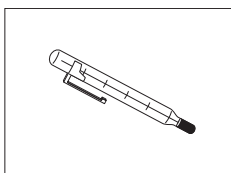
Reagent reservoirs, 5 pcs.

11600616



Barometer

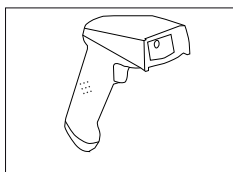
11600086



Precision thermometer with clip, not certified

00238767

## Barcode reader



### RS232C Barcode Reader

21901297

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

RS232 F cable 21901305

Null modem adapter 21900924

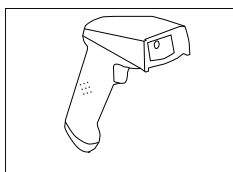
Plus one of the following: AC adapter 5 V for EU 21901370

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

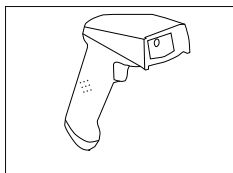
Plus one of the following: AC adapter 12 V for EU 21901373

AC adapter 12 V for US 21901375

AC adapter 12 V for GB 21901374

AC adapter 12 V for AU 21901373

+ 71209966

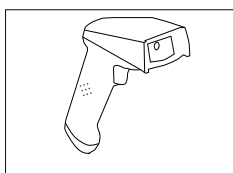


### PS/2 Barcode Reader, without cable

21901297

PS/2 wedge single cable

21901307



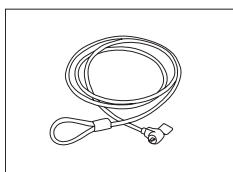
### PS/2Y Barcode Reader, without cable

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 terminal, "S" and "M" platform

11106870

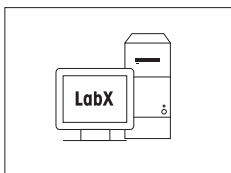
## Dust covers



Dust cover

30035838

## Software

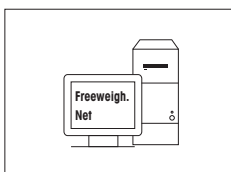


### LabX software for one click™ weighing solutions

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 automatically, 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](http://www.mt.com/one-click-weighing) for more information



Freeweigh.Net

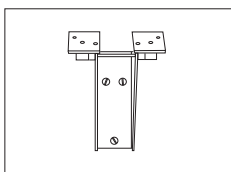
21900895

## Various



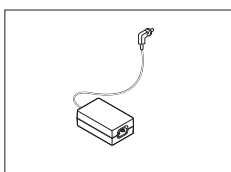
Terminal and printer stand, mounting on balance

11106730



Wall fixture for terminal

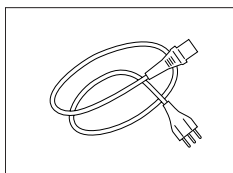
11132665



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

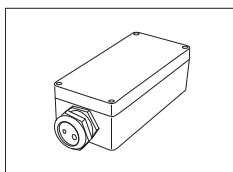
11107909





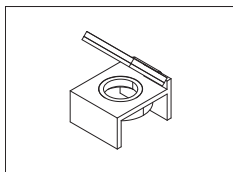
Country-specific 3-Pin power cable with grounding conductor.

|                    |          |
|--------------------|----------|
| 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 |



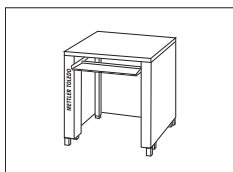
IP54 protective housing for AC adapter

11132550



Level bubble mirror

11140150



Weighing table

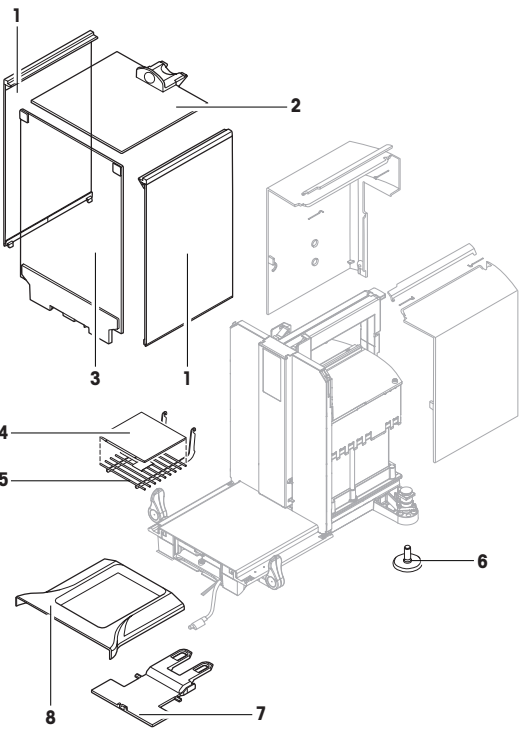
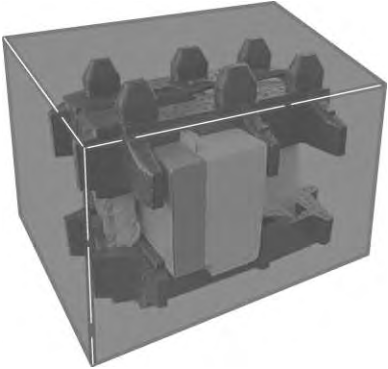
11138042



Production Certificate "PRO"

11106895

## 7.2 Spare parts

|                                                                                     | Pos | Description            | Part No. |
|-------------------------------------------------------------------------------------|-----|------------------------|----------|
|    | 1   | Side draft shield door | 11106841 |
|                                                                                     | 2   | Top draft shield door  | 11106842 |
|                                                                                     | 3   | Front glass            | 11106843 |
|                                                                                     | 4   | SmartGrid cover        | 11106709 |
|                                                                                     | 5   | SmartGrid              | 11106333 |
|                                                                                     | 6   | Foot screw             | 11106323 |
|                                                                                     | 7   | Terminal support       | 11106539 |
|                                                                                     | 8   | Drip tray              | 11106449 |
|    |     | Brush                  | 00071650 |
|  |     | Packaging complete     | 11106849 |
|  |     | Export box             | 11106860 |

## 8 Appendix

### 8.1 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/xs-analytical](http://www.mt.com/xs-analytical)

### 8.2 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  $\pm 2\%$  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  $\overline{\text{TI}}$  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.

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## **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

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