

Dosino Module



2.1042.00x0

Manual

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1 Overview

1.1 Product description

The Dosino Module is an external dosing drive which can be used with a number of Metrohm dosing devices or titrators. The Dosino Module together with the 807 Dosing Unit with cylinder sizes of 2 mL, 5 mL, 10 mL, 20 mL or 50 mL is suitable for simple dosings and titrations, and for complex automation tasks and liquid handling tasks, e.g., sample transfer or pipetting procedures.

The following product versions of the 807 Dosing Unit can be used with the Dosino Module:

- 807 Dosing Unit with glass cylinder (6.1580.xx0 and 6.3032.xx0)
- 807 Dosing Unit ETFE (6.1575.xx0)

 Only product versions of the 807 Dosing Unit with a dual memory chip (white) can be used with the Dosino Module.

The Dosino Module is attached directly to the bottle together with the 807 Dosing Unit. A selection of thread adapters ensures optimum seating on the various bottle types and threads. This type of assembly results in a very space-saving installation. The Dosino Module cannot be damaged by escaping liquid because the reagent is below the dosing drive.

With the combination of Dosino Module and 807 Dosing Unit, reagents can be changed with the lowest possible loss of reagent, due to the fact that the design of the 807 Dosing Unit has been optimized for a minimum dead volume. In the event of frequent reagent replacement, the 807 Dosing Unit can remain mounted on the bottle. The Dosino Module is removed and attached to the next 807 Dosing Unit.

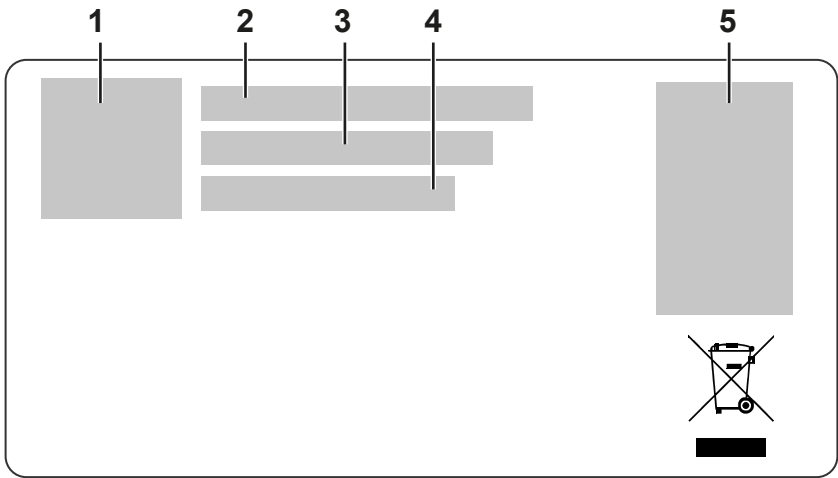
1.2 Product versions

The product is available in the following versions:

Table 1 Product versions

Article number	Designation
2.1042.0010	Dosino Module (with 0.75 m cable)
2.1042.0020	Dosino Module (with 2 m cable)

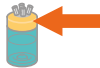
The article number and serial number for identification of the product can be found on the type label:



1	QR code	2	(01) = Article number in accordance with GS1 standard
3	(21) = Serial number	4	(240) = Metrohm article number
5	Certification		

1.3 About the documentation

Possible depictions in the documentation:

Depiction	Meaning
	Cross-reference to figure legend (Figure number - Element in the figure)
	Instruction step
Method	Parameters, menu items, tabs, and dialogs
File ► New	Menu path
[Continue]	Button or key
	Supplementary information to the descriptive text
	Note In graphics, orange arrows or frames indicate the reference to the descriptive text. The relevant elements may also be colored orange.
	Movement In graphics, blue arrows indicate the movement direction. The elements to be moved may also be colored blue.

1.4 Additional information

Additional information on the product is available on the following pages:

- Metrohm website <https://www.metrohm.com> – Overview of product family, documents as PDF, details of accessories, and information on applications.
- Software help for the control software [Metrohm Knowledge Base](#) – Thematically filtered individual content, videos, information on the control software.

2 Safety

2.1 Intended use

The Dosino Module is designed for simple dosings and titrations and for complex automation tasks and liquid handling tasks. The product is suitable only for operation indoors and may not be used in potentially explosive or fire-hazard environments.

Chemicals and samples can be processed with the Dosino Module. Usage therefore requires the user to have basic knowledge and experience in handling chemicals.

The Dosino Module may be used only with the product versions of the 807 Dosing Unit and with a control instrument with MDL connector.

2.2 Responsibility of the operator

The operator has the following responsibilities:

- Observe applicable national, regional, and local regulations.
- 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 personnel on basic occupational safety and accident prevention regulations.
- Provide personal protective equipment (e.g., protective glasses, gloves).
- Provide suitable tools and equipment for safe execution of work.

The product may be used only when its status is perfect. 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.

2.4.2 **Danger from biological and chemical hazardous substances**

Contact with biological hazardous substances may cause poisoning from toxins or infections from microorganisms. Contact with aggressive chemical substances may cause poisoning or chemical burns. To avoid danger from biological or chemical hazardous substances, observe the following:

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

2.4.3 **Danger from highly flammable substances**

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

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

2.4.4 **Danger from leaking liquids**

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

- Check the product and its accessories for leakages and loose connections.
- Replace leaking components and connecting elements without delay.
- Only use stirring bars that are the right length for the vessel size.
- Tighten loose connecting elements.
- Do not loosen tubing connections under pressure.
- Do not remove aspiration tubing under pressure.
- Carefully pull the tubing ends out of the vessels.
- Carefully allow liquids from the tubing to drain into suitable vessels.
- Insert the tubing tips completely into the vessels.

- Remove and dispose of escaping liquids in accordance with regulations.
- If you suspect that liquid has penetrated the instrument, disconnect the instrument from the energy supply. Then have the instrument checked by a regional Metrohm service representative.

2.4.5 Danger during transport of the product

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

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

2.5 Design of warning messages

The present documentation uses warning messages as follows.

Structure

1. Severity of the danger (signal word)
2. Type and source of danger
3. Consequences of disregarding the danger
4. Measures for averting the danger

Hazard levels

Signal color and signal word designate the hazard level.



DANGER

Indicates an immediate danger. It will result in serious injuries or death if not avoided.



WARNING

Indicates a potential danger. Failure to avoid the danger may result in death or serious injury.



CAUTION

Indicates a potential danger. If not avoided, it may result in light or minor injuries.

NOTICE

Indicates a potentially damaging situation. If not avoided, the product or something in the surrounding area could be damaged.

2.6 Meaning of warning signs

Warning signs on the product or in the documentation indicate potential dangers or draw attention to certain behaviors in order to avoid accidents or damage.

Depending on the application purpose, the operating company attaches additional warning signs to the product. The corresponding instructions of the operator must be followed.

Table 2 Warning signs according to ISO 7010 (examples)

Warning signs / meaning		Warning signs / meaning	
	General warning sign		Warning of hot surface
	Warning of sharp object (cut/puncture)		Warning of hand injuries (crushing)
	Warning of electrical voltage		Warning of corrosive substances
	Warning of optical radiation		Warning of a laser beam
	Warning of flammable materials		Warning of biological hazard
	Warning of toxic materials		

5 Drive pin

Protruding pins on the drive disk for the rotation of the stopcock.

6 Contact surfaces

To read data from the 807 Dosing Unit memory chip with a suitable device/instrument (e.g., IONIC Titrator or OMNIS Titrator) and write new data to the memory chip.

7 Push rod

With coupling. For moving the piston in the 807 Dosing Unit.

8 Drive disk**Function**

The Dosino Module is a module for software-controlled, accurate dosing of liquids and only works in combination with an instrument with an electrical connection.

The Dosino Module is equipped with the following functional units:

- MDL interface for connecting to an instrument with an electrical connection
- Exchangeable 807 Dosing Unit

Together with an 807 Dosing Unit, the Dosino Module is suitable for simple dosing tasks or complex liquid handling applications. The Dosino Module can be attached to an 807 Dosing Unit and removed again. With attachment, the integrated piston in the 807 Dosing Unit is coupled with the push rod of the dosing drive of the Dosino Module. The drive pin of the dosing drive is inserted into the recess provided in the centering tube in the 807 Dosing Unit.

The Dosino Module performs the following functions as soon as the Dosino Module is attached to the 807 Dosing Unit:

- **Raise and lower the piston:**
The solution is aspirated as soon as the piston rises. The cylinder fills up.
The solution is dosed as soon as the piston is lowered. The cylinder empties.
- **Change port:**
The rotation of the valve disk controls which of the 4 ports the solution flows through.

3.2 807 Dosing Unit – Overview

General overview

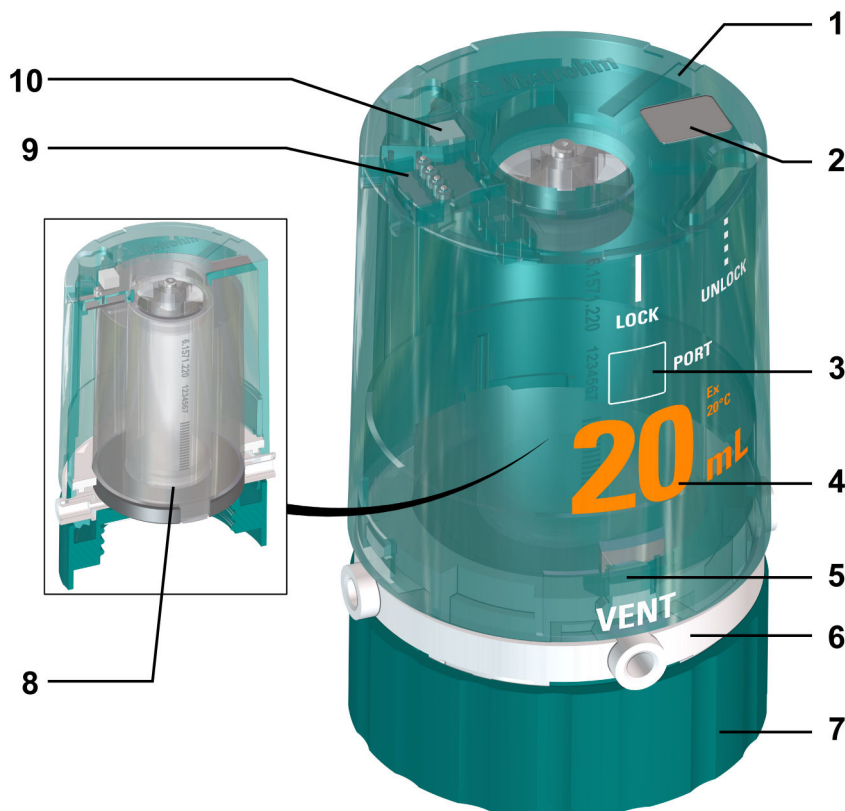


Figure 2 807 Dosing Unit – Overview

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 "Ports", page 14)
7 Fixing ring With GL 45 thread for tightening the 807 Dosing Unit.	8 Cylinder element (see "Cylinder element", page 13)
9 Memory chip with contact pins Contains all information on the 807 Dosing Unit.	10 Coding magnet For automatic recognition of the volume of the 807 Dosing Unit.

Cylinder element

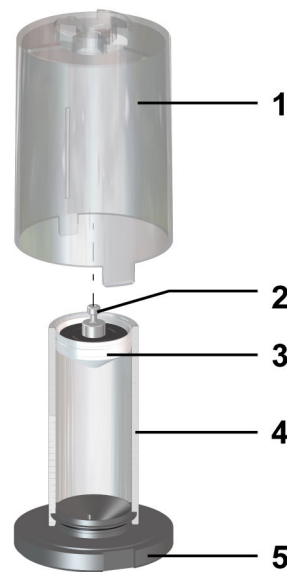


Figure 3 Cylinder element

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

and emptying of the cylinder. The **VENT** port purges the supply bottle and cannot be controlled by the valve disk.

The 807 Dosing Unit is equipped with a memory chip that contains the following information, among other things:

- Standard assignment of the ports
- Information on the 807 Dosing Unit
- Tubing length and tubing diameter
- Information on the reagent
- Information on the titer

The product versions of the 807 Dosing Unit 2 mL to 20 mL are suitable for dosing and for titrating. The 807 Dosing Unit 50 mL is particularly suitable for dosing larger volumes and for the precise transfer of larger sample amounts.

3.3 Indicators

 The operation of the Dosino Module is possible solely via the control instrument.



Figure 5 Dosino Module – Indicators

1 Status display multi-colored

The status of the Dosino Module is displayed in different colors via the status display (see *"System – Signals"*, chapter 3.4, page 16).

- The storage vessel holder, the storage vessel for tubing tips, the adsorber tube, and the aspiration tubing are mounted on the 807 Dosing Unit (see *807 Dosing Unit manual (8.807.8002)*).

Required accessories:

- Bottle

- 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.



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



- 4 Rotate the adsorber tube back into a hanging position.
- 5 Attach the Dosino Module to the 807 Dosing Unit (see *"Attaching the Dosino Module to the 807 Dosing Unit", chapter 6.1, page 23*).



- Thread adapter (6.1618.050)
- Container (6.1621.000)
- Aspiration tubing 0.5 m (6.1829.020)

- 1** Screw the thread adapter onto the container.
- 2** Screw the aspiration tubing 0.5 m onto the fill port **Port 2** on the underside of the 807 Dosing Unit.
- 3** Use the fixing ring to screw the 807 Dosing Unit onto the thread adapter.
- 4** Attach the Dosino Module to the 807 Dosing Unit (*see "Attaching the Dosino Module to the 807 Dosing Unit", chapter 6.1, page 23*).



5.3 Connecting the Dosino Module



WARNING

Health hazards from electrical potential.

Severe injuries with possibly fatal consequences.

- Operate the product only if it is in perfect condition. The housing must also be intact.
- Only use the product with the covers fitted.
- Protect live components (e.g. power supply unit, power cord, connection sockets) against moisture.
- Always have maintenance work and repairs on electrical components carried out by a regional Metrohm service representative.

- 1** Plug the MDL plug of the Dosino Module into one of the MDL sockets on the rear of the control instrument.

6 Operation

The product can be operated via the software of the control instrument. Additional information on the control software can be found in the respective software help.

6.1 Attaching the Dosino Module to the 807 Dosing Unit

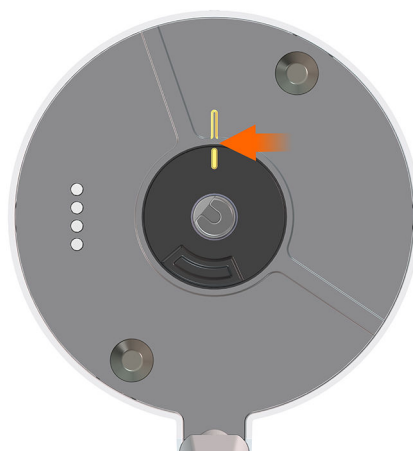
i Information on equipping the 807 Dosing Unit can be found in the *807 Dosing Unit manual (8.807.8002)*.

Checking positions

1 Checking the position of the drive disk on the Dosino Module

Check whether the wedge on the drive disk is flush with the wedge on the underside of the Dosino Module.

If necessary, open the **Manual control** of the Dosino Module and start the **Init.** function in the control software.



2 Checking the position of the centering tube at the 807 Dosing Unit

Check that the triangles on the centering tube and on the housing of the 807 Dosing Unit are exactly opposite one another.

If necessary, rotate the centering tube by hand until the triangles are in the correct position.

2 In the control software, open the **Manual control** of the Dosino Module.

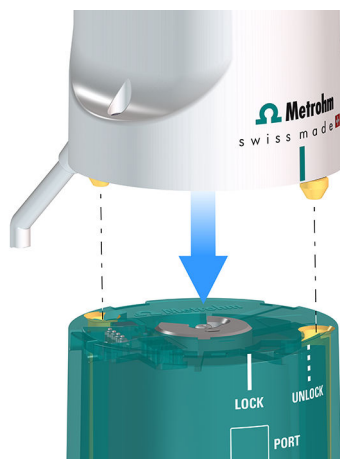
3 Start the **Exchange position** function.

 Additional information can be found in the software help of the control instrument.

Attaching the Dosino Module to the 807 Dosing Unit

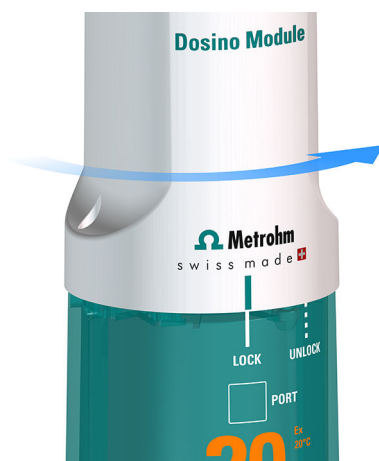
1 Insert the guide bolts of the Dosino Module into the openings of the 807 Dosing Unit provided for this purpose.

The green line marking of the Dosino Module must be flush with the dotted white line marking ("UNLOCK") of the 807 Dosing Unit.

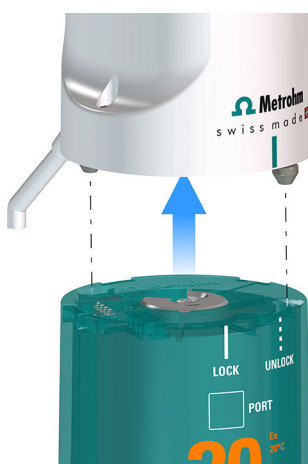


2 Rotate the Dosino Module to the left until the green line marking of the Dosino Module is flush with the solid white line marking ("LOCK") of the 807 Dosing Unit.





- 2 Lift the Dosino Module upward.



- i** Do not adjust the centering tube of the 807 Dosing Unit when dismantled, as otherwise this will make it more difficult to attach the 807 Dosing Unit to the Dosino Module.

7 Maintenance

Perform maintenance work on the product at regular intervals to prevent functional disruptions and to ensure a long service life.

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

7.1 Cleaning the product surface

Regularly clean the product to prevent malfunctions and to ensure a long service life.

- Remove spilled chemicals immediately.
- Protect plug connections against contamination.



WARNING

Chemical hazardous substances

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

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

8 Troubleshooting

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

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

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

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

See also

[System – Signals \(chapter 3.4, page 16\)](#)

8.1 Problems

Problem	Cause	Remedy
The system is jammed.	The Dosino Module or the control instrument is in an error state.	▪ Check the cable connections. ▪ Switch the control instrument off and then back on again. ▪ Remove the Dosino Module from the 807 Dosing Unit (see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26). Check whether the drive pin of the dosing drive can be rotated when the control instrument is switched on. – If the drive pin can be rotated, then it is defective. – If the drive pin cannot rotate, disassemble the 807 Dosing Unit and clean the valve disk (see 807 Dosing Unit manual (8.807.8002)).

Problem	Cause	Remedy
	The 807 Dosing Unit is jammed because the valve disk and the distributor disk stick together or because the piston is damaged.	(see "Clearing jamming", chapter 8.3, page 40)
The dosing drive rotates continuously.	The electronics of the Dosino Module are damaged.	Contact the regional Metrohm service representative.
The data of the 807 Dosing Unit is not being read.	The 807 Dosing Unit contains a single memory chip (green).	Have the dual memory chip (white) installed by your regional Metrohm service representative.
	The memory chip of the 807 Dosing Unit is mechanically damaged or impaired by chemicals.	- Remove the Dosino Module(see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26) and reattach it (see "Attaching the Dosino Module to the 807 Dosing Unit", chapter 6.1, page 23). - Clean the contact surfaces (see "Cleaning the contact surfaces", chapter 7.2, page 30). - Remove the memory chip from the housing of the 807 Dosing Unit 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 807 Dosing Unit is recognized either not at all or incorrectly.	The Dosino Module was not attached correctly.	- Remove the Dosino Module(see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26) and reattach it (see "Attaching the Dosino Module to the 807 Dosing Unit", chapter 6.1, page 23). - Check the correct placement of the Dosino Module. - Switch the control instrument off and then back on again.

Problem	Cause	Remedy
	The push rod of the Dosino Module does not reach the piston.	Remove the Dosino Module (<i>see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26</i>) and check whether the piston is connected to the push rod of the dosing drive. If the piston stopper is below the upper edge of the housing, then correct the position of the piston (<i>see "Adjusting the position of the piston", chapter 8.2, page 37</i>).

8.2 Adjusting the position of the piston

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

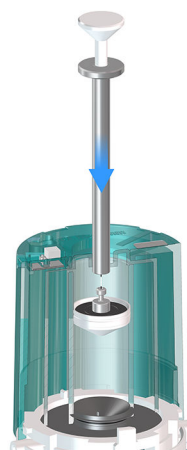
i The instructions show a position of the piston as an example. However, the piston may also be further up or in an inclined position.

Required accessories:

- Piston tongs (6.1546.030)

1 Inserting the piston tongs

Insert the piston tongs into the cylinder opening.

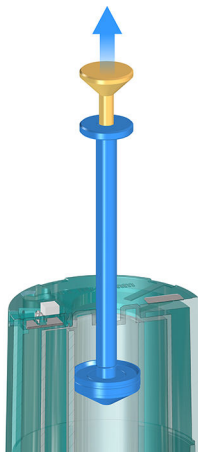


2 Grasping the piston

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

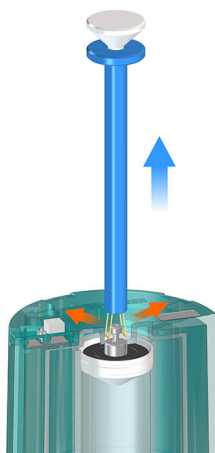
3 Positioning the piston

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



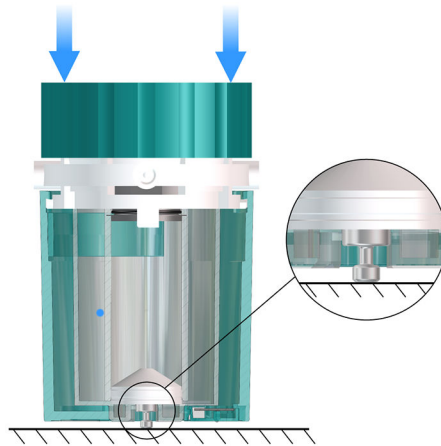
4 Removing the piston tongs

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 zoomed in 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 Dosino Module can be attached to the 807 Dosing Unit.

8.3 Clearing jamming



CAUTION

Contact with chemicals

Chemicals in the 807 Dosing Unit may leak and cause chemical burns.

- Wear personal protective equipment (e.g., protective glasses, gloves).

- 1 Remove the tubing and stoppers from the 807 Dosing Unit.
- 2 In the control software, open the **Manual control** of the Dosino Module and start the **Exchange position** function.
- 3
 - If the **Exchange position** function is completed successfully, then remove the 807 Dosing Unit from the Dosino Module (*see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26*).
 - If the **Exchange position** function is not completed successfully, then carry out the following steps.
- 4 Switch off the control instrument.
- 5 **Removing the distributor**
 - Press the unlocking button of the 807 Dosing Unit and hold it down.
 - Rotate the housing counterclockwise.

- Release the unlocking button and carefully remove the distributor downwards.

6 Turn the Dosino Module connected to the housing and the cylinder element of the 807 Dosing Unit upside down.

7 Switch on the control instrument and start the **Exchange position** function.

8 Attaching the distributor

- If the valve disk rotates audibly, then insert the distributor of the 807 Dosing Unit into the housing 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.
- Hold on the housing and rotate the distributor clockwise until the housing snaps into place.

9 Remove the 807 Dosing Unit from the Dosino Module (*see "Removing the Dosino Module from the 807 Dosing Unit", chapter 6.2, page 26*).

10 If the Dosino Module still cannot be removed, then contact the regional Metrohm service representative or replace the 807 Dosing Unit.

