

Bottle cap multi-use



6.01601.000

Product manual

8.0108.8009EN / 2021-07-23



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Disclaimer

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Table of contents

1	Overview	1
1.1	Bottle cap multi-use – Brief description	1
1.2	Bottle cap multi-use – Product versions	1
1.3	Symbols and conventions	1
1.4	Further information	2
1.5	Accessories	2
2	Safety	3
2.1	Intended use	3
2.2	Responsibility of the operator	3
2.3	Requirements for operating personnel	4
2.4	Safety instructions	4
2.4.1	Danger from electrical potential	4
2.4.2	Danger from biological and chemical hazardous substances	4
2.4.3	Danger from highly flammable substances	5
2.4.4	Danger from leaking liquids	5
2.4.5	Danger during transport of the product	6
2.5	Design of warning messages	6
2.6	Meaning of warning signs	7
3	Functional description	8
3.1	Bottle cap multi-use – Overview	8
3.2	Bottle cap multi-use – Function	9
4	Delivery and packaging	10
4.1	Delivery	10
4.2	Packaging	10
5	Installation	11
5.1	Mounting the bottle cap multi-use	11
5.2	Attaching the bottle cap multi-use	12
5.3	Cutting the aspiration tubing to length	14
6	Operation and control	15
6.1	Operation	15
6.2	Setting up the bottle cap multi-use	15

1 Overview

1.1 Bottle cap multi-use – Brief description

The bottle cap multi-use is a bottle cap for laboratory bottles with a GL 45 thread. It contains a writeable RFID tag.

1.2 Bottle cap multi-use – Product versions

The product is available in the following versions:

Table 1 Product versions

Article number	Designation
6.01601.000	Bottle cap multi-use

1.3 Symbols and conventions

The following formatting may appear in the documentation:

(5- 12)	Cross-reference to figure legend The first number refers to the figure number. The second number refers to the product part in the figure.
1	Instruction step Numbers indicate the order of the instructions steps.
Method	Names of parameters, menu items, tabs and dialog windows
File ► New	Menu path
[Continue]	Button or key

1.4 Further information

The Metrohm Knowledge Base <https://guide.metrohm.com> always provides the current version of this document. Further instructions, leaflets, release notes etc. may be available, depending on the product. You can directly access the required information or the associated PDF document using the full-text search function and filters.

1.5 Accessories

Up-to-date information on the scope of delivery and on optional accessories can be found on the Metrohm website. Download this information as follows:

Downloading the accessories list

- 1 Go to <https://www.metrohm.com>.
 - 2 Enter the article number of the product (e.g. **2.1001.0010**) into the search field.

The search result is displayed.
 - 3 Click on the product.

Detailed information regarding the product is shown on various tabs.
 - 4 On the **Included parts** tab, click the link to download the PDF.

The PDF file with the accessories data is loaded.
-  Metrohm recommends downloading the accessories list from the Internet and keeping it for reference purposes.

2 Safety

2.1 Intended use

Metrohm products are used for the analysis and handling of chemicals.

Usage therefore requires the user to have basic knowledge and experience in handling chemicals. Knowledge regarding the application of fire prevention measures prescribed for laboratories is also mandatory.

Adherence to this technical documentation and compliance with the maintenance specifications make up an important part of intended use.

Any utilization in excess of or deviating from the intended use is regarded as misuse.

Specifications regarding the operating values and limit values of individual products are contained in the "Technical specifications" section, if relevant.

Exceeding and/or not observing the mentioned limit values during operation puts people and components at risk. The manufacturer assumes no liability for damage due to non-observance of these limit values.

The EU declaration of conformity loses its validity as soon as modifications are carried out on the products and/or the components.

2.2 Responsibility of the operator

The operator must ensure that basic regulations on occupational safety and accident prevention in chemical laboratories are observed. The operator has the following responsibilities:

- Instruct personnel in the safe handling of the product.
- Train personnel in the use of the product according to the user documentation (e.g. install, operate, clean, eliminate faults).
- Train staff on basic occupational safety and accident prevention regulations.
- Provide personal protective equipment (e.g. protective glasses, gloves).
- Provide suitable tools and equipment to carry out the work safely.

The product may be used only when it is in perfect condition. The following measures are required to ensure the safe operation of the product:

- Check the condition of the product before use.
- Remedy defects and malfunctions immediately.
- Maintain and clean the product regularly.

- Label the product according to regulations if it is used for substances that have a potential for chemical hazards and are generally subject to the Hazardous Substances Ordinance.
- Wear personal protective equipment (e.g. protective glasses, gloves).
- Use exhaust equipment when working with vaporizing hazardous substances.
- Dispose of hazardous substances in accordance with regulations.
- Clean and disinfect contaminated surfaces.
- Only use detergents that do not cause any unwanted side reactions with the materials to be cleaned.
- Dispose of chemically contaminated materials (e.g. cleaning material) in accordance with regulations.
- Proceed as follows in case of a return shipment to Metrohm AG or a regional Metrohm representative:
 - Decontaminate the product or product component.
 - Remove the labeling for hazardous substances.
 - Create a declaration of decontamination and enclose it with the product.

2.4.3 Danger from highly flammable substances

Using highly flammable substances or gases may cause fires or explosions. To avoid danger from highly flammable substances, observe the following:

- Avoid ignition sources.
- Use protective grounding.
- Use exhaust equipment.

2.4.4 Danger from leaking liquids

Leaking liquids may cause injuries and may damage the product. To avoid danger from leaking liquids, observe the following:

- Check the product and its accessories for leakages and loose connections.
- Replace leaking parts and connecting elements without delay.
- Tighten loose connecting elements.
- Do not loosen tubing connections under pressure.
- Do not remove aspiration tubing under pressure.
- Carefully pull the ends of the tubing out of the containers.
- Carefully let liquids from tubing drain into suitable containers.
- Insert the buret tips completely into the containers.
- Remove and dispose of leaked liquids in accordance with regulations.
- If you suspect that liquid has penetrated the instrument, disconnect the instrument from the energy supply. Then have the instrument checked by a regional Metrohm service representative.

2.4.5 Danger during transport of the product

Chemical or biological substances may be spilled during the transport of the product. Parts of the product may fall down or may be damaged. There is a risk of injury from chemical or biological substances and pieces of broken glass. To ensure safe transport, observe the following:

- Remove loose parts (e.g. sample racks, sample vessels, bottles) before transport.
- Remove liquids.
- Lift and transport the product with both hands on the base plate.
- Lift and transport heavy products only according to instructions.

2.5 Design of warning messages

There are 4 hazard levels for warning messages. The following signal words are used for classifying the hazard levels in warning messages:

- **DANGER** indicates a hazardous situation which, if not avoided, will result in serious injury or death.
- **WARNING** indicates a hazardous situation which, if not avoided, could result in serious injury or death.
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- **NOTICE** indicates a hazardous situation which, if not avoided, could result in property damage.

Warning messages differ in design (color and warning sign) depending on the hazard level:

 DANGER

Type and source of danger

Consequences when not observing the notice: An irreversible injury that may result in death is very probable.

- Measures to avoid the danger

 WARNING

Type or source of danger

Consequences when not observing the notice: A serious injury that may result in death is probable.

- Measures to avoid the danger

 CAUTION

Type or source of danger

Consequences when not observing the notice: A minor to moderate injury is probable.

- Measures to avoid the danger

2.6 Meaning of warning signs

This documentation uses the following warning signs:

Table 2 Warning sign according to ISO 7010

Warning sign	Meaning
	General warning sign
	Warning of electrical voltage
	Warning of hand injuries
	Warning of sharp object
	Warning of hot surface
	Warning of biological hazard
	Warning of toxic materials
	Warning of flammable materials
	Warning of corrosive substances
	Warning of optical radiation
	Warning of laser beams

Depending on the intended use of the product, the corresponding warning sign stickers must be placed on the product.

3 Functional description

3.1 Bottle cap multi-use – Overview

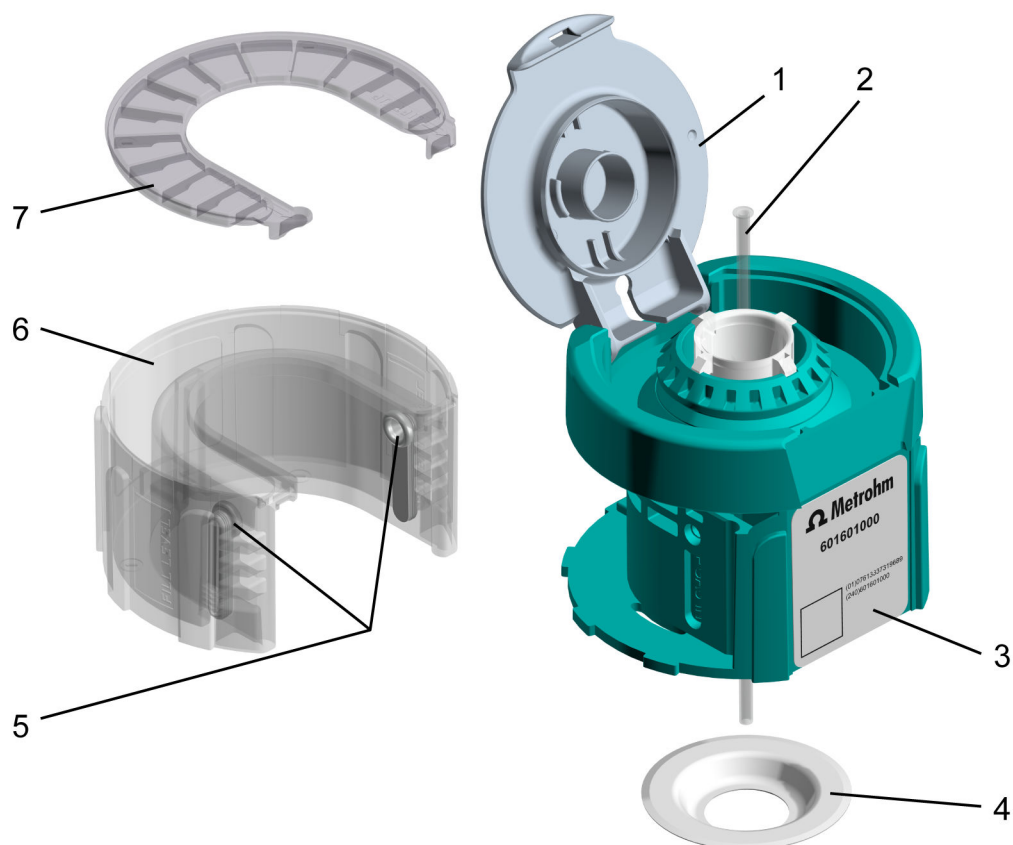


Figure 1 Bottle cap multi-use, complete (6.01601.000)

1 Flip-top lid	2 Aspiration tubing Aspiration tubing (6.1819.020)
3 RFID tag RFID chip for contact-free data transmission.	4 PTFE sealing ring PTFE sealing ring (6.02701.010)
5 Absorption cartridge insert (2 pieces)	6 Absorption cartridge housing
7 Absorption cartridge lid	5–7 Absorption cartridge, complete Absorption cartridge, complete (6.02701.000)

3.2 Bottle cap multi-use – Function

The bottle cap multi-use is a bottle cap for laboratory bottles with a GL 45 thread. Suitable thread adapters (6.1616.0X0) are available for laboratory bottles with different threads.

The bottle cap is equipped with an RFID tag. Information regarding the content of the bottle can be stored on the RFID tag. Thus, identifying the solution in a bottle is made easier.

The bottle cap can be reused several times, even for different solutions. The information on the RFID tag can be altered. The OMNIS Liquid Adapter that provides the connection to the OMNIS Software is used to write and read out the information on the RFID tag.

Other features of the bottle cap are:

- Various absorber materials or adsorber materials (sorbents) can be filled or replaced.
- The flip-top lid can be used to seal bottles that are currently not being used.



4 Delivery and packaging

4.1 Delivery

Inspect the delivery immediately upon receipt:

- Check the delivery against the delivery note to ensure completeness.
- Check the product for damage.
- If the delivery is incomplete or damaged, contact your regional Mettler representative.

4.2 Packaging

The product and accessories are supplied in protective special packaging. Keep this packaging to ensure safe transportation of the product. If a transport locking device is present, keep this as well for future reuse.

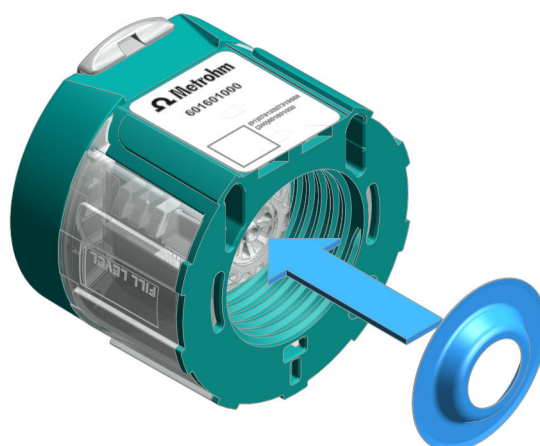


5 Installation

5.1 Mounting the bottle cap multi-use

Required accessories:

PTFE sealing ring (6.02701.010)



1 Inserting the PTFE sealing ring

Insert the PTFE sealing ring into the bottle cap from below.

When you screw the bottle cap onto the bottle, the PTFE sealing ring is automatically pressed into the correct position.

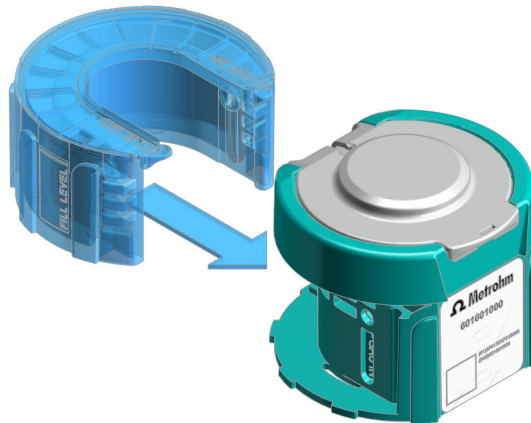
2 Removing the absorption cartridge

(see "Removing the absorption cartridge", chapter 7.2, page 17)

3 Filling the absorption cartridge

(see "Replacing the absorber material", chapter 7.3, page 18)

4 Inserting the absorption cartridge



Insert the absorption cartridge into the bottle cap.

5.2 Attaching the bottle cap multi-use

 CAUTION

Leakage

Handling the bottle cap multi-use incorrectly might lead to leaking.

- Remove the pouring ring from the bottle before attaching the bottle cap.

Prerequisite:

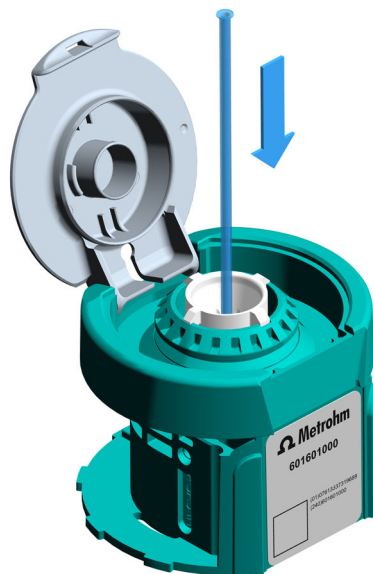
- The pouring ring is removed from the bottle.
- The length of the aspiration tubing suits the bottle used. (*see "Cutting the aspiration tubing to length", chapter 5.3, page 14*)
- The PTFE sealing ring is inserted.

Required accessories:

Aspiration tubing, e.g. for 1-L bottle (6.1819.020) or longer for cutting to length (6.1829.020)

- 1** Open the flip-top lid of the bottle cap.

2

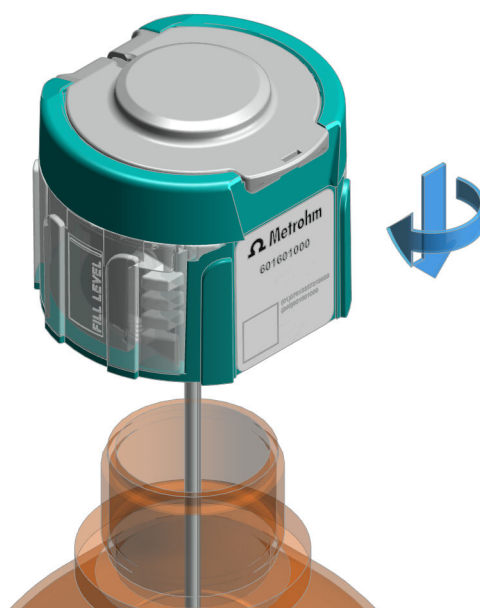


Insert the aspiration tubing into the bottle cap from above.

3

Pull the aspiration tubing down from below until it stops. When doing so, take care not to damage the tubing flare of the aspiration tubing.

4



Screw the bottle cap onto the bottle and tighten it by hand. Make sure the end of the aspiration tubing only touches the bottom of the bottle lightly and is not bent.

5.3 Cutting the aspiration tubing to length

The aspiration tubing (6.1819.020) for the bottle cap is 250 mm long. It suits a laboratory bottle with a volume of 1 liter.

Required accessories:

sharp knife

- 1 If the bottle cap is to be used on a bottle with less than 1 L volume, then the aspiration tubing needs to be shortened to the appropriate length.
- 2 If the bottle cap is to be used on a larger bottle, then a longer aspiration tubing (6.1829.020) needs to be shortened to the appropriate length.
- 3 After shortening the aspiration tubing, enter the new tubing length in the OMNIS Software under **Properties ► Specific data**, see *[Metrohm Knowledge Base](#)*.

6 Operation and control

6.1 Operation

The product can be operated via the OMNIS Software. Further information on the OMNIS Software under [OMNIS Help](#).

6.2 Setting up the bottle cap multi-use

The RFID tag in the bottle cap can be inscribed electronically with the OMNIS Software, see [Metrohm Knowledge Base](#).

6.3 Bottle cap multi-use – Connecting/removing the protective gas supply



CAUTION

Risk of injury from splashing or leaking hazardous substances

Injuries and/or damage through contact with hazardous substances. If the **GAS IN** connector shows an overpressure of ≥ 30 mbar and the aspiration tubing is removed from the bottle cap, hazardous substances can leak or splash.

- Set a work pressure of max. 20 mbar on the **GAS IN** connector and protect the gas supply against pressure adjustment.
- Do not remove aspiration tubing under pressure. Switch off the gas supply before removing the aspiration tubing.

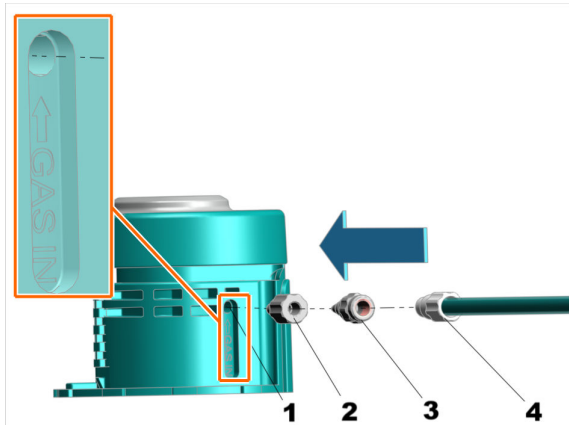
Connecting the protective gas supply

Prerequisites:

The absorption cartridge is removed and the tubing is connected to the protective gas supply.

Accessories:

- Luer/UNF coupling (6.2744.020)
- Adapter UNF 10/32 outer / M6 inner (6.2744.200)
- Wrench for nipple (6.2739.000)



- Hold the bottle cap multi-use with one hand.
- Plug the Luer/UNF coupling **(2)** with the conical running tip tightly into the **GAS IN** opening **(1)** of the bottle cap multi-use.
- Plug the adapter **(3)** into the Luer/UNF coupling **(2)** and tighten it with the wrench.
- Screw the tubing with the thread **(4)** into the adapter **(3)** using the wrench.

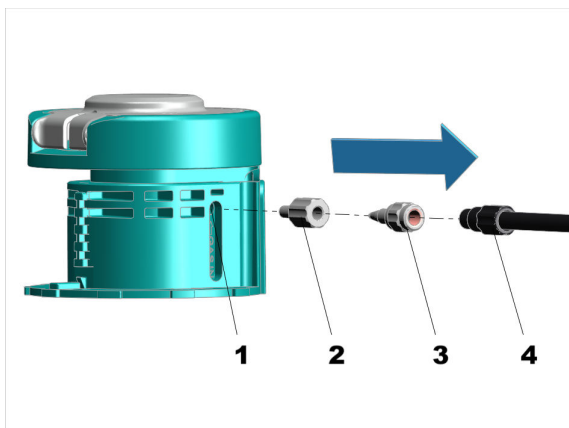
 The gas supply may only be switched on after the bottle cap multi-use is screwed onto the sample bottle.

The overpressure on the GAS IN connector must not exceed 20 mbar.

Removing the protective gas supply

Prerequisites:

The gas supply is switched off. The gas supply tubing with its accessories is connected to the **GAS IN** connector.



- Hold the bottle cap multi-use with one hand.
- Slightly rotate the Luer coupling **(2)** and pull it out of the **GAS IN** opening **(1)**. This requires a bit of force.
- Unscrew the tubing with the thread **(4)** from the Luer adapter **(3)** using the wrench.
- Unscrew the Luer adapter **(3)** from the Luer coupling **(2)** using the wrench.

7 Maintenance

7.1 Maintenance

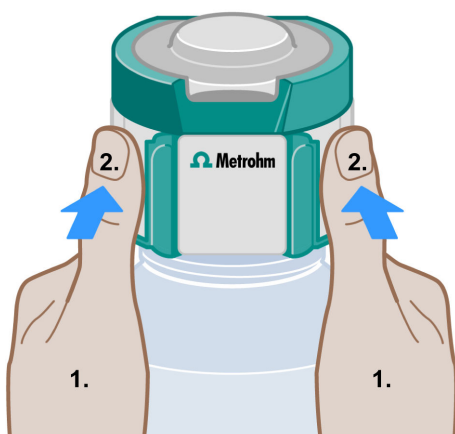
Regularly perform maintenance work on the product to prevent malfunctions and to ensure a long service life.

- Metrohm recommends having the products maintained by specialist personnel of Metrohm AG as part of an annual service. Shorter maintenance intervals may be necessary if you frequently work with caustic and corrosive chemicals.
- Only perform maintenance work that is described in this instruction. Contact your regional Metrohm service representative for further maintenance work and repairs. The regional Metrohm service representative offers every form of technical advice for maintenance and service of all Metrohm products.
- Only use spare parts that meet the technical requirements of the manufacturer. Original spare parts always meet these requirements.

7.2 Removing the absorption cartridge

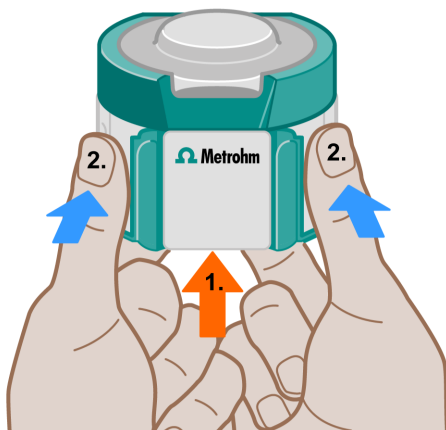
There are 2 ways to remove the absorption cartridge, depending on whether the bottle cap multi-use is mounted on a bottle or is separate.

Bottle cap multi-use is mounted on the bottle



1. Facing the RFID tag, hold the bottle at the top with both heels of your hands on the left and right.
2. Press against the curvatures of the absorption cartridge with both thumbs at the same time until it is loose.
3. Pull out the loosened absorption cartridge completely with one hand.

Bottle cap multi-use is separate



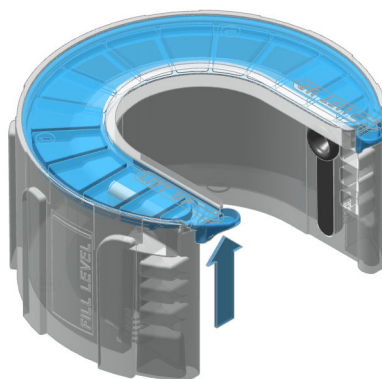
1. Facing the RFID tag, insert both index fingers into the bottle cap multi-use from below and hold it tight using your thumbs.
2. Press against the curvatures of the absorption cartridge with both thumbs at the same time until it is loose.
3. Pull out the loosened absorption cartridge completely with one hand.

7.3 Replacing the absorber material

Prerequisites:

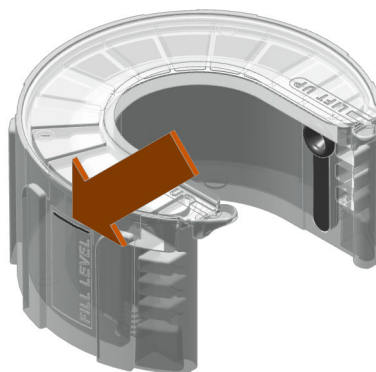
The absorption cartridge is removed from the bottle cap multi-use. (see *"Removing the absorption cartridge", chapter 7.2, page 17*)

1 Removing the absorption cartridge lid



- Use thumb and index finger of one hand to carefully push the nose of the lid upwards until the lid is loose.
- Completely remove the lid of the absorption cartridge housing.
- Empty the absorption cartridge if it is filled.

2 Filling with absorber material



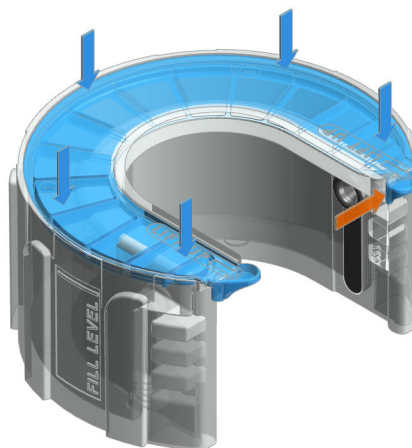
Fill the absorption cartridge with a sorbent (absorber material or adsorber material) that is suitable for the reagent:

- Molecular sieve for moisture-sensitive solutions (e.g. KF solutions),
- Soda lime for sodium hydroxide solution (CO₂ adsorption).

Fill in sorbent at least up to the **FILL LEVEL** marking.

Once the absorption cartridge is filled up to the **FILL LEVEL** marking, it contains between 27 and 28 cm³ of sorbent.

3 Sealing the absorption cartridge lid



i Make sure that the sealing surface between the housing and the lid is clean and dry and that there are no residuals of filling material.

- Place the lid centrally on the absorption cartridge housing (see blue arrows).

- Push down with both thumbs in the middle of the lid at the back and then run both thumbs on either side to the front until the lid clicks into place (see blue arrows).
- The nose of the lid must click into place at the front at the housing recess (see orange arrow).

Hint:

Write the date when the filling took place on the outside of the absorption cartridge housing (square field) when you replace the sorbent. The date can be written on the RFID tag via the OMNIS Software.

7.4 Repair kit for the flip-top lid (with sealing ring)

- The flip-top lid with sealing ring is replaced with a new flip-top lid without sealing ring. There is a matching coupling spigot for the new flip-top lid.

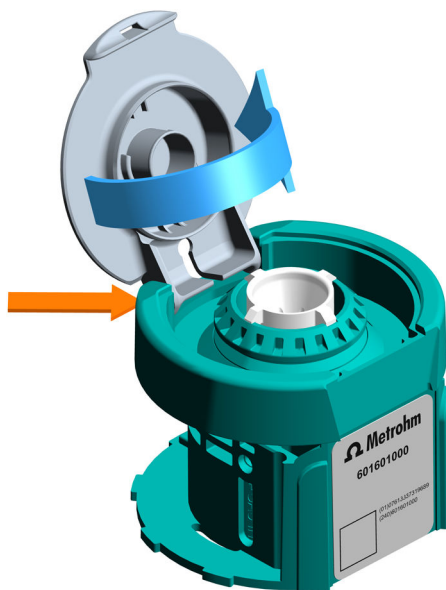
The new flip-top lid must be used with the matching coupling spigot in order to guarantee sufficient leak-tightness. Both parts are available as part of the repair kit (6.05700.260).

7.5 Removing and mounting the flip-top lid

If the flip-top lid gets in the way during operation, it can be removed with a firm hand movement.

Removing the flip-top lid

- 1 Open the flip-top lid.
- 2  Removing the flip-top lid requires a bit of force. The flip-top lid is designed in such a way that it cannot be broken during removal.



- Press against the hinge of the flip-top lid from the outside using your thumb.
- Use a forceful twist to remove the flip-top lid from its anchoring.

3 Keep the flip-top lid and mount it again if needed.

Mounting a flip-top lid

1



- Place the first stud of the flip-top lid in the corresponding recess in the bottle cap.

- Press onto the other side of the flip-top lid from the inside of the bottle cap until the second stud moves into the corresponding recess.

7.6 Cleaning the bottle cap multi-use



WARNING

Chemical hazardous substances

Contact with aggressive chemical substances may cause poisoning or chemical burns.

- Wear personal protective equipment (e.g. protective glasses, gloves).
- Use exhaust equipment when working with vaporizing hazardous substances.
- Clean contaminated surfaces.
- Only use detergents that do not cause any unwanted side reactions with the materials to be cleaned.
- Dispose of chemically contaminated materials (e.g. cleaning material) in accordance with regulations.

7.6.1 Removing the bottle cap multi-use



CAUTION

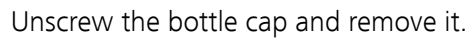
Risk of injury from splashing or leaking hazardous substances

Injuries and/or damage through contact with hazardous substances. Hazardous substances can leak or splash out when you undo tubing connections.

- Do not loosen tubing connections under pressure.
- Do not remove aspiration tubing under pressure.
- Carefully pull the ends of the tubing out of the containers.
- Carefully let liquids from tubing drain into suitable vessels.
- Buret tips must point into a container.
- Wear protective equipment.

Prerequisite:

1



7.6.2 Disassembling the bottle cap multi-use

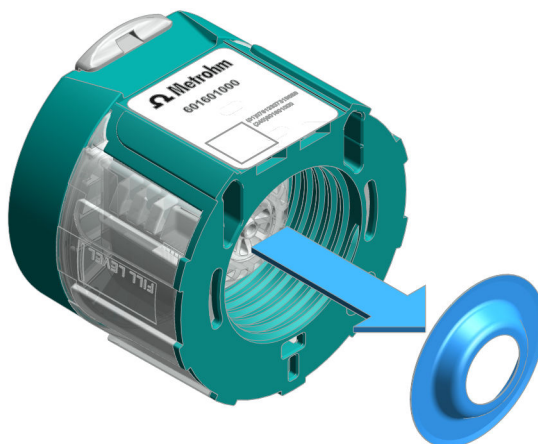
■■■■■■■■ 23

1 Removing the aspiration tubing



- Pull the aspiration tubing out of the bottle cap.
- Check that the tubing flare of the aspiration tubing is not damaged. If the tubing flare is damaged, replace the aspiration tubing.

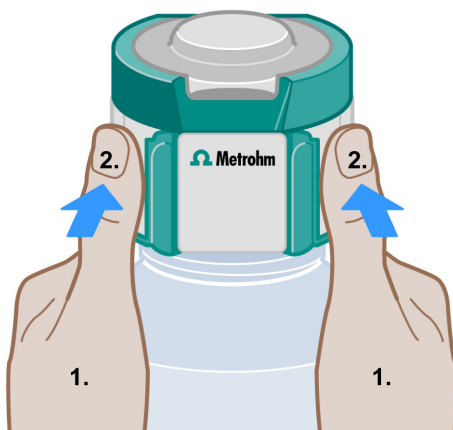
2 Removing the PTFE sealing ring



- Replace the PTFE sealing ring if it was removed more than 20 times.

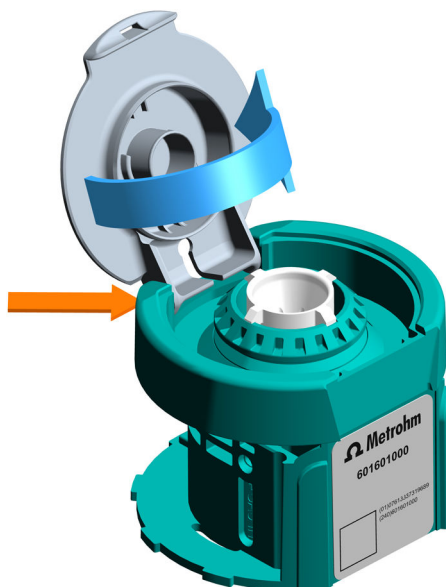
Pull the PTFE sealing ring downwards and out of the bottle cap.

3 Removing the absorption cartridge



(see "Removing the absorption cartridge", chapter 7.2, page 17)

4 Removing the flip-top lid



(see "Removing and mounting the flip-top lid", chapter 7.5, page 20)

5 Removing the coupling spigot

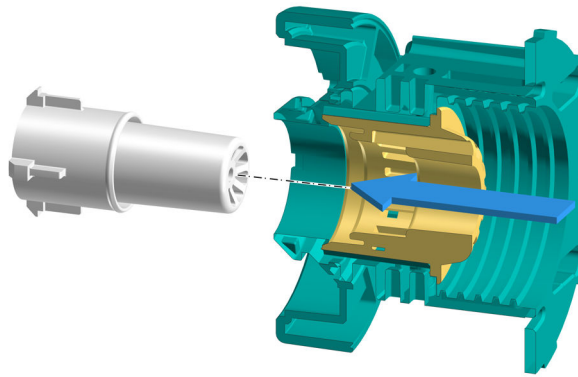


CAUTION

Leakage

Removing the air duct leads to the bottle cap leaking.

- Never remove the air duct (see yellow coloring) from the bottle cap.



Push out the coupling spigot from below and hold it above.

- 6 Store the removed coupling spigot together with the corresponding bottle cap so that the bottle cap is always used together with its coupling spigot.

7.6.3 Cleaning the bottle cap multi-use



CAUTION

Leakage

Handling the bottle cap multi-use and its parts incorrectly might lead to leaking.

- Only clean the bottle cap multi-use and its parts manually with deionized water.
Cleaning the bottle cap multi-use and its parts in the dishwasher might lead to them starting to leak.

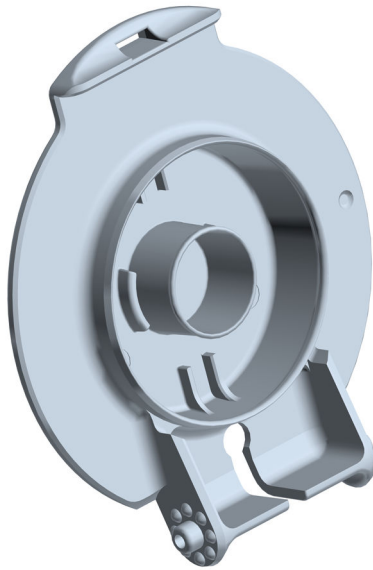
Cleaning the bottle cap multi-use

Prerequisite:

- The bottle cap multi-use is removed from the bottle. (*see "Removing the bottle cap multi-use", chapter 7.6.1, page 22*)
- The bottle cap multi-use is dismantled, i.e. the absorption cartridge and the coupling spigot are separate. (*see "Disassembling the bottle cap multi-use", chapter 7.6.2, page 23*)

- 1 Rinse the bottle cap multi-use well with deionized water.
- 2 Allow the bottle cap multi-use to dry at room temperature for around 24 hours.

Cleaning the flip-top lid

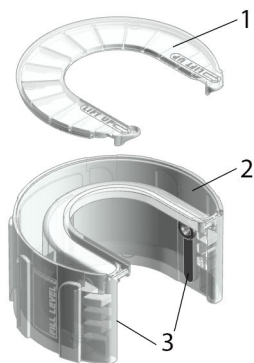


Prerequisite:

The bottle cap multi-use is removed from the bottle. (see "Removing the bottle cap multi-use", chapter 7.6.1, page 22)

- 1 Rinse the flip-top lid well with deionized water. Use ethanol in case of persistent contamination.
- 2 Allow the flip-top lid to dry at room temperature for around 24 hours.

Cleaning and checking the absorption cartridge



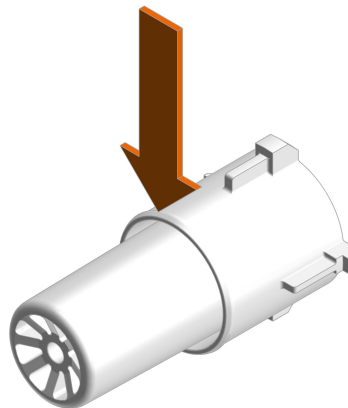
Prerequisite:

- The bottle cap multi-use is removed from the bottle. (*see "Removing the bottle cap multi-use", chapter 7.6.1, page 22*)
- The absorption cartridge is removed from the bottle cap multi-use. (*see "Removing the absorption cartridge", chapter 7.2, page 17*)

- 1 Remove the absorption cartridge lid (1).
- 2 Empty the sorbent from the absorption cartridge housing (2).
- 3 Check the absorption cartridge inserts (3) for damage but do not remove them.
- 4 Rinse the absorption cartridge with deionized water.
- 5 Clean the surfaces of the absorption cartridge inserts with deionized water or ethanol.
- 6 Allow the absorption cartridge to dry at room temperature for around 24 hours.

The surfaces of the absorption cartridge inserts must be kept clean, dry and free from dust.

Cleaning and checking the coupling spigot



Prerequisite:

- The bottle cap multi-use is removed from the bottle. (see *"Removing the bottle cap multi-use"*, chapter 7.6.1, page 22)
- The coupling spigot is removed from the bottle cap multi-use. (see *"Disassembling the bottle cap multi-use"*, chapter 7.6.2, page 23)

i Store the removed coupling spigot together with the corresponding bottle cap multi-use so that the bottle cap multi-use is always used together with its coupling spigot.

- 1** Rinse the coupling spigot well with deionized water.
- 2** Check the sealing lip (see orange arrow) for signs of damage. If the sealing lip is damaged, then replace the entire bottle cap multi-use.
- 3** Allow the coupling spigot to dry at room temperature for around 24 hours.

See also

Assembling the bottle cap multi-use (chapter 7.6.4, page 29)

7.6.4 Assembling the bottle cap multi-use

Prerequisite:

- The coupling spigot is clean.
- The sealing lip of the coupling spigot shows no signs of damage.

1 Inserting the coupling spigot



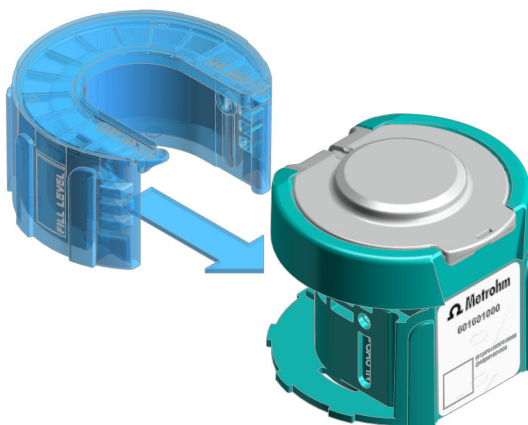
- Insert the coupling spigot into the bottle cap from above.
- Fit the raised sections into the recesses on the bottle cap.
- Press the coupling spigot into the bottle cap until it stops.



2 Mounting a flip-top lid

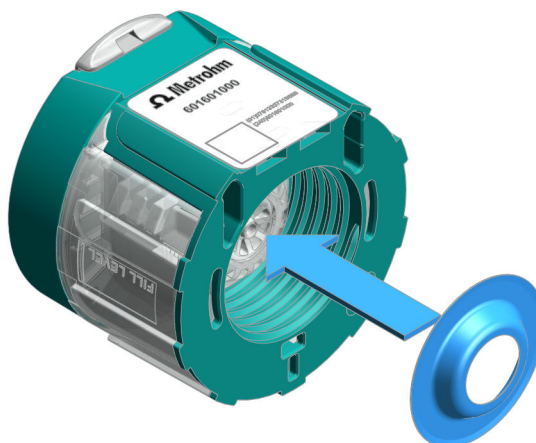
(see "Removing and mounting the flip-top lid", chapter 7.5, page 20)

3 Inserting the absorption cartridge



Insert the absorption cartridge into the bottle cap.

4 Inserting the PTFE sealing ring



Insert the PTFE sealing ring into the bottle cap multi-use from below.

When you screw the bottle cap onto the bottle, the PTFE sealing ring is automatically pressed into the correct position.

5 Inserting the aspiration tubing



8 Troubleshooting

Messages on malfunctions and errors are displayed in the control software or in the embedded software (e.g. on the display of an instrument) and contain the following information:

- Descriptions of causes of malfunctions (e.g. jammed drive)
- Descriptions of problems with the control (e.g. missing or invalid parameter)
- Information on how to solve the problem

System components with status display elements also indicate malfunctions and errors with a red flashing LED.

Troubleshooting on the product is often only possible with the control software or the embedded software (e.g. initializing, moving to a defined position).

