807 Dosing Unit

Manual

8.807.8002EN / v5 / 2025-11-03

Metrohm

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Technical Communication
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This documentation is an original document.

This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

Disclaimer

Deficiencies arising from circumstances that are not the responsibility of Metrohm, such as improper storage or improper use, etc., are expressly excluded from the warranty. Unauthorized modifications to the product (e.g., conversions or attachments) exclude any liability on the part of the manufacturer for resulting damage and its consequences. Instructions and notes in the Metrohm product documentation must be strictly followed. Otherwise, Metrohm's liability is excluded.

Table of contents

1 Overview

1.1 Product description

The 807 Dosing Unit is a versatile piston buret and is suitable for precise dosing, titrations, pipetting procedures, sample transfers, etc.

The following dosing drives can be operated with the 807 Dosing Unit:

- 700 Dosino *(see 8.700.102x manual)*
- 800 Dosino *(see 8.800.8002 manual)*

The 4 inputs and outputs (ports) are designed for flexible use (presuming the presence of a suitable control device).

Thanks to the transparent housing of the 807 Dosing Unit, piston movements and rotations of the stopcock are visible. This means that even complex liquid handling applications are easy to monitor. The unobstructed view into the cylinder also ensures that solutions can be monitored with respect to the absence of bubbles and the leak-tightness of the cylinder element.

Specifications concerning the 807 Dosing Unit and the reagent can be stored in the integrated memory chip. This data can be read out and updated by a suitable control device.

1.2 Product versions

The 807 Dosing Unit is available with cylinder sizes of 2 mL, 5 mL, 10 mL, 20 mL, and 50 mL.

In addition to glass cylinders, plastic cylinders (ETFE) specially manufactured for alkali solutions and hydrofluoric acid (HF) are also available. Metrohm recommends not using the 807 Dosing Unit with ETFE cylinders for titrations, as the necessary accuracy cannot be guaranteed.

The 807 Dosing Unit with glass cylinder can be ordered with or without accessories. The version with accessories contains all components required for installation on a bottle and for titrations.

Table 1 807 Dosing Unit with glass cylinder with accessories

Volume	Order number
2 mL	6.3032.120
5 mL	6.3032.150

Volume	Order number
10 mL	6.3032.210
20 mL	6.3032.220
50 mL	6.3032.250

Table 2 807 Dosing Unit with glass cylinder without accessories

Volume	Order number
2 mL	6.1580.120
5 mL	6.1580.150
10 mL	6.1580.210
20 mL	6.1580.220
50 mL	6.1580.250

Table 3 807 Dosing Unit with ETFE cylinder

Volume	Order number
2 mL	6.1575.120
5 mL	6.1575.150
10 mL	6.1575.210
20 mL	6.1575.220
50 mL	6.1575.250

Spare parts

Table 4 Glass cylinder element

Volume	Order number
2 mL	6.1574.120
5 mL	6.1574.150
10 mL	6.1574.210
20 mL	6.1574.220
50 mL	6.1574.250

Table 5 ETFE cylinder element

Volume	Order number
2 mL	6.1566.120

Volume	Order number
5 mL	6.1566.150
10 mL	6.1566.210
20 mL	6.1566.220
50 mL	6.1566.250

NOTE

If spare parts are purchased, then contact your regional Metrohm representative so that the serial number on the memory chip can be adapted.

1.3 Displaying accessories

Up-to-date information on the scope of delivery and on optional accessories can be found on the Metrohm website.

1 Searching for a product on the website

- Go to *https://www.metrohm.com*.
- Click on 🔍.
- Enter the article number of the product (e.g. **2.1001.0010**) into the search field and press **[Enter]**.

The search result is displayed.

2 Displaying product information

- To display the products matching the search term, click on **Product models**.
- Click on the desired product.

Detailed information regarding the product is displayed.

3 Displaying accessories and downloading the accessories list

- To display the accessories, scroll down to **Accessories and more**.
  - The **scope of delivery** is displayed.
  - Click on **[Optional parts]** for the optional accessories.
- To download the accessories list, click on **[Download accessories PDF]** under **Accessories and more**.

NOTE

Metrohm recommends keeping the accessories list for reference purposes.

1.4 Symbols and conventions

The following symbols and formatting may appear in this documentation:

*(5-**12**)*	**Cross-reference to figure legend** The first number refers to the figure number, the second to the device part in the figure.
1	**Instruction step** Perform the steps one after the other.
Method	**Dialog text**, **parameter** in the software
File ▶ New	Menu or menu item
[Continue]	**Button** or **key**
	**WARNING** This symbol draws attention to a possible life-threatening hazard or risk of injury.
	**WARNING** This symbol draws attention to a possible hazard due to electrical current.
	**WARNING** This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	**WARNING** This symbol draws attention to a possible biological hazard.
	**WARNING** Warning of optical radiation
	**CAUTION** This symbol draws attention to possible damage to devices or device parts.

NOTICE

This symbol highlights additional information and tips.

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.

2.3 Requirements for operating personnel

Only qualified personnel may operate the product. Qualified personnel are persons who meet the following requirements:

- Basic regulations on occupational safety and accident prevention for chemical laboratories are known and complied with.
- Knowledge of handling hazardous chemicals is present. Personnel have the ability to recognize and avoid potential dangers.
- Knowledge of how to apply fire prevention measures for laboratories is available.
- Safety-relevant information is communicated and understood. The personnel can operate the product safely.
- The user documentation has been read and understood. The personnel operate the product according to the instructions in the user documentation.

2.4 Safety instructions

2.4.1 General notes on safety

WARNING

Operate this device only according to the information contained in this documentation.

This device left the factory in a flawless state in terms of technical safety. The following instructions must be observed carefully to preserve this status and ensure non-hazardous operation of the device.

2.4.2 Electrical safety

Electrical safety when working with the device is ensured as part of the international standard IEC 61010.

WARNING

Only personnel qualified by Metrohm are authorized to carry out service work on electronic components.

WARNING

Never open the housing of the device. The device could become damaged. There is a considerable risk of injury if live components are touched.

There are no parts inside the housing which can be serviced or replaced by the user.

Supply voltage

WARNING

An incorrect supply voltage can damage the device.

Operate this device only with a supply voltage specified for it (refer to the rear of the device).

Protection against electrostatic charges

WARNING

Electronic components are sensitive to electrostatic charges and can be destroyed by discharges.

Do not fail to pull the power cord out of the power socket before setting up or disconnecting electrical plug connections at the rear of the device.

The device is to be operated only with the door closed.

2.4.3 Tubing and capillary connections

CAUTION

Leaks in tubing connections and capillary connections are a safety risk. Tighten all connections well by hand. Avoid applying excessive force to tubing connections. Damaged tubing ends lead to leakage. Suitable tools can be used for disconnecting connections.

The leak-tightness of the connections must be checked regularly. If the device is used mainly in unattended operation, then weekly inspections are mandatory.

2.4.4 Flammable solvents and chemicals

WARNING

All relevant safety measures are to be observed when working with flammable solvents and chemicals.

- Set up the device in a well-ventilated location (e.g., fume cupboard).
- Keep all sources of ignition far from the workplace.
- Clean up spilled liquids and solids immediately.
- Follow the safety instructions of the chemical manufacturer.

2.4.5 Danger from biological substances

As soon as the device is used for biological hazardous substances, it must be marked in accordance with regulations.

If the device is returned to Metrohm or to the regional Metrohm service representative, then the device or device components must be decontaminated and the hazard symbol for biological hazardous substances must be removed. A declaration of decontamination must be enclosed.

WARNING

Danger of infection and poisoning from biological hazardous substances

Poisoning from toxins and/or infections from samples contaminated with microorganisms.

- Wear protective equipment.
- Use exhaust equipment when working with vaporizing hazardous substances.
- Dispose of biologically contaminated substances properly.

3 Overview of the device

3.1 Total view

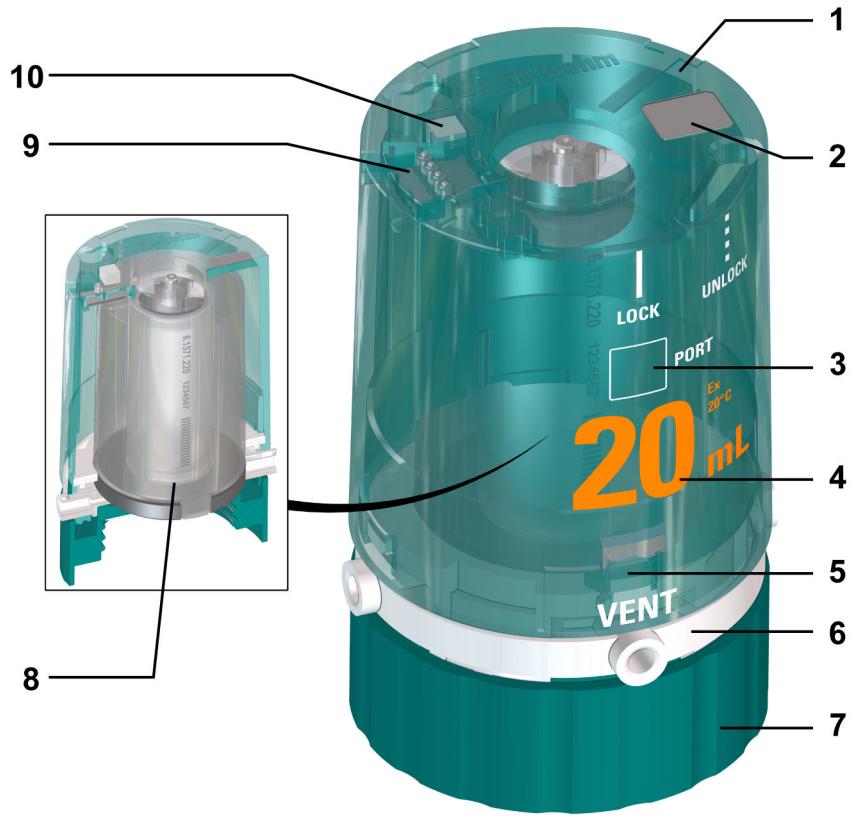


Figure 1 807 Dosing Unit

1	**Housing**	**2**	**Serial number, order number and bar-code**
3	**Port display** Displays the port currently opened on the cylinder element.	**4**	**Nominal volume** Volume of the cylinder.
5	**Unlocking button with spring clip** For locking and unlocking the housing.	**6**	**Distributor with ports** *(see chapter 3.3, page 12)*

7 **Fixing ring** With GL 45 thread for screwing the 807 Dosing Unit tight.	**8** **Cylinder element** *(see chapter 3.2, page 11)*
9 **Memory chip with contact pins** Contains all specifications for the 807 Dosing Unit.	**10** **Coding magnet** For automatic recognition of the volume of the 807 Dosing Unit.

3.2 Cylinder element

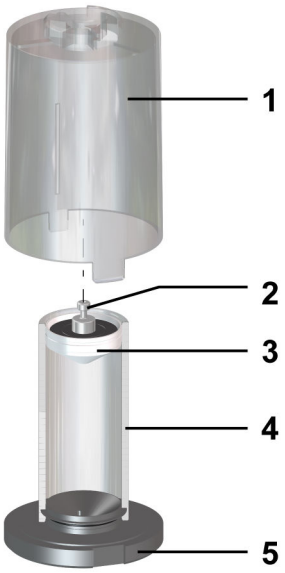


Figure 2 Cylinder element

1 **Centering tube** Actuated by the dosing drive and rotates the entire inner cylinder element, together with cylinder, cylinder base and the integrated valve disk.	**2** **Piston stopper** Coupling for the push rod of the dosing drive.
3 **Piston** For ejecting and aspirating a solution.	**4** **Cylinder** Contains the solution for dosing. Available for volumes of 2 mL, 5 mL, 10 mL, 20 mL or 50 mL.
5 **Cylinder base** Seals the cylinder and contains the valve disk.	

3.3 Ports

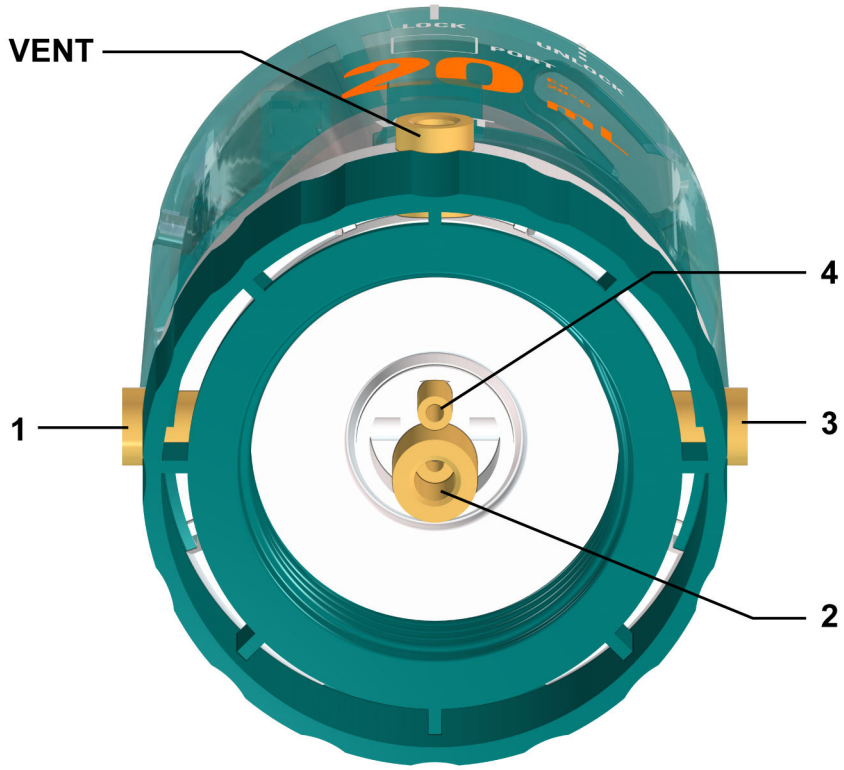


Figure 3 807 Dosing Unit – Ports

1	**Port 1** Dosing port (standard port) M6 connector for dosing tubing.
2	**Port 2** Fill port (standard port) M6 connector for aspiration tubing.
3	**Port 3** Dosing port M6 connector for second dosing tubing.
4	**Port 4** Special port, waste port or recycling port An adapter (6.1808.280) provides an M6 connector for an additional tubing.
	VENT Purge M6 connector for adsorber tube (6.1619.000).

4 Installation

4.1 Greasing the valve disk

NOTE

Metrohm recommends not greasing the valve disk for trace analysis applications using voltammetry. In certain cases, degreasing the 807 Dosing Unit is also required for voltammetry. For the correct procedure for degreasing, contact your regional Metrohm service representative.

Metrohm recommends lightly greasing the valve disk with the supplied paraffin grease (6.2803.010) before using the 807 Dosing Unit for the first time. This measure will reduce friction resistance when the valve disk is rotated.

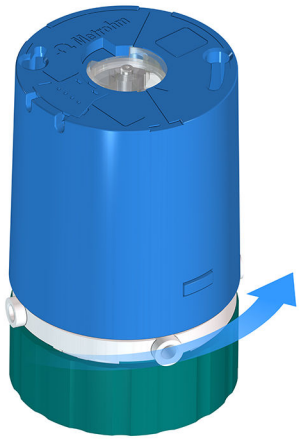
Greasing is not necessary for the 807 Dosing Unit 2 mL, as it is already supplied with a greased valve disk.

To reduce friction resistance when rotating the centering tube, it is supplied with a greased top surface. If the fat film wears off during use, Metrohm recommends regreasing the centering tube with paraffin grease *(see chapter 5.4, page 35)*.

Removing the housing

1. Place the 807 Dosing Unit on a flat, level surface.
2. Press the unlocking button and hold it down.

3 Rotate the housing counterclockwise.



4 Release the unlocking button and carefully lift the housing upwards.

NOTE

Take care to ensure that the spring clip on the interior side of the housing does not slide out of place.

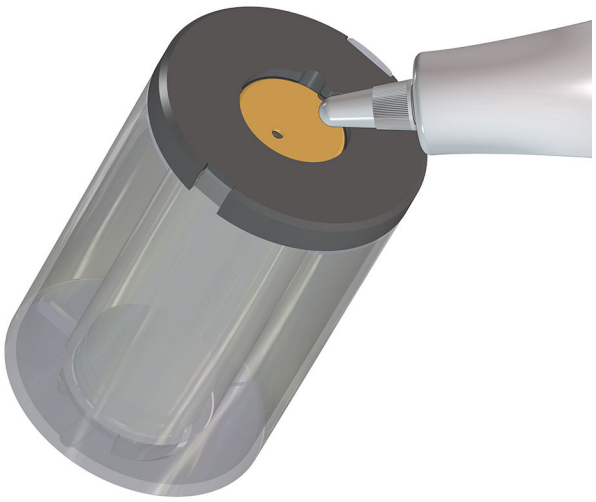
Greasing the valve disk

Required accessories:

- Grease (6.2803.010 or 6.2803.000)
- Lint-free cloth

1 Remove the cylinder element from the distributor.

2 Apply the grease very thinly to the valve disk.



3 Wipe off excess grease with a lint-free cloth.

4.2 Installing the dosing system

4.2.1 Installing the storage vessel holder and storage vessel for tubing tips

The 6.3032.xx0 product versions of the 807 Dosing Unit come with a storage vessel for tubing tips with a storage vessel holder. The storage vessel for tubing tips should be installed during initial start-up. It is used to store the tubing tip when the 807 Dosing Unit is not in use.

The associated storage vessel holder at the same time serves to hold a labeling plate with the designation of the reagent in the 807 Dosing Unit.

Installing the storage vessel holder and storage vessel for tubing tips

Prerequisite:

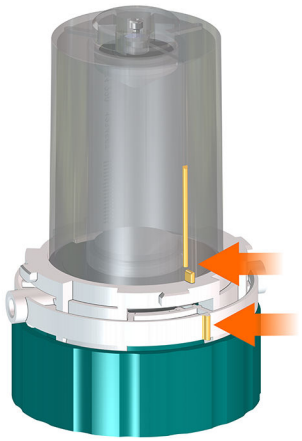
- The housing of the 807 Dosing Unit has been removed *(see "Removing the housing", page 13)*.

Required accessories:

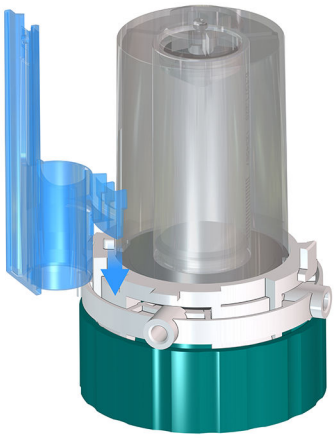
- Storage vessel holder (6.2008.050)
- Storage vessel for tubing tips (6.2008.030)

- Labeling plate (6.2244.020)

1 Rotate the cylinder element on the distributor in such a way that the marking rib on the centering tube is lined up with the marking rib on the edge of the distributor.



2 Place the storage vessel holder on the edge of the distributor.



NOTE

The storage vessel holder can be placed at any one of 4 positions on the ring of the distributor.

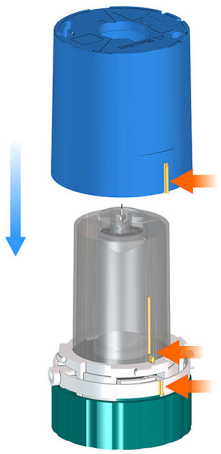
3 Place the storage vessel for tubing tips in the storage vessel holder.

NOTE

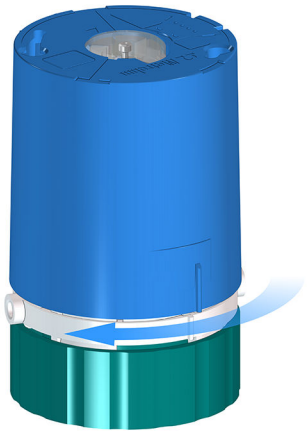
In order to ensure perfect seating, the rib on the storage vessel for tubing tips must be guided into the recess of the storage vessel holder and pushed downward.

4 Insert the labeling plate with the designation of the reagent into the 807 Dosing Unit in the storage vessel holder.

5 Place the housing over the centering tube so that the marking ribs on the housing and on the centering tube are aligned with the marking rib on the edge of the distributor.



6 Hold the distributor and rotate the housing clockwise until the housing snaps into place.



4.2.2 Installing the adsorber tube

Installing the adsorber tube

NOTE

Only the adsorber tube may be screwed onto the **VENT** deaeration port.

Required accessories:

- Adsorber tube (6.1619.000)

1 Fill the adsorber tube with an adsorber material required for the reagent.

- Molecular sieve for moisture-sensitive solutions (e.g., KF solutions).
- Soda lime for sodium hydroxide solution (CO_2 adsorption)

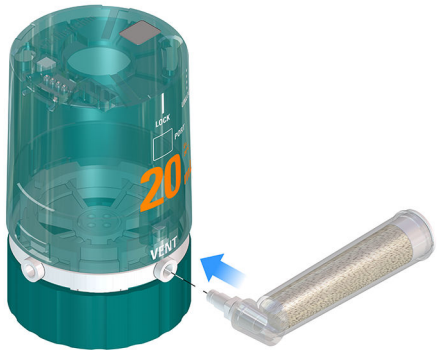
NOTE

If no adsorber material is required, then the adsorber tube can be filled with cotton and used as a dust filter.

2 Seal the adsorber tube with the associated lid.

A minimum pressure equalization remains ensured.

3 Screw the adsorber tube onto the **VENT** deaeration port of the 807 Dosing Unit and rotate it to hanging position.



4.2.3 Installing the aspiration tubing

NOTE

Port 2 is the fill port by default. Take care to ensure that the tubing is firmly screwed in place in order that no air bubbles will be able to enter during aspiration of the reagent solution.

Required accessories:

- Aspiration tubing (6.1829.010)

1 Screw the aspiration tubing onto the fill port **Port 2** on the underside of the 807 Dosing Unit.

4.2.4 Installing the 807 Dosing Unit on the bottle

Various bottles with a GL 45 thread can be used. Amber glass bottles (6.1608.023), clear glass bottles (6.1608.030), or PE bottles (6.1608.040) with a capacity of 1 liter and a GL 45 thread are used as standard. Suitable adapters are available for bottles with other threads *(see chapter 1.3, page 3)*.

NOTE

Do not use mechanical aids to install the 807 Dosing Unit.

Required accessories:

- Bottle with intact spout

1 Rotate the adsorber tube upward.

2 Hang the aspiration tubing into the filled bottle.

3 Use the fixing ring to screw the 807 Dosing Unit onto the bottle.

NOTE

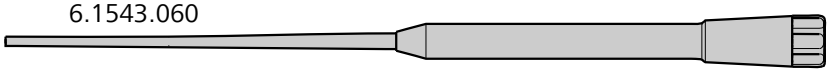
The 807 Dosing Unit should still be easy to rotate by hand.

4 Rotate the adsorber tube back into a hanging position.

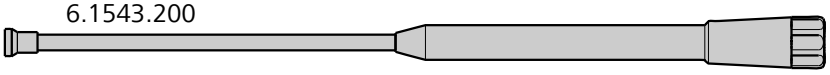
4.2.5 Installing the tubing tip

The following tubing tips are included in the standard equipment of the 6.3032.xx0 product versions of the 807 Dosing Unit:

6.1543.060



6.1543.200



- **Dosing tip (6.1543.060)**
  The open dosing tip is suitable for tasks during which the tubing tip is not immersed, e.g., dosing procedures.
  The tubing tip can be stored in the same solvent as the one contained in the reagent in order to prevent reagent nucleation in the dosing tip. Metrohm recommends filling the storage vessel for tubing tips with solvent and placing the dosing tip inside it. If a KF reagent is used as a titrant, then store the dosing tip in methanol or ethanol.

- **Antidiffusion tip (6.1543.200)**
  The antidiffusion tip has an antidiffusion valve and is used for work requiring the immersion of the tubing tip, e.g., titrations.
  This antidiffusion valve prevents the diffusion of liquids into the tip.
  The pressure surrounding the liquid and the internal stress of the membrane press on the tubing end, thus sealing off the opening.
  The backpressure of the dosed liquid is overcome during the dosing process. The membrane opens up the tubing end. The tubing end is sealed off again automatically after the dosing is completed.

CAUTION

Do not dismantle the antidiffusion valve.

Installing the tubing tip

Required accessories:

- FEP tubing (6.1805.100)
- Wrench (6.2739.000)
- Tubing tip: Dosing tip (6.1543.060) or antidiffusion tip (6.1543.200)

1 Screw the FEP tubing onto the **Port 1** dosing port of the 807 Dosing Unit.

2 Tighten the connection nipple of the FEP tubing with the wrench.

3 Screw the tubing tip onto the other end of the FEP tubing.

NOTE

The link stopper (6.1446.030) included in the scope of delivery can be used to fasten the tubing tip in place in a storage vessel for tubing tips or in a ground-joint opening SGJ 14/15.

4 Insert the tubing tip with the link stopper into the storage vessel for tubing tips.

NOTE

If only one dosing port is used, then the other dosing port can be sealed with a threaded stopper (6.1446.040).

The first-time filling of the 807 Dosing Unit requires no special measures. Every Metrohm control device (e.g., Titrando, Dosing Interface, or Sample Processor) has a **PREP/Prepare** function. The **PREP/Prepare** function fills the cylinder and rinses the tubing of the 807 Dosing Unit in an automated sequence.

4.3 Avoiding air bubbles

Air bubbles could collect in the cylinder as the result of leaking tubing connections or the degassing of air released in the liquid to be dosed. To ensure the leak-tightness of the tubing connections, perform the following steps:

- Check the tubing ends for possible damage before assembly.
- Always tighten the screw nipples with the wrench (6.2739.000), taking care not to damage the tubing ends.

All Metrohm devices which support dosing drives offer a **PREP/Prepare** function. This function is a preparatory step which automatically fills cylinders and tubing with liquid. The specification of length and diameter of all of the connected filling tubing and dosing tubing is required in order for the control device to be able to calculate the necessary rinsing volume correctly. The specification is made in the configuration of the 807 Dosing Unit of the respective device. The data is stored in the memory chip of the 807 Dosing Unit.

The **PREP/Prepare** function must be performed before the first use of a 807 Dosing Unit, i.e., before the start of a sample series (at least once

per day). More detailed information is available in the manual for the respective Metrohm device.

The contents present in the cylinder will be expelled completely during the **PREP/Prepare** function. The piston moves past the regular end position and is pressed against the base of the cylinder. The outline of the cylinder base will, however, never be able to be filled out completely by the piston, which means that a small air bubble might still remain in place. However, the air bubble is not expelled during dosing and is so small that it does not affect the precision of the dosage.

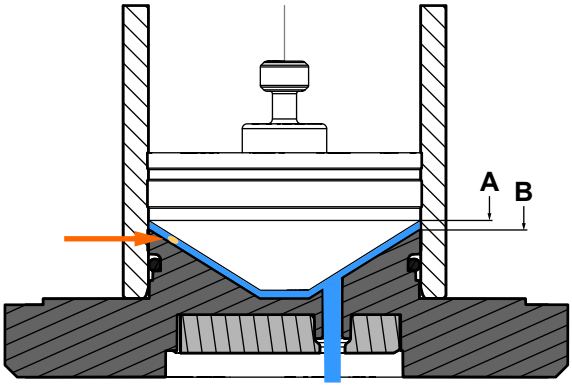


Figure 4 Air bubbles in the cylinder

The end position A (end volume) will never be exceeded by the piston during dosing procedures. It is only with the **PREP/Prepare** function that the piston will be moved all the way to the stop (PREP position B).

A dead volume will always remain after dosing which is greater in size than any remaining air bubble (see arrow) following the execution of the **PREP/Prepare** function. This means that the air bubble cannot exit into the tubing system and impair the precision of the dosing. The air bubble remains in the cylinder.

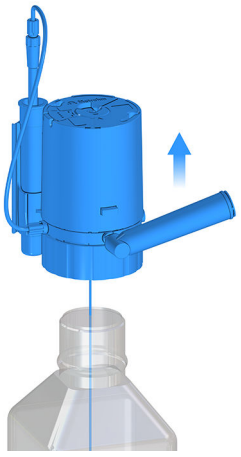
The design and mode of operation of the 807 Dosing Unit is constructed in such a way that air bubbles which arise in the system during dosing will not be able to escape unchecked. The air bubbles can be expelled efficiently prior to the dosing with the **PREP/Prepare** function. Any small air bubbles which might form will be held back in a bubble trap and have no effect on the dosing.

4.4 Dismantling the dosing system

Dismantling the dosing system

1 Unscrew the 807 Dosing Unit with the fixing ring from the bottle.

2 Remove the 807 Dosing Unit from the bottle.



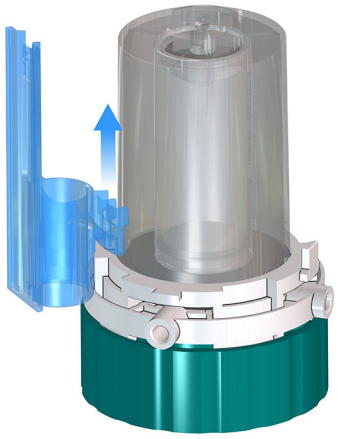
3 Unscrew the adsorber tube.

4 Unscrew the aspiration tubing and the FEP tubing.

5 Remove the tubing tip and the storage vessel for tubing tips.

6 Remove the housing of the 807 Dosing Unit *(see "Removing the housing", page 13)*.

7 Remove the storage vessel holder.



5 Operation and maintenance

5.1 Care and maintenance

The 807 Dosing Unit requires regular care.

If aggressive reagents are dosed with the 807 Dosing Unit, then the 807 Dosing Unit should be rinsed 2 to 3 times with an inert solvent when not in use (**PREP/Prepare** function) and then subsequently emptied (**EMPTY/Emptying** function). If a reagent is not used for more than 2 days, then rinse and empty the 807 Dosing Unit. Remove the dosing drive in the event of prolonged downtimes (> 1 week).

WARNING

Damage by chemicals

- Regularly check the 807 Dosing Unit for leaking liquid (under the piston, on the cylinder base or on the 807 Dosing Unit).
- Check the cylinder and the piston for wear and damaged surfaces at regular intervals.
- Replace defective types of the 807 Dosing Unit immediately. Do not continue using them.

NOTE

Depending on the application, cylinders, pistons and, distributors are subject to different mechanical strain. A 807 Dosing Unit, for example, that is often used for alkaline, high-concentration or nucleating reagents will be subject to higher wear. This results in shorter maintenance intervals. The 807 Dosing Unit must therefore be replaced more often.

Maintenance work	Maintenance interval
Check the housing for contamination and clean if necessary *(see "Cleaning the housing and contact surfaces", page 32)*.	Daily

Maintenance work	Maintenance interval
Check contact surfaces for contaminations and clean them if necessary *(see "Cleaning the housing and contact surfaces", page 32)*. Clean the distributor disk and valve disk *(see "Cleaning the distributor disk and valve disk", page 33)*. Grease the centering tube and the valve disk *(see chapter 5.4, page 35)*.	Weekly if using: ▪ Concentrated solutions that tend to nucleate. ▪ EDTA solutions, ultrapure solvents and ultrapure water ▪ Organic solvents ▪ Alkaline (e.g. KOH or isopropyl alcohol), corrosive or high-concentration reagents
Check and replace the 807 Dosing Unit *(see chapter 5.5, page 37)*.	Every 3 months if using unproblematic reagents.

5.2 Disassembling the 807 Dosing Unit

Disassembling the 807 Dosing Unit for a reagent replacement is usually not necessary. Thanks to the low exchange volume of only a few microliters, and thanks to the **EMPTY/Empty** and **PREP/Prepare** functions, which every control device for the dosing drive has, a reagent in a 807 Dosing Unit can be replaced without any large loss of reagent.

Metrohm recommends checking the piston and cylinder of a 807 Dosing Unit regularly (e.g., every 6 months). Metrohm recommends shorter intervals (e.g., every week) in the event that alkaline, corrosive or high-concentration reagents are used. The glass cylinder itself could become corroded by aggressive alkalis, or solids could nucleate out of the solution. Metrohm recommends using the product versions of the 807 Dosing Unit with ETFE cylinders for strongly alkaline reagents and hydrofluoric acid (HF).

Removing the housing

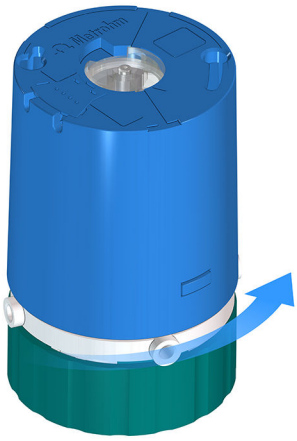
NOTE

When removing the housing, take care to ensure that the spring clip on the interior side of the housing does not slide out of place.

1 Place the 807 Dosing Unit on a flat, level surface.

2 Press the unlocking button and hold it down.

3 Rotate the housing counterclockwise.



4 Release the unlocking button and carefully lift the housing upwards.

Disassembling the cylinder element

Prerequisite:

- The housing of the 807 Dosing Unit has been removed *(see "Removing the housing", page 29)*.

1 Remove the cylinder element from the distributor.

2 Carefully pull out the centering tube on the cylinder base in an upward direction.

The cylinder is visible on the cylinder base with the integrated valve disk.

3 Check the condition of the cylinder and the piston.

The glass cylinder should not exhibit any signs of corrosion. The plastic coating (PTFE) of the piston should not be damaged in any way.

CAUTION

- **Never** disconnect the cylinder from the cylinder base. There is a danger of the sensitive material in the cylinder base (particularly the edges) becoming damaged when the cylinder is attached by hand.
- Do not remove the piston from the cylinder. Damage to individual parts will impair the leak-tightness and accuracy of the 807 Dosing Unit.
- Always replace the piston and cylinder together. Complete cylinder elements can be ordered under 6.1574.xxx or 6.1566.xxx *(see chapter 1.3, page 3)*.

5.3 Cleaning the 807 Dosing Unit

The 807 Dosing Unit requires appropriate care. Excess contamination of the 807 Dosing Unit results in functional disruptions and a reduction in the service life.

Cleaning the housing and contact surfaces

Prerequisite:

- The 807 Dosing Unit is removed from the dosing drive *(see dosing drive manual)*.

1 Cleaning the housing

NOTE

The housing is not dishwasher proof.

Clean the housing with lukewarm water and dishwashing detergent.

2 Cleaning the contact surfaces of the 807 Dosing Unit

- If the contact surfaces of the 807 Dosing Unit are slightly contaminated, moisten a lint-free cloth with deionized water and clean the contact surfaces.
- If the contact surfaces are heavily contaminated, then add dishwashing detergent or ethanol to the moist cloth and clean the contact surfaces.

Do not exceed 50 °C when drying. Use compressed air if necessary.

3 Cleaning the contact surfaces of the dosing drive

- If the contact surfaces are slightly contaminated, moisten a lint-free cloth with deionized water and clean the contact surfaces.
- If the contact surfaces are heavily contaminated, then add dish-washing detergent or ethanol to the moist cloth and clean the contact surfaces.

The valve disk and distributor disk must also be checked regularly. Blockage of the valve opening or of the outlet port is to be avoided under all circumstances.

CAUTION

- If the valve disk and distributor disk are not cleaned, then the cylinder element may block the distributor and thereby damage the 807 Dosing Unit.
- The valve disk must not be damaged. Even small scratches could lead to leakage.
- Do not under any circumstances remove the valve disk from the cylinder base or the distributor disk from the distributor.

Cleaning the distributor disk and valve disk

Prerequisite:

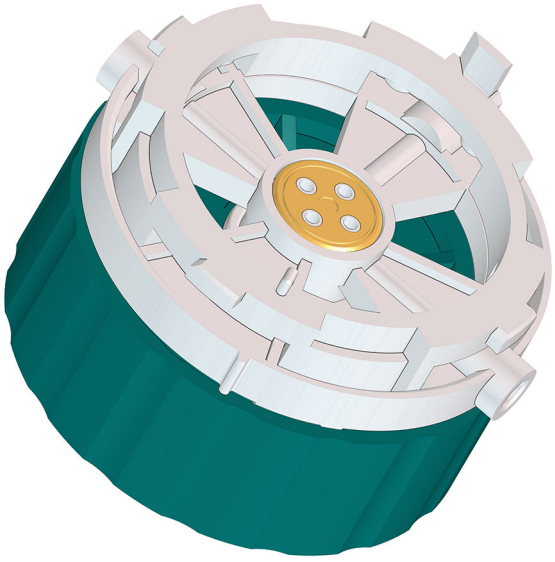
- The housing of the 807 Dosing Unit has been removed *(see "Removing the housing", page 29)*.
- The distributor and the cylinder element (centering tube incl. cylinder) have been removed *(see "Disassembling the cylinder element", page 31)*.

NOTE

If the distributor is stuck, place the 807 Dosing Unit with the fixing ring facing down in warm water (with a little dishwashing detergent if necessary) for at least 30 minutes.

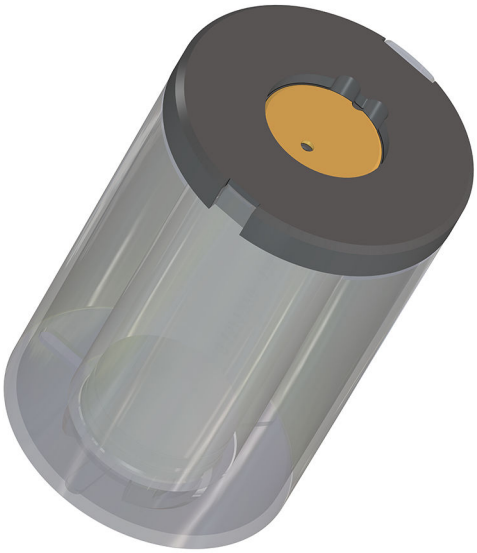
1 Cleaning the distributor and distributor disk

- Rinse the distributor and its channels with deionized water.
- Rinse the channels of the distributor with ethanol.
- Clean the contact surface of the distributor disk using a lint-free cloth and ethanol.



2 Cleaning the centering tube and valve disk

- Rinse the centering tube with deionized water and wipe it with ethanol.
- Clean the lid of the centering tube using a lint-free cloth with ethanol.
- Clean the contact surface of the valve disk using a lint-free cloth and ethanol.



3 Dry all cleaned parts thoroughly, either in the air or with a stream of nitrogen.

5.4 Greasing the centering tube and valve disk

Greasing the centering tube and valve disk

Prerequisite:

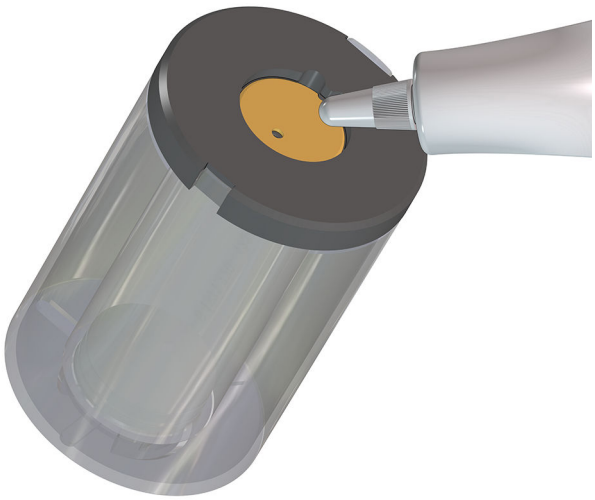
- The distributor and the cylinder element (centering tube incl. cylinder) have been removed *(see "Disassembling the cylinder element", page 31)*.

Required accessories:

- Grease (6.2803.010 or 6.2803.000)

1 Grease the centering tube.

2
- Apply the grease very thinly to the valve disk.
- Wipe off excess grease with a cloth.



5.5 Checking and replacing the 807 Dosing Unit

Prerequisite:

- The 807 Dosing Unit is disassembled *(see chapter 5.2, page 29)*.

1 Checking the cylinder

Are rough areas or scratches visible on the cylinder?

2 Checking the piston

- Are scratches visible on the piston surface?
- Is any unevenness visible on the sealing lips of the piston?
- Are the cylinder and piston leakproof?

3 Replacing a 807 Dosing Unit

If any of these defects is visible, replace the entire 807 Dosing Unit.

5.6 Assembling the 807 Dosing Unit

Assembling the cylinder element

1 Place the cylinder base with cylinder and piston on a flat surface.

2 Place the centering tube on the cylinder.

- Position the protrusions of the centering tube in such a way that they fit into the recesses of the cylinder base.
- Align the centering tube so that the piston stopper fits in the small opening in the centering tube.

3 Place the distributor on a flat surface with the fixing ring facing downwards.

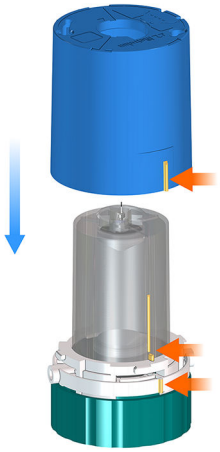
4 Place the cylinder element in the distributor.

Attaching the housing

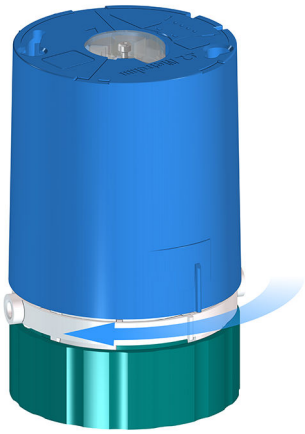
1 Check whether the interior spring clip is positioned correctly in its guide groove.

The spring clip must be easy to move by pressing the external unlocking button.

2 Place the housing over the centering tube so that the marking ribs on the housing and on the centering tube are aligned with the marking rib on the edge of the distributor.



3 Hold the distributor and rotate the housing clockwise until the housing snaps into place.



4 Check the seating of the housing.

5.7 Resistance and materials

5.7.1 Solvents

Conventional reagents and media can be dosed without difficulty with the 807 Dosing Unit. The materials of the individual components used which come into contact with the liquid being dosed have been selected for maximum resistance to chemicals and functionality.

Not all types of aggressive or high-concentration reagents can be conveyed without difficulty. It is the responsibility of the user to determine the resistance of the various individual components to specific, aggressive media.

WARNING

Reagents which corrode glass, e.g., hydrofluoric acid HF or strong inorganic alkalis, should be applied in diluted concentrations only. Caution is also called for with concentrated solutions which are subject to nucleation.

Many problems involving aggressive media can be prevented by regular cleaning and checks. It is possible that frequent replacement of the cylinder element (piston, cylinder, cylinder base with valve disk) will be required.

The temperature of the dosing material may not exceed 50 °C. The 807 Dosing Unit and its components cannot be autoclaved. The sterility of a germ-free dosing material cannot be guaranteed.

5.7.2 PCTG housing

In contrast to the other components of the 807 Dosing Unit, the PCTG housing has only limited resistance to chemicals.

NOTE

The product versions of the 807 Dosing Unit with glass cylinder have a PCTG housing.

Good resistance	Aqueous solutions, diluted acids, alcohols, and hydrocarbons
Limited resistance	Concentrated organic acids, diluted aqueous alkalis (cold cracking), acetone, isopropanol, tetrahydrofuran, hot water
Non-resistant	Concentrated inorganic acids and bases, bromine, chlorinated solvents, phenol, water vapor >100 °C

The PCTG housing is not dishwasher-safe, but it can be cleaned readily with lukewarm water and a dishwashing detergent.

5.8 GLP - Validation

Every 807 Dosing Unit and every dosing drive manufactured by Metrohm is subjected to rigorous quality controls prior to shipment. Every 807 Dosing Unit is issued a quality certificate attesting conformance with the strict quality criteria of Metrohm. **GLP** (**G**ood **L**aboratory **P**ractice) requires, among other things, periodic inspection of analytical measuring devices with respect to precision and trueness on the basis of standard operating procedures (**S**tandard **O**perating **P**rocedure, **SOP**). This may also include a check of dosing accuracy.

The regional Metrohm service representatives worldwide offer the possibility of on-site inspections and certifications of piston burets of the 807 Dosing Unit type and dosing drives with respect to accuracy.. Metrohm recommends an accuracy inspection whenever a cylinder and/or a piston of a 807 Dosing Unit has been replaced.

Piston burets of the 807 Dosing Unit type with glass cylinders can be inspected according to the standard **Piston-operated volumetric apparatus – Part 3: Burets (ISO 8655-3:2022)**.

6 Troubleshooting

6.1 807 Dosing Unit – Malfunctions

Problem	Cause	Remedy
Air bubbles are in the cylinder or in the dosing tubing.	*The tubings are defective or not tightened properly.*	▪ Check the tubing ends, in particular the tubing end of the aspiration tubing. Ensure that the aspiration tubing does not draw in air. ▪ Tighten all of the tubing connections with the wrench (6.2739.000). ▪ Check the lock release mechanism of the housing. Remove the housing *(see "Removing the housing", page 29)* and reattach if required *(see "Attaching the housing", page 38)*.
	The reagent degasses excessively, i.e., the released air forms bubbles.	▪ Execute the **PREP/Prepare** function to rinse the 807 Dosing Unit and all tubing. ▪ Reduce the filling rate. ▪ Degas the reagent with ultrasound, nitrogen or in a vacuum.
	The piston and cylinder have scratches and/or are worn.	Replace the cylinder element.
	*The **PREP/Prepare** function has not been executed or false parameters have been set.*	▪ Execute the **PREP/Prepare** function. ▪ Check the tubing length and tubing diameter and correct the settings in the control software if necessary. ▪ Check the fill port and correct the settings in the control software if necessary.
	The distributor is leaking or defective.	Clean the valve disk and distributor disk *(see "Cleaning the distributor disk and valve disk", page 33)*. If the problem persists, then replace the distributor.
Liquid drips into the bottle.	*The tubings are defective or not tightened properly.*	▪ Check the tubing ends, in particular the tubing end of the aspiration tubing. Ensure that the aspiration tubing does not draw in air.

Problem	Cause	Remedy
		▪ Tighten all of the tubing connections with the wrench (6.2739.000). ▪ Check the lock release mechanism of the housing. Remove the housing *(see "Removing the housing", page 29)* and reattach if required *(see "Attaching the housing", page 38)*
	The distributor is leaking or defective.	▪ Clean the valve disk and distributor disk *(see "Cleaning the distributor disk and valve disk", page 33)*. ▪ If the problem persists, then replace the distributor.
The 807 Dosing Unit can be removed from the dosing drive only with difficulty.	*The friction points have not been greased.*	Grease the centering tube and the valve disk *(see chapter 5.4, page 35)*.
	The coupling is contaminated.	Remove the contamination at the coupling between the 807 Dosing Unit and the dosing drive.
The 807 Dosing Unit doses an incorrect volume.	*The 807 Dosing Unit is mounted or assembled incorrectly.*	▪ Remove the 807 Dosing Unit and reattach it. ▪ Check whether the nominal volume on the housing and the effective cylinder volume match one another. Use a housing with the corresponding volume if necessary.
The 807 Dosing Unit does not dose.	*The dosing drive is not connected.*	Check whether the connector plug of the dosing drive is correctly connected to the control device.
	The tubing connections and/or the valve openings are jammed.	▪ Check whether the dosing port is sealed off with a stopper. ▪ Check whether the tubing tip is blocked. Clean the tubing tip if necessary. ▪ Check whether the valve openings are blocked. Clean the valve openings if necessary. ▪ Check whether the **VENT** deaeration port is sealed off with a stopper (vacuum in the supply bottle). The **VENT** deaeration port must be open for pressure equalization.

Problem	Cause	Remedy
	The 807 Dosing Unit has been assembled incorrectly.	Check whether the dosing tubing is connected to the correct port and adjust if necessary.
	The push rod of the dosing drive does not reach the piston.	Remove the dosing drive and check whether the piston is connected to the push rod of the dosing drive. If the piston stopper is not flush with the underside of the housing, then correct the position of the piston using the piston tongs *(see chapter 6.2, page 46)*.
The 807 Dosing Unit is recognized either not at all or incorrectly.	*The dosing drive was not attached correctly.*	▪ Remove the dosing drive and attach it again. ▪ Check the correct seating of the dosing drive. ▪ Switch the control device off and then back on again. ▪ If the problem persists, then contact the regional Metrohm service representative.
	The 807 Dosing Unit has been assembled incorrectly.	Check whether the nominal volume on the housing and the effective cylinder volume match one another.
	The memory chip of the 807 Dosing Unit is mechanically damaged or impaired by chemicals.	▪ Clean the contact surfaces *(see chapter 5.3, page 32)*. ▪ Remove the memory chip from the 807 Dosing Unit housing and place it in deionized water for at least 30 minutes. Dry the memory chip thoroughly in the air or with a stream of nitrogen, then reinsert it into the housing. ▪ If the problem persists, then contact the regional Metrohm service representative.
The adsorber tube is jammed.		Using your thumb or the balls of your hand, apply forceful pressure to the axis of rotation of the adsorber tube, while at the same time carefully rotating it counterclockwise until the screw nipple releases.
The complete 807 Dosing Unit rotates.	*The friction points have not been greased.*	Grease the centering tube and the valve disk *(see chapter 5.4, page 35)*.

Problem	Cause	Remedy
The cylinder element is jammed in the distributor or the port change is not possible.	*The valve disk and distributor disk stick to one another.*	Clean the valve disk and distributor disk *(see "Cleaning the distributor disk and valve disk", page 33)*.
The data of the 807 Dosing Unit cannot be read.	*The memory chip of the 807 Dosing Unit is mechanically damaged or impaired by chemicals.*	▪ Remove the dosing drive and attach it again. ▪ Clean the contact surfaces *(see chapter 5.3, page 32)*. ▪ Remove the memory chip from the 807 Dosing Unit housing and place it in deionized water for at least 30 minutes. Dry the memory chip thoroughly in the air or with a stream of nitrogen, then reinsert it into the housing. ▪ Have the memory chip replaced by the regional Metrohm service representative.
The dosing drive becomes hot.	*The dosing drive is overloaded. The valve disk or piston is jammed.*	▪ Switch off the device immediately. ▪ Remove the 807 Dosing Unit from the bottle *(see chapter 4.4, page 25)*. ▪ Disassemble the 807 Dosing Unit *(see chapter 5.2, page 29)* and clean all of the single parts *(see chapter 5.3, page 32)*. Replace defective parts.
The housing does not shut.	*The spring clip is inserted incorrectly.*	Remove the housing and insert the spring clip correctly.
There is liquid above the piston or on the cylinder base.	*The piston and/or the cylinder is worn out or defective.*	Replace the cylinder element.

6.2 Correcting the position of the piston

If the piston stopper is not flush with the top of the housing, then the push rod of the dosing drive cannot reach the piston.

NOTE

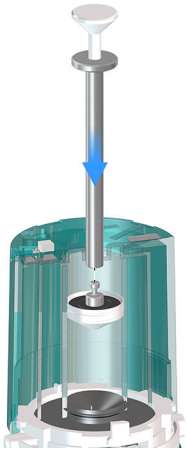
The instructions show a position of the piston as an example. However, the piston may also be further up or in an inclined position.

Required accessories:

- Piston tongs (6.1546.030)

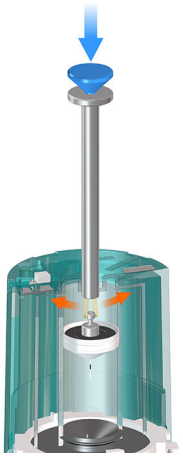
1 Inserting the piston tongs

Insert the piston tongs into the cylinder opening.

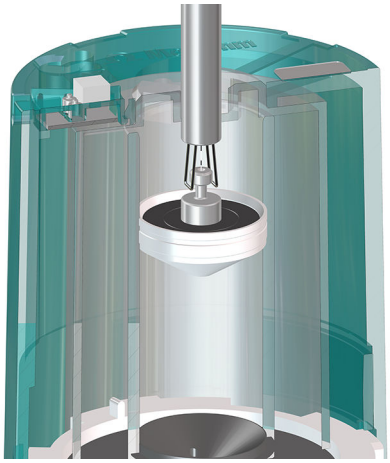


2 Grasping the piston

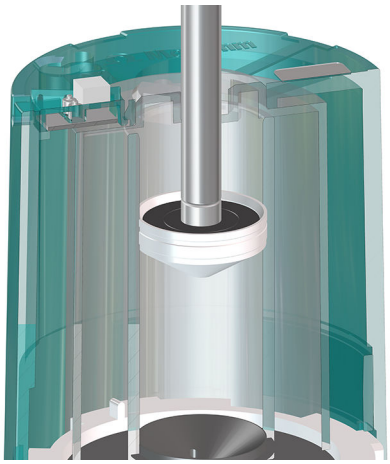
- Press the plunger of the piston tongs (blue) down until 2 wire loops emerge from the piston tongs.



- Hold the plunger of the piston tongs pressed down and position the piston tongs so that the wire loops surround the piston stopper.



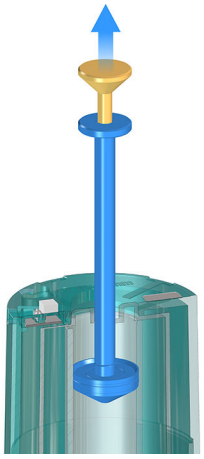
- Release the plunger of the piston tongs and check that the piston tongs are fully seated on the piston.



The piston tongs clasp the piston.

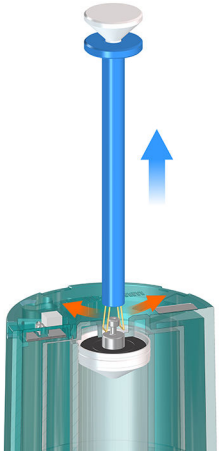
3 Positioning the piston

- Hold the 807 Dosing Unit.
- Hold on to the plunger (yellow) of the piston tongs and carefully pull up the piston until it stops.



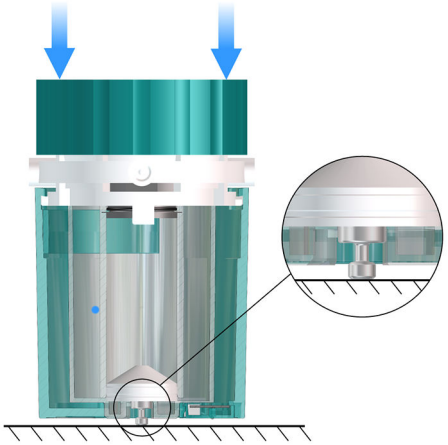
4 Removing the piston tongs

Hold the plunger of the piston tongs pressed down and remove the piston tongs.



5 Checking the position of the piston stopper

- If the piston stopper protrudes beyond the housing (see magnified view), then place the 807 Dosing Unit on a flat surface with the housing facing downwards.
- Carefully push the 807 Dosing Unit vertically onto the support surface.



The piston stopper is positioned flush with the top of the housing so that the dosing drive can be attached to the 807 Dosing Unit.

6.3 Clearing the jamming

A liquid film must always be present between the valve disk and the distributor disk. If the 807 Dosing Unit is used with solvent or pure water, then it could happen that this liquid film will dry out during prolonged downtime periods. This could then lead to the valve disk and the distributor disk adhering to one another so strongly that the 807 Dosing Unit is no longer able to function. It will no longer be possible to switch the stopcock setting in such a case. The control device will announce that the dosing drive is overloaded.

CAUTION

Do **not** attempt to clear the jamming of the disks by applying force or by using manual control commands.

Separating the valve disk and the distributor disk from one another

1. Remove the housing *(see "Removing the housing", page 29)*.
2. Place the rest of the 807 Dosing Unit in warm water for 30 minutes.
3. Carefully release the cylinder base from the distributor by hand without rotating it in order to separate the two disks from one another.

NOTE

If jamming persists, repeat the procedure. Otherwise contact the regional Metrohm service representative.

If the disks stick together repeatedly, Metrohm recommends greasing the valve disk and the distributor disk with PTFE paste for the following titrants:

- H2SO4 solutions
- Nonaqueous alkaline titrants
- Aqueous alkaline solutions
- EDTA solutions
- AgNO3 solutions
- Titrant 5
- KMnO4 solutions

7 Appendix

7.1 Memory chip

The 807 Dosing Unit is equipped with a memory chip which contains the specifications for the 807 Dosing Unit, the tubing connections, and the reagent used. The memory chip can be read and overwritten by a suitable dosing drive.

Specifications for the 807 Dosing Unit and the tubing connections

- Order number of the 807 Dosing Unit
- Serial number of the 807 Dosing Unit
- Serial number of the cylinder
- Tubing length and tubing diameter at the ports
- Validation date
- etc.

Indications on the reagent

- Name of the reagent
- Titer of the reagent
- Concentration of the reagent
- Manufacturing date and expiry date of the reagent
- etc.

The 807 Dosing Unit makes it possible to read and overwrite data with the aid of a suitable device (e.g., Titrando). Whether or not the control device is suitable for this can be found in the respective manual. The contact surfaces for data exchange with the memory chip are made of titanium and are exceptionally resistant to both chemicals and abrasion.

7.2 Dosing accuracy

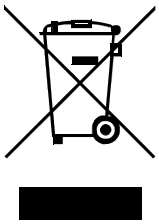
Every 807 Dosing Unit is subjected to a strict quality control prior to shipment. Every 807 Dosing Unit is issued a quality certificate attesting conformance with the quality criteria of Metrohm.

The 807 Dosing Unit meets the following limit values for the maximum systematic measurement deviation and for the maximum permissible measurement deviation. The limit values comply with the **Piston-operated volumetric apparatus – Part 3: Burettes (ISO 8655-3:2022)** standard.

Table 6 Limit values

Cylinder volume (mL)	maximum systematic measurement deviation		maximum permissible measurement deviation	
2 mL	± 0.5%	± 10 µL	± 0.1%	± 2 µL
5 mL	± 0.3%	± 15 µL	± 0.1%	± 5 µL
10 mL	± 0.2%	± 20 µL	± 0.07%	± 7 µL
20 mL	± 0.2%	± 40 µL	± 0.07%	± 14 µL
50 mL	± 0.2%	± 100 µL	± 0.05%	± 25 µL

8 Recycling and disposal



Properly dispose of chemicals and of the product to reduce negative effects on the environment and public health. Local authorities, waste disposal companies or dealers provide more detailed information on disposal. Observe the WEEE EU directive (WEEE = Waste Electrical and Electronic Equipment) for the proper disposal of waste electronic equipment within the European Union.

9 Technical specifications

9.1 Ambient conditions

Nominal function range	+5 to +45 °C (at max. 80% relative humidity, non-condensing)
Storage	+5 to +45 °C (at max. 80% relative humidity, non-condensing)

9.2 Dimensions

Measurements

Diameter	68 mm
Height	100 mm

807 Dosing Unit

Weight

2 mL	180 g
5 mL	190 g
10 mL	190 g
20 mL	210 g
50 mL	240 g

807 Dosing Unit ETFE

Weight

2 mL	190 g
5 mL	190 g
10 mL	190 g
20 mL	200 g
50 mL	220 g

9.3 Housing

807 Dosing Unit

Materials	
Housing	PCTG (polycyclohexylenedimethylene terephthalate glycol-modified)
Centering tube	PCTG (polycyclohexylenedimethylene terephthalate glycol-modified)
Piston	PTFE (polytetrafluoroethylene)
Cylinder	Borosilicate 3.3
Valve disk	Silicone carbide ceramic
Distributor disk	Al_2O_3 ceramic
Distributor	ETFE (ethylene tetrafluorethylene)

807 Dosing Unit ETFE

Materials	
Housing	PVDF (polyvinylidene fluoride)
Centering tube	PVDF (polyvinylidene fluoride)
Piston	PTFE (polytetrafluoroethylene)
Cylinder	ETFE (ethylene tetrafluorethylene)
Valve disk	Silicone carbide ceramic
Distributor disk	Al_2O_3 ceramic
Distributor	ETFE (ethylene tetrafluorethylene)
Degree of protection	IP 40

9.4 Connectors specifications

Electrical contacts	4 spring contacts

9.5 Liquid handling specifications

Cylinder volume 2 mL, 5 mL, 10 mL, 20 mL, 50 mL

Index