806 Exchange Unit

Manual

8.806.8003EN / v6 / 2025-05-16

Metrohm

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Technical Communication
Metrohm AG
CH-9100 Herisau

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.

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1 Overview

1.1 Product description

The 806 Exchange Unit is a versatile piston buret which can be operated with various Metrohm dosing devices or titrators. The 806 Exchange Unit is suitable for simple dosings or titrations.

Specifications concerning the 806 Exchange Unit and the reagent can be stored in the integrated memory chip. This data can be read out and updated by a suitable device.

1.2 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.

1.3 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 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 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.

2.4.2 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.

2.4.3 Filling the cylinder

CAUTION

If a tubing tip is clogged, then it could happen that no liquid will be aspirated when the cylinder is being filled. A vacuum can arise as a result.

If the 806 Exchange Unit is then removed from the device, then the piston may destroy the cylinder.

First, loosen the tubing connections on the cylinder before removing the 806 Exchange Unit. This will eliminate the vacuum.

3 Structure of the 806 Exchange Unit

3.1 Total view

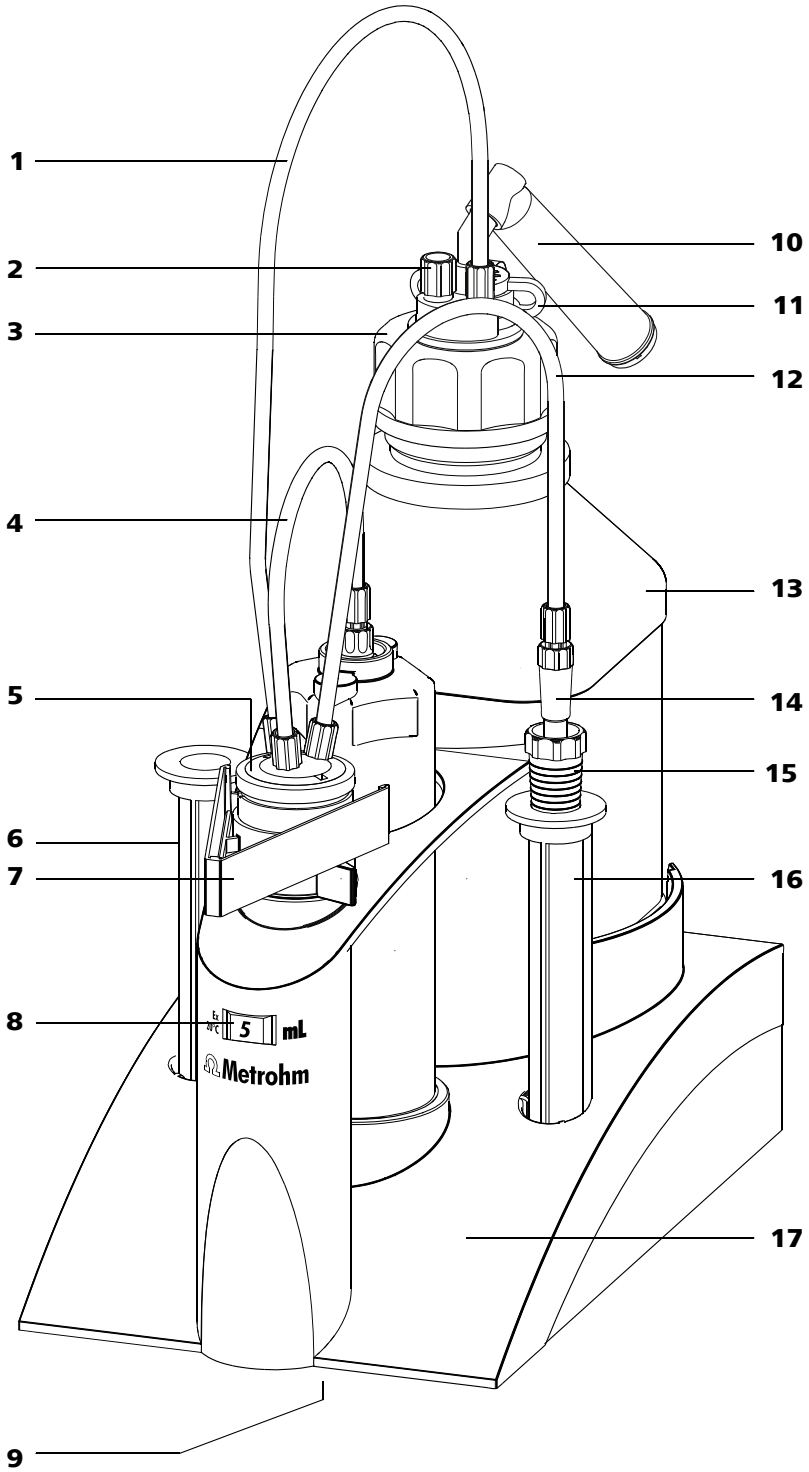


Figure 1 806 Exchange Unit

1 **Tubing connection (6.1805.080)**
Length 25 cm

2 **Threaded stopper (6.1446.080)**

3 **Bottle cap (6.1602.105)**
Made of PFA/PP, GL 45 thread

4 **Tubing connection (6.1805.010)**
Length 13 cm (6.1805.050 for 1 mL cylinder)

5 **PCTFE/PTFE flat stopcock (6.1542.020)**
Or 6.1542.010 ceramic stopcock

6 **Vessel (6.1228.000)**
For tubing tips or electrodes

7 **Card holder (6.2046.070)**
For name plates

8 **Nominal volume**

9 **Memory chip**
On the underside

10 **Adsorber tube (6.1619.010)**

11 **Ground-joint clip (6.2023.020)**
Made of POM

12 **Tubing connection (6.1805.100)**
Length 40 cm

13 **Bottle with thread (6.1608.23)**
Amber glass, GL 45 thread

14 **Antidiffusion tip (6.1543.200)**
Made of ETFE/FEP, for titrations

15 **Link stopper (6.1446.030)**

16 **Vessel (6.1228.000)**
For tubing tips or electrodes

17 **Main body (6.1576.XXX)**
.110 for 1 mL cylinder
.150 for 5 mL cylinder
.210 for 10 mL cylinder
.220 for 20 mL cylinder
.250 for 50 mL cylinder

3.2 Single parts of the 806 Exchange Unit

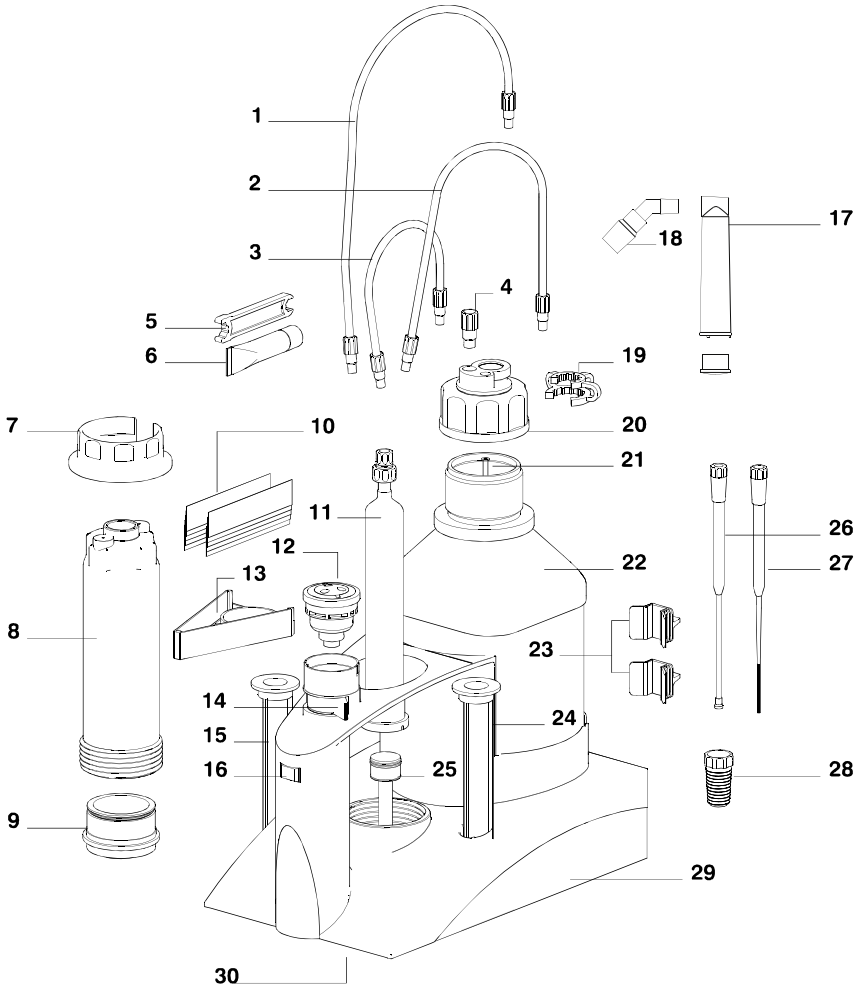


Figure 2 806 Exchange Unit - Single parts

1	**Tubing connection (6.1805.080)** Length 25 cm	**2**	**Tubing connection (6.1805.100)** Length 40 cm
3	**Tubing connection (6.1805.010)** Length 13 cm (6.1805.050 for 1 mL cylinder)	**4**	**Threaded stopper (6.1446.080)**
5	**Wrench (6.2739.000)** For loosening the tubing nipples	**6**	**Paraffin grease (6.2803.010)** For piston, 2 g
7	**Insert for wrench (6.2739.030)** For loosening the light protection	**8**	**Light protection (6.1563.030)** Made of PETG

9 **Mounting ring for cylinder (6.2045.XXX)**
.000 for 5 mL cylinder and 10 mL cylinder
.010 for 20 mL cylinder
.020 for 50 mL cylinder

10 **Name plates (6.2244.020)**
For labeling the reagent, 10 x

11 **Cylinder (6.1518.XXX)**
Clear glass
.113 1 mL cylinder
.150 5 mL cylinder
.210 10 mL cylinder
.220 20 mL cylinder
.250 50 mL cylinder

12 **Flat stopcock**
6.1542.020 PCTFE/PTFE
6.1542.010 ceramic

13 **Card holder (6.2046.070)**
For name plates

14 **Switching lever**
For switching the flat stopcock

15 **Vessel (6.1228.000)**
For tubing tips or electrodes

16 **Nominal volume**

17 **Adsorber tube (6.1619.010)**

18 **Adapter SGJ 14 for adsorber tube**
Made of ETFE

19 **Ground-joint clip (6.2023.020)**
Made of POM

20 **Bottle cap (6.1602.105)**
Made of PFA/PP, GL 45 thread

21 **Cannula (6.1819.020)**
Made of FEP, thread M6

22 **Bottle with thread (6.1608.23)**
Amber glass, GL 45 thread

23 **Holding clips (6.2043.005)**
For reagent bottles

24 **Vessel (6.1228.000)**
For tubing tips or electrodes

25 **Piston (6.1556.XXX)**
with coupling
.110 for 1 mL cylinder
.150 for 5 mL cylinder
.210 for 10 mL cylinder
.220 for 20 mL cylinder
.250 for 50 mL cylinder

26 **Antidiffusion tip (6.1543.200)**
Made of ETFE/FEP, for titrations

27 **Dosing tip (6.1543.060)**
Made of ETFE/FEP, for dosings

28 **Link stopper (6.1446.030)**

29 **Main body (6.1576.XXX)**
.110 for 1 mL cylinder
.150 for 5 mL cylinder
.210 for 10 mL cylinder
.220 for 20 mL cylinder
.250 for 50 mL cylinder

30 **Memory chip**
On the underside

4 Installation

4.1 Setting up the device

4.1.1 Packaging

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

4.1.2 Checks

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 Metrohm representative.

4.1.3 Location

The instrument has been developed for operation indoors and may not be used in explosive environments.

Place the instrument in a location of the laboratory which is suitable for operation and free of vibrations and which provides protection against corrosive atmosphere and contamination by chemicals.

The instrument should be protected against excessive temperature fluctuations and direct sunlight.

4.2 Start-up

4.2.1 Preparing the 806 Exchange Unit

Required accessories:

- Wrench (6.2739.000)

1 Mount the holding clamps so that the reagent bottle is secure.

2 Check whether the reagent bottle contains solvent.

3 Fill the adsorber tube with a suitable adsorber.

CO_2 adsorption: Soda lime

KF reagent: Molecular sieve

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

4 Place the filled adsorber tube on the reagent bottle.

5 Check whether the tubing connections are tightened. If necessary, tighten the tubing connections with the wrench.

NOTE

Use no other aids. The threads of the screw nipples and the tubing openings must not be deformed.

6 Write the solution name in the reagent bottle on a colored label.

7 Slide the label into the label holder.

8 Store the tubing tip or the electrode in the 2 vessels.

Use of original reagent bottles

A special bottle cap or a thread adapter may also be required with the supplied standard bottle cap (6.1602.105):

Bottle cap	Order number
Bottles with GL 45 thread	Standard
Bottles with S40 thread	6.1602.115
Bottles with GL32 thread	6.1602.105 / 6.1618.000
Bottles with 28 mm thread	6.1602.105 / 6.1618.010

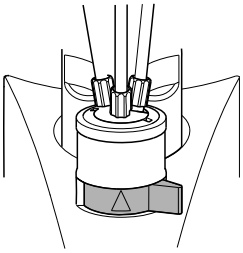
4.2.2 Attaching the 806 Exchange Unit

Required accessories:

- Wrench (6.2739.010, standard accessory of the dosing device or titrator)

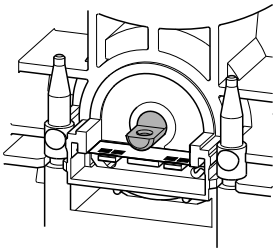
1 Before attaching the 806 Exchange Unit, check whether the stopcock can be rotated manually with the switching lever.

To attach, the switching lever must point to the right (stopcock in dosing position). The arrow marking must point upwards.



2 Check the position of the piston rod on the underside of the 806 Exchange Unit.

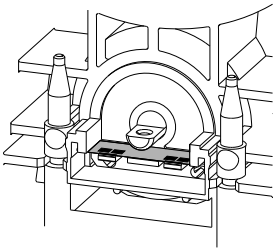
The recess in the piston rod must be flush with the base of the 806 Exchange Unit and the smooth surface with the opening must face backwards.



3 If necessary, correct the position of the piston rod with the wrench.

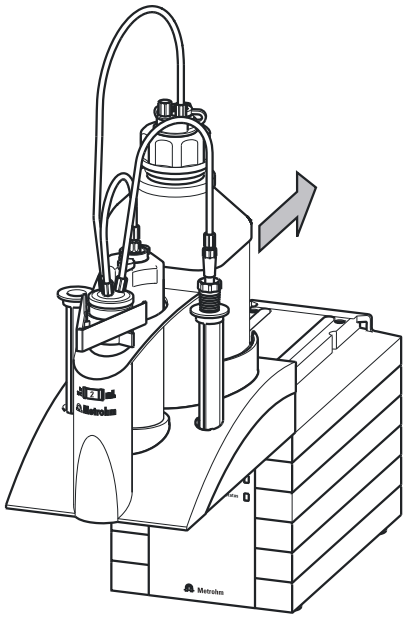
NOTE

The memory chip can be damaged if the wrench is handled carelessly. Do not touch the white ceramic carrier of the memory chip.



4 Attach the 806 Exchange Unit from the front onto the control device and push it all the way to the rear so that it snaps in place and the **Status**LED LED flashes slowly.

The 806 Exchange Unit must snap in audibly.



5 If the 806 Exchange Unit does not snap into place, check the following:

- Position of the piston rod
- Stopcock position of the 806 Exchange Unit

The switching lever must point to the right (stopcock in dosing position). The arrow marking must point upwards (*see step 1*).

Once the 806 Exchange Unit is attached correctly, its initialization is activated by a microswitch which is triggered by the guide bolts of the 806 Exchange Unit. The 806 Exchange Unit is recognized and the data is read out automatically from the memory chip.

The control device carries out an automatic rotation of the stopcock and then returns it to the dosing position.

Afterwards, the **Status** LED on the control device is continuously illuminated.

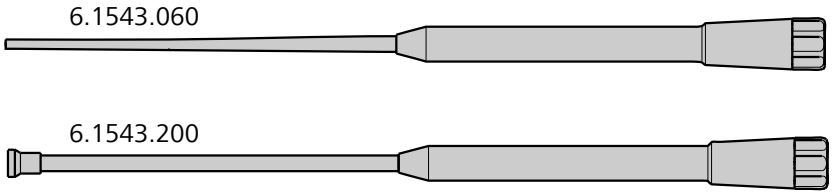
4.2.3 Filling tubings

The procedure for filling the tubings of the 806 Exchange Unit depends on the control device and the control software. For manual dosing and filling, read the respective manual.

The **Preparing** or **PREP** function of the control software is used to rinse the cylinder and tubings of the 806 Exchange Unit and fill them free of air bubbles. Carry out this function before the first determination or once a day.

4.2.4 Tubing tips

The following tubing tips are included in the standard equipment of the 806 Exchange Unit:



Dosing tip 6.1543.060

The dosing tip is suitable for tasks during which the tip is not immersed, e.g., dosings.

The tubing tip can be stored in the same solvent as the one contained in the reagent in order to prevent reagent crystallization in the tip.

Metrohm recommends filling the storage vessel with the solvent and placing the tubing tip in it. If a KF reagent is used as a titrant, then store the dosing tip in methanol or ethanol.

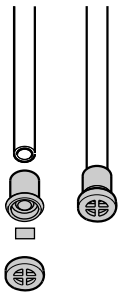
Antidiffusion tip 6.1543.200

The antidiffusion tip is used for work requiring the immersion of the tip, e.g., titrations.

This antidiffusion valve prevents the diffusion of liquids into the tubing tip.

The pressure of the surrounding 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.

4.2.5 Removing the 806 Exchange Unit

1 Perform the 'Filling' function on the control device.

NOTE

If the piston of the 806 Exchange Unit or the push rod of the drive is not in the zero position, then do not remove the 806 Exchange Unit.

2 Carefully remove the 806 Exchange Unit towards the front.

If the 806 Exchange Unit cannot be removed, then check the status of the control device.

3 If the control instrument is still busy, then press the <STOP> button and wait until the device is ready.

4 If the control device is overloaded and displays a corresponding error message, then switch the device off and on again.

5 If the device indicates that it is busy filling the cylinder but nothing seems to be moving, then the filling rate may be set too low. Attempt to increase the filling rate and wait until the device is ready.

4.3 Mounting single parts

4.3.1 Mounting the thermostat casing

If a solvent with a constant temperature is required for a titration, then the thermostat casing (6.1563.040) is used. Water is pumped through the thermostat casing at a specific temperature, keeping the temperature of the content of the cylinder constant.

The thermostat casing may be operated only with a thermostat that has a pressure pump and an aspiration pump (the inlet pressure must not be too high). The thermostat casing may be used only within a temperature range of 15–50 °C.

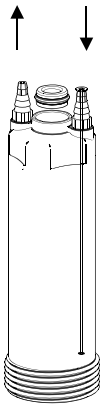


Figure 3 Thermostat casing

1 Loosen the tubing connection to the cylinder.

2 Unscrew the light protection.

3 Unscrew the cylinder with the holder.

4 Loosen the screw nipple at the cylinder.

5 Roll the O-ring upwards out of the groove on the glass support. Do not use any hard objects to remove the O-ring, otherwise the edge of the glass support may chip.

6 Replace the coupling nut of the cylinder with the sealing ring of the thermostat casing (threaded side facing upwards).

7 Lightly grease the O-ring and attach it to the glass support.

8 Tighten the sealing ring with the screw nipple.

9 Insert the cylinder with the holder into the thermostat casing and press firmly.

10 Screw the thermostat casing with the cylinder in the main body.

11 Connect thermostat tubings.

4.3.2 Mounting the flat stopcock

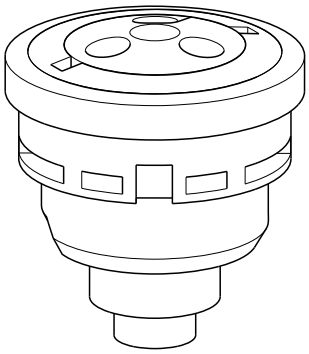


Figure 4 Flat stopcock

1 Check whether the stopcock can be moved. Rotate the lower and upper parts of the flat stopcock towards one another. To install the stopcock, rotate the lower part to the right as far as it will go, i.e., clockwise.

2 Check whether the switching lever points to the right.

3 Insert the stopcock into the holder *(see figure 2, page 9)*.

Align the rectangular recess of the stopcock with the groove on the edge (left side) of the holder.

4 Check whether the stopcock can be moved with the switching lever.

5 Rotate the switching lever to the right to the dosing position.

6 Attach the 806 Exchange Unit onto a control device.

Flat stopcock types

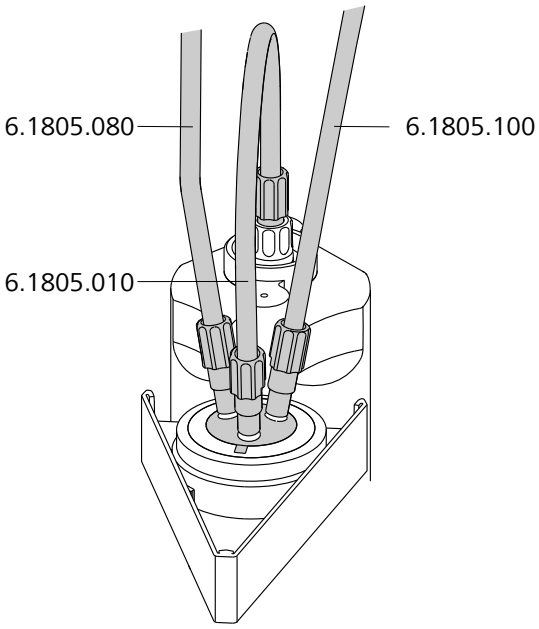
A PCTFE/PTFE stopcock (6.1542.020, standard equipment) and a ceramic stopcock (6.1542.010) are available and can be ordered separately. If hard crystals can precipitate from the solution, then the ceramic stopcock is more suitable. Metrohm recommends the PCTFE/PTFE stopcock for reagents that are only used occasionally or if soft crystals precipitate. The PCTFE/PTFE stopcock is subject to a certain amount of wear. This stopcock therefore needs to be replaced more frequently than the ceramic stopcock.

Metrohm recommends the following flat stopcock type:

Solution	6.1542.020 PCTFE/PTFE	6.1542.010 ceramic
Alkali, aqueous	•	•
EDTA, complexone	•	
HClO4 in glacial acetic acid	•	•
Iodine solution	•	
Karl Fischer reagent	•	
KOH in ethanol	•	•
Organic solvent	•	
Permanganate, KMnO4	•	
Acids, aqueous	•	
Silver nitrate, AgNO3	•	•
TBAOH	•	
Thiosulfate, Na2S2O3	•	•

4.3.3 Mounting tubings on the flat stopcock

Mounting tubings on the flat stopcock



Required accessories:

- Tubing 1 (6.1805.080)
- Tubing 2 (6.1805.010)

- Tubing 3 (6.1805.100)
- Wrench (6.2739.000)

1 Screw tubing 1 to the flat stopcock and to the bottle cap of the reagent bottle.

2 Screw tubing 2 to the flat stopcock and to the cylinder.

3 Screw tubing 3 to the flat stopcock.

4 Screw the tubing tip on tubing 3.

5 Tighten the tubing connections by hand or, if necessary, with the wrench.

NOTE

Use no other aids. The thread of the screw nipple and the tubing openings must not be deformed.

6 Trigger the 'Filling' function.

7 Fill the tubings by dosing and filling the cylinder multiple times or by using the PREP/Preparing function.

Air bubbles are expelled by repeated dosing and filling. It is important that the tubing connection between the cylinder unit 806 and the flat stopcock is free of bubbles. If necessary, tapping against the tubing helps to remove any remaining bubbles.

5 Mode of operation

5.1 Filling and dosing the cylinder

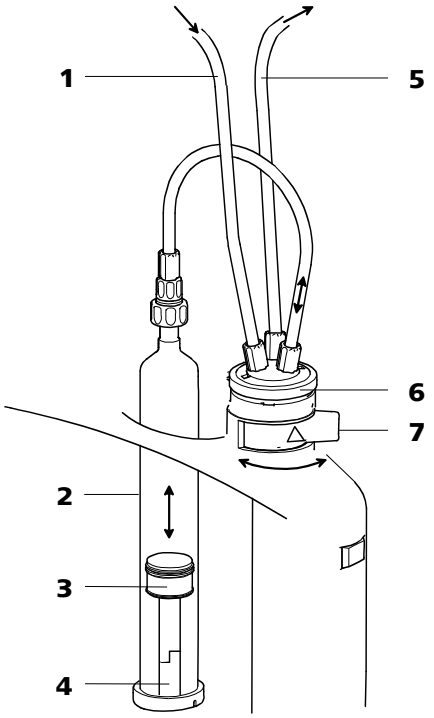


Figure 5 Dosing/filling

1	**Filling tubing** For aspirating solvent from the reagent bottle.	**2**	**Cylinder** Contains the solution for dosing. Volume 1 mL, 5 mL, 10 mL, 20 mL or 50 mL.
3	**Piston** For ejecting and aspirating a solution.	**4**	**Push rod** With coupling. For moving the piston in the cylinder unit 806.
5	**Dosing tubing** For dosing the solvent via the tubing tip.	**6**	**Flat stopcock** For switching between filling and emptying the cylinder.
7	**Switching lever** For manually switching the flat stopcock.		

When a titrant is ejected, the push rod of the drive propels the piston in the cylinder upward. The flat stopcock is thereby in the dosing position.

The switching lever points to the right. The liquid in the cylinder is pressed through the flat stopcock into the dosing tubing.

After flat stopcock switching, i.e., flat stopcock rotation (switching lever points to the left), liquid is aspirated from the filling tubing by pulling the piston downwards from the push rod of the drive.

Because the 806 Exchange Unit is interchangeable, the coupling of the push rod exhibits a slight mechanical tolerance that has an effect on the dosing accuracy when the piston changes its movement direction. This tolerance is mechanically compensated for by the drive in automatic runs.

The piston movements are controlled by the precise electronic fine mechanics of the drive. Independent of the cylinder volume, it exhibits a resolution of 20,000 increments across the entire piston stroke.

The rate at which a solution is to be dosed and the rate at which the cylinder is to be filled depend on the cylinder volume of the 806 Exchange Unit. The maximum and minimum filling rates and dosing rates are as follows:

Cylinder volume (mL)	1	5	10	20	50
maximum filling rate/dosing rate (mL/min)	3	15	30	60	150
Minimum filling rate/dosing rate (µL/min)	10 (depending on device)				

NOTE

If viscous solutions are dosed or if tubing is used that is thinner than standard tubing, then the rate needs to be reduced accordingly so that the drive is not overloaded.

6 Operation and maintenance

6.1 Care and maintenance

The 806 Exchange Unit requires appropriate care.

NOTE

Piston burets of the 806 Exchange Unit type must be monitored and cleaned at regular intervals.

Metrohm recommends monthly inspections in the event that alkaline, corrosive or high-concentration reagents are used. If non-problematic reagents are used, then the inspection intervals can be extended to several months.

6.1.1 Disassembling the cylinder unit 806

Metrohm recommends disassembling and cleaning the cylinder unit 806 when replacing reagents.

The piston and cylinder of the 806 Exchange Unit can be checked at the same time. When using alkaline, corrosive or highly concentrated reagents, check whether the glass cylinder has been attacked by aggressive alkalis, for example, or whether solids have crystallized out of the solution.

WARNING

Do not dismantle the cylinder unit 806 on the drive. Remove the 806 Exchange Unit from the control device before loosening the tubing connections. Leaking reagents can seep into the device.

Required accessories:

- Wrench (6.2739.010)
- Insert (6.2739.030)

1 Eject the reagent as far as possible without refilling the cylinder.

2 Loosen the tubing connection on the reagent bottle.

3 Execute the 'Filling' function to bring the piston to the zero position.

4 Remove the 806 Exchange Unit from the drive.

5 Remove all tubing.

6 Unscrew and pull out the cylinder unit 806 with light protection or thermostat casing. If necessary, use the wrench with the insert to loosen the light protection.

7 Press on the cylinder screw connection and pull the cylinder holder with the cylinder out of the light protection.

8 Pull off the glass cylinder holder upwards.

9 Use the wrench to empty the cylinder completely and then carefully pull out the piston.

6.1.2 Cleaning the cylinder and piston

Required accessories:

- Paraffin grease (6.2803.010)

1 Check the leak-tightness of the piston and cylinder.

If there is liquid under the piston, then the cylinder is either insufficiently greased or not at all. Check the piston for deformation or damage to the sealing lips. The piston and the cylinder must be replaced in the event that any changes are discovered.

2 Clean the cylinder and piston with a liquid cleaning agent.

NOTE

Do not use any abrasive cleaning powder that could scratch the cylinder.

3 Rinse the single parts with deionized (or distilled) water.

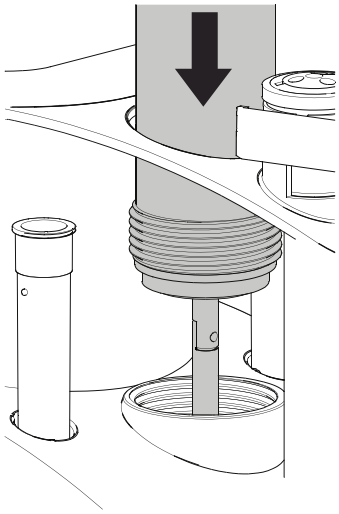
4 Degrease the piston and cylinder with a suitable cleaning agent or solvent and clean in an ultrasonic bath if necessary. Follow the cleaning agent manufacturer's recommendations.

5 Lightly grease the sides of the piston with paraffin grease. Wipe off the edge of the piston so that the reagent does not come into contact with the grease. Wipe off excess grease with a soft, lint-free cloth. The piston should not be greased for pipetting.

6 Check the piston and cylinder for any changes once more before assembling the 806 Exchange Unit. If the cylinder has scratches or rough surfaces, then replace the cylinder.

6.1.3 Assembling the cylinder unit 806

Mounting the cylinder



1 Carefully insert the greased piston approx. 1 cm into the cylinder.

2 Place the cylinder holder over the cylinder from above (O-ring must be on top) and press firmly.

3 Insert the cylinder with the holder into the light protection and press firmly.

4 Attach the 806 Exchange Unit onto a control device.

5 Manually dose until the push rod of the drive protrudes slightly from the main body of the 806 Exchange Unit.

6 Insert the cylinder with the light protection into the cylinder holder from above.

7 Lock the piston rod with the push rod of the drive. The hook of the push rod must fit snugly into the opening of the piston rod (see figure).

8 Carefully press the light protection downwards and screw it into the thread of the main body. The piston is thereby pressed into the cylinder.

9 Dose manually and move the piston upward to the stop.

6.1.4 Flat stopcock blocked

1 Check whether the stopcock is in the dosing position. The switching lever must point to the right.

2 Release the flat stopcock from the holder. To do this, rotate the card holder to the left and lift the clip on the side of the holder slightly with your fingernail or a pointed object.

The flat stopcock can be removed from the holder.

3 Place the stopcock in a solvent.

- For aqueous solutions – hot water
- For non-aqueous solutions – suitable solvent (see chapter 8)
- For KF reagent – methanol, then water, then methanol.

4 If necessary, clean the stopcock with a suitable solvent (see above) in an ultrasonic bath and then allow it to dry.

5 As soon as the stopcock can be moved again, reinsert the stopcock into the 806 Exchange Unit (see above).

6.2 Chemical resistance and materials

The 806 Exchange Unit is designed for use with aqueous solutions and the most common solvents.

The temperature of the dosing material must not exceed 50 °C. The 806 Exchange Unit unit and its components cannot be autoclaved. The sterility of a germ-free dosing material cannot be guaranteed.

6.2.1 Solutions

Different solutions can be dosed with the 806 Exchange Unit. The materials of the single parts have been selected for maximum resistance to chemicals and functionality.

It is not to be assumed, however, that all types of aggressive or high-concentration solutions 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.

Many problems involving aggressive media can be prevented by regular cleaning and checks.

6.2.2 Main body

The main body is made of polybutylene terephthalate and is only partially resistant to chemicals.

Good resistance	Acids, organic solvents
Limited resistance	Alkalis (with a concentration > 1 M)

The 806 Exchange Unit is not dishwasher-safe. However, it is usually sufficient to clean the 806 Exchange Unit with lukewarm water and dishwashing detergent.

6.2.3 Materials

Main body	PBT (polybutylene terephthalate)
Piston	PTFE (polytetrafluoroethylene)
Cylinder	Borosilicate 3. 3
Flat stopcock	PCTFE/PTFE or ceramic
Light protection	PETG (poly(ethylene terephthalate), glycol-modified) or PVDF

6.3 GLP - Validation

Every 806 Exchange Unit and every dosing drive manufactured by Metrohm is subjected to rigorous quality controls prior to shipment. Every 806 Exchange 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 instruments with respect to precision and correctness 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 806 Exchange Unit type and dosing drives with respect to accuracy. Metrohm recommends an accuracy inspection whenever a cylinder and/or a piston of a 806 Exchange Unit has been replaced.

Piston burets of the 806 Exchange Unit type with glass cylinders can be inspected according to the standard **Piston-operated volumetric apparatus - Part 3: Burets (ISO 8655-3:2022)**.

7 Troubleshooting

7.1 Problems

Problem	Cause	Remedy
806 Exchange Unit recognized either not at all or incorrectly	*The 806 Exchange Unit has not been attached correctly.*	▪ Remove the 806 Exchange Unit and reattach it. ▪ Check the correct placement of the 806 Exchange Unit. ▪ Check the position of the piston and the stopcock. ▪ Switch the device off and then back on again. ▪ Contact the regional Metrohm service representative.
Air bubbles are in the cylinder or in the dosing tubing.	*Leaking connection*	▪ Check the tubing ends, in particular the tubing end of the aspiration tubing. ▪ Tighten all of the tubing connections with the wrench (6.2739.000). ▪ Check the lock release mechanism of the housing. Remove and reattach the housing if required.
	The reagent degasses excessively, e.g., released air forms bubbles.	▪ Carry out **[PREP]** / **[Preparing]** ▪ Reduce the filling rate. ▪ Degas the reagent with ultrasound, nitrogen or in a vacuum if required.
	Wear	Replacing piston and cylinder.
	***[PREP]** / **[Preparing]** is not carried out or false parameters-*	▪ Carry out **[PREP]** / **[Preparing]**. ▪ Correct the tubing length and tubing diameter.
No dosing takes place at all.	*The tubing connections are jammed or the 806 Exchange Unit is not assembled correctly.*	▪ Check whether the tubings are correctly connected. ▪ Check whether the dosing tip is blocked. ▪ Check whether the filling tubing is blocked.

Problem	Cause	Remedy
		▪ Check whether all of the openings of the bottle cap have accidentally been closed (vacuum in the supply bottle!). One of the openings must be open as pressure equalization or has to be equipped with an (open) adsorber tube. ▪ Remove the 806 Exchange Unit and check whether the piston is connected to the push rod of the drive.
The 806 Exchange Unit doses an incorrect volume.	*The 806 Exchange Unit is either mounted or assembled incorrectly.*	▪ Remove the 806 Exchange Unit and reattach it. ▪ Check whether the nominal volume on the housing and the effective cylinder volume match one another.
The data of the 806 Exchange Unit cannot be read.	*The memory chip of the 806 Exchange Unit is mechanically damaged or impaired by chemicals.*	▪ Remove the 806 Exchange Unit and reattach it. ▪ Clean the memory chip and the contact surfaces. ▪ Have the memory chip replaced by the regional Metrohm service representative.
The flat stopcock is blocked.	*The stopcock is contaminated, corroded or worn out.*	▪ Carefully loosen the stopcock out of its holder. Switch the control device off and then back on again. ▪ Put the stopcock into water with a small amount of dishwashing detergent or into ethanol, and if necessary clean it with ultrasound. Rinse it thoroughly and place it again into the stopcock holder. ▪ Replace the defective stopcock.
The 806 Exchange Unit cannot be attached.	*The stopcock of the 806 Exchange Unit is not in the exchange position.*	Switch the flat stopcock manually to the exchange position (switching lever directed to the right).
	The piston rod in the 806 Exchange Unit is not in the right position.	Move the piston rod into the correct position *(see chapter 4.2.2, page 13)*.
	The push rod of the drive is misaligned.	Switch the device off and then back on again.

Problem	Cause	Remedy
The 806 Exchange Unit cannot be removed and the "Status" LED flashes slowly.	*It is being dosed or filled and/or the dosing drive is not in the exchange position.*	Stop the run or carry out the "Filling" function.
Die "Status" LED does not light up, even though an 806 Exchange Unit is attached.	*The 806 Exchange Unit has not been attached correctly.*	Remove the 806 Exchange Unit and reattach it until it snaps into place. The LED flashes while data is read out from an intelligent 806 Exchange Unit. The LED lights up continuously as soon as the 806 Exchange Unit has been recognized correctly.
The "Status" LED flashes rapidly.	*The dosing drive is overloaded because the stopcock is jammed.*	Switch off the control device. Check whether the 806 Exchange Unit can be removed. If the 806 Exchange Unit cannot be removed, then check whether the stopcock can be rotated. Manually move the stopcock to the exchange position by rotating the stopcock to the right. Remove the 806 Exchange Unit.
	The dosing drive is overloaded because the piston is jammed.	Switch the control device off and then back on again. The dosing device is being initialized during switching on. Remove and clean the 806 Exchange Unit. If the 806 Exchange Unit cannot be removed, then contact the regional Metrohm service representative.
	The data of the 806 Exchange Unit cannot be read because the memory chip has been damaged mechanically or by chemicals.	Have the memory chip replaced by the regional Metrohm service representative. Until the memory chip is being replaced, you can remove the memory chip yourself in order to be able to still use the 806 Exchange Unit. The cylinder volume is automatically recognized nevertheless, but no data can be read from the 806 Exchange Unit nor be saved on the memory chip anymore.

8 Appendix

8.1 Memory chip

The 806 Exchange Unit is equipped with a memory chip which contains the specifications for the 806 Exchange Unit, the tubing connections, and the reagent used.

Specifications for the 806 Exchange Unit and the tubing connections

- Order number of the 806 Exchange Unit
- Serial number of the 806 Exchange Unit
- Serial number of the cylinder
- Tubing length and tubing diameter at the ports
- Validation date

Indications on the reagent

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

The 806 Exchange Unit makes it possible to read and overwrite data with the aid of a suitable device (e.g., Titrando or sample changer). Whether the Metrohm device is suitable can be found in the respective manual.

8.2 Dosing accuracy

Every 806 Exchange Unit is subjected to a strict quality control prior to shipment. Every 806 Exchange Unit is issued a quality certificate attesting conformance with the strict quality criteria of Metrohm.

8.2.1 Typical measurement deviation

The accuracy of products of the 806 Exchange Unit type can be seen in the following table. The values listed are to be regarded as typical values which can be achieved with a Titrando, for example.

Table 1 Typical measurement deviation of the Metrohm 806 Exchange Unit

Cylinder volume	maximum systematic deviation
1 mL	± 3 µL

Cylinder volume	maximum systematic deviation
5 mL	± 15 µL
10 mL	± 20 µL
20 mL	± 30 µL
50 mL	± 50 µL

8.2.2 ISO/EN/DIN standard 8655-3

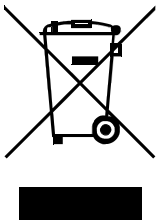
The Metrohm 806 Exchange Unit fulfills the requirements of the ISO/EN/DIN standard 8655-3 **Volumetric apparatus with pistons – Part 3: Piston burets**. Metrohm guarantees that the 806 Exchange Unit are in compliance with the following limit values at the time of shipment:

Table 2 Permissible limit values as per ISO/EN/DIN 8655-3

Cylinder volume	maximum systematic measurement deviation		maximum permissible measurement deviation	
1 mL	± 0.6%	± 6 µL	± 0.1%	± 1 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

The regional Metrohm service representatives worldwide offer the possibility of on-site inspections and certifications of devices of the 805 Dosimat type and piston burets of the 806 Exchange Unit type with respect to accuracy. Metrohm recommends an accuracy inspection whenever a cylinder and/or a piston of a 806 Exchange Unit has been replaced.

9 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.

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