

Operating Instructions
Original Operating Instructions

VWR[®] Premium Balance Analytic PBA VWR[®] Premium Balance Precision PBP

Analytical and Precision Balances



1000085028 | Last updated: 08 | 2020

CE

Legal Address of Manufacturer

Europe

VWR International bv
Researchpark Haasrode 2020
Geldenaaksebaan 464
B-3001 Leuven

Phone + 32 16 385011
www.vwr.com

Country of Origin

Germany

Contents

1 About these Instructions	5	6 Getting Started	17
1.1 Scope.....	5	6.1 Installing the Power Supply Unit.....	17
1.2 Other Applicable Documents.....	5	6.1.1 Assembling the Power Supply Unit ...	17
1.3 Target Groups	5	6.1.2 Dismantling the Power Plug Adapter ..	17
1.4 Symbols Used.....	5	6.2 Connecting the Power Supply.....	17
1.4.1 Warnings in Operating Instructions....	5		
1.4.2 Other Symbols	6	7 System Settings	18
2 Safety Instructions	6	7.1 Performing System Settings	18
2.1 Intended Use	6	7.2 Setting the Calibration and Adjustment	18
2.2 Personnel Qualification.....	6	7.2.1 Setting Internal Calibration and	
2.3 Significance of these Instructions.....	6	Adjustment (Only Model I-1x).....	18
2.4 Proper Working Order of the Device	6	7.2.2 Setting the External Calibration	
2.5 Symbols on the Device	7	and Adjustment.....	18
2.6 Electrical Equipment	7	7.3 Parameter List	19
2.6.1 Damage to the Electrical		7.3.1 "SETUP"/"BALANCE" Menu.....	19
Equipment of the Device	7	7.3.2 "SETUP"/"GEN.SERV." Menu.....	20
2.6.2 Working on the Device's Electrical		7.3.3 "DEVICE"/"RS232" Menu.....	21
Equipment.....	7	7.3.4 "DEVICE"/"USB" Menu	22
2.6.3 Power Supply Unit and		7.3.5 "DEVICE"/"EXTRAS" Menu.....	22
Power Supply Cable.....	7	7.3.6 "DATA.OUT."/"COM. SBI" Menu	23
2.7 Conduct in an Emergency	7	7.3.7 "DATA.OUT."/"PRNT.PAR." Menu	24
2.8 Accessories and Spare Parts.....	7	7.3.8 "DATA.OUT."/"PC.DIREC." Menu	
2.9 Personal Protective Equipment.....	7	(only PC.TABL.)	25
2.10 Glass Breakage	7	7.3.9 "APPLIC."/"WEIGH" Menu	25
3 Device Description	8	7.3.10 "APPLIC."/"COUNT" Menu	25
3.1 Device Overview.....	8	7.3.11 "APPLIC."/"PERCENT" Menu.....	25
3.2 Device Connections	8	7.3.12 "APPLIC."/"ANIM.WG" Menu.....	26
3.3 Weighing Pan and Associated Components....	9	7.3.13 "APPLIC."/"DENSITY" Menu.....	26
3.4 Symbols on the Device	9	7.3.14 "INPUT" Menu	26
4 Operating Concept	10	7.3.15 "INFO" Menu	27
4.1 Operating Display in Weighing Mode	10	7.3.16 "LANGUAG." Menu.....	27
4.2 Menu and System Settings Display	10	8 Operation	27
4.2.1 Buttons	11	8.1 Switching the Device On and Off.....	27
4.3 Displays in the Operating Display.....	12	8.2 Warming Up the Balance	27
4.4 Menu Structure.....	13	8.3 Leveling the Balance Using	
4.4.1 "Main Menu" Menu Structure.....	13	the Level Indicator.....	28
4.4.2 "Toggle Between Weight Units"		8.4 Overview of Calibration and Adjustment	28
Menu Structure	14	8.5 Calibrating and Adjusting	
4.5 Navigating the Menus	14	the Device Internally	
5 Installation	15	(Only Model I-1x)	28
5.1 Scope of Delivery	15	8.6 Externally Calibrating and Adjusting	
5.2 Selecting an Installation Site.....	15	the Device	29
5.3 Unpacking	15	8.7 Printing Results of the Calibration and	
5.4 Installing the Weighing Pan and		Adjustment Process	29
Associated Components	15	8.8 Weighing	29
5.4.1 Installing a Device with		8.9 Setting or Changing an Application	30
Analytical Draft Shield	15	8.10 Running Applications (Examples)	30
5.4.2 Installing a Device with		8.10.1 Executing the "Toggle Between	
Round Draft Shield.....	15	Weight Units" Function.....	30
5.5 Acclimatizing the Device	16	8.10.2 Selecting Convertible Units and	
		their Decimal Places	30
		8.10.3 Running the "COUNT" Application ..	30
		8.11 Printing Weighing Result with ID Marking	30

9 Cleaning and Maintenance	31	15 Technical Data	36
9.1 Detaching the Draft Shield	31	15.1 Ambient Conditions	36
9.1.1 Detaching the Analytical Draft Shield, Weighing Pan, and Associated Components.....	31	15.2 Contamination Type, Overvoltage Category (Device)	36
9.1.2 Dismantle the Round Draft Shield, Weighing Pan, and Associated Components.....	31	15.3 Power Supply	36
9.2 Cleaning the Device	31	15.3.1 Power Supply Device.....	36
9.3 Installing the Draft Shield	32	15.3.2 Power Supply Unit	37
9.3.1 Installing the Analytical Draft Shield	32	15.4 Electromagnetic Compatibility	37
9.3.2 Installing the Round Draft Shield	32	15.5 Backup Battery	37
9.4 Maintenance Schedule	32	15.6 Materials.....	37
9.5 Software Update.....	32	15.7 Warm-up Time.....	38
10 Malfunctions	33	15.8 Interfaces	38
10.1 Warning Messages	33	15.8.1 Specifications of the RS232 Interface	38
10.2 Troubleshooting	34	15.8.2 Specifications for the USB-C Interface	38
11 Decommissioning	35	15.9 Device Dimensions	39
11.1 Decommissioning the Device.....	35	15.10 Metrological Data.....	40
12 Transport	35	15.10.1 Models PBA224 PBA124 PBP623 PBP423.....	40
12.1 Transporting the Device	35	16 Accessories	41
13 Storage and Shipping	35	16.1 Balance Accessories	41
13.1 Storage	35	16.2 External Calibration and Adjustment Weights.....	41
13.2 Returning the Device and Parts.....	35	17 Technical Service	41
14 Equipment Disposal	35	18 Warranty	42
		19 Compliance with Local Laws and Regulations	42

1 About these Instructions

1.1 Scope

These instructions are part of the device. These instructions apply to the device in the following versions:

Device	Model ^{1) 2)}
A analytical balance with manual analytical draft shield, readability of 0.1 mg	PBA224I-1x PBA224-1x PBA124I-1x PBA124-1x
A precision balance with round glass draft shield, readability of 1 mg	PBP623I-1x PBP623-1x PBP423I-1x PBP423-1x

1) Country-specific marking in model, x =

S	Standard balances without country-specific additions
---	--

2) Model-typical marking in model

I-1x	Devices with internal calibration and adjustment function
x-FC	Incl. factory acceptance test report

1.2 Other Applicable Documents

In addition to these instructions, observe the following documentation:

- 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

User	The user is familiar with the operation of the device and the associated work processes. They understand the hazards which may arise when working with the device and know how to prevent them. They have been trained in the operation of the device.
Operator	The operator of the device is responsible for ensuring compliance with workplace health and safety regulations. The operator must ensure that all persons who work with the device have access to the relevant information and are trained in working with the device.

1.4 Symbols Used

1.4.1 Warnings in Operating Instructions

WARNING

Denotes a danger with the risk that death or severe injury may result 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 danger with the risk that property damage may result if it is **not** avoided.

1.4.2 Other Symbols

- ▶ Required action: Describes actions which must be carried out.
- ▷ Result: Describes the result of the actions carried out.
- [] Text inside brackets refers to control and display items.
- [] Text inside brackets 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 on the Operating Display

The figures on the operating display of the device may deviate from those in these instructions.

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 was developed for the accurate determination of 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 exclusively designed for use according to these instructions. Any further use beyond this is considered **improper**.

If the device is **not** used properly: the protective systems of the device may be impaired. This can lead to unforeseeable personal injury or property damage.

Operating Conditions for the Device

Do **not** use the device in potentially explosive environments. The device may only be used indoors.

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

Modifications to the Device

You may **not** modify or repair the device or make any technical changes. Any retrofitting or technical changes to the device are only permitted with prior written permission from VWR.

2.2 Personnel Qualification

If people who do **not** have sufficient knowledge on the safe handling of the device carry out work on the device: Those people may injure themselves or other people nearby.

- ▶ Ensure that all individuals working on the device possess the necessary knowledge and qualifications (description see Chapter “1.3 Target Groups”, page 5).
- ▶ If a particular qualification is indicated for the actions described: Have these activities carried out by the required target group.
- ▶ If **no** particular qualification is indicated for the actions described: Have these activities carried out by the “user” target group.

2.3 Significance of these Instructions

Failure to follow the instructions in this manual can have serious consequences, e.g. exposure of individuals to electrical, mechanical, or chemical hazards.

- ▶ Before working with the device: Read the instructions carefully and completely.
- ▶ If these instructions are lost, request a replacement or download the latest version from the VWR website (www.vwr.com).
- ▶ Ensure that the information contained in these instructions is available to all individuals working on the device.

2.4 Proper Working Order of the Device

A damaged device or worn parts may lead to malfunctions or cause hazards which are difficult to recognize.

- ▶ Only operate the device when it is safe and in perfect working order.
- ▶ In the event of damage to the housing, disconnect the device from the power supply and prevent it from being restarted.
- ▶ Do not open the device housing. Have any malfunctions or damage repaired immediately by VWR Service.
- ▶ Comply with the maintenance intervals (for intervals and maintenance work, see Chapter “9.4 Maintenance Schedule”, page 32).

2.5 Symbols on the Device

All symbols appearing on the device, such as warnings and safety labels, must be legible.

- ▶ Do **not** conceal, remove, or modify the symbols.
- ▶ Replace the symbols if they become illegible.

2.6 Electrical Equipment

2.6.1 Damage to the Electrical Equipment of the Device

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

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

2.6.2 Working on the Device's Electrical Equipment

Only VWR Service personnel may work on or modify the electrical equipment of the device. The device may only be opened by VWR Service personnel.

2.6.3 Power Supply Unit and Power Supply Cable

Serious injury can result, e.g. from electric shocks, if an unsuitable/inadequately dimensioned power cord or unsuitable power supply unit is used.

- ▶ Only use the original power supply unit and original power supply cable.
- ▶ If the power supply unit or power supply cable must be replaced: Contact VWR Service. Do **not** repair or modify the power supply unit or power cable.

2.7 Conduct in an Emergency

If there is immediate danger of personal injury or equipment damage, e.g., due to malfunctions or dangerous situations, the device must be immediately taken out of operation.

- ▶ Disconnect the device from the power supply.
- ▶ Malfunctions should be remedied by VWR Service.

2.8 Accessories and Spare Parts

The use of unsuitable accessories and spare parts can affect the functionality and safety of the device and have the following consequences:

- Risk of injury to persons
- Damage to the device
- Device malfunctions
- Device failure

- ▶ Only use approved accessories and spare parts supplied by VWR.
- ▶ Only use accessories and spare parts that are in proper working order.

2.9 Personal Protective Equipment

Personal protective equipment protects against risks arising from the material being processed.

- ▶ If the workplace or the process in which the device is being used requires personal protective equipment: Wear personal protective equipment.

2.10 Glass Breakage

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

- ▶ Only lift the device by its base, **not** by the draft shield.
- ▶ When lifting and transporting, ensure that **no** personnel or objects are in the way.
- ▶ Only operate the operating display with your fingers. Do **not** use pointed or sharp objects.

3 Device Description

3.1 Device Overview

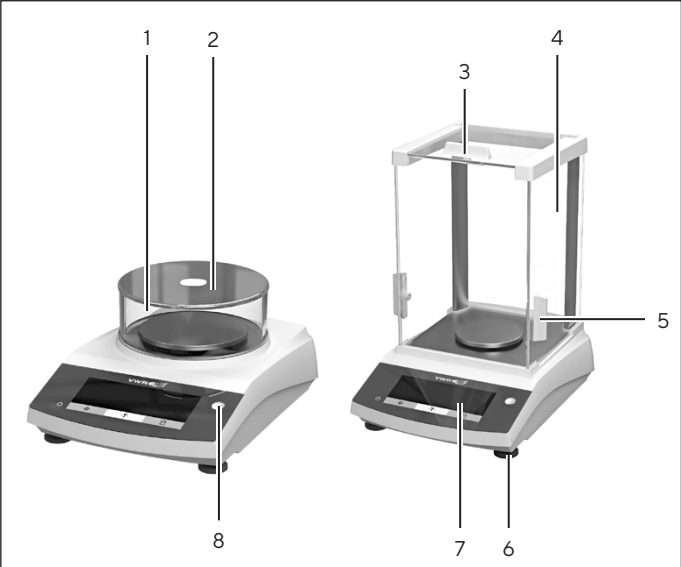


Fig. 1: Precision balance with round draft shield and analytical balance with analytical draft shield (example)

Pos.	Designation	Description
1	Round draft shield	
2	Cover of the round draft shield	
3	Upper draft shield	Used to manually open the upper panel
4	Analytical draft shield	
5	Side draft shield	Used to manually open the side panel
6	Leveling foot	Used to level the balance, manually adjustable
7	Control module	
8	Level	

3.2 Device Connections

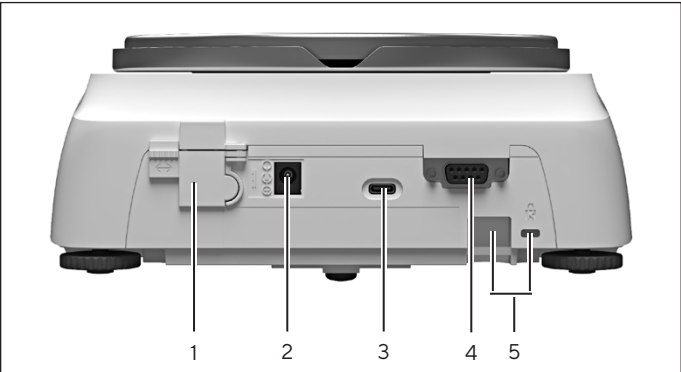


Fig. 2: Precision balance with round draft shield (rear view)

Pos.	Designation	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
4	RS232 connection	9-pin, for connection to a printer. PC
5	Slot	For attaching an anti-theft device or a Kensington lock

3.3 Weighing Pan and Associated Components



Fig. 3: Analytical balance with analytical draft shield, precision balance with analytical draft shield, and precision balance with round draft shield (example)

Pos.	Designation	Description
1	Weighing pan	
2	Pan support	
3	Pan retainer	

3.4 Symbols on the Device

Symbol	Meaning
	NOTICE! Read the operating instructions.

4 Operating Concept

4.1 Operating Display in Weighing Mode

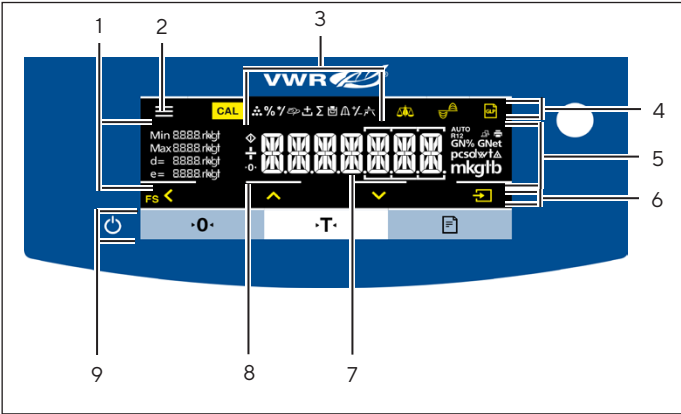


Fig. 4: Operating display in weighing mode (example)

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

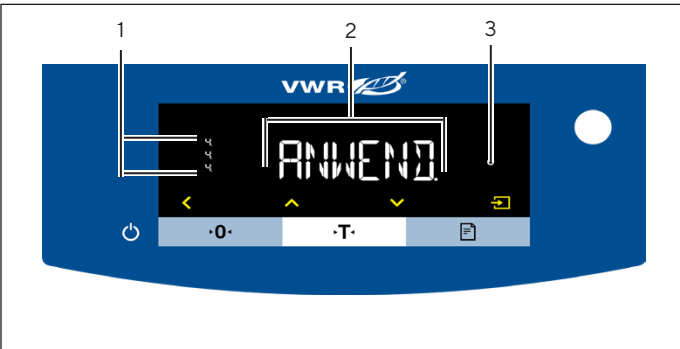


Fig. 5: Menu and System Settings Display (example)

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

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.
	[Toggle between weight units] button	If the “Toggle between weight units” function is active: – If the button is held down: Accesses the “Toggle between weight units” 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: Accesses 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: Accesses 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.
	[Weighing in percent] display	Indicates that the "Weighing in percent" application is selected.
	[Animal weighing] display	Indicates that the "Animal weighing" application is selected.
	[Density determination] display	Indicates that the "Density determination" application is selected.
	[Ambient condition] display	Switches between the ambient conditions "V.STABLE", "STABLE", UNSTABL." and "V.UNSTBL."
	[Application filter] display	Switches between the "weighing" and "filling" application filters.
	[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.
	[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.
	[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]	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 [Change] key.

4.4 Menu Structure

4.4.1 "Main Menu" Menu Structure

► Navigating in menus (see Chapter 4.5, page 14).

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.OUT. "Data output"	COM. SBI "SBI communication"	Configure the automatic data output.
	PRNT.PAR. "Printout settings"	Perform the settings for the printout.
	PC.DIREC. "Direct transfer of data (PC)"	Define the output format for the data exchange between the balance and the PC.
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 "Weighing in percent"	Determine the percentage share of a sample based on a reference weight.
	ANIMALW. "Animal weighing"	Weigh unstable samples, e.g. animals. This program calculates the average of several measurement cycles.
	DENSITY "Density determination"	Determine the density of solid samples based on the buoyancy method.
INPUT	DEV.ID.	Save the entered ID number for the device.
	DATE	Set the date.
	TIME	Set the time.
	USER.PW	Set the user password.
	SERV.PW	Activate the service mode.
	PW. DEL.	Deletes the entered password.
	INTERV.	The SBI output rate can be set from 0 - 9999 seconds.

Level 1	Level 2	Description
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 ID.
	BAC VER.	Display the version of the BAC processor.
LANGUAGE		Set the menu language of the operating display.

4.4.2 "Toggle Between Weight Units" Menu Structure

► Navigating in menus (see Chapter 4.5, page 14).

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

4.5 Navigating the Menus

Procedure



► To open 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.

5 Installation

5.1 Scope of Delivery

Item	Quantity
Device	1
Weighing pan	1
Pan support	1
Power supply unit with country-specific adapters	1
Draft shield	1
Operating instructions	1

5.2 Selecting an Installation Site

Procedure

- Ensure that the following conditions are met at the installation site:

Condition	Characteristics
Ambient conditions	– Suitability tested (for ambient conditions, see Chapter 15.1, page 36)
Setup surface	– Stable, even surface with little vibration – Sufficient space for the device (for space requirements, see Chapter “15.9 Device Dimensions”, page 39) – Sufficient load bearing capacity for the device (for device weight, see Chapter “15.10 Metrological Data”, page 40)
Access to parts relevant to operation	Convenient and safe

5.3 Unpacking

Procedure

- Unpack the device.
- **⚠ CAUTION** Glass breakage due to the incorrect handling of the device! Do **not** lift the device by the draft shield. Only lift the device by its base.
- Install the device at the intended installation site.
- If the device is stored temporarily: Observe the storage information (see Chapter 13.1, page 35).
- Keep all parts of the original packaging, e.g. to return the device.

5.4 Installing the Weighing Pan and Associated Components

5.4.1 Installing a Device with Analytical Draft Shield

Procedure



- Fully open the side panel of the analytical draft shield.
- Fit the pan support on the pan retainer and place the weighing pan on top.

5.4.2 Installing a Device with Round Draft Shield

Procedure



- Place the base of the draft shield into the round recess on the device.
- Fit the pan support on the pan retainer.
- Place the weighing pan onto the pan support.
- Place the round glass ring on the base of the draft shield.
- Place the cover of the draft shield onto the round glass ring.

5.5 Acclimatizing the Device

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 for approx. 2 hours at the installation site. Ensure that the device is disconnected from the power supply during that time.

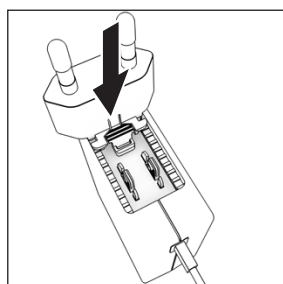
6 Getting Started

6.1 Installing the Power Supply Unit

6.1.1 Assembling the Power Supply Unit

Item number on packaging	Power supply unit with connection cable and country-specific power plug adapters (packed in PE bag with printed country identification, e.g. EU)
611-4917	USA and Japan (US+JP), Europe and Russia (EU+RU), Great Britain (UK), India (IN), South Africa (ZA), Australia (AU), China (CN)

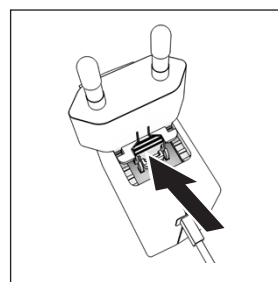
Procedure



- ▶ 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 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: It is locked in place.

6.1.2 Dismantling 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 VWR Service.
- ▶ Check whether the country-specific power plug matches the power connections at the installation site.
 - ▶ If required: Replace the country-specific power plug adapter.
- ▶ **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 VWR Service.
- ▶ Connect the right angle plug to the "Power Supply" connection.
- ▶ Connect the mains plug to the wall outlet (mains voltage) at the installation site.
- ▷ The [BOOTING] display appears in the operating display.
- ▷ The device performs a self-test.

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 the 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 parameter (parameters, see Chapter “7.3 Parameter List”, page 19).
- ▶ Exit the menu.

7.2 Setting the Calibration and Adjustment

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

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.JUST.” parameter and select the value “CAL.INT.”.
- ▶ 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.

Procedure

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

7.3 Parameter List

7.3.1 "SETUP"/"BALANCE" Menu

Parameter	Setting values	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 filling containers.
STAB.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".
ZER./TAR.	W/O STB.	If the button is pressed: The function of the [Zero] or [Tare] button is executed immediately.
	W/ STAB.*	The function of the [Zero] or [Tare] button is only executed after stability is achieved.
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

Parameter	Setting values	Explanation
WT.UNIT	GRAMS*, KILOGR., CARATS, POUNDS, OUNCES, TROY. OZ., HKTAEL, SNGTAE, TWNTAE, GRAINS, PENYWT, MILLIGR., PTS./LB, CHNTAE, 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 calibration weight.
	E.CAL.USR.	The [Adjust] button starts an external calibration and adjustment process with the user-defined calibration weight value.
	REPRO	Starts the reproducibility test. Determines the current calibration frequency with a user weight.
	SELECT	The interface [CAL] is assigned a selection of permitted menu items from "CAL./ADJ."
	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.
ON Z/T	ON*	Activates the initial taring/zeroing. The device is tared or zeroed after it is switched on.
	OFF	Deactivates the initial taring/zeroing: After it is switched on, the device shows the same value as before it was last switched off.
EXT.CAL.	UNLOCKED*	Activates the external calibration/adjustment function under [CAL./ADJ.].
	LOCKED	Deactivates the external calibration/adjustment function under [CAL./ADJ.].

* Factory setting

7.3.2 "SETUP"/"GEN.SERV." Menu

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

* Factory setting

7.3.3 “DEVICE”/“RS232” Menu

Parameter	Setting values	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.
	BARCODE	Allows for the connection of an approved barcode scanner.
	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.
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		

7.3.4 “DEVICE”/“USB” Menu

Parameter	Setting values	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.
	PC.SPREA.	Enables data output to a spreadsheet program via a direct PC connection.
	PC.TEXT	The balance transmits the data via keyboard command to the currently opened application on the PC in text format.
	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.
HANDSHK.**	SOFTWARE	Sets the handshake protocol to software handshake.
	HARDW.	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”

7.3.5 “DEVICE”/“EXTRAS” Menu

Parameter	Setting values	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.

* Factory setting

Parameter	Setting values	Explanation
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 time.
	ON/OFF	The [On/Off] button switches between on/standby without time..
	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

7.3.6 “DATA.OUT.”/“COM. SBI” Menu

Parameter	Setting values	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.
	AFTER 2	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

7.3.7 “DATA.OUT.”/“PRNT.PAR.” Menu

Parameter	Setting values	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.N.	The output rate can be set from 0–9999 seconds under “INPUT/INTERV.” once stability is achieved.
	INTERV.A.	The output rate can be set from 0–9999 seconds under “INPUT/INTERV.” once stability is achieved.
	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.
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

7.3.8 “DATA.OUT.”/“PC.DIREC.” Menu (only PC.TABL.)

Parameter	Setting values	Explanations
DEC.SEP.	POINT*	Sets a point as a decimal separator.
	COMMA	Sets a comma as a decimal separator.
OUT.FORM.	TXT+NUM.*	Exports text and numbers.
	ONLY.NUM.	Only exports numbers.

* Factory setting

7.3.9 “APPLIC.”/“WEIGH” Menu

Parameter	Setting values	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

7.3.10 “APPLIC.”/“COUNT” Menu

Parameter	Setting values	Explanation
RESOLUT.	DISP.ACC.*	Sets the resolution to “display resolution”. The “Counting” application is started with the displayed value.
	10-FOLD	Sets the resolution to 10-times more accurate than “display resolution”.
	100.FOLD	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

7.3.11 “APPLIC.”/“PERCENT” Menu

Parameter	Setting values	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

7.3.12 “APPLIC.”/“ANIM.WG” Menu

Parameter	Setting values	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.
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

7.3.13 “APPLIC.”/“DENSITY” Menu

Parameter	Setting values	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

7.3.14 “INPUT” Menu

Parameter	Setting values	Setting values	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.
USER.PW		Max 7 characters 09-0, A-Z, -, empty	Saves the entered user password.
DEL. PW.		YES	Deletes the entered password.
		NO*	Does not delete the entered password.
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.

* Factory setting

7.3.15 “INFO” Menu

Parameter	Setting values	Explanation
VERSION		Displays the version number of the control module.
SER. NO.		Displays the serial number of the device.
Model		Displays the type designation of the device.
BAC VER.		Displays the version number of the weight sensor.
* Factory setting		

7.3.16 “LANGUAG.” Menu

Parameter	Setting values	Explanation
LANGUAG.	ENGLISH, DEUTSCH, FRANC., ITAL., ESPANOL, PORTUG., РУССКИЙ, POLSKI	Defines the menu language.
* Factory setting		

8 Operation

8.1 Switching the Device On and Off

Requirements

The device is connected to the power supply.

Procedure

- ▶  **CAUTION** Pointed or sharp-edged objects may damage the operating display!
- ▶ Only touch the operating display with your fingertips.
- ▶ To switch the device on: Press the [On/Off] button.
- ▶ To switch the device off: Press and hold the [On/Off] button.

8.2 Warming Up the Balance

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 Warm-up Time”, page 38).

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**.

8.3 Leveling the Balance Using the Level Indicator

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

Procedure

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

8.4 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

8.5 Calibrating and Adjusting the Device Internally (Only Model I-1x)

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 Setting Internal Calibration and Adjustment (Only Model I-1x)”, page 18).

Procedure

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

8.6 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 18).
- 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 18).

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 calibration weight placed on the device is within the specified limits:
 - ▷ The adjustment process starts.
 - ▷ If the "+" prefix was displayed: The applied weight is too big.
 - ▷ If the "-" prefix was displayed: The applied weight is too small.
- ▷ The "CAL.END" message indicates the end of calibration.
- ▶ Remove the calibration weight.
- ▶ If the calibration without subsequent automatic adjustment function is selected and the calibration weight placed on the device is within the specified limits:
 - ▶ Press the [Confirm] button.
 - ▷ The adjustment process starts.
 - ▷ If the "+" prefix was displayed: The applied weight is too big.
 - ▷ If the "-" prefix was displayed: The applied weight is too small.
- ▷ The "CAL.END" message indicates the end of calibration.
- ▶ Remove the calibration weight.

8.7 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 7.3.7, page 24).
- ▶ Calibrate the device.
- ▷ Once the calibration is complete: The printing process starts.

8.8 Weighing

Requirements

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

NOTICE

Chemicals may damage the device or accessories!

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

- ▶ Use appropriate containers when weighing chemicals.

Procedure

- ▶ Zero the device. In order to do so, press the [Zero] button.
- ▶ If a container is being used for the sample:
 - ▶ Tare the device. In order to do so, press the [Tare] button.
 - ▶ Place the sample in the container.
- ▶ If **no** container is used for the sample: Place the sample on the weighing pan.
- ▷ The weight value is displayed depending on the selected application program.

8.9 Setting or Changing an Application

Procedure

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

8.10 Running Applications (Examples)

8.10.1 Executing the "Toggle Between Weight Units" Function

The "Toggle between weight units" function enables a switch between a maximum of four different units. The selected basic unit is displayed every time the device is started (see "UNIT", Chapter "7.3.1 "SETUP"/"BALANCE" Menu", page 19). 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 "7.3.9 "APPLIC."/ "WEIGH" Menu", page 25).

M

The weight value must be valid.

Procedure

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

8.10.2 Selecting Convertible Units and their Decimal Places

Procedure

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

8.10.3 Running the "COUNT" Application

The „COUNT“ application is used to determine the number of parts that have nearly the same piece weight. As the basis for this application, the balance measures the weight of a manually counted number of parts (reference quantity) and determines the individual average piece weight. The balances then uses this individual average piece weight as a reference for determining an unknown number of parts.

Requirements

The „COUNTING“ application is selected.

Procedure

- ▶ To define the reference piece count: Press the [Down] button.
 - ▶ To define the reference piece count, press the [Up] or [Down] buttons until the desired manually counted number appears, e.g., 10.
 - ▶ Press the [Confirm] button.
- ▶ Place the number of reference parts on the weighing pan.
- ▶ Press the [Confirm] button.
- ▷ The average individual piece weight is now determined.
- ▶ Remove the reference parts from the weighing pan.
- ▶ Then place the desired sample of uncounted parts on the weighing pan.
- ▷ The balance calculates the actual number of parts.
- ▶ To toggle between the display of the average piece weight, the total weight and the number of parts: Press the [Up] and [Down] buttons.

8.11 Printing Weighing Result with ID Marking

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

Requirements

- The identity number is specified (see Chapter "7.3.14 "INPUT" Menu", page 26).
- The GLP-compliant printout is activated (see Chapter "7.3.7 "DATA.OUT."/ "PRNT.PAR." Menu", page 24).

Procedure

- ▶ Start the printout. To do so, press the [Print] button.
- ▷ The GLP header is printed with the ID marking of the LOT ID set in the menu and the current weight value.
- ▷ The [GLP] button appears 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 Detaching the Draft Shield

9.1.1 Detaching the Analytical Draft Shield, Weighing Pan, and Associated Components

Material: 1 soft support base

Requirements

- The device is switched off.
- The device is disconnected from the power supply.

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.
- ▶ **CAUTION** Glass breakage due to incorrect handling!

- ▶ 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.
- ▶ If this relates to a device with a shield disk: Remove the weighing pan, the pan support, and the shield disk.
- ▶ If this relates to a device without a shield disk: Remove the weighing pan and the pan support.

9.1.2 Dismantle the Round Draft Shield, Weighing Pan, and Associated Components

Material: 1 soft support base

Requirements

- The device is switched off.
- The device is disconnected from the power supply.

Procedure



- ▶ Remove the cover and the round glass ring and place on a soft surface.
- ▶ Remove the weighing pan, pan support, and the base of the draft shield.

9.2 Cleaning the Device

NOTICE

Corrosion or damage to the device due to unsuitable cleaning agents.

- ▶ Do **not** use corrosive, chloride-containing, or aggressive cleaning agents.
- ▶ Do **not** use cleaning agents that contain abrasive ingredients, e.g. scouring agents, steel wool.
- ▶ Do **not** use solvent-based cleaning agents.
- ▶ Only use suitable cleaning agents (materials, see Chapter "15.6 Materials", page 37) and observe the product information for the cleaning agent used.

Procedure

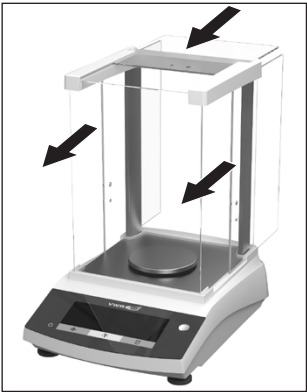
- ▶ **NOTICE** Malfunction or damage to the device due to the ingress of moisture or dust.
 - ▶ Only slightly moisten cleaning materials, such as cloths.
 - ▶ Remove dust and powdery sample residue with a brush or hand-held vacuum cleaner.
- ▶ Wipe the device and the associated components with a slightly damp cloth. Use a mild soapy solution or a suitable cleaning agent for more severe contamination.

9.3 Installing the Draft Shield

9.3.1 Installing the Analytical Draft Shield

Procedure

- ▶ If this relates to a device with a shield disk: Install the shield disk, the pan support, and the weighing pan.
- ▶ If this relates to a device without a shield disk: Install the pan support and the weighing pan.



- ▶ 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.

- ▶ Connect the device to the power supply (see Chapter “6.2 Connecting the Power Supply”, page 17).

9.3.2 Installing the Round Draft Shield

Procedure

- ▶ Install the draft shield (see Chapter “9.3 Installing the Draft Shield”, page 32).
- ▶ Connect the device to the power supply (see Chapter “6.2 Connecting the Power Supply”, page 17).

9.4 Maintenance Schedule

Interval	Component	Action
Regularly; depending on the operating conditions	Device	Contact VWR Service.

9.5 Software Update

For a software update, contact VWR Service.

10 Malfunctions

10.1 Warning Messages

Warning message	Fault	Cause	Remedy	Chapter, page
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 VWR Service.	
COMM.ERR.	The device is not receiving any weight values.	No communication exists between the control module and the weigh cell.	Wait until the control module restores the communication with the weigh cell.	
			If the problem occurs again: Contact VWR Service.	
PRT.ERR.	The [Print] key is locked.	The data interface for print output is set to xBPI mode.	Reset the menu to the factory settings.	
			If the problem occurs again: Contact VWR Service.	
SYS.ERR.	The system data is faulty.	A memory error exists in the control module.	Switch the device off and on again.	
			If the problem occurs again: Contact VWR Service.	
ERR 02	The device cannot be calibrated when starting the calibration function due to a zero point error.	The device was not zeroed before calibration.	Zero the device. Check the preload and set if necessary.	
		The device is loaded.	Remove the sample from the weighing pan.	

Warning message	Fault	Cause	Remedy	Chapter, page
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

Fault	Cause	Remedy	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.	
The displayed weight value changes constantly.	The installation site is unstable.	Adjust the parameter for the ambient temperatures.	
		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.	8.4, 28
	The device was not tared before weighing.	Tare the device.	
For a conformity-assessed device: The [Invalid weight value] display appears.	The cause of this fault is displayed after pressing the [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, 38
	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 device from the power supply.
- ▶ Disconnect the device from all connected devices and all accessories, e.g. printer.
- ▶ Clean the device (see Chapter 9.2, page 31).

12 Transport

12.1 Transporting the Device

Procedure

- ▶ **⚠ CAUTION** Risk of injury from breaking glass!
Glass components can break if they fall or are handled incorrectly. Glass fragments can cause cuts.
 - ▶ Only lift the device by its base, **not** by the draft shield.
 - ▶ When lifting and transporting, ensure that no personnel or objects are in the way.
- ▶ Use suitable conveyance devices for long transport routes.

13 Storage and Shipping

13.1 Storage

Procedure

- ▶ Switch off the device.
- ▶ Disconnect the device from the power supply.
- ▶ Disconnect the device from all connected devices, e.g. printer.
- ▶ Store the device according to the ambient conditions (see Chapter 15.1, page 36).

13.2 Returning the Device and Parts

Defective devices or parts can be sent back to VWR. Returned devices must be clean, decontaminated, and packed correctly, e.g. in their original packaging.

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

⚠ WARNING

Risk of injury due to contaminated devices.

Devices contaminated with hazardous materials (nuclear, biological, or chemical – NBC) will **not** be accepted for repair or disposal.

- ▶ Observe the information on decontamination (see Chapter 14, page 35).

Procedure

- ▶ Switch off the device.
- ▶ Disconnect the device from the power supply.
- ▶ Contact VWR Service for instructions on how to return devices or parts (please refer to our website at www.vwr.com for return instructions).
- ▶ Pack the device and its parts properly for return, e.g. in their original packaging.

14 Equipment Disposal



This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste.

Instead it's your responsibility to correctly dispose of your equipment at lifecycle -end by handling it over to an authorized facility for separate collection and recycling. It's also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, so as to protect from health hazards the persons involved in the disposal and recycling of the equipment.

For more information about where you can drop off your waste of equipment, please contact your local dealer from whom you originally purchased this equipment.

By doing so, you will help to conserve natural and environmental resources and you will ensure that your equipment is recycled in a manner that protects human health

15 Technical Data

15.1 Ambient Conditions

	Unit	Value
Installation site: For indoor use only, max. height above sea level	m	3000
Temperature		
Environment	°C	+5 – +40
Storage and transport	°C	-10 – +60
Relative humidity		
At temperatures up to 31°C, non -condensing	%	15 – 80
Then linear decrease from max. 80 % at 31 °C to max. 50 % at 40 °C		
No heat from heating systems or direct sunlight		
No electromagnetic fields		

15.2 Contamination Type, Overvoltage Category (Device)

	Unit	Value
Pollution level according to IEC 61010-1		2
Overvoltage category according to IEC 60664-1		I

15.3 Power Supply

15.3.1 Power Supply Device

	Unit	Value
Input voltage	V _{DC}	15 (±10 %)
Power consumption, max.	W	4
Only by VWR power supply unit		

15.3.2 Power Supply Unit

	Unit	Value
Type: VWR power supply unit		
Primary		
Voltage	V _{AC}	100 – 240 (±10 %)
Frequency	Hz	50 – 60
Current consumption, maximum	A	0.2
Secondary		
Voltage	V _{DC}	15 (±5 %)
Current, maximum	A	0.53
Short-circuit protection		Electronic
Protection class according to IEC 60950-1		II
Pollution level according to IEC 61010-1		2
Overvoltage category according to IEC 60664-1		II
Other data: See label on the power supply unit		

15.4 Electromagnetic Compatibility

Interference resistance:

Suitable for use in industrial areas

Transient emissions:

Class B

Suitable for use in residential areas and areas that are connected to a low voltage network that also supplies residential buildings.

15.5 Backup Battery

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

15.6 Materials

Housing	Polybutylene terephthalate (PBT)	
Control module	Glass	
Draft shield	Glass/polybutylene terephthalate (PBT)	

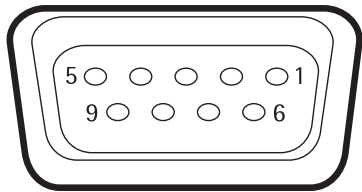
15.7 Warm-up Time

	Unit	Value
Device, approx.	h	2

15.8 Interfaces

15.8.1 Specifications of the RS232 Interface

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



- Pin 1: Not assigned
- Pin 2: Data output (TxD)
- Pin 3: Data input (RxD)
- Pin 4: Not assigned
- Pin 5: Internal ground
- Pin 6: Not assigned
- Pin 7: Clear to Send (CTS)
- Pin 8: Request to Send (RTS)
- Pin 9: Universal key

15.8.2 Specifications for the USB-C Interface

Communication: USB UTL
Connectable devices: VWR printers, PC

15.9 Device Dimensions

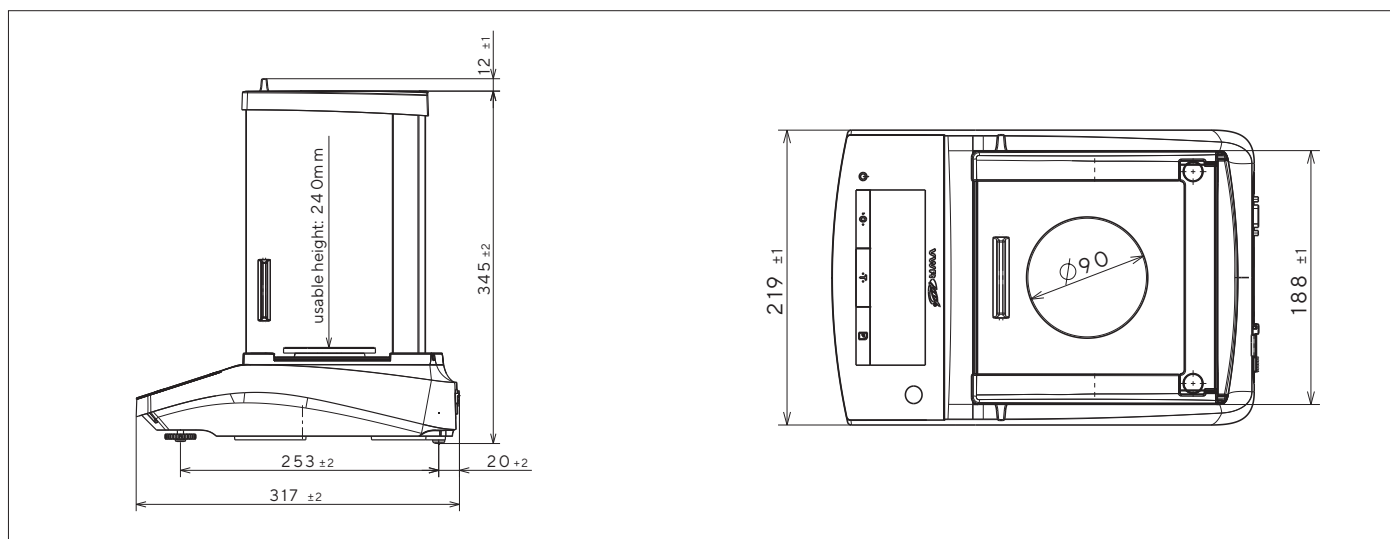


Fig.6: Device dimensions of an analytical balance with analytical draft shield in mm

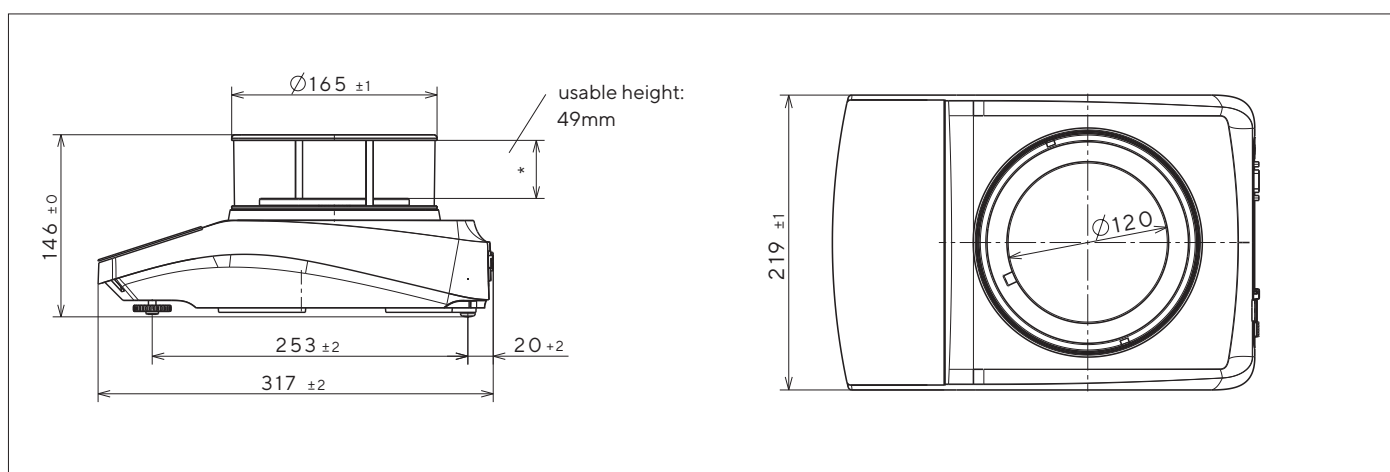


Fig.7: Device dimensions of a precision balance with round draft shield in mm

15.10 Metrological Data

15.10.1 Models PBA224 | PBA124 | PBP623 | PBP423

Model		PBA224-1x PBA224I-1x	PBA124-1x PBA124I-1x	PBP623-1x PBP623I-1x	PBP423-1x PBP423I-1x
	Unit	Value	Value	Value	Value
Readability Scale interval (d)	mg	0.1	0.1	1	1
Maximum capacity (Max)	g	220	120	620	420
Repeatability					
At approx. maximum load, typical value	mg	0.1	0.1	1	1
Linearity deviation					
Limits	± mg	0.2	0.2	2	2
Sensitivity drift between +10 °C and +30 °C	± ppm/K	1.5	1.5	2	2
Tare maximum capacity (subtractive)		<100% of maximum capacity			
Typical measurement time	s	≤2.0	≤2.0	≤1.5	≤1.5
Recommended calibration weight					
External calibrated test weight	g	200	100	500	200
Accuracy class in accordance with OIML R111-1		E2	E2	F1	F1
Weighing pan size	mm	Ø 90	Ø 90	Ø 120	Ø 120
Weighing chamber height (upper edge of the weighing pan to the lower edge of the upper draft shield panel)	mm	240	240	50	50
Net weight, approx.	kg	5.9 6.2	5.9 6.2	4.5 4.8	4.5 4.8

16 Accessories

16.1 Balance Accessories

These tables contain an excerpt of the accessories that can be ordered. For information on other products, contact VWR.

Item	Quantity	Order number
Dust cover for balances with an analytical draft shield	1	630-0876
Dot matrix printer (RS232)	1	611-4790
Data cable USB-C > USB-B	1.5 m	611-4919
Data cable USB-C > USB-A	1.5 m	611-4918
Data cable RS232 (9-pin) > USB-A	1.5 m	611-4920

16.2 External Calibration and Adjustment Weights

These tables contain an excerpt of the accessories that can be ordered. For information on other products, contact VWR.

Model PBA PBP	Weight	Accuracy class	Order number
224	200 g	E2	611-8147
124	100 g	E2	611-8146
623	500 g	F1	611-8248
423	200 g	F1	611-8247

17 Technical Service

Web Resources

Visit the VWR website at vwr.com for:

- Complete technical service contact information
- Access to the VWR Online Catalogue, and information about accessories and related products
- Additional product information and special offers

Contact us:

For information or technical assistance contact your local VWR representative or visit vwr.com.

18 Warranty

VWR warrants that this product will be free from defects in material and workmanship for a period of two (2) years from date of delivery. If a defect is present, VWR will, at its option and cost, repair, replace, or refund the purchase price of this product to the customer, provided it is returned during the warranty period. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or from ordinary wear and tear. If the required maintenance and inspection services are not performed according to the manuals and any local regulations, such warranty turns invalid, except to the extent, the defect of the product is not due to such non-performance.

Items being returned must be insured by the customer against possible damage or loss. This warranty shall be limited to the aforementioned remedies. IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.

19 Compliance with Local Laws and Regulations

The customer is responsible for applying for and obtaining the necessary regulatory approvals or other authorizations necessary to run or use the product in its local environment. VWR will not be held liable for any related omission or for not obtaining the required approval or authorization, unless any refusal is due to a defect of the product.

Your Distributor

Austria

VWR International GmbH
Graumannsgasse 7
1150 Vienna
Tel.: +43 01 97 002 0
Email: info.at@vwr.com

Belgium

VWR International bv
Researchpark Haasrode 2020
Geldenaaksebaan 464
3001 Leuven
Tel.: +32 016 385 011
Email: vwr.be@vwr.com

China

VWR (Shanghai) Co., Ltd
Bld.No.1, No.3728 Jinke Rd,
Pudong New District
Shanghai, 201203- China
Tel.: 400 821 8006
Email: info_china@vwr.com

Czech Republic

VWR International s. r. o.
Veetee Business Park
Pražská 442
CZ - 281 67 Stříbrná Skalice
Tel.: +420 321 570 321
Email: info.cz@vwr.com

Denmark

VWR International A/S
Tobaksvej 21
2860 Søborg
Tel.: +45 43 86 87 88
Email: info.dk@vwr.com

Finland

VWR International Oy
Valimotie 9
00380 Helsinki
Tel.: +358 09 80 45 51
Email: info.fi@vwr.com

France

VWR International S.A.S.
Le Périgares – Bâtiment B
201, rue Carnot
94126 Fontenay-sous-Bois cedex
Tel.: 0 825 02 30 30* (national)
Tel.: +33 (0) 1 45 14 85 00 (international)
Email: info.fr@vwr.com
* 0,18 € TTC/ min + prix appel

Germany

VWR International GmbH
Hilpertstraße 20a
D - 64295 Darmstadt
Freecall: 0800 702 00 07
Tel.: +49 (0) 6151 3972 0 (international)
Email: info.de@vwr.com

Hungary

VWR International Kft.
Simon László u. 4.
4034 Debrecen
Tel.: +36 (52) 521-130
Email: info.hu@vwr.com

India

VWR Lab Products Private Limited
No.139. BDA Industrial Suburb,
6th Main, Tumkur Road, Peenya Post,
Bangalore, India – 560058
Tel.: +91-80-28078400
Email: vwr_india@vwr.com

Ireland / Northern Ireland

VWR International Ltd / VWR International
(Northern Ireland) Ltd
Orion Business Campus
Northwest Business Park
Ballycoolin
Dublin 15
Tel.: +353 01 88 22 222
Email sales.ie@vwr.com

Italy

VWR International S.r.l.
Via San Giusto 85
20153 Milano (MI)
Tel.: +39 02-3320311
Email: info.it@vwr.com

Korea

VWR International ~
17, Daehak 4-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do
Tel.: +82 31 645 7256
saleskorea@avantorsciences.com

Middle East & Africa

VWR International FZ-LLC
DSP Laboratory Complex
125, Floor 01
Dubai, United Arab Emirates
Tel.: +971 4 5573271
info.mea@vwr.com

The Netherlands

VWR International B.V.
Postbus 8198
1005 AD Amsterdam
Tel.: +31 020 4808 400
Email: info.nl@vwr.com

Norway

VWR International AS
Brynsalleen 4
0667 Oslo
Tel.: +47 22 90 00 00
Email: info.no@vwr.com

Poland

VWR International Sp. z o.o.
Limbowa 5
80-175 Gdansk
Tel.: +48 058 32 38 200
Email: info.pl@vwr.com

Portugal

VWR International –
Material de Laboratório, Lda
Centro Empresarial de Alfragide
Rua da Indústria, nº 6
2610-088 Amadora
Tel.: +351 21 3600 770
Email: info.pt@vwr.com

Singapore

VWR Singapore Pte Ltd
18 Gul Drive
Singapore 629468
Tel: +65 6505 0760
Email: sales.sg@vwr.com

Spain

VWR International EuroLab S.L.
C/ Tecnología 5-17
A-7 Llinars Park
08450 - Llinars del Vallès
Barcelona
Tel.: +34 902 222 897
Email: info.es@vwr.com

Sweden

VWR International AB
Fagerstagatan 18a
163 94 Stockholm
Tel.: +46 08 621 34 00
Email: info.se@vwr.com

Switzerland

VWR International AG
Lerzenstrasse 16/18
8953 Dietikon
Tel.: +41 044 745 13 13
Email: info.ch@vwr.com

UK

VWR International Ltd
Customer Service Centre
Hunter Boulevard
Magna Park
Lutterworth
Leicestershire
LE17 4XN
Tel.: +44 (0) 800 22 33 44
Email: uksales@vwr.com