872 Extension Module

2.872.0110 – Suppression

Manual
8.872.8006EN

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Although all the information given in this documentation has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please send us your comments using the address given above.

Documentation in additional languages can be found on *http://products.metrohm.com* under **Literature/Technical documentation**.

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1 Introduction

1.1 Instrument description

Existing 850 Professional IC instruments can be expanded to include additional functions by means of 872 Extension Modules. Every 850 Professional IC instrument can be supplemented with up to 3 extension modules.

The **872 Extension Module Suppression** can be used in IC systems whenever an additional suppression module or a sample preparation module is required.

The extension module is operated with **MagIC Net** software, just like the IC instrument. When it is connected to an 850 Professional IC instrument, MagIC Net recognizes the extension module automatically and checks its functional capability. It controls and monitors the unit IC instrument – extension module, evaluates the measured data and administers it in a database.

The 872 Extension Module Suppression comprises the following components:

Peristaltic pump

The Peristaltic pump is used for pumping sample and auxiliary solutions. It can rotate in both directions.

Suppressor drive

The suppressor drive allows you to flexibly use different rotors according to the principle "one drive – many rotors". With appropriate adapters, the rotor for the sample preparation module (SPM Rotor) or suppressor rotors with different capacities and construction can be easily exchanged.

1.2 Intended use

This instrument is suitable for processing chemicals and flammable samples. The usage of the 872 Extension Module therefore requires that the user has basic knowledge and experience in the handling of toxic and caustic substances. Knowledge with respect to the application of the fire prevention measures prescribed for laboratories is also mandatory.

1.3 About the documentation

1.3.1 Content and scope

This document describes the **872 Extension Module Suppression**, its assembly and connection to the IC instrument, as well as the installation, operation and maintenance of the individual components. Technical specifications, troubleshooting and information concerning scope of delivery and optional accessories makes up the rest of the manual.

This document does not on the other hand describe the functions of the IC instrument - IC extension module unit, nor does it describe the capillary connections that proceed from the extension module. For this purpose, please refer to the manual for the IC instrument and that for the sample processor.

Additional information concerning the configuration of MagIC Net can be found on the online help for MagIC Net.

1.3.2 Symbols and conventions

The following symbols and styles are used in this documentation:

*(5-**12**)*	**Cross-reference to figure legend** The first number refers to the figure number, the second to the instrument part in the figure.
1	**Instruction step** Carry out these steps in the sequence shown.
	**Warning** This symbol draws attention to a possible life 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.
	**Caution** This symbol draws attention to a possible damage of instruments or instrument parts.
	**Note** This symbol marks additional information and tips.

1.4 Safety instructions

1.4.1 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.

1.4.2 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.

1.4.3 Tubing and capillary connections

Caution

Leaks in tubing 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. Appropriate tools can be used to loosen connections.

Check the connections regularly for leakage. If the instrument is used mainly in unattended operation, then weekly inspections are mandatory.

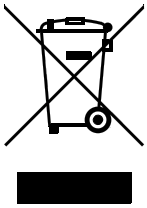
1.4.4 Flammable solvents and chemicals

Warning

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

- Set up the 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.

1.4.5 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

2.1 Front

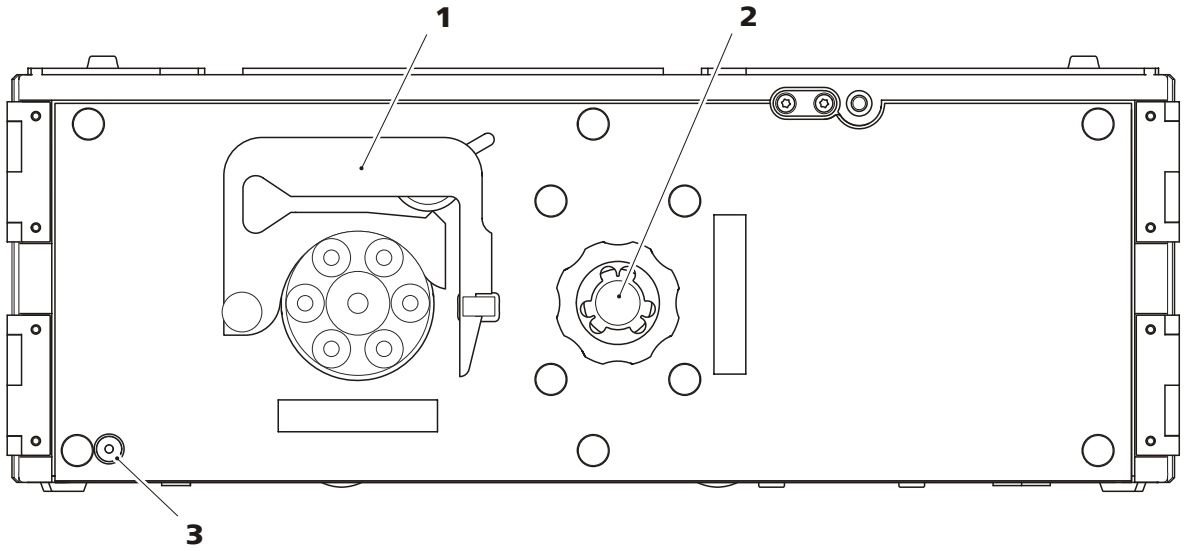


Figure 1 Front 872 Extension Module Suppression

1 **Peristaltic pump** *(see Chapter 3.4, page 15)*	**2** **Suppressor drive** *(see Chapter 3.5, page 19)*
3 **Standby indicator**	

2.2 Rear

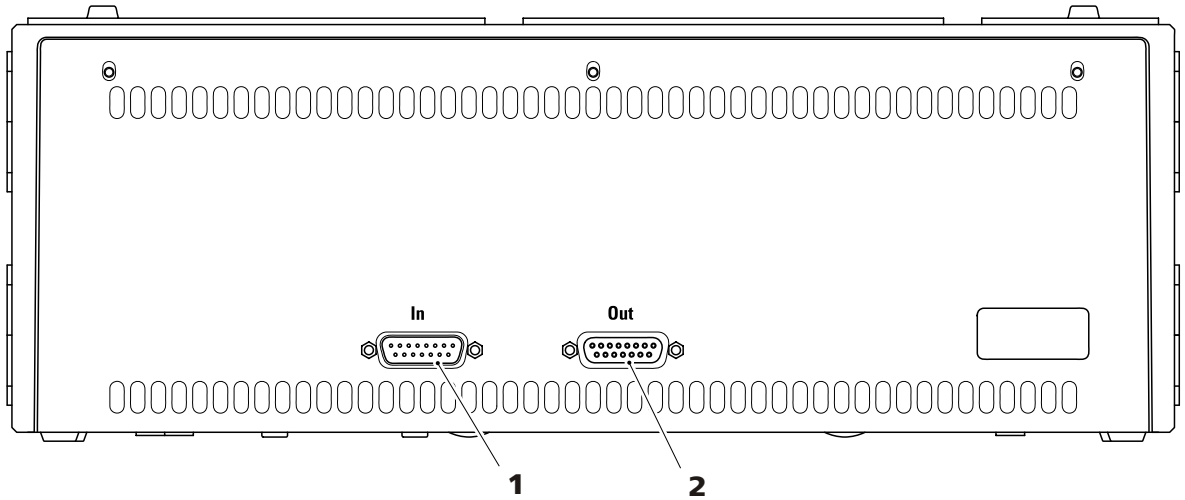


Figure 2 Rear 872 Extension Module Suppression

1	**Connector In** To connect the extension module to the IC instrument or to a previous extension module.
2	**Connector Out** To connect an additional extension module.

2.3 Extension Module and 850 Professional IC instrument

The extension modules are fitted directly to the 850 Professional IC instrument and connected with it via the connection cable provided. Extension modules have no power supply of their own, but rather draw the electricity they require from the instrument with which they are connected.

Extension Modules can be mounted on top of the 850 Professional IC instrument (between instrument and bottle holder) *(3-**A**)*, or below the instrument (between instrument and base tray) *(3-**B**)*, or set up next to the instrument *(3-**C**)* with separate 6.2061.110 base tray and 6.2061.100 bottle holder (to be ordered separately).

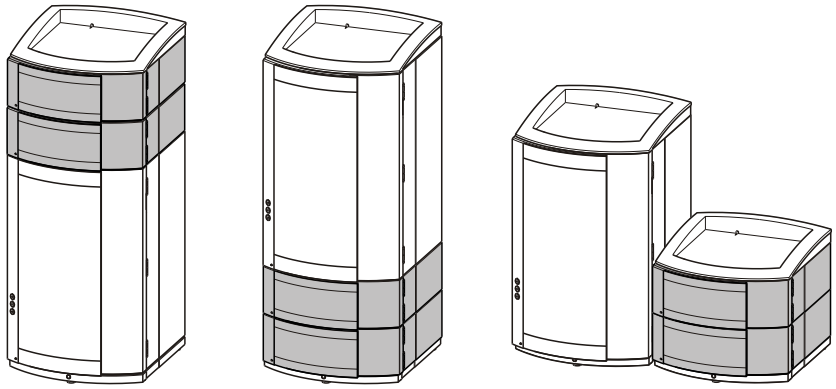


Figure 3 Proposed setup

A	**Extension module on top** Between the 850 Professional IC and the bottle holder.
B	**Extension module below** Between the base plate and the 850 Profession IC.
C	**Extension module separately** With its own base plate and its own bottle holder next to the 850 bottle holder.

Up to three extension modules can be connected to an 850 Professional IC instrument. The following restrictions are to be taken into account:

Restrictions

The 850 Professional IC instruments and their extension modules must not have more than 4 identical components in common, i.e.:

- a maximum of 4 high pressure pumps,

- a maximum of 4 peristaltic pumps,
- a maximum of 4 injection valves,
- a maximum of 4 suppressors (MSM, SPM incl.),
  BUT
- only a maximum of 3 degassers
- and a maximum of 3 CO_2 suppressors (MCS)

Note

If all 4 high pressure pumps are being used at once, then not all of them are permitted to run at maximum flow for longer periods of time.

Position the extension module in such a way that the capillary connections can be kept as short as possible. If several extension modules are used, then they should all be installed in the same location, either on top or below. If this is not possible, then the extension modules that are located at greater distances from one another must be connected with one another by means of the longer 6.2156.070 connection cable.

3 Installation

3.1 Installation overview

The 872 Extension Module Suppression can be installed carrying out the following easy steps:

1 Setting up the instrument

See Chapter 3.2, Page 10

2 Mounting base tray and bottle holder

See Chapter 3.3, Page 10

3 Installing the peristaltic pump

See Chapter 3.4, Page 15

- Install pump tubings.
- Connect aspirating capillaries for the regeneration solution and the rinsing solution.

4 Installing the suppressor

See Chapter 3.5, Page 19

- Insert the rotor.
- Connect the suppressor.

5 Connecting the instrument

- Connect the socket labeled *in* on the 872 extension module and the socket labeled *Extension Module* on the 850 Professional IC with the cable 6.2156.070.

3.2 Setting up the instrument

3.2.1 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.

3.2.2 Checks

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

3.2.3 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.

3.3 Mounting base tray and bottle holder (optional)

The 6.2061.110 base tray and 6.2061.100 bottle holder protect IC instruments from dust, dirt and leaking fluids. If more than one instrument of the Professional IC family is used, these can be set up in one or more stacks. We recommend that a bottle holder and a base tray be mounted on/below each stack of instruments.

Bottle holder and base tray must be removed or mounted every time one of the following instruments is mounted on or under an 850 Professional IC instrument:

- One or more 872 Extension Module.
- or another instrument of the same support surface.

3.3.1 Removing / mounting the base tray

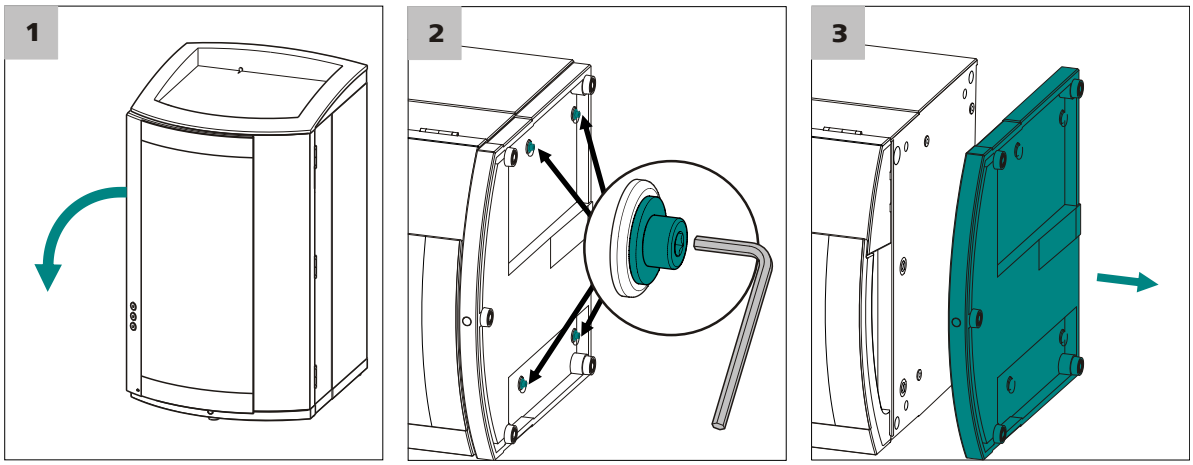
The base tray must be removed, in case you want to place another instrument under the IC instrument. Proceed as follows:

Removing the base tray

Before you can remove the base tray, the following preconditions must be met:

- The instrument is switched off.
- The bottle holder is cleared.
- All connections at the rear of the instrument are disconnected.
- There are no loose parts in the instrument.

To remove the base tray, you need the 6.2621.100 hexagon key 3 mm.



1 Tilt the instrument sideways and lay it down flat.

2 Loosen the cylinder screws with the 3 mm hexagon key and remove them and their washers.

3 Remove base tray.

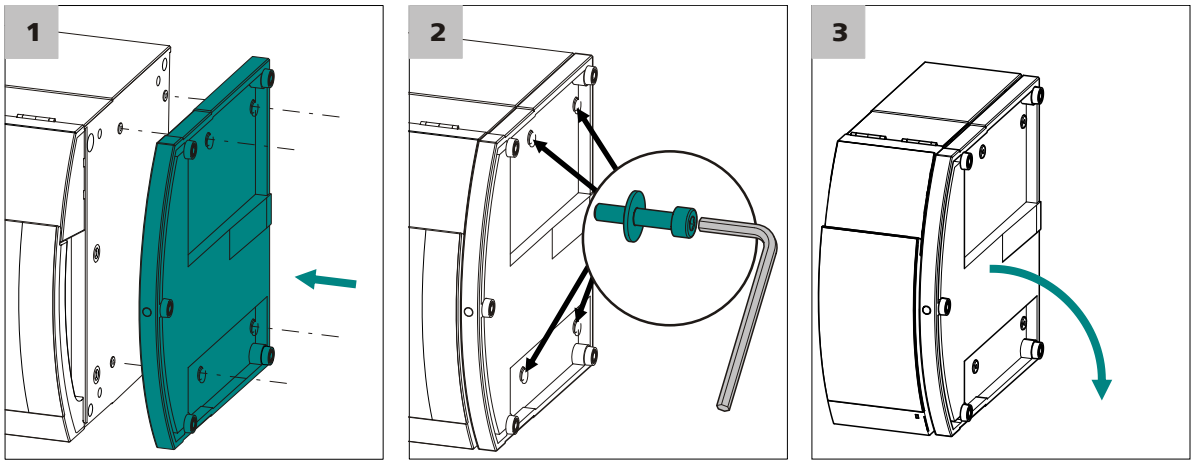
The base tray must always be mounted under the lowermost instrument of the stack. Proceed as follows:

Mounting the base tray

Before you can mount the base tray, the following preconditions must be met:

- The instrument is switched off.
- The bottle holder is cleared.
- All connections at the rear of the instrument are disconnected.
- There are no loose parts in the instrument.
- The instrument is lying on it side, and the bottom surface is visible.

To mount the base tray, you need the 3 mm hexagon key (6.2621.100).



1 Attach the base tray so that the openings in the base tray match exactly the screw threads in the bottom of the instrument.

2 Slide the four washers onto the four cylinder screws, insert the screws and tighten them with the 3 mm hexagon key.

3 Set the instrument up on the base tray.

Stack other instruments in the required order. Mount the 6.2061.100 bottle holder onto the topmost instrument *(see "Mounting the bottle holder", page 13)*.

3.3.2 Removing / mounting the bottle holder

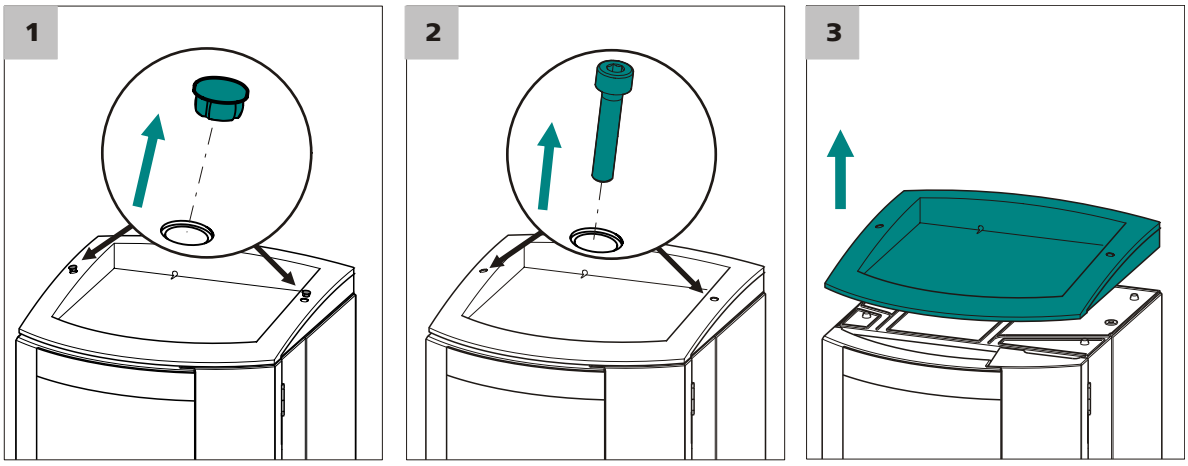
The bottle holder must be removed in case you want to mount another instrument on top of the IC instrument. Proceed as follows:

Removing the bottle holder

Before you can remove the bottle holder, the following preconditions must be met:

- The instrument is switched off.
- The bottle holder is cleared.
- Drainage tubing is disconnected from the drainage tubing connection of the bottle holder.

To remove the bottle holder, you need a 3 mm hexagon key (6.2621.100).



1 Remove the two covering stoppers.

2 Loosen the two cylinder screws with the 3 mm hexagon key and remove them.

3 Remove the bottle holder.

Stack other instruments in the required order. Mount the 6.2061.100 bottle holder onto the topmost instrument *(see "Mounting the bottle holder", page 13)*.

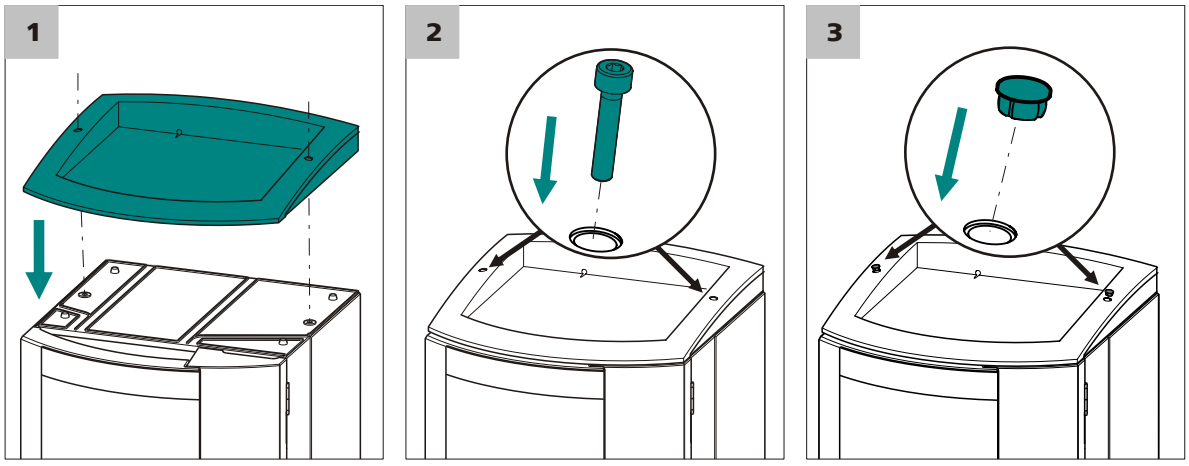
Proceed as follows:

Mounting the bottle holder

Before you can mount the bottle holder, the following preconditions must be met:

- The instrument is switched off.

To mount the bottle holder, you need a 6.2621.100 hexagon key 3 mm.



1 Attach the bottle holder onto the topmost instrument so that the openings in the bottle holder exactly match the screw threads on the top surface of the instrument.

2 Insert the two cylinder screws and tighten them with the 3 mm hexagon key.

3 Insert covering stoppers .

After having attached the bottle holder, all connections which were undone at the beginning of the process, must be reconnected. Proceed as follows:

Restoring the loosened connections

1 Connect the USB cable.

2 Connect the MSB cable.

3 Plug in the mains cable.

4 Reconnect drainage tubings *(see manual of the IC instrument)*.

Possibly, a longer section of silicone tubing 6.186.020 must be cut to fit and mounted *(see also the manual for the IC instrument)*.

5 If one of the instruments in the stack is equipped with a leak sensor connection socket, connect the leak sensor *(see manual of the IC instrument)*.

3.4 Peristaltic pump

3.4.1 Principle of the peristaltic pump

The Peristaltic pump is used for pumping sample and auxiliary solutions. It can rotate in both directions.

The peristaltic pump pumps liquids according to the principle of displacement. The pump tubing is clamped between the rollers *(4-**3**)* and the tubing cartridge *(4-**5**)*. During operation, the peristaltic pump drive rotates the roller hub *(4-**2**)*, so that the rollers *(4-**3**)* push the liquid forward in the pump tubing.

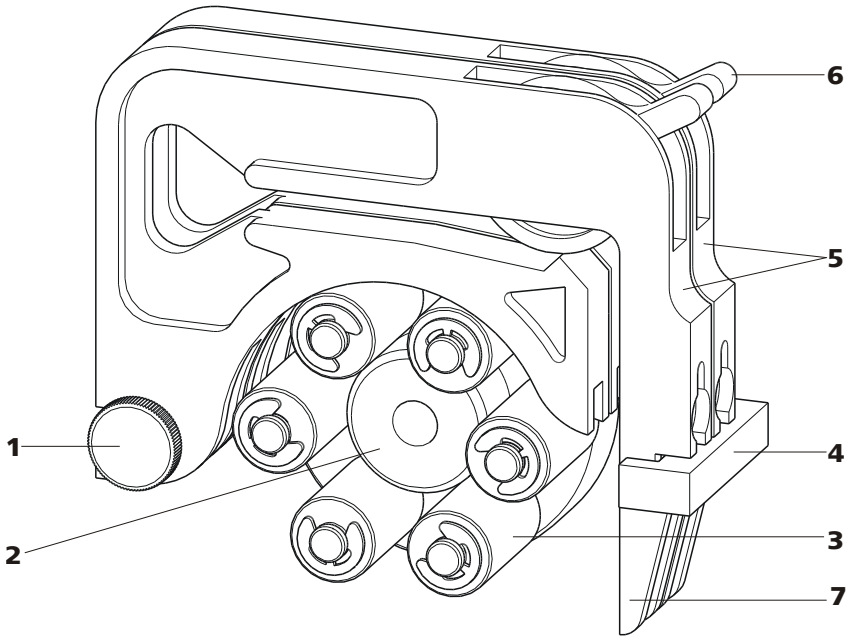


Figure 4 Peristaltic pump

1	**Knurled screw in the mounting pin**	**2**	**Roller hub**
3	**Rollers**	**4**	**Cartridge holder**
5	**Tubing cartridges 6.2755.000**	**6**	**Contact pressure lever**
7	**Snap-action lever**		

3.4.2 Installing the peristaltic pump

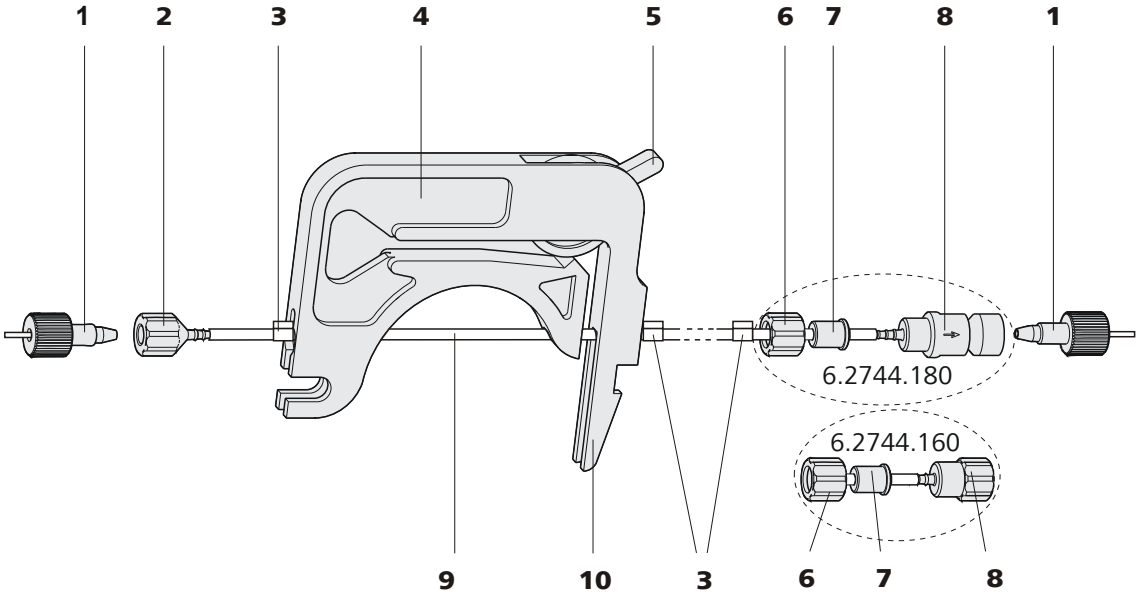


Figure 5 Installing the pump tubing

1	**PEEK pressure screws, short (6.2744.070)**	**2**	**Tubing olive (6.2744.034)**
3	**Stopper** The colors of the stopper indicate the inner diameter of the pump tubing.	**4**	**Tubing cartridge (6.2755.000)**
5	**Contact pressure lever**	**6**	**Union nut**
7	**Adapter**	**8**	**Tubing olive** Either with filter holder (6.2744.180) or without filter holder (6.2744.160).
9	**Pump tubing (6.1826.xx0)**	**10**	**Snap-action lever**

Mount the pump tubing as follows:

1 Removing the tubing cartridge

Release the tubing cartridge from the cartridge holder by pressing the snap-action lever and unhooking from the mounting pins *(4-**1**)*.

2 Connecting the aspiration side

Place a 6.2744.034 tubing olive *(5-**2**)* on the aspiration side of the pump tubing.

3 Connecting the pressure side

Note

Depending on the use of the peristaltic pump, on the pressure side you can either connect:

- **Case A:** a 6.2744.180 pump tubing connection **with filter** *(see Figure 6, page 17)* or
- **Case B:** a 6.2744.160 pump tubing connection **without filter** *(see Figure 7, page 17)*.

For pumping the auxiliary solutions to the MSM or to the SPM, a 6.2744.180 pump tubing connection **with** filter **must** be used.

Case A: 6.2744.180 pump tubing connection with filter:

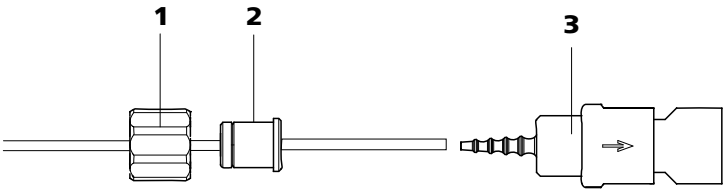


Figure 6 Install pump tubing connection with filter

1 Union nut	**2 Adapter**
3 Tubing olive with filter holder	

- Slide union nut *(6-**1**)* onto the pump tubing.
- Select a suitable adapter *(6-**2**)* and slide it onto the pump tubing. The type of adapter depends on the pump tubing *(see Table 1, page 18)*.
- Place the tubing olive with filter holder *(6-**3**)* onto the pump tubing.
- Screw the union nut *(6-**1**)* onto the tubing olive *(6-**3**)*.

or

Case B: 6.2744.160 pump tubing connection without filter:

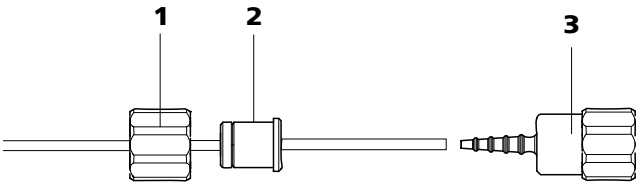


Figure 7 Install pump tubing connection without filter

1 Union nut	**2 Adapter**
3 Tubing olive	

- Slide union nut *(7-**1**)* onto the pump tubing.
- Select a suitable adapter *(7-**2**)* and slide it onto the pump tubing. The type of adapter depends on the pump tubing *(see Table 1, page 18)*.
- Place the tubing olive *(7-**3**)* onto the pump tubing.
- Screw the union nut *(7-**1**)* onto the tubing olive *(7-**3**)*.

4 Inserting the pump tubing

- Press the contact pressure lever all the way down.
- Place the pump tubing in the tubing cartridge. The stoppers *(5-**3**)* must snap into the corresponding holders of the tubing cartridge.

5 Inserting the tubing cartridge

- Hang the tubing cartridge in the mounting pin and press in the cartridge holder until the snap-action lever snaps in.

6 Connecting the capillaries

- Screw the respective capillaries tightly to the two tubing olives with PEEK pressure screws *(5-**1**)*.

Table 1 Pump tubings and suitable adapters

Pump tubing	Adapter
6.1826.020 (blue/blue)	
6.1826.310 (orange/green)	
6.1826.320 (orange/yellow)	
6.1826.330 (orange/white)	
6.1826.340 (black/black)	
6.1826.360 (white/white)	
6.1826.380 (gray/gray)	
6.1826.390 (yellow/yellow)	

Set flow rate

The contact pressure of the tubing cartridge must be adjusted in order to regulate the flow rate. Proceed as follows:

Set the contact pressure

1

- Fully loosen the contact pressure lever *(5-**5**)*, i.e. press it all the way down.
- Switch on the peristaltic pump.
- Raise the contact pressure lever one step at a time until liquid flows.
- When liquid starts flowing, raise the contact pressure lever by an additional 2 ratchet increments.

The contact pressure is now set optimally.

The delivery rate depends not only on the correct contact pressure but also on the interior diameter of the pump tubing and the rotational speed of the drive.

Note

Pump tubings are consumable material. The service life of the pump tubings depends on the contact pressure amongst other factors.

3.5 Suppressor drive

The suppressor housing of the 872 Extension Module Suppression can hold various rotors. Large rotors like the SPM rotors A (6.2835.000) and the MSM-HC rotor A (6.2842.000) can be inserted directly.

Small rotors like the MSM rotor A (6.2832.000) and the MSM-LC rotor A (6.2844.000) must first be fitted into the adapter (6.2842.010) which can then be inserted into the suppressor housing.

For all rotors the large connecting piece (6.2835.010) is used.

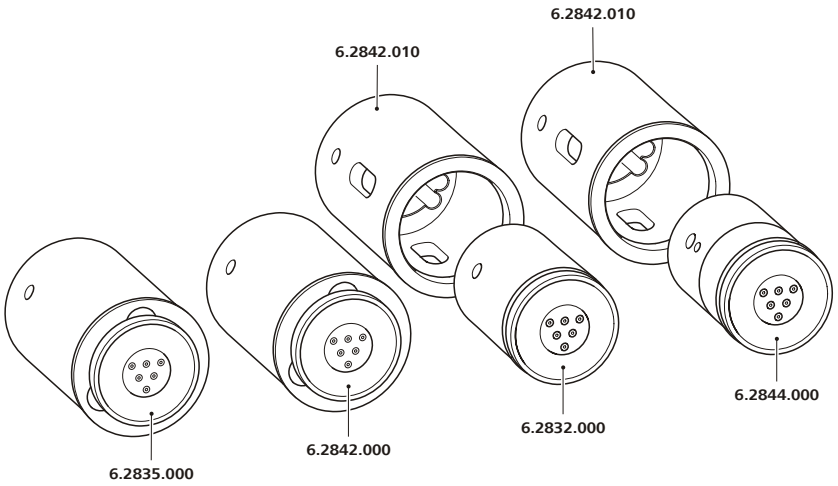


Figure 8 Rotors and adapter

Note

The instruments are supplied without rotor and without adapter.

The suitable rotor and the adapter, if required, must be ordered separately.

3.5.1 Inserting the rotors

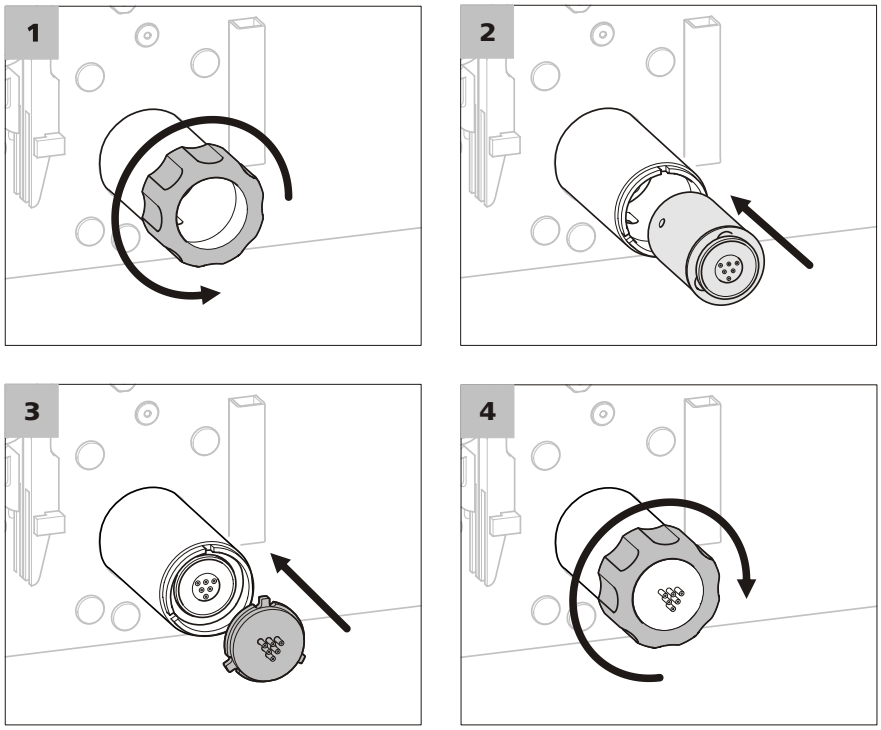
Large rotors can be directly inserted into the rotor housing.

Caution

An incorrectly inserted rotor can be **destroyed** during start-up.

Therefore, follow the following instructions exactly.

Inserting large rotors



1 Removing the union nut

Loosen the union nut and remove it.

2 Inserting the rotor

- Clean the surface of the rotor with ethanol using a lint-free cloth.
- Insert the rotor into the rotor housing in such a way that the tubing connections on the rear of rotor fit into the corresponding recesses inside the housing and one of the three holes of the rotor is visible from below in the slot of the housing.

Note

If the rotor is correctly inserted, its sealing surface will be approx. 4 mm within the housing.

If this is not the case, the rotor must be moved into the right position from below using a sharp object (e.g. screwdriver).

3 Inserting the connecting piece

- Clean the sealing surface of the connecting piece with ethanol using a lint-free cloth.
- Insert the connecting piece into the rotor housing in such a way that the connector *1* is on top and the three pins of the connecting piece fit into the corresponding recesses on the housing.

4 Attaching the union nut

Tighten by hand the union nut on the thread of the rotor housing (do not use any tools).

Inserting small rotors

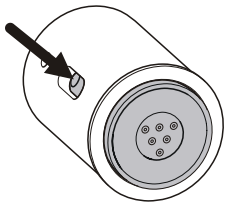
In order to insert small rotors into the suppressor housing, you need the adapter (6.2842.010)

1 Inserting the rotor into the adapter

Caution

An incorrectly inserted rotor can be **destroyed** during start-up.

- Clean the surface of the rotor with ethanol using a lint-free cloth.
- Insert the rotor into the adapter in such a way that the tubing connections on the rear of rotor fit into the corresponding recesses inside the adapter and one of the three holes of the rotor is visible in the slot of the adapter.



2 Inserting the adapter

Insert the adapter as you would insert a large rotor *(see "Inserting large rotors", page 21)*.

3.5.2 Connecting the suppressor

The three inputs and outputs of the suppressor units, numbered with 1, 2 and 3 on the connecting piece, each have 2 fixed mounted PTFE capillaries.

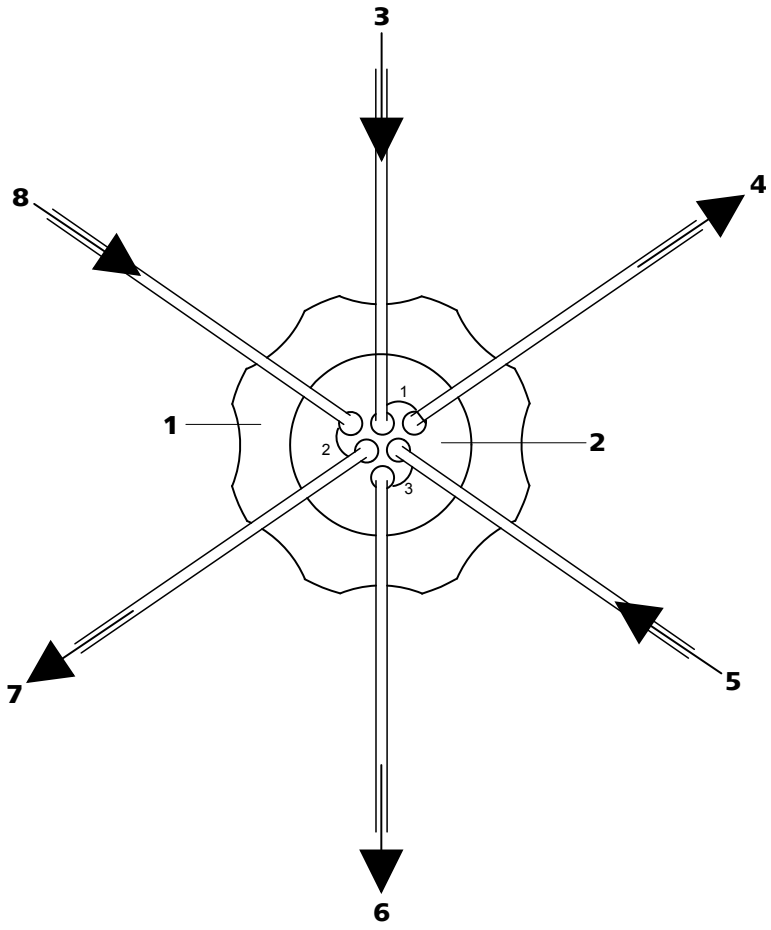


Figure 9 Suppressor – connection capillaries

1	**Union nut**	**2**	**Connecting piece (6.2835.010)**
3	**Eluent inlet capillary** Labeled with *in*.	**4**	**Eluent outlet capillary** Labeled with *out*.
5	**Rinsing solution inlet capillary** Labeled with *rinsing solution*.	**6**	**Rinsing solution outlet capillary** Labeled with *waste rins.*.
7	**Regeneration solution outlet capillary** Labeled with *waste reg.*.	**8**	**Regeneration solution inlet capillary** Labeled with *regenerant*.

The rinsing and regeneration solutions are pumped with a peristaltic pump *(see Chapter 3.4, page 15)*.

Connect the PTFE capillaries firmly mounted on the connecting piece to the other components of the IC system as follows:

Connecting the capillaries of the suppressor

In order to protect the Suppressor from foreign particles or bacterial growth, the following precondition must be fulfilled:

- Pump tubing connections with filter (6.2744.180) are installed at the pump tubing outlets of the peristaltic pump.

Caution

As the PTFE capillaries are very soft, the pressure screws should not be overtightened.

Squeezed capillary ends can be shortened with the capillary cutter (6.2621.080).

1 Connecting the eluent inlet capillary

- Fasten the end of the inlet capillary labeled with *in* to the output of the column with a short PEEK pressure screw (6.2744.070).

2 Connecting the eluent outlet capillary

- **At the MCS (in case an MCS is being used):** Fasten the end of the outlet capillary labeled with *out* to the input *in* of the MCS with a long PEEK pressure screw (6.2744.090).
  or
- **At the detector:** Fasten the end of the outlet capillary labeled with *out* to the detector *(see manual of the detector)*.

3 Connecting the rinsing solution inlet capillary

- With a short PEEK pressure screw (6.2744.070), fasten the end of the inlet capillary labeled with *rinsing solution* to the pump tubing connection of the pump tubing which carries the rinsing solution.

4 Connecting the rinsing the solution outlet capillary

- Guide the other end of the outlet capillary labeled with *waste rins.* into a sufficiently large waste container and fasten it there.

5 Connecting the regeneration solution inlet capillary

- With a short PEEK pressure screw (6.2744.070), fasten the end of the inlet capillary labeled with *regenerant* to the pump tubing connection of the pump tubing which carries the regeneration solution.

6 Connecting the regeneration solution outlet capillary

- Guide the other end of the outlet capillary labeled with *waste reg.* into a sufficiently large waste container and fasten it there.

4 Start-up

The extension module is put into operation together with the IC instrument.

Putting IC instrument into operation with extension modules

Before the star-up, the following preconditions must be met:

- The peristaltic pump is installed and connected.
- A rotor is correctly inserted.
- The 872 Extension Module Suppression is connected to the 850 Professional IC instrument.

1 Start MagIC Net.

2 Connect the 850 Professional IC instrument to the PC and switch on.

The extension module is recognized automatically by MagIC Net.

3 Follow the other instructions in the chapter *"Initial start-up"* of the manual for the 850 Professional IC.

5 Handling and maintenance

5.1 General information

5.1.1 Care

Warning

The instrument housing must not be opened by untrained personnel.

The instrument requires appropriate care. Excess contamination of the instrument may result in functional disruptions and a reduction in the service life of the sturdy mechanics and electronics.

Caution

Although this is prevented to a great extent 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.

Spillages of chemicals and solvents should be cleaned up immediately. In particular, the plug connections on the rear panel of the instrument (especially the mains plug) should be protected from contamination.

5.1.2 Maintenance by Metrohm Service

Maintenance of the instrument is best carried out as part of an annual service, which is performed by specialist personnel from Metrohm. If working frequently with caustic and corrosive chemicals, a shorter maintenance interval is recommended. The Metrohm service department offers every form of technical advice for maintenance and service of all Metrohm instruments.

5.1.3 Operation

Caution

In order to avoid disturbing temperature influences, the entire system must be protected against direct sunlight.

5.1.4 Shutting down

If the instrument is shut down for a longer period of time, the entire IC system must be rinsed as follows to rid it of salts in order to prevent eluent salts from forming crystals which may cause subsequent damage.

- rinse all capillaries and the Dosino with methanol/ultra pure water (1:4),
- rinse all pump tubings of the peristaltic pump with ultra pure water.

5.2 Door

Caution

The door is made of PMMA (polymethylmetacrylate). It must never be cleaned with abrasive media or solvents.

Caution

Never use the door as a handle.

5.3 Peristaltic pump

5.3.1 Operation

The pumping capacity of the peristaltic pump depends on the drive speed (set via software), the contact pressure and, above all, the internal diameter of the pump tubing. Depending on the application, different pump tubings are used.

Caution

The service life of the pump tubings also depends on the contact pressure. Therefore fully lift the tubing cartridges by loosening the snap-action lever *(5-**10**)* on the right-hand side if the peristaltic pump is to be turned off for a longer period. Once set, the contact pressure remains unaffected.

Caution

The 6.1826.xxx pump tubings consist of PVC or PP and therefore must not be used for rinsing with solutions containing acetone. In this case, use other pump tubings or use another pump for rinsing.

5.3.2 Maintenance

5.3.2.1 Pump tubing

The pump tubing used in the peristaltic pump is a consumable whose service life is restricted.

The LFL pump tubing with 3 stoppers is stretched in the tubing cartridge in such a way that it comes to rest between two stoppers. This results in two possible positions for the tubing cartridge. If the pump tubing should exhibit clear signs of wear, then this can be stretched a second time, in the respective alternate position.

Therefore replace the pump tubing periodically, or when used permanently approx. every 4 weeks .

Selecting the pump tubing

The pump tubing differs in material, diameter and hence also pumping capacity. Depending on the application, different pump tubings are used.

The following table provides information on the properties and use of the pump tubing:

Table 2 Pump tubing

Order number	Name	Material	Inner diameter	Use
6.1826.020	Pump tubing (blue/blue), 2-stopper	PVC (Tygon ST)	1.65 mm	Pump tubing for online IC instruments and automation in voltammetry
6.1826.310	Pump tubing LFL (orange/green), 3-stopper	PVC (Tygon)	0.38 mm	Pump tubing for bromate determination using the triiodide method.
6.1826.320	Pump tubing LFL (orange/yellow), 3-stopper	PVC (Tygon)	0.48 mm	For suppressor solutions, acceptor solutions for inline dialysis and for inline ultrafiltration.

Order number	Name	Material	Inner diameter	Use
6.1826.330	Pump tubing LFL (orange/white), 3-stopper	PVC (Tygon)	0.64 mm	No special applications.
6.1826.340	Pump tubing LFL (black/black), 3-stopper	PVC (Tygon)	0.76 mm	For the sample solution in inline dialysis.
6.1826.360	Pump tubing LFL (white/white), 3-stopper	PVC (Tygon)	1.02 mm	For sample transfer.
6.1826.380	Pump tubing LFL (gray/gray), 3-stopper	PVC (Tygon)	1.25 mm	For inline sample dilution.
6.1826.390	Pump tubing LFL (yellow/yellow), 3-stopper	PVC (Tygon)	1.37 mm	For the sample solution in inline ultrafiltration.

5.3.2.2 Pump tubing connection with filter

The 6.2821.130 filters *(10-**2**)* should be changed every 3 months, more frequently at higher backpressure.

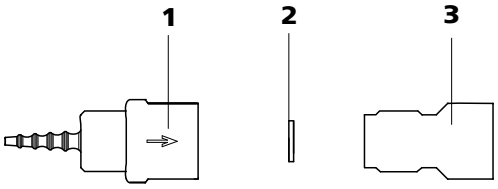


Figure 10 Pump tubing connection – Changing the filter

1 Tubing olive

2 Filter 6.2821.130
Packaging contains 10 items.

3 Filter housing

Replacing the filter

1 Unscrewing filter screw

- Screw the filter screw *(10-**3**)* out of the tubing olive *(10-**1**)* with the aid of two 6.2621.000 adjustable wrenches.

2 Replacing the filter

- Remove the old filter *(10-**2**)* with tweezers.
- Place the new filter *(10-**2**)* flat in the tubing olive *(10-**1**)* with tweezers.

3 Mounting filter screw

- Screw the filter screw *(10-**3**)* back into the tubing olive *(10-**1**)* and tighten by hand. Then additionally tighten with two 6.2621.000 adjustable wrenches.

5.4 Suppressor/SPM

5.4.1 Protection

To protect the suppressor/SPM against foreign particles or bacterial growth, a pump tubing connection with filter (6.2744.180) *(see Figure 6, page 17)* must be mounted between the peristaltic pump *(see Figure 4, page 15)* and the inlet capillaries of the suppressor/SPM.

5.4.2 Operation Suppressor

Note

The suppressor units must never be regenerated in the same flow direction in which the eluent is pumped. Therefore always mount the inlet and outlet capillaries according to the diagram outlined in *figure 9*.

The suppressor consists of 3 suppressor units, which are in rotation used for suppression – regenerated with regeneration solution – rinsed with ultra pure water. In order to record every new chromatogram under comparable conditions, you should normally work with a freshly regenerated suppressor.

Caution

The suppressor must never be switched over in a dry state, as there is a risk of jamming. If the suppressor is in a dry state, it must be rinsed for at least 5 minutes before it may be switched over.

Caution

In the case of reduced capacity or high backpressure, the suppressor must be regenerated *(see Chapter 5.4.4.2, page 33)*, cleaned *(see Chapter 5.4.4.3, page 35)* or replaced *(see Chapter 5.4.4.4, page 36)*.

5.4.3 Operation Sample Preparation Module (SPM)

Caution

The neutralization units must never be regenerated in the same flow direction the eluent is pumped. Therefore always mount the inlet and outlet capillaries according to diagram outlined in *figure 9*.

The SPM consists of 3 neutralization units, which are in rotation used for neutralization – regenerated with 100 mmol/L perchloric acid – rinsed with ultra pure water . In order to record every new chromatogram under comparable conditions, you should normally work with a freshly regenerated SPM.

Caution

The SPM must never be switched over in a dry state, as there is a risk of jamming. If the SPM is in a dry state, the SPM must be rinsed for at least 5 minutes before it may be switched over.

Caution

In the case of reduced capacity or high backpressure, the SPM must be regenerated *(see Chapter 5.4.4.2, page 33)*, cleaned *(see Chapter 5.4.4.3, page 35)* or replaced *(see Chapter 5.4.4.4, page 36)*.

5.4.4 Maintenance

Note

The following chapters equally apply to the suppressor and the sample preparation module (SPM).

5.4.4.1 Components of the suppressor

The SPM is made up of the same components as the suppressor.

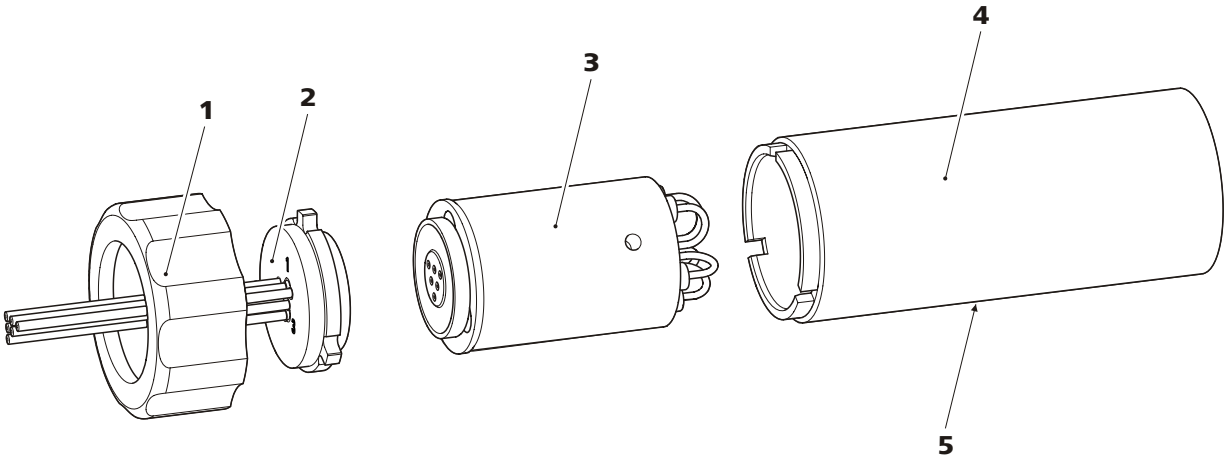


Figure 11 Components

1	**Union nut**	**2**	**Connecting piece (6.2835.010)**
3	**Rotor**	**4**	**Housing**
5	**Slot in the housing**		

5.4.4.2 Regenerating the suppressor

If the suppressor units or the neutralization units of the SPM are loaded for a longer period with certain heavy metals (e.g. iron) or organic impurities, these can no longer be completely removed with the standard regeneration solution. The capacity of the suppressor units is consequently affected, which can result in reduced phosphate sensitivity in less serious cases and a significant rise in the baseline in more serious cases. The neutralization units of the SPM react to contamination with a reduced verification sensitivity.

If such capacity or sensitivity problems occur at one or more positions, all suppressor units or neutralization units must be regenerated wit one of the following solutions::

- **Contamination with heavy metals**:
  1 mol/L H_2SO_4 + 0.1 mol/L oxalic acid
- **Contamination with organic cationic complexing agents**:
  0.1 mol/L H_2SO_4 **/** 0.1 mol/L oxalic acid **/** acetone 5%
- **Severe contamination with organic substances**:
  0.2 mol/L H_2SO_4 **/** acetone≥ 20%

Caution

The pump tubings made of PVC must not be used for rinsing with solutions containing organic solvents.

We recommend to use the high pressure pump for regeneration.

Regenerating the suppressor

1 Disconnecting the suppressor/SPM from the IC system

- Disconnect the capillaries of the suppressor/SPM labeled with *regenerant* and *rinsing solution* from the IC system.

2 Connecting the suppressor/SPM to the high pressure pump

- Connect the inlet capillary for the regeneration solution (labeled with *regenerant*) to the outlet of the high pressure pump with the aid of a coupling (6.2744.040)

3 Regenerating the suppressor/SPM

- Regenerate the first suppressor unit/neutralization unit for about 15 minutes.
- In the software, use the **Step** command to switch to the second suppressor unit/neutralization unit and regenerate this for about 15 minutes.
- In the software, use the **Step** command to switch to the third suppressor unit/neutralization unit and regenerate this for about 15 minutes.

4 Rinsing the suppressor

After regeneration, the three suppressor units/neutralization units must be rinsed with degassed ultra pure water for about 15 minutes.

- Remove the inlet capillary for the regeneration solution (labeled with *regenerant*) from the outlet of the high pressure pump.
- Connect the inlet capillary for the rinsing solution (labeled with *rinsing solution*) to the outlet of the high pressure pump with the aid of a coupling (6.2744.040).
- Rinse the first suppressor unit/neutralization unit with degassed ultra pure water for about 15 minutes.
- In the software, use the **Step** command to switch to the second suppressor unit/neutralization unit and rinse this for about 15 minutes.
- In the software, use the **Step** command to switch to the third suppressor unit/neutralization unit and rinse this for about 15 minutes.

5 Connect the suppressor to the IC system

- Reconnect the capillaries labeled *regenerant* and *rinsing solution* to the IC system.

5.4.4.3 Cleaning the suppressor

In the following cases, it may be necessary to clean the suppressor/SPM:

- Increased backpressure on the connection tubings of the suppressor/SPM.
- Blockage of the suppressor/SPM which cannot be eliminated (solutions can no longer be pumped through the suppressor/SPM).
- Jamming of the suppressor/SPM which cannot be eliminated (suppressor/SPM can no longer be switched over).

Cleaning the suppressor

Clean the suppressor/SPM as follows:

1 Disconnecting the suppressor/SPM from the IC system

- Switch off the instrument.
- Disconnect all capillaries of the suppressor/SPM from the IC system.

2 Dismantling the suppressor/SPM

- Unscrew union nut *(11-**1**)* from the housing *(11-**4**)*.
- Pull the connecting piece *(11-**2**)* and the rotor *(11-**3**)* out of the housing.
  The connecting piece and the rotor normally stick to one another – if this is not the case: Take a sharp object, inserti it into the slot of the housing *(11-**5**)* and pull out the rotor in this way.
- Detach the connecting piece from the rotor.

3 Cleaning the inlets and outlets

- Connect in turn each of the 6 PTFE capillaries fastened on the connecting piece *(11-**2**)* to the high pressure pump and pump through ultra pure water.
- Check whether solution emerges at the connecting piece. If one of the inlets or outlets remains blocked, the connecting piece must be replaced (order number 6.2835.010) *(see "Replacing parts of the suppressor", page 37)*.

4 Cleaning the rotor

- Clean the surface of the rotor *(11-**3**)* with ethanol using a lint-free cloth.

5 Inserting the rotor

Caution

An incorrectly inserted rotor can be **destroyed** during start-up.

- Insert the rotor *(11-**3**)* into the housing *(11-**4**)* in such a way that the tubing connections on the rear of rotor fit into the corresponding recesses inside the housing and one of the three holes of the rotor is visible from below in the slot of the housing *(11-**5**)*.
- If the rotor is correctly inserted, its sealing surface will be approx. 4 mm within the housing. If this is not the case, the rotor must be moved into the right position from below using a sharp object (e.g. screwdriver).

6 Cleaning the connecting piece

- Clean the surface of the connecting piece *(11-**2**)* with ethanol using a lint-free cloth.

7 Inserting the connecting piece

- Insert the connecting piece *(11-**2**)* into the rotor housing in such a way that the connector *1* is on top and the three pins of the connecting piece fit into the corresponding recesses on the housing.
- Reattach the union nut *(11-**1**)* onto the housing and tighten by hand (do not use a tool).

8 Connecting and conditioning the suppressor/SPM

- Reconnect the suppressor/SPM to the IC system.
- Before switching the Suppressor/SPM over for the first time, rinse the three suppression units/neutralization units with solution for 5 minutes.

5.4.4.4 Replacing parts of the suppressor

In the following cases, it might be necessary to replace parts of the suppressor/SPM:

- Loss of suppression capacity which cannot be eliminated (reduced phosphate sensitivity and/or significant rise in the baseline) or loss of sensitivity.
- Blockage of the suppressor/SPM which cannot be eliminated (solutions can no longer be pumped through the suppressor/SPM).

Both the rotor and the connecting piece can be replaced.

Replacing parts of the suppressor

Replace the parts of the suppressor/SPM as follows:

1 Disconnecting the suppressor/SPM from the IC system

- Switch off the instrument.
- Disconnect all capillaries of the suppressor/SPM from the IC system.

2 Dismantling the suppressor/SPM

- Unscrew union nut *(11-**1**)* from the housing .
- Pull the connecting piece *(11-**2**)* and the rotor *(11-**3**)* out of the housing.
  The connecting piece and the rotor normally stick to one another – if this is not the case: Take a sharp object, inserti it into the slot of the housing *(11-**5**)* and pull out the rotor in this way.
- Detach the connecting piece from the rotor.

3 Cleaning the new rotor

- Clean the surface of the rotor *(11-**3**)* with ethanol using a lint-free cloth.

4 Inserting the new rotor

Caution

An incorrectly inserted rotor can be **destroyed** during start-up.

- Insert the new rotor *(11-**3**)* into the housing *(11-**4**)* in such a way that the tubing connections on the rear of rotor fit into the corresponding recesses inside the housing and one of the three holes of the rotor is visible from below in the slot of the housing *(11-**5**)*.
- If the rotor is correctly inserted, its sealing surface will be approx. 4 mm within the housing. If this is not the case, the rotor must be moved into the right position from below using a sharp object (e.g. screwdriver).

5 Cleaning the new connecting piece

- Clean the surface of the rotor *(11-**2**)* with ethanol using a lint-free cloth.

6 Inserting the new connecting piece

- Insert the connecting piece *(11-**2**)* into the housing *(11-**4**)* in such a way that the connector *1* is on top and the three pins of the connecting piece fit into the corresponding recesses on the housing.
- Reattach the union nut *(11-**1**)* onto the coupling and tighten by hand.

7 Connecting and conditioning the suppressor/SPM

- Reconnect all capillaries of the suppressor/SPM to the IC system.
- Before switching the suppressor/SPM over for the first time, rinse the three suppressor units/neutralization units with solution for 5 minutes.

5.5 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/* under **Support**.

6 Troubleshooting

6.1 Problems and their solutions

Problem	Cause	Remedy
Marked rise in pressure	*Suppressor – blocked.*	▪ Regenerate the suppressor *(see Chapter 5.4.4.2, page 33)*. Note: 6.2821.180 pump tubing connection with filter must be used.
Peristaltic pump – insufficient or no delivery rate	*Peristaltic pump – contact pressure too weak.*	Correctly set contact pressure *(see "Set flow rate", page 19)*.
	Peristaltic pump – filter blocked.	Replace the filter *(see Chapter 5.3.2.2, page 30)*.
	Peristaltic pump – pump tubing defective.	Replace pump tubing *(see Chapter 5.3.2.1, page 29)*.
Background conductivity too high	*Suppressor – not connected.*	Connect the suppressor *(see Chapter 3.5, page 19)*.
	Suppressor – regeneration or rinsing solution flow problems.	Check the flow of the regeneration and rinsing solution *(see Chapter 3.5.2, page 23)*.
Suppressor – No (or insufficient) pumping of regeneration or rinsing solution	*Leak in the system.*	Check connections.
	Peristaltic pump – contact pressure too weak.	Correctly set contact pressure *(see "Set the contact pressure", page 19)*.
	Peristaltic pump – filter blocked .	Replace the filter *(see "Replacing the filter", page 30)*.
	Suppressor – backpressure too high.	Clean the suppressor *(see Chapter 5.4.4.3, page 35)* or replace parts *(see Chapter 5.4.4.4, page 36)*.
	Peristaltic pump – pump tubing defective.	Replace pump tubing.
Greater rise in the baseline	*Suppressor – reduced capacity.*	Regenerate the suppressor *(see Chapter 5.4.4.2, page 33)*.

Problem	Cause	Remedy
	SPM – reduced capacity.	Regenerate the SPM *(see Chapter 5.4.4.2, page 33)*.
SPM – No (or insufficient) pumping of regeneration or rinsing solution	*Leak in the system.*	Check connections.
	Peristaltic pump – contact pressure too weak.	Correctly set contact pressure *(see "Set the contact pressure", page 19)*.
	Peristaltic pump – filter blocked .	Replace the filter *(see "Replacing the filter", page 30)*.
	SPM – backpressure too high.	Clean the SPM *(see Chapter 5.4.4.3, page 35)* or replace parts *(see Chapter 5.4.4.4, page 36)*.
	Peristaltic pump – pump tubing defective.	Replace pump tubing.

7 Technical specifications

7.1 Reference conditions

The technical specifications listed in this chapter refers to the following reference conditions:

Ambient temperature	+25 °C (±3 °C)
Instrument status	> 40 minutes in operation (equilibrated)

7.2 Instrument

IC system	Metal-free IC system
Material	Painted polyurethane hard foam without CFCs, fire class V0
Intelligent components	MagIC Net

7.3 Ambient conditions

Operation	
Ambient temperature	+5…+45 °C
Humidity	20…80 % relative humidity
Storage	
Ambient temperature	–20…+70 °C
Transport	
Ambient temperature	–40…+70 °C

7.4 Housing

Dimensions

Width	365 mm
Height	131 mm
Depth	380 mm

Material of base tray, housing and bottle holder	Polyurethane hard foam (PUR) with flame retardation for fire class UL94V0, CFC-free, coated

7.5 Peristaltic pump

Type	2-channel peristaltic pump
Rotating direction	Counterclockwise/Clockwise rotation
Rotational speed	0…42 rpm in 7 stages at 6 rpm.
Pumping properties	0.3 mL/min at 18 rpm; with 6.1826.320 standard pump tubing.
Material of pump tubings	recommended: Tygon Long Flex Life

7.6 Suppressor

Resistance to solvents	No restriction
Switching time	typ.100 ms

7.7 Interfaces

Auxiliary	1 DSUB plug 15-pin (female)

7.8 Safety specification

Design / testing

- EN/IEC 61010-1
- UL 61010-1
- CSA-C22.2 No. 61010-1
- Protection class III

7.9 Electromagnetic compatibility (EMC)

Emission

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

Immunity

- EN/IEC 61326-1
- EN/IEC 61000-6-1
- EN/IEC 61000-4-2
- EN/IEC 61000-4-3

7.10 Weight

1.872.0110 5.6 kg (without accessories))

8 Conformity and warranty

8.1 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

872 Extension Module

The 872 Extension Module is an expansion tool for upgrading all 850 Professional IC instruments.

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: 2004, EN 55011 / CISPR 11: 2003
Immunity:	EN/IEC 61326-1: 2006, EN/IEC 61000-6-1: 2007, EN/IEC 61000-4-2: 2001, EN/IEC 61000-4-3: 2002.

Safety specifications

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

CE

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, 31 March, 2008

D. Strohm
Vice President, Head of R&D

Ch. Buchmann
Vice President, Head of Production
Responsible for Quality Assurance

8.2 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.

8.3 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.

9 Accessories

Note

Subject to change without notice.

9.1 Scope of delivery

2.872.0110 872 Extension Module Suppression

Qty.	Order no.	Description
1	1.872.0110	**872 Extension Module Suppression**
2	6.1602.150	**Bottle attachment / GL 45 - 3 x UNF 10/32** For connecting capillary tubing 1/16 in. Used with MSM auxiliary solutions and in inline dialysis Material: Plastic
2	6.1608.020	**Glass bottle / 1000 mL / GL 45** Bottle for auxiliary solutions Width (mm): 96 Height (mm): 223 Volume (mL): 1000
1	6.1803.020	**PTFE capillary 0.97 mm i.d. / 5 m** For all IC instruments Material: PTFE Outer diameter (mm): 1.57 Inner diameter (mm): 0.97 Length (m): 5

Qty.	Order no.	Description	
2	6.1826.320	**Pump tubing LFL (orange/yellow) , 3-stopper** For suppressor solutions, acceptor solutions for inline dialysis and for inline ultrafiltration	
1	6.2156.070	**Cable extension module - Professional IC, 1 m** Cable for the connection of an extension module to a Professional IC instrument Length (m): 1.0	
1	6.2744.034	**Coupling olive/UNF 10/32 2x** Connection of pressure screw and pump tubing. 2 pieces. For IC instruments with peristaltic pumps	
2	6.2744.040	**2 x UNF 10/32 coupling** For connecting 1/16 in. capillaries. For IC instruments Material: PEEK Length (mm): 24	

Qty.	Order no.	Description	
2	6.2744.070	**Pressure screw short** Short version. With UNF 10/32 connection. 5 pieces. For the connection of PEEK capillaries Material: PEEK Length (mm): 21	
2	6.2744.180	**Pump tubing connection with safety device and filter** For the connection of a pump tubing and a capillary with built-in filter Material: PEEK	
1	6.2835.010	**Connection piece to MSM-HC and SPM module** With inlets and outlets. For inline sample preparation	
	8.872.8006DE	**Manual for 872 Extension Module 2.872.0110 Suppression, English**	

9.2 Optional accessories

2.872.0110 872 Extension Module Suppression

Order no.	Description
6.2832.000	**MSM rotor A**

Suppressor rotor for all IC instruments with MSM

Length (mm): 32

6.2835.000	**SPM rotor A**

Rotor for inline sample preparation with cation exchange.

6.2842.000	**MSM-HC Rotor A**

Suppressor rotor for all IC instruments with MSM-HC (Metrohm Suppressor Module with high capacity)

6.2842.010	**Adapter to MSM**

The adapter allows the use of the standard MSM rotor in the MSM-HC unit.

6.2844.000	**MSM-LC Rotor A**

Suppressor rotor for use with 2 mm columns.

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