

# 800 Dosino



**Manual**

8.800.8002EN

 **Metrohm**





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### **Manual**

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# 1 Introduction

The 800 Dosino is a versatile dosing drive which can be used with a number of different Metrohm dosing devices or titrators (e.g. Titrando). The 800 Dosino and the 807 Dosing Unit associated with it are suitable as a buret for simple dosings, titrations and for complex automation and liquid handling tasks such as sample transfers or pipetting.

## 1.1 Instrument description

- Thanks to various 807 Dosing Units with 2, 5, 10, 20 or 50 mL dosing cylinders, the 800 Dosino is suitable for flexible use as a buret (dosing drive and dosing unit) and for adaptation to a number of different kinds of applications. Older dosing units (without data chip) can also be used.
- Reagent changes with the lowest possible loss of reagent are now possible, due to the fact that the design of the dosing unit has been optimized to a minimum dead volume.
- The 800 Dosino with the dosing unit is attached directly to the reagent bottle. 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 dosing drive cannot be damaged by escaping fluid because it is placed above the reagent.
- In the event of frequent changes of reagent, the dosing units can remain mounted on the reagent bottle. The dosing drive can be readily removed and set up on the next dosing unit in one manual step.

## 1.2 About the documentation



### Caution

Please read through this documentation carefully before putting the instrument into operation. The documentation contains information and warnings which the user must follow in order to ensure safe operation of the instrument.



### **1.2.1 Symbols and conventions**

The following symbols and styles are used in this documentation:

|   |   |
|---|---|
| (5-12)  | <b>Cross-reference to figure legend</b><br>The first number refers to the figure number, the second to the instrument part in the figure. |
| <b>1</b>  | <b>Instruction step</b><br>Carry out these steps in the sequence shown.   |
|    | <b>Warning</b><br>This symbol draws attention to a possible life hazard or risk of injury.  |
|    | <b>Warning</b><br>This symbol draws attention to a possible hazard due to electrical current.   |
|    | <b>Warning</b><br>This symbol draws attention to a possible hazard due to heat or hot instrument parts.                                   |
|  | <b>Warning</b><br>This symbol draws attention to a possible biological hazard.  |
|  | <b>Caution</b><br>This symbol draws attention to a possible damage of instruments or instrument parts.                                    |
|  | <b>Note</b><br>This symbol marks additional information and tips.   |

## 1.3 Safety instructions

### 1.3.1 General notes on safety



#### Warning

This instrument may only be operated in accordance with the specifications in this documentation.

This instrument has left the factory in a flawless state in terms of technical safety. To maintain this state and ensure non-hazardous operation of the instrument, the following instructions must be observed carefully.

### 1.3.2 Electrical safety

The electrical safety when working with the instrument 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 instrument. The instrument could be damaged by this. There is also a risk of serious injury if live components are touched.

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

### Mains voltage



#### Warning

An incorrect mains voltage can damage the instrument.

Only operate this instrument with a mains voltage specified for it (see rear panel of the instrument).



### Protection against electrostatic charges



#### Warning

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

Always pull the mains cable out of the mains connection socket before connecting or disconnecting electrical appliances on the rear panel of the instrument.

### 1.3.3 Working with liquids



#### Caution

Periodically check all system connections for leaks. Observe the relevant regulations in respect to working with flammable and/or toxic fluids and their disposal.

### 1.3.4 Flammable solvents and chemicals



#### Warning

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

- Set up the instrument in a well-ventilated location (e.g. laboratory flue).
- Keep all sources of flame far from the workplace.
- Clean up spilled fluids and solids immediately.
- Follow the safety instructions of the chemical manufacturer.

### 1.3.5 Recycling and disposal



This product is covered by European Directive 2002/96/EC, WEEE – Waste from Electrical and Electronic Equipment.

The correct disposal of your old equipment will help to prevent negative effects on the environment and public health.

More details about the disposal of your old equipment can be obtained from your local authorities, from waste disposal companies or from your local dealer.

## 2 Overview of the instrument

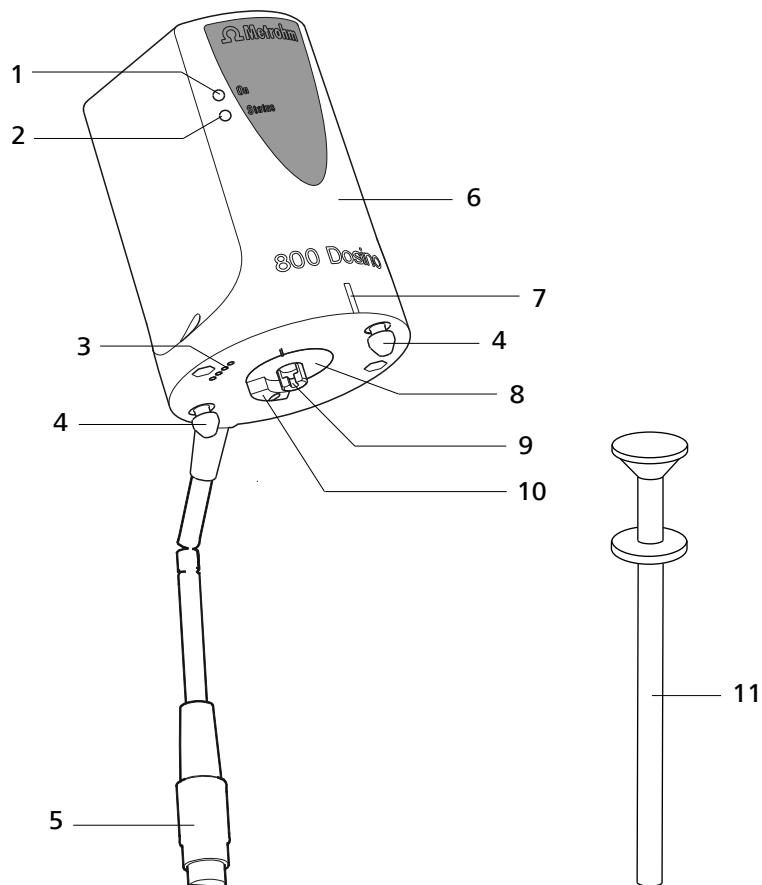


Figure 1 800 Dosino

### 1 On LED

Lights up, when the Dosino is connected to an MSB connector of a control device and the control device is switched on.

### 3 Contact surfaces

For reading / writing the data on the chip of the dosing unit.

### 5 Mini DIN plug (8-pin)

For connecting to an MSB connector of the control device.

### 7 Line marking green

### 2 Status LED

Indicates the current status of the Dosino.

### 4 Guide pins

For inserting the Dosino into the openings on the upper side of the dosing unit.

### 6 Housing

Of PBT (polybutylene terephthalate).

### 8 Drive disc

**9 Piston rod**

With coupling. For moving the dosing piston in the dosing unit.

**11 Piston tongs 6.1546.030**

For pulling the PTFE piston out of the dosing unit.

**10 Drive pin**

For the rotation of the stopcock.

## 3 Installation

### 3.1 Setting up the instrument

#### 3.1.1 Packaging

The instrument is supplied in highly protective special packaging together with the separately packed accessories. Keep this packaging, as only this ensures safe transportation of the instrument.

#### 3.1.2 Checks

Immediately after receipt, check whether the shipment has arrived complete and without damage by comparing it with the delivery note.

#### 3.1.3 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, free of vibrations, protected from corrosive atmosphere, and contamination by chemicals.

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

### 3.2 Setting up the Dosino and the dosing unit

#### 3.2.1 Dosino with Titrando

When the 800 Dosino is used together with an 807 Dosing Unit as a titrating buret with a Titrando, two bottles (with titrant or auxiliary reagents) can be placed on the Titrando with dosing unit and Dosino mounted (*see Figure 2, page 8*). Additional titrants or auxiliary reagents can be given stable storage in practical bottle holders (*see Figure 3, page 8*).

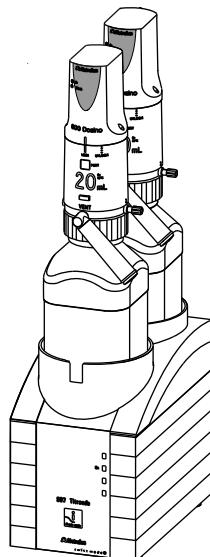


Figure 2 800 Dosino on the Titrando

### 3.2.2 Dosino with bottle holder

- If the 800 Dosino is utilized as a dosing drive for adding auxiliary reagents, e.g. in operations with the Titrando, then the practical and stable 6.2061.010 bottle holder with storage vessel for buret tips can be used.
- The bottle holder can be adjusted for various bottle sizes with the aid of a 6.2043.005 retaining clip.

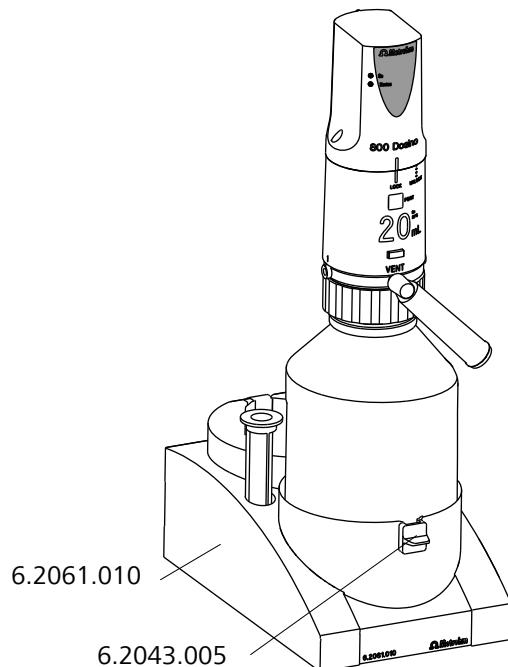


Figure 3 800 Dosino in the bottle holder

### 3.2.3 Dosino on the canister

A Dosino with dosing unit can be mounted directly on a canister when a suitable thread adapter is used. Use for this purpose the 6.1618.050 thread adapter for the canister provided by Metrohm.

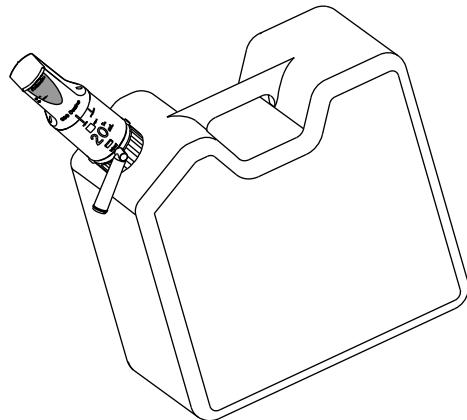


Figure 4 800 Dosino on the canister

### 3.2.4 Dosino on the stand holder

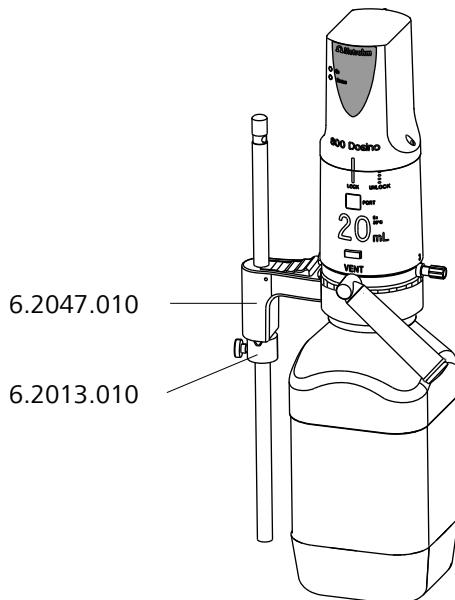


Figure 5 Fixed support assembly

#### Screwing the holder to the support rod

Screw on the holder for the Dosino with dosing unit as follows:

- 1** Screw the 6.2013.010 clamping ring tightly to the support rod ( $\varnothing$  10 mm).

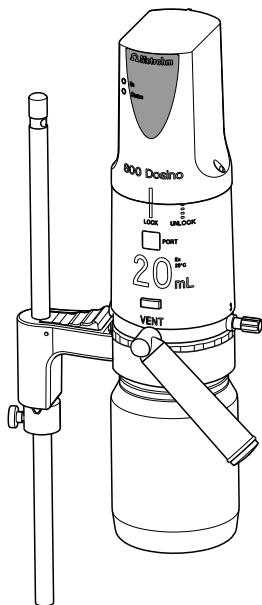


**2** Set the holder for dosing units 6.2047.010 on the support rod.

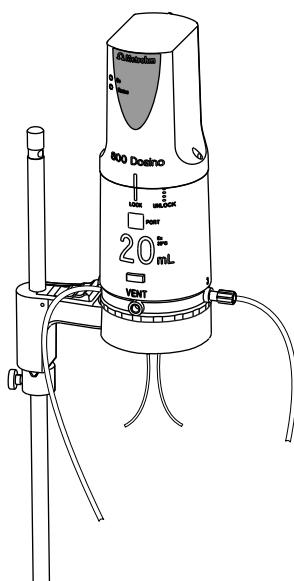
**3** Insert the dosing unit with Dosino into the holder from above.

**4** Screw the bottle tightly onto the dosing unit from below.

Additional support assembly options:



*Figure 6 Hanging support assembly*



*Figure 7 Free-standing support assembly*

All four dosing unit ports can be used with the free-standing support assembly.

### 3.2.5 Dosino with Sample Processor

With a Sample Processor, the 800 Dosino can be mounted on the side wall of the tower.

#### Screwing on the holder for the dosing unit with Dosino

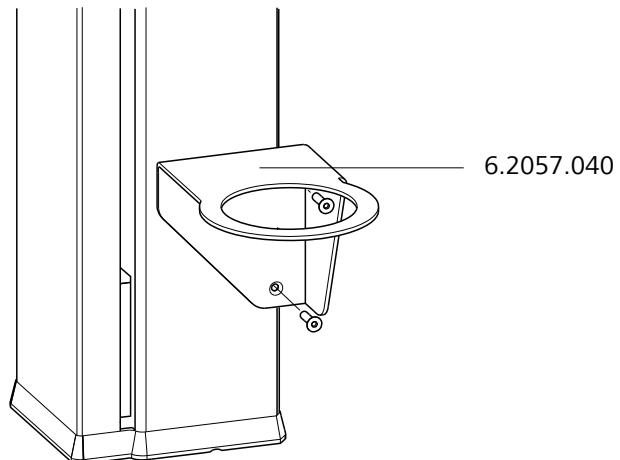


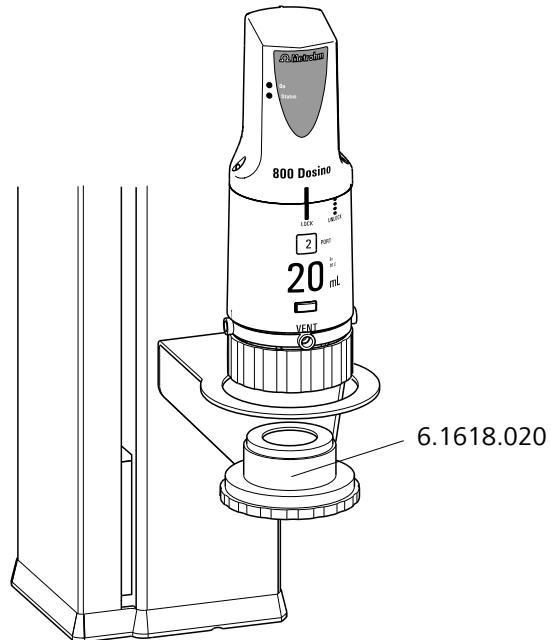
Figure 8 Screwing on the holder for the dosing unit with Dosino

Screw on the holder as follows:

- 1** Remove the second and third screws from below on the side wall.
- 2** Screw the 6.2057.040 holder tight with the two screws supplied.



### Mounting the Dosino with the dosing unit



Mount the Dosino with the dosing unit as follows:

- 1** Attach the Dosino on the dosing unit and engage in place.
- 2** Guide the tubing adapter GL 45 (6.1618.020) from below into the holder.
- 3** Attach the dosing unit with the Dosino onto the holder.
- 4** Screw the thread adapter tight

### 3.3 Connecting the 800 Dosino



#### Warning

Connect the Dosino only to control devices which have been switched off beforehand. The control device will only be able to recognize the Dosino during the switch-on sequence. Observe the alignment of the connection socket. **Never** use excessive force to plug in the connection cable! Doing so could damage the device electronics.



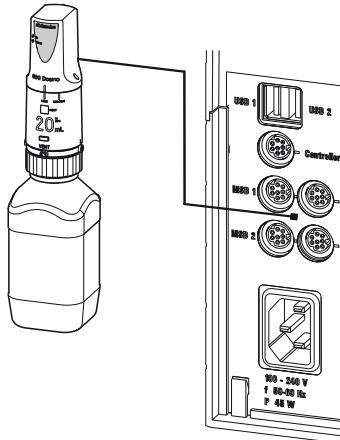
#### Warning

In the case of a Titrando with exchange unit, the MSB Port 1 is used by the internal dosing drive. The MSB 1 is therefore not available for the 800 Dosino!

The 800 Dosino is controlled by a Metrohm device via the 'Metrohm Serial Bus' (MSB). It can be operated with all Titrando models. Connect the 800 Dosino on the rear side of the Titrando to one of the connectors ( MSB 1/MSB 2 to MSB 4 ).

The position of the correct connection socket (Mini DIN plug) to be used with the 800 Dosino can be found in the manual for the control device.

#### Connecting the Dosino



*Figure 9 Connecting the 800 Dosino to the Titrando*

Connect the 800 Dosino as follows:

- 1** Exit the control software.



**2** Connect the connection cable of the Dosino to one of the sockets marked with **MSB** on the rear of the control instrument.

Observe the reference mark on the socket.

**3** Start the control software.

## 4 Functioning

The 800 Dosino forms, together with an 807 Dosing Unit (with 2, 5, 10, 20 or 50 mL cylinder), a buret unit for simple dosing tasks or complex liquid handling applications.

The dosing units are normally mounted on reagent bottles in fixed position and the necessary dosing inputs and outputs are equipped with tubing. Four ports are available for use.

The dosing drive can be set up on a dosing unit and also removed again in one easy manual step. During attachment, the dosing piston integrated in the dosing unit is coupled with the piston rod of the dosing drive and the drive pin of the dosing drive is guided into the recess on the centering tube provided for this purpose in the dosing unit.



## 4.1 Dosing/filling the dosing cylinder

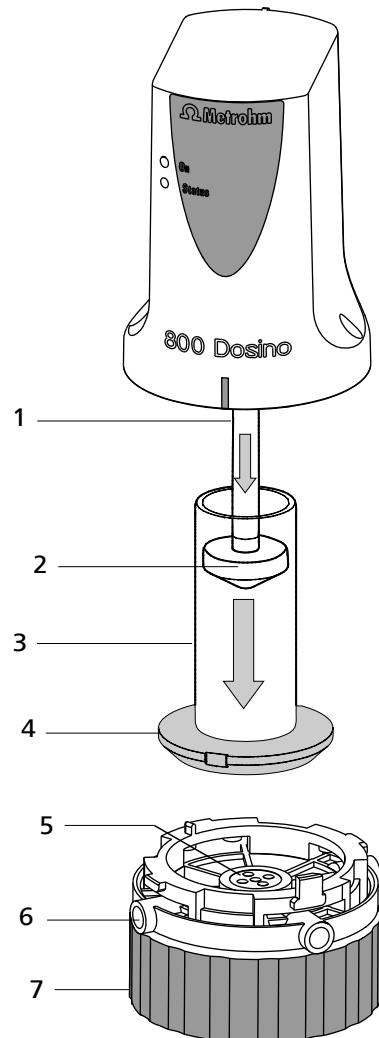


Figure 10 Dosing / Filling of the dosing cylinder

**1 Piston rod**

With coupling. For moving the dosing piston in the dosing unit.

**3 Cylinder**

Contains the solution for dosing.

**2 Dosing piston**

For ejecting and aspirating a solution.

**4 Valve disc in the cylinder base**

A hole in the valve disc guides the solution into one of four selected openings in the distributor disc.

**5 Distributor disc**

The four holes in the distributor disc each sets up a connection with one of the four ports (input/output) of the dosing unit.

**6 Dosing port**

Input or output for the solution.

**7 Distributor**

Contains four ports (input/output) for solutions. The ports are actuated by the distributor disc in the distributor and the valve disc in the base of the cylinder.

When a solution is ejected, the piston rod of the 800 Dosino propels the dosing piston in the cylinder downward. The solution in the cylinder is pressed through the valve disc in the base of the cylinder into one of the four openings of the distributor, depending on the valve position. The solution is guided onward to a dosing port in the distributor.

After switching the flat stopcock (*see Chapter 4.2, page 18*), i.e. rotating the valve disc, liquid is aspirated in the opposite direction through a different port as a result of the dosing piston being pulled upward by the piston rod of the dosing drive.

Because of the fact that the dosing units are interchangeable, the coupling of the piston rod exhibits a low mechanical tolerance that has an effect when the dosing piston changes its direction of movement. This tolerance is mechanically compensated for during automatic dosing drive procedures. The piston movements are controlled by the precise electronic fine mechanics of the dosing drive. Independent of the cylinder volume, they exhibit a resolution of 10,000 increments across the entire piston stroke.



## 4.2 Switching the stopcock

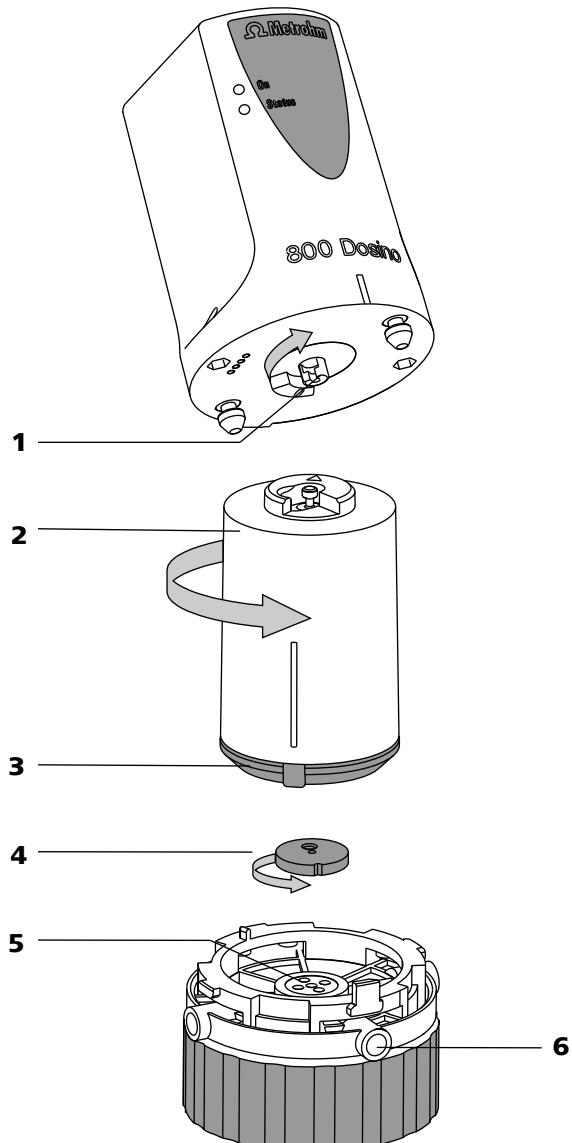


Figure 11 Switching the stopcock

**1 Drive pin**  
for the rotation of the stopcock

**3 Cylinder base**

**5 Distributor disc**

**2 Centering tube**

**4 Valve disc**

**6 Dosing port**

The dosing unit has four ports. Two of these are located on the outside and two on the underside of the distributor. Depending on the position of the black valve disk, a connection is set up between the cylinder and the opening of the white distributor associated with the port.

The dosing drive sitting on the dosing unit turns, with the rotating drive pin, the centering tube and thus the entire interior cylinder unit, with dosing cylinder, cylinder base and the valve disc mounted within.

The bore hole of the valve disc faces a different distributor disc opening after one rotation of the cylinder unit. This means that a different port is selected for dosing (or filling).

### 4.3 Port assignments

The distributor of a dosing unit has four inputs/outputs (ports), which can be freely selected. An additional connection, the **VENT**-Port (see Figure 12, page 19), leads directly to the underside of the distributor and cannot be actuated by the valve disc. It deaerates the supply bottle and can be equipped with an adsorber tube.

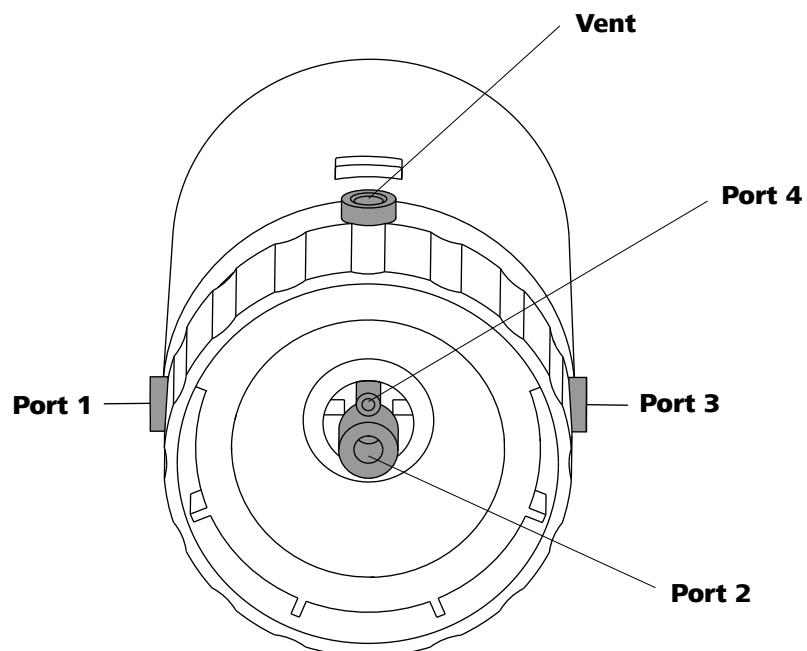


Figure 12 807 Dosing Unit from below

All ports of the 807 Dosing Unit can be used differently (see Chapter 4.4, page 20). This is an important precondition for complex liquid handling tasks. Titrando's use a standard port allocation which is the most suitable for titration tasks.



## 4.4 Standard assignment of the Dosino ports

|               |  |
|---------------|--|
| <b>Port 1</b> | Dosing outlet. M6 threaded connection on the left-hand side of the housing. The solution is ejected through a dosing or titration tip.   |
| <b>Port 2</b> | Filling inlet. M6 threaded connection on the underside of the dosing unit. The solution is aspirated out of a supply vessel.   |
| <b>Port 3</b> | Not assigned. M6 threaded connection on the right-hand side of the housing.  |
| <b>Port 4</b> | Special functions. Small diameter connection nipple on the underside of the dosing unit. This can be used with the <b>PREP/Preparing</b> function for ejecting the solution. Port 4 is used as an air inlet when the dosing unit is being emptied. |
| <b>VENT</b>   | Deaeration of the supply bottle. M6 threaded connection at the front. Here an adsorber tube can be connected, filled with a molecular sieve or soda lime.  |



### Warning

If one of the Ports numbered 1 to 3 is not used, then it should be sealed with a threaded stopper (6.1446.040).



### Warning

**Never** seal the **VENT** connector with a threaded stopper when the dosing unit is attached on top of a supply bottle. A vacuum could be created in the supply bottle – danger of implosion!

## 5 Operation

In this chapter you will learn the following regarding the handling of the 800 Dosino with a dosing unit:

- Attaching the Dosino on a dosing unit
- Removing the Dosino from a dosing unit
- Function of the On and Status LEDs.

### 5.1 Attaching the Dosino onto the dosing unit

The 800 Dosino can be attached to a dosing unit in both switched-off and switched-on modes.

#### 1 Checking the position of the drive disk of the dosing drive



##### Caution

The drive pin of the dosing drive can adjusted only if the control device connected to it is switched off.

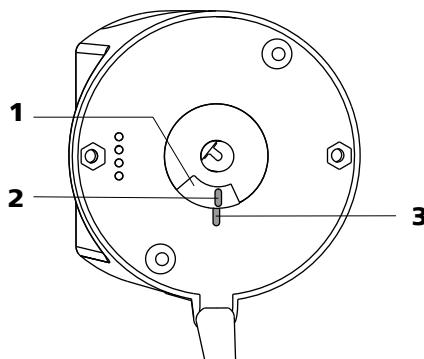


Figure 13 800 Dosino from below

#### 1 Drive disc

For the drive of the dosing unit.

#### 2 Plastic rib

On the drive disc

#### 3 Plastic rib

On the underside of the dosing drive

- The plastic rib on the drive disk must be flush with the plastic rib on the underside of the dosing drive (rib to rib)
- Rotate the drive pin by hand if necessary until the ribs are lined up with one another.



## 2 Check the position of the centering tube of the dosing unit

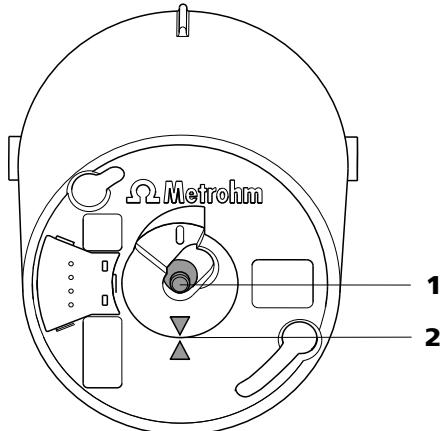


Figure 14 807 Dosing Unit from above

### 1 Centering tube

### 2 Triangles

- The two triangles on the upper side of the dosing unit(14-2) must be positioned exactly opposite one another.
- If necessary, rotate the centering tube(14-1) by hand until they are in the correct position (see *Figure 14, page 22*).

## 3 Check the piston setting of the dosing unit

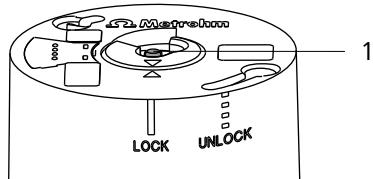


Figure 15 Check the piston stopper

### 1 Piston stopper

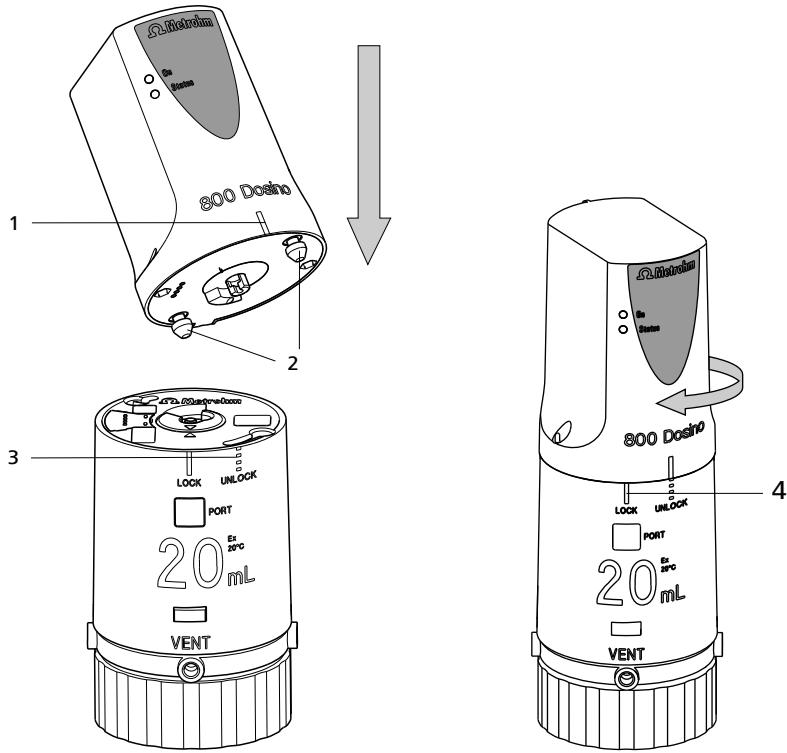
- The piston stopper must be flush with the upper edge of the housing of the dosing unit.
- If necessary, use the piston tongs to pull out the piston until the stop is reached.
- Turn the entire dosing unit upside-down and press it together on a tabletop.

## 4 Attaching 800 Dosino on 807 Dosing Unit



### Caution

Avoid using excessive force when attaching the dosing unit.



*Figure 16 Mounting the 800 Dosino onto the 807 Dosing Unit*

|          |                    |          |               |
|----------|--------------------|----------|---------------|
| <b>1</b> | Green line marking | <b>2</b> | Guide pins    |
| <b>3</b> | UNLOCK position    | <b>4</b> | LOCK position |

- Attach the dosing drive on the dosing unit with a slight offset.
  - Insert the guide pins of the Dosino into the openings on the dosing unit provided for this purpose.

The **green line marking** of the Dosino must come to rest on the dotted **white line marking** (UNLOCK position) of the dosing unit. It is only then that the guide pins are inserted correctly.

- Rotate the dosing drive to the left until it stops.  
The **green line marking** of the Dosino now lies on the **extended white line marking** (LOCK position) of the dosing unit.
  - Check the correct seating of the 800 Dosino.



## **Caution**

After the 800 Dosino has been attached to a dosing unit, the Status LED must light up when the control device is switched on. If this does not occur, then the dosing drive is not attached correctly.



## 5.2 Problems when attaching the Dosino

If the 800 Dosino cannot be attached (Status LED does not light up), then it could be that either the drive disc of the Dosino or the centering tube of the dosing unit is not in exchange position (Port 2) (*see Figure 12, page 19*). The drive pin of the Dosino must fit into the recess on the dosing unit intended for that purpose. Observe the preceding illustrations.



### Caution

The stopper of the dosing piston (*see Figure 15, page 22*) must be flush with the upper edge of the dosing unit.

### Adjusting the dosing piston

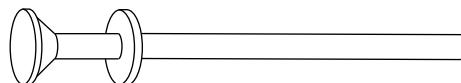


Figure 17 Piston tongs



### Note

Use caution when handling the 2 mL cylinder! In contrast to the larger dosing cylinders, here the dosing cylinder can be pulled out completely.

Adjust the dosing piston as follows:

**1** Press down on the white grip of the piston tongs.

Two wire loops will appear at the tip of the piston tongs.

**2** Arrange the piston tongs in such a way that these wire loops surround the piston stopper.

**3** Carefully let go of the grip.

The piston tongs snap shut.

**4** Carefully pull out the dosing piston with the white grip, applying a certain amount of force while doing so, until the gray upper edge becomes visible.

**5** Release the piston tongs by pressing on the white grip.

- 6** Turn the dosing unit upside-down and press it together against a tabletop.

The piston stopper should now be flush with the upper edge of the housing of the dosing unit.

## 5.3 Removing the Dosino from the dosing unit



### Caution

The Dosino can be removed from the dosing unit only if the Status LED is permanently lit up or if the control device is switched off.

The valve disc of the dosing unit must be positioned at Port 2 (fill port, exchange position)(see *Figure 12, page 19*) and the dosing piston must be in zero position. Should this not be the case, then the active process may need to be stopped and/or the dosing unit may need to be filled.

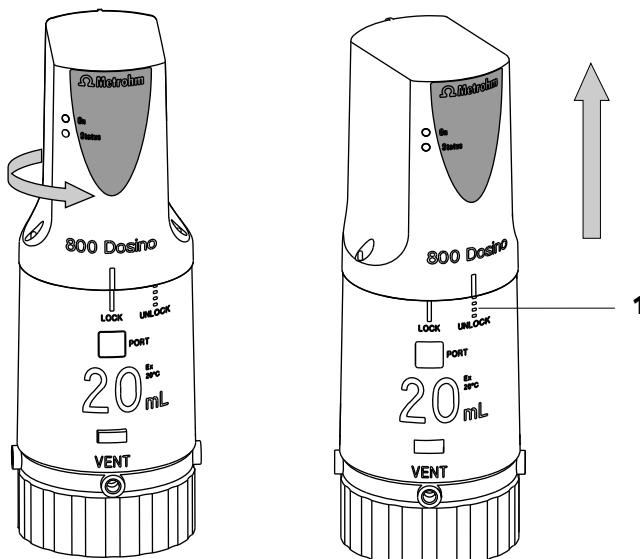


Figure 18 Removing the 800 Dosino from the 807 Dosing Unit

#### 1 UNLOCK position

Remove the Dosino from the dosing unit as follows:

- 1** Fill the dosing unit.

The stopcock is then rotated automatically to the **Exchange** position.



**2** Check whether the Status LED of the dosing drive is lit up.

**3** Rotate the Dosino to the right (in counterclockwise direction).

The dosing drive mounted on the dosing unit is unlocked.

The **green line marking** of the Dosino now lies on the **dotted white line marking** (UNLOCK position) of the dosing unit.

**4** Lift the Dosino upward.



#### Note

**Never** readjust the drive pin of the Dosino or the centering tube of the dosing unit when these are disconnected. Doing so could make attaching the dosing unit more difficult. Observe the explanations on the previous pages.

## 5.4 Reagent exchange

As a rule, is not necessary to disassemble and clean the dosing unit when reagents are changed. The dosing unit is constructed in such a way that only a small dead volume is present.

### Reagent exchange in the dosing unit

Exchange the reagent as follows:

**1** Empty the dosing unit with the **EMPTY/Emptying** function of the control device.

**2** Fill the dosing unit with the **PREP/Preparing** function.

The **PREP/Preparing** function rinses the dosing cylinder once before it is filled with reagent.

If additional rinses are required, then the **PREP/Preparing** function must be run again.

If there is a possibility of precipitation or chemical reactions occurring when old and new reagents are mixed, then an interim rinse with an inert solvent is to be recommended.



### Note

If you do not use a reagent for more than one week, empty the dosing unit with the **EMPTY/Emptying** function and remove the dosing drive.

## 5.5 Function of the LEDs

The 800 Dosino is equipped with two green LEDs which display the status of the dosing drive.

### On LED

The upper LED displays the overall status of the 800 Dosino.

*The LED lights up*

The 800 Dosino is connected to a device which is switched on.

*The LED does not light up*

The 800 Dosino is not connected or the control device is switched off.



### Caution

The dosing drive is supplied with electricity for as long as the On LED is lit. Even if the 800 Dosino is not attached to a dosing unit, the drive pin on the underside of the dosing drive will still not be able to be adjusted by hand. If it should happen that it needs to be adjusted, thus making the attachment of the Dosino on a dosing unit impossible, then the control device must be switched off. Manual adjustment of the drive pin is possible only when the On LED is **not illuminated**.

### Status LED

The lower one of the two LEDs of the 800 Dosino shows the respective operating mode of the dosing drive. The precondition for this is that the 800 Dosino is supplied with electricity, i.e. that the "On" LED lights up.

*The LED lights up*

The 800 Dosino is attached to a dosing unit and ready for operation. It is only in this configuration that the 800 Dosino can be removed from the dosing unit.

*The LED does not light up*

The 800 Dosino is either not attached or not correctly attached to a dosing unit.

*The LED flashes slowly*

The 800 Dosino is in operation. It doses, fills, is in waiting mode or is currently extracting the data from the data chip of the dosing unit.



*The LED flashes fast*

The 800 Dosino has detected a malfunction. This could involve, for example, a blocked valve disc, a blocked dosing piston or problems reading from or recording on the data chip of the dosing unit.

## 6 Handling and maintenance

### 6.1 General information

#### 6.1.1 Care

In contrast to the dosing units, the 800 Dosino requires no special care. Take care to ensure however that it not exposed to any excessive contamination nor to any corrosive influences. These could under certain circumstances result in functional disruptions and a reduction in the service life of the inherently sturdy mechanics and electronics.



#### Caution

The dosing units must be monitored regularly and cleaned from time to time.

Monthly inspections are called for in the event that alkali, corrosive or high-concentration reagents are used. If non-problematic reagents are used, then the inspection intervals can be extended to between six and twelve months.



#### Warning

If aggressive reagents are used for dosing, and if the dosing unit is not being used, then it should be rinsed with an inert solvent and then emptied afterwards. Remove the dosing drive in the event of prolonged periods of disuse (longer than one week).



#### Caution

Although this is extensively prevented by design measures, the mains plug should be unplugged immediately if aggressive media has penetrated the inside of the instrument, so as to avoid serious damage to the instrument electronics. In such cases, the Metrohm Service must be informed.



### 6.1.2 Maintenance by Metrohm Service

Maintenance of the 800 Dosino is best carried out as part of an annual service, which is performed by specialist personnel of the Metrohm company. If working frequently with caustic and corrosive chemicals, a shorter maintenance interval could be necessary.

The Metrohm service department offers every form of technical advice for maintenance and service of all Metrohm instruments.

## 6.2 Quality Management and validation with Metrohm

### Quality Management

Metrohm offers you comprehensive support in implementing quality management measures for instruments and software. Further information on this can be found in the brochure **«Quality Management with Metrohm»** available from your local Metrohm agent.

### Validation

Please contact your local Metrohm agent for support in validating instruments and software. Here you can also obtain validation documentation to provide help for carrying out the **Installation Qualification** (IQ) and the **Operational Qualification** (OQ). IQ and OQ are also offered as a service by the Metrohm agents. In addition, various application bulletins are also available on the subject, which also contain **Standard Operating Procedures** (SOP) for testing analytical measuring instruments for reproducibility and correctness.

### Maintenance

Electronic and mechanical functional groups in Metrohm instruments can and should be checked as part of regular maintenance by specialist personnel from Metrohm. Please ask your local Metrohm agent regarding the precise terms and conditions involved in concluding a corresponding maintenance agreement.



#### Note

You can find information on the subjects of quality management, validation and maintenance as well as an overview of the documents currently available at [www.metrohm.com/com/](http://www.metrohm.com/com/) under **Support**.

## 6.3 GLP - Validation

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

### Recommended literature

- Metrohm brochure "Quality management with Metrohm", detailed information concerning the principles and procedural methods of Good Laboratory Practice
- Metrohm Applications Bulletin 283/1 "Validation of Metrohm burets"

The validation of burets is carried out by the Metrohm-Service with a special software.

The Metrohm agents worldwide offer the possibility of on-site inspections and certifications of dosing units and Dosinos with respect to accuracy. It is recommended that an accuracy inspection be performed when the dosing cylinders and dosing pistons of a dosing unit are replaced.



## 7 Troubleshooting

### 7.1 Problems

| Problem   | Cause  | Remedy  |
|---|--|---|
| <b>Data of the dosing unit cannot be read.</b>                  | <i>Data chip of the dosing unit mechanically damaged or impaired by chemicals.</i>                         | <ul style="list-style-type: none"> <li>▪ Remove the dosing drive and set it up again.</li> <li>▪ Clean the data chip and the contact surfaces.</li> <li>▪ Have the data chip replaced by the Metrohm Service Dept.</li> </ul>   |
| <b>Dosing unit recognized either not at all or incorrectly.</b> | <i>The dosing drive was not attached correctly.</i>  | <ul style="list-style-type: none"> <li>▪ Remove the dosing drive and set it up again.</li> <li>▪ Check whether the dosing drive is correctly seated.</li> <li>▪ Switch the control instrument off and on again.</li> <li>▪ If necessary contact Metrohm Service Dept.</li> </ul>  |
| <b>Dosino becomes hot</b>                                       | <i>Dosing drive is overloaded. Valve disc or dosing piston is blocked.</i>                                 | <ul style="list-style-type: none"> <li>▪ Switch off the instrument immediately.</li> <li>▪ Disassemble the dosing unit (see the manual for the dosing unit) and clean all of the individual parts. Replace defective parts.</li> </ul>  |
| <b>Dosino cannot be actuated by the control device.</b>         | <i>Connection between Dosino and control device is interrupted or an error has occurred on the Dosino.</i> | <ul style="list-style-type: none"> <li>▪ Check the cable connections.</li> <li>▪ Switch the control instrument off and on again.</li> <li>▪ Check the dosing and filling rate.</li> <li>▪ If necessary contact Metrohm Service Dept.</li> </ul>   |
| <b>No dosing takes place at all</b>                             | <i>Tubing connections are blocked or dosing unit is not assembled correctly.</i>                           | <ul style="list-style-type: none"> <li>▪ Check whether the dosing tip is blocked.</li> <li>▪ Check whether the dosing port is sealed off with a stopper.</li> <li>▪ Check whether the VENT port is sealed off with a stopper (vacuum in the supply bottle!). The VENT port must be open for pressure compensation.</li> <li>▪ Remove the dosing drive and check whether the dosing piston is connected to the dosing drive. The piston stopper must be flush with the upper side of the housing.</li> </ul> |

| <b>Problem</b>  | <b>Cause</b>  | <b>Remedy</b>   |
|---|---|---|
| <b>The Dosino cannot be attached to the dosing unit.</b>  | <i>The drive pin of the dosing drive is misaligned.</i>   | Switch the control instrument off and on again. If the drive pin does not rotate into starting position automatically at this time, then switch the instrument back off again and rotate the drive pin by hand into the correct position. Note marking ribs. Rib to rib   |
|   | <i>The centering tube is misaligned</i>   | Rotate the centering tube of the dosing unit by hand into the correct position. Observe the triangle markings.  |
|   | <i>The dosing piston is misaligned. The piston stopper must be flush with the housing.</i>  | Use the piston tongs to pull out the dosing piston as far as the stop (caution with 2 mL buret) and press the dosing unit upside down onto a tabletop.  |
|   | <i>The piston rod of the dosing drive is misaligned.</i>  | Set the dosing drive on an empty housing of a dosing unit and carry out 'Filling'.  |
| <b>The Dosino cannot be removed from the dosing unit.</b> | <i>Dosing piston and/or stopcock are not in the Exchange position.</i>  | <ul style="list-style-type: none"> <li>▪ Carry out the <b>[Filling]</b> on the control device.</li> <li>▪ Check the cable connections to the control instrument.</li> <li>▪ Switch the control instrument off and on again.</li> <li>▪ Engage the dosing drive in place on the dosing unit, i.e. rotate it to the left until it stops.</li> </ul>   |
|   | <i>If the dosing unit can still not be removed after the <b>[Filling]</b> function has been run, then the dosing piston or the valve disc is blocked or even damaged.</i> |  <b>Caution, Chemicals!</b> When disassembling a dosing unit, be aware that chemicals could still be contained in the cylinder. <ol style="list-style-type: none"> <li>1. Switch off the control device.</li> <li>2. Press the locking button of the dosing unit and remove the distributor. Turn it upside down in its entirety.</li> <li>3. Switch on the control device and trigger 'Filling'. If the rotation of the stopcock is clearly audible, then the dosing unit, with Dosino attached, can be reattached to the distributor.</li> </ol> |



| Problem   | Cause   | Remedy  |
|---|---|---|
|   |   | <p>4. Place the dosing unit with Dosino attached upright on the distributor, align marking rib to marking rib, and rotate the dosing unit to the left until the spring clip snaps audibly into place. Now you should be able to remove the Dosino from the dosing unit.</p> <ul style="list-style-type: none"> <li>▪ You can also dismantle the dosing unit directly by positioning the dosing buret without distributor upright on a table top and removing the dosing drive. Once you have removed the housing from the dosing unit, the interior part of the dosing unit, along with centering tube and cylinder, etc., will be freely accessible. Afterwards, reassemble the dosing unit in accordance with the instructions (see manual for the dosing unit).</li> <li>▪ If the stopcock can no longer be rotated or if the piston does not move properly into zero position, then the dosing unit must be disassembled by a Metrohm Service Point specialist. Improper opening of a dosing cylinder filled with chemicals could damage the dosing unit and/or the dosing drive. The housing of the dosing drive is not permitted to be opened, because the of the dosing drive is readily vulnerable to mechanical damage.</li> </ul> |
| <b>The drive pin on the dosing drive rotates without interruption</b> | <i>The electronics of the Dosino are damaged.</i>                             | Send the dosing drive in to the Metrohm Service Point for repair.   |
| <b>The entire system is blocked</b>                                   | <i>An exceptional error has occurred on the Dosino or the control device.</i> | <ul style="list-style-type: none"> <li>▪ Check the cable connections</li> <li>▪ Switch the control instrument off and on again.</li> <li>▪ Remove the dosing drive from the dosing unit. Check whether the drive pin of the dosing drive can be rotated when the device is switched on. – If it can, then it is defective. – If it cannot, then disassemble the dosing unit. Clean the black valve disc in the base of the cylinder (see manual for the dosing unit).</li> </ul>  |

## 8 Appendix

### 8.1 Buret data

The 807 Dosing Units are equipped with a data chip which contains the specifications for the dosing unit, the tubing connections and the reagent used.

#### Indications on dosing unit / tubing connections

- Order number of the dosing unit
- Serial number of the dosing unit
- Serial number of the cylinder.
- Length and diameter of the tubings on the dosing ports
- Validation date
- etc.

#### Indications on the reagent

- Name of the reagent
- Titer of the reagent
- Concentration of the reagent
- Production and expiry date of the reagent
- etc

The 800 Dosino makes it possible to read and record data with the aid of a suitable device (e.g. Titrando). The contact surfaces for data exchange with the data chip are made of titanium and are exceptionally resistant to both chemicals and abrasion.



#### Caution

Take care to ensure that the contact surfaces do not become contaminated. Wipe off any contaminations at once. In the event of more serious contamination, the underside of the 800 Dosino can be cleaned with a moist cloth (possibly with a small amount of dishwashing detergent or ethanol).

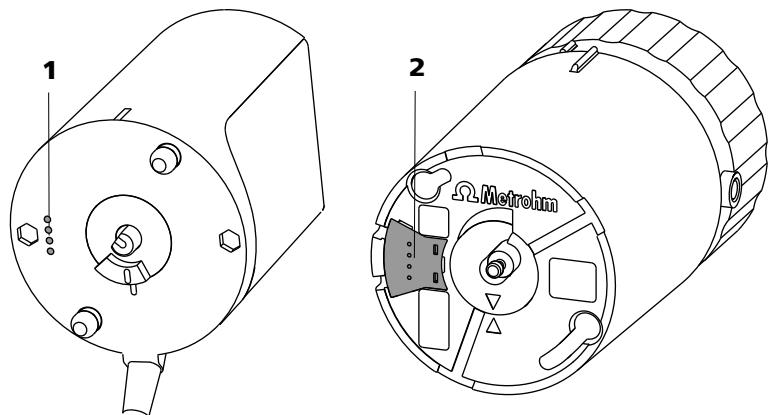


Figure 19 Data chip and contact pin

**1 Contact surface**  
on the 800 Dosino

**2 Data chip with contact pins**  
on the 807 Dosing Unit

## 9 Technical specifications

### 9.1 Dosing drive

*Resolution* 10000 steps per cylinder volume

*Dosing unit*

- Cylinder volume*
- 2 mL
  - 5 mL
  - 10 mL
  - 20 mL
  - 50 mL

*Dosing / Filling times* 18 seconds each for the cylinder volume

*Accuracy* Fulfils ISO/DIN standard 8655-3

### 9.2 Power supply

*from control device*  $\pm 12$  V, 5 V, 6W

*Dosing device connector* Mini DIN plug, 8-pin

### 9.3 Safety specification

*Design and testing*

- EN/IEC 61010-1
- UL 61010-1
- CSA-C22.2 No. 61010-1
- Degree of protection IP40
- Protection class III

*Safety instructions* The documentation contains safety instructions which have to be followed by the user in order to ensure safe operation of the instrument.



## 9.4 Electromagnetic compatibility (EMC)

### *Emission*

Standards fulfilled:

- EN/IEC 61326-1
- EN/IEC 61000-6-3
- EN 55011 / CISPR 11

### *Immunity*

Standards fulfilled:

- EN/IEC 61326-1
- EN/IEC 61000-6-2
- EN/IEC 61000-4-2
- EN/IEC 61000-4-3
- EN/IEC 61000-4-4
- EN/IEC 61000-4-5
- EN/IEC 61000-4-6
- EN/IEC 61000-4-11
- EN/IEC 61000-4-14
- NAMUR

## 9.5 Ambient temperature

*Nominal function range* +5...+45 °C (at a maximum of 85 % relative humidity)

*Storage* -20...+60 °C

*Transport* -40...+60 °C

## 9.6 Dimensions and material

### *Height*

98 mm

*Width* 67 mm

*Depth* 83 mm

*Weight* approx. 410 g

*Material of housing* PBT (polybutylene terephthalate)

## 10 Conformity and warranty

### 10.1 Declaration of Conformity

This is to certify the conformity to the standard specifications for electrical appliances and accessories, as well as to the standard specifications for security and to system validation issued by the manufacturing company.

*Name of commodity*

#### 800 Dosino

Dosing drive with low dead volume for liquid handling such as dosing, liquid transfer, dilution etc

This instrument has been built and has undergone final type testing according to the standards:

*Electromagnetic compatibility*

Emission: EN/IEC 61326-1: 2006, EN/IEC 61000-6-3: 2006,  
EN 55011 / CISPR 11: 2007

Immunity: EN/IEC 61326-1: 2006, EN/IEC 61000-6-2: 2005,  
EN/IEC 61000-4-2: 2001,  
EN/IEC 61000-4-3: 2006,  
EN/IEC 61000-4-4: 2004,  
EN/IEC 61000-4-5: 2001,  
EN/IEC 61000-4-6: 2001,  
EN/IEC 61000-4-11: 2004,  
EN/IEC 61000-4-14: 2004, NAMUR: 2004

*Safety specifications*

EN/IEC 61010-1: 2001, UL 61010-1: 2004,  
CSA-C22.2 No. 61010-1: 2004, degree of protection IP40 protection  
class III



This instrument meets the requirements of the CE mark as contained in the EU directives 2006/95/EC (LVD), 2004/108/EC (EMC). It fulfils the following specifications:

EN 61326-1: 2006 Electrical equipment for measurement, control  
and laboratory use – EMC requirements

EN 61010-1: 2001 Safety requirements for electrical equipment for  
measurement, control and laboratory use

*Manufacturer*

Metrohm Ltd., CH-9101 Herisau/Switzerland



Metrohm Ltd. is holder of the SQS certificate ISO 9001:2000 Quality management system for development, production and sales of instruments and accessories for ion analysis.

Herisau, 6 January, 2009

D. Strohm

Vice President, Head of R&D

A. Dellenbach

Head of Quality Management

## 10.2 Quality Management Principles

Metrohm Ltd. holds the ISO 9001:2000 Certificate, registration number 10872-02, issued by SQS (Swiss Association for Quality and Management Systems). Internal and external audits are carried out periodically to assure that the standards defined by Metrohm's QM Manual are maintained.

The steps involved in the design, manufacture and servicing of instruments are fully documented and the resulting reports are archived for ten years. The development of software for PCs and instruments is also duly documented and the documents and source codes are archived. Both remain the possession of Metrohm. A non-disclosure agreement may be asked to be provided by those requiring access to them.

The implementation of the ISO 9001:2000 quality management system is described in Metrohm's QM Manual, which comprises detailed instructions on the following fields of activity:

### Instrument development

The organization of the instrument design, its planning and the intermediate controls are fully documented and traceable. Laboratory testing accompanies all phases of instrument development.

### Software development

Software development occurs in terms of the software life cycle. Tests are performed to detect programming errors and to assess the program's functionality in a laboratory environment.

### Components

All components used in the Metrohm instruments have to satisfy the quality standards that are defined and implemented for our products. Suppliers of components are audited by Metrohm as the need arises.

### **Manufacture**

The measures put into practice in the production of our instruments guarantee a constant quality standard. Production planning and manufacturing procedures, maintenance of production means and testing of components, intermediate and finished products are prescribed.

### **Customer support and service**

Customer support involves all phases of instrument acquisition and use by the customer, i.e. consulting to define the adequate equipment for the analytical problem at hand, delivery of the equipment, user manuals, training, after-sales service and processing of customer complaints. The Metrohm service organization is equipped to support customers in implementing standards such as GLP, GMP, ISO 900X, in performing Operational Qualification and Performance Verification of the system components or in carrying out the System Validation for the quantitative determination of a substance in a given matrix.

## **10.3 Warranty (guarantee)**

Metrohm guarantees that the deliveries and services it provides are free from material, design or manufacturing errors. The warranty period is 36 months from the day of delivery; for day and night operation it is 18 months. The warranty remains valid on condition that the service is provided by an authorized Metrohm service organization.

Glass breakage is excluded from the warranty for electrodes and other glassware. The warranty for the accuracy corresponds to the technical specifications given in this manual. For components from third parties that make up a considerable part of our instrument, the manufacturer's warranty provisions apply. Warranty claims cannot be pursued if the Customer has not complied with the obligations to make payment on time.

During the warranty period Metrohm undertakes, at its own choice, to either repair at its own premises, free of charge, any instruments that can be shown to be faulty or to replace them. Transport costs are to the Customer's account.

Faults arising from circumstances that are not the responsibility of Metrohm, such as improper storage or improper use, etc. are expressly excluded from the warranty.



## 11 Accessories

### 11.1 Scope of delivery



#### Note

Subject to change without notice.

#### 11.1.1 800 Dosino 2.800.0010

| Qty. | Order no.  | Description  |
|------|------------|--------------|
| 1    | 1.800.0010 | 800 Dosino   |
| 1    | 6.1546.030 | Piston tongs |

For the PTFE pistons of the dosing unit



|   |              |                   |
|---|--------------|-------------------|
| 1 | 8.800.8002EN | 800 Dosino Manual |
|---|--------------|-------------------|

#### 11.1.2 800 Dosino 2.800.0020

| Qty. | Order no.  | Description |
|------|------------|-------------|
| 1    | 1.800.0020 | 800 Dosino  |

With cable 0.65 m.

| Qty. | Order no.         | Description  |
|------|-------------------|--|
| 1    | <b>6.1546.030</b> | <b>Piston tongs</b><br>For the PTFE pistons of the dosing unit |




---

|   |                     |                          |
|---|---------------------|--------------------------|
| 1 | <b>8.800.8002EN</b> | <b>800 Dosino Manual</b> |
|---|---------------------|--------------------------|

## 11.2 Optional accessories

| Order no.         | Description  |
|-------------------|--|
| <b>6.1562.130</b> | <b>Transfer tubing with holder 2 x M6 / 10 mL for Sample Processors</b><br>Transfer tubing for sample dilution and preconcentration with the Dosino on an Advanced IC Sample Processor.<br>Material: FEP<br>Inner diameter (mm): 2<br>Length (m): 5<br>Volume (mL): 10 |
| <b>6.2151.010</b> | <b>Cable MSB plug / socket</b><br>Extension cable for MSB connections and for Touch Control - Titrando. Mini DIN socket - Mini DIN plug<br>Length (m): 2   |
| <b>6.3032.120</b> | <b>Dosing unit 2 mL</b><br>Dosing unit with integrated data chip with 2 mL glass cylinder and light protection, can be mounted on a reagent bottle with ISO/DIN GL45 glass thread. FEP tubing connection, antidi diffusion buret tip.<br>Volume (mL): 2                |






| <b>Order no.</b>  | <b>Description</b>       |   |
|-------------------|--------------------------|---|
| <b>6.3032.150</b> | <b>Dosing unit 5 mL</b>  |    |
| Volume (mL):      | 5                        |    |
| <b>6.3032.210</b> | <b>Dosing unit 10 mL</b> |   |
| <b>6.3032.220</b> | <b>Dosing unit 20 mL</b> |  |
| <b>6.3032.250</b> | <b>Dosing unit 50 mL</b> |   |
| Volume (mL):      | 10                       |   |
| Volume (mL):      | 20                       |   |
| Volume (mL):      | 50                       |   |

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