Sartorius Cubis Series

Electronic Semimicro, Micro, Precision and Analytical Balances
MSE Models

Contents

ℹ The enclosed CD-ROM contains the operating instructions as a PDF file. To read and print the file, you require the program Acrobat Reader, which you can download for free from the Adobe website (www.adobe.com).

Software drivers for configuration of SB interfaces can also be downloaded from the internet:
http://www.ftdichip.com/FTDrivers.htm
The "installation guides" for these drivers can be found here:
http://www.ftdichip.com/Documents/InstallGuides.htm

Notes on Using these Instructions

▷ Please read these instructions carefully and completely before using the device.
▷ Read the Safety Instructions carefully.
▷ These instructions are part of the product. Keep them in a safe and easily accessible location.
▷ If the instructions should be lost or misplaced, please contact Sartorius for a replacement or download the latest version from our website: www.sartorius.com

Symbols and Signs

The following symbols are used in this manual:

⚠	Danger of explosion Potential danger of physical injury or death
⚡	Danger of electrical shock Danger of physical injury or death
⚠	Warning of potential physical injury, Health risk or risk of property damage
ⓘ	Useful information and tips
M	Notes on use in legal metrology within the scope of validity of Council Directive 2009/23/EC
✍	Note regarding device operation

Explanation of Symbols

The following symbols are used in these instructions:

▶ Indicates a required action

▷ Describes what happens after you have performed a particular step

1., Perform steps in the specified order
2.
– Indicates an item in a list

ⓘ **Technical advice / Hotline:**
Phone: +49.551.308.4440
Fax: +49.551.308.4449

Safety Instructions

This device complies with European Council Directives as well as international regulations and standards for electrical equipment, electromagnetic compatibility, and the stipulated safety requirements. Improper use or handling can, however, result in damage and/or injury.
This device should only be operated by trained personnel.
Operators must read these installation instructions, particularly the safety information, and must be familiar with the operation of the equipment. The operator is required to supplement these safety precautions as appropriate.
The operating personnel must be provided with the appropriate training.
The requirements pertaining to applicable installation regulations must be followed when using electrical equipment in systems and environmental conditions with increased safety requirements. Relevant laws, standards, regulations, guidelines and environmental protection laws valid in your country must be observed.
Always keep the equipment and balance freely accessible.
Any installation work or balance operation that does not conform to the instructions will result in forfeiture of all claims under the manufacturer's warranty.

Danger of Explosion!

Do not use this equipment in hazardous areas in which explosive materials are present.

Danger of Electrical Shock!

If the device is not used in accordance with the instructions, this can affect the product liability for the device.

Make sure that the voltage rating printed on the AC adapter is identical to your local line voltage. The wall outlet must have a protective grounding conductor. The operating instructions included with the AC adapter must be followed.

Do not switch on the equipment if the AC adapter or power cord are damaged. If the balance, the AC adapter or any of the cables are damaged, disconnect the equipment from the power supply and secure it so that it cannot be turned on.

Chemicals (e.g. gases or liquids) that can corrode and damage the inside or outside of the balance, AC adapter, power cable or peripherals must be kept away from the equipment.

Do not operate the balance unless the housing and the display are undamaged and the housing is closed so that inadvertent contact with parts inside the equipment is not possible. Make sure that no liquids penetrate the balance and do not allow conductive parts to touch the balance.

Note on Installation:
The operator shall be solely responsible for any modifications to the equipment and for connecting any cables or equipment not supplied by Sartorius.
Information on operational quality is available upon request from Sartorius.
You should only use peripherals and options supplied by Sartorius.

Protection Class of the Balance Housing
– Models with a readability of >10 mg: These models fulfill the requirements of protection class IP54.
   The IP protection only applies to the balance housing and not to the AC adapter.
– The IP protection is only guaranteed when the weighing pan is mounted.
– The IP protection is restricted if the data interfaces are used.
   Retain the cover cap for the data output. When the data output is not in use, reapply the cover cap to protect it against vapors, moisture, and dust or dirt.

Note on cable quality:
CE conformity is only guaranteed with well shielded cables.
The shielding braid of the cable must be made of metal with at least 80% coverage and also covered with metal foil as much as possible.
The shielding on both sides on the full metal or metalized connector casing, as well as on the casing inlet, must be high-frequency compliant and have a flat design.

You can only turn off power to the device by pulling the plug or disconnecting the power cord, or by unscrewing the four-pin plug at the DC supply cable for the balance.

Only use a lightly-moistened cloth for cleaning. See "Care and Maintenance" for cleaning the device. Do not compromise the IP protection of the balance.

Do not open the balance housing. If the seal is broken, this will result in forfeiture of all claims under the manufacturer's warranty. The device may only be opened by specialized personnel trained by Sartorius.

Disconnect the balance from the wall outlet prior to moving the device.

Avoid condensation damage to the device. When the balance is turned on,
condensation build-up is not possible. If the device is moved from a cool environment to a warm environment, you must allow the device to acclimatize for approx. 2 hours before connecting to the power supply.

Hazards at the Place of Installation and During Operation

Avoid generating static electricity and establish potential equalization. A 10 kOhm ground is used when connecting the balance to the power supply.
Disconnecting the ground conductor is not permitted.

Models with a separate electronics module (e.g. MSE6.6/3.6/2.7 225S/P and 125P): Do not replace the electronics module.
Replacing with, e.g. models of the ME/SE series will damage the device.

Exercise caution to avoid glass breakage.
There is a danger of lacerations or cuts caused by sharp edges on glass or metal (contact springs), particularly when removing or replacing the glass draft shield panels; during cleaning; if a glass sample container breaks, or when modifying the balance hardware configuration.

Make sure all equipment operators have received proper instructions when working with hazardous or toxic materials.
Failure to follow correct handling procedures can result in breakage of parts or spillage of liquids or other substances.
Make sure the necessary protective clothing or equipment is worn, such as protective gloves, clothing, eyewear. All safety regulations applicable in the laboratory must be observed.

Exercise caution to avoid squeezing or crushing fingers when
– Operating the electronic draft shield
– Removing or installing the panels
– Adjusting the display

Do not expose the device to aggressive chemical vapors or to unnecessarily extreme temperatures, moisture, shocks, or vibration.

The device should be setup in areas away from equipment or devices that have strong magnetic properties.
Extreme electromagnetic fields from electrical lines should also be avoided.

Intended Use

Cubis models are high-resolution balances. They were specially developed for exact determination of material mass in liquid, paste, powder or solid form.

Appropriate containers must be used for each type of sample material.
Specific models cover specific weighing ranges: see "Specifications."

Cubis models are designed specially for use in research, education and day-to-day laboratory tasks in science and industry.

They are designed to be used exclusively indoors.

Cubis models can be operated as standalone, connected to a PC, or on a network.

General View of the Equipment and Equipment Supplied

Balances with a readability of ≤ 1 μg
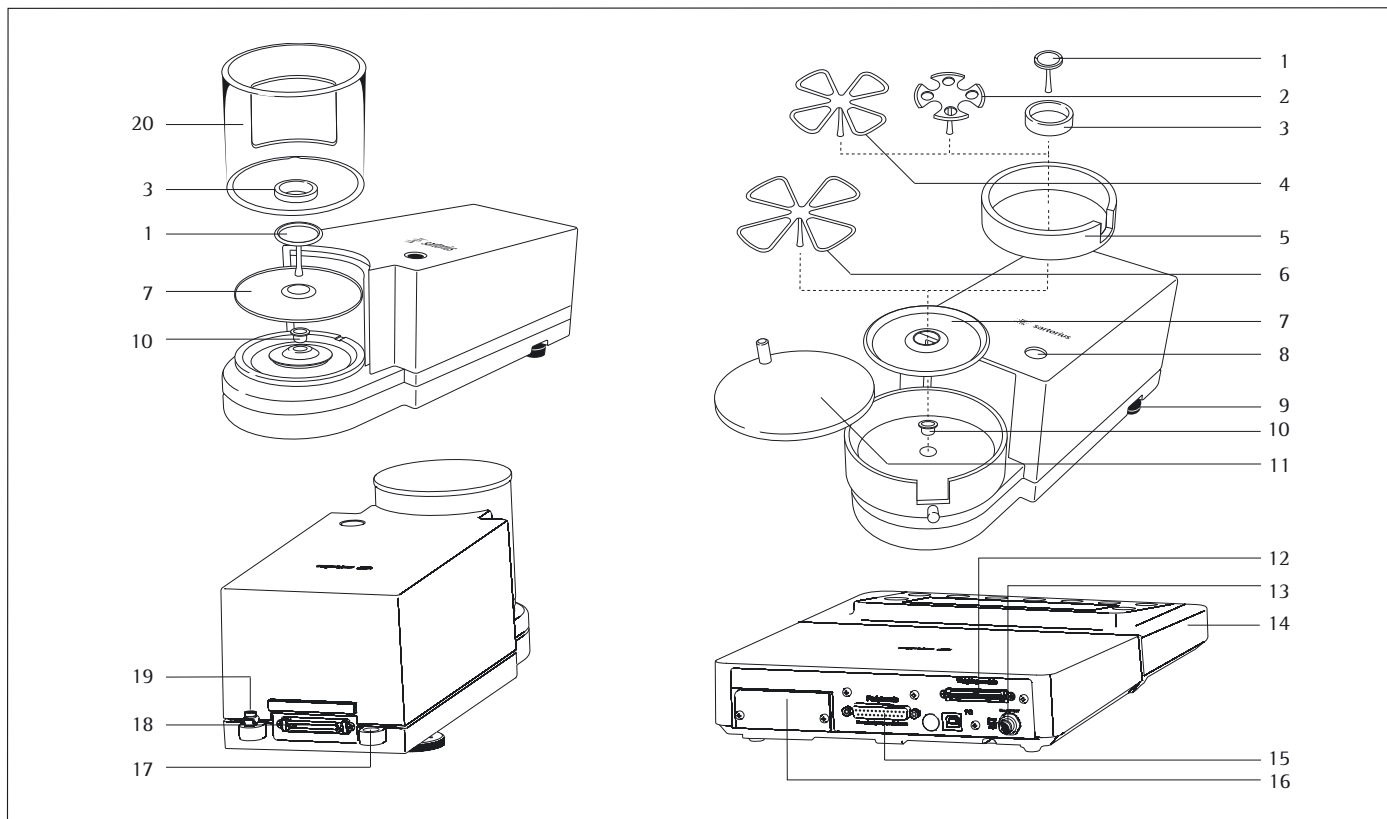
Pos.	Description
1	Weighing pan
2	Filter weighing pan ⌀ 50 mm
3	Internal draft shield (for MSx2.7S-F only)
4	Optional weighing pan ⌀ 75 mm
5	Shield disk
6	Optional filter weighing pan ⌀ 90 mm
7	Shield plate
8	Level indicator
9	Leveling foot
10	MSE2.7.. model: bush
11	Draft shield cover

Pos.	Description
12	Female connector for weigh cell
13	DC jack
14	Display and control unit
15	Serial communications port (PERIPHERALS)
16	Slot for optional interfaces, e.g. 9-pin data output or Bluetooth. PS2 socket has no function.
17	Lug for attaching antitheft locking device
18	Equipotential bonding conductor terminal
19	Equipotential bonding conductor terminal
20	Draft shield
	Not shown: AC adapter, USB cable

General View of the Equipment and Equipment Supplied

Analytical and precision balances with a weighing range of up to 15 kg

Item Description
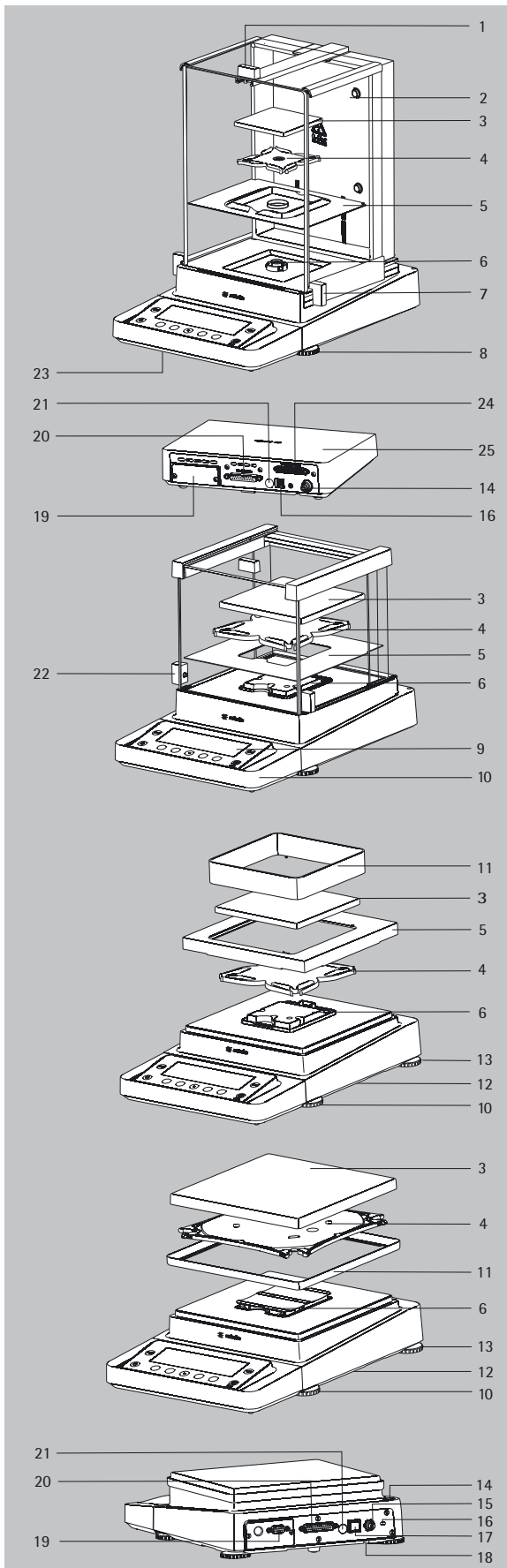
1   Upper sliding draft shield panel/Handle
2   Back panel
3   Weighing pan
4   Pan support (not for MSx225.../MSx125... models)
5   Shield plate
6   Pan retainer
7   Right sliding panel/Handle
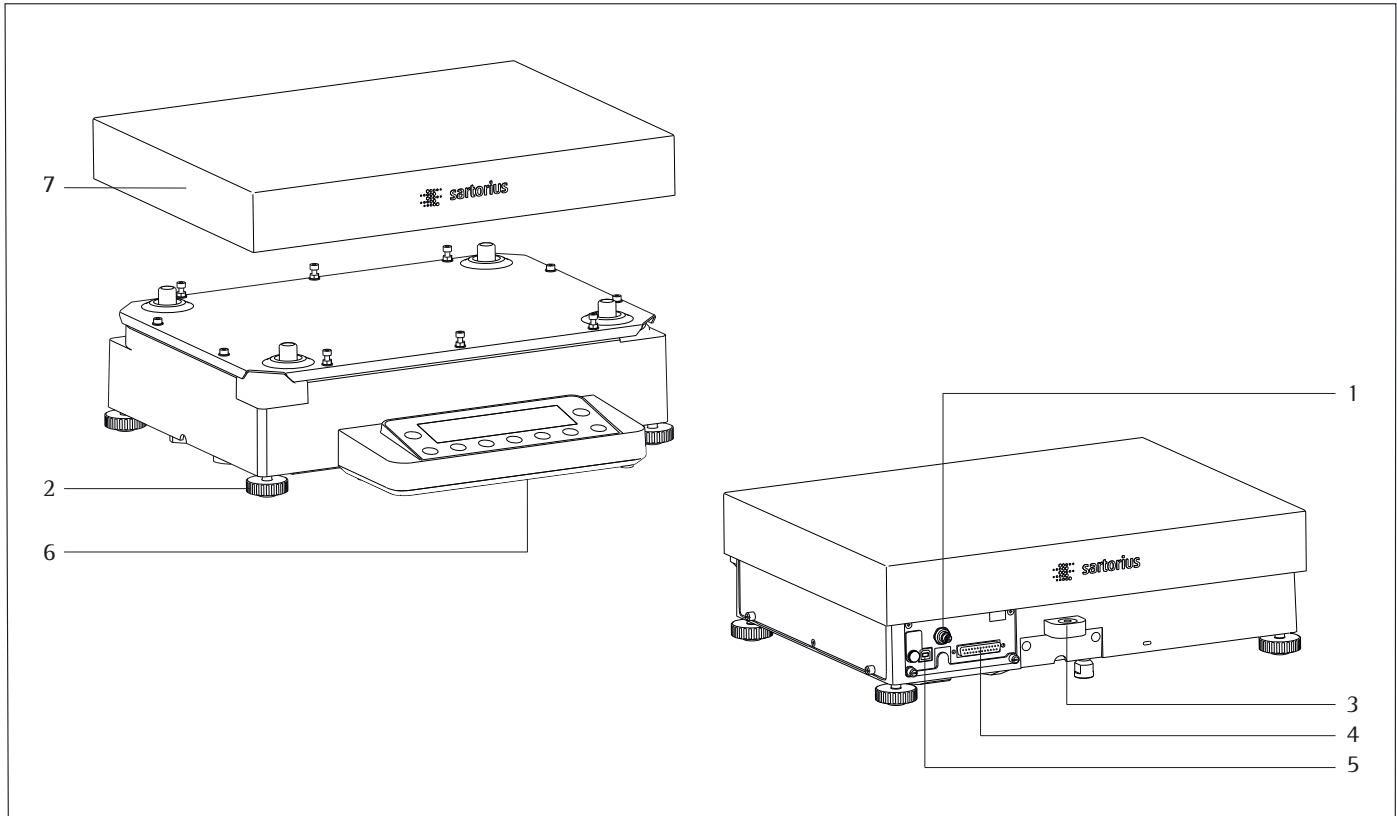8   Leveling foot
9   Display
10   Display and control unit
11   Draft shield/Shield disk (only for models with a readability of 1 mg and 10 mg)
12   Below-cell weighing port (on the bottom of the balance)
13   Leveling foot
14   Level indicator
15   Power socket
16   Slot for attaching an anti-theft locking device
17   USB socket for a PC connection
18   Below-cell weighing hook
19   Slot for optional interfaces, e.g., 9-pin data output (as shown) or Bluetooth. PS2 socket has no function.
20   Communication port (PERIPHERALS) for accessories
21   Menu access switch
22   Left sliding panel/handle
23   Ethernet Interface (on the bottom of the display and control unit)
24   Semi-microbalances: Female connector for weigh cell
25   Semi-microbalances: Electronics module (for MSx225.../MSx125... models)

     Not shown:
–   AC adapter
–   USB cable
–   Operating instructions

Equipment Supplied and General View of the Equipment

Balances with a weighing range of 20 kg or more

Pos.	Bezeichnung
1	DC jack
2	Leveling foot
3	Level indicator
4	Serial communications port (PERIPHERALS)

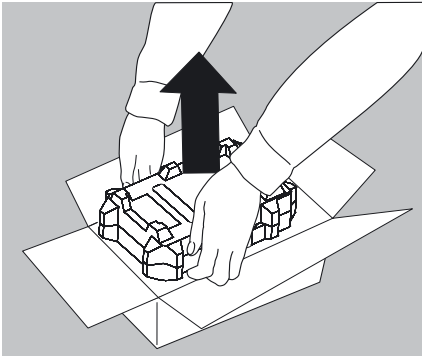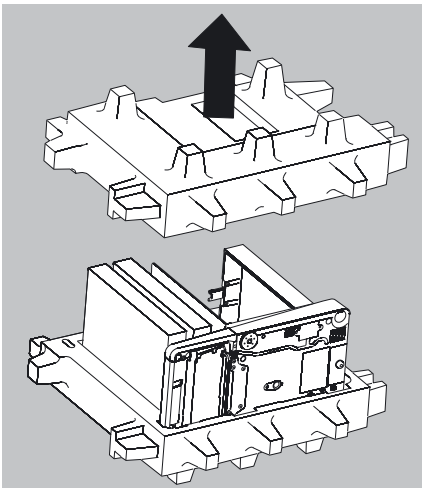| Pos.	Bezeichnung
5	USB interface for PC connection
6	Display and control unit
7	Weighing pan
	Not shown: AC adapter, USB cable

Getting Started

Unpacking the Equipment

▶ Open the packaging at the top.

▶ Use both hands to lift the balance, with the packaging, out of the cardboard box.

▶ Place the packaging with the balance on the floor.

▶ Remove the top part of the packaging.

Installation Instructions

▶ Select the proper setup location:
– Set up the device on a stable, even surface that is not exposed to vibrations (e.g. weighing stone).
– Place the device in a location with enough free space around it so that excessive heat cannot build up.
– Maintain free access to the device at all times.

Choose a location that is not subject to the following negative influences:
– Heat (heater or direct sunlight)
– Drafts from open windows, AC systems and doors
– Extreme vibrations during weighing
– Excessive moisture

Acclimatization
Condensation from humidity can form on the surfaces of a cold device when it is brought into a substantially warmer area.
To avoid the effects of condensation, condition the balance for about two hours at room temperature, leaving it unplugged from the power supply.
Carefully read all warnings and safety precautions in the respective section of this manual.
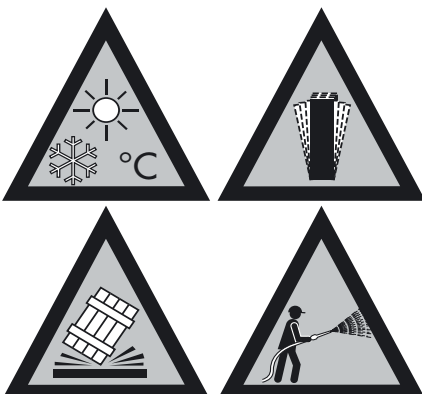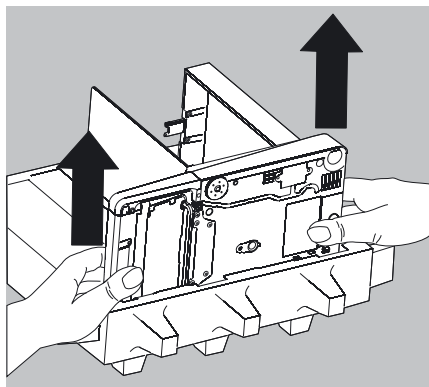
Balance with Draft Shield

▶ Remove the packages (containing draft shield panels, weighing pan, pan support, AC adapter, etc.) from the lower packaging and place them to one side.

▶ Use both hands to lift the balance out of the packaging.

⚠ Exercise caution to avoid glass breakage.
Never lift the equipment by the draft shield panels to remove it from the packaging.

▶ Place the balance on an even surface.

Balance with No Draft Shield

▶ Use both hands to remove the model without a draft shield from the packaging.

▶ Remove the AC adapter and the balance parts from the packaging.
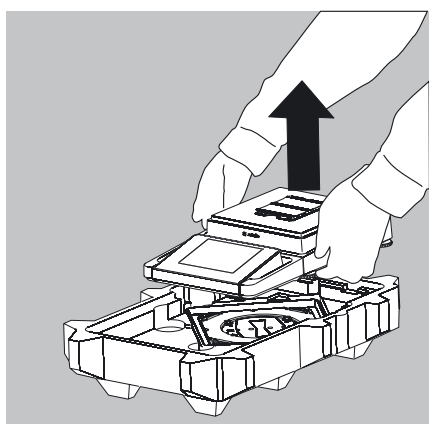
Assembly

Installing the Analytical Draft Shield Labeled DA, DI, and DU
Assembling the Balance
▶ Fit parts onto the balance as shown in the picture.

1. Shield plate
2. Pan support (not for MSx225.../MSx125... models)
3. Weighing pan
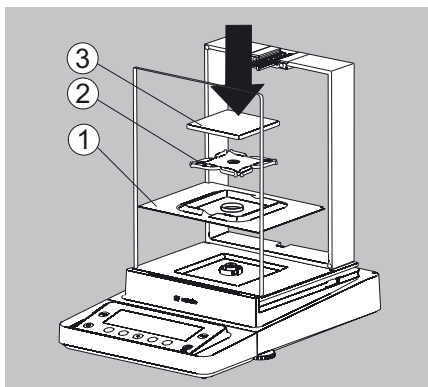
▶ Slide the upper draft shield panel into the guide rails from the rear.
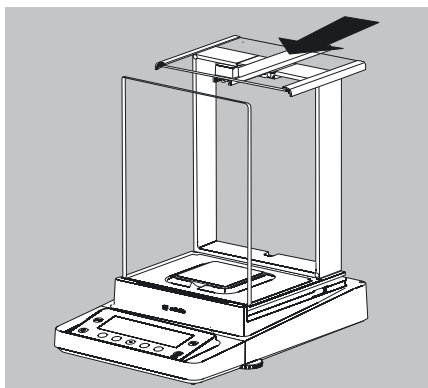
▶ Slide the left and right draft shield panels into the guide rails from the rear. Make sure the panels are within the upper and lower guide rails.
▶ Slide the panels in until they engage.

1. Right draft shield panel
2. Left draft shield panel

▷ This completes the balance assembly.
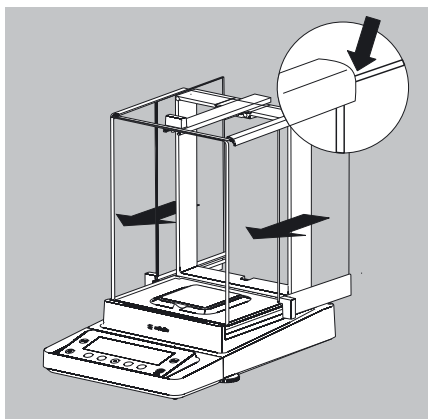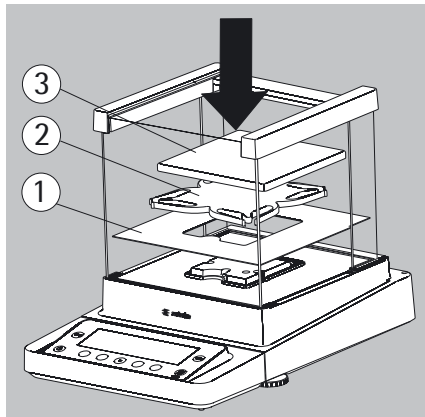
Installing the Draft Shield Labeled DE for Milligram Balances
Assembling the Balance

▶ Fit parts onto the balance as shown in the picture.

1. Shield plate
2. Pan support
3. Weighing pan
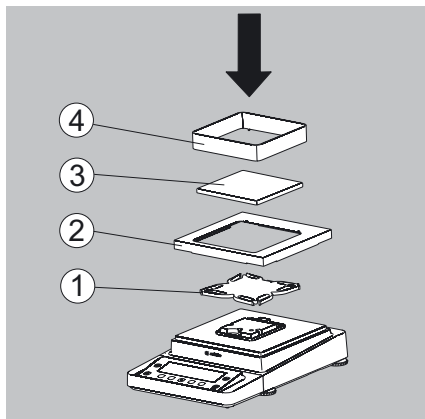
Assembly of Milligram Balances without Glass Draft Shield (DR Option):
Balance Assembly

▶ Fit all components listed below onto the balance in the order given:
1. Pan support (see also next section)
2. Shield plate
3. Weighing pan
4. Draft shield frame

▶ First insert the shield plate.
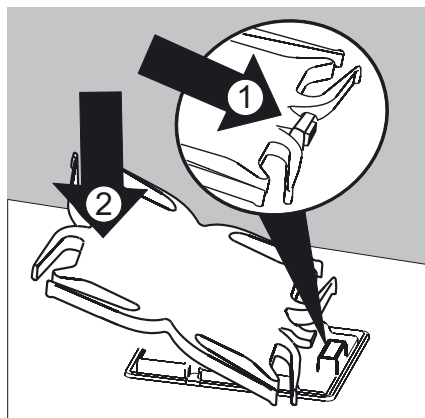
▶ Make sure the pin on the pan support is facing toward the front, and slide it under the clip on the pan retainer.

1. Insert the pan support.

▶ After inserting the pan support, press it down against the shield plate so that it lies flat.

⚠ Exercise caution to avoid pinching or crushing fingers.

2. Press down the pan support.

▶ Place the weighing pan on the pan support.

3. Weighing pan
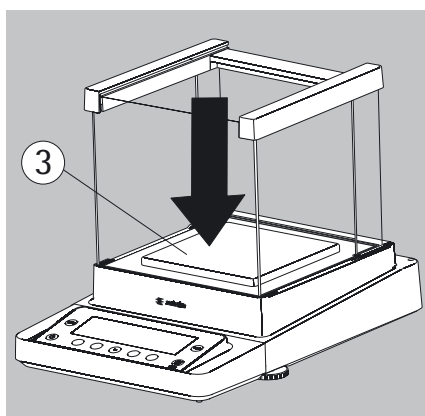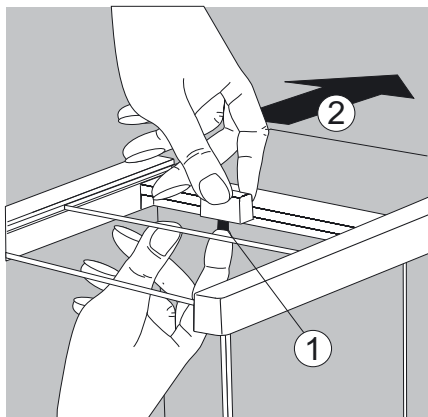
▶ Slide the upper draft shield panel into the guide rails from the rear while pressing the locking tab.
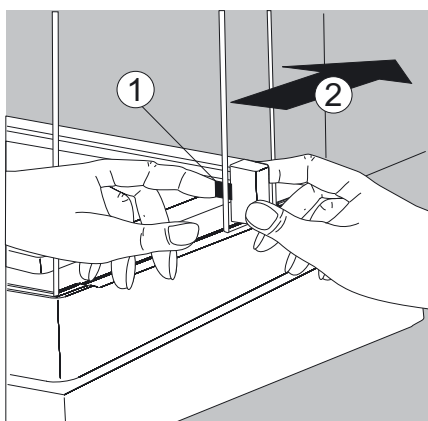
▶ Slide the side draft shield panel into the guide rails from the rear while pressing the locking tab.

▷ This completes the balance assembly.

▶ Remove the panel again if necessary

1. Press on the locking tab.
2. Remove the panel again if necessary

▶ Place the panel in the storage slot at the back of the balance.
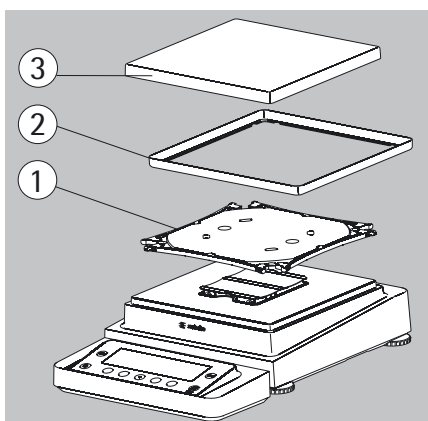
Assembly for Precision Balances without Draft Shield with a Weighing Range up to 15 kg

▶ Fit parts onto the balance as shown in the picture.

1. Pan support
2. Shield plate/Draft shield
3. Weighing pan
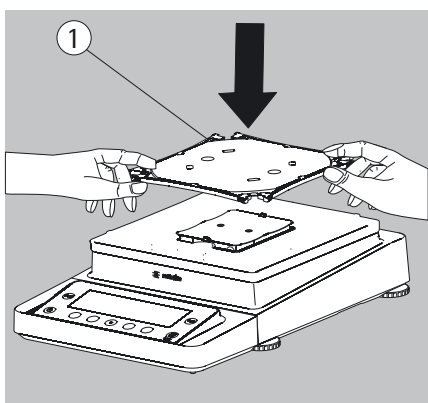
▶ Place the pan support diagonally and press down lightly.

1. Pan support
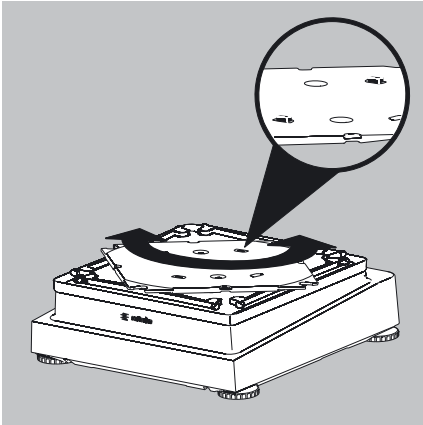
▶ Carefully turn the pan support clockwise until the two buttons engage. The pan support is now attached.
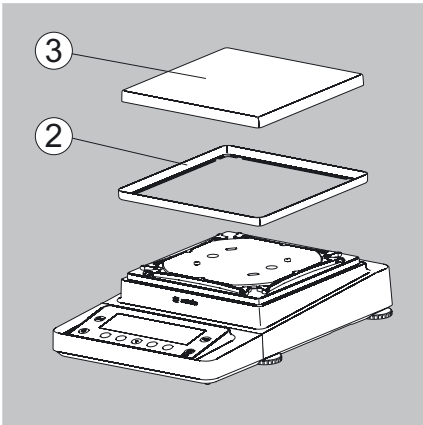
▶ **2.** Insert the shield plate/draft shield.

▶ **3.** Place the weighing pan on the pan support.

▷ This completes the balance assembly.
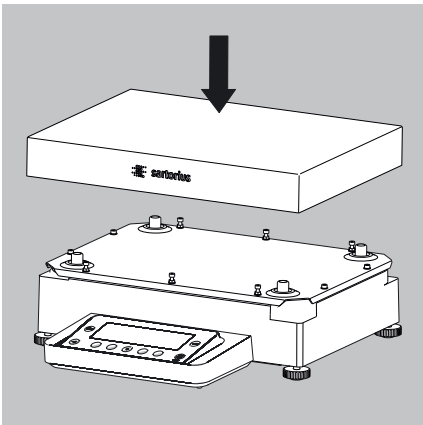
Models with a Weighing Range from 20 kg Upwards:

▶ Place the weighing pan on the balance.

MSE225..., MSx125:
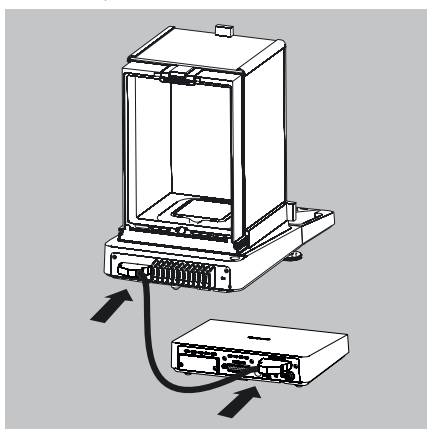
Connecting the Weigh Cell to the Electronics Module/Evaluation Unit

▶ Connect the weigh cell and electronics module using the connection cable. Make sure that the connectors click into place so that both ends are securely connected.

⚠ Please check the plug contacts to ensure a proper connection. There should be no tension on the connection cable. We therefore recommend placing the device close to the wall.

MSE6.6S/3.6P/2.7S:
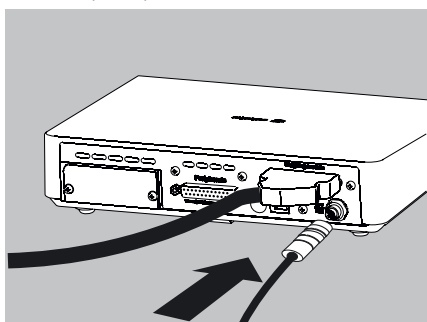
▶ Connecting the Weigh Cell to the Evaluation Unit Make sure that the connectors click into place so that the connection is secure.

⚠ Models with a separate electronics module (e.g. MSE6.6/3.6/2.7), MSE225S/P and MSE125P: Do not replace the electronics module. Replacing them with models from the ME/SE series, for example, can damage the device.

MSE6.6S/3.6P/2.7S:
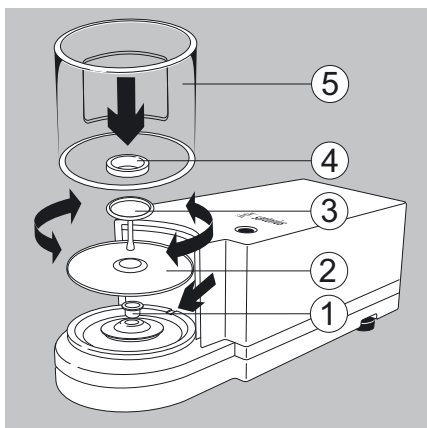
Microbalances (Models MSE6.6S/3.6P/2.7S):
Placing Components on the Weigh Cell
▶ Install the following parts in the order listed:

1. MSE2,7S models: bush
2. Shield plate
3. Weighing pan
   Note: After inserting the weighing pan, turn it slightly to the left and right, while pressing it down lightly.
4. Internal draft shield (for MSE2.7S only)
5. Draft shield: Center the hole over the pan (see arrows)

MSE6.6S-F/2.7S-F:
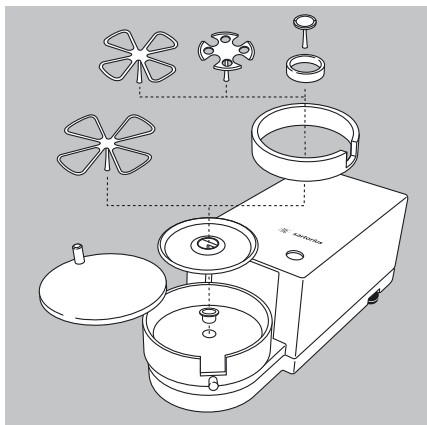
Filter Balances (Models MSE6.6S–F/2.7S–F):
Placing Components on the Weigh Cell
▶ Place the components listed below inside the weigh cell in the order given:
1. MSE2,7S-F models: female connector
2. Shield plate
3. Internal draft shield
4. Filter weighing pan ∅ 50 mm or weighing pan
   (optional filter weighing pan ∅ 75 mm or ∅ 90 mm)
   Note: After inserting the pan, turn it slightly to the left and right, while pressing it down lightly.
5. Draft shield cover

⚠ Tip: Turn the balance off and then on again after replacing the pan during operation.
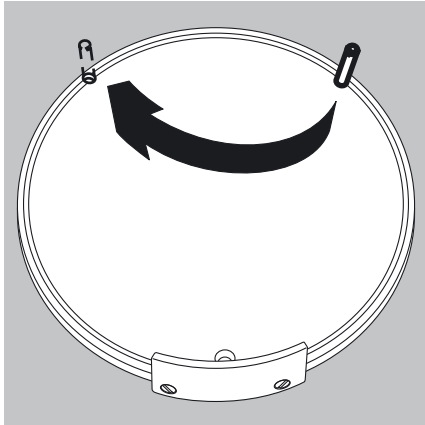
Setting up a filter weighing pan for left-handed users:

▶ Remove the draft shield cover

▶ Unscrew the pin and move from the right to the left side
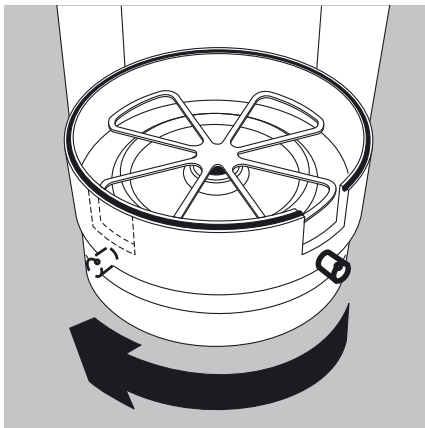
▶ Turn draft shield parts approx. 90 degrees to the left (loosen knurled screw)

Power Connection

▶ Check the voltage rating and plug design.

– Make sure that the voltage rating printed on the manufacturer's ID label is identical to that of your local line voltage.
– If the stated supply voltage or the plug design of the power cord does not comply with your country's standard, please inform the nearest Sartorius representative or your dealer.
– The power connection must be made in accordance with the regulations applicable in your country.
– In order to connect the equipment to the power supply (protection class 1), use a suitable, correctly installed wall outlet with a protective grounding conductor (PE) and a fuse of a maximum 16 A.
– If a main feeder from the ceiling is required or if installation of a CEE plug is necessary, these must be carried out by a qualified electrician.
– Only use original Sartorius AC adapters.
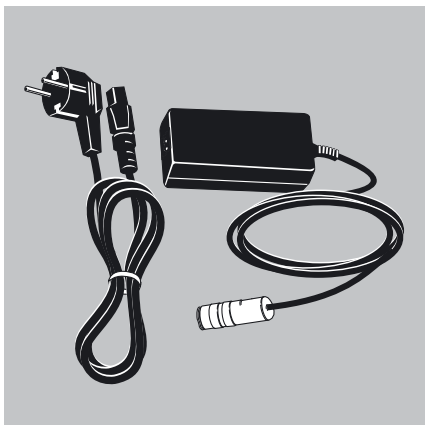
Transporting the Balance

Transporting the Device over Short Distances

⚠️ Exercise caution to avoid glass breakage.
Never lift and carry the balance by its draft shield.
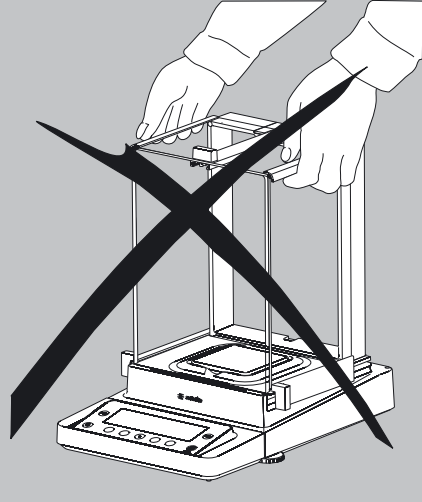
▶ Carry as shown in the illustration.
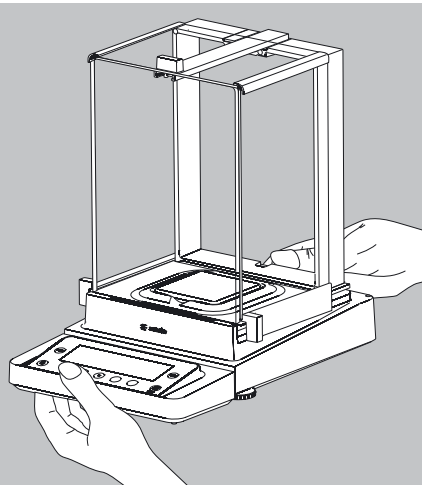
or

▶ Carry as shown in the illustration.
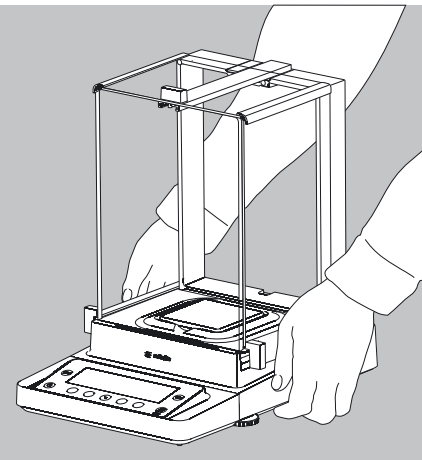
Storage and Shipping Conditions
– Permitted storage and shipping temperature: -10 to +60 °C
– Unpacked devices can lose their precision if subject to extreme vibrations.
– Excessive vibrations may compromise the safety of the equipment.
Save the packaging for any future storage or shipment of the balance.
Only the original packaging provides optimum protection for the equipment.
– Follow all warnings and safety precautions.
– Follow the instructions in the chapter: "Transporting the Balance."
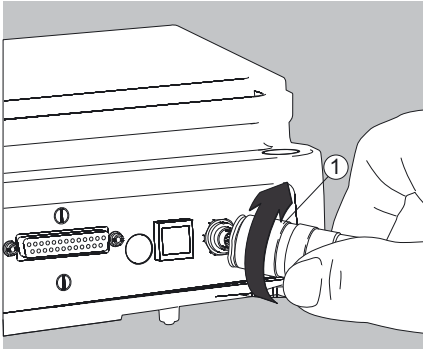
Analytical and precision balances:
1. Plug the DC supply cable of the AC adapter into the power socket of the balance and tighten the threaded fitting.
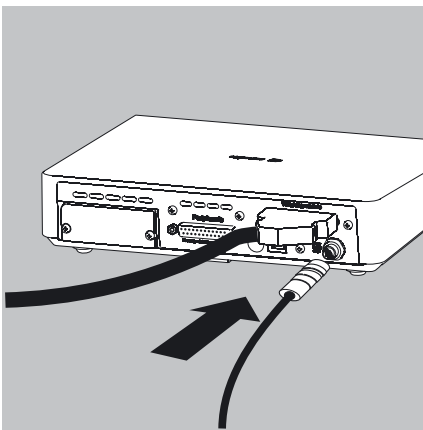
Balances with a readability of ≤ 0.01 mg
1. Plug the DC supply cable of the AC adapter into the power socket of the electronics module and tighten the threaded fitting.
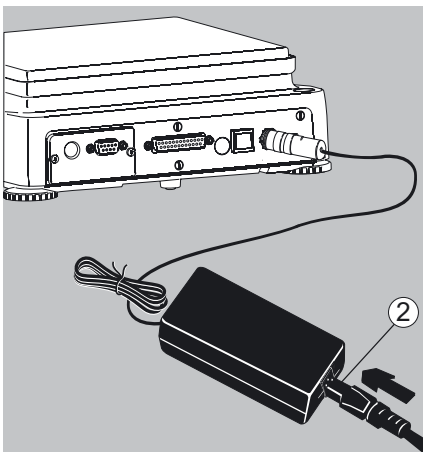
2. Plug the other end of the power cord into the AC adapter.

3. Insert the AC adapter power plug into the wall outlet.

▷ The balance is now ready to use.

Safety Precautions
The output line of the adapter has a terminal (GND) connected to the metal housing of the balance. The data port is also galvanically linked to the balance housing (GND).
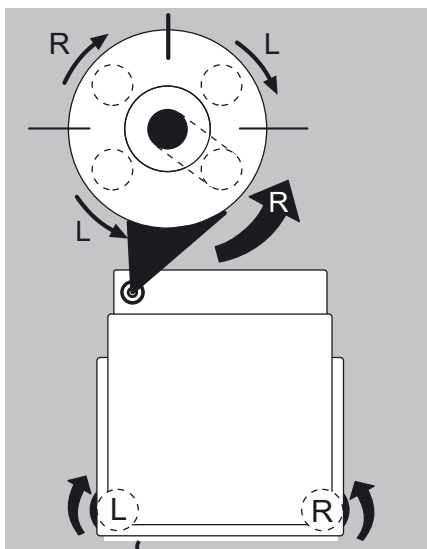
Leveling the Balance, Setting the Level Indicator

ℹ️ Leveling the balance compensates for slant or unevenness at the place of installation. The balance must be perfectly horizontal to ensure consistent, reproducible weighing results. All models are equipped with an electronic tilt angle detection feature. If the balance is not level, a warning symbol ◯ is shown on the display. Push-button automatic leveling is available on models with motorized leveling feet. For models with manual leveling feet, please follow the instructions on the display:

see "Leveling the Balance with the Inclination Sensor."

Leveling the Balance Manually

▶ The balance is leveled using both front leveling feet.
▶ Screw in both back leveling feet (only for models with back leveling feet).
▶ Turn the two front feet as shown in the illustration until the air bubble is centered within the circle of the level indicator.
▷ Normally, several leveling steps are required.

▶ Screw out both back leveling feet until they touch the setup surface (only for models with back leveling feet).
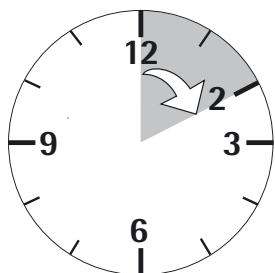
Warm–up Time

▷ In order to deliver the precise results described in the Technical Specifications, the balance must warm up for at least 30 minutes after initial connection to the power supply. Only after this time will the device have reached the required operating temperature.

M When a verified balance used in legal metrology (legal-for-trade applications) is connected to the power, it must warm up for at least two hours before operation.
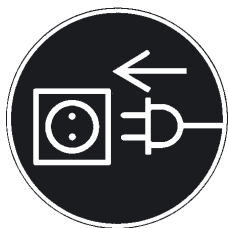
Connecting Electronic Devices (Peripherals)

▶ Make absolutely sure that the device is unplugged from the power supply before connecting/disconnecting any peripheral device (printer, scanner, PC) to or from the data port.

⚠ A device connected to the power supply should never be opened.
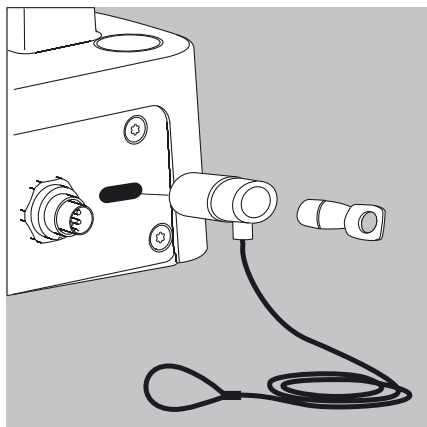
Anti-theft Locking Device (Accessory)

Balances with a readability of ≤ 0.01 mg
▶ An anti-theft locking device can be installed to the back of the balance if required.
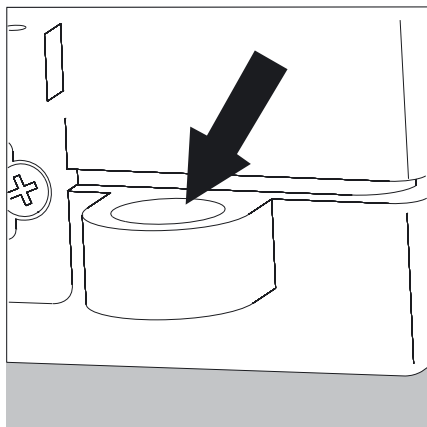
Balances with a readability of ≤ 1 µg
To fasten an antitheft locking device, use the lug located on the back of the weigh cell.
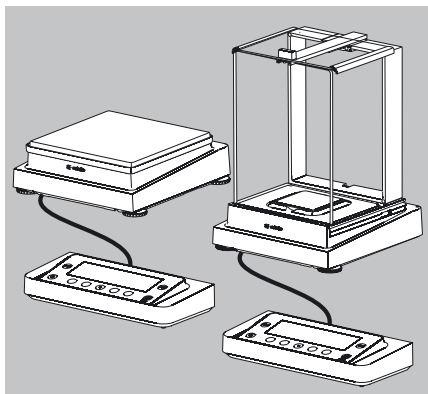
Modification Options

Setting Up the Display and Control Unit at the Place of Use

The display and control unit can be removed for all models to enable the operator to customize the work space.
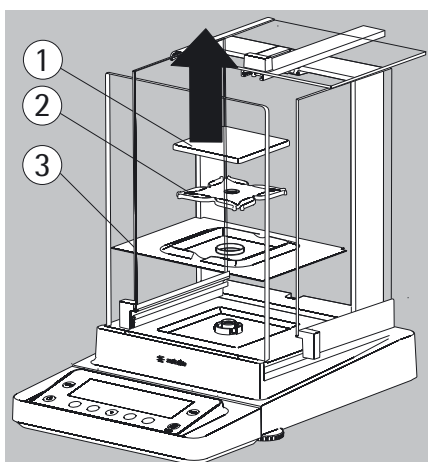
Removing the Retainer with the Display and Control Unit

▶ Remove all items (such as weights) from the draft shield.

▶ Carefully remove all parts as shown in the illustration.

1. Weighing pan
2. Pan support (not for MSE225... MSE125... models)
3. Shield plate/Draft shield

▶ Keep all parts in a safe place.
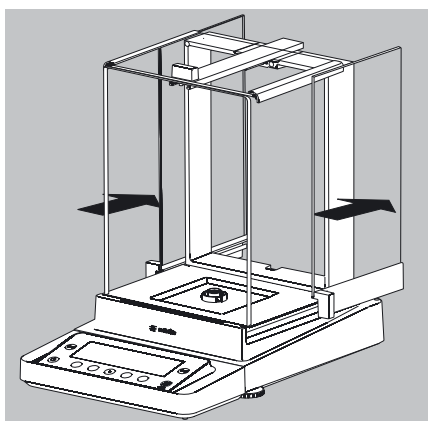
▶ Remove the panels (right and left).

Models with the analytical draft shield:
1. Press on the locking tab.
2. Remove the panel.

Models with the milligram draft shield:
1. Press on the locking tab.
2. Remove the panel.
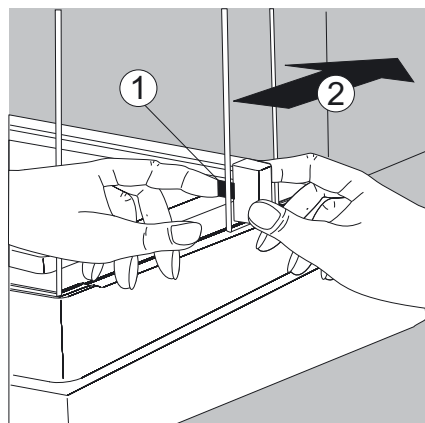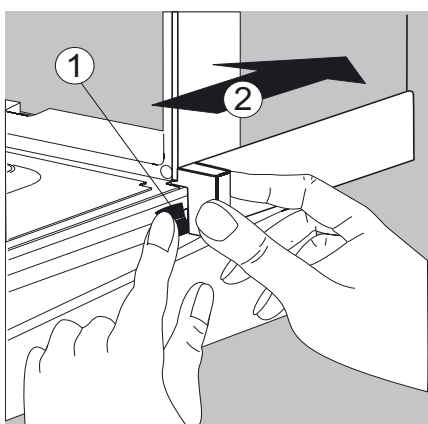
▶ Keep all parts in a safe place.
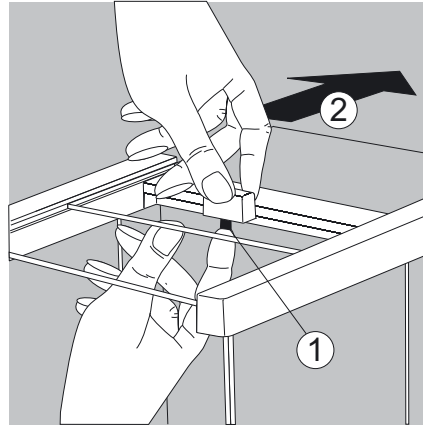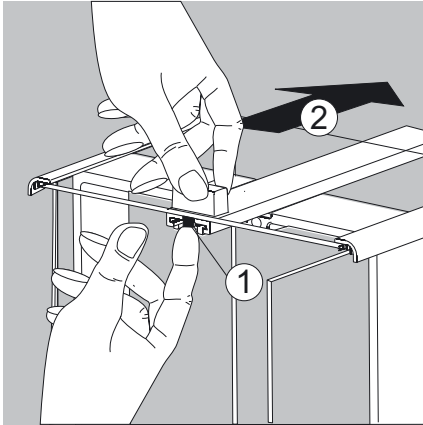
► Remove the upper draft shield panel.

Models with the analytical draft shield (left illustration).
1. Press on the locking tab.
2. Remove the panel.

Models with the milligram draft shield (right figure):
1. Press on the locking tab.
2. Remove the panel.

► Keep all parts in a safe place.

► Turn over the balance and place it on a soft surface.

⚠ Exercise caution to avoid breaking the glass on models with a draft shield.
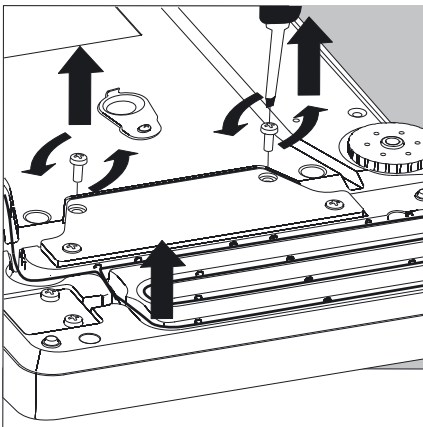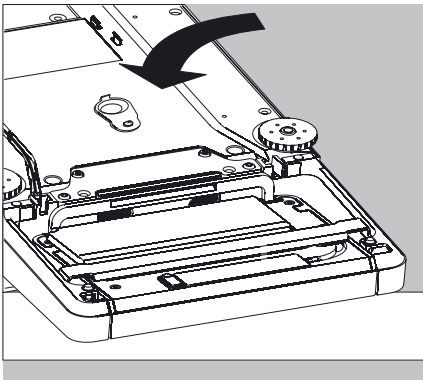
► Use a 2.5 mm Allen wrench to remove the two screws from the display and control unit retainer bracket.

► Remove the display and re-insert both screws back into their holes.

► Lengthen the cable and position the display and control unit as desired.

► Turn the balance over and place it on an even surface.
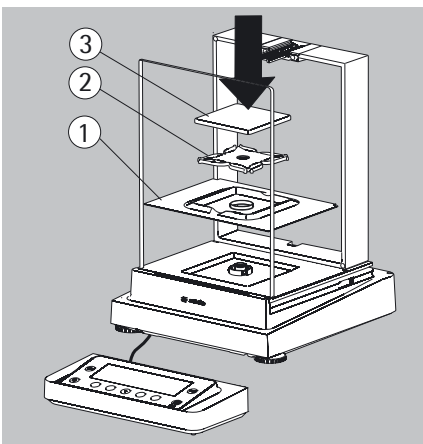
► Carefully place all parts on the balance:
1. Shield plate/Draft shield
2. Pan support (not for MSE225... /MSE125... models)
3. Weighing pan
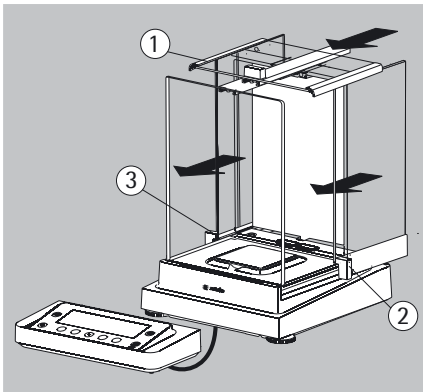
▶ Replace the upper and side shield panel.
1. Upper draft shield panel
2. Right draft shield panel
3. Left draft shield panel

▶ Level the balance.

ⓘ Leveling the balance compensates for slant or unevenness at the place of installation. The balance must be perfectly horizontal to ensure consistent, reproducible weighing results. All models are equipped with an electronic tilt angle detection feature.
If the balance is not level, a warning symbol is shown ◯ on the display. The display shows a graphical representation of a level indicator and text prompts that guide the user through the leveling process: see "Leveling the Balance with the Inclination Sensor."
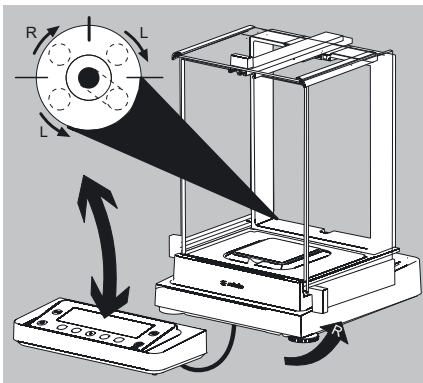
▶ The balance is leveled using both front leveling feet.

▶ Screw in both back leveling feet (only for models with back leveling feet).

▶ Turn the two front feet as shown in the illustration until the air bubble is centered within the circle of the level indicator.

▷ Normally, several leveling steps are required.

▶ Screw out both back leveling feet until they touch the setup surface (only for models with back leveling feet).
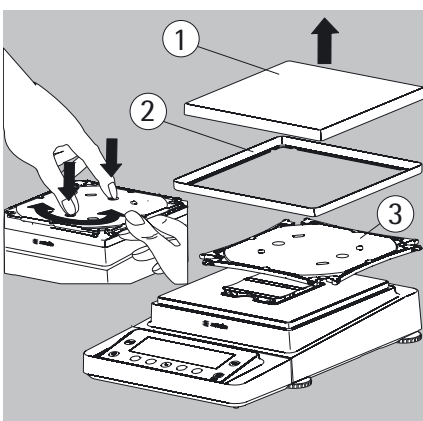
Removing the Display and Control Unit from Precision Balances without a Draft Shield and with a Weighing Range of up to 15 kg

▶ Carefully remove all parts as shown in the illustration.

1. Weighing pan
2. Shield plate/Draft shield
3. Pan support

▶ Keep all parts in a safe place.
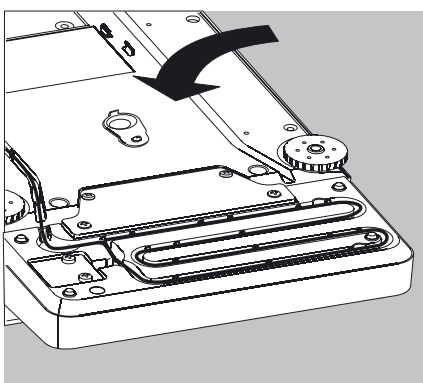
▶ Turn over the balance and place it on a soft surface.
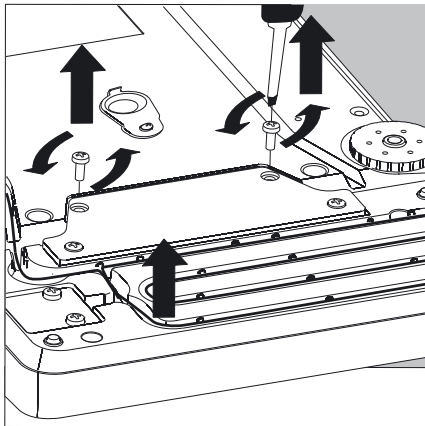
▶ Remove the two retaining screws.

▶ Remove the display and re-insert both screws back into their holes.

▶ Carefully pull the cable connected between the display and control unit from the retainer.
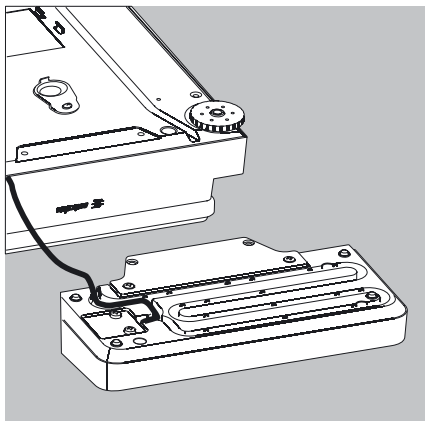
▶ Determine the required cable length.
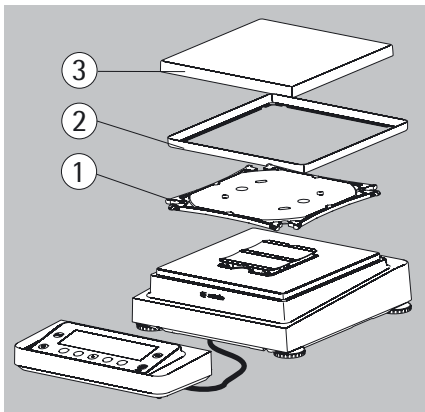
▶ Return the balance to an upright position and fit the parts onto the balance.

1. Attach the pan support.

2. Shield disk (only for models with a readability of 10 mg)

3. Weighing pan

▶ Level the balance.
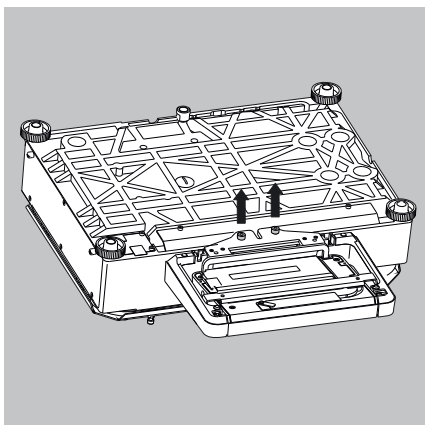
Removing the Display and Control Unit from Models with a Weighing Range of 20 kg or more

⚠ Remove the weighing pan before unscrewing the control unit so that the weighing pan does not fall and cause injury.

▶ Turn over the balance so that the pan side is facing down.
▶ Remove the two fixing screws using a screwdriver.
▶ Remove the control unit and re-insert both screws into their holes.
▶ Carefully remove the connection cable from its holder.
▷ Long connection cables should only be installed by a Sartorius technician.

Semi-microbalances: Attaching the Display and Control Unit to the Electronics Module (MSE225..., MSE125... models)

The display and control unit can also be attached to the electronics module if required for operation.
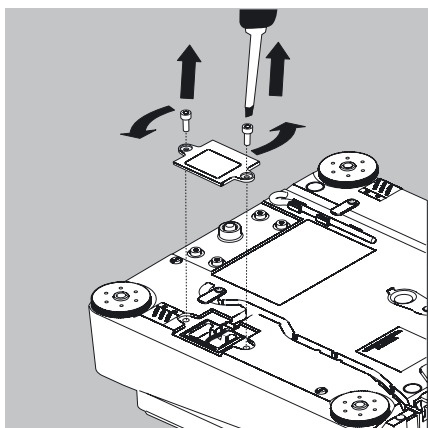
▶ Turn over the balance and place it on a soft surface.

Remove the connection cable from the cable channel:
▶ Remove two screws from beneath the weigh cell and detach the plate.
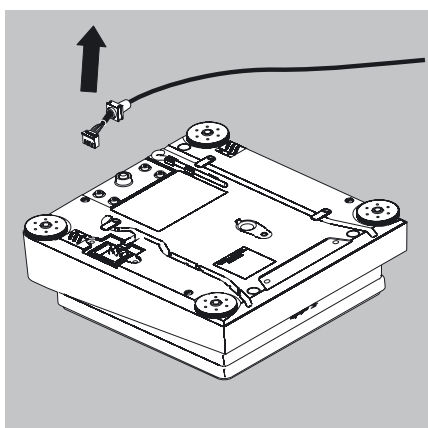
▶ Remove the connection cable plug.

▶ Then reattach the plate to the slot.
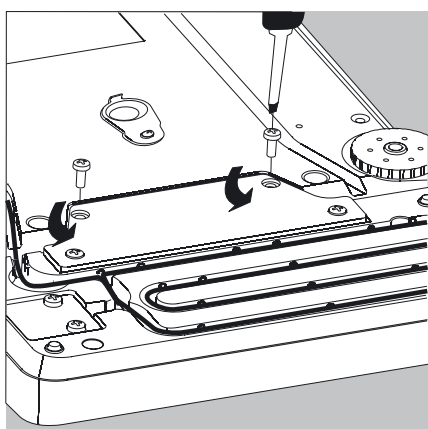
▶ Remove the display and control unit from the weigh cell:
  Remove two retaining screws.

▶ Remove the display and control unit.
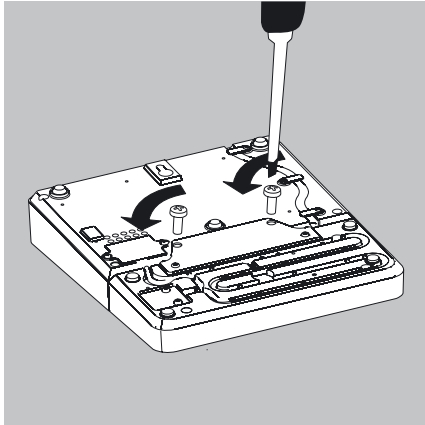
► Attach the display and control unit to the electronics module:
Reattach the two retaining screws.
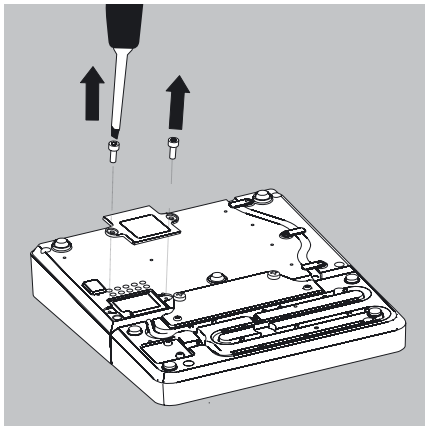
Open the slot for the connection cable on the electronics module:
► Remove the screws from beneath the electronics module and detach the plate.
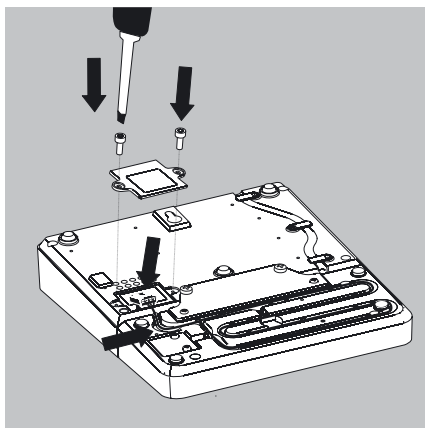
Connect the display and control unit to the electronics module:
► Plug in the connection cable.

► Then reattach the plate to the slot.

► Slide the cable that sticks out into the cable channel.
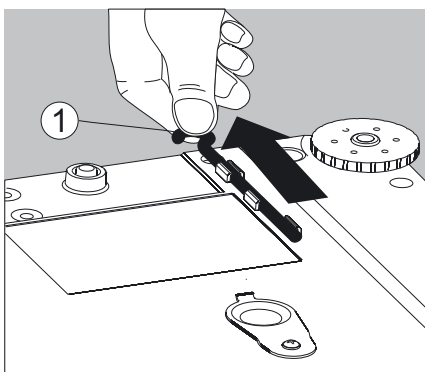
Preparing Below–Cell Weighing

Balances with a readability of ≥ 0,01 mg:
A port for a below-cell weighing hook is located on the bottom of the balance.

Analysis and Precision Balances with a Weighing Range up to 15 kg:

1. Remove the hook for below-cell weighing from the clip on the bottom of the balance.
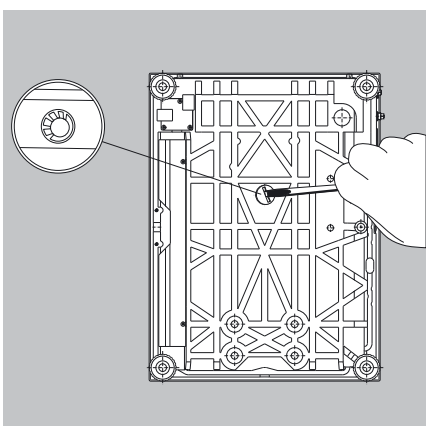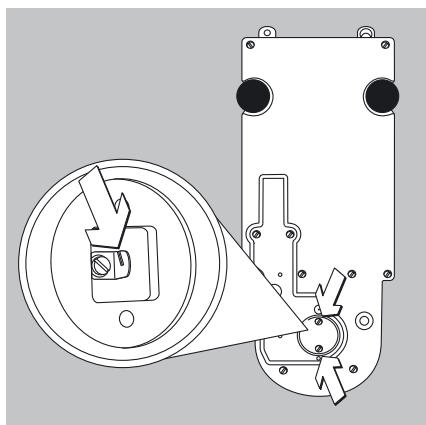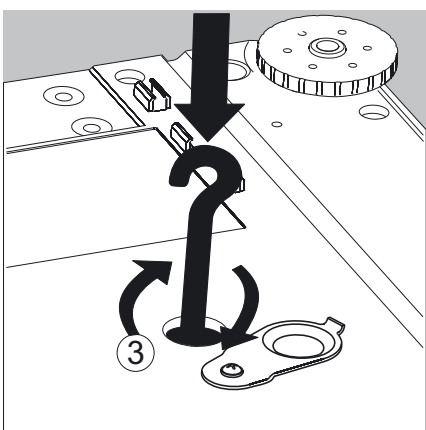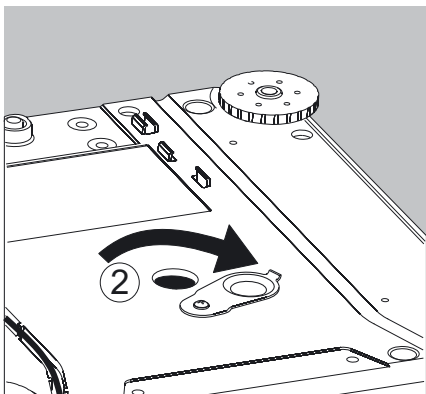
2. Push the cover of the below-cell weighing port to one side.

3. Carefully screw on the below-cell weighing hook.

⚠️ Do not screw it in too tightly, as this could damage the thread or the balance.

ℹ️ Install a draft protection shield.

▶ Attach the sample (e.g., using a suspension wire) to the hook.

4. When weighing has been completed, unscrew the hook and return it to the clip.

▶ Close the cover of the below-cell weighing port.

Balances with a readability of ≤ 1 μg
▶ Remove both screws from beneath the weigh cell and detach the cover plate.

▶ Attach a wire, for example, to the sample and hang it on the notched hook.

ℹ️ Install a draft protection shield.

Balances with a Weighing Range of 20 kg or more:
▶ Use a suitable screwdriver to unscrew the cover plate from the bottom of the balance.

▶ Request the hook directly from Sartorius. The hook is available as an accessory.

ℹ️ Install a draft protection shield.

M The below-cell weighing port may not be opened or used on balances used for legal metrology.
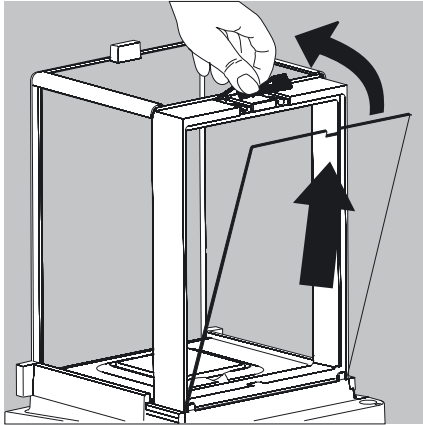
Using the Cable Opening of the Manual Analytical Balance Draft Shield

Models with a manual analytical draft shield have an opening for passing a cable (for example, for a temperature sensor) through to the interior of the weighing chamber.

1. Lift the locking tab on the rear panel of the analytical draft shield.

2. Lift the panel out of the draft shield.
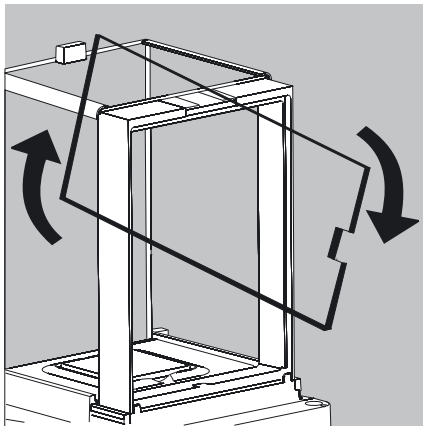
▶ Turn the panel clockwise 180° so that the opening is at the bottom.
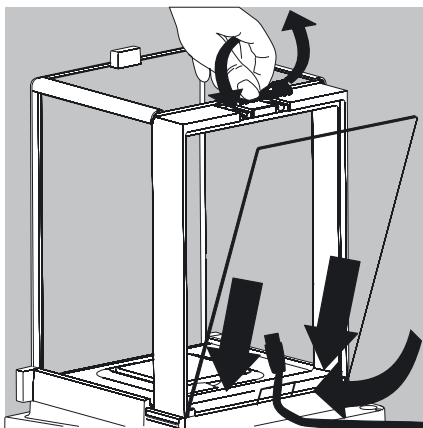
▶ Install the desired sensor.

▶ Insert the panel in the guide rail.
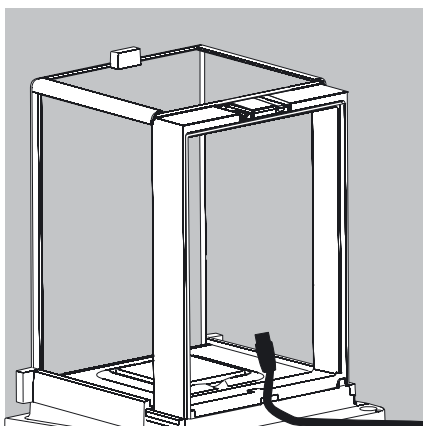
▶ Lift the locking tab and gently press the panel into position.

▶ Press the locking tab down and close it.

▶ You can now begin weighing.

Operation
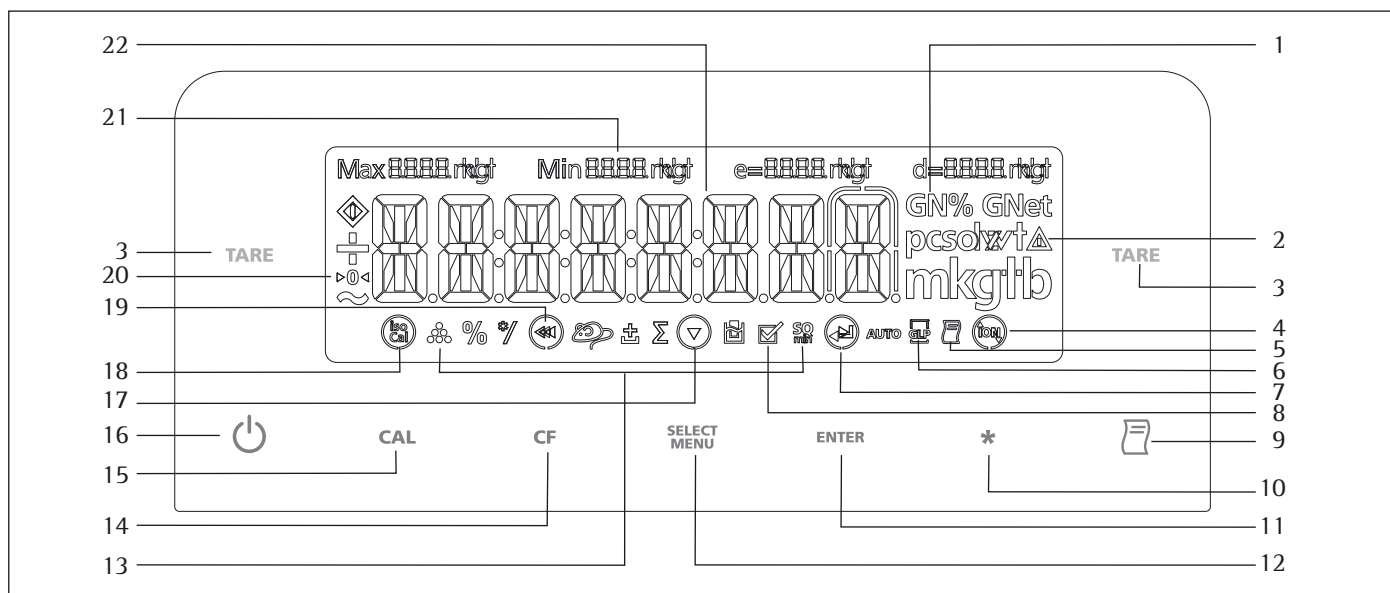
Overview of Display and Control Panel

Position	Description
1	Weight units
2	Calculated-value indicator: not a weight value
3	Tare
4	◯ symbol flashes: Balance is not level, leveling is required; ⓘ: open/close draft shield using key (✳); ⓘₒₙ: ionizer active
5	Symbol for "Printing mode active"
6	Symbol for "GLP printing mode active"
8	Symbol for "Application program active"
9	Data output: Press this key to send readout values to the built-in data interfaces.
10	Level balance, open/close draft shield or turn on/off ionizer
11	Start an application program
12	Select an application program ⎸ Access the menu
13	Symbols for an active application (⸭⸭, %, 🐁, ⊥, ✳⁄, 🗒, SQ min)

Position	Description
14	Clear Function This key is generally used to cancel functions: – Quit application program – Cancel calibration/adjustment routine ⎸ Exit the menu – GLP-compliant printout
15	Start the calibration process
16	On/off Key
18	Display: "isoCAL:" Calibration/adjustment function
20	Symbols for zero range (verified models only)
21	Metrological Data
22	Weight value displayed in selected weight unit
	Symbol:
19	◀◀ Exit the menu
19	◀ Select previous menu level
17	▼ Select menu item
7	▶ Select next item in current menu level
7	↵ Confirm menu item

Basic Weighing Function

Features
– Tare the balance
– Print weight value

M	**Using a verified balance in legal metrology:** The Type-Approval Certificate for verified balances is only valid for non-automatic weighing instruments. For automatic operation with or without additional, integrated equipment, please follow the applicable national regulations for the installation location.

● Before use in legal metrology, the balance should be adjusted via the internal motorized calibration weight at the installation location:
see the "Calibration and Adjustment" section in this chapter.

○ The temperature range (°C) listed on the ID label should not be exceeded during operation.

Example:
MSX
Ⅱ
+10/+30°C
+5°C/+40°C isoCAL
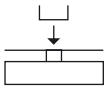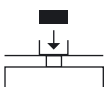
Preparation
● Turn balance on: Press the (⏻) key
● Level the balance if required
● Tare the balance if necessary: Press the (**TARE**) key

○ If necessary, change the configuration settings: see "Configuration"
○ If desired, load the factory settings: see "Configuration"

Additional functions:
○ Turn balance off: Press the (⏻) key

Quick Guide: First Weighing

	Step	Press key	Display/Printout
1.	Turn balance on Self-test runs. Then the balance performs an automatic initial tare.	(⏻)	0.0 g
2.	Place container on weighing pan (in this example : 11.5 g). Close the draft shield (if available).		+ 11.5 g
3.	Tare the balance The balance is tared and the displayed value is zero.	(**TARE**)	0.0 g
4.	If required, open the draft shield and carefully place the sample in the container on the weighing pan - in this example : 132 g. Close the draft shield (if available). You can read the measured value as soon as the weight value stops changing and the unit is displayed.		+ 132.0 g
5.	Print weight value	(🖶)	N + 132.0 g

Level the Balance (Q–Level)

It is essential for exact weighing results that the balance is absolutely level. The front leveling feet can be used to level out small tilts in the floor. An integrated sensor detects the alignment of the balance and triggers a warning message when leveling is required. When "○" flashes on the display, you must level the balance.

Leveling with the inclination sensor:

Step	Press key	Display
1. ○ flashes on the display:		○ flashes
Start leveling.	(✱)	*SCREW IN*
2. Fully screw in both back leveling feet (depends on the model) and confirm.	(✱)	*⌄▴TURN▴⌄*
3. Directional arrow on the right of TURN: Turn right leveling foot.		*TURN⌄▴*
Directional arrow on the left of TURN: Turn left leveling foot.		*▴⌄TURN*
Directional arrow ▴⌄: Turn the respective leveling foot to the right until the directional arrow disappears.		
Directional arrow ⌄▴: Turn the respective leveling foot to the left until the directional arrow disappears.		*SCREW OUT*
4. Screw out both back leveling feet (depends on the model) until they touch the setup surface.	(✱)	*0.0*g

Leveling the balance with motorized leveling feet (optional):

▶ To start the leveling function, press the (✱) key.　　　○ flashes
　　　　　　　　　　　　　　　　　　　　　　　　　　　　AUT.LEV

▷ You can continue when the balance displays a weight value.

⚠ Each time the balance is leveled, the balance must be **calibrated/adjusted** (see **Calibrating/Adjusting the Balance**).

Turning the ionizer on/off (optional)

Purpose: The electrostatically charged weighing sample is neutralized as much as possible in the air flow of the ionizer.
If your balance is equipped with an ionizer module, you can use the (✱) key to turn the ionizer on/off.

Preparation
▶ Set the intensity of the ionization in the menu.
　Menu setting: *EXTRAS: DEVICE: IONISAT.*: ***Off**, **Soft intensity**, **Normal intensity** or **Strong intensity**

Opening and closing the motorized draft shield (optional)

(✱)

If your balance is equipped with a motorized draft shield, you can use the (✱) key to open and close the draft shield doors.

Models with the analytical draft shield:
The (✱) key can be set, for example, so that it opens and closes the right and top door (for right-handed people). The opening width (entirely or partially) of the sliding panels can also be defined. You can configure these settings manually on the draft shield itself (see next section "Learning Function" below).

Assigning Opening Functions to the (✱) **Key (Learning Function)**
The balance must be turned on.
▶ Close all draft shield doors.
▶ Manually operate the door you want to assign to the (✱) key: Push the right door open as far as you want it to opened (entirely or partially).
▶ Press the (✱) key.
▷ The door will close again. Now you have configured the (✱) key so that, when pressed, it opens or closes the right door.
▶ Proceed in the same way to configure the left door.

ⓘ Using the same method, you can assign the upper door to this key. You can also configure one key to move both doors by manually opening both doors during setup before pressing the (✱) key.
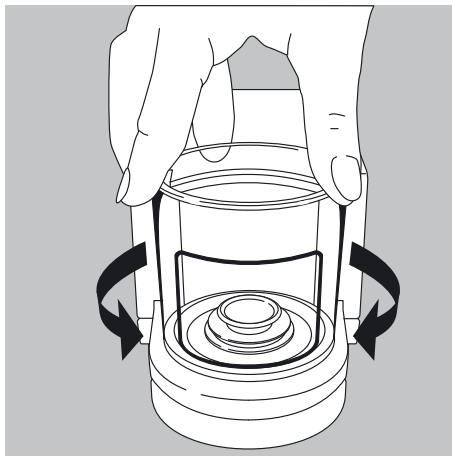
Models with a rotation draft shield (MSx6.6S/3.6P/2.7S):

▶ Set the opening width: manually select the desired opening angle

▶ 1) Open to the previously selected opening angle:
    Press the (✱) key

   2) Close: Press the (✱) key
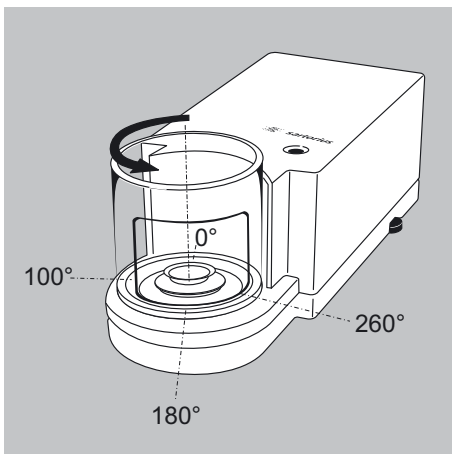
Calibration and Adjustment

Purpose
Adjustment is the correction of the difference between the measured value displayed and the true weight of a sample, or the reduction of the difference to an allowable level within maximum permissible error limits.

M Using a verified balance in legal metrology:
Before use in legal metrology, the "internal calibration" function should be carried out at the installation location.

Features
The adjustment procedure should only be started when
– The balance is unloaded
– The balance is tared
– The weighing signal is stable

– The sensitivity of the balance can be corrected a max. of 2%.
– Adjustment with a Sartorius density determination kit YDK... is possible.
– Balances with motorized leveling feet are leveled automatically prior to each new calibration/adjustment (menu setting: DEVICE:EXTRAS:LEVEL:AUTO.)

If these settings are not made, the error message "ERR 02" appears.

Adjustment can be made using different weight units:
CAL.UNIT - GRAMS, KILOGR (not for verified models)

– You can also configure the mass comparator to perform calibration/adjustment automatically (isoCAL), when the preset time or temperature limit has been exceeded.

M **External calibration for verified balances of accuracy class** Ⓘ
– When the balance is used in legal metrology, external calibration is blocked as follows:
– The menu access switch is locked
– The menu access switch cap is sealed

To block calibration/adjustment:
– Select CAL./ADJ. - BLOCKED
– Close the menu access switch on the back of the balance

Calibration and adjustment results can be printed in an ISO/GLP-compliant printout: settings and printout templates are listed starting on page 62.

Application parameters are deleted after calibration/adjustment.

Internal Calibration
In the operating menu, select CAL./ADJ.-CAL.INT..
The balance housing has a built-in motorized calibration weight.
● Select Calibration/Adjustment: Press the (CAL) key
> The internal calibration weight is loaded automatically
> The balance is adjusted
> The internal calibration weight is removed
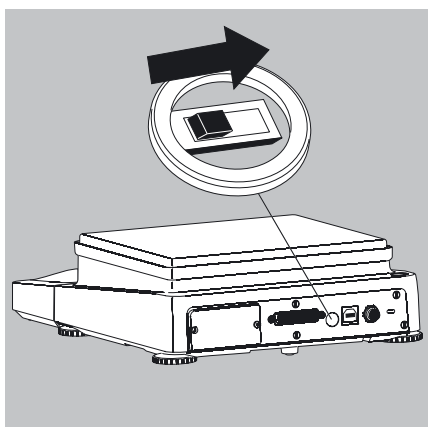
isoCAL*: automatic calibration and adjustment
In the operating menu, select ISOCAL-ON.
The balance will automatically display a flashing "isoCAL" character whenever the ambient temperature has changed since the last calibration|adjustment or a time interval has been exceeded.
The balance wants to perform an automatic adjustment.

The automatic internal calibration and adjustment prompt is activated when the following conditions have been met
– Temperature change or time interval is higher than listed in the table below
– The load has not changed within the last 2 minutes
– The balance has not been operated within the last 2 minutes
– The load may not exceed 2% of the maximum capacity.

The following appears when the requirements are met
1. The "isoCal" symbol flashes
2. CAL.INT. appears in the measured value line

In the Setup menu, you can configure the balance so that it displays an adjustment prompt, but does not perform the calibration and adjustment functions automatically. (menu item NOTE).

M **isoCAL is turned off on verified models:**
the balance can only be used for legal-for-trade applications within a limited temperature range.
– Balance of accuracy class ①: +15°C to +25°C
– Balance of accuracy class ②: +10°C to +30°C

The fully automatic adjustment function is triggered by the following criteria:

Model	When the temperature changes by	After a time interval of
MSE6.6..., MSE3.6P, MSE2.7..., MSE225S, MSE225P, MSE125P, MSE324S, MSE224S, MSE324P, MSE124S, MSE3203P, MSE2203S, MSE2203P, MSE1203P	1.5 °C	4 h
MSE623S, MSE623P, MSE323S, MSE10202S, MSE8202S, MSE6202P, MSE4202S, MSE70201S, MSE36201S, MSE36201P, MSE20201S, MSE70200S, MSE36200S	2 °C	6 h
MSE2202S, MSE1202P	4 °C	12 h
MSE8201S, MSE5201S	4 °C	24 h

These criteria are also set on the corresponding verified models (models MSE...-0CE).

Internal Calibration/Adjustment

Configuration:
SETUP – BAL.SCAL – CAL./ADJ. – CAL.INT.

The balance housing has a built-in calibration/adjustment weight.

● Select Calibration/Adjustment: (CAL) key

> The internal calibration weight is automatically loaded
> The balance is calibrated
> When the setup is configured to "Calibration and adjustment in one," the balance will be adjusted automatically
> The internal calibration weight is removed

Performing Calibration and Adjustment Routines
The following settings can be configured:
– Always perform calibration and adjustment in one routine (factory setting)
– After calibration, the user has the option to quit the routine without correction or to adjust the balance

If no deviations are found during calibration, the calibration/adjustment routine can be exited after the calibration is completed.
Two keys are now active:

– The (CAL) key for initiating the adjustment routine
– The (CF) key for exiting the routine

Step	Key	Display/Printout
1. Tare the balance	(**TARE**)	*0.0* g
2. Start the calibration process	(**CAL**)	*CAL.INT.*
Internal weight is applied automatically		*CAL.RUN.*
3. Calibration/Adjustment executed		*CAL.END*
4. The internal weight is removed		*0.0* g

External Calibration

Configuration:
SETUP – BAL.SCAL – CAL./ADJ. – CAL.EXT.
The balance has a factory-set calibration weight value (see "Specifications").

Step	Key	Display/Printout
1. Tare the balance	(**TARE**)	*0.0* g
2. Start the calibration process	(**CAL**)	*CAL.EXT.*
Once you store the zero point, the display prompts for the required calibration weight (flashing display).		*– 5000.0* g
3. Place displayed calibration weight on balance (in this example: 5000 g). Weight too low: a minus sign "-" is shown Weight too high: a plus sign "+" is shown		*5000.0* g
The display stops flashing as soon as the weight value is within the defined limit.		
4. Calibration/Adjustment executed; then the calibration weight value is displayed		*CAL.END*
		+ 5000.0 g
5. Remove calibration weight		*0.0* g
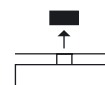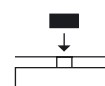
Configuration (Operating Menu)

You can configure the balance; i.e., adapt it to individual requirements.

Functions of the Keys in the Menu:

Symbol displayed	Key	Function
▼	(SELECT/MENU)	Scroll through menu items
▶	(ENTER)	Select next item on current menu level (use right cursor to scroll through up to 4 menu levels)
↵	(ENTER)	Confirm menu item
	(CF) (Press and hold)	Save settings and exit menu from any position
◀◀	(CF)	Save settings and exit menu
◀	(CF)	Select previous menu level (left cursor)
2. 3. 1. 1		Indicates menu level

Menu Navigation
Example: Setting the Language

	Step	Press key	Display/Printout
1.	**Open the menu**: Display the 1st menu item in the weighing mode	(SELECT/MENU) Hold	APPLIC.
2.	Scroll upward within the menu level; After the last menu code, the first code is displayed again (scroll)	Press repeatedly (SELECT/MENU)	INPUT ... LANGUAGE
3.	Select next menu level (scrolls to the right)	Press repeatedly (ENTER)	ENGLISH o
5.	**Change setting:** Select the menu item by scrolling up	(SELECT/MENU)	ENGLISH
6.	**Confirm setting**; "o" indicates the menu item you have set	(ENTER)	ENGLISH o
7.	Go back to the previous menu level (from menu level 4)	(CF)	LANGUAGE
○	If required, select further menu items (SELECT/MENU), (ENTER)		
8.	**Save setting** and exit the menu	Press repeatedly (CF)	
>	Restart your application		0.0 g

Menu Structure (Overview)

Level 1	Level 2	Level 3	Info about Menu Level
1) SETUP	BAL.SCAL. Balance parameters	AMBIENT conditions	1. 1. 1.
		APP.FILT. Application filter	1. 1. 2.
		STAB.RNG. Stability range	1. 1. 3.
		STABIL.DLY. STABILITY delay	1. 1. 4.
		TARE [1])	1. 1. 5.
		AUTOZER. Auto zero	1. 1. 6.
		WT.UNIT Basic weight unit	1. 1. 7.
		DISP.DIG. Display accuracy [1])	1. 1. 8.
		CAL./ADJ. Function of the (CAL) key	1. 1. 9.
		CAL.ROUTINE	1. 1. 10.
		ZERO.RNG. Zero range	1. 1. 11.
		INIT.ZERO Zero at Power On	1. 1. 12.
		ON.TARE Tare/zero at Power On	1. 1. 13.
		CYC.RATE Output rate	1. 1. 14.
		ISOCAL Autom. calibration/adjustment	1. 1. 15.
		EXT.CAL. External adjustment	1. 1. 16.
		CAL.UNIT Weight unit for calibration [1])	1. 1. 17.
	GEN.SERV. General Service	MEN.RESET Factory settings	1. 9. 1.
2) DEVICE	EXTRAS (Additional functions)	MENU Menu read only/can edit	2. 1. 1.
		SIGNAL Acoustic Signal	2. 1. 2.
		KEYS (Keypad)	2. 1. 3.
		EXT.KEY External switch function	2. 1. 4.
		ON.MODE Power-on mode	2. 1. 6.
		DR.SHIELD	2. 1. 9.
		RE.DR.SH Resolution, draft shield open	2. 1. 10.
		IONIZER	2. 1. 11.
		LEVEL	2. 1. 12.
		LEVELING	2. 1. 13.
	PERIPHER. (25-pin "Peripherals" interface)	DAT.REC. Communication mode	2. 2. 1./2. 3. 1.
		BAUD rate	2. 2. 2./2. 3. 2.
		PARITY Parity	2. 2. 3./2. 3. 3.
	PC-USB (USB port "PC")	STOP.BIT Number of stop bits	2. 2. 4./2. 3. 4.
		HANDSHK. Handshake mode	2. 2. 5./2. 3. 5.
		DATA.BIT Number of data bits	2. 2. 6./2. 3. 6.
3) DATA.OUT (data output	COM.SBI (PC communication)	COMmunications OUTput	3. 1. 1.
		STOP automatic output	3. 1. 2.
		AUT.CYCL. Time-dependent automatic data output	3. 1. 3.
		FORMAT (Line format)	3. 1. 4.
		AUTO.TARE Autom. taring after data output	3. 1. 5.
	PRINT.PARA for printing	RES.olution (manual/automatic)	3. 2. 1.
		FORMAT Line format for printout	3. 2. 2.
		PRT.INIT. Printout of appl. parameters	3. 2. 3.
		GLP ISO/GLP-compliant printout	3. 2. 4.
		TAR./PRT. Tare bal./scale after ind. print	3. 2. 5.
		TIME: 12h/24h	3. 2. 6.
		DATE format	3. 2. 7.
4) APPLIC. Application programs	WEIGH		4. 1.
	UNIT Toggle		4. 2.
	COUNTING	RESOLUT.	4. 3. 1.
		REF.UPDT. Automatic Reference updating	4. 3. 2.
	PERCENT weighing	DEC.PLCS Decimal places	4. 4. 1.
	NET.TOT. Net total	COMP.PRT. Printout of components	4. 5. 1.
	TOTAL Totalizing	COMP.PRT. Printout of components	4. 6. 1.
	ANIMALW. Animal weighing	ACTIVITY. Animal activity	4. 7. 1.
		START	4. 7. 2.
	CALC. Calculation	METHOD (Operator)	4. 8. 1.
		DEC.PLCS Decimal places	4. 8. 2.
	DENSITY determination	DEC.PLCS Decimal places	4. 9. 1.
5) INPUT Input	ID. ID input; max. 7 characters		5. 1.
	DATE Set date		5. 2.
	TIME Set time		5. 3.
	PASSWORD Password entry (for Service)		5. 4.
	CAL.WT.. Enter weight value		5. 5.
6) INFO Information	VERSION, SER.NR., MODEL, LObS, KDC VERS, DR.SHIELD, if OPT.MOD	Display software version, serial no., model	6. 1. to 6. 6.
7) LANGUAGE (LANGUAGE)	ENGLISH (factory setting)		7. 1.
	DEUTSCH (German)		7. 2.
	FRANC.çais (French)		7. 3.
	ITAL.iano (Italian)		7. 4.
	ESPANOL (Spanish)		7. 5.
	PYCCKИЙ (Russian)		7. 6.
	POLSKI (Polish)		7. 7.
8) OPT.MOD (optional interface)			8. 1. to 8. 6.

[1]) Not available on balances verified for use in legal metrology

Parameter Settings: Overview
o = Factory setting √ = User-defined setting

Level 1	Level 2	Level 3		Level 4	Info about Menu Level
1) *SETUP*	*BAL.SCAL.* Balance parameters	*AMBIENT* conditions (adapt filter)	o	*V.STABLE* Very stable	1. 1. 1. 1
				STABLE	1. 1. 1. 2
				UNSTABL	1. 1. 1. 3
				V.UNSTBL. Very unstable	1. 1. 1. 4
		APP.FILT. Application filter	o	*FINAL.RD.* Final readout mode	1. 1. 2. 1
				FILLING Filling mode	1. 1. 2. 2
				REDUC. Reduced	1. 1. 2. 3
				OFF	1. 1. 2. 4
		STAB.RNG. Stability range		*MAX.ACC.* Maximum accuracy	1. 1. 3. 1
				V.ACC.	1. 1. 3. 2
			o	*ACC.*	1. 1. 3. 3
				FAST	1. 1. 3. 4
				V.FAST.	1. 1. 3. 5
				MAX.FAST [1])	1. 1. 3. 6
		ST.DEL. Delay		*NO*	1. 1. 4. 1
			o	*SHORT*	1. 1. 4. 2
				AVERG.	1. 1. 4. 3
				LONG	1. 1. 4. 4
		TARE [1])		*WIOSTB.* W/o stability	1. 1. 5. 1
			o	*WISTB.* After stability	1. 1. 5. 2
				ATSTAB. At stability	1. 1. 5. 3
		AUT.ZERO Auto zero		*OFF*	1. 1. 6. 1
			o	*ON*	1. 1. 6. 2
		WT.UNIT Basic weight unit		For list of units, see "Toggling Between Weight Units"	1. 1. 7. 1 to 1. 1. 7.24
		DISP.DIG. [1]) Display accuracy	o	*ALL*	1. 1. 8. 1
				LP.ON.OFF (last digit after load change)	1. 1. 8. 2
				DIV.1 1 interval	1. 1. 8. 6
				MINUS 1 Reduced by 1 digit	1. 1. 8. 7
		CAL./ADJ. Function of (**CAL**) key		*EXT.CAL.* External calibration with standard weight[2])	1. 1. 9. 1
				E.CAL.USR. External calibr./adjustment with user-defined weight[2])	1. 1. 9. 3
			o	*CAL.INT.* Internal calibration	1. 1. 9. 4
				INT.LIN. Internal linearization (on analytical balances only)	1. 1. 9. 5
				SET.PREL. Setting the Preload	1. 1. 9. 8
				DEL.PREL. Clearing the Preload	1. 1. 9. 9
				BLOCKED (**CAL**) Blocked	1. 1. 9.10
				SELECT	1. 1. 9.12
				SET.EXT.W. Determine ext. calibration weight for *E.CAL.USR.*	1. 1. 9.17
		CAL.ADJ.ON	o	*SEQUENCE* adjustment	1. 1.10. 1
				CAL.ADJ. Adjustment as needed	1. 1.10. 2
		ZERO.RNG. Zero range		*1 PERC.*ent	1. 1.11. 1
			o	*2 PERC.*ent	1. 1.11. 2
		INIT.ZERO Zero at Power On	o	*DEFAULT* Factory setting	1. 1.12. 1
				*2 PERC.*ent	1. 1.12. 2
		ON.TARE Tare/zero at power on	o	*ON*	1. 1.13. 1
				OFF	1. 1.13. 2
		CYC.RATE Output rate	o	*NORMAL*	1. 1.14. 1
				HIGHVAR.	1. 1.14. 2
				SLOW	1. 1.14. 3
				MEDIUM	1. 1.14. 4
				FAST	1. 1.14. 5
				VERYFAST	1. 1.14. 6
				MAXIMUM	1. 1.14. 7
		ISOCAL Autom. calibration/adjustment		*OFF*	1. 1.15. 1
				NOTE	1. 1.15. 2
			o	*ON*	1. 1.15. 3
				*TO.W.LIN*earization (for analytical balances only)	1. 1.15. 4
		EXT.CAL. External calibration [1])	o	*FREE*	1. 1.16. 1
				LOCKED (blocked)	1. 1.16. 2
		CAL.UNIT [1]) for calibration weight	o	*GRAM*	1. 1.17. 1
				KILOGR. Kilograms	1. 1.17. 2
				USERDEF. (factory setting: pound)	1. 1.17. 4
	GEN.SERV. General servicing	*MEN.RESET* Menu reset (Factory Settings)		*YES* Restore fcty. settings	1. 9. 1. 1
			o	*NO* Do not restore settings	1. 9. 1. 2
				STANDARD [1])	1. 9. 1. 3
				VERIFIABLE [1])	1. 9. 1. 4

[1]) Not available on balances verified for use in legal metrology
[2]) Not available on balances for use in legal metrology of accuracy class Ⅱ

Level 1	Level 2	Level 3	Level 4	Info about Menu Level
2) *DEVICE*	*EXTRAS* (Additional functions)	*MENU*	*CAN.EDIT*	2. 1. 1. 1
			RD.ONLY Read only	2. 1. 1. 2
		SIGNAL Acoustic Signal	*OFF*	2. 1. 2. 1
			o *ON*	2. 1. 2. 2
		KEYS (Keypad)	o *FREE*	2. 1. 3. 1
			LOCKED	2. 1. 3. 2
		EXT.KEY External switch function	o *PRINT* key (🖷)	2. 1. 4. 1
			Z/TARA key (**TARE**)	2. 1. 4. 2
			CAL. key (**CAL**)	2. 1. 4. 3
			CF key (**CF**)	2. 1. 4. 5
			ENTER key (**ENTER**)	2. 1. 4. 6
			DR.SHIELD	2. 1. 4. 9
			IONIZER	2. 1. 4. 10
			APPL. key	2. 1. 4. 11
			ASTERISK key (✱)	2. 1. 4. 12
		ON.MODE Power-on mode	o *OFF/ON/SB* off/on/standby	2. 1. 6. 1
			OFF/ON/SO off/on/autom. shut-off	2. 1. 6. 2
			ON/SB On/Standby	2. 1. 6. 3
			AUTO.ON Auto on	2. 1. 6. 4
		DR.SHIELD	o *OFF*	2. 1. 9. 1
			ON/ION: Ionizer is turned on when closing the draft shield	2. 1. 9. 2
			CL/CO: Close → Execute command	2. 1. 9. 3
			LOCKED (blocked)	2. 1. 9. 4
			LOCKED (blocked)	2. 1. 9. 5
		RES.DR.SH (Weight resolution when door is open)	o *ALL* All decimal places	2. 1.10. 1
			*REDUC.*ed	2. 1.10. 2
		IONIZER Intensity	o *OFF*	2. 1.11. 1
			WEAK	2. 1.11. 2
			MEDIUM	2. 1.11. 3
			STRONG	2. 1.11. 4
		LEVEL	*OFF*	2. 1.12. 1
			o *NOTE TO*	2. 1.12. 2
			ERR.MSG. Error message	2. 1.12. 3
		LEVELING	o *KEY* (manual start)	2. 1.13. 1
			AUTO. Auto. before cali./adjustment	2. 1.13. 2

Periphery:/PC USB:

Level 1	Level 2	Level 3	Level 4	Info about Menu Level
	PERIPHER (25-pin "Peripherals" interface)	*DAT.REC.* Operating mode	# *SBI* (ASCII) [1]	2. 2. 1. 1 / 2. 3. 1. 1
			XBPI	2. 2. 1. 2 / 2. 3. 1. 2
			REM.DISPL.	2. 2. 1. 4 / 2. 3. 1. 4
			UNI.PRINT. UNIVERSAL PRINTER	2. 2. 1. 7 / 2. 3. 1. 7
	PC-USB (USB port "PC")		o *LAB.PRINT* (parameters for YDP10 printer)	2. 2. 1. 8 / 2. 3. 1. 8
			OFF	2. 2. 1.10 / 2. 3. 1.10
		*BAUD*rate	*600*	2. 2. 2. 3 / 2. 3. 2. 3
			1200	2. 2. 2. 4 / 2. 3. 2. 4
			2400	2. 2. 2. 5 / 2. 3. 2. 5
			4800	2. 2. 2. 6 / 2. 3. 2. 6
			o *9600*	2. 2. 2. 7 / 2. 3. 2. 7
			19200	2. 2. 2. 8 / 2. 3. 2. 8
			38400	2. 2. 2. 9 / 2. 3. 2. 9
			57600	2. 2. 2.10 / 2. 3. 2.10
			115200	2. 2. 2.11 / 2. 3. 2.11

[1]) Note concerning verified balances/scales as legal measuring instruments in the EU*: In the "SBI" setting, the non-verified display digit is not automatically identified.
Please take the corresponding measures or adjust the settings on the peripheral device (see also "Interfaces").

Level 1	Level 2	Level 3	Level 4	Info about Menu Level
				Periphery:/PC USB:
2) *DEVICE* ──	*PERIPHER* ── *PC-USB* ──	*PARITY* ── Parity	o *ODD* *EVEN* *NONE*	2. 2. 3. 3 / 2. 3. 3. 3 2. 2. 3. 4 / 2. 3. 3. 4 2. 2. 3. 5 / 2. 3. 3. 5
		STOPBIT ── Number of stop bits	o *1STOP* *2 BITS*	2. 2. 4. 1 / 2. 3. 4. 1 2. 2. 4. 2 / 2. 3. 4. 2
		HANDSHK. ── Handshake mode	*SOFTW.*are o *HARDW.*are # *NONE*	2. 2. 5. 1 / 2. 3. 5. 1 2. 2. 5. 2 / 2. 3. 5. 2 2. 2. 5. 3 / 2. 3. 5. 3
		DATABIT ── Number of data bits	*7 BITS* o *8 BITS*	2. 2. 6. 1 / 2. 3. 6. 1 2. 2. 6. 2 / 2. 3. 6. 2
3) *DATA OUT* ── (data output)	*COMM.SBI* ── (computer communication)	*COM.OUTPUT* ── (manual/automatic)	o *IN.WIO* Stability *IN.AFTER* Stability *IN.AT* Stability *AUTO.WIO* Auto w/o stability *AUT.WITH* Stability	3. 1. 1. 1 3. 1. 1. 2 3. 1. 1. 3 3. 1. 1. 4 3. 1. 1. 5
		STOP ── Auto output	o *OFF* *ON*	3. 1. 2. 1 3. 1. 2. 2
		AUTO.CYCL. ── Time-dependent automatic data output	o *EVERY* *2NDVALUE*	3. 1. 3. 1 3. 1. 3. 2
		FORMAT (Line format) ──	*16 CHARS* (digit is not identified) o *22 CHARS* (digit is identified) *EXTR.LINE* (date, time and weight value)	3. 1. 4. 1 3. 1. 4. 2 3. 1. 4. 4
		AUTO.TARE ── Autom. taring after data output	o *OFF* *ON*	3. 1. 5. 1 3. 1. 5. 2
	PRINT.PARA ──	*RES.* ── (manual/autom.)	*MANUAL WITHOUT* Stability o *MAN.AFTER.* Stability *MAN.AT* Stability *AUTO.LC* (autom. at load change)	3. 2. 1. 1 3. 2. 1. 2 3. 2. 1. 3 3. 2. 1. 6
	for printing	*FORMAT* Line format for printout	*16 CHARS* (digit is not identified) o *22 CHARS* (digit is identified) *EXTR.LINE* (date, time and weight value)	3. 2. 2. 1 3. 2. 2. 2 3. 2. 2. 4
		PRT.INIT. Printout of application parameters	*OFF* o *ALL* Parameters *MAINPAR.* Main parameters	3. 2. 3. 1 3. 2. 3. 2 3. 2. 3. 3
		GLP ISO/GLP-compliant printout ──	o *OFF* *CAL.ADJ.* For calibration/adjustment only *ALWAYS* on	3. 2. 4. 1 3. 2. 4. 2 3. 2. 4. 3
		TAR./PRT. ── Tare bal./scale after ind. print	o *OFF* *ON*	3. 2. 5. 1 3. 2. 5. 2
		TIME ──	o *24H* display *12H* display "AM/PM"	3. 2. 6. 1 3. 2. 6. 2
		DATE ──	o *DD.MMM.YY* format *MMM.DD.YY* format	3. 2. 7. 1 3. 2. 7. 2

= Factory setting for "PC-USB" interface

Level 1	Level 2	Level 3	Level 4	Info for Menu level
4) *APP-LIC.* Application programs	*WEIGH.*			4. 1.
	UNIT Toggle			4. 2.
	COUNTING	*RESOLUT.*	o *DISP.DIG.* Display accuracy	4. 3. 1. 1
			10 FOLD 10 times > disp.	4. 3. 1. 2
			100 FOLD 10 times > disp.	4. 3. 1. 3
		REF.UPDT. Auto. Reference updating	o *OFF*	4. 3. 2. 1
			*AUTOM.*atically	4. 3. 2. 2
	PERCENT Weighing in Percent	*DEC.PLCS.* Decimal places	*NONE* No decimal places	4. 4. 1. 1
			o *1 DEC.PL.* 1 decimal place	4. 4. 1. 2
			2 DEC.PL. 2 decimal places	4. 4. 1. 3
			3 DEC.PL. 3 decimal places	4. 4. 1. 4
	NET.TOT. Net-total Formulation	*COMP.PRT.* Component printout	*OFF*	4. 5. 1. 1
			o *ON*	4. 5. 1. 2
	TOTAL Totalizing	*COMP.PRT.* Component printout	*OFF*	4. 6. 1. 1
			o *ON*	4. 6. 1. 2
	ANIMALW. Animal Weighing	*ACTIVTY.* Animal activity	*CALM* (fluct.: 2% of test obj.)	4. 7. 1. 1
			o *ACTIVE* (fluct.: 5% of test obj.)	4. 7. 1. 2
			V.ACTIVE (fluct.: 20% of test obj.)	4. 7. 1. 3
		START	*MANUAL*	4. 7. 2. 1
			o *AUTO*	4. 7. 2. 2
	CALC. Calculation	*METHOD* (Operator)	o *MUL.* Multiplier	4. 8. 1. 1
			DIV. Divisor	4. 8. 1. 2
		DEC.PLCS Decimal places	*NONE* No decimal places	4. 8. 2. 1
			o *1 DEC.PL.* 1 decimal place	4. 8. 2. 2
			2 DEC.PL. 2 decimal places	4. 8. 2. 3
			3 DEC.PL. 3 decimal places	4. 8. 2. 4
	DENSITY determination	*DEC.PLCS* Decimal places	*NONE* No decimal places	4. 9. 1. 1
			o *1 DEC.PL.* 1 decimal place	4. 9. 1. 2
			2 DEC.PL. 2 decimal places	4. 9. 1. 3
			3 DEC.PL. 3 decimal places	4. 9. 1. 4
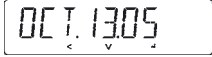
[1]) Not available on balances verified for use in legal metrology

Input: ID number, date and time
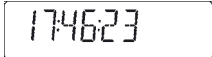
Level 1	Level 2	Level 3	Info about Menu Level
5) *INPUT* Input	*ID.*	ID input, max. 7 characters Possible characters: 0-9, A-Z, dash|hyphen and space	5. 1.
	DATE	Set date	5. 2.
	TIME	Set time	5. 3.
	PASSWORD	Password entry (for Service)	5. 4.
	CAL.WT.	Enter weight value	5. 5.

Depending on the setting of the "Print PRINT.PARA – DATE" menu item, the date is displayed in the following format:

Format	Display: Date
DD.MMM.YY	`13.OCT.05`
MMM.DD.YY	`OCT.13.05`

Depending on the setting of the "Print PRINT.PARA – TIME" menu item, the time is displayed in the following format:

Time	Display: Time
24h mode	`17:46:23`
12h mode	`11:48 AM`

Level 1	Level 2	Level 3	Level 4		Info about Menu Level

Device–specific information

6) *INFO* Info	*VER.NO.*	Displays the software version		*00-39-13*	6. 1.
	SER.NO.	Displays the serial number (to toggle between the upper/lower part of the display: press the (SELECT/MENU) key)		*1080 1234*	6. 2.
	MODEL	Displays the model ID (to toggle between the upper, middle and lower part of the display: Press the (SELECT/MENU) key)		*MSE820 1S*	6. 3.
	LOBS	Displays the software version		*REL. 19.03*	6.4.1.
	KBC VERS	Displays the software version		*REL. 10.02*	6.6.1.
	BR.SHIELD	Displays the software version		*00-00-00*	6.6.1.

Menu display: Selecting languages or codes

7) *LANGUAGE* (*LANGUAGE*)	*ENGLISH* (factory setting)		7. 1.
	DEUTSCH (German)		7. 2.
	*FRANC.*çais (French)		7. 3.
	*ITAL.*iano (Italian)		7. 4.
	ESPANOL (Spanish)		7. 5.
	PYCCKИЙ (Russian)		7. 6.
	POLSKI (Polish)		7. 7.

Interface Options

8) *OPT.MOD:* 9-pin or 25-pin interface	*DAT.REC.* Operating mode		*SBI* (ASCII) [1]		8. 1. 1
			UNI.PRINT UNIVERSAL PRINTER		8. 1. 7
			o *LAB.PRINT* (: parameters for YDP10 printer)		8. 1. 8
			OFF		8. 1.10
	*BAUD*rate		*1200*		8. 2. 3
			2400		8. 2. 5
			4800		8. 2. 6
			o *9600*		8. 2. 7
			19200		8. 2. 8
			38400		8. 2. 9
			57600		8. 2.10
			115200		8. 2.11
	PARITY Parity		o *ODD*		2. 3. 1
			EVEN		2. 3. 2
			NONE		2. 3. 3
	STOPBIT Number of stop bits		o *1STOP*		2. 4. 1
			2 BITS		2. 4. 2
	HANDSHK. Handshake mode		*SOFTW.*are		2. 5. 1
			o *HARDW.*are		2. 5. 2
			NONE		2. 5. 3
	DATABIT Number of data bits		*7 BITS*		2. 6. 1
			o *8 BITS*		2. 6. 2

or

8) *OPT.MOD:* Bluetooth	*DAT.REC.* Operating mode		*SBI* (ASCII) [1]		8. 1. 1
			UNI.PRINT UNIVERSAL PRINTER		8. 1. 2
			o *LAB.PRINT* (: parameters for YDP10 BT printer)		8. 1. 3
			OFF		8. 1. 4
	FIND				8. 2.
	SER.NO. (serial number)		10801234		8. 3. 1
	MODEL (e. g. printer ID)		YDP10BT		8. 4. 1

[1] Note concerning verified balances/scales as legal measuring instruments in the EU*: In the "SBI" setting, the non-verified display digit is not automatically identified.
Please take the corresponding measures or adjust the settings on the peripheral device (see also "Interfaces").

Setting the ID number, date and time

	Step	Press key	Display
1.	Starting the Menu: 1. Display menu level	(SELECT/MENU) Hold	_APPLIC._
2.	Select "Input"	(SELECT/MENU)	_INPUT_
	ID no.:		
3.	Select input for ID	2x (ENTER)	_ID._
4.	Set or change ID number – With auto key repeat:	(SELECT/MENU) (SELECT/MENU) Press and hold	_3-------_
5.	Moving within the 7-digit number Move ID no.	(ENTER) or (CF)	_3-ABC 12_
6.	Save at the last position of the ID no.	(ENTER)	_ID._
	Date:		
7.	Select and confirm "Date"	(SELECT/MENU), (ENTER)	_08.FEB.09_
8.	Change setting – With auto key repeat:	(SELECT/MENU) (SELECT/MENU) Press and hold	_10.FEB.09_
9.	Change position between the day/month/year	(ENTER) or	_10.FEB.09_
10.	Save setting at "Year" position	(ENTER)	_DATE_
	Time:		
11.	Select "Time"	(SELECT/MENU), (ENTER)	_10.46.23_
12.	Change setting – With auto key repeat:	(SELECT/MENU) (SELECT/MENU) Press and hold	_11.46.23_
13.	Change position between hour/minute/second	(ENTER) or	_11.46.32_
14.	Set seconds to "zero"	(SELECT/MENU)	_11.47.00_
15.	Save setting at "Second" position	(ENTER)	_TIME_
16.	Save settings and exit menu	Press repeatedly (CF)	
>	Restart your application		_0.0_ g

Application Programs

M All application programs can be selected on models verified for use in legal metrology.
Verified values can be marked using the following characters:
– Percent = %
– Piece count (Counting) = pcs
– Computed values = o, ⚠

Density Determination

Display symbol: 🗒

Purpose
This application program can be used to determine the density of solid materials according to the buoyancy method.

Features
The density of liquid (g/cm³) can be set for a corresponding temperature via the $\left(\substack{\text{SELECT}\\\text{MENU}}\right)$ key. See the next page for a table on water density values. Factory setting is 1 g/cm³.

The following formula is used:

Density of sample =

$$\frac{\text{Weight in air}}{\text{(weight in air – weight in water)}} \cdot \text{Density of liquid}$$

The liquid density is displayed briefly when you start the density calculation.
Positive and negative weight values can be applied for the sample in the air and water. The value in water, however, must be less than the value in the air; otherwise, this will trigger an error message.
The results can be displayed with 0 to 3 decimal places: See the chapter entitled "Configuration." Not part of the scope of delivery: sample holder and suspension wire.

Preparation
● Select the "Density Determination" application in the menu:
See "Configuration"

● Configuring parameters:

APPLIC. Application programs

└── DENSITY Density determination

└── DEC.PLCS Number of decimal places

├── NONE No dec. places
├── o 1 DEC PL. 1 decimal place
├── 2 DEC PL. 2 decimal places
└── 3 DEC PL. 3 decimal places
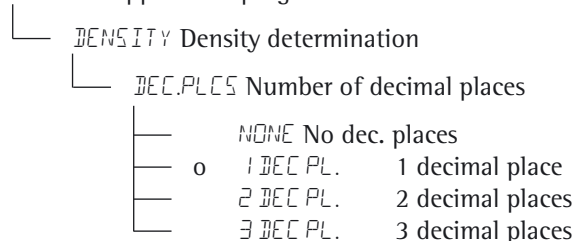
Note on using 3 decimal places:
Using three decimal places for density can result in a high measurement error rate because corrections to the air density and the density calculation sets are not taken into account, for example.

o= Factory settings

Density determination printout
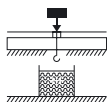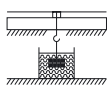
```
RhoFl    0.99823 o      : Liquid density (g/cm³)
Wa       +    20.0 g     : Weight in air
Wfl      +    15.0 g     : Weight in liquid
Rho           4.0 o      : Result: Density of sample
```

Table:
Density values of H₂O at temperature T (in °C)

T/°C	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10.	0.99973	0.99972	0.99971	0.99970	0.99969	0.99968	0.99967	0.99966	0.99965	0.99964
11.	0.99963	0.99962	0.99961	0.99960	0.99959	0.99958	0.99957	0.99956	0.99955	0.99954
12.	0.99953	0.99951	0.99950	0.99949	0.99948	0.99947	0.99946	0.99944	0.99943	0.99942
13.	0.99941	0.99939	0.99938	0.99937	0.99935	0.99934	0.99933	0.99931	0.99930	0.99929
14.	0.99927	0.99926	0.99924	0.99923	0.99922	0.99920	0.99919	0.99917	0.99916	0.99914
15.	0.99913	0.99911	0.99910	0.99908	0.99907	0.99905	0.99904	0.99902	0.99900	0.99899
16.	0.99897	0.99896	0.99894	0.99892	0.99891	0.99889	0.99887	0.99885	0.99884	0.99882
17.	0.99880	0.99879	0.99877	0.99875	0.99873	0.99871	0.99870	0.99868	0.99866	0.99864
18.	0.99862	0.99860	0.99859	0.99857	0.99855	0.99853	0.99851	0.99849	0.99847	0.99845
19.	0.99843	0.99841	0.99839	0.99837	0.99835	0.99833	0.99831	0.99829	0.99827	0.99825
20.	0.99823	0.99821	0.99819	0.99817	0.99815	0.99813	0.99811	0.99808	0.99806	0.99804
21.	0.99802	0.99800	0.99798	0.99795	0.99793	0.99791	0.99789	0.99786	0.99784	0.99782
22.	0.99780	0.99777	0.99775	0.99773	0.99771	0.99768	0.99766	0.99764	0.99761	0.99759
23.	0.99756	0.99754	0.99752	0.99749	0.99747	0.99744	0.99742	0.99740	0.99737	0.99735
24.	0.99732	0.99730	0.99727	0.99725	0.99722	0.99720	0.99717	0.99715	0.99712	0.99710
25.	0.99707	0.99704	0.99702	0.99699	0.99697	0.99694	0.99691	0.99689	0.99686	0.99684
26.	0.99681	0.99678	0.99676	0.99673	0.99670	0.99668	0.99665	0.99662	0.99659	0.99657
27.	0.99654	0.99651	0.99648	0.99646	0.99643	0.99640	0.99637	0.99634	0.99632	0.99629
28.	0.99626	0.99623	0.99620	0.99617	0.99614	0.99612	0.99609	0.99606	0.99603	0.99600
29.	0.99597	0.99594	0.99591	0.99588	0.99585	0.99582	0.99579	0.99576	0.99573	0.99570
30.	0.99567	0.99564	0.99561	0.99558	0.99555	0.99552	0.99549	0.99546	0.99543	0.99540

Parameter configuration: *APPLIC. - DENSITY - DEC.PLCS. - 1 DEC.PL.*

Example: Determining the density of a solid sample. The density at 20.0 degrees Celsius is 0.99823 g/cm³.

Step	Press key	Display/Printout
1. Attach sample holder and suspension wire		
2. Tare the balance	(TARE)	*0.0 g*
3. Change density of buoyancy liquid	(SELECT/MENU)	*_ 1.00000*
4. Set density value (in this example: 0.99823) Enter numerals in increments of 1 or:	Repeatedly press (SELECT/MENU), press and hold the (ENTER) key	*_0.99823*
5. Set the density value and start the application. The current density value will be saved in protected memory until the setting is changed.	(ENTER)	
6. Confirm "*AIR*" display	(ENTER)	*AIR*
7. Determining the weight of the sample in air: Place sample on the balance		*+ 20.0 g*
8. Save weight in air	(ENTER)	
9. Remove sample from the balance		*WATER*
10. Determining weight value in liquid: Place sample in basket		
11. Confirm "*WATER*" display	(ENTER)	*0.0 g*
12. Place sample in liquid		*+ 15.0 g*
13. Save weight value in liquid, display and print results	(ENTER)	*+ 4.0 °* RhoFl 0.99823 o Wa + 20.0 g Wfl + 15.0 g
14. Delete results	(CF)	Rho 4.0 o
15. Repeat as needed, starting from Step 5		

Counting

Display symbol: ⁂

Purpose
With the Counting application, you can determine the number of parts which each have approximately equal weight. First the weight of a manually-determined number of parts is calculated and then the individual weight is determined from this (reference).
The total number of the unknown number of parts is then calculated from the weight.

Changing the Reference Sample Quantity
Activate function: Press the (SELECT/MENU) key
Select the desired reference quantity (1 to 100):
In increments of one: Press the (SELECT/MENU) key briefly
In increments of ten: Press and hold the (SELECT/MENU) key
The selected number is saved to protected memory.

Optimizing the counting results
Automatic reference sample updating optimizes the counting accuracy. This function can be turned on or off in the menu.

Automatic reference sample updating is performed when the requirements, including the specified stability criterion, have been met.

The abbreviation *OPT*, for "optimizing", is displayed briefly with the new reference sample quantity.

Preparation
● Select the "Counting" application in the menu: see "Configuration"

● Configuring parameters:

APPLIC. Application programs
    COUNT.
    ├── *RES.*
    │   ├── o *DISP.ACC*   Display accuracy
    │   ├──   *10-FOLD*   10-fold higher
    │   └──   *100-FOLD* 100-fold higher
    │
    └── *REF.UPDT.* Autom. ref. sample updating
        ├── o *OFF*   Switched off
        └──   *AUTOM.*   Automatic
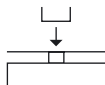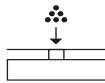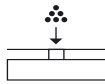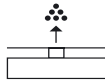
o = Factory settings

Printout: Counting

nRef	10	: Reference sample quantity
wRef	21.14 g	: Reference weight for 1 unit
Qnt +	500 pcs	: Calculated quantity

Example: Counting parts of equal weight
Parameter settings: *APPLIC. - COUNT.*

Step		Press key	Display/Printout
1.	Place the parts container on the balance		+ 22.6 g
2.	Tare the balance	(TARE)	0.0 g
3.	Place the reference sample quantity in the container (in this example: 20 units)		
4.	Changing the Reference Sample Quantity	(SELECT/MENU)	REF 10pcs
5.	Select the reference sample quantity: In increments of one (1, 2, 3, ..., 100) In increments of ten (1, 10, 20, ..., 100)	Repeatedly press (SELECT/MENU) briefly or hold the (SELECT/MENU) key	REF 20pcs
6.	Confirm selected reference sample quantity and start the application. The current reference weight remains saved until a new reference is set.	(ENTER)	+ 20pcs nRef 20 pcs wRef 1.07 g
7.	Add desired number of pieces		+ 500pcs
8.	If desired, print the results	(🖶)	Qnt + 500 pcs
9.	Toggle display between average piece weight, weight and quantity	Repeatedly press (SELECT/MENU)	+ 1.07 g △ + 535.0 g + 500pcs
10.	Unload the balance		− 2 !pcs
11.	Repeat as needed, starting from Step 7		
12.	Delete the reference value	(CF)	0.0 g

Weighing in Percent

Display symbol: %

Purpose
This application allows you to obtain weight readouts in percent which are in proportion to a reference weight.

Changing the reference percentage value
Activate function:
Press the (SELECT/MENU) key
Select the desired reference quantity (1 to 100):
In increments of one: Press the (SELECT/MENU) key briefly
In increments of ten: Press and hold the (SELECT/MENU) key

The selected percentage is saved to protected memory.

Preparation
● Select the "Weighing in Percent" application in the menu:
   See "Configuration"

● Configuring parameters:

APPLIC. Application programs
└── PERCENT Weighing in Percent
        └── DEC.PLCS Number of decimal places
                ── NONE No dec. places
             o ── 1 DEC.PL. 1 decimal place
                ── 2 DEC.PL. 2 decimal places
                ── 3 DEC.PL. 3 decimal places
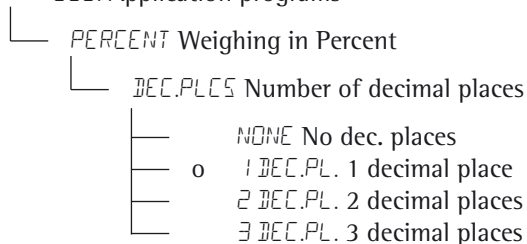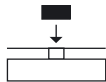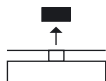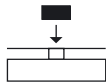
o = Factory settings

Weighing in percent printout

pRef	100 %	: Reference percentage
Wxx%	111.6 g	: Reference weight net xx% for selected reference percentage
Prc	+ 94.9 %	: Calculated reference percentage

Example: Determining residual weight in percent
Parameter settings: *APPLIC. - PERCENT*
Reference percentage value: *REF 100*%

Step		Press key	Display/Printout
1.	Tare the balance	(TARE)	*0.0* g
2.	Information: Enter the reference percentage (Changing the reference: see the previous page)	(SELECT MENU)	*REF 100* %
3.	Place sample equal to 100% on the balance (in this example: 111.6 g)		
4.	Initialize the balance The current reference weight remains saved until a new reference is set	(ENTER)	+ *100.0* % p R e f 100 % W x x % + 111.6 g
5.	Remove sample (e.g. for drying)		
6.	Place unknown weight on balance (in this example: 105.9 g)		+ *94.9* %
7.	If desired, print the percentage	(🖶)	P r c + 94.9 %
8.	Toggle display between weight and percentage	Repeatedly press (SELECT MENU)	+ *105.9* g + *94.9* %
9.	Clear display of residual weight and reference percentage	(CF)	+ *105.9* g
10.	If desired, print the residual weight	(🖶)	N + 105.9 g

Calculation

Display symbol: */

Purpose
With this application, you can calculate weight values using
a multiplier or divisor.
This can be used, for example, to determine the weight per unit area, or "gsm"
weight (grams per square meter), of paper.

Setting the Factor or Divisor
Activate function:
Press the (SELECT/MENU) key
Select a number of up to 8 digits and, if needed, one decimal point
(0.0000001 – 99999999):
In increments of one: Press the (SELECT/MENU) key briefly
To increase the value without pressing repeatedly: Press and hold the (SELECT/MENU) key

The selected operator is saved to protected memory.

Preparation
● Select the "Calculation" application in the menu:
 See "Configuration"

● Configuring parameters:

APPLIC. Application programs

└── CALC. Calculation

 ├── METHOD (Operator)

 │   ├── o   MUL. Multiplier
 │   └──   DIV. Divisor

 └── DEC.PLCS Number of decimal places

  ├──   NONE No dec. places
  ├── o   1 DEC.PL. 1 decimal place
  ├──   2 DEC.PL. 2 decimal places
  └──   3 DEC.PL. 3 decimal places
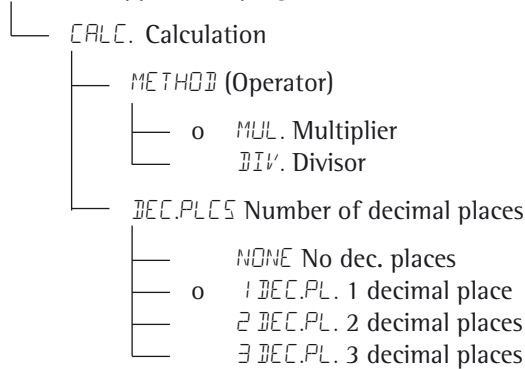
o = Factory settings

Calculation printout
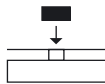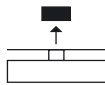
```
Mul    +   1.2634        : Multiplier
Div    +   0.6237        : Divisor
Res    +    79.7 o       : Result
```

Example:
Calculating the weight per unit area of paper: An A4 sheet of paper is used in this example, with surface dimensions of 0.210 m × 0.297 m = 0.06237 m². To determine the weight per unit area, the total weight is divided by the surface.

Parameter settings:
APPLIC.‑CALC.‑METHOD‑DIVIS.

Step		Press key	Display/Printout
1.	Tare the balance	(TARE)	0.00 g
2.	Activate divisor input	(SELECT MENU)	_ _ _ _ _ _ 1.0
3.	Set the divisor (in this example: 0.06237): Position the decimal point,	(ENTER), 4× (SELECT MENU), 2× (ENTER),	_ _ _.00000
	Enter numerals in increments of 1 or:	Repeatedly press (SELECT MENU)	_ _ _.06000
		briefly or hold the, (ENTER) key	_ _ _.06237
4.	Save the divisor and initialize the balance The current divisor will be saved in protected memory until the setting is changed.	(ENTER)	+ 0.0 o
			D i v 0.06237
5.	Determine the weight per unit are: Place a sheet of DIN A4 paper on the balance		+ 79.7 o
6.	If desired, print the result	(🖨)	R e s + 79.7 o
7.	Toggle display between weight and calculated value	Repeatedly press (SELECT MENU)	+ 4.97 g
			+ 79.7 o
8.	Unload the balance		+ 0.0 o
9.	Repeat as needed, starting from Step 5		

Averaging (animal weighing)

Display symbol: 🐁

Purpose
This application is used to determine the weights of unstable samples (e.g., live animals) or to determine weights under very unstable ambient conditions.
This requires an average to be calculated over several measurement cycles (also referred to as "subweighing operations").

Changing the number of subweighing operations
Activate function: Press the (ᴹᴱᴺᵁˢᴱᴸᴱᶜᵀ) key
Select the desired number of measurements (1 to 100):
In increments of one: Press the (ᴹᴱᴺᵁˢᴱᴸᴱᶜᵀ) key briefly
In increments of ten: Press and hold the (ᴹᴱᴺᵁˢᴱᴸᴱᶜᵀ) key

The selected number of subweighings is saved to protected memory.

Preparation
● Select the "Animal Weighing" application in the menu:
   See "Configuration"

● Configuring parameters:

APPLIC. Application programs
 └─── ANIM.WG Animal weighing
        ├─── ACTIVTY. Animal activity
        │   ├─── CALM stable
        │   ├─ o ACTIVE unstable
        │   └─── UNSTABL very unstable
        └─── START
                ├─── MANUAL
                └─ o AUTOM. Automatic
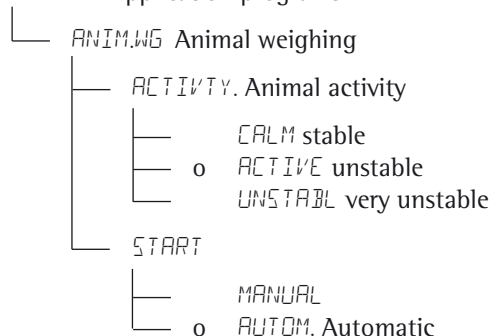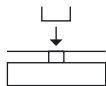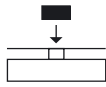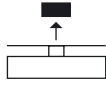
o = Factory settings

Printout: Averaging

| mDef   20 | : Defined number of subweighing operations |
| x-Net + 410.1 g | : Result of averaging |

Example: Automatic weighing of animals with 20 subweighing operations

Parameter configuration: *APPLIC. - ANIMALW.*

Step		Press key	Display/Printout
1.	Place animal weighing bowl on the balance		*22.6* g
2.	Tare the balance	(TARE)	*0.0* g
3.	Change the number of subweighing operations	(SELECT/MENU)	*REF 30*
4.	Set number of measurements: In increments of one (1, 2, 3, ..., 100) In increments of ten (10, 20, ..., 100)	Repeatedly press (SELECT/MENU) briefly or hold the (SELECT/MENU) key	*REF 20*
5.	Confirm selected subweighing operations and start automatic animal weighing. The number of subweighing operations will be saved in protected memory until the setting is changed.	(ENTER)	+ *0.0* g
6.	Place first animal in bowl. The balance delays the start of measurements until the difference between 4 measurements meets the criterion.		*888* *20* *19* *....* *1*
7.	Read the result The result is displayed with the "⚠" (= calculated value) and remains displayed until the sample (animal) is removed from the load plate (bowl).		+ *410.1* g ⚠ m D e f 20 x – N e t + 410.1 g
8.	Unload and tare the balance		+ *0.0* g
9.	Weigh next animal (if desired).		

The next weighing series starts automatically.

Net–total Formulation

Display symbol: ♨

Purpose
This application can be used to weigh different components up to a defined total. You can print out both the total weight and the individual weights of the components.

Features
– Weigh up to 99 components from "0" to a defined total component weight.

– Save component weights ("Store xx comp."), with
  – display zeroed automatically after value is stored, and
  – automatic printout

– Clear component memory following cancellation of the weighing sequence by pressing (**CF**) and print the total weight.

– Toggle between component weight and total weight by pressing and holding the (**SELECT MENU**) key.

– Print the total of the individual component weights **T−Comp**)

Preparation
● Select the "Net-total Formulation" application in the menu: See "Configuration"

● Configuring parameters:

APPLIC. Application programs

   └── *NET-TOTL.* Net-total formulation

        └── *COMP.PRT.* Printout of components

              ├──   *OFF*
              └── o   *ON*
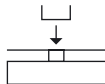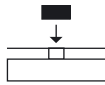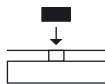
o = Factory settings

Net–total formulation printout

`Comp 2+  278.1 g`	: Second component weight
`T−Comp+ 2117.5 g`	: Total components

Example: Counting parts into a container

Parameter configuration: *APPLIC. – NET.TOTL.*

Step		Press key	Display/Printout
1.	Place empty container on the balance		*65.0* g
2.	Tare	(**TARE**)	*0.0* g
3.	Add first component		+ *120.5* g
4.	Save component data	(**ENTER**)	+ *0.0* g *Net* **Comp 1+ 120.5 g**
5.	Add next component		+ *70.5* g *Net*
6.	Save component data	(**ENTER**)	+ *0.0* g *Net* **Comp 2+ 70.5 g**
7.	Weigh further components as desired	Repeat steps 5 and 6 as often as necessary	
8.	Fill to desired final value (toggle to the total weight value)	(**SELECT MENU**)	+ *191.0* g
9.	Print total weight and delete the component memory	(**CF**)	+ *2117.5* g **T-Comp+ 2117.5 g**

Totalizing

Display symbol: ⯱

Purpose
This application can be used to add values from successive, mutually independent weight values to a total that exceeds the capacity of the balance.

Features
– Totalizing memory for up to 99 products

– Save component weights ("Store xx comp."), with automatic printout

– Toggle display between the current individual weight value and the value in totalizing memory by pressing (SELECT/MENU).

– Print the total of the individual component weights S–Comp)

– To close the application and print the total weight:
   press (CF)

Preparation
● Select the "Totalizing" application in the menu:
   See "Configuration"

● Configuring parameters:

APPLIC. Application programs
└── TOTAL Totalizing
        └── COMP.PRT. Printout of components
                ├──   OFF
                └──   o   ON
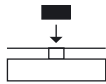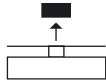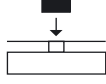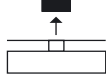
o = Factory settings

Printout: Totalizing

```
Comp 2+   278.1 g      : Second component weight
S-Comp+ 2117.5 g       : Totalizing memory
```

Example: Totalizing weight values

Parameter configuration: APPLIC.- TOTAL - COMP.PRT: ON

Step		Press key	Display/Printout
1.	Tare	(TARE)	0.0 g
2.	Place sample on the balance (in this example: 380 g)		+ 380.0 g
3.	Save the value to memory	(ENTER)	+ 380.0 g Comp 1+ 380.0 g
4.	Remove sample		+ 0.0 g
5.	Place the next sample on the balance (in this example: 575 g)		+ 575.0 g
6.	Save the value to memory	(ENTER)	+ 955.0 g + 575.0 g Comp 2+ 575.0 g
7.	Remove sample		+ 0.0 g
8.	View value in totalizing memory	(SELECT MENU)	+ 955.0 g ⚠
9.	Weigh further components as desired	Repeat steps 5 and 6 as often as necessary	
10.	Print total weight and delete the totalizing memory	(CF)	0.0 g S-Comp+ 2117.5 g

Mass Unit Conversion
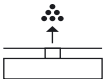
Purpose
This application is used to change the weight value displayed from the basic weight unit to any of 4 application weight units (see table on next page).

Features
– Set the basic unit and display accuracy in the Setup menu: See "Configuration."
– Set the application weight units and display accuracies for all 4 units in the Application menu.
– The units selected are saved to protected memory.
– The basic unit is always active once the balance is turned on.

Example: Change display from grams [g] (basic unit) to pounds [lb] and then to Troy ounces [ozt] reduced by 1 digit.

Configuration: *APPLIC.-UNIT*

Step		Press key	Display/Printout
Preparation:			
1.	Start selection of an application weight unit	(**SELECT MENU**)	*UNIT 1*
2.	Confirm unit 1	(**ENTER**)	*NO* °
3.	Select an application unit (in this example: pounds) Units and display accuracy: See table on the next page	Press repeatedly (**SELECT MENU**)	*POUNDS*
4.	Confirm pounds weight unit	(**ENTER**)	*POUNDS* °
5.	Select next application unit, Units and display accuracy: See table on the next page	(**CF**) (**SELECT MENU**), (**ENTER**) Repeatedly press (**SELECT MENU**), (**ENTER**)	*UNIT 2* *NO* SDgr *TROY.OZ.*
6.	Confirm troy ounces weight unit	(**ENTER**)	*TROY.OZ.* °
7.	Reduce display unit by 1	Repeatedly press (**SELECT MENU**), (**ENTER**)	*MINUS 1*SDgr
8.	You can select an additional 4 units, if desired (otherwise, confirm "*NO*" using (**ENTER**))		
9.	Save selection	Repeatedly press (**CF**)	*0.00* g
	Operation:		
10.	Place the sample on the scale		+ *100.00* g
11.	Change weight unit	Press repeatedly (**ENTER**)	+ *0.22046* lb + *3.527* ozt

The balance can operate using the following units and display accuracies
(in legal metrology, only units permitted by national law are available):

Menu item	Unit	Conversion factor	Symbol displayed	Display accuracy
0) *NO*	Unit same as used in menu under basic unit			0) *NO* (display accuracy same as basic unit) 1) *ALL* Show all decimal places 2) *LP.ON.OFF* Last digit after load change 6) *DIV. 1* 1 interval 7) *MINUS 1* Reduced by 1 digit
1) *USERDEF.*	Grams	1.00000000000	o	*NONE* to *MINUS 1*
2) *GRAMS* (factory setting)	Grams	1.00000000000	g	*NONE* to *MINUS 1*
3) *KILOGR.*	Kilograms	0.00100000000	kg	*NONE* to *MINUS 1*
4) *CARATS*	Carats	5.00000000000	o	*NONE* to *MINUS 1*
5) *POUNDS*	Pounds	0.00220462260	lb	*NONE* to *MINUS 1*
6) *OUNCES*	Ounces	0.03527396200	oz	*NONE* to *MINUS 1*
7) *TROY.OZ.*	Troy ounces	0.03215074700	ozt	*NONE* to *MINUS 1*
8) *HKTAEL*	Hong Kong taels	0.02671725000	tl	*NONE* to *MINUS 1*
9) *SNG.TAEL.*	Singapore taels	0.02645544638	tl	*NONE* to *MINUS 1*
10) *TWN.TAEL.*	Taiwanese taels	0.02666666000	tl	*NONE* to *MINUS 1*
11) *GRAINS*	Grains	15.4323583500	GN	*NONE* to *MINUS 1*
12) *PENY.WT.*	Pennyweights	0.64301493100	dwt	*NONE* to *MINUS 1*
13) *MILLIGR.*	Milligrams	1000.00000000	mg	*NONE* to *MINUS 1*
14) *PT.P.LB.*	Parts per pound	1.12876677120	o	*NONE* to *MINUS 1*
15) *CHN.TAEL*	Chinese taels	0.02645547175	tl	*NONE* to *MINUS 1*
16) *MOMMES*	Mommes	0.26670000000	m	*NONE* to *MINUS 1*
17) *CARATS*	Carats	5.00000000000	Kt	*NONE* to *MINUS 1*
18) *TOLA*	Tola	0.08573333810	o	*NONE* to *MINUS 1*
19) *BAHT*	Baht	0.06578947436	b	*NONE* to *MINUS 1*
20) *MESGHAL*	Mesghal	0.21700000000	o	*NONE* to *MINUS 1*
21) *TONS*	Tons	0.00000100000	t	*NONE* to *MINUS 1*
22) *LB:OZ* [1])	Pounds : Ounces (lb/oz)	0.03527396200	lb oz	*NONE* to *MINUS 1*
23) *NEWTON*	Newton	0.00980665000	N	*NONE* to *MINUS 1*
24) *MICROGR.* [2])	Micrograms	1000000.00000	o	*NONE* to *MINUS 1*

[1]) = The format for display of pounds|ounces cannot be changed: xx:yy.yy x=lb, y=oz
[2]) = Unit not available on all models

⚠ Some weight units may be blocked from use in legal metrology, depending on national verification laws.

ISO/GLP-compliant Printout

Features
You can have the device information, ID and the current date printed before (GLP header) and after (GLP footer) the values from the weighing series. These parameters include:

GLP Header:
– Date
– Time at the start of a weighing series
– Balance manufacturer
– Balance model
– Model serial number
– Software version number
– ID number (of weighing series)

GLP footer:
– Date
– Time at the end of a weighing series
– Field for signature

Configuration
▶ Set the following menu items
(Setup mode, see "Configuration"):
– Line format for printout with ID –
22 characters (factory setting): *PRINT – PRNT.PARA. – FORMAT – 22 CHARS*

– ISO/GLP-compliant printout or record for calibration/adjustment only:
DATA OUT – PRNT.PARA. – GLP – CAL.IADJ.
or
ISO/GLP-compliant printout or record always on:
DATA OUT – PRNT.PARA. – GLP – ALWAYS ON

– Time formats:
DATA OUT – PRNT.PARA. – TIME – 24H
or
DATA OUT – PRNT.PARA. – TIME – 12H
with "**A**hh:mm" or "**P**hh:mm"

– Date formats:
DATA OUT – PRNT.PARA. – DATE – DD.MMM.YY
or
DATA OUT – PRNT.PARA. – DATE – MMM.DD.YY

⚠ No ISO|GLP-compliant record is output if any of the following settings are configured:
DATA OUT – PRNT.PARA. – FORMAT – 16 CHARS

Operation
▶ To print the header and the first measurement value:
Press the (🗐) key.
▷ The header is included with the 1st printout.
▶ To print the header and reference data automatically when an application program is active:
Press the (ENTER) key
▶ Print the footer/Exit the application:

Application	Functional process
Density Determination, Net-total Formulation, Totalizing	Print footer and quit application program: 1× Press the (CF) key
Counting, Weighing in Percent Calculation, Animal Weighing	1) Print footer: press (CF) 2) Quit application program: press (CF)

The ISO/GLP-compliant printout can have the following lines:

```
--------------------
17-Aug-2008    10:15
     SARTORIUS
Mod.         MSE8201S
Ser. no.     10105355
Ver. no.     00-39-04
ID            690 923
--------------------
L ID
nRef           10 pcs
wRef        21.14 g
Qnt    +      567 pcs
--------------------
17-Aug-2008    10:20
Name:

--------------------
```

	Dash line
	Date/Time (start of measurement)
	Balance manufacturer
	Balance type
	Balance serial number
	Software version
	ID no.
	Dash line
	Weighing series no. (Lot ID)
	Counting: Reference sample quantity
	Counting: Reference weight
	Counting results
	Dash line
	Date/Time (end of measurement)
	Field for signature
	Space line
	Dash line

The ISO/GLP-compliant printout for external calibration/adjustment:

```
--------------------
17-Aug-2008    10:30
     SARTORIUS
Mod.         MSE8201S
Ser. no.     10105352
Ver. no.     00-39-04
ID            690 923
--------------------
Cal. Ext. Test
Set    +   5000.0 g
Diff. +       0.2 g
Cal. Ext. Complete

Diff.         0.0 g

Level ok
--------------------
17-Aug-2008    10:32
Name:

--------------------
```

	Dash line
	Date/Time (start of measurement)
	Balance manufacturer
	Balance type
	Balance serial number
	Software version
	ID no.
	Dash line
	Calibration/adjustment mode
	Calibration weight value
	Difference after calibration
	Confirmation of completed calibration process
	Difference between current and target values after calibration
	Balance level
	Dash line
	Date/Time (end of measurement)
	Field for signature
	Space line
	Dash line

Data Interfaces

Purpose   Interfaces are used to exchange data with connected peripheral devices: Measured values and calculated values can be output to a printer or PC; conversely, control commands and data inputs can be sent to connected devices (PC, keyboard, foot switch, barcode scanner).
Each interface has to be configured according to the peripheral device and desired function. No error messages are generated when no devices are connected to an interface port (open data port).

Features   Cubis series balances have at least two interfaces:
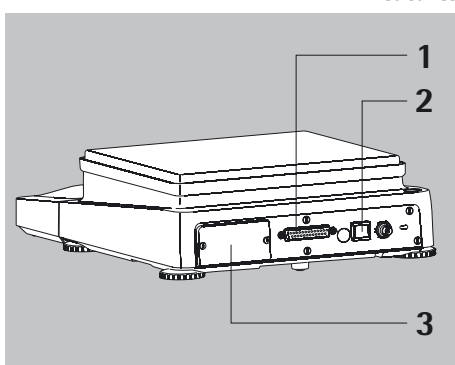
1   Peripheral port (25-pin interface)
2   USB socket for PC connection
3   In models with a weighing range of up to 15 kg, the slot may contain other ports:
–   25-pin interface (YDO01MS-R)
–   9-pin interface with PS2 port The PS2 socket has no function. (YDO01MS-P)
–   Bluetooth® module (YDO01MS-B)

Protocols   For data exchange, the interfaces are configured with the following protocols:
–   **Printer output**
–   **SBI** (Sartorius Balance Interface): Sartorius standard protocol for output to a PC or control unit. This simple ASCII-based protocol allows you to use ESC commands from your PC to control the basic weighing functions.
–   **xBPI** (eXtended Balance Processor Interface, also called X-Bus): binary protocol with extended command volume. This protocol lets you control numerous weighing functions. For further information on this, please contact Sartorius.
To use the protocols, application software must be installed on the PC, e.g., SartoTerminal.

Synchronization   During data communication between balance and PC, messages consisting of ASCII or binary characters are transmitted via the interface. For error-free data exchange, parameters for baud rate, parity, handshake mode, and character format must be identical for both units.

You can configure the respective settings in System Settings (menu). In addition to these settings, data output for the balance can also be made dependent on several conditions that are defined in the individual tasks. These conditions are described under each of the tasks.

USB Port (PC)

Purpose
Any Cubis balance can be connected to a PC equipped with a USB port. A virtual serial interface (virtual COM port) is set up as a device type at the USB port. This virtual serial interface is identified und operated by the application program.
The protocols xBPI, SBI, and SICS can be transmitted via the USB port.

⚠️ The USB port is designed for the laboratory environment and is not suitable for use in rough industrial environments. Full IP protection is only guaranteed when the USB cover is closed.

System Requirements
– Computer (PC) with Windows 98SE®, Windows ME®, Windows 2000®, Windows XP®, Windows Vista® or Windows 7® or Windows 8*
– Available USB port on the PC
– USB cable

Software Driver and Installation Guides
The VCP driver, used to set up the virtual interface on the computer, can be downloaded from the internet:
http://www.ftdichip.com/FTDrivers.htm

The installation guides for the drivers can be found here:
http://www.ftdichip.com/Documents/InstallGuides.htm

Connecting the Balance via USB

ℹ️ The current USB port for the computer is established when the software driver is being installed. The driver must be re-installed every time you wish to change the port.
Therefore, choose one USB port that can permanently or regularly be used to connect the balance.

▶ Switch off the balance.
▶ Unplug the balance from the mains.
▶ Connect the USB cable to the balance and to the USB port on the computer.
▶ Plug the balance into the mains again and switch it on.
▷ Windows detects the device connected to the USB port.
   If the device is being connected for the first time, the Windows Installation Wizard will run.

Installing Software Drivers
▶ Run the Installation Wizard for the driver.
▶ Follow the instructions that appear.
▶ To complete the installation, click on **Finish**.
▷ The virtual interface is now ready for operation.

Windows® usually adds the virtual port in the position following your highest-numbered COM port.

Example:
For a PC with up to 4 COM ports, the new virtual port would then be COM5 (see Device Manager).

Installation Guides for Windows XP®, Windows Vista® and Windows 7® and Windows 8®

Changing the Port Number   If you use the USB interface with a program that limits the number of COM port designations (e. g., only COM1, 2, 3, 4), you may have to assign one of these port numbers to the new virtual port.

▶ Open the setting for the **USB serial port** in the Windows® Control Panel:
   – START > My Computer > Control Panel
   – System > Hardware > Device Manager
▶ Open the **Connections** submenu.
▶ Double-click on **USB Serial Port**.
▶ Select **Port Settings** > **Advanced**.

Changing Latency Time   ▶ Open the settings for the USB serial port, following the above instructions.
▶ For a faster rate of communication, change the setting for the **latency timer** to 1msec.

Plug & Play Mode in Autoprint (SBI)   ▶ Open the settings for the USB serial port, following the above instructions.
▶ Stop the **Plug & Play mode** from running.

Uninstalling the Driver
The software driver for the USB connection can be uninstalled with the Windows® Uninstaller.

Pin Assignment Chart

"Peripherals" Interface and Optional RS–232 Interface (25–pin)

Female Interface Connector:
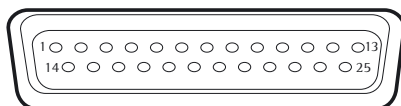
Pin Assignment Chart, 25-pin socket, RS-232:
Pin 1:   Signal ground
Pin 2:   Data output (TxD)
Pin 3:   Data input (RxD)
Pin 4:   Internal ground (GND)
Pin 5:   Clear to send (CTS)
Pin 6:   Not used
Pin 7:   Internal ground (GND)
Pin 8:   Internal ground (GND)
Pin 9:   Not used
Pin 10: Not used
Pin 11: + 12 V output
Pin 12: Reset _ Out*)
Pin 13: + 5 V output
Pin 14: Internal ground (GND)
Pin 15: Universal switch
Pin 16: Not used
Pin 17: Not used
Pin 18: Not used
Pin 19: Not used
Pin 20: Data terminal ready (DTR)
Pin 21: No function
Pin 22: No function
Pin 23: No function
Pin 24: No function
Pin 25: + 5 V output

For remote switch
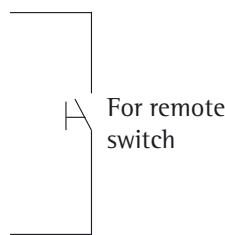
*) = Hardware restart

Preparation
You can set these parameters for other devices in the Setup menu:
See "Configuration."

The many and versatile properties of these balances can be fully utilized for printing out records of the results when you connect your balance to a Sartorius data printer.
The recording capability for printouts makes it easy for you to work in compliance with GLP.

Cabling Diagram 25-pin Interface
Diagram for interfacing a computer or other peripheral device to the balance using the RS-232/V24 standard and cables up to 15 m (50 ft.) long

⚠ **Do not connect any other pins to the cable connector of the balance.**

Balance Plug 25-pin				Computer socket 9-pin
TxD 2	→		2	RxD
RxD 3	←		3	TxD
CTS 5	←		4	DTR
DTR 20	→		8	CTS
GND 4/7			6	DSR
GND 14			5	GND
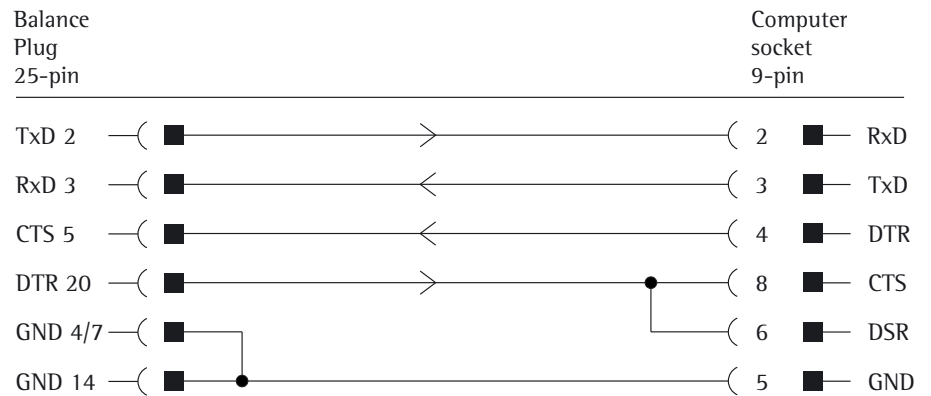
Cable type: AWG 2 specification
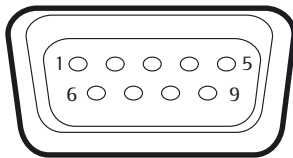
Pin Assignment Chart, 9-contact Female Connector, RS-232:
Pin 1:   Not used
Pin 2:   Data output (TxD)
Pin 3:   Data input (RxD)
Pin 4:   Not used
Pin 5:   Internal ground (GND)
Pin 6:   Not used
Pin 7:   Clear to send (CTS)
Pin 8:   Data Terminal Ready (DTR)
Pin 9:   Not used

Establish a connection via a conventional RS-232 cable.

Data Output

You can define the data output parameter so that output is activated either when a print command is received or automatically synchronized with the display or at defined intervals (see application programs and autoprint settings).

Data Output by Print Command   The print command can be transmitted by pressing (🗐) or by a software command (EscP).

Automatic Data Output   In **autoprint** mode, data is output to the data interface port without an extra print command. You can have synchronized data output automatically at defined display update intervals, with or without the stability parameter. The interval time depends on the balance operating status and balance type.
If the automatic data output is activated in the Device Configuration, it starts immediately after the balance is turned on. You can also configure whether the automatic data output can be stopped and started by pressing the (🗐) key.

Data Output Formats

You can output the values displayed in the line for measured values and weight units with or without an ID code. Configure this output parameter in the Device Parameters menu (Menu > Device parameters > Configure data output > Line format).

Example: Output Without an ID Code   `+      253 pcs`   16 characters are printed

Example: Output With an ID Code   `Qnt   +      253 pcs`   22 characters are printed

Data Output Format with 16 Characters
Display segments that are blank are output as spaces.
Display values without a decimal point are printed without a decimal point.
The type of character that can be printed depends on the character's position.

Normal Operation

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		+	A	A	A	A	A	A	A	A	*	E	E	E	CR	LF
or		−	.	.	.	.	.	.	.	.	.	*	*	*		
or			*	*	*	*	*	*	*	*	*					

*:   Space   CR: Carriage return
A: Displayed characters   LF: Line feed
S: Characters for the unit

Special Outputs

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	*	*	*	*	*	*	*	*	*	*	*	*	*	*	CR	LF
or						H	i	g	h							
or						L	o	w								
or				C	a	l	.	E	x	t	.					

*:	Space		High:	Overload
Cal. Ext.:	Calibration, external		Low:	Underload

W:	Draft shield status (optional)
I:	Ionizer (optional)
Y,Y,Y =	Draft shield doors
XXX =	Decimal value calculated from binary data:
	Control information for models with normal draft shields

Decimal value	Binary value	Control information
1	Bit0 = 0:	No error/ionizer off
	Bit0 = 1:	Draft shield error/ionizer on
2	Bit1 = 0:	Draft shield motors off
	Bit1 = 1:	Draft shield in motion
8	Bit3 = 0:	Learning function off
	Bit3 = 1:	Learning function on
16	Bit4 = 0:	At least one draft shield door open
	Bit4 = 1:	All draft shield doors closed
32	Bit6 = 0:	Motorized draft shield operation
	Bit6 = 1:	Manual draft shield operation

R,M,L = COO: **R**ight door closed (**C**losed), **M**iddle and **L**eft doors open (**O**pen)
R,M,L = OCC: **R**ight door open (**O**pen), **M**iddle and **L**eft doors closed (**C**losed)

Error message

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
				E	r	r	*	#	#	#	*	*	*	*	CR	LF
				A	P	P	.	E	R	R[1]	*	*	*	*	CR	LF
				D	I	S	.	E	R	R[1]	*	*	*	*	CR	LF
				P	R	T	.	E	R	R[1]	*	*	*	*	CR	LF

*:	Space	# # #: Error code number

[1] For cause and solution, please refer to "Error Messages"

Example: Output of the weight value + 123,56 g

Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	+	*	*	*	1	2	3	.	5	6	*	g	*	*	CR	LF
	+	*	*	1	2	3	.	5	[	6	][1]	g	*	*	CR	LF

Position 1:	Plus +, or minus – or space
Position 2:	Space
Positions 3 – 10:	Weight value with decimal point; leading zeros are output as spaces.
Position 11:	Space
Position 12 – 14:	Characters for unit of measure or space
Position 15:	Carriage Return
Position 16:	Line Feed

Data Output Format with 22 Characters

Here, the data output format with 16 characters is preceded by an ID code with a 6 characters. These six characters identify the subsequent value.

Normal Operation

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
K	K	K	K	K	K	+	A	A	A	A	A	A	A	A	A	*	E	E	E	CR	LF
*	*	*	*	*	*	_	.	.	.	.	.	.	.	.	.	*	*	*	*		
							*	*	*	*	*	*	*	*	*						

K: ID code character[1])   S: Unit symbol character[1])
*:   Space   See Section "Mass Unit Conversion"
A: Displayed characters   CR: Carriage return
LF: Line feed

Example:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
N						+				1	2	3	.	5	6	*	g	*	*	CR	LF
N						+				1	2	3	.	5	[	6	][1])	g	*	*	CR	LF

[1]) **Identification of non-verified digits**
Non-verified digits where „e=d" are automatically marked on the printout by square brackets when you select the following setting: Configuration: Communication mode: PRINTER (code 1. 5. 6. 2).

SBI setting:
In the SBI setting (code 1. 5. 6. 1), the unverified values are not automatically identified. Please take appropriate measures or adjust the settings on the peripheral device.

Special Outputs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	CR	LF
											H	i	g	h							
											L	o	w								
										C	a	l	.	E	x	t	.				

*:   Space   High: Overload
Cal. Ext.:   Calibration, external   Low: Underload

Error message

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S	t	a	t	*	*	*	*	*	E	R	R	*	#	#	#	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	A	P	P	.	E	R	R[2])	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	D	I	S	.	E	R	R[2])	*	*	*	*	CR	LF
S	t	a	t	*	*	*	*	*	P	R	T	.	E	R	R[2])	*	*	*	*	CR	LF

*: Space   # # #:   Error code number

[2]) For cause and solution, please refer to „Error Messages"

Data Input

SBI Commands (Data Input Format)

The computer connected via the data port can send control commands to the balance to control balance and application program functions.

These control commands may have different formats and contain up to 20 characters. Each of these characters must be sent based on the setup configuration for data transmission.

Formats for Control Commands (Syntax)

Format 1:	Esc	!	CR	LF		
Format 2:	Esc	!	#	_	CR	LF

Esc: Escape
!:   Command character
#:   Digit
&:   Parameter (number or letter)
_: Underline (ASCII: 95)
CR: Carriage return (optional)
LF: Line feed (optional)

Examples:
Format 1: Esc P
Format 2: Esc x1_

Overview of SBI Commands

Format	Command	Action/Function		Comments
1	ESC P	Print to the interface where the prompt originated		Corresp. to menu, with/ without stability
1	ESC T	"TARE" key taring and zeroing		
1	ESC K	Filter "Very stable conditions"		
1	ESC L	Filter "Stable conditions"		
1	ESC M	Filter "Unstable conditions"		
1	ESC N	Filter "Very unstable conditions"		
1	ESC O	Block keys		
1	ESC Q	Acoustic signal		
1	ESC R	Unblock keys		
1	ESC S	Restart		
1	ESC Z	Internal calibration/adjustment		Depending on menu, 1/2 step increments
1	ESC U	Tare		
1	ESC V	Zero		
1	ESC W	Ext. Adjustment with default weight		Depending on menu, 1/2 step increments
2	ESC f0_	(SELECT/MENU) key		
2	ESC f1_	Start calibration		
2	ESC f2_	(ENTER) key		
2	ESC f5_	Left draft shield key (closing and opening as learned or default)		Only if available
2	ESC f6_	Right draft shield key (closing and opening as learned or default)		Only if available
2	ESC kP_	Print as with "PRINT" key (e.g., to several interfaces)		
2	ESC m0_	Ionizer status		Only if available
2	ESC m1_	Ionizer on, with preset time		Only if available
2	ESC m2_	Ionizer off		Only if available
2	ESC s3_	(CF) key: Back, exit, cancel		

Format	Command	Models with the analytical draft shield:	Models with the rotational draft shield	Comments
2	ESC w0_	Draft shield status	Draft shield status	Only if available
2	ESC w1_	Open left door	Open draft shield 100% to the left	Only if available
2	ESC w2_	Close all doors	Close draft shield	Only if available
2	ESC w3_	Open upper door	Open draft shield up to position saved	Only if available
2	ESC w4_	Open right door	Open draft shield door 100% to the right	Only if available
2	ESC w5_	Open left and upper doors	–	Only if available
2	ESC w6_	Open left and right doors	–	Only if available
2	ESC w7_	Open right and upper door	–	Only if available
2	ESC w8_	Open all doors	–	Only if available
2	ESC x1_	Print weigher type		
2	ESC x2_	Output serial number of		
2	ESC x3_	Print balance software version		
2	ESC s0_	Press and hold the (SELECT/MENU) key		
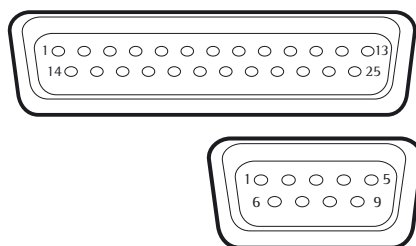
Optional Interfaces (RS-232) 25-pin and 9-pin

The balance is standard-equipped with a 25-pin interface (**peripheral port**) where different Sartorius peripheral devices can be connected, e. g., hand or foot switch. This interface is also used for the control lines for the **Checkweighing** application.

A 9-pin interface can optionally be installed into models with a weighing range of up to 15 kg. This port is intended for connecting a PC.

Warning When Using Pre-wired RS-232 Connecting Cables for the 25-pin Interface:
RS-232 cables purchased from other manufacturers often have incorrect pin assignments for use with Sartorius devices. Failure to do so may damage or destroy your weighing system and/or peripheral devices!
▶ Be sure to check the pin assignments before you connect cables purchased from other manufacturers.
▶ Disconnect any lines assigned differently (e. g., Pin 6).

Features (* = factory settings)

Type of interface:		Serial interface
Interface operating mode:		Full duplex
Level:		RS232
Interface connector:		D-SUB connector, 25-pin or 9-pin
Transmission rate:		600, 1200, 2400, 4800, *9600 und 19200 baud (selectable)
Parity:		*Even, odd, none; blank spaces (selectable)
Character transmission:		Start bit, 7/8* bit ASCII, parity, *1 or 2stop bits (selectable)
Handshake (selectable):	25-pin	For 2-wire interface: Software (XON/XOFF) For 4-wire interface: *Hardware (CTS/DTR)
	9-pin	Hardware (CTS/RTS)
Operating mode:		*SBI, xBPI, printer, SICS, 2nd display
Manual print mode:		Without stability, *after stability
Auto print mode:		*Without stability, at stability, after load change
Cancel automatic printing:		Not possible
Time-dependent automatic printout:		After 1 display update
Data output of balance:		16 or *22 characters
Tare after individual printout:		Off
Basic values, application:		Off

Connectable Peripherals   The following devices can be connected to the interface:
– Verifiable data printers YDP03-0CE, YDP10-0CE, YDP20-0CE
– Verifiable data printer with Bluetooth data transmission YDP10BT-0CE (module required)
– Universal (serial printer)
– Strip/label printer YDP04IS-0CEUV
– Hand switch YHS01
– Foot switch YFS01, YPE01RC
– External control display YRD11Z
– Remote display YRD03Z

Bluetooth® Interface (optional)

How to assemble the Bluetooth® module is described in the supplied installation instructions.
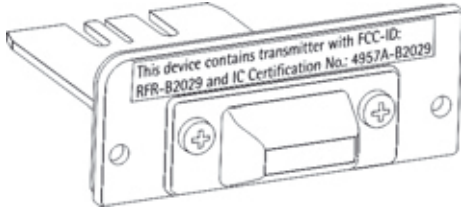
In order to transmit data via the Bluetooth module, the interface must first be configured.

Configuring the Bluetooth® Interface

Step	Press key	Display
▶ If necessary, toggle to the menu		
1. Accessing the Menu: 1. Display menu level	(SELECT MENU) Press and hold	*APPLIC.*
2. Select and confirm *OPT.MOD*	Repeatedly press (SELECT MENU), (ENTER)	*OPT.MOD*
3. Select and confirm the *DAT.PROT.* submenu	(SELECT MENU), (ENTER)	*DAT.PROT.*

The following operating modes are possible for this interface under *DAT.PROT.*:
– SBI (data exchange with PC or notebook)
– Universal printer
– Laboratory printer: parameters for YDP10BT
– No function (off)

▶ Select the desired operating type.

Establishing a Radio Connection with the Bluetooth® Printer
▶ Make sure that the printer to which you wish to connect is ready to operate.
▶ To establish a connection,
  Select the OPT.MOD: FIND submenu.   (SELECT MENU), (ENTER)   *FIND*
▷ The balance will now search for the Bluetooth device.

This process may take time.   *WAIT*
Wait for the next message to appear on the display.

⚠ You can only connect to one Bluetooth printer at a time.

▷ A message will appear to confirm whether the printer has been found.   *SER.NO.*
  Connection established to printer YDP01BT: The serial no. appears   *2320 1234*
▷ As soon as the menu is exited, the connection will be re-established.
  The LED on the printer will then illuminate permanently (blue).

Bluetooth Series No. and Model ID
▶ If required, you can enter the serial number and device name   (SELECT MENU), (ENTER)   *SER.NO.*
  (only with Bluetooth modules from Version 04-10-01).   (SELECT MENU), (ENTER)   *MODEL*

Error Messages

Error codes are displayed for about 2 seconds. The program then returns automatically to the weighing mode.

Display	Cause	Solution
No segments appear	No power Power supply not plugged in	Check power supply Connect power supply to the wall outlet (mains)
HIGH	Weighing capacity exceeded	Unload the weighing pan
LOW or ERR 54	Contact between load plate and environment	Move the object that is touching the weighing pan
APP.ERR.	Cannot save data: load is too light or no sample on the weighing pan while application is active	Increase load
DIS.ERR.	Data output not compatible with output format	Change the configuration with output format in the operating menu
PRT.ERR.	Interface port for printer output is blocked	Reset the menu factory settings or Contact your local Sartorius Service Center
MODUL.ERR.	Balance cannot find a Bluetooth printer No Bluetooth connection	Establishing a radio connection between the balance and printer: See "Establishing a Radio Connection with the Bluetooth® Printer"
ERR 02	Adjustment condition was not met, e.g., – Tare with the (TARE) key – Load on weighing pan	Calibrate only when zero is displayed Unload the balance
ERR 10	The (TARE) key is blocked when the "Net-total Formulation" application is active; only 1 tare function can be used at a time	The (TARE) key can be used again after the tare memory has been deleted using the (CF) key
ERR 11	Tare memory not allowed	Press the (TARE) key
ERR 81	1) No print command received from the balance. Bluetooth® connection was briefly interrupted. 2) Balance was turned on and then data output took place.	Wait approx. 40 seconds; device will reconnect automatically. Reestablish connection: See "Establishing a Radio Connection with the Bluetooth® Printer"
LEVEL.ERR.	You should level the balance	Level balance
◯ flashes	Balance not level	1) Level the balance using the leveling feet 2) or for models with motorized leveling feet: Press the (*) key
The weight readout changes constantly	Setup location unstable (excessive vibration or draft) Foreign object is caught between weighing pan and balance/scale housing	Set up balance in another area Change Setup Configurations Remove the foreign object
The weight readout is obviously wrong	The balance was not calibrated/adjusted Balance was not tared before weighing	Adjustment Tare

If any other errors occur, contact your local Sartorius Service Center.
Contact information: Please point your Internet browser to: http://www.sartorius.com

Care and Maintenance

Service
Regular servicing by a Sartorius technician will extend the service life of your balance and ensure its continued weighing accuracy. Sartorius offers its customers service contracts with regular maintenance intervals ranging from 1 month to 2 years. The frequency of the maintenance intervals depends on the operating conditions and user's tolerance requirements.

Repairs
Repair work must only be carried out by trained service technicians. Repairs performed by untrained persons may result in considerable hazards for the user.

⚠ The device should be unplugged during repair work.
Unplug the power cord from the outlet.
Repair work must only be performed by Sartorius-trained service technicians.
If required: Please contact your Sartorius dealer!

Cleaning the Balance

⚠ Ensure that no dust or liquid enters the balance weighing system.
Do not use aggressive cleaning agents (solvents or similar.
Isolate from supply voltage: Unplug the power cord from the wall outlet and unplug any data cables connected to the balance.
Make sure all equipment operators have received proper instructions when working with hazardous or toxic materials.
Failure to follow correct handling procedures can result in breakage of parts or spillage of liquids or other substances.
Make sure the necessary protective clothing or equipment is worn, such as protective gloves, clothing, eyewear.
All safety regulations applicable in the laboratory must be observed.
When using the balance in the chemical industry, handle defective or device parts to be cleaned according to respective regulations.
Models with a Readability of >1 mg:
– These models meet the requirements of protection class IP54.
  The IP protection only applies to the balance housing and not to the AC adapter.
– The IP protection is only guaranteed when the weighing pan is mounted.
– The IP protection is limited when the data interfaces are used. Retain the cover cap for the data output. When the data output is not in use, reapply the cover cap to protect it against vapors, moisture, and dust or dirt.
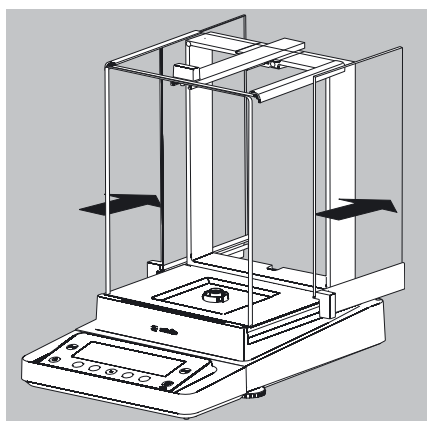
▷ Open the panels of the analytical draft shield completely.

▷ Clean the housing and interior of the balance with a cloth lightly moistened with a soap solution.

▷ Dry all parts with a soft, dry cloth or use blotting paper to absorb dampness. Then replace all dried parts.

▷ Remove panels from the analytical draft shield and clean them with commercially available glass cleaner. Dry the panels. Then reinstall them to the balance.
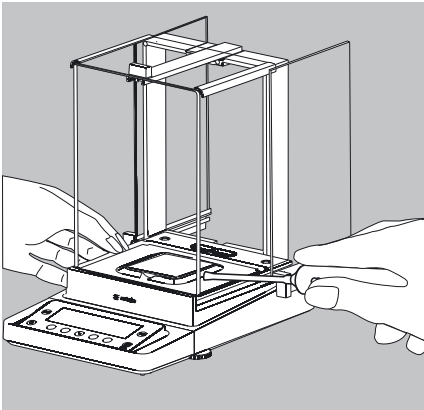
▶ Carefully remove any sample residue/spilled powder using a brush or hand-held vacuum.
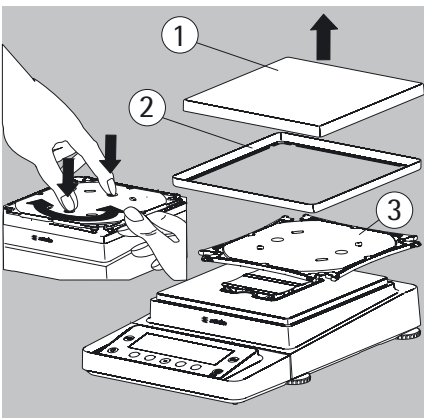
▶ If necessary, remove the weighing pan, shield plate, and pan support.

1. Weighing pan

2. Shield plate/Draft shield

3. Pan support
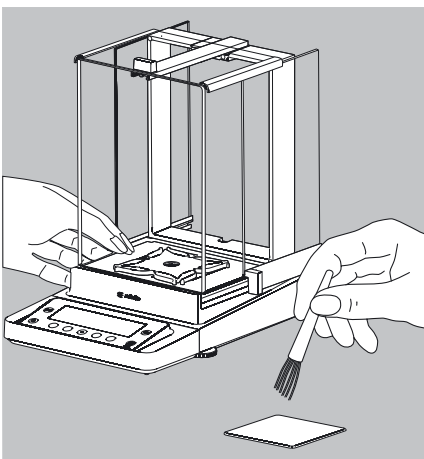
▶ Clean parts with a cloth or brush.
Then replace the parts.
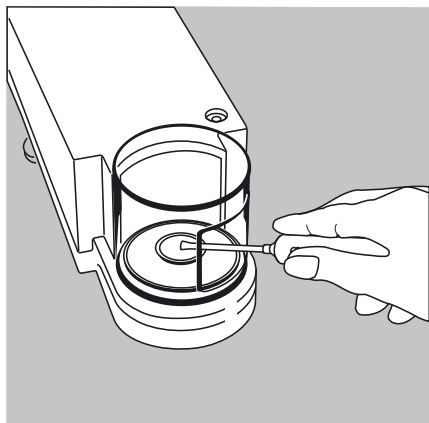
Cleaning the Weighing Chamber of Balances with a Readability of ≤ 1 μg

▶ Carefully remove any powdered sample material from beneath the shield disk using a small car vacuum cleaner with an mini-hose attached.

▶ Use blotting paper to remove any liquid sample material.
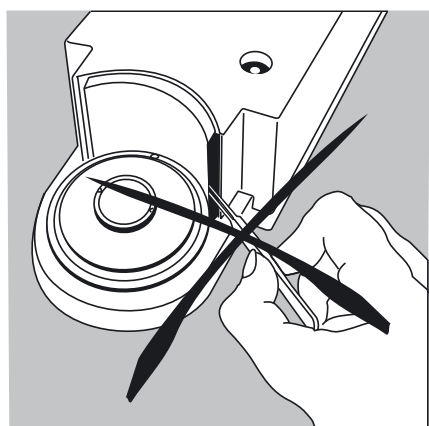
⚠ Do not insert forceps or similar utensils behind the draft shield plate.

Note: The weighing system is hermetically separated from the area of the draft shield plate. This prevents spillage or other impurities from entering.

Cleaning the Weighing Pan
All stainless steel parts should be cleaned at regular intervals.

Use a damp cloth or sponge to clean stainless steel parts on the balance.
Only use conventional household cleaning agents which are suitable for stainless steel (e.g. Stahlfix). After this, let the device dry.
For additional protection, protective oil may be applied.

Remove the stainless steel weighing pan and thoroughly clean it separately.
Only use solvents for cleaning stainless steel parts.
The stainless steel weighing pan should be cleaned simply by rubbing. After this, rinse the equipment thoroughly until all residue is removed.
No protective oil should be applied to the stainless steel weighing pan.
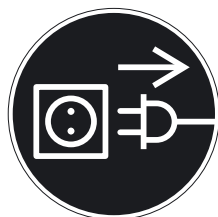
Safety Inspection

If there is any indication that safe operation of the balance is no longer warranted:
▶ Disconnect from the supply voltage: Unplug the power cord from the outlet.

▶ Secure the AC adapter and cord so that they cannot be used.

Safe operation of the AC adapter is no longer ensured:

– The AC adaptor or the mains connecting lead shows visible damage.
– The AC adaptor no longer functions properly.
– Following extended storage in adverse conditions.
  In this case, notify the Sartorius Service Center.

Maintenance and repair work may be performed only by authorized service technicians who have access to the required maintenance manuals and instructions and who have received the necessary training.

We recommend that the AC adapter be inspected by a qualified service technician with regard to the following:

– Leakage current: <0.25 mA measured with a properly calibrated multimeter.
– Insulation resistance >7 MOhm as measured with a constant voltage of at least 500 volts at a 500 kOhm load.

The duration and number of checks should be determined by a qualified Sartorius service technician on site based on specific ambient and operating conditions (once a year as a minimum).

Transporting the Balance

If repairs are required, use the original packaging to transport the balance.
To ensure adequate protection for safe shipment, Sartorius products have been packaged to the extent necessary using environmentally friendly materials. Only the original packaging provides optimum protection for the equipment.
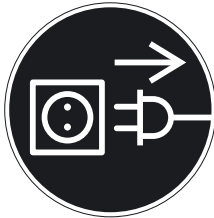
► Disconnect the device from the power supply.

► Disconnect any data cables from the device.
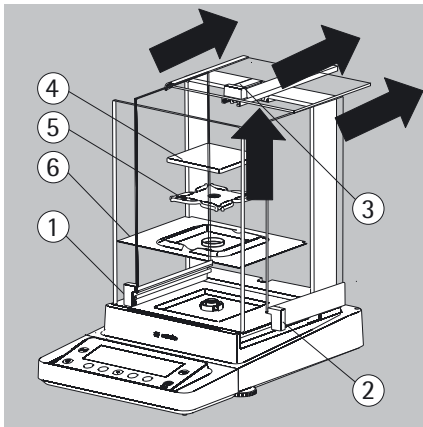
► Remove all items (such as weights, sensors, etc.) from the weighing chamber.
1. Remove the other side draft shield panel
2. Remove the other side draft shield panel
3. Remove the upper draft shield panel
4. Remove the weighing pan
5. Remove pan support (not for MSE225.../MSE125... models)
6. Remove shield plate/draft shieldz
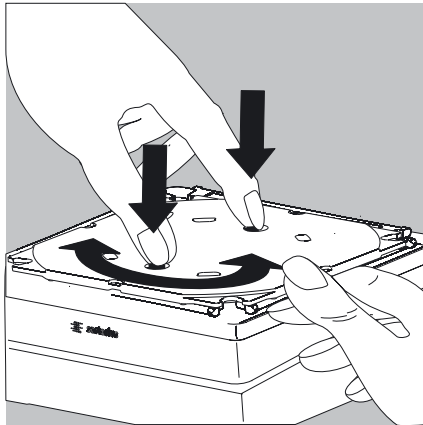
► On models without a draft shield: press down on the two pan support fasteners.

► Rotate and remove the pan support.
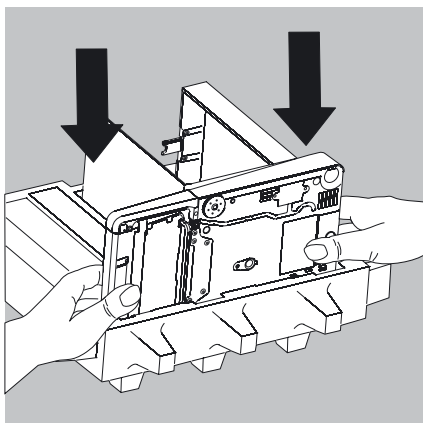
► Place the balance in the lower part of the packaging.
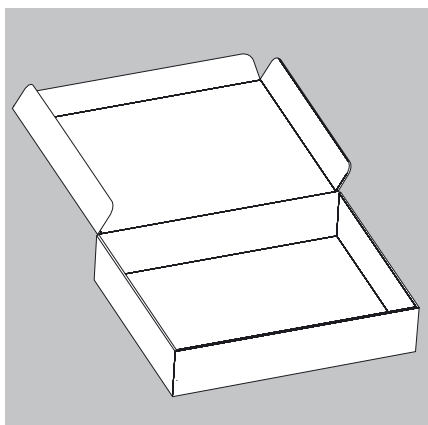
Transporting the Parts (Large Analytical Draft Shield)

▶ Get the box for the individual parts of the balance ready.
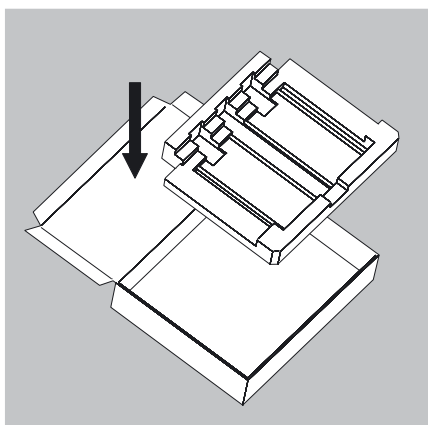
▶ Place the bottom foam piece in the box.
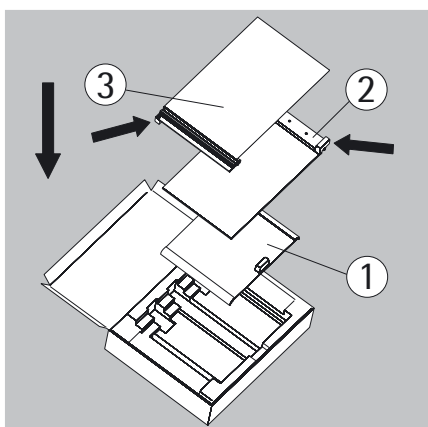
▶ Place the panels in the packaging:
1) Place the upper draft shield panel into the packaging (handle upwards).
2) Place the side draft shield panel into the packaging (handle upwards).
3) Place the other side panel into the packaging (handle downwards).
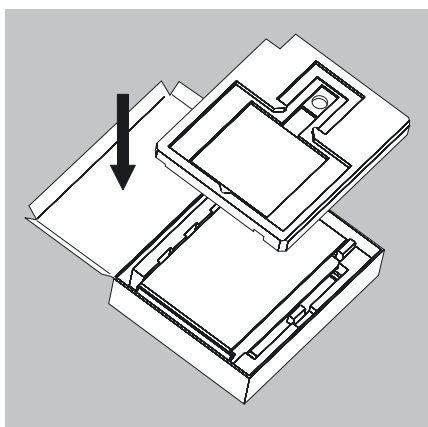
▶ Then place the top foam piece in the box.
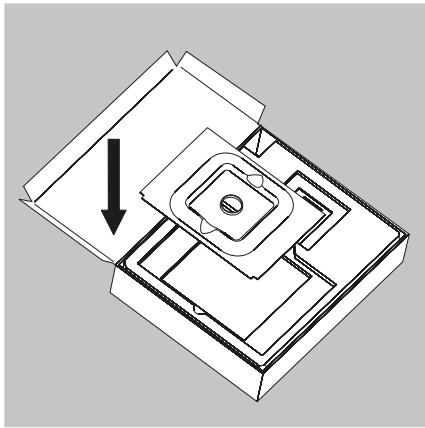
For small weighing pans:
▶ Place the shield plate into the box.
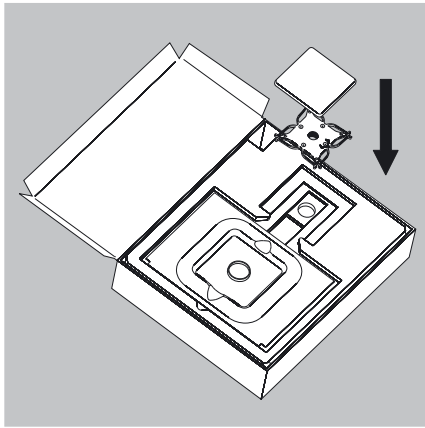
▶ Place the pan support and weighing pan into the opening.

▶ Close the box.
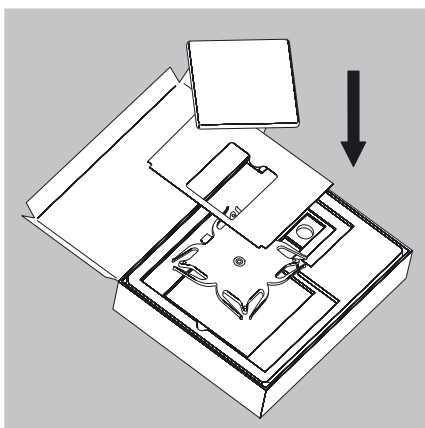
For large weighing pans:
▶ Insert the following parts into the foam piece:
1) Pan support
2) Shield plate
3) Weighing pan
▶ Close the box.

Transporting the Parts (Small Analytical Draft Shield)
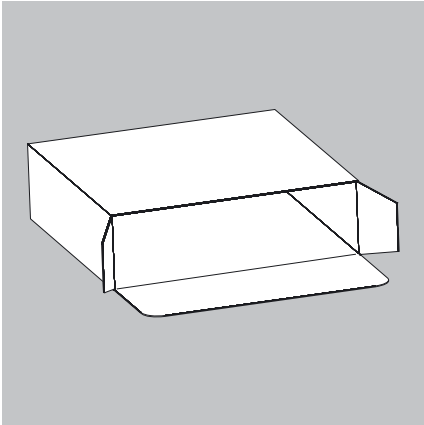
▶ Get the box ready for the individual parts of the balance.
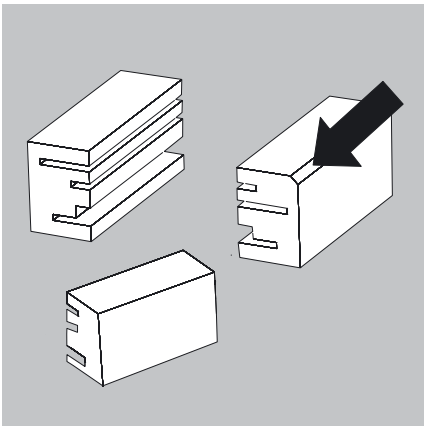
▶ Get the foam pieces ready.
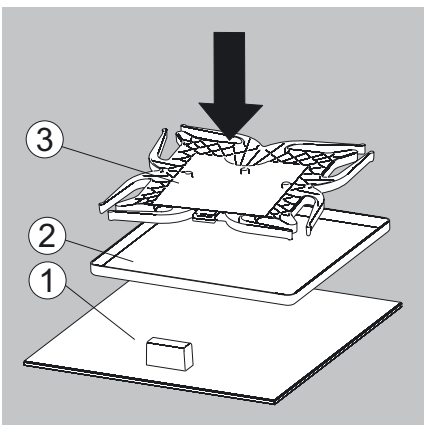
▶ Place the balance parts on top of each other
1) Upper draft shield panel
2) Shield plate/draft shield
3) Pan support
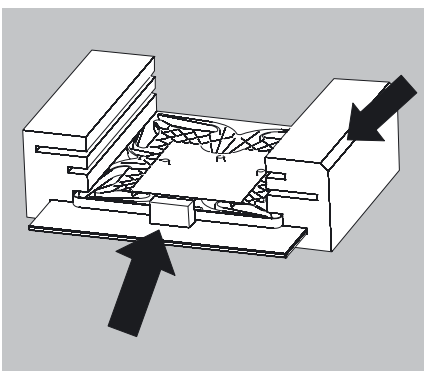
▶ Slide the parts into the foam.
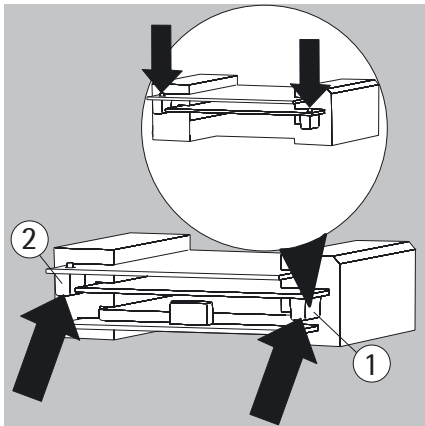
▶ Place the panels in the packaging.
1) Place one side panel into the packaging (handle downwards).
2) Place the other side panel into the packaging (handle downwards).
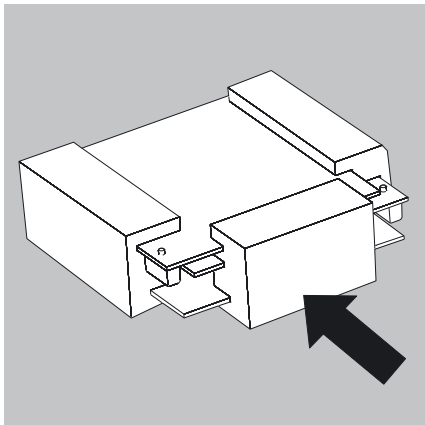
▶ Place the foam piece in front of the parts.
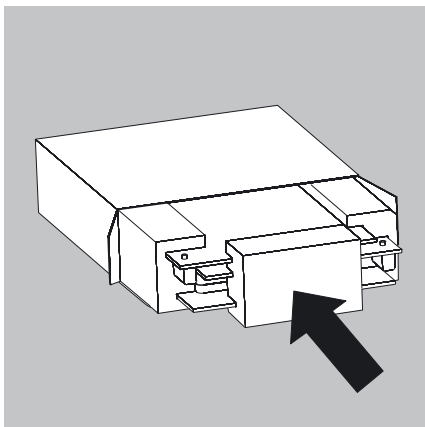
▶ Place the package in the box.
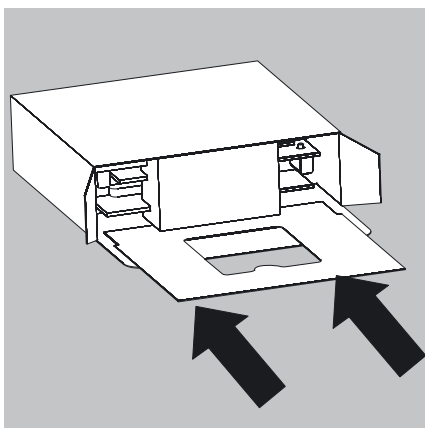
▶ Slide the shield plate into the packaging.
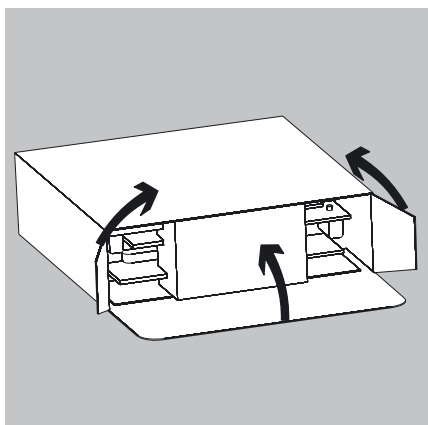
▶ Close the box.
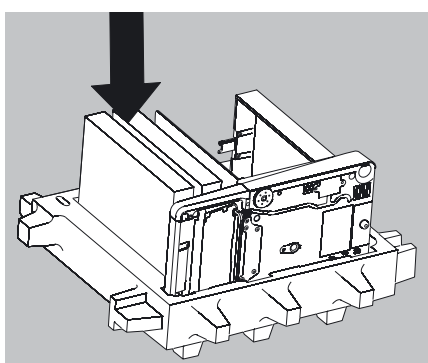
▶ Place the box into the packaging.
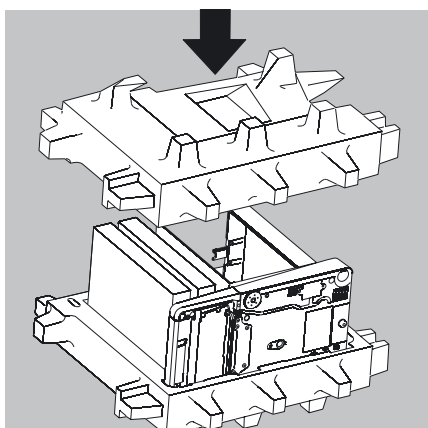
▶ Place the top part on to the packaging.
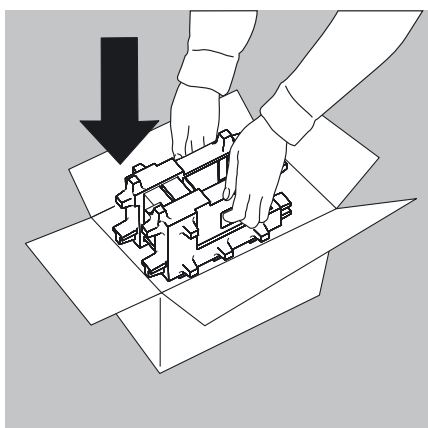
▶ Insert the balance into the box with cushioning.

▶ The balance is now ready for transport.

Disposal
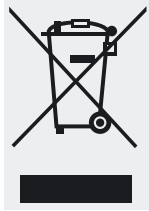
The packaging is made of environmentally friendly materials that can be used as secondary raw materials. If you no longer require the packaging, you can dispose of it free of charge in Germany through the Vfw dual system (contract number D-59101-2009-1129). Otherwise you should dispose of the material in accordance with the waste disposal regulations that are applicable in your area. The device, including its accessories and batteries, should not be disposed of as household waste. It should instead be recycled as electric/electronic equipment. For more information regarding disposal and recycling, please contact our local service representatives. Our partners listed on the following website will also be able to provide assistance within the EU:

1) Go to http://www.sartorius.com.
2) Select the "Services" tab.
3) Then select "Information on Disposal".
4) Addresses for the local Sartorius disposal contacts can be found in the PDF files available for download on this page.

Sartorius will not take back equipment contaminated with hazardous materials (ABC contamination) – either for repair or disposal.

Detailed information, including service addresses for returning your device for repair or disposal, can be found on our website (www.sartorius.com) or requested from a Sartorius Service Center.

Technical Specifications

General Data

Sartorius power supply 6971987

Primary	100 – 240 V~, –15%/+10%, 50 – 60 Hz, 1.0 A
Secondary	15 V, ± 5%, 2.66 A (max.), protected electronically against short circuit
Other data	Protection class II as per EN/IEC 60950-1 | up to 3000 m above sea level | IP40 as per EN 60529/IEC 60529

Power supply cable	Two-sided plug with a 3-pin country-specific power plug and 3-pin socket (IEC/EN60320-1/C14) for connection to the power supply
Other data	See the power supply label

Balance

Power supply	Only via Sartorius adaptor 6971987
Input voltage	15 VDC, ± 5%
Power consumption	7 W (max.)
IP protection for models	
with a readability of ≥ 10 mg	IP54 as per EN 60529/IEC 60529

Environmental conditions

Environment	For indoor use only
Ambient temperature:	
Storage and shipping	-10 °C ... +60 °C
Ambient temperature: Operation*	+5 °C ... +40 °C
Elevation	2000 m above sea level
Highest relative humidity**	80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity for 40°C

Safety of electrical equipment	According to EN 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: general requirements

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Electromagnetic compatibility	According to EN 61326-1:2006 Electrical equipment for measurement, control, and laboratory use - EMC requirements - Part 1: general requirements
Defined immunity to interference:	Suitable for use in industrial areas
Interference emission:	Class B (suitable for use in residential areas and areas that are connected to a low voltage network that also supplies residential buildings).

Standard equipment

Selectable weight units	Grams, Kilograms, Carats, Pounds, ounces, troy ounces, Hong Kong tael, Singapore tael, Taiwanese tael, grains, pennyweights, milligrams, parts per pound, Chinese tael, mommes, Austrian carats, tola, baht and mesghal
Available application programs	Changing unit, counting, weighing in percent, calculation, averaging (animal weighing), density determination, totalizing, net-total formulation

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M CE model balances verified for use in legal metrology comply with the requirements of Council Directive No. 90/384/EEC (2009/23/EC) with EN45501:1992 and OIML R76:2006.

M * For -.CE model balances/scales verified for use in legal metrology, refer to the information on the balance/scale.
** For -.CE model balances/scales verified for use in legal metrology, the legal regulations apply.

Model-specific Data

Microbalances 0.001mg

Model		MSE6.6S	MSE6.6S–F	MSE3.6P
Readability	mg	0.001	0.001	0.001/0.002/0.005
Weighing capacity	g	6.1	6.1	1.1/2.1/3.1
Tare range (subtractive)	g	–6.1	–6.1	–3.1
Repeatability	≤±mg	0.001	0.001	0.003/0.004/0.005
Linearity	≤±mg	0.004	0.004	0.004
Corner load (test load [g])[1]	µg	4 (2 g)	4 (2 g)	5 (1 g)
Min. initial weight[2]	mg	2	–	4
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1
Typical stabilization time	s	≤ 5	≤ 5	≤ 5
Typical measurement time	s	≤ 8	≤ 8	≤ 8
External standard calibration value (of at least accuracy class…)	g	5 (E2)	5 (E2)	3 (E2)
Display result (depending on the set filter level)		0.1 – 0.4	0.1 – 0.4	0.1 – 0.4
Weighing pan size ∅	mm	30	50/30	30
Weighing chamber height	mm	70	15	70
Protection		Protected against dust and water		

Ultramicrobalances 0.0001mg

Model		MSE2.7S	MSE2.7S–F
Readability	mg	0.0001	0.0001
Weighing capacity	g	2.1	2.1
Tare range (subtractive)	g	–2.1	–2.1
Repeatability	≤±mg	0.00025	0.00025
Linearity	≤±mg	0.0009	0.0009
Corner load (test load [g])[1]	µg	0.5 (1 g)	0.5 (1 g)
Min. initial weight[2]	mg	1	–
Sensitivity drift between +10 to +30°C	±ppm/K	1	1
Typical stabilization time	s	≤ 7	
Typical measurement time	s	≤ 10	
External standard calibration value (min. accuracy class)	g	2 (E2)	2 (E2)
Display result (depending on the set filter level)		0.1 – 0.4	0.1 – 0.4
Weighing pan size ∅	mm	20	50/20 [1]
Weighing chamber height	mm	70	15
Protection		Protected against dust and water	

[1] = Standard pan
[2] = Typical min. initial weighing according to USP (United States Pharmacopeia), USP31-NF26

Model–specific Data

Semi-microbalances 0.01 mg

Model		MSE225S	MSE225P	MSE125P
Readability	mg	0.01	0.01/0.02/0.05	0.01/0.1
Weighing capacity	g	220	60/120/220	60/120
Tare range (subtractive)	g	– 220	– 220	– 120
Repeatability	≤±mg	0 to 6 g: 0.015 60 to 220 g: 0.025	0 to 6 g: 0.015 60 to 220 g: 0.04	0 to 6 g: 0.015 60 to 120 g: 0.06
Linearity	≤±mg	0.1	0.15	0.15
Corner load (test load [g])	mg	0.15 (100)	0.2 (100)	0.15 (50)
Min. initial weight*	mg	20	20	20
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1
Typical stabilization time	s	≤ 2	≤ 2	≤ 2
Typical measurement time	s	≤ 6	≤ 6	≤ 6
External standard calibration value (min. accuracy class)	g	200 (E2)	200 (E2)	100 (E2)
Display result (depending on the set filter level)		0.2 – 0.4		
Weighing pan size (W×D)	mm	85 × 85		
Weighing chamber height (draft shield DU)	mm	261		
Protection		Protected against dust and water		

* = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26

Analytical balances 0.1 mg

Model		MSE524S	MSE524P	MSE324S	MSE224S	MSE324P	MSE124S
Readability	mg	0.1	0.1/0.2/0.5	0.1	0.1	0.1/0.2/0.5	0.1
Weighing capacity	g	520	120/240/520	320	220	80/160/320	120
Tare range (subtractive)	g	– 520	– 520	– 320	– 220	– 320	– 120
Repeatability	<±mg	0.1	0.15/0.2/0.4	0.1	0.07	0.1/0.2/0.4	0.1
Linearity	<±mg	0.4	0.5	0.3	0.2	0.5	0.2
Corner load (test load [g])	mg	0.3 (200)	0.4 (200)	0.3 (200)	0.2 (100)	0.4 (200)	0.2 (50)
Min. initial weight*	mg	120	120	120	120	120	120
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1	1	1	1
Typical stabilization time	s	< 1	< 1	< 1	< 1	< 1	< 1
Typical measurement time	s	< 3	< 3	< 3	< 3	< 3	< 3
External standard calibration value (min. accuracy class)	g	500 (E2)	500 (E2)	200+100 (E2)	200 (E2)	200+100 (E2)	100 (E2)
Display result (depending on the set filter level)		0.1 – 0.4					
Weighing pan size (W × D)	mm	85 × 85					
Weighing chamber height (draft shield DU)	mm	261					
Protection		Protected against dust and water					

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSE5203S	MSE5203P	MSE3203S	MSE3203P
Readability	mg	1	1/2/5	1	1/10
Weighing capacity	g	5,200	1,200/2,400/5,200	3,200	1,010/3,200
Tare range (subtractive)	g	− 5,200	− 5,200	− 3,200	− 3,200
Repeatability	≤±mg	1	1	1	1/6
Linearity	≤±mg	5	5	5	5
Corner load (test load [g])	mg	2 (2,000)	2 (2,000)	2 (1,000)	2 (1,000)
Min. initial weight*	g	1.5	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1	1
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 2	≤ 2	≤ 2	≤ 1.5
External standard calibration value (min. accuracy class)	g	5,000	5,000	2,000	2,000 (E2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	140 × 140			
Weighing chamber height (draft shield DE)	mm	172			
Protection		Protected against dust and water			

* = Position according to OIML R76

Models		MSE2203S	MSE2203P	MSE1203S
Readability	mg	1	1/10	1
Weighing capacity	g	2,200	1,010/2,200	1,200
Tare range (subtractive)	g	− 2,200	− 2,200	− 1,200
Repeatability	≤±mg	1	1/6	0.7
Linearity	≤±mg	3	5	2
Corner load (test load [g])	mg	2 (1,000)	3 (1,000)	2 (500)
Min. initial weight*	g	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	1	1	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	g	2,000 (E2)	1,000 (E2)	1,000 (E2)
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* = Position according to OIML R76

Model–specific Data

Precision balances

Models		MSE623S	MSE623P	MSE323S
Readability	mg	1	1/2/5	1
Weighing capacity	g	620	150/300/620	320
Tare range (subtractive)	g	– 620	– 620	– 320
Repeatability	≤±mg	0.7	1/2/4	0.7
Linearity	≤±mg	2	5	2
Corner load (test load [g])	mg	2 (200)	4 (200)	2 (200)
Min. initial weight*	g	1.5	1.5	1.5
Sensitivity drift between +10 to +30°C	±ppm/K	2	2	2
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	g	500 (E2)	500 (F1)	200 (E2)
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* = Position according to OIML R76

Models		MSE14202S	MSE14202P	MSE10202S	MSE8202S
Readability	mg	10	10/20/50	10	10
Weighing capacity	g	14,200	3,500/7,000/14,200	10,200	8,200
Tare range (subtractive)	g	–14,200	–14,200	–10,200	–8,200
Repeatability	≤±mg	10	10/20/40	7	7
Linearity	≤±mg	30	50	20	20
Corner load (test load [g])	mg	20 (5,000)	40 (5,000)	20 (5,000)	20 (5,000)
Min. initial weight*	g	15	15	12	12
Sensitivity drift between +10 to +30°C	±ppm/K	1.5	1.5	2	2
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	kg	10 (E2)	10 (E2)	10 (E2)	5 (E2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206			
IP protection		IP54			

* = Position according to OIML R76

Model-specific Data

Precision balances

Models		MSE6202S	MSE6202P	MSE5202S	MSE4202S
Readability	mg	10	10/20/50	10	10
Weighing capacity	g	6,200	1,500/3,000/ 6,200	5,200	4,200
Tare range (subtractive)	g	– 6,200	– 6,200	– 5,200	– 4,200
Repeatability	≤±mg	7	7/20/40	6	7
Linearity	≤±mg	20	50	10	20
Corner load (test load [g])	mg	20 (2,000)	50 (2,000)	10 (2,000)	30 (2,000)
Min. initial weight*	g	12	12	10	12
Sensitivity drift between +10 to +30°C	±ppm/K	2	2	2	2
Typical stabilization time	s	≤ 1	≤ 1	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	kg	5 (E2)	5 (F1)	5	2 (E2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206	206 × 206	140 × 140	206 × 206
IP protection		IP54			

* = Position according to OIML R76

Models		MSE2202S	MSE1202S	MSE70201S	MSE36201S	MSE36201P
Readability	mg	10	10	100	100	100/1,000
Weighing capacity	g	2,200	1,200	70,200	36,200	10,200/36,200
Tare range (subtractive)	g	– 2,200	– 1,200	– 70,200	– 36,200	– 36,200
Repeatability	≤±mg	7	7	100	100	100/500
Linearity	≤±mg	20	20	500	200	200
Corner load (test load [g])	mg	20 (1,000)	20 (500)	500 (20,000)	300 (10,000)	300 (10,000)
Min. initial weight*	g	12	12	120	120	120
Sensitivity drift between +10 to +30°C	±ppm/K	2	2	3	2	2
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1	≤ 1	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	kg	2 (F1)	1 (F1)	50 (F1)	20 (F1)	20 (F1)
Display result (depending on the set filter level)		0.1 – 0.4				
Weighing pan size (W + D)	mm	206 + 206	206 + 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

* = Position according to OIML R76

Model–specific Data

Precision balances

Models		MSE20201S	MSE12201S	MSE8201S	MSE5201S
Readability	mg	100	100	100	100
Weighing capacity	g	20,200	12,200	8,200	5,200
Tare range (subtractive)	g	– 20,200	– 12,200	– 8,200	– 5,200
Repeatability	≤±mg	100	50	50	50
Linearity	≤±mg	200	100	100	100
Corner load (test load [g])	mg	300 (5,000)	200 (5,000)	200 (5,000)	200 (2,000)
Min. initial weight*	g	120	100	100	100
Sensitivity drift between +10 to +30°C	±ppm/K	2	4	4	4
Typical stabilization time	s	≤ 1	≤ 0.8	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1.5	≤ 1	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	kg	20 (F1)	10 (F1)	5 (F2)	5 (F2)
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206			
Protection		IP54			

* = Position nach OIML R76

Models		MSE70200S	MSE36200S
Readability	mg	1,000	1,000
Weighing capacity	g	70,200	36,200
Tare range (subtractive)	g	– 70,200	– 36,200
Repeatability	≤±mg	500	500
Linearity	≤±mg	1,000	1,000
Corner load (test load [g])	mg	1,000 (20,000)	1,000 (10,000)
Min. initial weight*	g	1,000	1,000
Sensitivity drift between +10 to +30°C	±ppm/K	3	2
Typical stabilization time	s	≤ 0,8	≤ 0,8
Typical measurement time	s	≤ 1	≤ 1
External standard calibration value (min. accuracy class)	kg	50 (F1)	20 (F1)
Display result (depending on the set filter level)		0.1 – 0.4	
Weighing pan size (W × D)	mm	400 × 300	
IP protection		IP54	

* = Position according to OIML R76

Model–specific Data

Verified Models with EC Type Approval Certificate: Micro- and ultramicrobalances

Model		MSE6.6S–0CE	MSE2.7S–0CE	MSE3.6P–0CE
Accuracy class*		ⓘ	ⓘ	ⓘ
For verified models: EC Type Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	0.001	0.0001	0.001/0.002/0.005
Weighing capacity max*	g	6.1	2.1	1.1/2.1/3.1
Calibration value e*	mg	1	1	1
Min. load min*	mg	0.1	0.01	0.1
Tare equalization range (subtractive)		≤ 100 % from max. weighing capacity		
Application range according to DIR*	g	0.001 – 6.1	0.001 – 2.1	0.001 – 3.1
Min. initial weight**	mg	2	1	4
Typical stabilization time	s	≤ 5	≤ 7	≤ 5
Typical measurement time	s	≤ 8	≤ 10	≤ 8
External standard calibration value (min. accuracy class)	g	5	2	3
Application range (temperature)		With "isoCAL" function: +5...+40°C | Without "isoCAL" function: +15 ... +25°C		
Display result (depending on the set filter level)		By selection of 1 of 4 optimized filter levels		
Weighing pan size ⌀	mm	30	20	30
Weighing chamber height (draft shield DM)	mm	70	70	70
Protection		Protected against dust and water		

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area
**   = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31–NF26

Model–specific Data

Verified models with EC Type Approval Certificate: Semi-microbalances 0.01 mg

Model		MSE225S-0CE	MSE225P-0CE	MSE125P-0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	0.01	0.01/0.02/0.05	0.01/0.1
Weighing capacity max*	g	220	60/120/220	60/120
Calibration value e*	mg	1	1	1
Min. load min*	mg	1	1	1
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.001 – 220	0.001 – 220	0.001 – 120
Min. initial weight**	mg	20	20	20
Typical stabilization time	s	≤ 2	≤ 2	≤ 2
Typical measurement time	s	≤ 6	≤ 6	≤ 6
External standard calibration value (min. accuracy class)	g	200 (E2)	200 (E2)	100 (E2)
Application range (temperature)		With "isoCAL" function: +5 to +40 °C │ Without "isoCAL" function: +15 to +25 °C		
Adaptation to ambient conditions		By selection of 1 of 4 optimized filter levels		
Display result (depending on the set filter level)		0.2 – 0.4		
Weighing pan size (W × D)	mm	85 × 85		
Weighing chamber height (draft shield DU)	mm	261		
Protection		Protected against dust and water		

Verified models with EC Type Approval Certificate: Analytical balances 0.1 mg

Model		MSE524S-0CE	MSE524P-0CE	MSE324S-0CE	MSE224S-0CE	MSE324P-0CE	MSE124S-0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ	Ⓘ	Ⓘ	Ⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX							
Scale interval d*	mg	0.1	0.1/0.2/0.5	0.1	0.1	0.1/0.2/0.5	0,1
Weighing capacity max*	g	520	120/240/520	320	220	80/160/320	120
Calibration value e*	mg	1	1	1	1	1	1
Min. load min*	mg	10	10	10	10	10	10
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity					
Application range according to DIR*	g	0.01–520	0.01–520	0.01–320	0.01–220	0.01–320	0.01–120
Min. initial weight**	mg	120	120	120	120	120	120
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
External standard calibration value (min. accuracy class)	g	500 (E2)	500 (E2)	200+100 (E2)	200 (E2)	200 +100 (E2)	100 (E2
Application range (temperature)		With "isoCAL" function: +5 to +40 °C │ Without "isoCAL" function: +15 to +25 °C					
Display result (depending on the set filter level)		0.1 – 0.4					
Weighing pan size (W × D)	mm	85 × 85					
Weighing chamber height (draft shield DU)	mm	261					
Protection		Protected against dust and water					

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area
** = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26

Model–specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSE5203S–0CE	MSE5203P–0CE	MSE3203S–0CE	MSE3203P–0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ	Ⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	mg	1	1/2/5	1	1/10
Weighing capacity max*	g	5,200	1,200/2,400/5,200	3,200	1,010/3,200
Calibration value e*	mg	10	10	10	10
Min. load min*	mg	100	100	100	100
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	0.1 – 5,200	0.1 – 5,200	0.1 – 3,200	0.1 – 3,200
Min. initial weight**	g	1.5	1.5	1.5	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 2	≤ 2	≤ 2	≤ 1.5
External standard calibration value (min. accuracy class)	g	5,000 (E2	5,000 (E2	2,000 (E2	2,000 (E2)
Application range (temperature)		With "isoCAL" function: +5 ... +40 °C Without "isoCAL" function: +15 ... +25 °C			
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	140 × 140			
Weighing chamber height (draft shield DE)	mm	172			
Protection		Protected against dust and water			

Models		MSE2203S–0CE	MSE2203P–0CE	MSE1203S–0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	1	1/10	1
Weighing capacity max*	g	2,200	1,010/2,200	1,200
Calibration value e*	mg	10	10	10
Min. load min*	mg	100	100	100
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.1 – 2,200	0.1 – 2,200	0.1 – 1,200
Min. initial weight**	g	1.5	1.5	1.5
Typical stabilization time	s	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5
External standard calibration value (min. accuracy class)	g	2,000 (E2)	1,000 (E2)	1,000 (E2)
Application range (temperature)		With "isoCAL" function: +5 ... +40 °C Without "isoCAL" function: +15 ... +25 °C		
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE)	mm	172		
Protection		Protected against dust and water		

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area
**   = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26

Model–specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSE623S–0CE	MSE623P–0CE	MSE323S–0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ
For verified models: EG-Type-Approval Certificate D09-09-015, Type: MSX				
Scale interval d*	mg	1	1/2/5	1
Weighing capacity max*	g	620	150/300/620	320
Calibration value e*	mg	10	10	10
Min. load min*	mg	20	20	20
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity		
Application range according to DIR*	g	0.02 – 620	0.02 – 620	0.02 – 320
Min. initial weight**	g	1.5	1.5	1.5
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1	≤ 1	≤ 1
Application range (temperature)		With "isoCAL" function: +5 to +40 °C │ Without "isoCAL" function: +10 to +30 °C		
Display result (depending on the set filter level)		0.1 – 0.4		
Weighing pan size (W × D)	mm	140 × 140		
Weighing chamber height (draft shield DE))	mm	172		
Protection		Protected against dust and water		

Models		MSE14202S–0CE	MSE14202P–0CE	MSE10202S–0CE	MSE8202S–0CE
Accuracy class*		Ⓘ	Ⓘ	Ⓘ	Ⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	g	0.01	0.01/0.02/0.05	0.01	0.01
Weighing capacity max*	g	14,200	3,500/7,000/ 14,200	10,200	8,200
Calibration value e*	g	0.1	0.1	0.1	0.1
Min. load min*	g	1	1	1	0.5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	1 – 14,200	1 – 14,200	1 – 10,200	0.5 – 8200
Min. initial weight**	g	15	15	12	12
Typical stabilization time	s	≤ 1	≤ 1	≤ 1	≤ 1
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
Application range (temperature): With "isoCAL" function Without "isoCAL" function		+5 to +40 °C +15 to +25 °C	+5 to +40 °C +15 to +25 °C	+5 to +40 °C +15 to +25 °C	+5 to +40 °C +10 to +30 °C
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206			
IP protection		IP54			

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area
**   = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26

Model-specific Data

Verified models with EC Type Approval Certificate: Precision balances

Models		MSE6202S–0CE	MSE6202P–0CE	MSE5202S–0CE	MSE4202S–0CE
Accuracy class*		ⓘⓘ	ⓘⓘ	ⓘⓘ	ⓘⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX					
Scale interval d*	g	0.01	0.01/0.02/0.05	0.01	0.01
Weighing capacity max*	g	6,200	1,500/3,000/6,200	5,200	4,200
Calibration value e*	g	0.1	0.1	0.1	0.1
Min. load min*	g	0.5	0.5	0.5	0.5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity			
Application range according to DIR*	g	0.5 – 6,200	0.5 – 6,200	0.5 – 5,200	0.5 – 4,200
Min. initial weight**	g	12	12	10	12
Typical stabilization time	s	≤ 1	≤ 1	≤ 0.8	≤ 0.8
Typical measurement time	s	≤ 1.5	≤ 1.5	≤ 1	≤ 1
Application range (temperature): With "isoCAL" function Without "isoCAL" function		+5 to +40 °C +10 to +30 °C	+5 to +40 °C +10 to +30 °C		+5 to +40 °C +10 to +30 °C
Display result (depending on the set filter level)		0.1 – 0.4			
Weighing pan size (W × D)	mm	206 × 206	206 × 206	140 × 140	206 × 206
IP protection		IP54			

| Models		MSE2202S–0CE	MSE1202S–0CE	MSE36201S–0CE	MSE36201P–0CE	MSE20201S–0CE
Accuracy class*		ⓘⓘ	ⓘⓘ	ⓘⓘ	ⓘⓘ	ⓘⓘ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX						
Scale interval d*	mg	10	10	100	100/1,000	100
Weighing capacity max*	g	2,200	1,200	36,200	10,200/36,200	20,200
Calibration value e*	g	0.1	0.1	1	1	1
Min. load min*	g	0.5	0.5	5	5	5
Tare equalization range (subtractive)		≤ 100% from max. weighing capacity				
Application range according to DIR*	g	0.5 – 2,200	0.5 – 1,200	5 – 36,200	5 – 36,200	5 – 20,000
Min. initial weight**	g	12	12	120	120	120
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 1.5	≤ 1.5	≤ 1.5
Typical measurement time	s	≤ 1	≤ 1	≤ 2	≤ 2	≤ 2
Application range (temperature)		With "isoCAL" function: +5 to +40 °C │ Without "isoCAL" function: +10 to +30 °C				
Display result (depending on the set filter level)		0.1 – 0.4				
Weighing pan dimensions (W + D)	mm	206 × 206	206 × 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

** = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26

Model–specific Data

Verified models with EC Type Approval Certificate: Precision balances

Modelle		MSE12201S-0CE	MSE8201S-0CE	MSE5201S-0CE	MSE70200S-0CE	MSE36200S-0CE
Accuracy class*		Ⅱ	Ⅱ	Ⅱ	Ⅱ	Ⅱ
For verified models: EC Type-Approval Certificate D09-09-015, Type: MSX						
Scale interval d*	mg	100	100	100	1,000	1,000
Weighing capacity max*	g	12,200	8,200	5,200	70,200	36,200
Calibration value e*	g	1	1	1	10	1
Min. load min*	g	5	5	5	50	50
Tare equalization range (subtractive)		≤ 100% vom maximalen Wägebereich				
Application range according to DIR*	g	5 – 12,200	5 – 8,200	5 – 5,200	50 – 70,200	50 – 36,200
Min. initial weight**	g	100	100	100	1,000	1,000
Typical stabilization time	s	≤ 0.8	≤ 0.8	≤ 0.8	≤ 1	≤ 1
Typical measurement time	s	≤ 1	≤ 1	≤ 1	≤ 1.2	≤ 1.2
Application range (temperature)		With "isoCAL" function: +5 to +40 °C │ Without "isoCAL" function: +10 to +30 °C				
Display result (depending on the set filter level)		0.1 – 0.4				
Weighing pan size (W × D)	mm	206 × 206	206 × 206	400 × 300	400 × 300	400 × 300
IP protection		IP54				

* DIR = Directive 90/384/EEC on non-automatic weighing instruments used within the European Economic Area

**   = Typical min. initial weighing according to USP (Unites States Pharmacopeia), USP31-NF26
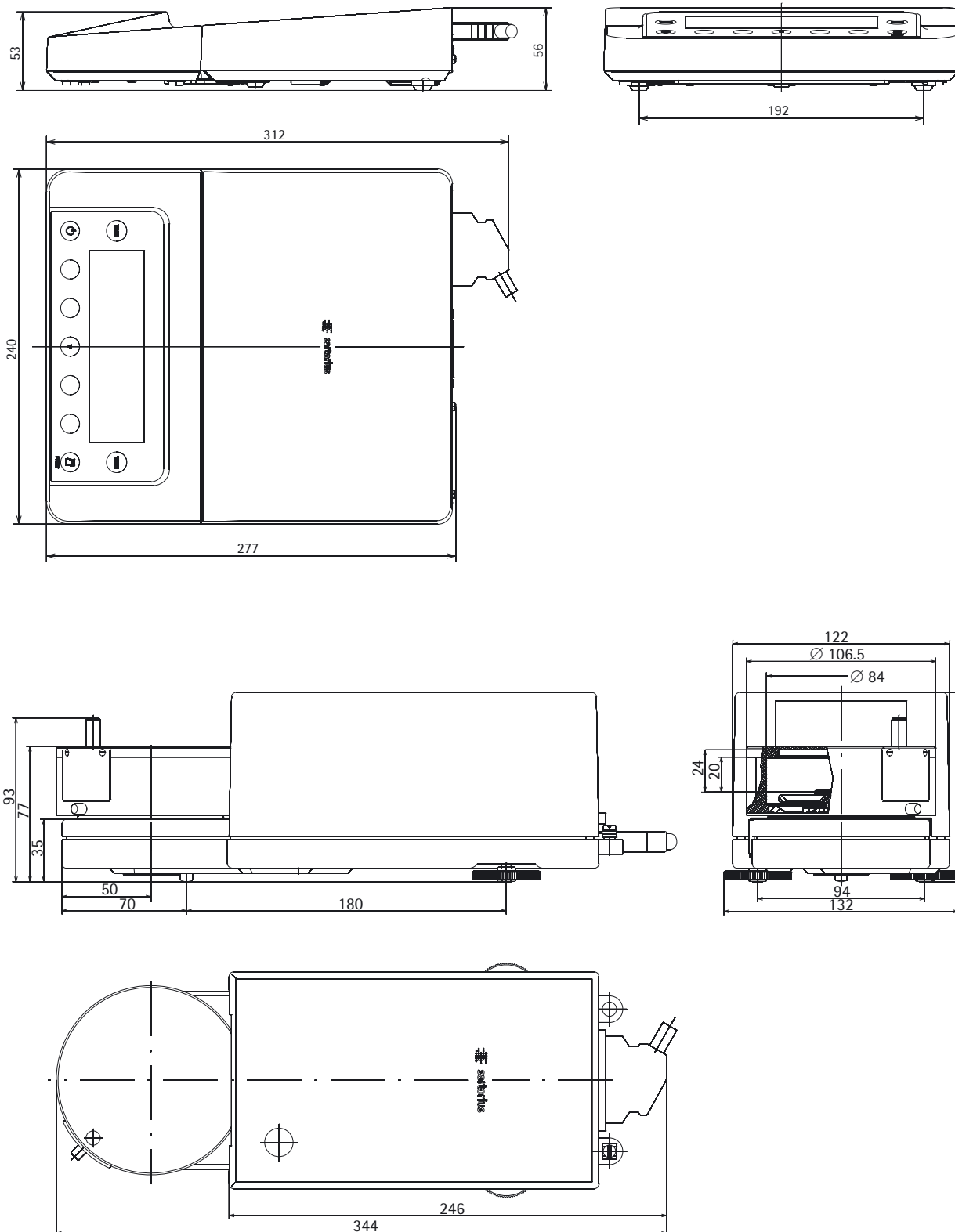
Balance Dimensions

Microbalances
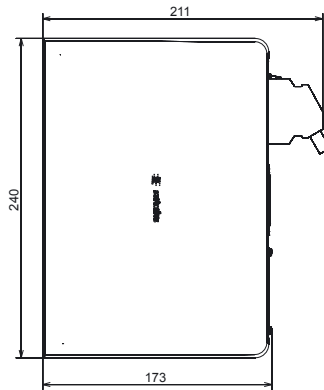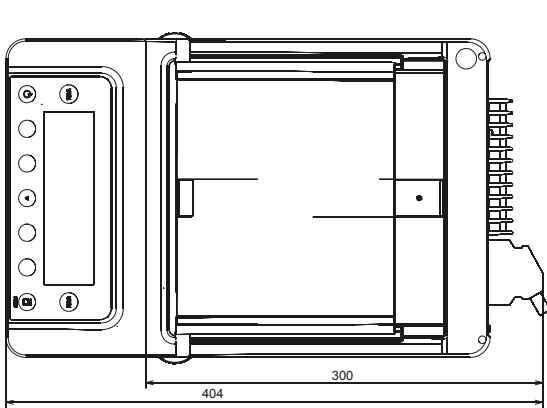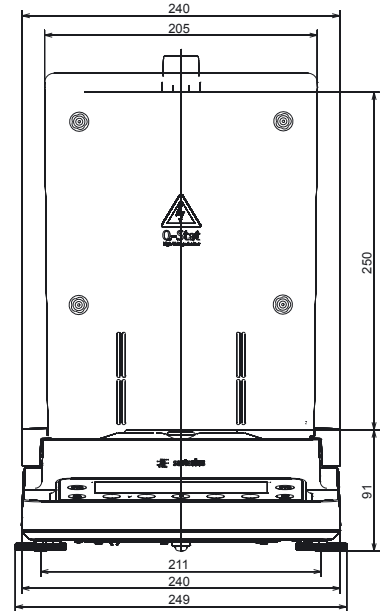
All dimensions are given in millimeters
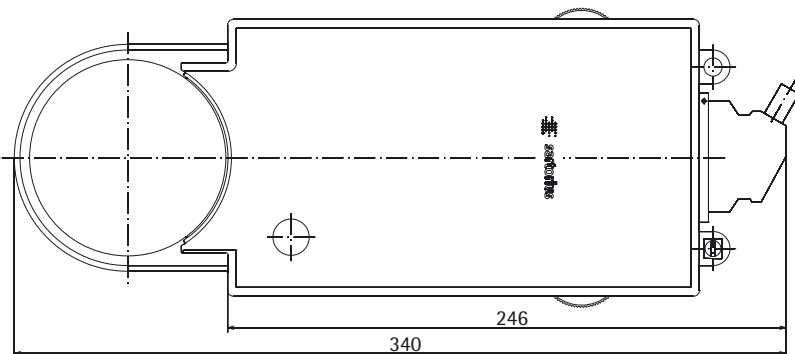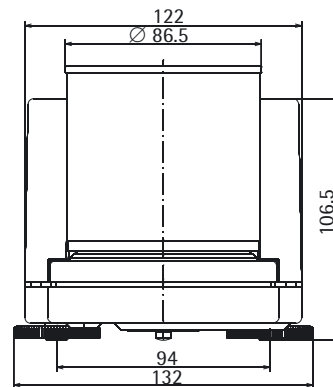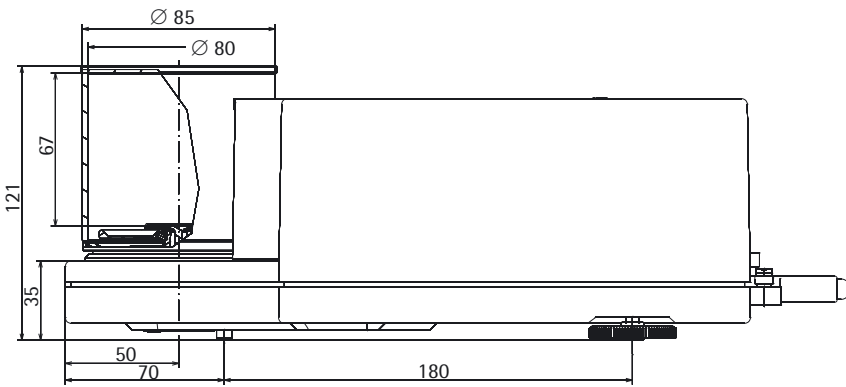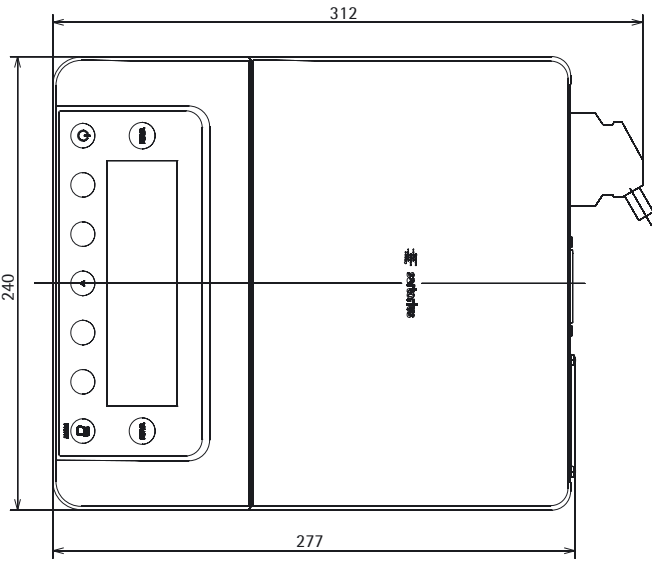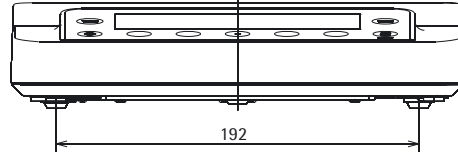
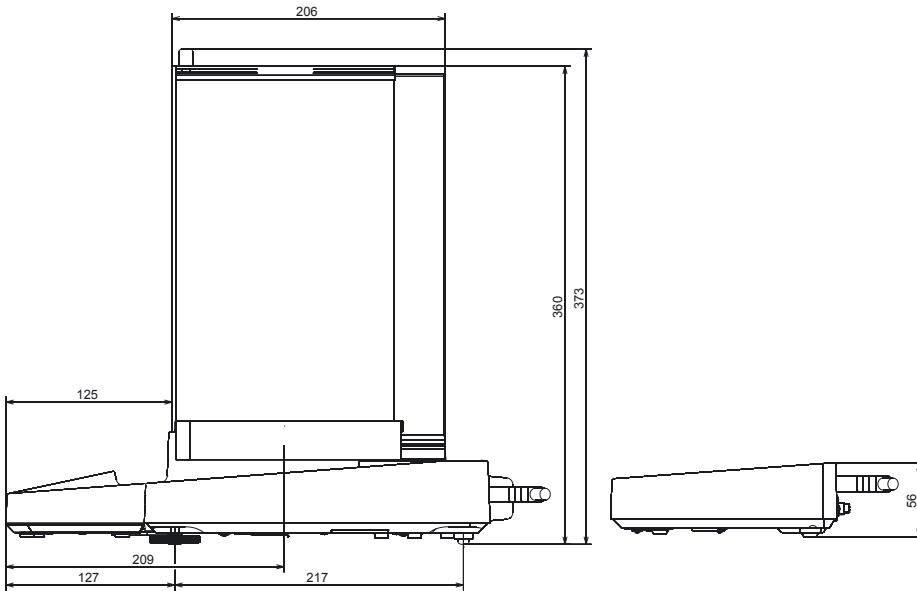## Filter Microbalances

All dimensions are given in millimeters

Semi-microbalances
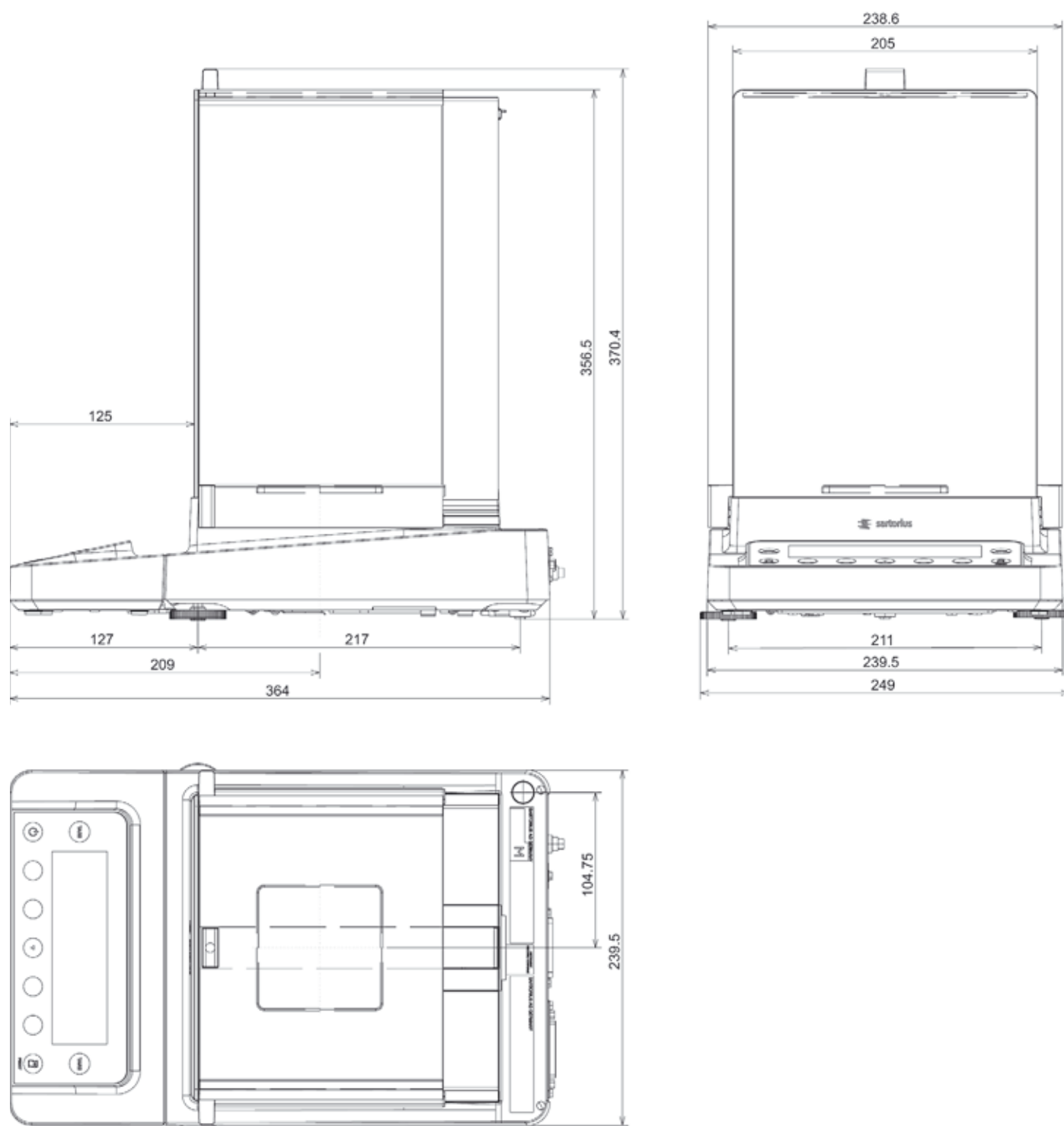
All dimensions are given in millimeters

Innenmaße Windschutz DA/DI
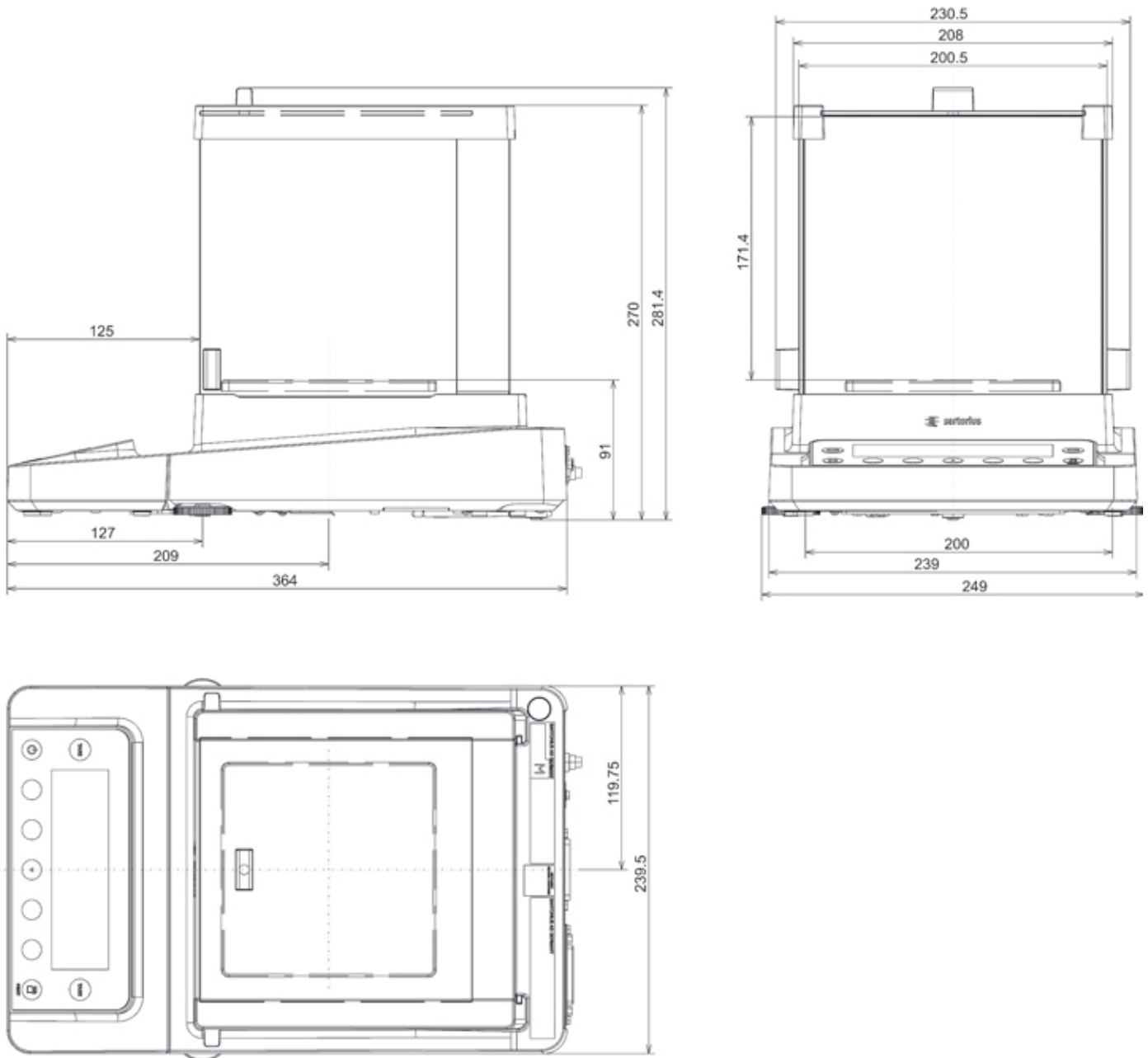Windshield inside dimensions

(H)250 x (B)192 x (T)154

Analytical Balances with a Manual DU Draft Shield

All dimensions are given in millimeters

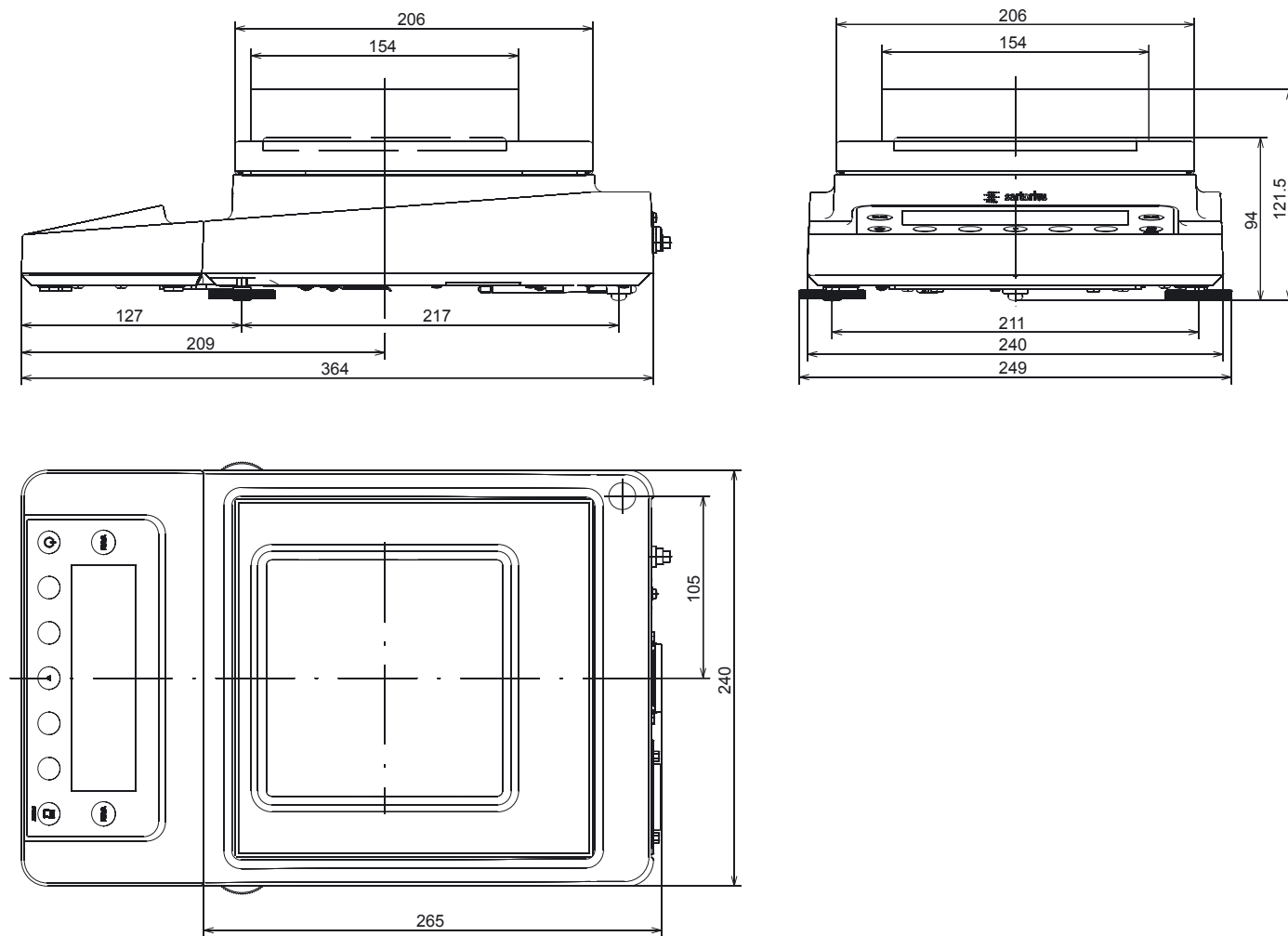## Precision Balances with a Readability of 1 mg and Manual DE Draft Shield

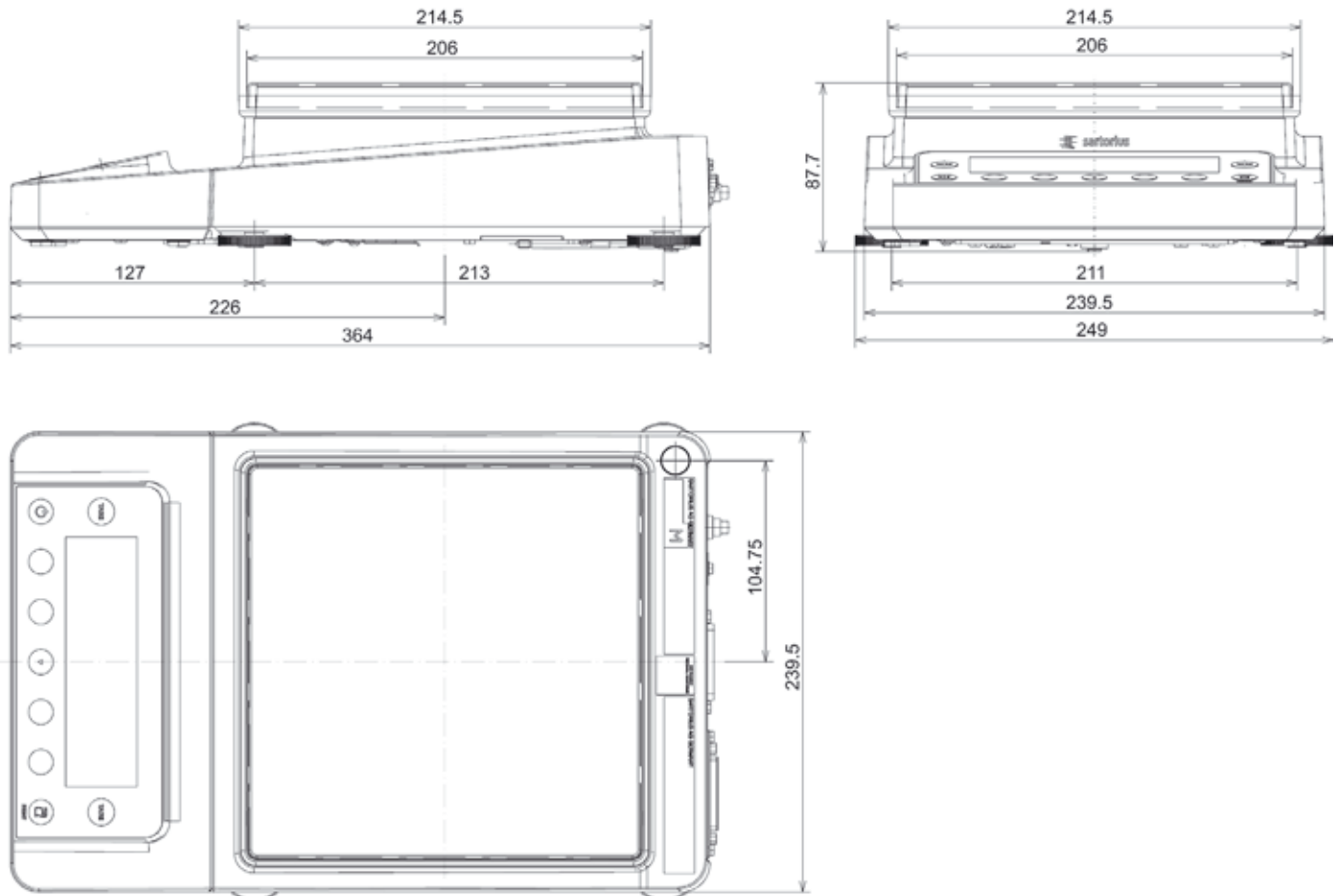All dimensions are given in millimeters

Precision Balances with a Readability of 1 mg and Framed DR Draft Shield

All dimensions are given in millimeters
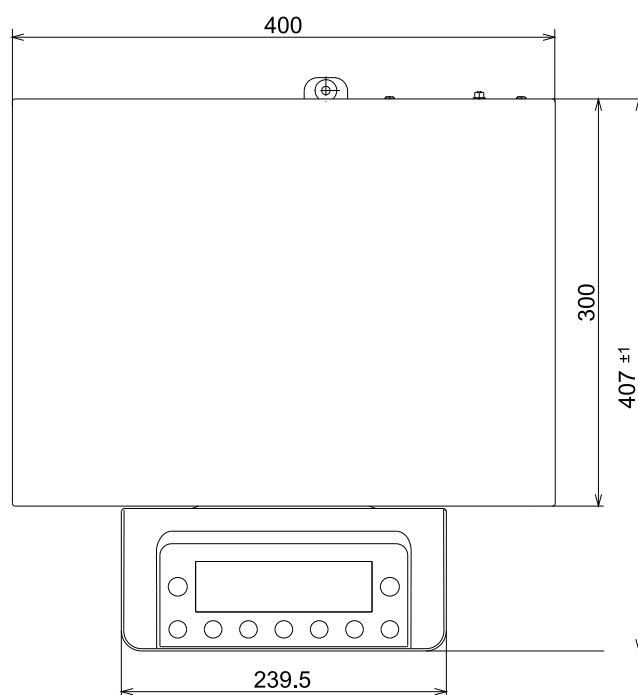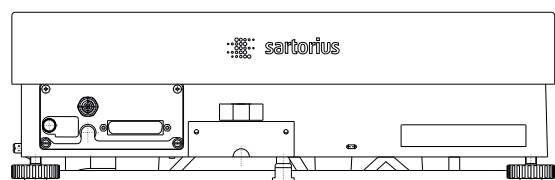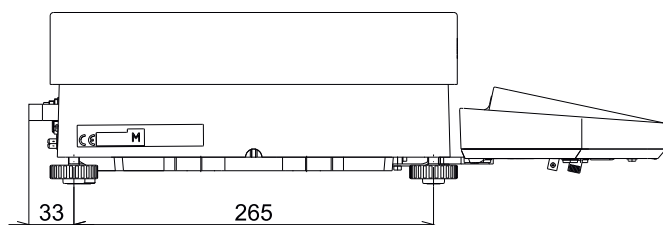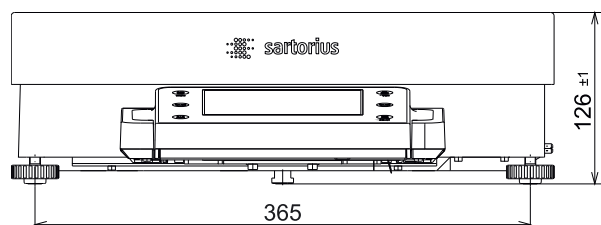
Precision Balances with No Draft Shield and with a Weighing Range of up to 15 kg

All dimensions are given in millimeters

on Balances with No Draft Shield and with a Weighing Range of up to 20 kg

All dimensions are given in millimeters

Accessories (Options)

Printers and Communication

Verifiable data printer for connection to RS-232, 25-pin. Accessory interface	YDP10-0CE
Verifiable data printer with *Bluetooth*® data transmission (with YDO01MS-B or IB option only)	YDP10BT-0CE
Color ribbon for YDP10-0CE and YDP10BT-0CE	6906918
Paper rolls for printer YDP10-0CE; 5 rolls 50 m each	6906937
Bluetooth® data interface for wireless connection of data printer YDP10BT	YDO01MS-B
RS-232C data interface, 9-pin including PS/2 for connecting a PC or keyboard	YDO01MS-P
RS-232C data interface, 25-pin for connection of Cubis® accessories	YDO01MS-R
Display cable 3 m for Cubis® MSE models, for separate setup of display and weighing unit (Installation by Sartorius Service or ex works [order VF4016])	YCC01-MSED3
Cable 3 m between weighing module and electronics module for Cubis® models with 0.01 mg readability	YCC01-MSM3
Installation display cable 3 m for Cubis® models, for separate setup of display and weighing unit	VF4016
RS-232C connection cable to connect PC with 9-pin. COM interface, length 1.5 m	7357314
SartoCollect software for data communication between balance and PC	YSC02
Sartorius OPC Server for connecting all Sartorius Cubis® balances Requires 32-bit Microsoft Windows 2000 or XP with current service packs. (free download of a 30-day trial version from the Sartorius website) – Initial license – Each additional license within an order	62890PC 62890PC-L

Displays and Input│Output Elements

MSA control unit with color TFT graphic display and touch screen	YAC01MSA
MSE display unit with backlit LC display and tactile keys	YAC01MSE
MSU display and control unit with backlit b│w graphic display and tactile navigation keys	YAC01MSU
Barcode reader with connection cable, 120 mm reading range	YBR03PS2
Foot switch for printing, taring, or using function keys, selection via menu, incl. T connector	YFS01
Infrared sensor for touch-free activation of functions (e.g., draft shield control)	YHS01MS
Hand switch for printing, taring, or using function keys, selection via menu, incl. T connector	YHS02
Foot switch for functions draft shield OPEN│CLOSED (in combination with DA and DI draft shields only), tare, and print	YPE01RC
Additional display, LCD, figure size 13 mm, backlit	YRD03Z
3-segment control display, red – green – red, for plus│minus measurements, incl. T connector	YRD11Z

Pipette Calibration Hardware and Software

Pipette calibration kit (hardware) for models with 0.1 mg and 0.01 mg readability Consists of moisture trap and all required adapters	YCP04MS
Pipette calibration kit (hardware) for microbalance weighing modules 6.6S and 3.6P Consists of moisture trap and all required adapters	VF988
Pipette Tracker pipette calibration software. Software and user manual in English only.	YCP04-PT
Pipette Tracker Pro pipette calibration software, for use in regulated areas, networkable and validatable, according to the 21 CFR Part 11 regulations. Software and user manual in English only.	YCP04-PTPro
Documentation basis for validation (IQ, OQ) of Pipette Tracker PRO version. All documents are in English only.	YCP04-VTK

Filter Weighing and Antistatic Accessories

Antistatic weighing pan, diameter 130 mm, for weighing modules with a readability of 0.1 mg or 0.01 mg	YWP01MS
Filter weighing pan $\varnothing$ 75 mm, for ultramicrobalance or microbalance models (weighing modules 6.6S, 2.7S; only together with DF draft shield)	VF2562
Filter weighing pan $\varnothing$ 90 mm, for ultramicrobalance or microbalance models (weighing modules 6.6S, 2.7S; only together with DF draft shield)	VF2880
Ionization blower to eliminate electrostatic charges on sample containers and samples	YIB01-DR
Stat-Pen ionization probe for discharging electrostatically charged samples and filters	YSTP01

Special Applications

Density determination kit for solids and liquids for weighing modules with a readability of < 1 mg	YDK01MS
Density determination kit for solids and liquids for weighing modules with a readability of 1 mg	YDK02MS
Q-Grip, flexible holder for weigh-in containers and filters up to 120 mm diameter (replaces the original weighing pan; for Cubis® models with 0.01 and 0.1 mg readability)	YFH01MS
Q-Grid grid weighing pan for Cubis® models with a readability of 10 mg or 100 mg for weighing in laboratory hoods, safety weighing cabinets or workbenches (reduced wind attack surface of the weighing pan; replaces the standard weighing pan)	YWP03MS

Weighing Tables

Weighing table made from synthetic stone, with vibration dampening	YWT03
Wall console	YWT04
Weighing table made from wood with synthetic stone for precise, reliable measurements	YWT09

Weighing Accessories

Weighing scoop made from chrome nickel steel, 90 × 32 × 8 mm	641214
Aluminum weighing scoop, 4.5 mg (250 pieces) for ultramicrobalance and microbalance models	6565-250
Aluminum weighing scoop, 52 mg (50 pieces) for ultramicrobalance and microbalance models	6566-50
Support arm for 10│100 mg precision weighing modules for raising MSE, MSU, and MSA display and control units	YDH01MS
Support arm for modules with a weighing range of 20 kg or more for raising the operating unit	YDHo2MS

The brand name and logo for Bluetooth® wireless technology are the property of Bluetooth SIG Inc. The use of this brand name and trademark by Sartorius AG is under license. Other brand names and trademarks are the property of their respective owners.

Declaration of Conformity

Weighing instruments for use in legal metrology: Council Directive 2009/23/EC "Non-automatic Weighing Instruments"
This directive regulates the determination of weight in legal metrology.
For the respective Declaration of Conformity for weighing instruments that have been verified by SARTORIUS for use as legal measuring instruments and that have an EC Type-Approval Certificate, see next page.

This Directive also regulates EC verification by the manufacturer, provided that an EC Type Approval Certificate has been issued and the manufacturer has been accredited by a Notified body registered at the Commission of the European Community for performing such verification.

The legal basis for Sartorius to perform the EC verification is EC Directive No. 2009/23/EC for non-automatic weighing instruments. This Council Directive has been in effect since January 1, 1993 in the Internal Market. The further legal basis is founded on the approval of the Sartorius Quality Management System issued by the Metrology Department of the Regional Administration Office of Lower Saxony, Germany ("Niedersächsisches Landesverwaltungsamt - Eichwesen") on February 15, 1993.

"Installation" Service in Germany
Our "Installation" service package provides a range of important services that guarantee satisfactory work from your device:
– Setup
– Getting Started
– Inspection
– Instruction

If the installation of the weighing instrument is to be carried out by Sartorius, please request this service from a customer service employee.

Re-verification in Germany
Balance verification for legal metrology is valid until the end of the calendar year after next. If the balance is used for fill level control in accordance with legislation on prepackaging, verification is valid until the end of the following calendar year. Re-verification must currently be carried out by a weights and measures official. Re-verification should be requested in good time from the local Weights and Measures office. As appropriate, please observe all statutory amendments.

Subsequent Verifications within European Countries
The expiration date of the verification depends on the national regulations of the country in which the weighing instrument is used. For information on verification and legal regulations currently applicable in your country, and to obtain the names of the persons to contact, please contact your local SARTORIUS office, dealer, or Service Center.

Further information concerning "verification" can be obtained from our customer service centers.

CE EG-Konformitätserklärung
EC Declaration of Conformity

Sartorius Weighing Technology GmbH
Weender Landstr. 94 – 108
D-37075 Goettingen, Germany

erklärt, dass das Betriebsmittel
declares that the equipment

Geräteart:	Elektronische Halbmikro-, Analysen- und Präzisionswaage
Device type:	*Electronic Semi-micro, Analytical and Precision Balance*

Baureihe / *Type series:*   MSA.....-...-.., MSE.....-...-.., MSU.....-...-..

in der von uns in Verkehr gebrachten Ausführung mit den grundlegenden Anforderungen der
folgenden Europäischen Richtlinien übereinstimmt:
in the form as delivered complies with the basic requirements of the following European Directives:

Richtlinie 2004/108/EG   Elektromagnetische Verträglichkeit
Directive 2004/108/EC   *Electromagnetic compatibility*

Richtlinie 2006/95/EG   Elektrische Betriebsmittel zur Verwendung innerhalb bestimmter
   Spannungsgrenzen
Directive 2006/95/EC   *Electrical equipment designed for use within certain voltage limits*

Richtlinie 1999/5/EG   Funkanlagen und Telekommunikationsendeinrichtungen und die
   gegenseitige Anerkennung ihrer Konformität
Directive 1999/5/EC   *Radio equipment and telecommunications terminal equipment and the mutual*
   recognition of their conformity

Das Gerät erfüllt die anwendbaren Anforderungen der in Anhang aufgeführten harmonisierten
Europäischen Normen.
The apparatus meets the applicable requirements of the harmonized European Standards listed in Annex.

Jahr der Anbringung der CE-Kennzeichnung / *Year of attachment of CE marking:* **11**

Sartorius Weighing Technology GmbH
Goettingen, 2011-06-30

Dr. Reinhard Baumfalk
Vice President R&D

Dr. Dieter Klausgrete
Leitung International Certification Management
Head of International Certification Management

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten EG-Richtlinien, ist jedoch keine Zusicherung
von Eigenschaften. Bei einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre
Gültigkeit. Die Sicherheitshinweise der zugehörigen Produktdokumentation sind zu beachten.
This declaration certifies conformity with the above mentioned EC Directives, but does not guarantee product
attributes. Unauthorised product modifications make this declaration invalid. The safety information in the
associated product documentation must be observed.

SWT11CE001   34785-000-58   SOP-3.RD-045-fo2

sartorius
mechatronics

EG-Konformitätserklärung
EC Declaration of Conformity
Anhang / *Annex*

Liste der angewendeten harmonisierten Europäischen Normen
List of the applied harmonized European Standards

1. Richtlinie 2004/108/EG / *Directive 2004/108/EC*

   EN 61326-1:2006   Elektrische Mess-, Steuer-, Regel- und Laborgeräte - EMV- Anforderungen -
   Teil 1: Allgemeine Anforderungen (IEC 61326-1:2005)
   Electrical equipment for measurement, control and laboratory use – EMC
   requirements – Part 1: General requirements (IEC 61326-1:2005)

2. Richtlinie 2006/95/EG / *Directive 2006/95/EC*

   EN 61010-1:2001   Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und
   Laborgeräte - Teil 1: Allgemeine Anforderungen (IEC 61010-1:2001)

   Safety requirements for electrical equipment for measurement, control, and
   laboratory use – Part 1: General requirements (IEC 61010-1:2001)

3. Richtlinie 1999/5/EG / *Directive 1999/5/EC*

   Nur für Geräte mit Bluetooth[®] – Datenausgang Typ YBT03

   Only for devices with Bluetooth[®] data output interface type YBT03

   EN 301 489-1 V1.8.1   Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten
   (ERM) — Elektromagnetische Verträglichkeit (EMV) für Funkeinrichtungen
   und -dienste — Teil 1: Gemeinsame technische Anforderungen

   Electromagnetic compatibility and Radio spectrum Matters (ERM) —
   ElectroMagnetic Compatibility (EMC) standard for radio equipment and
   services — Part 1: Common technical requirements

   EN 301 489-17 V1.3.2   Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten
   (ERM) — Elektromagnetische Verträglichkeit für Funkeinrichtungen und -
   dienste — Teil 17: Spezifische Bedingungen für Breitbandübertragungs-
   systeme im 2,4 GHz Band, Einrichtungen in lokalen Hochleistungs-Funk-
   netzen (RLAN) im 5 GHz Band und Breitband-Datenübertragungssysteme
   im 5,8 GHz Band

   Electromagnetic compatibility and Radio spectrum Matters (ERM) —
   ElectroMagnetic Compatibility (EMC) standard for radio equipment — Part
   17: Specific conditions for 2,4 GHz wideband transmission systems, 5 GHz
   high performance RLAN equipment and 5,8 GHz Broadband Data
   Transmitting Systems

   EN 300 328 V1.7.1   Elektromagnetische Verträglichkeit und Funkspektrumangelegenheiten
   (ERM) — Breitband-Übertragungssysteme — Datenübertragungsgeräte, die
   im 2,4-GHz-ISM-Band arbeiten und Breitband-Modulationstechniken
   verwenden — Harmonisierte EN, die wesentliche Anforderungen nach
   Artikel 3 Absatz 2 der R&TTE-Richtlinie enthält

   Electromagnetic compatibility and Radio spectrum Matters (ERM) —
   Wideband transmission systems — Data transmission equipment operating
   in the 2,4 GHz ISM band and using wide band modulation techniques —
   Harmonized EN covering essential requirements under Article 3(2) of the
   R&TTE Directive

   . . . . . .

SWT11CE001   34785-000-58   SOP-3.RD-045-fo2

sartorius
mechatronics

RoHS
EU

Konformitätserklärung
Declaration of Conformity

Sartorius Weighing Technology GmbH
Weender Landstr. 94 – 108
37075 Goettingen, Germany

erklärt, dass das Betriebsmittel
declares that the equipment

Geräteart:	Elektronische Halbmikro-, Analysen- und Präzisionswaage
Device type:	*Electronic Semi-micro, Analytical and Precision Balance*
Baureihe / *Type series:*	MSA.....-...-.., MSE.....-...-.., MSU.....-...-..

übereinstimmt mit den Regelungen der Europäischen Richtlinie (in der heute gültigen Fassung):
complies with the regulations of the European Directive (in the today valid version):

Richtlinie 2002/95/EG Zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe
in Elektro- und Elektronikgeräten

Directive 2002/95/EC *on the restriction of the use of certain hazardous substances in electrical
and electronic equipment*

sofern das Betriebsmittel gekennzeichnet ist mit:
provided that the equipment is marked with:

RoHS
EU

Sartorius Weighing Technology GmbH
Goettingen, 2011-06-24

i.V. *P.C3.*

Dr. Reinhard Baumfalk
Leitung, Entwicklung, Mechatronik
Vice President, R&D, Mechatronics

i.V.

Dr. Dieter Klausgrete
Leitung International Certification Management, Mechatronik
Head of International Certification Management, Mechatronics

Diese Erklärung bescheinigt die Übereinstimmung mit der genannten EG-Richtlinie, ist jedoch keine Zusicherung
von Eigenschaften. Bei einer mit uns nicht abgestimmten Änderung des Produktes verliert diese Erklärung ihre
Gültigkeit.
*This declaration certifies conformity with the above mentioned EC Directive, but does not guarantee product
attributes. Unauthorised product modifications make this declaration invalid.*

SWT11RoHS001   34785-000-58   SOP-3.RD-045-fo3

$C \in$ Declaration of Type Conformity to Directive No. 2009/23/EC

This declaration is valid for non-automatic electromechanical weighing instruments for use in legal metrology. These weighing instruments accepted for legal metrological verification have an EC Type-Approval Certificate. The model(s) concerned is (are) listed below along with the respective type, accuracy class, and EC Type-Approval Certificate number:

Model	Weighing instrument type	Accuracy class	EC type-approval certificate no.
MS...-.CE	MSX	(I)	D09-09-015
GBB...-.CE	MSX	(I)	D09-09-015
MS...-.CE	MSX	(II)	D09-09-015

Type weighing module: SA EA, SB EA, SC EA, SD EE, SE EA, SF EA, SB EB, SC EB, SC EC, SG EE, SH EE
Type indicating and operator terminal: YAC01MSA, YAC01MSE, YAC01MSU

SARTORIUS Weighing Technology GmbH * declares that its weighing instrument types comply with the requirements of the Council Directive on non-automatic weighing instruments, no. 2009/23/EC of 23 April 2009; the associated European Standard "Metrological aspects of non-automatic weighing instruments," No. EN 45501; the most recently amended versions of the national laws and decrees concerning legal metrology and verification in the Member States of the European Union, the EU, and the Signatories of the Agreement on the European Economic Area, which have adopted this Council Directive into their national laws; and with the requirements stipulated on the Type-Approval Certificate for verification. This Declaration of Type Conformity is valid only if the ID label on the weighing instrument has the CE mark of conformity and the green metrology sticker with the letter

"M" stamped on it (the two-digit number in large print stands for the year in which the mark was affixed):

Example (date/year and number of the notified body may vary):

$C \in$ 11.₀₁₁₁ [M]

If these marks are not on the ID label, this Declaration of Type Conformity is not valid. Validity can be obtained, for example, by submitting the weighing instrument for final processing by an authorized representative of SARTORIUS Weighing Technology GmbH *. The period of validity of this Declaration of Type Conformity shall expire upon any tampering with, repair or modification of this weighing instrument or, in some Member States, on the date of expiration. This declaration applies only to the weighing instrument without peripheral devices. The operator of this weighing instrument shall be responsible for obtaining an authorized renewal of the verification, such as subsequent or periodic verification, of the weighing instrument for use as a legal measuring instrument.

Sartorius Weighing Technology GmbH *
37070 Goettingen, Germany
Signed in Goettingen on 05 August 2011

Dr. Reinhard Baumfalk
(Vice President R&D)

J. Rehwald
(Head of the Production Department Mechatronics / Weighing Technology Division)

LOP-3.225_an2e_2005.06.09.doc
P106ep03.doc

*) Sartorius Weighing Technology GmbH is the legal successor of Sartorius AG

Physikalisch-Technische Bundesanstalt

PTB

Braunschweig und Berlin
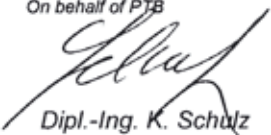
EG-Bauartzulassung

EC Type-approval Certificate

Zulassungsinhaber: *Issued to:*	Sartorius Weighing Technology GmbH Weender Landstr. 94-108 37075 Göttingen
Rechtsbezug: *In accordance with:*	Richtlinie 2009/23/EG vom 23. April 2009 über nichtselbsttätige Waagen (ABl. L 122 S. 6). *Directive 2009/23/EC of 23 April 2009 on non-automatic weighing instruments (OJ L 122 p. 6)*
Bauart: *In respect of:*	Nichtselbsttätige elektromechanische Präzisionswaage *Non-automatic electromechanical high accuracy weighing instrument*
Typ: *Type:*	MSX
Zulassungsnummer: *Approval No.:*	**D09-09-015** 5. Revision
Gültig bis: *Valid until:*	18.06.2019
Anzahl der Seiten: *Number of pages:*	23
Geschäftszeichen: *Reference No.:*	PTB-1.12-4062820
Benannte Stelle: *Notified Body:*	0102

Zertifizierung: *Certification:*	Braunschweig, 08.04.2013	**Bewertung:** *Evaluation:*
Im Auftrag *On behalf of PTB*	**Siegel** *Seal*	**Im Auftrag** *On behalf of PTB*
Dipl.-Ing. M. Link		Dipl.-Ing. K. Schulz

EG-Bauartzulassungen ohne Unterschrift und Siegel haben keine Gültigkeit. Diese EG-Bauartzulassung darf nur unverändert weiterverbreitet werden. Auszüge bedürfen der Genehmigung der Ph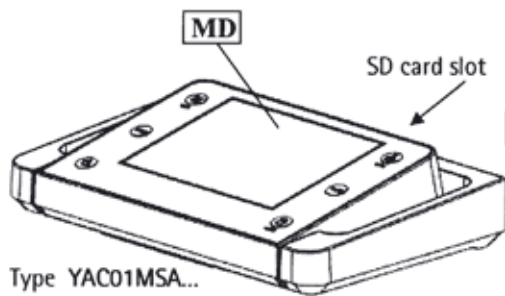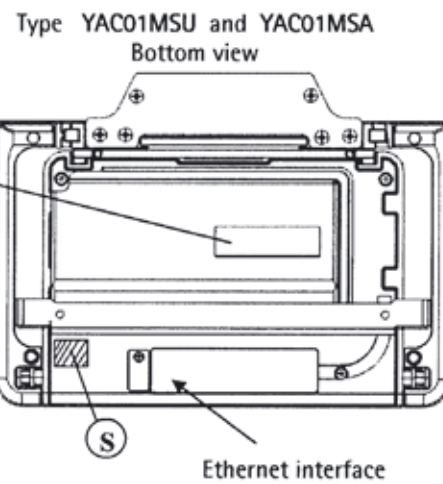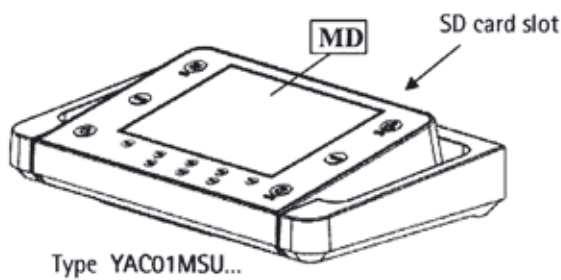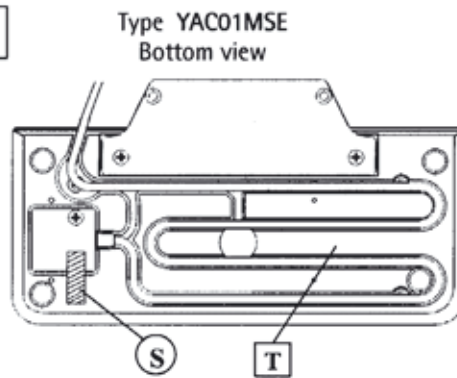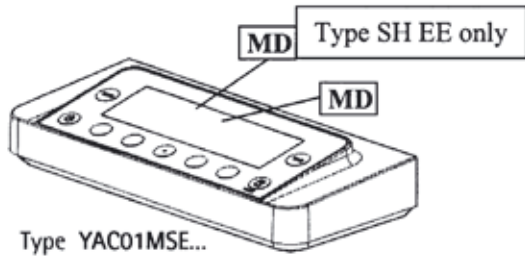ysikalisch-Technischen Bundesanstalt. *EC Type-approval Certificates without signature and seal are not valid. This EC Type-approval Certificate may not be reproduced other than in full. Extracts may be taken only with the permission of the Physikalisch-Technische Bundesanstalt.*

Die Hauptmerkmale, Zulassungsbedingungen und Auflagen sind in der Anlage enthalten, die Bestandteil der EG-Bauartzulassung ist. *The principal characteristics, the approval conditions and the special conditions, if any, are set out in the Annex which forms an integral part of the EC Type-approval Certificate.*

R3-0023

Plates and Markings

Indicating and operator terminals


MD | Type SH EE only

MD

Type YAC01MSE...

Version for motorized wind deflector with pushbutton for thenar use

Type YAC01MSE Bottom view

S   T

MD   SD card slot

Type YAC01MSU...

Type YAC01MSU and YAC01MSA Bottom view

T

S   Ethernet interface

MD   SD card slot

Type YAC01MSA...

Version for motorized wind deflector with pushbutton for thenar use

T   Plate with model designation (terminal)

S   Protective mark (self-adhesive mark or seal)

MD   Metrological data Max, Min, e and if existent d of the active weighing range

PPCU110711e

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015

Weighing modules
SA EA, SB EA, SB EB, SC EA, SC EB, SC EC, SE EA, SF EA
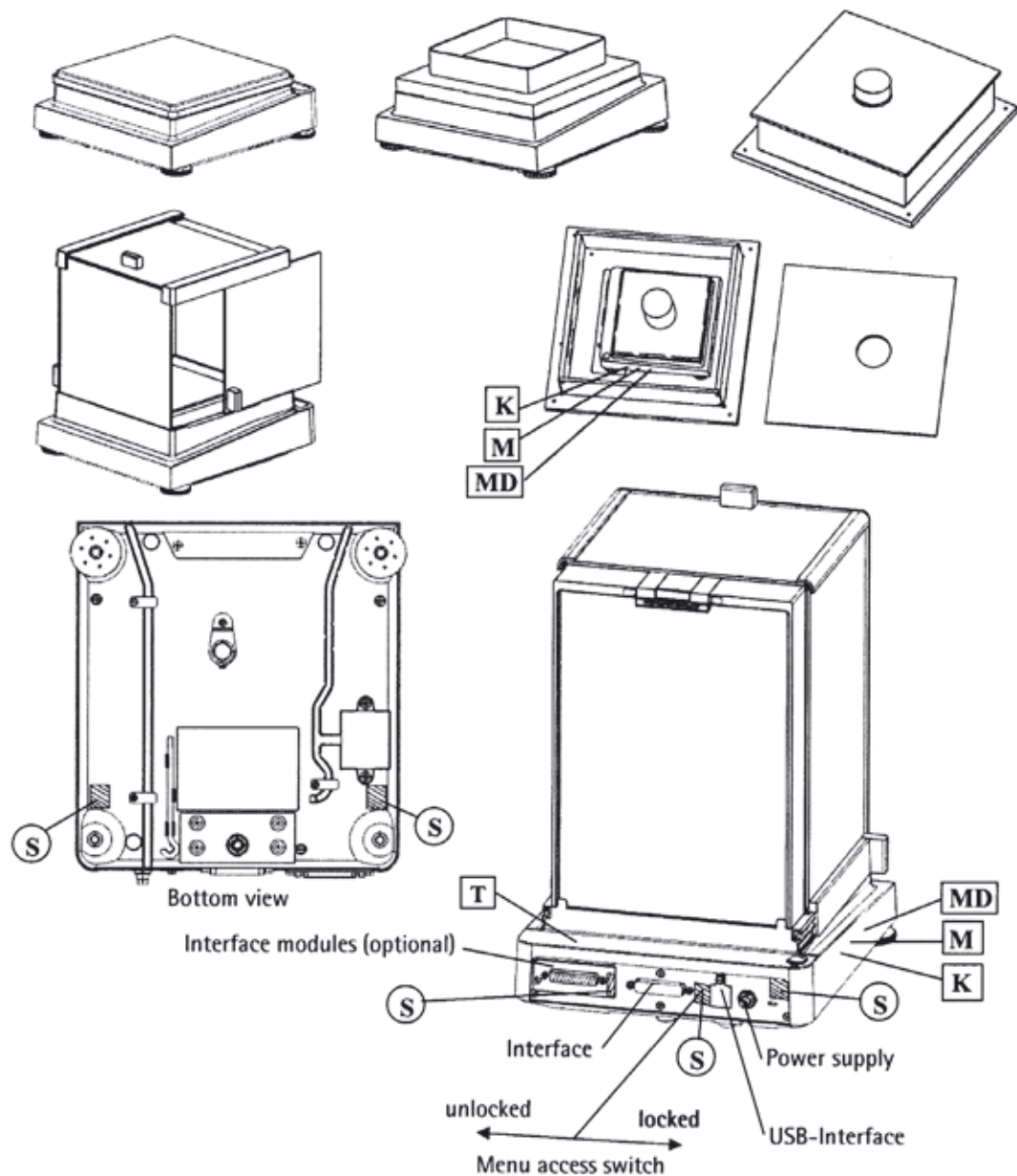
K — Descriptive plate with CE-sign

M — Mark for EC verification (green metrology sticker)

S — Protective mark (self-adhesive mark or seal)

MD — Metrological data Max, Min, e and if existent d

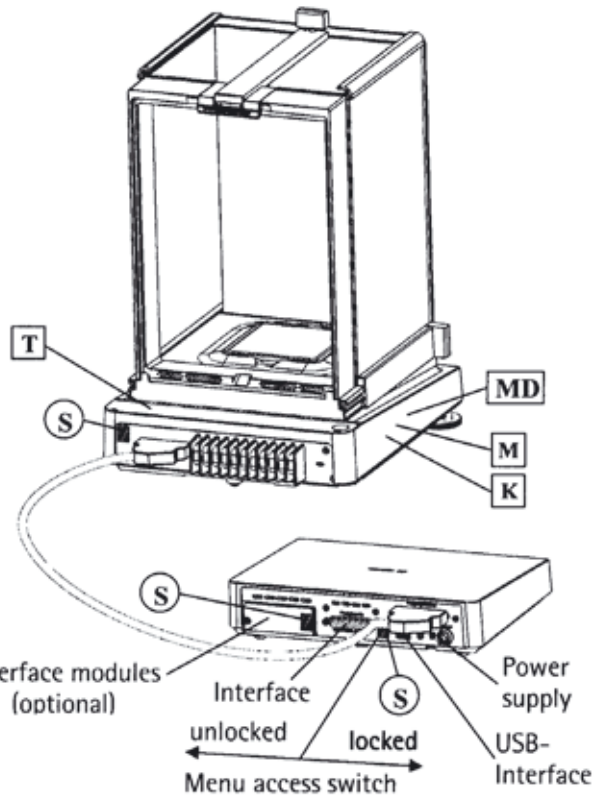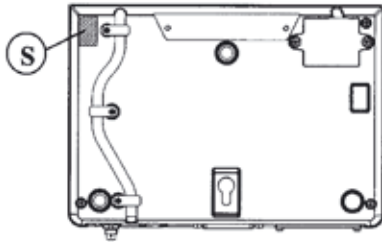T — Plate with model designation (weighing module)

PPCU110711e

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015
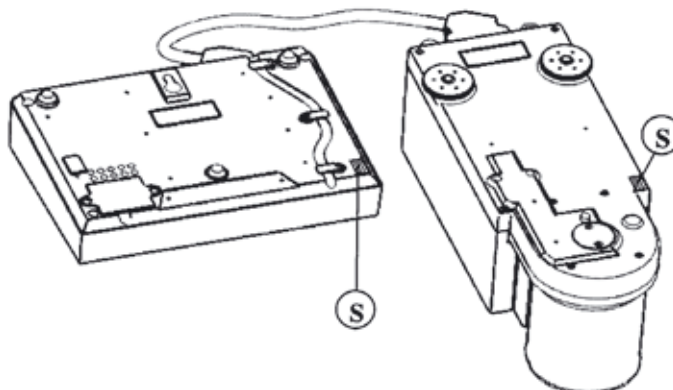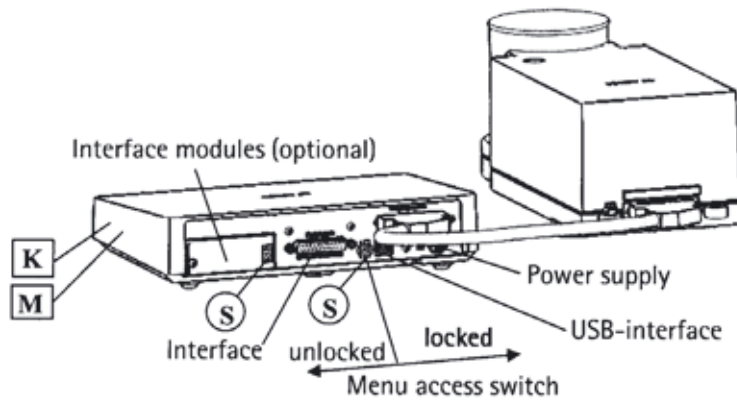
Weighing modules
SD EE

Load receptor – bottom view
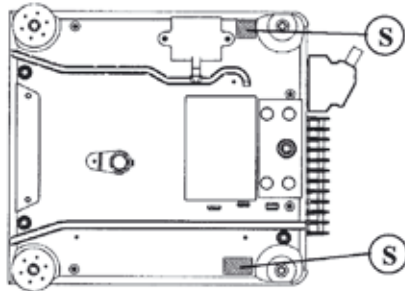
External electronics box – bottom view

Interface modules (optional)

Interface

Power supply

USB-Interface

unlocked   locked

Menu access switch

Weighing modules
SG EE, SH EE

Interface modules (optional)

Power supply

USB-interface

Interface   unlocked   locked

Menu access switch

PPCU110711e

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015

Type MSX

Indicating and operator terminals: YAC01MSE, YAC01MSA, YAC01MSU
Weighing modules: SA EA, SB EA, SB EB, SC EA, SC EB, SC EC, SD EE, SG EE, SH EE

Example of descriptive plate on a weighing instrument already verified [K]

Sartorius Weighing Technology GmbH, Goettingen, Germany	D09-09-015 MSX (SC EC)	Max	12200 g
CE09 ₀₁₁₁ [M]	+10 °C.ℓ.+30 °C	Min	5 g
	+ 5 °C.ℓ.+40 °C iso-CAL	e =	1 g
	⊂II⊃ 11114444	d =	0,1 g

Example of plate with model designation (weighing module) [T]

Sartorius Weighing Technology GmbH, Goettingen, Germany
MSU12201S-0CE-DO   CE (SA) 167555 RoHS
11114444 |||||||||||||||||

Example of plate with model designation (terminal) [T]

Sartorius Weighing Technology GmbH, Goettingen, Germany
YAC01MSE   Nicht unter Last verbinden oder trennen!
              Do not connect or disconnect when energized!
11114444 ||||||||||||||||| Ne jamais brancher ou débrancher sous tension!

Type weighing instrument: MSX
EC type-approval certificate: D09-09-015