Analytical Balances

XS models

METTLER TOLEDO
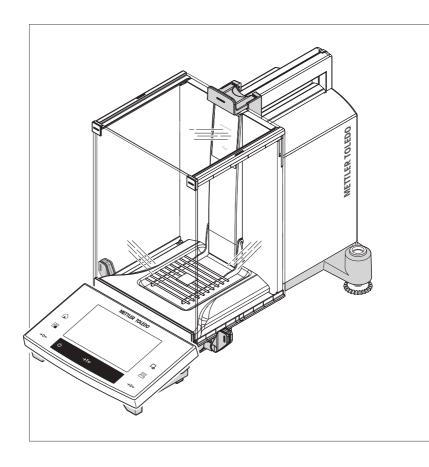
1 Introduction

Thank you for choosing a METTLER TOLEDO balance.

The balances offers numerous weighing and adjustment options with exceptional operating convenience.

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

METTLER TOLEDO is a leading manufacturer of balances for laboratory and production use as well as analytical measuring instruments. A globally present customer service network with highly trained personnel is always available to assist with the selection of accessories or provide advice on the optimal use of the balance.

The balance conforms to current standards and directives. It supports requirements, work techniques and protocols as specified by all international quality assurance systems, e.g. GLP (Good Laboratory Practice), GMP (Good Manufacturing Practice). The balance has a CE Declaration of Conformity and METTLER TOLEDO, as the manufacturer, is certified to ISO 9001 and ISO 14001. This provides the assurance that your capital investment is protected in the long term by high product quality and a comprehensive service package (repairs, maintenance, servicing, adjustment service).

Finding more information

▶ www.mt.com/xs-analytical

More detailed information is in the Operating Instructions on the CD-ROM.

Software version

These operating instructions refer to the originally installed firmware (software) version V 5.40.

1.1 Conventions and symbols used in these operating instructions

Key and button designations are shown in graphic or text form in square brackets (e.g. [🔧] or [**Define**].

These symbols indicate an instruction:

- ▪ prerequisites
- 1 steps
- 2 …
- ⇨ results

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

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

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 safety information

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

This balance complies with current industry standards and the recognized safety regulations; however, it can constitute a hazard in use. Do not open the balance housing: The balance contains no user-serviceable parts. In the event of problems, please contact a METTLER TOLEDO representative.

Always operate and use your instrument only in accordance with the instructions contained in this manual. The instructions for setting up your new instrument must be strictly observed.

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

Staff safety

These operating instructions must be read and understood before using the balance. These operating instructions must be retained for future reference.

The balance must not be altered or modified in any way. Only use METTLER TOLEDO original spare parts and accessories.

Safety notes

⚠⚡ **WARNING**

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
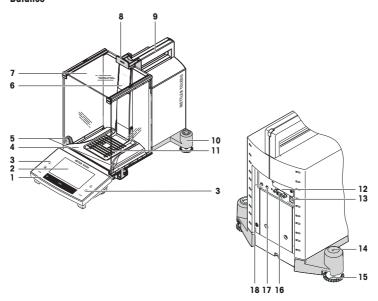
a)   Only use indoors in dry locations.

b)   Do not use pointed objects to operate the touch screen!
     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 Design and Function

3.1 Overview

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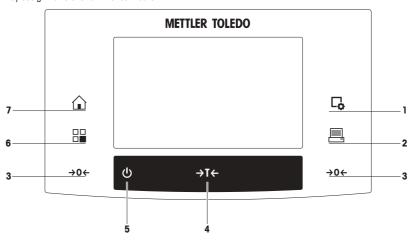
1	Terminal	**2**	Display ("Touch screen")
3	Operating keys	**4**	Drip tray
5	Handle for operating the draft shield side doors	**6**	Type designation
7	Glass draft shield	**8**	Handle for operation of the top draft shield door
9	Guide for top draft shield door and transport handle	**10**	Level indicator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

3.1.2 Terminal
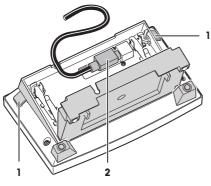
Key assignments and terminal connection.

1: Front view

		Designation	Explanation
1		Configuration	For displaying menus for the configuration of a current application. The application can be adjusted to a specific task via numerous settings.
2		Print	This key is used to transfer data via the interface, e.g. to a printer. Other devices, e.g. a PC can also be connected. The data to be transferred can be freely defined.
3		Zeroing	This key is used for setting a new zero point manually (only required if the balance is used for normal weighings).
4		Tare	This key is used to tare the balance manually (only necessary for normal weighings). When the balance has been tared, the **Net** symbol is displayed to indicate that all displayed weights are net.
5		On/Off	For switching the balance on and off (standby mode). **Note** It is recommended not to disconnect the balance from the power supply unless it is not going to be used for an extended period.
6		Select application / System	This key is used to select a required application.
7		Home	This key takes you directly from any menu level back to the active application.

| **1** | Levers | **2** | System connection (terminal cable) |

3.2 User interface

3.2.1 Display

The illuminated display of the terminal is a touch screen, i.e. a touch-sensitive screen. It can be used for displaying data, entering settings and selecting functions by tapping the screen.
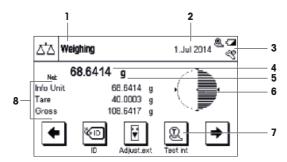
Note

Depending on country-specific requirements, non-calibrated decimal places are highlighted on approved balances.

⚠ **CAUTION**

Do not touch the touch screen with pointed or sharp objects!

This may damage the touch screen.

Note

The factory setting of the balance displays the weighing result at a large size, without SmartTrac and information fields.

	Designation	**Explanation**
1	Application name	Select application.
		The application menu can be selected by tapping this zone. This menu can also be displayed by pressing [⊞].
2	Date	The date can be changed by tapping this zone.
3	Status icons	These status icons indicate special balance statuses (e.g. service due, adjustment required, battery replacement, out of level).
		If you tap the icon, the function is explained.

4	Weight value	Tapping the weight displays a window showing the result in a large format. This is useful for reading a weight from a certain distance.
5	Weighing unit	The required weighing unit can be changed by tapping the weighing unit, e.g. from **mg** to **g**.
6	SmartTrac	SmartTrac is a graphic weighing-in aid, which shows at a glance an already used and still available weighing range.
7	Function keys	This area is reserved for **Function Keys** enabling direct access to frequently required functions and application settings. If more than 5 function keys are activated, these can be selected with the arrow keys.
8	Information fields	This area is used for displaying additional information (**information fields**) relating to an active application.

Large display

By pressing the function key [**Display**], the weighing result can be displayed larger and still allow the use of the terminal function keys.
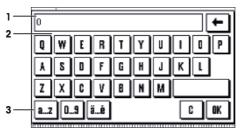

Screen saver

If the balance is not used for 15 minutes, the display is automatically dimmed and the pixels are inverted about every 15 seconds. When the balance is used again (e.g. load weight, press key), the display returns to a normal state.

3.2.2 Input dialog boxes

The keyboard dialog box is used to enter characters such as letters, numbers and special characters.

	Designation	**Explanation**
1	Data field	Displays (entered) alphanumeric and numeric characters.
2	Keyboard	Data input area
3	Selection	Select various keyboard layouts.

1 Enter the designation.

2 Confirm with [**OK**].

	Function
←	Delete last character
	Tap once to place the cursor at the end of the data field.

3.2.3 Firmware

The firmware controls all balance functions. It enables the balance to be adjusted to a specific working environment.

The firmware is divided as follows:

- System settings
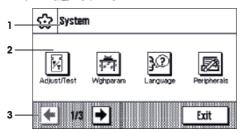- Applications
- Application-specific settings

Note
A displayed menu can be left at any time by repressing the same menu key.

3.2.3.1 System settings

System settings (e.g. settings for peripheral devices) are independent of the applications and apply to the entire weighing system.

Navigation: [▦] > [**System**]

|	Designation	Explanation
1	Title bar	The title bar displays elements for user orientation and information.
2	Contents area	The contents area is the main work area for menus and applications. The contents depend on the specific application or initiated action.
3	Action bar	The action bar contains action buttons for performing specific actions required in the active dialog box and are available (e.g. [**Exit**], [**STD**], [**C**], [**OK**]).
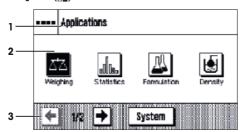
1 Settings can be changed by tapping the respective button.

2 To leave the settings, tap [**Exit**].

3.2.3.2 Applications

Applications are firmware modules for performing specific weighing tasks. The balance is delivered with various applications pre-installed. After switching on the balance, the last used application are loaded. The applications are available under the [▦] key. Instructions for working with standard applications are provided in the respective sections.
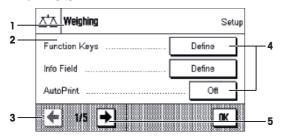
Navigation: [▦]

Application-specific settings

These settings can be used to adjust the applications. The available setting options depend on the selected application. Pressing [▤] opens the multipage menu with settings for a currently active application. Information on the individual setting options is provided in the section relating to the respective application.

Navigation: [⌨]

	Designation	Explanation
1	Title bar	The title bar displays elements for orientation and information.
2	Contents area	The contents area is the main work area for menus and applications. The contents depend on the specific application or initiated action.
3	Action bar	The action bar contains action buttons for performing specific actions required in the active dialog box and are available (e.g. [**Exit**], [**STD**], [**C**], [**OK**]).
4	Button	Edit/Select settings (e.g. [**Define**], [**On**], [**Off**]). The contents depend on the application.
5	Arrow	The arrow buttons are used to page forward or back.

1   Settings can be changed by tapping the respective button.

2   Confirm with [**OK**].

3   To leave the settings, select [**Exit**].

4   To change the system settings, tap [**System**].

3.2.4 Security system

The balance has a comprehensive security system with which individual access rights can be defined at administrator. Access to protected menu areas requires the entry of a password. On delivery of the balance, a password is defined. The menu settings are chosen, so that you have unrestricted access to all system settings.

When an password protected menu area is selected, an alphanumeric keyboard is initially displayed for entry of the password.

⚠ **CAUTION**

Remember passwords!

Protected menu areas cannot be accessed without password.

a)   Note passwords and keep them in a safe place.

1   Enter your password.
   - Case sensitive, tap the [**a...z**] and [**A...Z**] button to switch between upper and lower case.
   - To enter numbers, tap the [**0...9**] button.
   - Incorrect entries can be deleted character by character with the arrow key ⬅.
   Note
   Entry can be interrupted at any time by tapping [**C**].

2   Enter the password (for security reasons, this is displayed with asterisks instead of plain text) and confirm with [**OK**].

⇨   If the password are correct, the selected menu area is displayed or the required action initiated. If these are incorrect, an error message is displayed with a request to enter them again.

4 Installation and Putting into Operation

4.1 Unpacking

Open the balance packaging. Check the balance for transport damage. Immediately inform a METTLER TOLEDO representative in the event of complaints or missing accessories.

Note
Retain all parts of the packaging. This packaging offers the best possible protection for transporting the balance.

- Use the lifting strap to lift the balance out of the packaging box.

1   Remove the lifting strap (1).
2   Remove the top packaging (2).

1   Remove the operating instructions (3).
2   Remove the set with AC adapter (4), power supply cable, drip tray, SmartGrid, SmartGrid cover, SmartPrep single-use funnel and ErgoClip "Basket" (basket for small weighing objects).
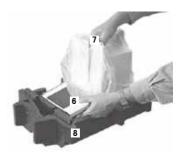3   Remove the set with draft shield doors (5) and terminal support.

1   Carefully remove the terminal (6) from the bottom packaging.
2   Remove the protective cover.

Note
Since the terminal is connected to the balance with a cable, only withdraw the balance slightly from the packaging in order to remove the protective cover.

1 Place the terminal (6) at the front of the balance.

2 Hold the balance (7) by the guide or handle. Hold the terminal firmly with the other hand. Pull out both components together from the bottom packaging (8).

1 Place the balance with the terminal at the site of use.

2 Remove the cover from the balance.

3 Remove the transport protection (9) of the weighing pan support.

4.2 Scope of delivery

Check the delivery for completeness. The following accessories are part of the standard equipment of the balance:

- 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
- SmartPrep single-use funnel (2 pieces)
- 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 or Quick Guide; printed or on CD-ROM, depending on country of use

4.3 Location

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

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

- The balance must only be used indoors and up to a maximum altitude of 4,000 m above sea level.
- Before switching on the balance, wait until all parts are at room temperature (+5 to 40 °C).
  The humidity must be between 10% and 80% non-condensing.
- The power plug must be accessible at all times.
- Firm, horizontal and vibration-free location.
- Avoid direct sunlight.
- No excessive temperature fluctuations.
- No strong drafts.
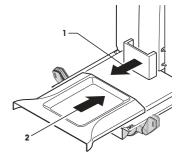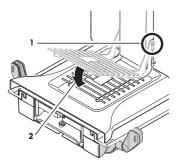
Further information can by found in Weighing the Right Way.

4.4 Assembling the balance
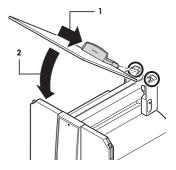
1 Remove the transport protection (1).
2 Insert the drip tray (2).
  Insert the tray from the front above the bottom plate up to the partition.
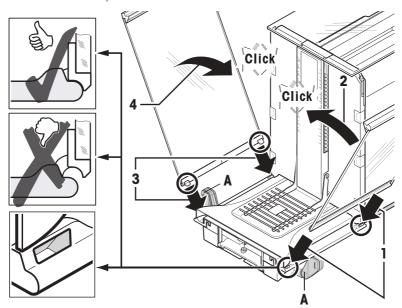
1 Insert the SmartGrid from the front.
2 Check that the SmartGrid (1) (2) is correctly hooked in on both sides.

1 Insert the top draft shield door (1) at an angle (slightly below 30 degrees) into the **rear** guide.
2 Carefully fold the draft shield door (2) downwards, **see** figure.
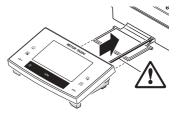
- The handles (A) must be folded outwards to mount the side draft shield doors.

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

2 Mount the side doors at an angle of about 30° in the 2 openings, **see** following figure.

3 Check that the side doors are correctly mounted as described.

4 Mount the side door so that it clicks in place in the balance. The side door will move easily when correctly mounted.

5 Fold the handle of the side draft shield door inwards.

6 Mount the second draft shield side door. The procedure is identical.

7 Move the side doors fully back.

1 Fit the front draft shield glass (2).
Insert the glass at an angle into the bottom of the balance at the front until the two hooks of the front draft shield glass rest on the rollers (1).

2 Move the front draft shield glass upwards until it engages.

1 Insert the terminal support.

2 Place the cable in the guide of the terminal support.

3 Insert the terminal support into the opening in the front draft shield glass.

   ⇨ The terminal support must engage with a click.

1 Mount the terminal.

2 Place the terminal in the center of the support.

3 Push the terminal against the balance until it folds down easily at the front of the terminal support.

4 Insert the cable into the balance.

Attention

The balance and terminal are not connected by the terminal support! Always hold the balance and terminal firmly during transport.

Note

The Terminal cable is of sufficient length to allow repositioning of the terminal in the area around the balance.

4.5 Connecting the balance

⚠️ **WARNING**

Risk of electric shock

a) To connect the balance, only use the supplied three-core power cable 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.
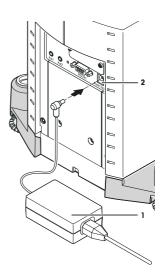
The balance is supplied with an AC adapter and country-specific power cable. The AC adapter is suitable for use with the following voltage range:

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 cable 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.

4.6 Setting up the balance

4.6.1 Weighing for the first time

After commissioning the new balance, the first weighing can be carried out. This will also familiarize you with the operation of the balance.

4.6.1.1 Switching on the balance

- Balance is connected to the power supply.

- Terminal and balance are interconnected.

- To switch on, press [⏻].
    ⇨ Display appears.
⇨ Balance is ready to use.

4.6.1.2 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.

4.6.1.3 Performing a simple weighing

To perform a simple weighing, only the keys in the lower part of the terminal are required. The balance has separate keys for zeroing [→0←] and taring [→T←].

Zeroing

- Press [→0←].
⇨ Zeroing

After zeroing, all weights also the tare weight apply to this new zero point and the following apply: tare weight = 0, net weight = gross weight = 0.

Taring

Note

A negative weight is not permitted. An error message is generated. When the stability detector icon extinguishes (small ring left of the weight display), the indication is stable. The weight is displayed.

- If a weighing container is used, the balance must first be set to zero.

1   Place the container on the balance.

2   Press [→T←].
    ⇨   The balance is tared.

⇨   The weight of the container is set as the new tare weight and the previous tare (if available) is overwritten.

⇨   The **Net** display signals that all indicated weights are net weights.

Congratulations!

The first weighing is now complete. The following sections contain further information about the extensive functions and applications of this balance.

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 cable, 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 to balance

Under no circumstances use cleaning agents containing solvents or abrasive agents, as this can damage 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.

Note
All removable non-coated parts of the outer draft shield are dishwasher safe to 80 degrees.

1   To clean the weighing chamber thoroughly, swing out the draft shield glass panels from the balance and remove them from their fastening points.

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

3   Remove the drip tray from the balance.

4   Ensure that these parts are correctly positioned when refitted.

Note
Contact a METTLER TOLEDO representative to find about the service options available – regular maintenance by an authorized service engineer will ensure consistent weighing accuracy over the long term and extend the service life of the 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

Only use an approved AC adapter with a current-limited SELV output.
Ensure correct polarity ⊖—●—⊕

Power supply

AC adapter:	Primary: 100 – 240 V AC, -15%/+10%, 50/60 Hz Secondary: 12 V DC ±3%, 2.5 A (with electronic overload protection)
Cable for AC adapter:	3-core, with country-specific plug
Balance power supply:	12 V DC ±3%, 2.25 A, maximum ripple: 80 mVpp

Protection and standards

Overvoltage category:	II
Degree of pollution:	2
Protection:	Protected against dust and water
Standards for safety and EMC:	See Declaration of Conformity
Range of application:	For use only in closed interior rooms

Environmental conditions

Height above mean sea level:	Up to 4000 m
Ambient temperature:	5–40 °C
Relative air humidity:	Max. 80% up to 31 °C, linearly decreasing to 50% at 40 °C, noncondensing
Warm-up time:	At least **120** minutes after connecting the balance to the power supply; when switched on from standby-mode, the balance is ready for operation immediately

Materials

Housing:	Die-cast aluminum, plastic, chrome steel and glass
Terminal:	Die-cast zinc, chromed and plastics
SmartGrid:	Chrome-Nickel-Molybdenum steel X2CrNiMo17

6.2 Explanatory notes for the METTLER TOLEDO AC adapter
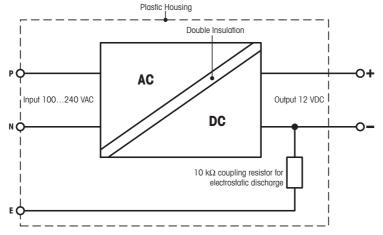
The certified external power supply which conforms to the requirements for Class II double insulated equipment is not provided with a protective earth connection but with a functional earth connection for EMC purposes. This earth connection IS NOT a safety feature. Further information about conformance 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 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.

2: Equivalent circuit diagram

6.3 Model-specific data

More detailed information is in the Operating Instructions on the CD-ROM.

		XS105	XS105DU	XS205DU
Limit values				
Maximum capacity		120 g	120 g	220 g
Readability		0.01 mg	0.1 mg	0.1 mg
Tare range (from…to)		0 … 120 g	0 … 120 g	0 … 220 g
Maximum capacity in fine range		–	41 g	81 g
Readability in fine range		–	0.01 mg	0.01 mg
Repeatability (at nominal load)	sd	0.4 mg (100 g)	0.1 mg (100 g)	0.1 mg (200 g)
Repeatability (at low load)	sd	0.02 mg (5 g)	0.05 mg (5 g)	0.05 mg (10 g)
Repeatability in fine range (at low load)	sd	–	0.02 mg (5 g)	0.02 mg (10 g)
Linearity deviation		0.2 mg	0.2 mg	0.2 mg
Eccentricity deviation (test load) [1]		0.3 mg (50 g)	0.3 mg (50 g)	0.3 mg (100 g)
Sensitivity offset (test weight)		0.4 mg (100 g)	0.8 mg (100 g)	0.8 mg (200 g)
Sensitivity temperature drift [2]		0.0001%/°C	0.00015%/°C	0.00015%/°C
Sensitivity stability [3]		0.0001%/a	0.0002%/a	0.0002%/a
Typical values				
Repeatability (at low load)	sd	0.008 mg (5 g)	0.04 mg (5 g)	0.04 mg (10 g)
Repeatability in fine range (at low load)	sd	–	0.01 mg (5 g)	0.01 mg (10 g)
Linearity deviation		0.06 mg	0.06 mg	0.06 mg
Eccentricity deviation (test load) [1]		0.1 mg (50 g)	0.075 mg (50 g)	0.08 mg (100 g)
Sensitivity offset (test weight)		0.06 mg (100 g)	0.2 mg (100 g)	0.3 mg (200 g)
Minimum weight (according to USP)		16 mg	82 mg	82 mg
Minimum weight (according to USP) in fine range		–	20 mg	20 mg
Minimum weight (U=1%, k=2)		1.6 mg	8.2 mg	8.2 mg
Minimum weight (U=1%, k=2) in fine range		–	2 mg	2 mg
Settling time		3 s	1.5 s	1.5 s
Settling time in fine range		–	3 s	3 s

Interface update rate		23 1/s	23 1/s	23 1/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
Dimensions				
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)
Weights for routine testing				
OIML CarePac		100 g F2, 5 g E2	100 g F2, 5 g E2	200 g F2, 10 g F2
	Weights	#11123002	#11123002	#11123001
ASTM CarePac		100 g 1, 5 g 1	100 g 1, 5 g 1	200 g 1, 10 g 1
	Weights	#11123102	#11123102	#11123101

sd =   Standard deviation

[1]   According to OIML R76   [2]   In the temperature range 10 … 30 °C

[3]   After putting into operation for the first time, with the self-adjustment function activated (ProFACT or FACT)

More detailed information is in the Operating Instructions on the CD-ROM.

		XS225DU	XS64	XS104
Limit values				
Maximum capacity		220 g	61 g	120 g
Readability		0.1 mg	0.1 mg	0.1 mg
Tare range (from…to)		0 … 220 g	0 … 61 g	0 … 120 g
Maximum capacity in fine range		120 g	–	–
Readability in fine range		0.01 mg	–	–
Repeatability (at nominal load)	sd	0.1 mg (200 g)	0.1 mg (60 g)	0.1 mg (100 g)
Repeatability (at low load)	sd	0.06 mg (10 g)	0.07 mg (5 g)	0.07 mg (5 g)
Repeatability in fine range (at low load)	sd	0.02 mg (10 g)	–	–
Linearity deviation		0.2 mg	0.2 mg	0.2 mg
Eccentricity deviation (test load) [1]		0.3 mg (100 g)	0.15 mg (20 g)	0.3 mg (50 g)
Sensitivity offset (test weight)		0.8 mg (200 g)	0.9 mg (60 g)	1 mg (100 g)
Sensitivity temperature drift [2]		0.00015%/°C	0.00015%/°C	0.00015%/°C
Sensitivity stability [3]		0.0002%/a	0.0002%/a	0.0002%/a
Typical values				
Repeatability (at low load)	sd	0.05 mg (10 g)	0.04 mg (5 g)	0.04 mg (5 g)
Repeatability in fine range (at low load)	sd	0.01 mg (10 g)	–	–
Linearity deviation		0.06 mg	0.05 mg	0.1 mg
Eccentricity deviation (test load) [1]		0.1 mg (100 g)	0.03 mg (20 g)	0.15 mg (50 g)
Sensitivity offset (test weight)		0.16 mg (200 g)	0.6 mg (60 g)	0.2 mg (100 g)
Minimum weight (according to USP)		100 mg	82 mg	82 mg
Minimum weight (according to USP) in fine range		20 mg	–	–
Minimum weight (U=1%, k=2)		10 mg	8.2 mg	8.2 mg
Minimum weight (U=1%, k=2) in fine range		2 mg	–	–
Settling time		1.5 s	1.5 s	1.5 s
Settling time in fine range		3 s	–	–
Interface update rate		23 1/s	23 1/s	23 1/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
Dimensions				
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)

Weights for routine testing				
OIML CarePac		200 g F2, 10 g F2	50 g F2, 2 g E2	100 g F2, 5 g E2
	Weights	#11123001	#11123003	#11123002
ASTM CarePac		200 g 1, 10 g 1	50 g 1, 2 g 1	100 g 1, 5 g 1
	Weights	#11123101	#11123103	#11123102

sd =   Standard deviation

[1]   According to OIML R76   [2]   In the temperature range 10 … 30 °C

[3]   After putting into operation for the first time, with the self-
adjustment function activated (ProFACT or FACT)

More detailed information is in the Operating Instructions on the CD-ROM.

		XS204	XS204DR	XS304
Limit values				
Maximum capacity		220 g	220 g	320 g
Readability		0.1 mg	1 mg	0.1 mg
Tare range (from…to)		0 … 220 g	0 … 220 g	0 … 320 g
Maximum capacity in fine range		–	81 g	–
Readability in fine range		–	0.1 mg	–
Repeatability (at nominal load)	sd	0.1 mg (200 g)	0.7 mg (200 g)	0.2 mg (300 g)
Repeatability (at low load)	sd	0.07 mg (10 g)	0.5 mg (10 g)	0.12 mg (10 g)
Repeatability in fine range (at low load)	sd	–	0.1 mg (10 g)	–
Linearity deviation		0.2 mg	1 mg	0.4 mg
Eccentricity deviation (test load) [1]		0.3 mg (100 g)	0.3 mg (100 g)	0.3 mg (100 g)
Sensitivity offset (test weight)		1 mg (200 g)	1 mg (200 g)	1.5 mg (300 g)
Sensitivity temperature drift [2]		0.00015%/°C	0.00015%/°C	0.00015%/°C
Sensitivity stability [3]		0.0002%/a	0.0002%/a	0.0002%/a
Typical values				
Repeatability (at low load)	sd	0.04 mg (10 g)	0.4 mg (10 g)	0.06 mg (10 g)
Repeatability in fine range (at low load)	sd	–	0.04 mg (10 g)	–
Linearity deviation		0.1 mg	0.2 mg	0.1 mg
Eccentricity deviation (test load) [1]		0.08 mg (100 g)	0.08 mg (100 g)	0.1 mg (100 g)
Sensitivity offset (test weight)		0.4 mg (200 g)	0.4 mg (200 g)	0.4 mg (300 g)
Minimum weight (according to USP)		82 mg	820 mg	120 mg
Minimum weight (according to USP) in fine range		–	82 mg	–
Minimum weight (U=1%, k=2)		8.2 mg	82 mg	12 mg
Minimum weight (U=1%, k=2) in fine range		–	8.2 mg	–
Settling time		1.5 s	1.5 s	1.5 s
Settling time in fine range		–	1.5 s	–
Interface update rate		23 1/s	23 1/s	23 1/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
Dimensions				
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)
Weights for routine testing				
OIML CarePac		200 g F2, 10 g F1	200 g F2, 10 g F1	200 g F2, 10 g F1
	Weights	#11123001	#11123001	#11123001
ASTM CarePac		200 g 1, 10 g 1	200 g 1, 10 g 1	200 g 1, 10 g 1
	Weights	#11123101	#11123101	#11123101

sd =   Standard deviation

[1]   According to OIML R76   [2]   In the temperature range 10 … 30 °C

After putting into operation for the first time, with the self-
adjustment function activated (ProFACT or FACT)

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