Operating Instructions

Original Operating Instructions

BSA II

Analytical and Precision Balances



1000140985

SARTORIUS

Content

1 About These Instructions . . . 6
- 1.1 Validity . . . 6
- 1.2 Related Documents . . . 6
- 1.3 Target Groups . . . 6
- 1.4 Symbols Used . . . 6
  - 1.4.1 Warnings in Operation Descriptions . . . 6
  - 1.4.2 Other Symbols Used . . . 7

2 Safety Instructions . . . 8
- 2.1 Intended Use . . . 8
  - 2.1.1 Modifications to the Device . . . 8
  - 2.1.2 Maintenance and Repairs on the Device . . . 8
- 2.2 Qualifications of Personnel . . . 8
- 2.3 Functionality of the Device Parts . . . 8
- 2.4 Electrical Equipment . . . 8
  - 2.4.1 Damage to the Device's Electrical Equipment . . . 8
  - 2.4.2 Power Supply Unit and Power Supply Cable . . . 8
- 2.5 Conduct in an Emergency . . . 9
- 2.6 Accessories . . . 9
- 2.7 Risk of Injury When Carrying the Device . . . 9
- 2.8 Glass Breakage . . . 9

3 Device Description . . . 10
- 3.1 Device Overview . . . 10
- 3.2 Device Connections . . . 10
- 3.3 Draft Shield . . . 11
  - 3.3.1 Analytical Draft Shield . . . 11
  - 3.3.2 Frame Draft Shield . . . 11
- 3.4 Weighing Pan and Associated Components . . . 11
  - 3.4.1 Devices with Analytical Draft Shield . . . 11
  - 3.4.2 Device with Frame Draft Shield . . . 12
- 3.5 Conformity-assessed Devices . . . 12

4 Operating Design . . . 13
- 4.1 Operating Display in Weighing Mode . . . 13
- 4.2 Menu and System Settings Display . . . 13
  - 4.2.1 Buttons . . . 14
- 4.3 Displays in the Operating Display . . . 15
- 4.4 Navigating the Menus . . . 16
- 4.5 Menu Structure . . . 17
  - 4.5.1 "Main Menu" Menu Structure . . . 17
  - 4.5.2 "Toggle Between Weight Units" Menu Structure . . . 18
- 4.6 Parameter List . . . 19
  - 4.6.1 "SETUP"/"BALANCE" Menu . . . 19
  - 4.6.2 "SETUP"/"GEN.SERV." Menu . . . 20
  - 4.6.3 "DEVICE"/"RS232" Menu . . . 21
  - 4.6.4 "DEVICE"/"USB" Menu . . . 22
  - 4.6.5 "DEVICE"/"EXTRAS" Menu . . . 23
  - 4.6.6 "DATA.OUT."/"COM. SBI" Menu . . . 24
  - 4.6.7 "DATA.OUT."/"PRNT.PAR." Menu . . . 24

4.6.8 "APPLIC."/"WEIGH" Menu ... 25
4.6.9 "APPLIC."/"COUNT" Menu ... 25
4.6.10 "APPLIC."/"PERCENT" Menu ... 26
4.6.11 "APPLIC."/"NET.TOT." Menu ... 26
4.6.12 "APPLIC."/"TOTAL" Menu ... 26
4.6.13 "APPLIC" / "ANIMALW" Menu ... 26
4.6.14 "APPLIC."/"CALC." Menu ... 27
4.6.15 "APPLIC."/"DENSITY" Menu ... 27
4.6.16 "APPLIC."/"STATIST." Menu ... 28
4.6.17 "INPUT" Menu ... 28
4.6.18 "LANGUAG." Menu ... 28

5 Installation ... 29
5.1 Scope of Delivery ... 29
5.2 Selecting an Installation Site ... 29
5.3 Unpacking ... 29
5.4 Installing a Device with an Analytical Draft Shield ... 29
5.5 Installing a Device with a Frame Draft Shield ... 30
5.5.1 Removing the Transport Lock ... 30
5.5.2 Mounting the Device ... 30
5.6 Acclimatizing ... 30

6 Commissioning ... 30
6.1 Mounting the Power Supply Unit ... 30
6.1.1 Inserting the Power Plug Adapter ... 30
6.1.2 Dismounting the Power Plug Adapter ... 31
6.2 Connecting the Power Supply ... 31
6.3 Switching the Device On and Off ... 31

7 System Settings ... 32
7.1 Performing System Settings ... 32
7.2 Setting the Calibration and Adjustment ... 32
7.2.1 Setting Internal Calibration and Adjustment (Only I-1x Models) ... 32
7.2.2 Setting the External Calibration and Adjustment ... 32

8 Operation ... 33
8.1 Waiting for the Warm-up Time ... 33
8.2 Leveling the Device with a Level ... 33
8.3 Overview of Calibration and Adjustment ... 33
8.4 Calibrating and Adjusting the Device Internally (Only I-1x Models) ... 33
8.5 Externally Calibrating and Adjusting the Device ... 34
8.6 Printing Results of the Calibration and Adjustment Process ... 34
8.7 Weighing ... 34
8.8 Setting or Changing an Application ... 35
8.9 Running Applications (Examples) ... 35
8.9.1 Executing the "Toggle Between Weight Units" Function ... 35
8.9.2 Selecting Convertible Units and their Decimal Places ... 35
8.9.3 Running the "Statistics" Application ... 35
8.10 Printing Weighing Result with ID Marking ... 36

9 Cleaning and Maintenance ... 37
9.1 Cleaning Device Components ... 37
9.1.1 Preparing the Device for Cleaning ... 37
9.1.2 Dismounting the Weighing Pan and Associated Components ... 37

9.1.3 Dismounting the Analytical Draft Shield Panels ... 37
9.1.4 Cleaning the Device, Draft Shield, and Associated Components ... 38
9.2 Mounting the Analytical Draft Shield ... 38
9.3 Mounting the Removed Device Components ... 38
9.4 Recommissioning ... 38
9.5 Maintenance Schedule ... 38
9.6 Software Update ... 38

10 Malfunctions ... 39
10.1 Warning Messages ... 39
10.2 Troubleshooting ... 40

11 Decommissioning ... 41
11.1 Decommissioning the Device ... 41

12 Transport ... 41
12.1 Transporting the Device ... 41

13 Storage and Shipping ... 41
13.1 Storing ... 41
13.2 Returning the Device and Parts ... 41

14 Disposal ... 41
14.1 Disposing of the Device and Parts ... 41

15 Technical Data ... 42
15.1 Dimensions for Devices with Analytical Draft Shield ... 42
15.2 Dimensions for Devices with Frame Draft Shield ... 43
15.3 Weights ... 43
15.4 Ambient Conditions During Storage and Transport ... 44
15.5 Installation Conditions ... 44
15.5.1 Installation Site ... 44
15.5.2 Ambient Conditions at the Installation Site ... 44
15.6 Electrical Data ... 45
15.6.1 Power Supply ... 45
15.6.2 Safety of Electromagnetic Equipment ... 45
15.6.3 Electromagnetic Compatibility ... 45
15.7 Warm-up Time to Reach Operating Temperature ... 46
15.8 Metrological Data ... 46
15.8.1 Devices with Analytical Draft Shield ... 46
15.8.2 Devices with Frame Draft Shield ... 47
15.9 Backup Battery ... 49
15.10 Interfaces ... 49
15.10.1 RS232 Interface ... 49
15.10.2 USB-C Interface ... 49
15.11 Materials ... 50
15.12 Cleaning Agents and Cleaning Procedures ... 50

16 Accessories ... 51

17 Sartorius Service ... 52

1 About These Instructions

1.1 Validity

These instructions are part of the device; they must be read in full and kept in a safe place. These instructions apply to the device in the following versions:

Device	Model [1) 2)]
BSA II analytical balance with manual analytical draft shield, readability 0.1 mg	BSA224-1x | BSA224I-1x BSA124-1x | BSA124I-1x
BSA II precision balance with manual analytical draft shield, readability 1 mg	BSA623-1x | BSA623I-1x BSA423-1x | BSA423I-1x BSA323-1x | BSA323I-1x BSA223-1x | BSA223I-1x
BSA II precision balance with frame draft shield, readability 10 mg | 0.1 g	BSA6202-1x | BSA6202I-1x BSA4202-1x BSA4202I-1x BSA3202-1x | BSA3202I-1x BSA2202-1x BSA2202I-1x BSA822-1x | BSA822I-1x BSA8201-1x | BSA8201I-1x BSA5201-1x | BSA5201I-1x BSA2201-1x | BSA2201I-1x

1) Country-specific marking in model, x =

S: Standard balances without country-specific additions

OIN: Balances with approval for India

CCN: Balances with approval for China

2) Model-typical marking in model

I-1x: Devices with internal calibration and adjustment function

1.2 Related Documents

- In addition to these instructions, observe the following documents: Installation instructions for the accessories, e.g. printer

1.3 Target Groups

These instructions are addressed to the following target groups. The target groups must possess the specified knowledge.

Target Group	Knowledge and Qualifications
Operator	The operator is familiar with the device and the associated work processes. The operator understands the hazards which may arise when working with the device and knows how to prevent them.*

* If a person in the target group operates the software interface of the device, they are also the “user”.

1.4 Symbols Used

1.4.1 Warnings in Operation Descriptions

⚠ WARNING
Denotes a hazard that may result in death or serious injury if it is **not** avoided.

⚠ CAUTION
Denotes a hazard that may result in moderate or minor injury if it is **not** avoided.

NOTICE
Denotes a hazard that may result in property damage if it is **not** avoided.

1.4.2 Other Symbols Used

▶	Required action: Describes actions which must be carried out. The activities in the sequence must be carried out in succession.
▷	Result: Describes the result of the actions carried out.
[ ]	Refers to operating and display elements. Indicates status, warning, and error messages.
M	Indicates information for legal metrology for conformity-assessed (verified) devices. Conformity-assessed devices are also referred to as “verified” in these instructions.

Figures in These Instructions

Depending on the device configuration, the figures depicting the device and operating display may differ slightly from the supplied device. The variants shown in these instructions are examples.

2 Safety Instructions

2.1 Intended Use

The device is a high-resolution balance, which can be used indoors, e.g. in industrial areas. The device is intended to accurately determine the mass of materials in liquid, paste, powder, or solid form.

Appropriate containers must be used for loading each type of material.

The device is intended solely for use in accordance with these instructions. Any other use is considered **improper** and can interfere with the device's protective functions.

Operating Conditions for the Device

Do **not** use the device in potentially explosive environments. Only use the device indoors.

The device may only be used with the equipment and under the operating conditions described in the Technical Data section of these instructions.

2.1.1 Modifications to the Device

If the device is modified: There is a risk of injury. Device-specific documents and product approvals may lose their validity.

Contact Sartorius if you have any questions concerning modifications.

2.1.2 Maintenance and Repairs on the Device

Device maintenance and repairs may only be carried out by persons with specialized knowledge of the device. If the device is **not** maintained or repaired by a specialist: There is a risk of injury. Device-specific documents and product approvals may lose their validity.

Only the maintenance tasks described in these instructions should be carried out. For maintenance tasks that need to be carried out by Sartorius Service, contact Sartorius Service.

Sartorius recommends that any repair work, even that carried out after the end of the warranty period, is carried out by Sartorius Service or after consulting with Sartorius Service.

2.2 Qualifications of Personnel

Persons who do not possess adequate knowledge about how to use the device may injure themselves and other persons.

If a particular qualification is required for an action: The target group is specified. If **no** qualification is specified: The action can be performed by the "Operator" target group.

2.3 Functionality of the Device Parts

Non-functioning device parts, e.g., as a result of damage or wear, can cause malfunctions. There is a risk of injury to persons.

- If device parts are **not** functioning: Do **not** use the device.
- Comply with the maintenance intervals (intervals and maintenance tasks see Chapter "9.5 Maintenance Schedule", page 38).

2.4 Electrical Equipment

2.4.1 Damage to the Device's Electrical Equipment

Damage to the device's electrical equipment, e.g., damaged insulation, can be life-threatening. Contact with live parts represents a danger to life.

- If the electrical equipment of the device is defective, disconnect the power supply and contact Sartorius Service.
- Keep live parts away from moisture. Moisture can cause short circuits.

2.4.2 Power Supply Unit and Power Supply Cable

The use of an **unauthorized** power supply unit or power supply cable may cause life-threatening injuries as a result of electric shocks, for example.

- Only use the original power supply unit and power supply cable.
- If the power supply unit or power supply cable needs to be replaced: Contact Sartorius Service. Do **not** repair or modify the power supply unit or power supply cable.

2.5 Conduct in an Emergency

If an emergency occurs, e.g., due to malfunctions of the device or dangerous situations: Persons may be injured. The device must be immediately taken out of operation:

- ▶ Disconnect the device from the power supply.
- ▶ Prevent the device from recommissioning.

2.6 Accessories

The use of unsuitable accessories can affect the functionality and operating reliability of the device and have the following consequences:

- Risk of injury to persons
- Damage, malfunctions, or failure of the device

- ▶ Only use accessories that have been approved by Sartorius for this device.

2.7 Risk of Injury When Carrying the Device

If the device is **not** carried correctly:

- Fingers could get caught in the draft shield.
- The device could fall and cause an injury, e.g. a foot injury.
- The device connections could be damaged.

- ▶ Use both hands to carry the device. To do this, reach sideways under the device with both hands.
- ▶ Do **not** carry the device on the draft shield or the control unit.
- ▶ Disconnect the device from all connections at the installation site.

2.8 Glass Breakage

Glass components can break if they fall or are handled incorrectly. Glass fragments can cause cuts.

- ▶ In the event of damage to the operating display or draft shield, do **not** use the device. Contact Sartorius Service.
- ▶ Only operate the operating display with your fingers. Do **not** use pointed or sharp objects.

3 Device Description

3.1 Device Overview

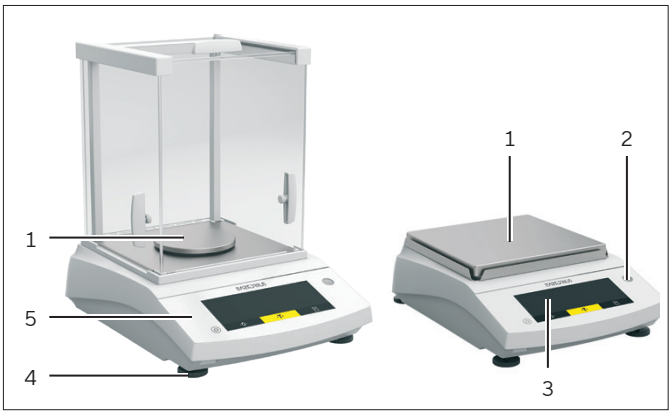


Fig. 1: Device with analytical draft shield and device with frame draft shield (example)

Pos.	Name	Description
1	Weighing pan	Intended for placing the sample
2	Level	
3	Operating display	
4	Leveling foot	Used to level the balance, manually adjustable
5	Control unit	

3.2 Device Connections

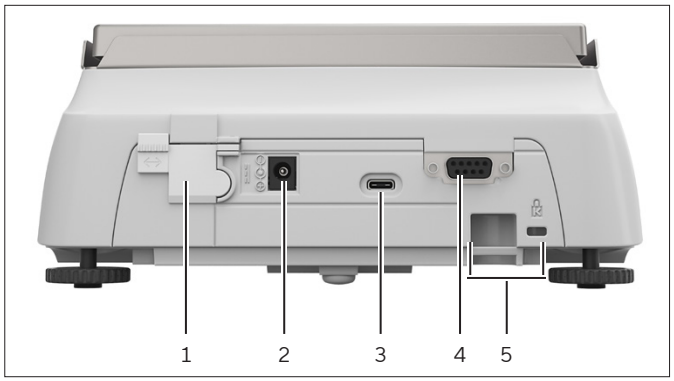


Fig. 2: Device with frame draft shield (rear view)

Pos.	Name	Description
1	Access switch	Protects the device from changes to the device settings. Is sealed for conformity-assessed devices.
2	Power supply	Connection for power supply to the device
3	USB-C connection	For connection to a printer, PC, or a second display
4	RS232 connection	9-pin, for the connection to a printer, PC, or a second display
5	Slot	For attaching an anti-theft device or a Kensington lock

3.3 Draft Shield

3.3.1 Analytical Draft Shield

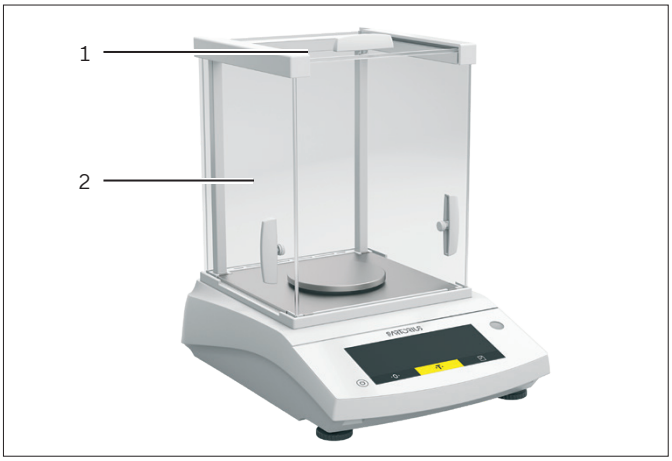


Fig. 3: Device with analytical draft shield (example)

Pos.	Name	Description
1	Upper draft shield panel	Used to open the upper panel manually
2	Side draft shield panel	Used to open the side panel manually

3.3.2 Frame Draft Shield



Fig. 4: Device with frame draft shield (example)

Pos.	Name
1	Frame draft shield

3.4 Weighing Pan and Associated Components

3.4.1 Devices with Analytical Draft Shield



Fig. 5: Device with analytical draft shield (example)

Pos.	Name	Description
1	Weighing pan	
2	Pan support	
3	Base plate	Can be taken out, e.g. for cleaning.
4	Pan retainer	

3.4.2 Device with Frame Draft Shield



Fig. 6: Device with frame draft shield (example)

Pos.	Name
1	Weighing pan
2	Shock absorber
3	Frame draft shield

3.5 Conformity-assessed Devices

Some settings of conformity-assessed models are protected against operator changes, e.g., external adjustment for devices in accuracy class II. This measure is intended to ensure the suitability of the devices for use in legal metrology.

4 Operating Design

4.1 Operating Display in Weighing Mode

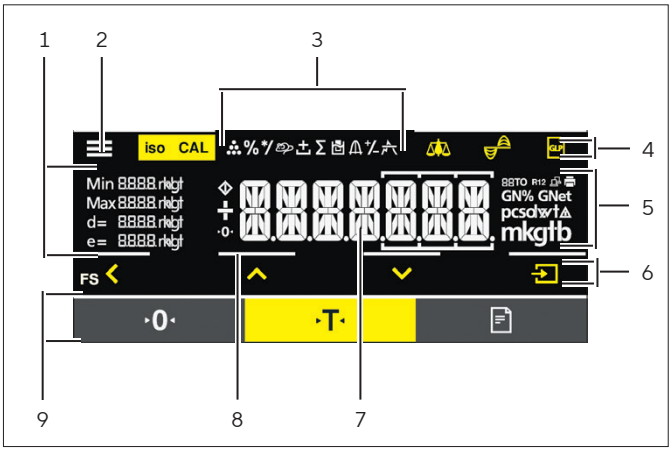


Fig. 7: Operating display in weighing mode (example)

Pos.	Designation	Description
1	Metrological Data	
2	Menu	
3	Application overview	Displays the selected application program during operation
4	Toolbar	
5	Weighing unit	Displays the selected unit, e.g., grams, [g]
6	Navigation bar	For navigation in the menu and system settings
7	Measurement display	
8	Visual touch feedback	
9	Toolbar	

4.2 Menu and System Settings Display

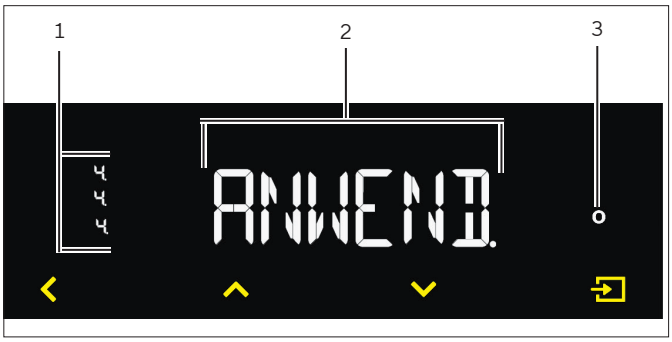


Fig. 8: Menu and system settings display (example)

Pos.	Designation	Description
1	Menu level	Shows the position of the displayed menu or parameter in up to 4 levels
2	Menu or parameter entry	
3	[Selection] display	

4.2.1 Buttons

Symbol	Designation	Description
	[On/Off] button	– When the button is pressed: Switches the operating display on. – If the button is held down: Switches the operating display off.
	[Menu] button	– When the button is pressed: The settings menu opens. – If the button is held down: It switches to version display.
	[Zero] button	Zeroes the device.
	[Tare] button	Starts taring.
	[Print] button	Exports the readouts to the integrated data interfaces.
	[Adjust] button	Starts the set calibration and adjustment function.
	[GLP] button	– Exits the GLP printout and starts printing the GLP footer. – If the “Net total”, “Totalizing”, or “Statistics” application is active: Prints and deletes the saved values and exits the application.
	[Unit change] button	If the “Unit change” function is active: – If the button is held down: Accesses the “Unit change” function menu. – When the button is pressed: Switches between the basic unit display and up to 4 other units.

	[Back] button	– In the menu:
		  – When the button is pressed: Returns to the previous display.
		  – If the button is held down: Saves the menu settings.
		– When entering digits: Selects the previous digit position.
		– For an active application: Exits the application and deletes the set reference value.

	[Up] button	– In the menu: Scrolls through the menu levels or the available parameters. – When entering digits: Increases the displayed value. – In the main display of an active application: Switches to the display of the current weight value/parameter.
	[Down] button	– In the menu: Scrolls through the menu levels or the available parameters. – When entering digits: Decreases the displayed value. – In the main display of an application that is **not** active: Opens the display to set the reference values. – In the main display of an active application: Switches to the display of the current weight value/parameter.
	[Confirm] button	– In the menu: Opens the displayed menu level or confirms the displayed parameter. – When entering digits: Selects the next digit position. – In the main display of an application that is **not** active: Starts the application process and saves the set reference value. – In the main display of an active application: Adopts the next component or the next parameter.

4.3 Displays in the Operating Display

Symbol	Designation	Description
	[Counting] display	Indicates that the “Counting” application is selected.
	[Percent weighing] display	Indicates that the “Percent weighing” application is selected.
	[Calculation] display	Indicates that the “Calculation” application is selected.
	[Animal weighing] display	Indicates that the “Animal weighing” application is selected.
	[Net total] display	Indicates that the “Net total” application is selected.
	[Totalizing] display	Indicates that the “Totalizing” application is selected.
	[Density determination] display	Indicates that the “Density determination” application is selected.
	[Statistics] display	Indicates that the “Statistics“ application is selected.
	[Busy] display	Indicates that the device is processing a command.
	[Sign] display	Indicates whether the value being displayed is positive or negative.
	[Zero] display	For some conformity-assessed devices: Indicates that the device has been zeroed.
	[AUTO] display	Indicates that the “Animal weighing” application starts automatically.
	[Application help] display	Indicates the number of components for “Totalizing“, “Net total”, and “Statistics“.
	[R12] display	Indicates the active range for multi-range balances.
	[Printer] display	– Indicates that a printer has been detected at the USB port. – Flashes if the data output is active.
	[PC-Connect] display	– Indicates that a PC or a second display has been detected at the USB port. – Flashes if the data connection is active.
	[Percent] display	Indicates that a percentage value is being displayed.
	[Net] display	Indicates that a net value is being displayed.
	[Gross] display	Indicates that a gross value is being displayed.

Symbol	Designation	Description
	[Selection] display	In the menu: Identifies the selected parameter. If the “Calculation“ or “Density determination“ application is active: Indicates that a calculated value is being displayed.
	[Unit symbol] display	Indicates the set weight unit, e.g., [g] for “grams”.
	[Quantity] display	Indicates that a quantity is being displayed.
	[**Invalid** weight value] display	– Indicates that the display does **not** contain a weight value, but is instead the calculated result of an application, e.g., for the “Totalizing” application. – For conformity-assessed devices: Indicates a fault. The cause of this fault is displayed after pressing the [Unit change] key.

4.4 Navigating the Menus



▶ To call up the main menu: Press the [Menu] button.



▶ To display menu items or parameters of a level: Press the [Up] or [Down] button.



▶ To return to the next higher menu level or exit the menu: Press the [Back] button.



▶ To open a displayed menu level or a displayed parameter: Press the [Confirm] button.

4.5 Menu Structure

4.5.1 “Main Menu“ Menu Structure

▶ Navigating the menus (see Chapter 4.4, page 16).

Level 1:	Level 2:	Description
SETUP	BALANCE	Set the functions of the device.
	GEN.SERV. “General services”	Reset the menu to factory settings.
DEVICE	RS-232 “RS232, 9-pin”	Define the parameters for the COM interface.
	USB “USB-C”	Define the parameters for the USB interface.
	EXTRAS	Define the functions of the operating display.
DATA.OUTP. “Data output”	COM.SBI “SBI communication”	Configure the automatic data output.
	PRNT.PR. “Printout settings”	Perform the settings for the printout.
APPLIC. “Applications”	WEIGH	– Determine the weight value of a sample. – Activate the functions for all applications.
	COUNT	Determine the number of parts that have approximately equal weight.
	PERCENT “Percent weighing”	Determine the percentage share of a sample based on a reference weight.
	NET.TOT. “Net total”	Carry out the weighing of components for a mixture.
	TOTAL “Totalizing”	Add weight values of independent weighing processes in a memory.
	ANIMALW. “Animal weighing”	Weigh unstable samples, e.g., animals. This program calculates the average of several measurement cycles.
	CALC. “Calculation”	Calculate the weight value using a multiplier or divisor, e.g., for determining the weight per unit area of paper.
	DENSITY “Density determination”	Determine the density of solid samples based on the buoyancy method.
	STATIST. “Statistics”	Save and statistically analyze weight values and calculated values.

Level 1:	Level 2:	Description
INPUT	DEV.ID.	Save the entered ID number for the device.
	DATE	Set the date.
	TIME	Set the time.
	SERV. PW.	Activate the service mode.
	INTERV.	The SBI output rate can be set from 0 - 9999 seconds.
INFO “Device information”	VERSION “Version number”	Display the software version number.
	SER. NO. “Serial number”	Display the device’s serial number.
	MODEL	Display the device’s model designation.
	BAC VER.	Display the version of the BAC processor.
LANGUAG.		Set the menu language of the operating display.

4.5.2 “Toggle Between Weight Units“ Menu Structure

▶ Navigating the menus (see Chapter 4.4, page 16).

Level 1:	Description
Unit 1 – unit 4	Define the displayed weight unit and the resolution for the 1st to 4th convertible unit.

4.6 Parameter List

4.6.1 “SETUP“/“BALANCE“ Menu

Parameters	Settings	Explanation
AMBIENT	V.STABLE	Sets the ambient conditions to “very stable”: Activates a fast change in the weight values in the event of a load change with a high output rate. Recommended for the following work environment: – Very stable table near the wall – Closed and calm room
	STABLE*	Sets the ambient conditions to “stable”. Recommended for the following work environment: – Stable table – Slight movement in the room – Slight draft
	UNSTABL.	Sets the ambient conditions to “unstable”: Activates the delayed change in weight values with a reduced output rate. Recommended for the following work environment: – Simple office desk – Room with moving machinery or personnel – Slight air movement
	V.UNSTBL.	Sets the ambient conditions to “very unstable”: Activates a significantly delayed change in the weight values and long wait for stability with a further reduction in the output rate. Recommended for the following work environment: – Noticeable and slow floor vibrations – Noticeable building vibrations – Weighed goods moved – Very strong air movements
APP.FILT.	FINAL.RD.*	Activates a filter that enables a fast change in the display for very fast load changes. Display changes with minimal load changes (in the digit range) occur more slowly.
	FILLING	Activates a filter that enables a very fast change in the display with minimal load changes, e.g., when dosing or filling vessels.
STB.RNG.	V. ACC.	Sets the stability to “very accurate“.
	ACC.*	Sets the stability to “accurate“.
	FAST	Sets the stability to “fast“.
	V. FAST	Sets the stability to “very fast“.
AUTOZER.	ON*	Activates automatic zeroing. The display is automatically set to zero in case of a deviation of 0 less than (X).
	OFF	Deactivates automatic zeroing. Zeroing must be triggered with the [Zero] button.

* Factory setting

Parameters	Settings	Explanation
WT.UNIT	GRAMS*, KILOGR., CARATS, POUNDS, OUNCES, TROY.OZ., HKTAEL, SNGTAEL, TWNTAEL, GRAINS, PENYWT., MILLIGR., PTS./LB, CHNTAEL., MOMMES, AUSTR.CT, TOLA, BAHT, MESGHAL, NEWTON	The device displays the weight in the selected unit. The availability of units depends on national legislation and is therefore country-specific.
DISP.DIG.	ALL*	"Show all decimal places": All decimal places are shown in the display. The setting change is not available on conformity-assessed devices.
	MINUS 1	"Last decimal place off": The last decimal place is switched off.
CAL./ADJ.	EXT.CAL.	The [Adjust] button starts an external calibration and adjustment process with the preset adjustment weight.
	E.CAL.USR.	The [Adjust] button starts an external calibration and adjustment process with the user-defined adjustment weight value.
	INT.CAL.*	The [Adjust] button starts an internal calibration and adjustment process.
CAL.SEQ.	ADJUST*	The adjustment starts automatically after the calibration.
	CAL.-ADJ.	The adjustment must be started or exited manually after calibration with the [Confirm] button.

* Factory setting

4.6.2 "SETUP"/"GEN.SERV." Menu

Parameters	Settings	Explanation
MENU.RES.	DEFAULT	Resets the system settings to the factory default settings.
	NO*	Deactivates the option of resetting the device menu.

* Factory setting

4.6.3 “DEVICE“/“RS232“ Menu

Parameters	Settings	Explanations
DAT.REC.	XBPI	Extended range of commands to control numerous balance functions with binary protocol for direct communication with the device.
	SBI*	Enables SBI communication. The data is output to a PC or control unit. Enables the use of ESC commands from a PC to control the basic balance functions with ASCII protocol.
	REM.DISP.	Enables data output on another display.
	YDP20	Sets the standard settings of YDP20 printers.
	YDP30	Sets the standard settings of YDP30 printers.
	OFF	Deactivates the automatic data output.
BAUD	600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600, 115200	Sets the baud rate to the selected value.
PARITY	ODD*	Applies an odd parity.
	EVEN	Applies an even parity.
	NONE	Does **not** apply a parity.
STOPBIT	1 BIT*	
	2 BITS	
HANDSHK.	SFTWARE	Sets the handshake protocol to software handshake.
	HRDWARE*	Sets the handshake protocol to hardware handshake.
	NONE	Does **not** set a handshake protocol.
DATABIT	7 BITS	Sets the number of data bits to 7.
	8 BITS*	Sets the number of data bits to 8.

* Factory setting

4.6.4 “DEVICE”/“USB” Menu

Parameters	Settings	Explanations
DAT.REC.**	XBPI	Extended range of commands to control numerous balance functions with binary protocol for direct communication with the device.
	SBI*	Enables SBI communication. The data is output to a PC or control unit. Enables the use of ESC commands from a PC to control the basic balance functions with ASCII protocol.
	REM.DISP.	Enables data output on another display.
	YDP20	Sets the standard settings of YDP20 printers.
	YDP30	Sets the standard settings of YDP30 printers.
	OFF	Deactivates the data output.
BAUD**	600, 1200, 2400, 4800, 9600*, 19200, 38400, 57600, 115200	Sets the baud rate to the selected value.
PARITY**	ODD*	Applies an odd parity.
	EVEN	Applies an even parity.
	NONE	Does **not** apply a parity.
STOPBIT **	1 BIT*	
	2 BITS	
HANDSHK.**	SFTWARE	Sets the handshake protocol to software handshake.
	HRDWARE	Sets the handshake protocol to hardware handshake.
	NONE*	Does **not** set a handshake protocol.
DATABIT**	7 BITS	Sets the number of data bits to 7.
	8 BITS*	Sets the number of data bits to 8.
DEV.USED	NONE*, PRINTER, VIRT.COM, PC HOST, REM. DISP.	Indicates which connection is detected at the USB port.

* Factory setting

** Are blocked if “PRINTER” or “REM.DISP.” are displayed under “DEV.USED”

4.6.5 “DEVICE“/“EXTRAS“ Menu

Parameters	Settings	Explanation
MENU	EDITABL.*	Activates write access. The menu parameters can be changed.
	RD.ONLY	Activates read access. The menu parameters **cannot** be changed.
SIGNAL	OFF	Switches the acoustic signal off.
	ON*	Switches the acoustic signal on.
KEYS	UNLOCK.*	Deactivates the button lock.
	LOCKED	Activates the button lock.
EXT.KEY	PRINT	Assigns the print function to the external key.
	CAL.	Assigns the calibration and adjustment function selected under [CAL.-ADJ.] to the external key.
	CF	Assigns the [Back] function to the external key.
	ENTER	Assigns the [Confirm] function to the external key.
	ZERO	Assigns the [Zero] function to the external key.
	TARE	Assigns the [Tare] function to the external key.
	GLP END	Assigns the [GLP] function to the external key.
	NO*	**No** function is assigned to the external key.
ON MODE	ON/STDB.*	The [On/Off] button switches between on/standby with clock display.
	ON/OFF	The [On/Off] button switches between on/standby without clock display.
	AUTO ON	Changes the function of the [On/Off] button: The device **no longer** switches off or to standby mode, instead it starts a boot process.
LIGHT	OFF	Deactivates the lighting on the operating display.
	ON*	Activates the lighting on the operating display.

* Factory setting

4.6.6 "DATA.OUT."/"COM. SBI" Menu

Parameters	Settings	Explanations
COM. OUTP.	IND.NO*	Activates the manual data output without stability.
	IND.AFTR	Activates the manual data output after stability.
	AUTO.W/O	Activates the automatic data output without stability.
	AUTO W/	Activates the automatic data output after stability.
STOP.AUT.	OFF*	Deactivates the option to abort the automatic data output.
	ON	The automatic data output is aborted by pressing the [Print] button or a software command.
AUTO.CYC.	EACH.VAL*	Starts the automatic data output with a cycle after each value.
	2.WERT	Starts the automatic data output with a cycle after every 2nd value.
	INTERV.	The output rate can be set from 0–9999 seconds under "INPUT/INTERV."
FORMAT	22CHARS*	The data output provides 22 characters per line (16 characters for the measured value and 6 characters for identifiers).
	16CHARS	The data output provides 16 characters per line for the measured value.
	EXTR.LIN.	The data output provides an additional line with the date, time, and weight value.
AUTO.TAR.	OFF*	Deactivates automatic taring after data output.
	ON	The device automatically tares after data output.

* Factory setting

4.6.7 "DATA.OUT."/"PRNT.PAR." Menu

Parameters	Settings	Explanation
ACTIVAT.	MAN. NO	Manual without stability: The print process can be started manually at any time.
	MAN.AFTR*	Manual after stability: After pressing the [Print] button, the print command is only executed once stability is achieved.
	INTERV.A.	The output rate can be set from 0–9999 seconds under "INPUT/INTERV." if stability is achieved.
	INTERV.N.	The output rate can be set from 0–9999 seconds under "INPUT/INTERV." without stability.
	AUTO.LC	Automatically at load change: The print process starts after every load change.
FORMAT	22CHARS*	The printer output prints 22 characters per line (16 characters for the measured values and 6 characters for identifiers)
	EXTR.LIN.	The printer output prints an additional line with the date, time, and weight value.

* Factory setting

Parameters	Settings	Explanation
PRT.INIT.	OFF	Deactivates the output of the application parameters.
	ALL*	The print command prints all parameters.
	MAIN.PAR.	The print command only prints the main parameters.
GLP	OFF*	Deactivates the GLP printout.
	CAL.-ADJ.	Activates the GLP printout for all calibration and adjustment processes.
	ALWAYS	The GLP printout is always switched on. All printouts contain a GLP header and a GLP footer.
TAR./PRT.	OFF*	Deactivates automatic taring after printer output.
	ON	Automatically tares the device after every printout.
TIME	24H*	Sets the time to 24-hour mode.
	12H	– Sets the time to 12-hour mode (AM/PM). – Is blocked for ISO format.
DATE	DD.MMM.YY*	Sets the date display format to DD.MMM.YY
	MMM.DD.YY	Sets the date display format to MMM.DD.YY
	YY.MM.DD	– Sets the date display format to ISO FORMAT YYYY-MM-DD. – Sets the time to 24-hour mode.

* Factory setting

4.6.8 “APPLIC.“/“WEIGH“ Menu

Parameters	Settings	Explanation
UNIT	ON*	Activates the “Toggle between weight units” touch function.
	OFF	Deactivates the “Toggle between weight units” touch function.
RECALL	ON	Activates the saving of the last stable weight value not equal to 0.
	OFF*	Deactivates saving.

* Factory setting

4.6.9 “APPLIC.“/“COUNT“ Menu

Parameters	Settings	Explanation
RESOLUT.	DISP.ACC.*	Sets the resolution to “display resolution“. The “Counting” application is started with the displayed value.
	10FACH	Sets the resolution to 10-times more accurate than “display resolution“.
	100FACH	Sets the resolution to 100-times more accurate than “display resolution“.
REF.UPDT.	OFF*	Deactivates automatic reference sample updating.
	AUTO	Activates the automatic reference sample updating.

* Factory setting

4.6.10 “APPLIC.“/“PERCENT“ Menu

Parameters	Settings	Explanation
DEC.PLCS	NONE	The result of the “Weighing in Percent” application is displayed without decimal places.
	1 DEC.PL.*	The result of the “Weighing in Percent” application is displayed to 1 decimal place.
	2 DEC.PL.	The result of the “Weighing in Percent” application is displayed to 2 decimal places.
	3 DEC.PL.	The result of the “Weighing in Percent” application is displayed to 3 decimal places.

* Factory setting

4.6.11 “APPLIC.“/“NET.TOT.“ Menu

Parameters	Settings	Explanation
PRT.COMP.	OFF	Deactivates the component printout.
	ON*	Activates the component printout.

* Factory setting

4.6.12 “APPLIC.“/“TOTAL“ Menu

Parameters	Settings	Explanation
PRT.COMP.	OFF	Deactivates the component printout.
	ON*	Activates the component printout.

* Factory setting

4.6.13 “APPLIC” / “ANIMALW” Menu

Parameters	Settings	Explanation
ACTIVIT.	CALM	Sets the intensity of the “Animal activity“ to “calm“. Recommended for minor movements of the sample, e.g. caused by placement on the weighing pan.
	ACTIVE*	Sets the intensity of the “Animal activity“ to “active“. Recommended for medium movements of the sample, e.g. caused by placement on the weighing pan.
	V.ACTIVE	Sets the intensity of the “Animal activity“ to “very active“. Recommended for very active movements of the sample, e.g. caused by placement on the weighing pan.

* Factory setting

Parameters	Settings	Explanation
START	MANUAL	The “Animal weighing” application must be manually selected in the start screen.
	AUTO*	Sets the trigger to start the “Animal weighing” application to “automatic”.

* Factory setting

4.6.14 “APPLIC.”/“CALC.“ Menu

Parameters	Settings	Explanation
METHOD	MUL.*	Specifies multiplication as the method of calculation for the “Calculation“ application.
	DIV.	Specifies division as the method of calculation for the “Calculation“ application.
DEC.PLCS	NONE	The result of the “Calculation” application is displayed without decimal places.
	1 DEC.PL.*	The result of the “Calculation” application is displayed to 1 decimal place.
	2 DEC.PL.	The result of the “Calculation” application is displayed to 2 decimal places.
	3 DEC.PL.	The result of the “Calculation” application is displayed to 3 decimal places.

* Factory setting

4.6.15 “APPLIC.”/“DENSITY“ Menu

Parameters	Settings	Explanation
DEC.PLCS	NONE	The result of the “Density determination” application is displayed without decimal places.
	1 DEC.PL.*	The result of the “Density determination” application is displayed to 1 decimal place.
	2 DEC.PL.	The result of the “Density determination” application is displayed to 2 decimal places.
	3 DEC.PL.	The result of the “Density determination” application is displayed to 3 decimal places.

* Factory setting

4.6.16 “APPLIC.”/“STATIST.“ Menu

Parameters	Settings	Explanation
PRT.COMP.	OFF	Deactivates the component printout.
	ON*	Activates the component printout.
TAR.STAT.	OFF*	Deactivates automatic taring after the components are saved.
	ON	Activates automatic taring after the components are saved.

* Factory setting

4.6.17 “INPUT“ Menu

Parameters	Settings	Settings	Explanation
DEV. ID		Max 14 characters 09-0, A-Z, - , empty	Saves the entered ID number for the device.
DATE			Saves the entered date.
TIME			Saves the entered time.
SERV. PW.		Max 7 characters 09–0, A–Z, - , empty	Activates service mode.
INTERV.			The SBI output rate can be set from 0 - 9999 seconds.

4.6.18 “LANGUAG.“ Menu

Parameters	Settings	Explanation
LANGUAG.	ENGLISH*, DEUTSCH, FRANC. ITAL., ESPANOL, PORTUG., РУССКИЙ, POLSKI	Defines the menu language.

* Factory setting

5 Installation

5.1 Scope of Delivery

Item	Quantity
Device	1
Devices with analytical draft shield:	
Weighing pan	1
Pan support	1
Base plate	1
Analytical draft shield*	1
Devices with frame draft shield:	
Weighing pan	1
Shock absorber	4
Transport lock*	2
Devices with analytical draft shield: Dust cover	1
Power supply unit YEPS01-15VOW, with country-specific power plug adapters YEPS01-PS8, YEPS01-PS9, YEPS01-PS10	1
Operating Instructions	1
*Mounted on delivery	

5.2 Selecting an Installation Site

Procedure

▶ Ensure that the installation conditions have been met (see Chapter 15.5, page 44).

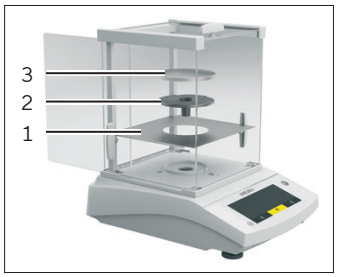
5.3 Unpacking

Procedure

▶ Open the package.
▶ Remove the top layer of foam packaging.
▶ ⚠ **CAUTION** Risk of injury when carrying the device!
  ▶ Grip the device underneath at the sides with both hands and lift the device out of the bottom layer of foam packaging.
  ▶ Do **not** grip the device on the draft shield or the control unit.
▶ ⚠ **CAUTION** Risk of injury from cuts due to broken glass edges! In the event of damage to the operating display or draft shield, do **not** use the device. Contact Sartorius Service.
▶ Place the device down on a stable, completely flat surface at the installation site.
▶ Remove the weighing pan and associated components from the packaging.
▶ Keep all parts of the original packaging, e.g., to return the device.

5.4 Installing a Device with an Analytical Draft Shield

Procedure

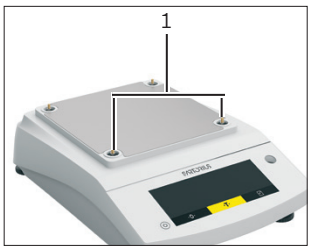


▶ Open one side panel completely.
▶ Insert the base plate (1).
▶ Fit the pan support (2) on the pan retainer.
▶ Place the weighing pan (3) on top.

5.5 Installing a Device with a Frame Draft Shield

5.5.1 Removing the Transport Lock

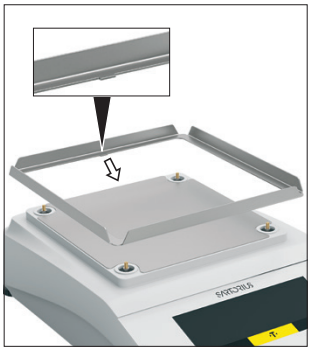
Procedure



▶ Remove the transport locks (1) and retain them for later use.

5.5.2 Mounting the Device

Procedure



▶ Insert the latch in the recess.
▶ Rest the frame draft shield completely on top.



▶ Fit all shock absorbers (2).
▶ Place the weighing pan (1) on top.

5.6 Acclimatizing

When a cold device is brought into a warm environment: The temperature difference can lead to condensation from humidity in the device (moisture formation). Moisture in the device can lead to malfunctions.

Procedure

▶ Allow the device to acclimatize to the installation site. The device must be disconnected from the power supply during that time.

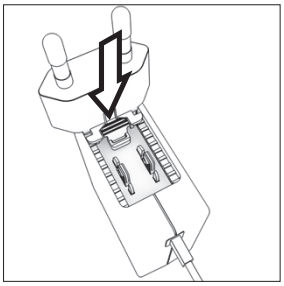
6 Commissioning

6.1 Mounting the Power Supply Unit

6.1.1 Inserting the Power Plug Adapter

Item number on packaging	**Power supply unit YEPS01-15VOW with connection cable and country-specific power plug adapters (packed in PE bag with printed country identification, e.g. EU)**
YEPS01-PS8	USA and Japan (US+JP), Europe and Russia (EU+RU), Great Britain (UK), India (IN), South Africa (ZA), Australia (AU), China (CN)
YEPS01-PS9	Argentina (AR), Brazil (BR), Korea (KR)
YEPS01-PS10	China (CN)

Procedure

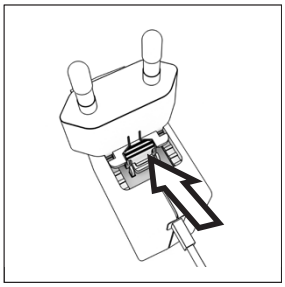


▶ Select the country-specific power plug adapter. The power plug adapter must be suitable for use with the wall outlet at the installation site.

▶ Insert the power plug adapter into the power supply unit. The grooved button must be facing upwards.
▶ Push the power plug adapter as far as you can until it audibly clicks into place.
▶ Check whether the power plug adapter is securely locked in place by pulling it gently.
▷ If the power plug adapter does **not** move: The power plug adapter is locked.

6.1.2 Dismounting the Power Plug Adapter

Procedure



- ▶ Press the grooved button from above and pull back on the power plug adapter.
- ▶ Push the power plug adapter out of the power supply unit and remove it.

6.2 Connecting the Power Supply

Procedure

- ▶ ⚠ **WARNING** Severe injuries caused by using defective power supply cables! Check the power supply cable for damage, e.g., cracks in the insulation.
  - ▶ If required: Contact Sartorius Service.
- ▶ Check whether the country-specific power plug matches the power supplies at the installation site.
  - ▶ If required: Use country-specific power supply cable or replace country-specific power plug adapter for power supply unit.
- ▶ **NOTICE** Damage to the device due to excessive input voltage! Check whether the voltage specifications on the manufacturer's ID label match those of the power supply at the installation site.
  - ▶ If the input voltage is too high: Do **not** connect the device to the power supply.
  - ▶ Contact Sartorius Service.
- ▶ Connect the right angle plug to the "Power Supply" connection.
- ▶ Connect the mains plug to the wall outlet (supply voltage) at the installation site.
- ▷ The [BOOTING] display is opened in the operating display.
- ▷ The device performs a self-test.

6.3 Switching the Device On and Off

Requirements

The device is connected to the power supply.

Procedure

- ▶ ⚠ **WARNING** Risk of injury from cuts due to broken glass edges! Only operate the operating display with your fingers. Do **not** use pointed or sharp objects.
- ▶ To switch the device on: Press the [On / Off] button.
- ▶ To switch the device off: Press and hold the [On / Off] button.

7 System Settings

7.1 Performing System Settings

Default settings can be adjusted for the device and the applications in order to align with the ambient conditions and individual operating requirements.

The following settings are necessary to operate the device together with connected components:

- Set up the communication of the connected devices
- Set up additional components

The following settings are recommended to set up the device:

- Set the menu language
- Set date and time
- Set the calibration and adjustment

Procedure

- ▶ Press the [Menu] button.
- ▶ To adjust settings: Open the desired menu.
- ▶ Select and confirm the desired parameters (parameters, see Chapter “4.6 Parameter List”, page 19).
- ▶ Exit the menu.

7.2 Setting the Calibration and Adjustment

7.2.1 Setting Internal Calibration and Adjustment (Only I-1x Models)

The following functions can be set for the internal calibration and adjustment:

- Internal calibration with automatic start of the adjustment.
- Internal calibration with manual start of the adjustment.

Procedure

- ▶ Open the “SETUP” / “BALANCE” menu. Call up the “CAL./ADJ.” parameter and select the value “INT. CAL.”.
- ▶ If the calibration function needs to be set with subsequent automatic adjustment: In the “SETUP” / “BALANCE” menu, for the “CAL.SEQ.” parameter, select the “ADJUST“ setting value.
- ▶ If the calibration function needs to be set without subsequent automatic adjustment: In the “SETUP” / “BALANCE“ menu, for the “CAL.SEQ.” parameter, select the “CAL.-ADJ.“ setting value.

7.2.2 Setting the External Calibration and Adjustment

The following functions can be set for the external calibration and adjustment:

- External calibration with manual start of the adjustment.

M If this relates to a conformity-assessed device in legal metrology: External calibration and adjustment is **not** possible.

Procedure

- ▶ Open the “SETUP” / “BALANCE” menu.
- ▶ If the calibration function needs to be set with subsequent automatic adjustment: For the “CAL.SEQ.” parameter, select the “ADJUST“ setting value.
- ▶ If the calibration function needs to be set without subsequent automatic adjustment: For the “CAL. SEQ.” parameter, select the “CAL./ADJ.” setting value.

Setting the Weight Value for the External Weight

A preset weight value can be set for the external weight.

Procedure

- ▶ In the “SETUP” / “BALANCE” menu, for the “CAL./ ADJ.” parameter, select the “EXT.CAL.” setting value.

8 Operation

8.1 Waiting for the Warm-up Time

In order to provide accurate weighing results, the device must have reached the necessary operating temperature. The operating temperature is reached after the warm-up time. The warm-up time starts when the device is switched on.

Procedure

▶ Switch on the device.
▶ Wait until the operating temperature is reached (warm-up time, see Chapter 15.7, page 46).

M If a weighing process is carried out on a conformity-assessed device during the warm-up time: The weight value is marked as **invalid**.

8.2 Leveling the Device with a Level

Unevenness at the installation site of the device may result in incorrect weighing results. Leveling balances out unevenness at the installation site.

Procedure

▶ To level the device: Bring the air bubble into the middle of the circular marking. To do this, turn the leveling feet to the left or right.

8.3 Overview of Calibration and Adjustment

During calibration, a calibration weight is used to determine the deviation of the displayed value from the actual value. The subsequent adjustment eliminates this deviation.

We recommend regular calibration and adjustment:

- Daily, every time the device is switched on
- After every leveling
- After changing the ambient conditions (temperature, humidity, or air pressure)
- After setting the device up at a new installation site

8.4 Calibrating and Adjusting the Device Internally (Only I-1x Models)

Requirements

- The weighing pan is unloaded.
- The operating display shows a stable weight value.
- The internal calibration and adjustment function is set (see Chapter 7.2.1, page 32).

Procedure

▶ Press the [Zero] button.
▶ Press the [Adjust] button.
▶ The “INT.CAL.“ display is opened
▶ If the calibration with subsequent automatic adjustment function is selected:
  ▷ The “CAL.RUN.“ display is opened in the operating display during the process.
  ▷ The “CAL.END.“ display indicates the end of the calibration process.
▶ If the calibration without subsequent automatic adjustment function is selected:
  ▶ Press the [Confirm] button.
  ▷ The calibration process is started.
  ▷ The “CAL.RUN.“ display is opened in the operating display during the process.
  ▷ The calibration error is displayed.
  ▶ Press the [Confirm] button
  ▷ The adjustment process is performed.
  ▷ The “CAL.END.“ display indicates the end of the calibration process.

8.5 Externally Calibrating and Adjusting the Device

Material Calibration and adjustment weight

Requirements

- The weighing pan is unloaded.
- The operating display shows a stable weight value.
- The external calibration and adjustment function is set (see Chapter 7.2.2, page 32).
- The preset weight value for the adjustment weight or the user-defined weight value for the adjustment weight is selected (see Chapter 7.2.2, page 32).

Procedure

▶ Press the [Zero] button.
▶ Press the [Adjust] button.
▶ Place the indicated calibration and adjustment weight on the balance.
▷ The weight value is displayed.
▶ If the calibration with subsequent automatic adjustment function is selected and the adjustment weight placed on the device is within the specified limits:
  ▷ The adjustment process starts.
  ▷ If the "+" prefix is displayed: The applied weight is too high.
  ▷ If the "–" prefix is displayed: The applied weight is too low.
▷ The "CAL.END." message indicates the end of the calibration process.
▶ Remove the adjustment weight.
▶ If the calibration without subsequent automatic adjustment function is selected and the adjustment weight placed on the device is within the specified limits:
  ▶ Press the [Confirm] button.
  ▷ The adjustment process starts.
  ▷ If the "+" prefix is displayed: The applied weight is too high.
  ▷ If the "–" prefix is displayed: The applied weight is too low.
▷ The "CAL.END." message indicates the end of the calibration process.
▶ Remove the adjustment weight.

8.6 Printing Results of the Calibration and Adjustment Process

The results of the calibration and adjustment process can be printed in a GLP printout.

Procedure

▶ Set the GLP printout in the menu (setting parameters, see Chapter 4.6.7, page 24).
▶ Adjust the device.
▷ Once the calibration is complete: The printing process starts.

8.7 Weighing

Chemicals can attack the device or the connected accessories internally and externally. This may damage the device and accessories.

We recommend using appropriate vessels when weighing chemicals.

Requirements

- The device has been leveled.
- The device is calibrated and adjusted.

Procedure

▶ Zero the device. To do this, press the [Zero] button.
▶ If using a vessel for the sample:
  ▶ Tare the device. To do this, press the [Tare] button.
  ▶ Place the sample in the vessel.
▶ If **no** vessel is used for the sample: Place the sample on the weighing pan.
▷ The weight value is displayed depending on the selected application program.

8.8 Setting or Changing an Application

Procedure

- ▶ In the "APPLIC." menu, select an application, e.g., "STATIST."
- ▶ Press the [Confirm] button.
- ▶ Exit the menu.

8.9 Running Applications (Examples)

8.9.1 Executing the "Toggle Between Weight Units" Function

The "Toggle between weight units" function enables to switch between a maximum of four different units. The selected basic unit is displayed every time the device started (see "UNIT" Chapter 4.6.8, page 25). The units can be set during the weighing process and the decimal places can be adjusted.

Requirements

The "Toggle between weight units" function is activated (see Chapter 4.6.8, page 25).

M The weight value must be valid.

Procedure

- ▶ To switch the displayed weight unit during weighing or before an application: Press the [Unit change] button until the desired unit is displayed.
- ▷ The current weight value is displayed in the selected unit.

8.9.2 Selecting Convertible Units and their Decimal Places

Procedure

- ▶ Press and hold down the [Unit change] button.
- ▶ Select one of the parameters "Unit 1" – "Unit 4" in the submenu. To do this, press the [Confirm] button.
- ▶ Select the desired unit. To do this, press the [Confirm] button.
- ▶ Specify the decimal places for the selected unit. To do this, press the [Confirm] button once again.
- ▶ Select the desired number of display digits. To do this, press the [Confirm] button.

8.9.3 Running the "Statistics" Application

The "Statistics" application saves up to 99 weight values and evaluates these statistically.

The following values are saved and exported:

- Number of components
- Mean value
- Standard deviation
- Variation coefficientSum of all values
- Lowest value (minimum)
- Highest value (maximum)
- Spread: Difference between maximum and minimum

Requirements

- A printer or a PC is connected and configured.
- The "STATIST." application is selected.

Procedure

- ▶ Place a sample on the weighing pan.
- ▶ To save the weight value: Press the [Confirm] button.
- ▷ The position of the saved value is displayed, e.g., "NO 1".
- ▷ The recording of the statistics starts.
- ▶ Remove the sample on the weighing pan.
- ▶ To save the next value:
  - ▶ Place a new sample on the weighing pan and press the [Confirm] button.
- ▶ To switch between the display of the current weight value, the number of saved components, and the calculated mean in the results display: Press the [Up] or [Down] button.
- ▶ To delete all saved values: Press the [Back] button.
- ▷ The evaluation is printed and the active GLP printout is ended.
- ▶ To print and exit the current statistics, and to delete the saved values: Press the [GLP] button.

8.10 Printing Weighing Result with ID Marking

The device can be assigned an ID number. The ID numbers are exported during GLP-compliant printing.

Requirements

- The ID number is specified (see Chapter "4.6.17 "INPUT" Menu", page 28).
- The GLP-compliant printout is activated (see Chapter 4.6.7, page 24).

Procedure

▶ Start the printout. To do this, press the [Print] button.
▷ The GLP header is printed with the ID number set in the menu and the current weight value.
▷ The [GLP] button is displayed in the operating display.
▶ Confirm the [PRINT] button.
▶ To exit the GLP printout: Press the [GLP] button.
▷ The GLP footer is printed.

9 Cleaning and Maintenance

9.1 Cleaning Device Components

9.1.1 Preparing the Device for Cleaning

Procedure

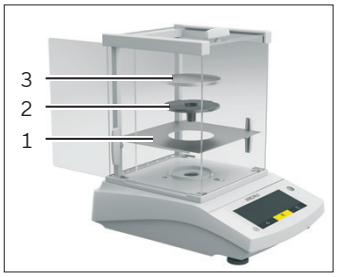
- ▶ Switch off the device.
- ▶ Disconnect the power plug from the socket (supply voltage) at the installation site.
- ▶ If accessories are connected to the device: Disconnect the accessory from the device (see instructions for the accessory).

9.1.2 Dismounting the Weighing Pan and Associated Components

The weighing pan and associated components can be dismounted for cleaning work.

Procedure

- ▶ If this relates to a device with an analytical draft shield:

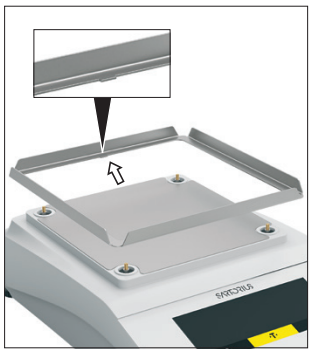


- ▶ Open one side panel completely.
- ▶ Remove the weighing pan (3).
- ▶ Remove the pan support (2).
- ▶ Remove the base plate (3).

- ▶ If this relates to a device with a frame draft shield:



- ▶ Remove the weighing pan (1).
- ▶ Remove all shock absorbers (2).



- ▶ Remove the frame draft shield.
- ▶ Remove the latch from the recess.

9.1.3 Dismounting the Analytical Draft Shield Panels

The panels of the analytical draft shield can be dismounted for cleaning work.

Material: 1 soft support base

Procedure



- ▶ Loosen the screws on the inner side of the side panels by turning. This allows the handles on the side panels and the upper panel to be removed.
- ▶ Slide the side panels and upper panel all the way back and out of the guide rails.
- ▶ Place the side panels and the upper panel on a soft surface.

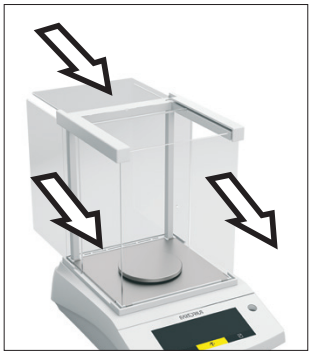
9.1.4 Cleaning the Device, Draft Shield, and Associated Components

Procedure

- ▶ Only use suitable cleaning agents and cleaning procedures and observe the product information for the cleaning agent used (see Chapter "15.12 Cleaning Agents and Cleaning Procedures", page 50).
- ▶ Remove dust and powdery sample residue with a brush or hand-held vacuum cleaner.
- ▶ Only slightly moisten cleaning cloths.
- ▶ Wipe the housing and the dismounted components with a slightly damp cloth.

9.2 Mounting the Analytical Draft Shield

Procedure



- ▶ Slowly slide the side panels and the upper panel into the frame rails.



- ▶ Hold the handles on the side panels or the upper panel from the outside and fasten to the inner side with the screws provided.

9.3 Mounting the Removed Device Components

Procedure

- ▶ Mount the removed device components, e.g. mount the weighing pan and associated components (see Chapter 5.4, page 29 and Chapter 5.5, page 30).

9.4 Recommissioning

Procedure

- ▶ Connect the device to the power supply (see Chapter 6.2, page 31).

9.5 Maintenance Schedule

Interval	Component	Activity
12 to 24 months, depending on operating conditions	Device	Contact Sartorius Service.

9.6 Software Update

For a software update, contact Sartorius Service.

10 Malfunctions

10.1 Warning Messages

Warning message	Malfunction	Cause	Solution
APP.ERR.	The device has measured an invalid weight value.	The applied weight is too low.	Increase the applied weight to more than the minimum load.
		The weight value is negative.	
		No sample has been placed on the balance.	Place the sample on the balance.
DIS.ERR.	The value to be output **cannot** be shown in the operating display.	The data to be displayed is **not** compatible with the set display format.	Adjust the display settings in the menu, e.g. resolution, unit, decimal places.
HIGH or ERR 55	The device is overloaded.	The device's maximum weighing capacity has been exceeded	Reduce the applied weight to below the device's maximum weighing capacity.
LOW or ERR 54	The modulation of the weighing converter inside the device is too low.	**No** weighing pan has been placed on the balance.	Insert the weighing pan into the device and switch the device off and on again.
		A previously forgotten weight was removed after starting the device.	
		An error exists in the weighing system or in the device electronics.	Contact Sartorius Service.
COMM.ERR.	The device is **not** receiving any weight values.	**No** communication exists between the control unit and the load cell.	Wait until the control unit restores the communication with the load cell.
			If the problem occurs again: Contact Sartorius Service.
PRT.ERR.	The [Print] key is locked.	The data interface for printout is set to xBPI mode.	Reset the menu to the factory settings.
			If the problem occurs again: Contact Sartorius Service.
SYS.ERR.	The system data is faulty.	A memory error exists in the control unit.	Switch the device off and on again.
			If the problem occurs again: Contact Sartorius Service.
ERR 02	The device **cannot** be adjusted when starting the adjustment function due to a zero point error.	The device was **not** zeroed before the adjustment process.	Zero the device. Check the preload and set if necessary.
		The device is loaded.	Remove the sample from the weighing pan.

Warning message	Malfunction	Cause	Solution
ERR 10	Taring is **not** possible.	The device **cannot** be manually tared because an application program has the tare memory reserved.	To release the tare memory: Exit the application program with the [Back] button.
ERR 11	The weight value **cannot** be saved in the tare memory.	The weight value is negative or “zero”.	Check the sample being weighed. Zero the device before placing the sample on the balance if necessary.

10.2 Troubleshooting

Malfunction	Cause	Solution	Chapter, Page
The operating display is blank.	The device is disconnected.	Check the connection to the power supply.	
	The power supply unit is **not** connected.	Connect the power supply cable to the power supply.	6.2, 31
The displayed weight value changes constantly.	The device installation site is unstable.	Adjust the parameter for the ambient conditions.	7.1, 32
		Change the installation site.	
	A foreign object is positioned between the weighing pan and the housing.	Remove the foreign object.	
The weight readout displayed by the device is obviously wrong.	The device has **not** been calibrated and adjusted.	Calibrate and adjust the device.	7.2, 32
	The device was **not** tared before weighing.	Tare the device.	
For a conformity-assessed device: The [**Invalid** weight value] display is displayed.	The cause of this fault is displayed after pressing the [Unit change] key. At the same time, the “Toggle between weight units” function is locked.		
	WARMU.xx.: The device is in the warm-up phase and has **not** yet reached its operating temperature. xx = remaining time in minutes	Comply with the warm-up time after switching the device on.	15.7, 46
	VALUE.ERR.: The displayed value is invalid.	Set the device to zero.	

11 Decommissioning

11.1 Decommissioning the Device

Procedure

- ▶ Switch off the device.
- ▶ Disconnect the power plug from the socket (supply voltage) at the installation site.
- ▶ If accessories are connected to the device: Disconnect the accessory from the device (see instructions for the accessory).

12 Transport

12.1 Transporting the Device

Procedure

- ▶ ⚠ **CAUTION** Risk of injury when carrying the device!
  - ▶ Use both hands to carry the device. To do this, reach sideways under the device with both hands.
  - ▶ Do **not** carry the device on the draft shield or the control unit.
- ▶ Use suitable conveyance devices for long transport routes.

13 Storage and Shipping

13.1 Storing

Procedure

- ▶ Decommission the device.
- ▶ Store the device according to the ambient conditions (see Chapter 15.4, page 44).

13.2 Returning the Device and Parts

Defective devices or parts can be returned to Sartorius. Returned devices must be clean, decontaminated, and properly packed, e.g. in the original packaging.

Transport damage as well as measures for subsequent cleaning and disinfection of the device or parts by Sartorius shall be charged to sender.

Devices contaminated with hazardous materials, e.g., harmful biological or chemical substances, will **not** be accepted for repair or disposal.

Procedure

- ▶ Decommission the device.
- ▶ Contact Sartorius Service for instructions on how to return devices or parts (see www.sartorius.com).
- ▶ Pack the device and the parts properly for return, e.g. in the original packaging.

14 Disposal

14.1 Disposing of the Device and Parts

The device and the device accessories must be disposed of properly by disposal facilities.

A battery is installed inside the device. Batteries must be disposed of properly by disposal facilities.

Many of the packaging materials are recyclable to contribute to reducing global waste volumes.

Procedure

- ▶ Dispose of the device in accordance with local government regulations. Inform the disposal facility that there is a lithium battery installed inside the device (type see Chapter “15.9 Backup Battery”, page 49).
- ▶ Dispose of the packaging in accordance with local government regulations. Utilize local recycling options.

15 Technical Data

15.1 Dimensions for Devices with Analytical Draft Shield

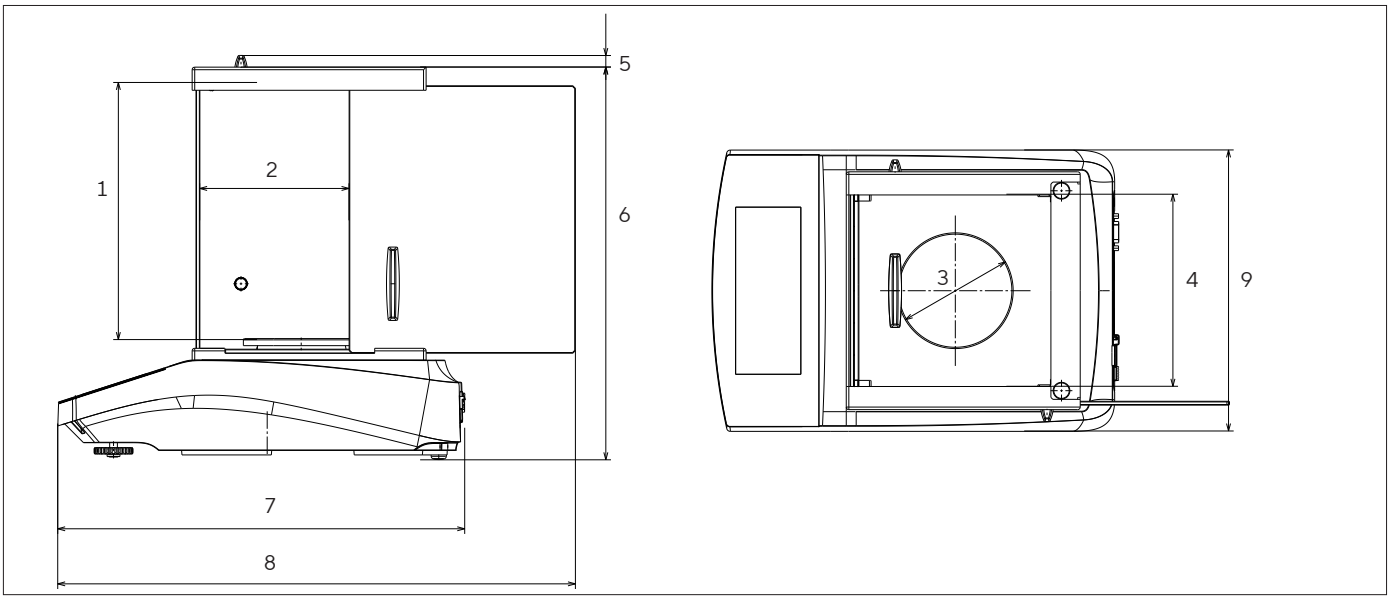


Fig. 9: Device with analytical draft shield (side view and top view)

Pos.	Description	Unit	Value
1	Usable height in weighing chamber	mm	200
2	Maximum opening width of side door	mm	115
3	Weighing pan size (diameter) for devices with analytical draft shield, with readability 0.1 mg | 1 mg	mm	90 | 120
4		mm	150 ± 2
5		mm	9
6		mm	306 ± 2
7		mm	317 ± 2
8		mm	402 ± 2
9		mm	219 ± 2

15.2 Dimensions for Devices with Frame Draft Shield

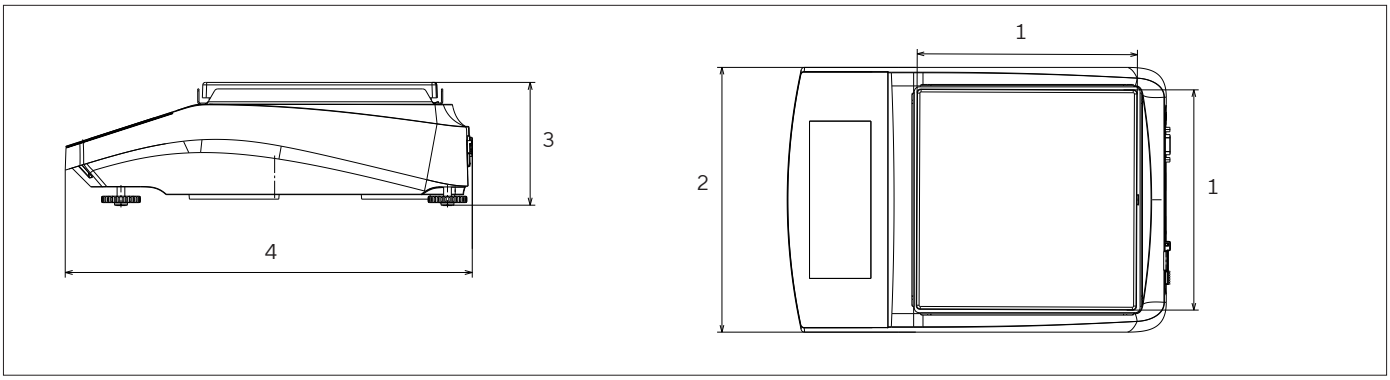


Fig. 10: Device with analytical draft shield (side view and top view)

Pos.	Description	Unit	Value
1	Weighing pan size (L × W)	mm	182 ± 1
2		mm	219 ± 2
3		mm	94 ± 5
4		mm	317 ± 2

15.3 Weights

		Devices with analytical draft shield, with readability 0.1 mg	**Devices with analytical draft shield,** with readability 1 mg	**Devices with frame draft shield**
	Unit	**Value**	**Value**	**Value**
Weight, including weighing pan and associated components				
Model 1x	kg	5.9	5.9	4.3
Model I-1x	kg	6.2	6.3	6.2

15.4 Ambient Conditions During Storage and Transport

	Unit	Value
Temperature		
During storage and transport	°C	-10 – +60
Storage, dry		

15.5 Installation Conditions

15.5.1 Installation Site

	Unit	Value
Height above sea level, maximum	m	3000
No potentially explosive atmospheres		
Pollution level at the installation site according to DIN EN 61010-1		2
Access to operation-relevant parts is guaranteed		
Space requirements		
Suitable for the dimensions of the device and the associated components		
Setup surface		
Suitable for the weight of the device and the associated components		
Additional properties		
No heat from heating systems or direct sunlight		
No electromagnetic fields or electromagnetic radiation, e.g., from radio equipment		

15.5.2 Ambient Conditions at the Installation Site

	Unit	Value
Temperature		
In operation	°C	+5 – +40
In operation, for conformity-assessed (verified) balances in accordance with country-specific approval, refer to the information on the balance.	°C	+5 – +30
Relative humidity		
At temperatures up to 31°C, maximum	%	15 – 80
Then linear decrease from max. 80% at 31°C to max. 50% at 40°C		
For conformity-assessed (verified) balances in accordance with country-specific approval, the legal regulations apply.		

15.6 Electrical Data

15.6.1 Power Supply

	Unit	Value
Power supply only permitted via the power supply cable and power supply unit supplied by Sartorius		
Sartorius power supply unit, type YEPS01-15VOW, with country-specific power plug adapters YEPS01-PS8, YEPS01-PS9, YEPS01-PS10		
Power supply unit		
AC voltage	V	100 – 240 (±10%)
Frequency	Hz	50–60
Current consumption, maximum	A	0.2
Device		
DC voltage	V	15 (± 5%)
Current consumption, maximum	A	0.53
Power supply unit fuses		
Quantity		1
Type: Short-circuit protection, electronic		
Protection class according to IEC 62368-1		
Power supply unit		II
Device		II
Overvoltage category according to IEC 61010-1		
Power supply unit		II
Device		II

15.6.2 Safety of Electromagnetic Equipment

Safety provisions according to IEC 61010-1 Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements

15.6.3 Electromagnetic Compatibility

Electromagnetic compatibility, according to DIN EN 61326-1 Electrical equipment for measurement, control, and laboratory use – EMC requirements - Part 1: General requirements (IEC 61326-1:2013)
Interference immunity: Suitable for use in industrial areas (Table 2 of the standard)
Transient emissions: Class B; suitable for use in residential areas and areas that are directly connected to a low voltage network that (also) supplies residential buildings.

15.7 Warm-up Time to Reach Operating Temperature

	Unit	Value
Time period between switching the device on and carrying out weighing tasks	h	2

15.8 Metrological Data

15.8.1 Devices with Analytical Draft Shield

Model		BSA224-1x | BSA224I-1x	BSA124-1x | BSA124I-1x	BSA623-1x | BSA623I-1x	BSA423-1x | BSA423I-1x	BSA323-1x | BSA323I-1x	BSA223-1x | BSA223I-1x
		Value	Value	Value	Value	Value	Value
Readability | Scale interval (d)	mg	0.1	0.1	1	1	1	1
Maximum capacity (Max)	g	220	120	620	420	320	220
Repeatability							
At approx. maximum capacity, typical value	mg	0.1	0.1	1	1	1	1
Linearity deviation							
Limits	± mg	0.2	0.2	2	2	2	2
Sensitivity drift between +10°C and +30°C	± ppm/K	1.5	1.5	2	2	2	2
Tare maximum capacity (subtractive)		<100% of maximum capacity					
Only for models with approval:							
Accuracy class		I	I	II	II	II	II
Type		BC-EB	BC-EB	BC-ED	BC-ED	BC-ED	BC-ED
Verification scale interval (e)	mg	1	1	10	10	10	10
Minimum load (Min)	mg	10	10	20	20	20	20
Typical measurement time	s	≤2.0	≤2.0	≤1.5	≤1.5	≤1.5	≤1.5
Recommended calibration weight							
External calibrated test weight	g	200	100	500	200	200	200
Accuracy class in accordance with OIML R111-1		E2	E2	F1	F1	F1	F1

15.8.2 Devices with Frame Draft Shield

Models BSA6202 | BSA4202 | BSA3202 | BSA2202

Model		BSA6202-1x | BSA6202I-1x	BSA4202-1x | BSA4202I-1x	BSA3202-1x | BSA3202I-1x	BSA2202-1x | BSA2202I-1x
	Unit	**Value**	**Value**	**Value**	**Value**
Readability | Scale interval (d)	mg	10	10	10	10
Maximum capacity (Max)	g	6200	4200	3200	2200
Repeatability					
At approx. the maximum load, typical value	mg	10	10	10	10
Linearity deviation					
Limits	± mg	20	20	20	20
Sensitivity drift between +10°C and +30°C	± ppm/K	2	2	2	2
Tare maximum capacity (subtractive)		<100% of maximum capacity			
Only for models with approval:					
Accuracy class		II	II	II	II
Type		BC-EE	BC-EE	BC-EE	BC-EE
Verification scale interval (e)	mg	100	100	100	100
Minimum load (Min)	mg	500	500	500	500
Typical measurement time	s	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Recommended calibration weight					
External calibrated test weight	g	5000	2000	2000	2000
Accuracy class in accordance with OIML R111-1		F1	F1	F1	F1

Models BSA822 | BSA8201 | BSA5201 | BSA2201

Model		BSA822-1x | BSA822I-1x	BSA8201-1x	BSA8201I-1x	BSA5201-1x | BSA5201I-1x	BSA2201-1x | BSA2201I-1x
	Unit	**Value**	**Value**	**Value**	**Value**	**Value**
Readability | Scale interval (d)	mg	10	100	100	100	100
Maximum capacity (Max)	g	820	8200	8200	5200	2200
Repeatability						
At approx. the maximum load, typical value	mg	10	100	100	100	100
Linearity deviation						
Limits	± mg	20	300	100	100	100
Sensitivity drift between +10°C and +30°C	± ppm/K	2	7	2	2	2
Tare maximum capacity (subtractive)		<100% of maximum capacity				
Only for models with approval:						
Accuracy class		II	II	II	II	II
Type		BC-EE	BC-EI	BC-EG	BC-EE	BC-EE
Verification scale interval (e)	mg	100	1000	1000	100	100
Minimum load (Min)	mg	500	5000	5000	5000	5000
Typical measurement time	s	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Recommended calibration weight						
External calibrated test weight	g	500	5000	5000	5000	2000
Accuracy class in accordance with OIML R111-1		F2	F2	F2	F2	F2

15.9 Backup Battery

	Unit	Value
Lithium battery, type CR2032		
Service life at room temperature, minimum	Years	10

15.10 Interfaces

15.10.1 RS232 Interface

	Unit	Value
Type of interface: Serial interface		
Interface operation: Full duplex		
Level: RS232		
Connection type: D-sub connector, 9-pin		
Maximum cable length:	m	10

Pin Assignment

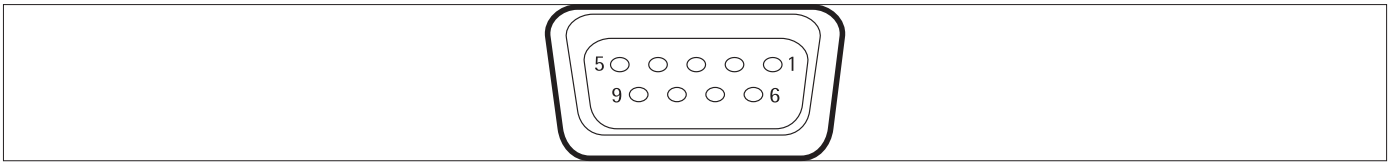


Fig. 11: Pin 1 – 9

Pin	Description
1, 4, 6	Not assigned
2	Data output (T x D)
3	Data input (R x D)
5	Internal ground
7	Clear to Send (CTS)
8	Request to Send (RTS)
9	Universal remote switch

15.10.2 USB-C Interface

Communication: USB OTG
Connectable devices: Sartorius printers, Sartorius second display or PC

15.11 Materials

Housing
Plastic (ABS)
Control unit and operating display
Glass
Devices with analytical draft shield
Draft shield: Glass, plastic (ABS)
Weighing pan: Stainless steel
Pan support: Plastic (LPC)
Base plate: Stainless steel
Device with frame draft shield
Frame draft shield: Stainless steel
Weighing pan: Stainless steel

15.12 Cleaning Agents and Cleaning Procedures

Approved cleaning agents
Water or a mild soap solution
Cleaning agents suitable for the device materials (see Chapter "15.11 Materials", page 50)
No corrosive, chloride-containing, or aggressive cleaning agents
No cleaning agents that contain abrasive ingredients, e.g. scouring agents, steel wool
No solvent-based cleaning agents
Approved cleaning procedures
Wiping the device surfaces with a lightly moistened cloth

16 Accessories

This table contains a selection of the accessories that can be ordered. For information on other products, contact Sartorius.

Item	Quantity	Order number
General device accessories		
Display protection film (set of 5)	1	YDC10
“Kensington Lock” anti-theft device	1	YKL01
Pedal button | foot switch	1	YFS03
Second display | remote display	1	YSD01
Weighing table		
made from wood with natural stone	1	YWT09
made from natural stone, with vibration dampening	1	YWT03
Wall console made from natural stone	1	YWT04
Weighing Accessories		
Dust cover for balances with an analytical draft shield	1	6960BC01
Density determination set for solids and liquids for balances with a readability of 0.1 mg | 1 mg	1	YDK03
Printer and Accessories for Data Communication		
Dot matrix printer (USB-B, RS232)	1	YDP50
Thermal transfer printer (USB-B, RS232)	1	YDP30
Data cable USB-C > USB-B, 1.5 m	1	YCC-USB-C-B
Data cable USB-C > USB-A, 1.5 m	1	YCC-USB-C-A
Data cable RS232 (9-pin) > USB-A, 1.5 m	1	YCC-D09M-USB-A
Data cable RS232 (9-pin) male > RS232 (9-pin) male, 1.5 m	1	YCC-D09MM
Data cable RS232 (9-pin) male > RS232 (9-pin) female, 1.5 m	1	YCC-D09MF
Y-adapter RS232 (9-pin) male > 2x RS232 (9-pin) female, 1.5 m	1	YCC-D09M-2D09F
External Calibration and Adjustment Weights		
For models BSA224-1x | BSA224I-1x; 200 g, accuracy class E2	1	YCW522-AC-02
For models BSA124-1x | BSA124I-1x; 100 g, accuracy class E2	1	YCW512-AC-02
For models BSA623-1x | BSA623I-1x; 500 g, accuracy class F1	1	YCW553-AC-02
For models BSA423-1x | BSA423I-1x | BSA323-1x | BSA323I-1x | BSA223-1x | BSA223I-1x; 200 g, accuracy class F1	1	YCW523-AC-02
For models BSA6202-1x | BSA6202I-1x; 5000 g, accuracy class F1	1	YCW653-AC-02
For models BSA4202-1x | BSA4202I-1x | BSA32023-1x | BSA3202I-1x | BSA2202-1x | BSA2202I-1x; 2000 g, accuracy class F1	1	YCW623-AC-02
For models BSA822-1x | BSA822I-1x; 500 g, accuracy class F2	1	YCW554-AC-02

Item	Quantity	Order number
For models BSA8201-1x | BSA8201I-1x | BSA5201-1x | BSA5201I-1x; 5000 g, accuracy class F2	1	YCW654-AC-02
For models BSA2201-1x | BSA2201I-1x; 2000 g, accuracy class F2	1	YCW624-AC-02

17 Sartorius Service

Sartorius Service is available for queries regarding the device. Visit the Sartorius website (www.sartorius.com) for information about the service addresses, services provided, or to contact a local representative.

For inquiries about the device or when contacting Sartorius Service in the event of a malfunction, ensure that you have the device information, e.g., serial number, hardware, firmware, configuration, close at hand so you can pass it on to Sartorius Service. To do this, refer to the information on the manufacturer's ID label and in the "INFO" menu.

Sartorius Scientific Instruments (Beijing)
Co., Limited
No.33 Yu'an road, Airport Economic Zone,
Shunyi District, 101300 Beijing, P.R. China

Phone: +86 10 8042 6300 | +86 800 8100 124
www.sartorius.com

The information and figures contained in these instructions correspond to the version date specified below.
Sartorius reserves the right to make changes to the technology, features, specifications and design of the equipment without notice.
Masculine or feminine forms are used to facilitate legibility in these instructions and always simultaneously denote all genders.

Copyright notice:
These instructions, including all components, are protected by copyright.
Any use beyond the limits of the copyright law is not permitted without our approval.
This applies in particular to reprinting, translation and editing irrespective of the type of media used.

Last updated:

11 | 2025

© 2025
Sartorius Scientific Instruments (Beijing) Co., Limited
No.33 Yu'an road, Airport Economic Zone, Shunyi District,
101300 Beijing, P.R. China

EL | Publication No.: WBC6008-e250302