

# 872 Extension Module



Liquid handling – 2.872.0060

Manual  
8.872.8003EN





Metrohm AG  
CH-9101 Herisau  
Switzerland  
Phone +41 71 353 85 85  
Fax +41 71 353 89 01  
info@metrohm.com  
www.metrohm.com

# **872 Extension Module**

## **Liquid handling – 2.872.0060**

**Manual**

Teachware  
Metrohm AG  
CH-9101 Herisau  
teachware@metrohm.com

This documentation is protected by copyright. All rights reserved.

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.

# Table of contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Instrument description .....	1
1.2	Intended use .....	2
1.3	About the documentation .....	2
1.3.1	Content and scope .....	2
1.3.2	Symbols and conventions .....	2
1.4	Safety instructions .....	3
1.4.1	General notes on safety .....	3
1.4.2	Electrical safety .....	3
1.4.3	Tubing and capillary connections .....	4
1.4.4	Flammable solvents and chemicals .....	4
1.4.5	Recycling and disposal .....	4
<b>2</b>	<b>Overview of the instrument</b>	<b>5</b>
2.1	Front .....	5
2.2	Rear .....	5
<b>3</b>	<b>Functioning</b>	<b>6</b>
3.1	10-port valve .....	6
3.2	Transfer tubing .....	8
3.3	Mixing vessel .....	9
3.4	Peristaltic pump and injection valve .....	10
<b>4</b>	<b>Assembly</b>	<b>12</b>
4.1	General .....	12
4.2	Mounting the extension module onto the IC instrument .....	13
4.3	Mounting the extension module below the IC instrument .....	16
4.4	Setting up the extension module next to the IC instrument .....	19
4.5	Mounting the accessories .....	23
<b>5</b>	<b>Installation</b>	<b>26</b>
5.1	About this chapter .....	26
5.2	Installation overview .....	26
5.3	Installation diagram .....	27



<b>5.4</b>	<b>10-port valve</b> .....	<b>28</b>
5.4.1	Connecting the 10-port valve .....	28
<b>5.5</b>	<b>Peristaltic pump</b> .....	<b>29</b>
5.5.1	Principle of the peristaltic pump .....	29
5.5.2	Installing the peristaltic pump .....	30
<b>5.6</b>	<b>Injection valve</b> .....	<b>34</b>
5.6.1	Connecting the injection valve .....	34
5.6.2	Mode of operation of the injection valve .....	35
<b>6</b>	<b>Start-up</b> .....	<b>37</b>
<b>7</b>	<b>Operation and maintenance</b> .....	<b>38</b>
<b>7.1</b>	<b>General information</b> .....	<b>38</b>
7.1.1	Care .....	38
7.1.2	Maintenance by Metrohm Service .....	38
7.1.3	Operation .....	38
7.1.4	Shutting down .....	39
<b>7.2</b>	<b>Door</b> .....	<b>39</b>
<b>7.3</b>	<b>Peristaltic pump</b> .....	<b>39</b>
7.3.1	Operation .....	39
7.3.2	Maintenance .....	40
<b>7.4</b>	<b>Quality Management and validation with Metrohm</b> .....	<b>42</b>
<b>8</b>	<b>Troubleshooting</b> .....	<b>43</b>
<b>8.1</b>	<b>Problems and their solutions</b> .....	<b>43</b>
<b>9</b>	<b>Technical specifications</b> .....	<b>44</b>
<b>9.1</b>	<b>Reference conditions</b> .....	<b>44</b>
<b>9.2</b>	<b>Instrument</b> .....	<b>44</b>
<b>9.3</b>	<b>Ambient conditions</b> .....	<b>44</b>
<b>9.4</b>	<b>Housing</b> .....	<b>45</b>
<b>9.5</b>	<b>10-port valve</b> .....	<b>45</b>
<b>9.6</b>	<b>Peristaltic pump</b> .....	<b>45</b>
<b>9.7</b>	<b>Injection valve</b> .....	<b>46</b>
<b>9.8</b>	<b>Interfaces</b> .....	<b>46</b>
<b>9.9</b>	<b>Safety specification</b> .....	<b>46</b>
<b>9.10</b>	<b>Electromagnetic compatibility (EMC)</b> .....	<b>46</b>
<b>9.11</b>	<b>Weight</b> .....	<b>46</b>
<b>10</b>	<b>Conformity and warranty</b> .....	<b>47</b>
<b>10.1</b>	<b>Declaration of Conformity</b> .....	<b>47</b>



10.2	Quality Management Principles .....	48
10.3	Warranty (guarantee) .....	49
<b>11</b>	<b>Accessories</b>	<b>50</b>
11.1	Scope of delivery .....	50
11.2	Optional accessories .....	53
	<b>Index</b>	<b>56</b>



## Table of figures

Figure 1	Front 872 Extension Module – Liquid handling .....	5
Figure 2	Rear 872 Extension Module – Liquid handling .....	5
Figure 3	10-port valve – positions .....	6
Figure 4	Valve switchover, normal and with secured position .....	7
Figure 5	6.1562.160 transfer tubing .....	8
Figure 6	6.2762.000 mixing vessel with cover .....	9
Figure 7	Measuring volume – Filling the sample loop .....	10
Figure 8	Measuring volume – Aspirating sample segment .....	11
Figure 9	Setup versions .....	13
Figure 10	Dismounting the bottle holder .....	14
Figure 11	Mounting the bottle holder .....	15
Figure 12	Removing the base tray .....	17
Figure 13	Mounting the base tray .....	18
Figure 14	Mounting the base tray .....	20
Figure 15	Mounting the bottle holder .....	21
Figure 16	Connecting the drainage tubings .....	22
Figure 17	Installation diagram .....	27
Figure 18	Peristaltic pump .....	29
Figure 19	Installing the pump tubing .....	30
Figure 20	Install pump tubing connection with filter .....	31
Figure 21	Install pump tubing connection without filter .....	32
Figure 22	Injection valve - Measuring volume .....	34
Figure 23	Injection valve – Positions .....	35
Figure 24	Pump tubing connection – Changing the filter .....	41

# 1 Introduction

## 1.1 Instrument description

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

The **872 Extension Module – Liquid handling** extends the possibilities of inline sample preparation and liquid handling. Up to six auxiliary solutions can be provided in the instrument. A mixing vessel that can be mounted on the instrument allows the mixing of different solutions. The 872 Extension Module – Liquid handling makes guard column reactions and pH adjustments possible - and much more.

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 IC instrument as well as the extension module, evaluates the measured data and administers it in a database.

The **872 Extension Module – Liquid handling** comprises the following components:

### **10-port valve**

The 10-port valve is utilized for sample preparation and serves as a switch-over point between different liquids.

### **Peristaltic pump**

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

### **Injection valve**

In Liquid Handling the injection valve is used for the measurement of precisely defined smaller volumes. The liquid is measured in the sample loop and injected into the sample preparation process by means of valve switchover.



## 1.2 Intended use

With the **872 Extension Module – Liquid handling**, an 850 Professional IC instrument can be extended to include a broad range of additional sample preparation possibilities without having to modify the instrument in between. For example calibration, ion exchange, guard column reactions or a combination of several of them.

The present 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 – Liquid handling**, 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 - 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- <b>12</b> )	<p><b>Cross-reference to figure legend</b></p> <p>The first number refers to the figure number, the second to the instrument part in the figure.</p>
<b>1</b>	<p><b>Instruction step</b></p> <p>Carry out these steps in the sequence shown.</p>

	<b>Warning</b> This symbol draws attention to a possible life hazard or risk of injury.
	<b>Warning</b> This symbol draws attention to a possible hazard due to electrical current.
	<b>Warning</b> This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	<b>Warning</b> This symbol draws attention to a possible biological hazard.
	<b>Caution</b> This symbol draws attention to a possible damage of instruments or instrument parts.
	<b>Note</b> 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.

**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

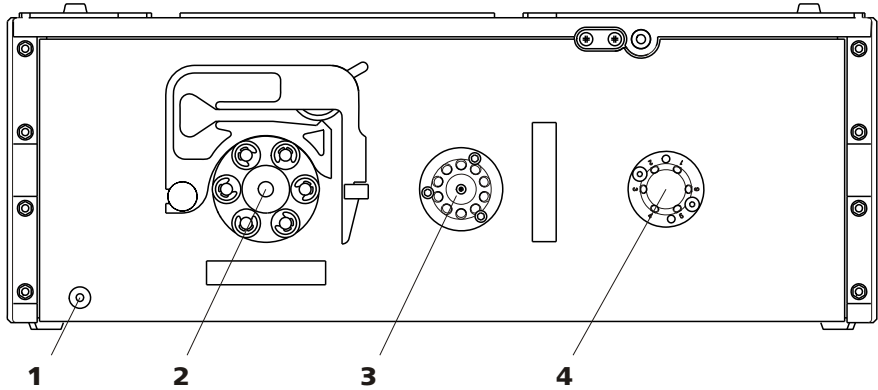


Figure 1 Front 872 Extension Module – Liquid handling

<b>1</b> Standby indicator	<b>2</b> Peristaltic pump
<b>3</b> 10-port valve	<b>4</b> Injection valve

## 2.2 Rear

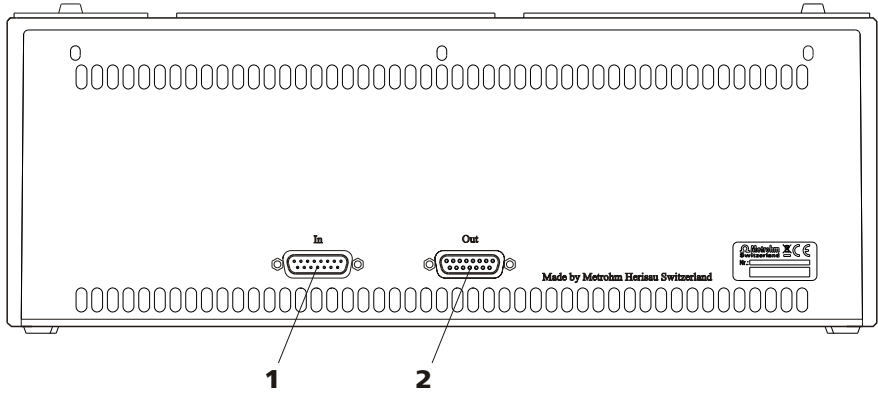


Figure 2 Rear 872 Extension Module – Liquid handling

<b>1</b> <b>Connector In</b> To connect the extension module to the IC instrument or to another previously connected extension module.	<b>2</b> <b>Connector Out</b> To connect an additional extension module.
---	---



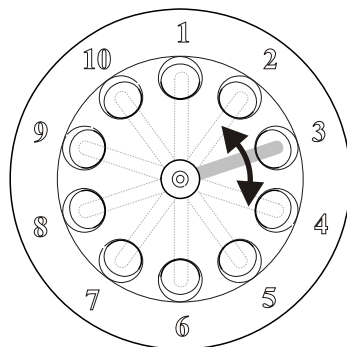
**11 Central position**

Connector connected with the transfer tubing.

**12 10-port valve****13 Selector**

Can be rotated for selecting the active position.

The selector can rotate in a clockwise or counterclockwise direction. Normally, the shortest path is selected when switching over to a new position.

**Secured positions**

In order to avoid contaminations, any given position can be defined as "secured". The secured position is moved to during switching only if it is the goal of the switching procedure.

If the secured position lies along the shortest route during a valve switch-over, then the longer path will automatically be selected.

*Example:*

Switching from position 2 to position 5.

The shorter path travels via positions 3 and 4 (see illustration 4, left). If however position 4 is defined as the secured position, then the 10-port valve will automatically switch via the connectors 1 – 10 – 9 – 8 – 7 – 6 (see illustration 4, right).

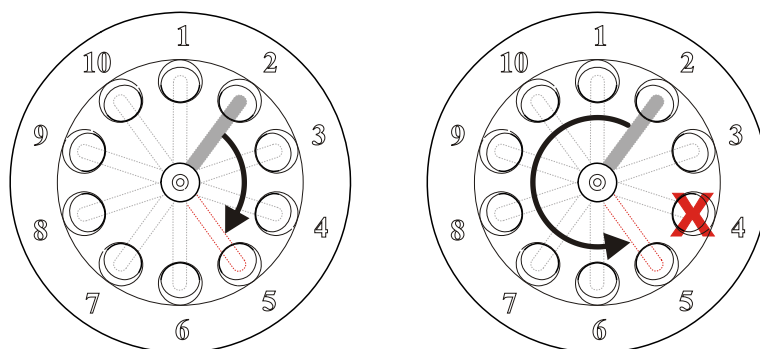


Figure 4 Valve switchover, normal and with secured position



## 3.2 Transfer tubing

The transfer tubing – a long coiled tubing (V=15 mL) – is used both for "storing" various liquids and in order not to contaminate the Dosino with these liquids. These liquid segments can be separated from one another with air bubbles or water. With its pedestal (5-3), the transfer tubing can be placed in one of the recesses of the bottle holder.

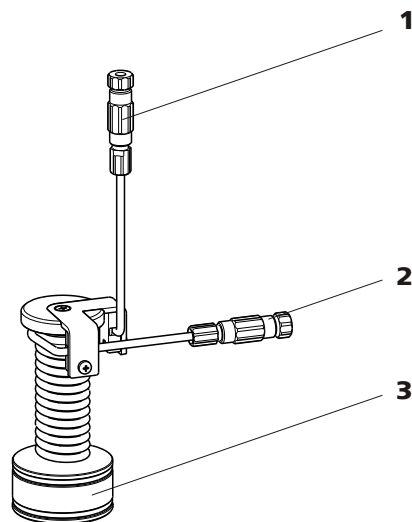


Figure 5 6.1562.160 transfer tubing

**1 Connector to the Dosino**

**2 Connector to the 10-port valve**

**3 Pedestal**

For placing into the 6.2057.200 bottle holder.

The transfer tubing is connected by means of a connector (5-2) with the central position of the 10-port valve and by means of another connector (5-1) with a Dosino.

The Dosino is responsible for the transport and dosing of the liquids and is filled with a transfer solution (usually water). It can move defined volumes of liquids in two directions: aspirate and eject.

- During aspiration, the liquid is suctioned out of the active position of the 10-port valve through the central position and into the transfer tubing.
- During ejection, the liquid that has collected in the transfer tubing is transported through the central position of the 10-port valve and from there to the active position.

### 3.3 Mixing vessel

The mixing vessel is connected with the 10-port valve, e.g. through position 3. Various liquids can be mixed in the mixing vessel. This takes place either by means of rapid injection of the liquids to be mixed or by the introduction of air bubbles. The homogenized liquid can be transported onward through the 10-port valve.

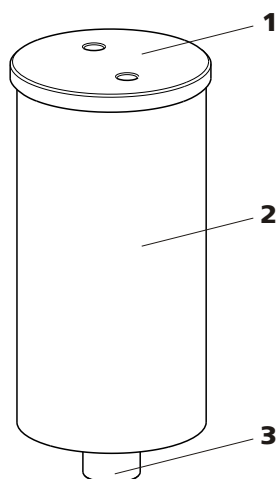


Figure 6 6.2762.000 mixing vessel with cover

**1 Cover for the 6.2762.010 mixing vessel**  
With two connector openings.

**2 6.2762.000 mixing vessel**  
Can be put on the 6.2057.200 bottle holder.

**3 Connector**  
For the 10-port valve.

Like the other Metrohm sample vessels, the mixing vessel is made of polypropylene PP. It has an extremely smooth surface which permits no drop formation. The mixing vessel can be readily rinsed out and dried. It can be used for anions as well as for cations.



### 3.4 Peristaltic pump and injection valve

The peristaltic pump and the injection valve are utilized for the precise measurement of small volumes.

The liquid to be dosed, e.g. sample (7-1), is pumped with the peristaltic pump (7-2) through the sample loop (7-4) on the injection valve (7-3). The desired volume is defined precisely by the size of the selected sample loop.

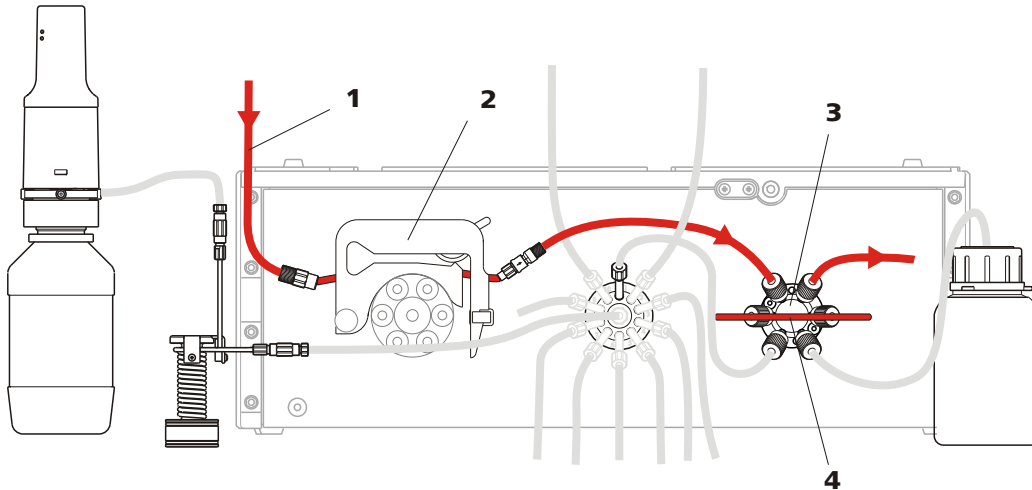


Figure 7 Measuring volume – Filling the sample loop

<b>1</b>	<b>Sample</b>	<b>2</b>	<b>Peristaltic pump</b>
<b>3</b>	<b>Injection valve</b>	<b>4</b>	<b>Sample loop</b>

Following the switchover of the valve (8-2), the measured sample segment (8-5) is conveyed by aspiration with the Dosino (8-1) through the 10-port valve (8-4) into the transfer tubing (8-6), from where it can be conveyed onward to a different outlet.

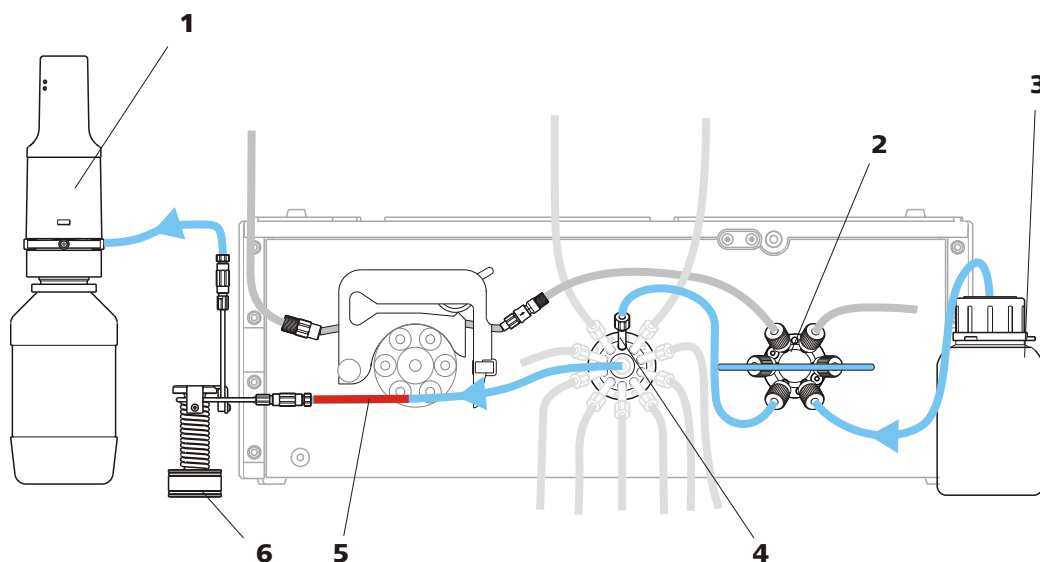


Figure 8 Measuring volume – Aspirating sample segment

<b>1</b>	<b>Dosino</b>	<b>2</b>	<b>Injection valve</b>
<b>3</b>	<b>Container with transfer solution</b>	<b>4</b>	<b>10-port valve</b>
<b>5</b>	<b>Sample</b>	<b>6</b>	<b>Transfer tubing</b>



## 4 Assembly

### 4.1 General

The extension modules are fitted directly to the 850 Professional IC instrument and connected with it via 6.2156.060 connection cable. Extension modules have no power supply of their own, but rather draw the electricity they require from the instrument with which they are connected.

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<sub>2</sub> 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.

Extension modules can be mounted in the following setup versions:

- above, between instrument and bottle holder (**9-A**), or
- below, between instrument and base tray (**9-B**), or
- next to the instrument (**9-C**) with a separate 6.2061.110 base tray and a 6.2061.100 bottle holder (to be ordered additionally). For this, the longer 6.2156.070 connection cable (to be ordered additionally), is necessary, too.

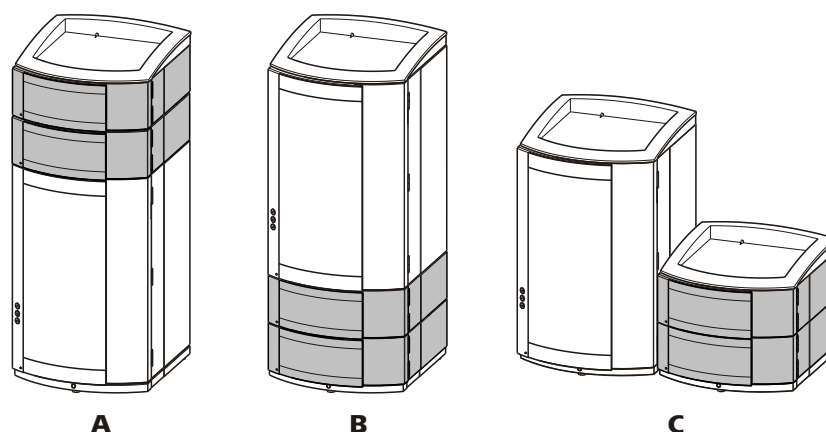


Figure 9 Setup versions

**A Extension module above the IC instrument**

Between the 850 Professional IC and the bottle holder.

**B Extension module on the below the IC instrument**

Between the base plate and the 850 Professional IC.

**C Extension module next to the IC instrument**

With its own base plate and its own bottle holder next to the 850 bottle holder.

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 if possible – either above, below or next to the IC instrument. 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 (available as optional accessory).

## 4.2 Mounting the extension module onto the IC instrument

**1 Switching off the IC instrument**

Switch the IC instrument off and disconnect the mains cable.

**2 Clearing the bottle holder**

If there are bottles and other items on the bottle holder, remove them.

**3 Removing drainage tubings**

Loosen the drainage tubing from the drainage tubing connector on the bottle holder.



#### 4 Dismounting the bottle holder

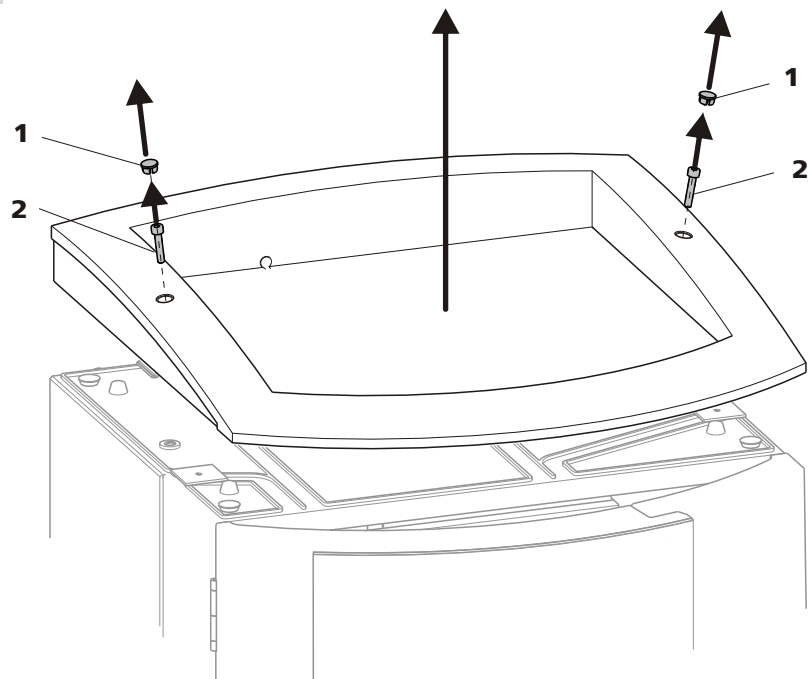


Figure 10 Dismounting the bottle holder

#### 1 Cover stoppers

#### 2 Cylinder screws

- Remove covering stoppers (10-1).
- Loosen the cylinder screws with a 6.2621.100 3 mm hexagon key.
- Remove the bottle holder

#### 5 Attaching the extension module(s)

Place the extension module(s) on the IC instrument.

## 6 Mounting the bottle holder

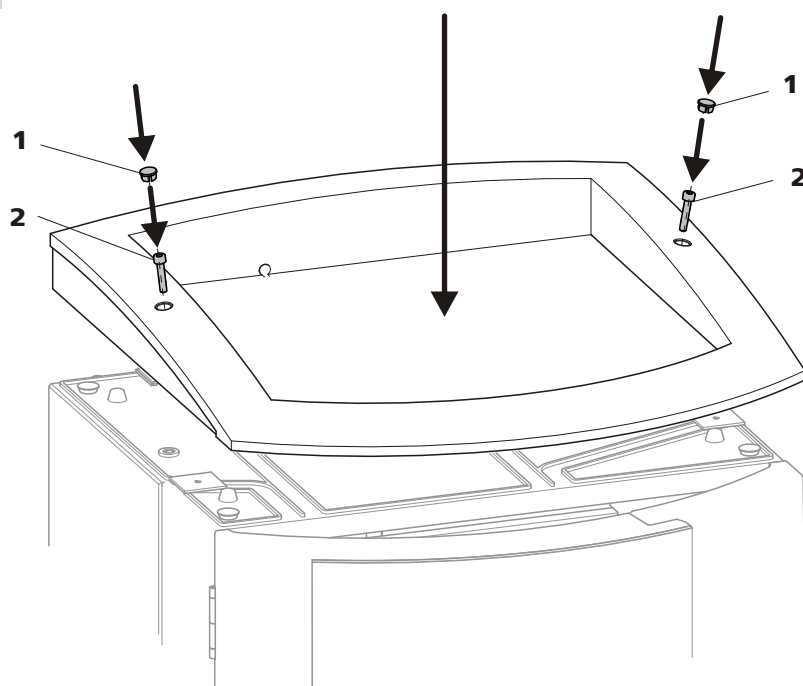


Figure 11 Mounting the bottle holder

### 1 Cover stoppers

### 2 Cylinder screws

- Attach the bottle holder on the extension module.
- Tighten the cylinder screws (10-2) with an 6.2621.100 3 mm hex-agon key
- Insert covering stoppers (10-1).

## 7 Connecting the extension module

- Plug a 6.2156.060 cable into the connector **In** of the extension module and screw it tight.
- Plug the other end of the cable into the **Extension module** connector of the IC instrument and screw it tight.

## 8 Optional: Connecting a further extension module

- Plug the cable 6.2156.060 or a longer 6.2156.070 cable (optional accessory) into the connector **In** of the second extension module and screw it tight.
- Plug the other end of the cable into the **Out** connector of the first extension module and screw it tight.

**9 Mounting the drainage tubing**

Reconnect the drainage tubing to the drainage tubing connector of the bottle holder.

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*).

## 4.3 Mounting the extension module below the IC instrument

**1 Switching off the IC instrument**

Switch the IC instrument off and disconnect the mains cable.

**2 Clearing the bottle holder**

If there are bottles and other things on the bottle holder, remove them.

**3 Disconnecting all connections on the rear of the instrument**

- Disconnect the mains cable,
- Disconnect the MSB cable,
- Disconnect the USB cable,
- Disconnect the leak sensor,
- Remove the drainage tubings.

**4 Removing the detector(s)**

Disconnect the detector cable(s) and remove the detector(s) from the IC instrument (*see manual for the IC instrument*).

**5 Removing the base tray**

- Tilt the IC instrument sideways and lay it down flat.
- Loosen the cylinder screws with a 6.2621.100 3 mm hexagon key.
- Remove base tray.

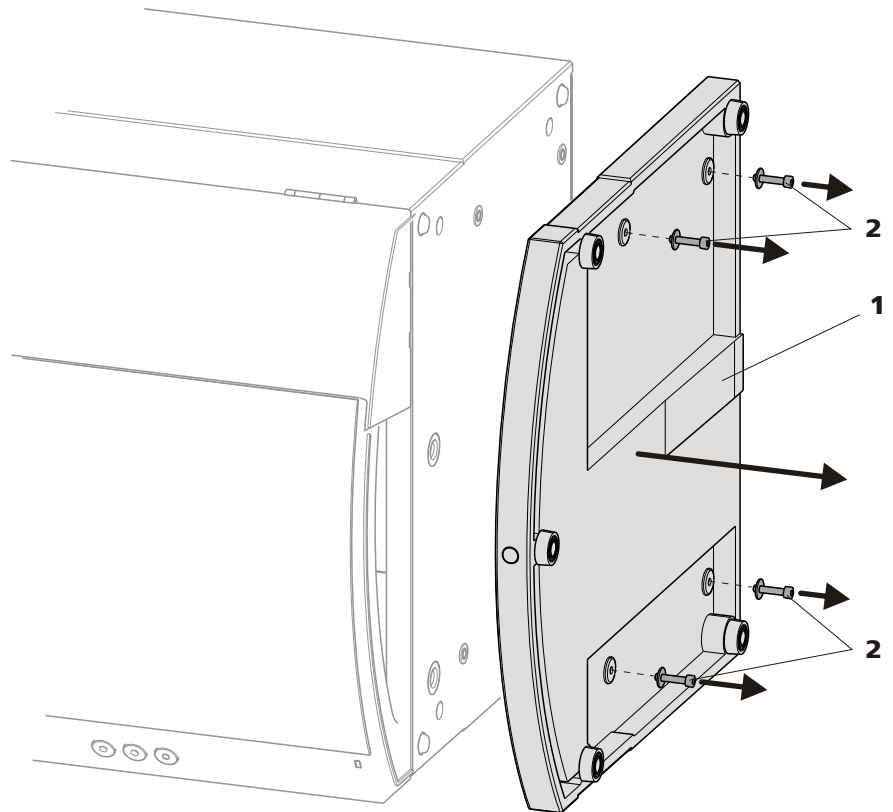


Figure 12 Removing the base tray

**1** Base tray

**2** Cylinder screws  
With washer.

#### **6** Mounting the base tray

- Tilt the extension module sideways and lay it down flat.
- Attach base tray.
- Slide the washers onto the cylinder screws (13-2) and tighten these with a 3 mm hexagon key (6.2621.100).

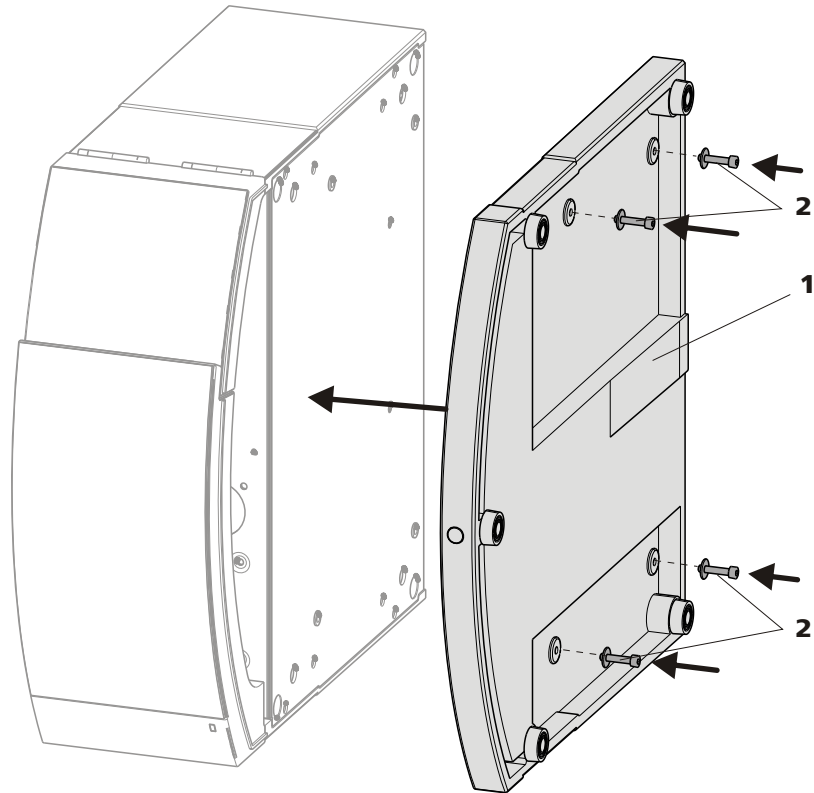


Figure 13 Mounting the base tray

**1** Base tray

**2** Cylinder screws  
With washer.

- Set up the extension module.
- Optional: Set up further extension modules.
- Set up the IC instrument.

#### **7** Connecting the extension module

- Plug a 6.2156.060 cable into the connector **In** of the extension module and screw it tight.
- Plug the other end of the cable into the **Extension module** connector of the IC instrument and screw it tight.

#### **8** Optional: Connecting a further extension module

- Plug the cable 6.2156.060 or a longer 6.2156.070 cable (optional accessory) into the connector **In** of the second extension module and screw it tight.
- Plug the other end of the cable into the **Out** connector of the first extension module and screw it tight.

**9 Inserting the detector(s) again and connecting it (them)**

*See manual for the IC instrument.*

**10 Restoring the loosened connections**

- Reconnect the drainage tubings,  
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*).
- Connect the leak sensor (*see manual for the IC instrument*),
- Connect the USB cable,
- Connect the MSB cable,
- Plug in the mains cable.

## **4.4 Setting up the extension module next to the IC instrument**

**1 Switching off the IC instrument**

Switch the IC instrument off and disconnect the mains cable.

**2 Mounting the base tray**

- Tilt the extension module sideways and lay it down flat.
- Attach base tray.
- Tighten the washers and the cylinder screws (14-2) with a 3 mm hexagon key (6.2621.100).

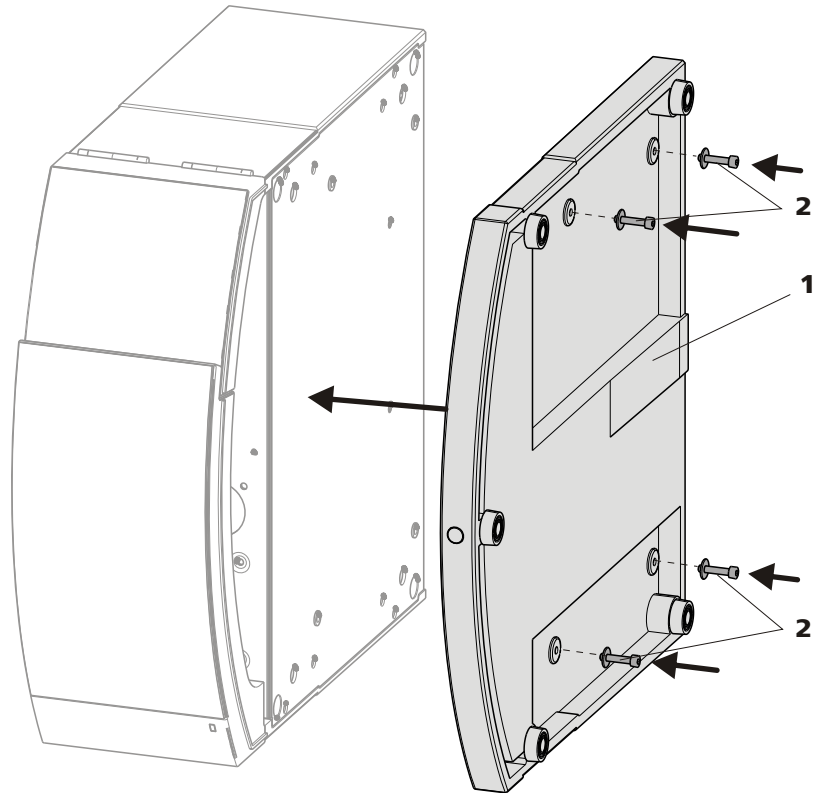


Figure 14 Mounting the base tray

**1** Base tray

**2** Cylinder screws

With washer.

- Set up the extension module.
- Optional: Set up further extension modules.

### 3 Mounting the bottle holder

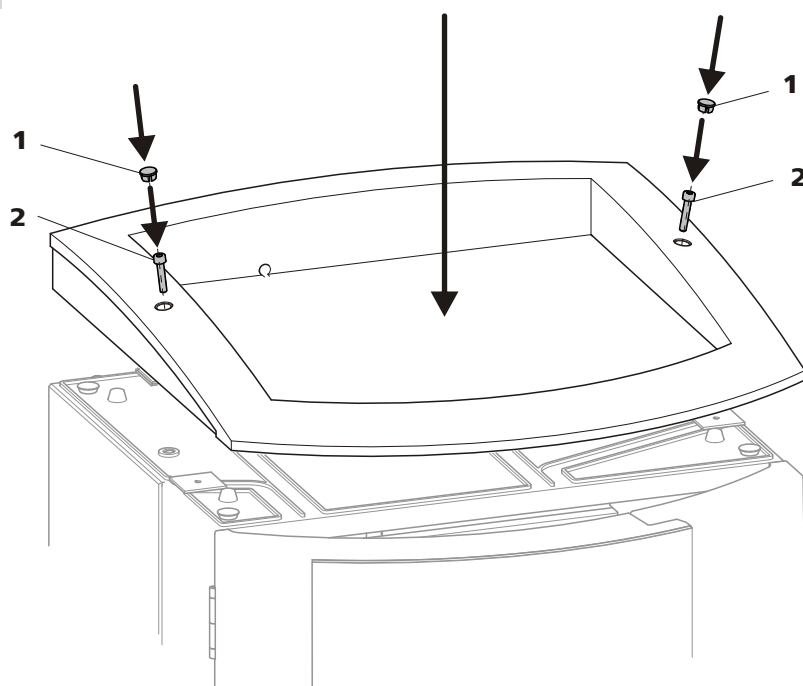


Figure 15 Mounting the bottle holder

#### 1 Cover stoppers

#### 2 Cylinder screws

- Place the bottle holder on the extension module.
- Tighten the cylinder screws (15-2) with an 6.2621.100 3 mm hex-agon key.
- Insert covering stoppers (15-1).

### 4 Connecting the extension module

- Plug a 6.2156.060 cable into the connector **In** of the extension module and screw it tight.
- Plug the other end of the cable into the **Extension module** connector of the IC instrument and screw it tight.

### 5 Optional: Connecting a further extension module

- Plug the cable 6.2156.060 or a longer 6.2156.070 cable (optional accessory) into the connector **In** of the second extension module and screw it tight.
- Plug the other end of the cable into the **Out** connector of the first extension module and screw it tight.



**6 Connecting the leak sensor**

- Plug the 6.2103.170 adapter into the leak sensor connector of the IC instrument.
- Connect the leak sensor cable of the IC instrument to the adapter.
- Connect the leak sensor cable of the extension module to the adapter.

**7 Connecting the drainage tubings**

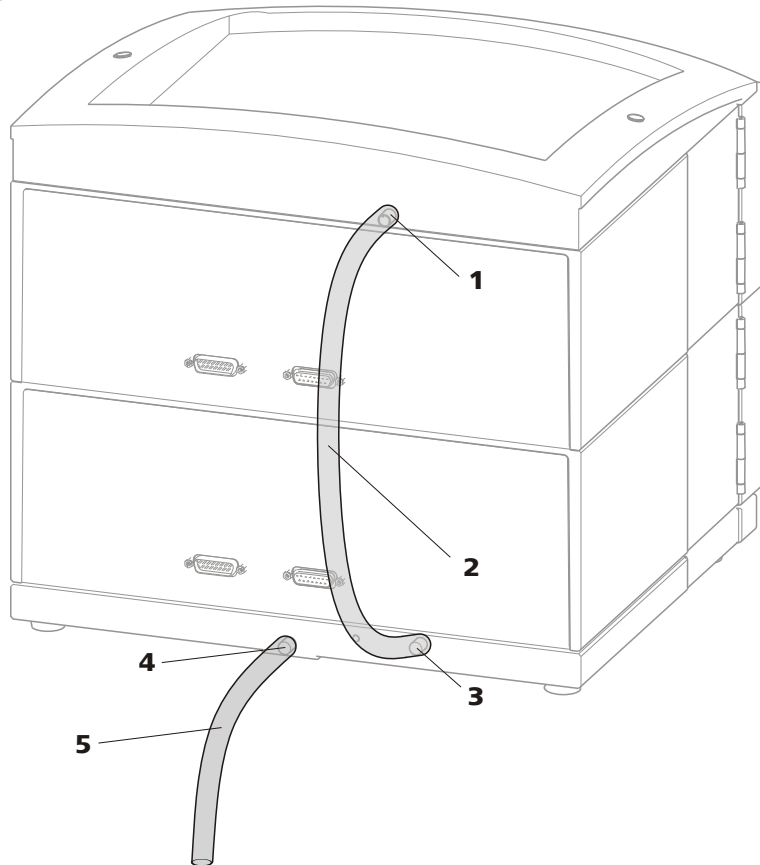


Figure 16 Connecting the drainage tubings

**1 Drainage tubing connector**  
For draining escaped liquid from the bottle holder.

**2 Drainage tubing**  
Section of the 6.1816.020 silicon tubing. For draining escaped liquid from the bottle holder.

**3 Drainage tubing connection**

For supplying escaped liquid through the connected drainage tubing to the leak sensor.

**5 Drainage tubing**

Section of the 6.1816.020 silicon tubing. Guides escaped liquid into a waste container.

**4 Drainage tubing connector**

For draining escaped liquid from the base tray through the connected drainage tubing.

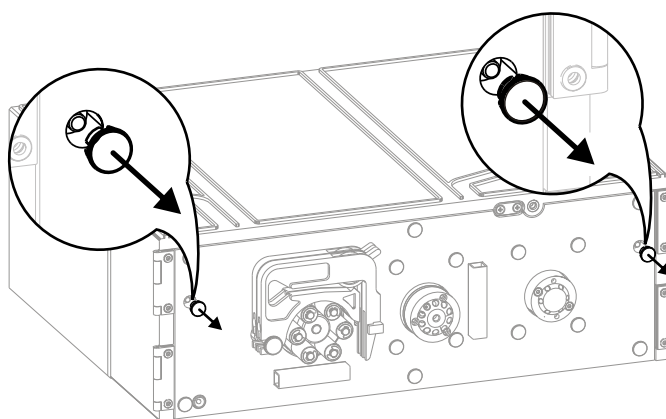
- Plug the drainage tubing (16-2) onto the drainage tubing connector (16-1) of the bottle holder and shorten to required length.
- Plug the other end of the drainage tubing (16-2) onto the drainage tubing connector (16-3) of the base tray.
- Plug the drainage tubing (16-5) onto the drainage tubing connector (16-4) and guide the other end into a waste container.

## 4.5 Mounting the accessories

The bottle holder for the 872 Extension Module – Liquid handling 6.2057.200 can be mounted on the instrument in order to set up the different small bottles, the mixing vessel and the transfer tubing in proper sequence in front of the instrument. This permits keeping the capillary connections as short as possible.

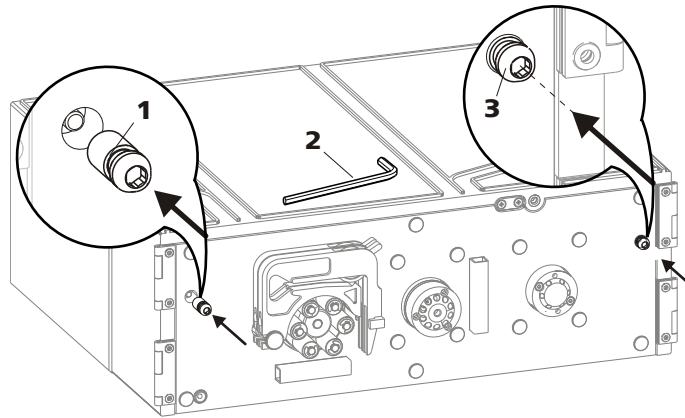
### Mounting the bottle holder

#### 1 Removing the stoppers



#### 2 Mounting the centring pins

Screw in the centring pin with a hexagon key as far as the limit stop.



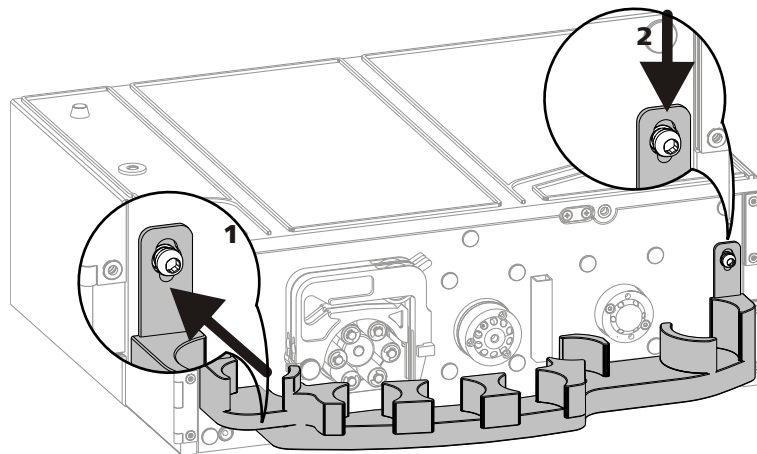
**1 Centring pin**  
Part of the 6.2057.200 accessories

**2 Hexagon key**  
Part of the 6.2057.200 accessories

**3 Centring pin**  
Screwed in.

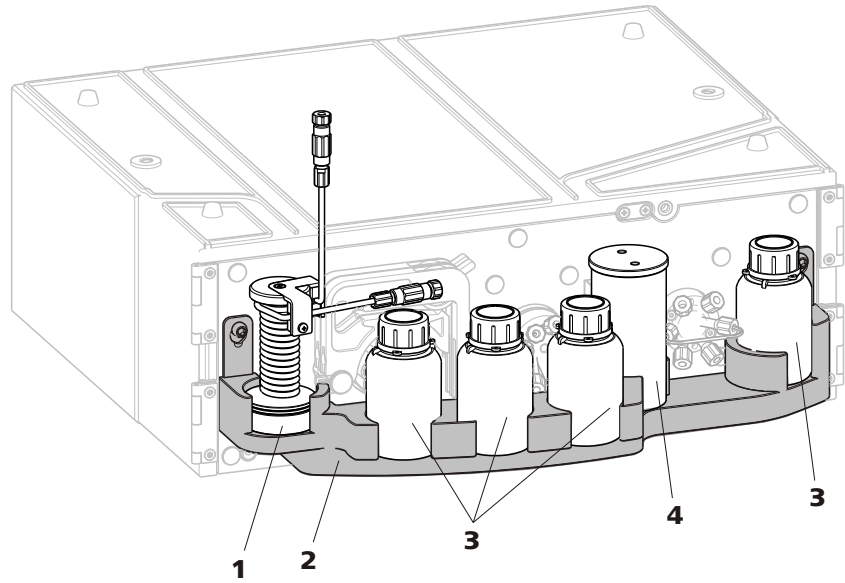
**3 Hanging up bottle holder**

Hang up the bottle holder (1) and slide it downwards (2)



**4 Equipping the bottle holder**

Place the transfer tubing, the mixing vessel and PE bottles in the recesses of the bottle holder.



**1** 6.1562.160 transfer tubing

**2** 6.2057.200 bottle holder

**3** 6.1608.100 PE bottle  
50mL content.

**4** 6.2762.000 mixing vessel  
50 mL content, with 6.2762.010 cover.



## 5 Installation

### 5.1 About this chapter

The *Installation* chapter contains

- this overview
- a general description of mounting and connection of IC instrument and extension module.
- a brief set of instructions for the installation of the 872 Extension Module Liquid handling (*see Chapter 5.2, page 26*). At each step you will find cross-references to more detailed installation instructions for individual components, should you require such aids.
- an installation diagram (*see Chapter 5.3, page 27*), showing an example for a possible installation.
- several chapters with extensive installation instructions for all components.

### 5.2 Installation overview

#### Connecting the 872 Extension Module – Liquid handling to the IC instrument

##### 1 Connecting the capillaries

- Connect the 10-port valve (*see Chapter 5.4.1, page 28*).
- Install peristaltic pump (*see Chapter 5.5.2, page 30*).
- Connect the injection valve (*see Chapter 5.6, page 34*).

##### 2 Putting extension module into operation

*See Chapter 6, Page 37*

## 5.3 Installation diagram

The peristaltic pump, the injection valve and the 10-port valve of the 872 Extension Module – Liquid handling can be installed in different ways, depending on the application.

The installation illustrated in the following shows only one out of many possible installations. The arrangement of the modules in the diagram corresponds to the front view of the extension module. Liquid containers and the components of the IC instruments are not shown in the diagram.

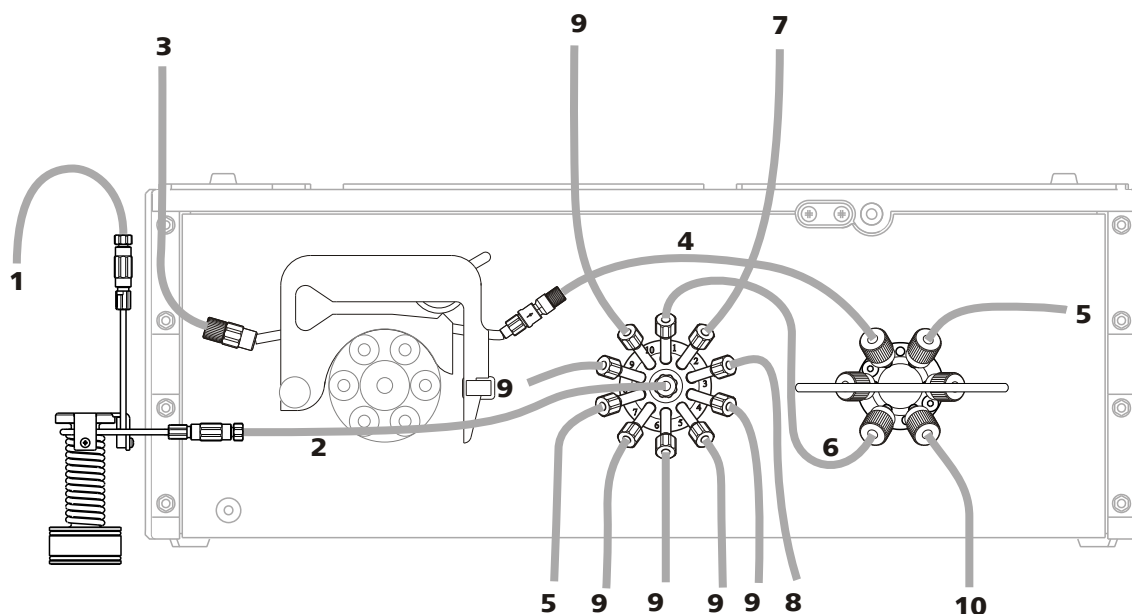


Figure 17 Installation diagram

<b>1</b> Connection to the Dosino	<b>2</b> Connection transfer tubing – 10-port valve The transfer tubing can also be connected directly to the central position of the 10-port valve.
<b>3</b> Sample aspirating capillary	<b>4</b> Connection peristaltic pump – injection valve on the extension module
<b>5</b> Capillary to waste container	<b>6</b> Connection 10-port valve – injection valve on the extension module
<b>7</b> Connection 10-port valve – injection valve on the IC instrument	<b>8</b> Connection 10-port valve – mixing vessel
<b>9</b> Connection 10-port valve – any auxiliary solution	<b>10</b> Capillary to the container with transfer solution



## 5.5 Peristaltic pump

### 5.5.1 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 (18-3) and the tubing cartridge (18-5). During operation, the peristaltic pump drive rotates the roller hub (18-2), so that the rollers (18-3) push the liquid forward in the pump tubing.

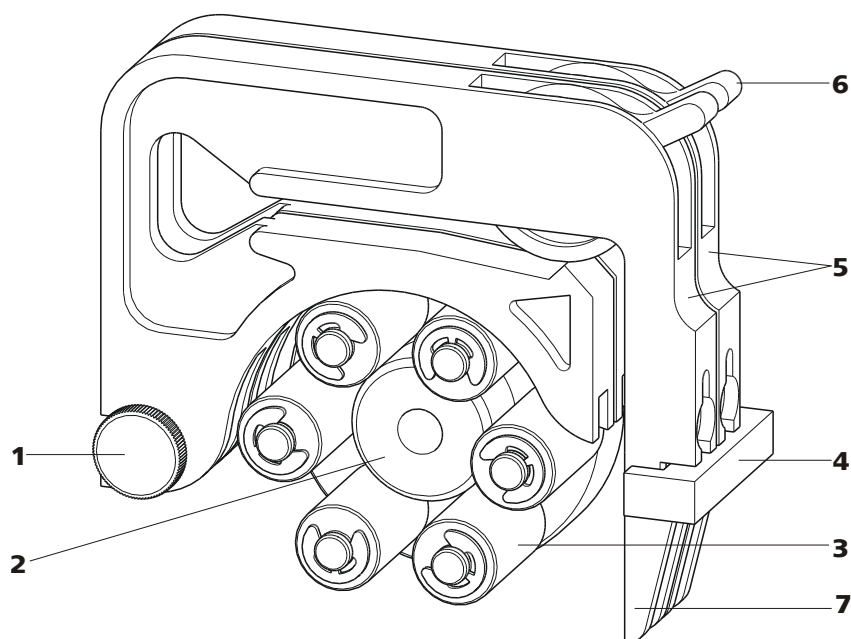


Figure 18 Peristaltic pump

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



### 5.5.2 Installing the peristaltic pump

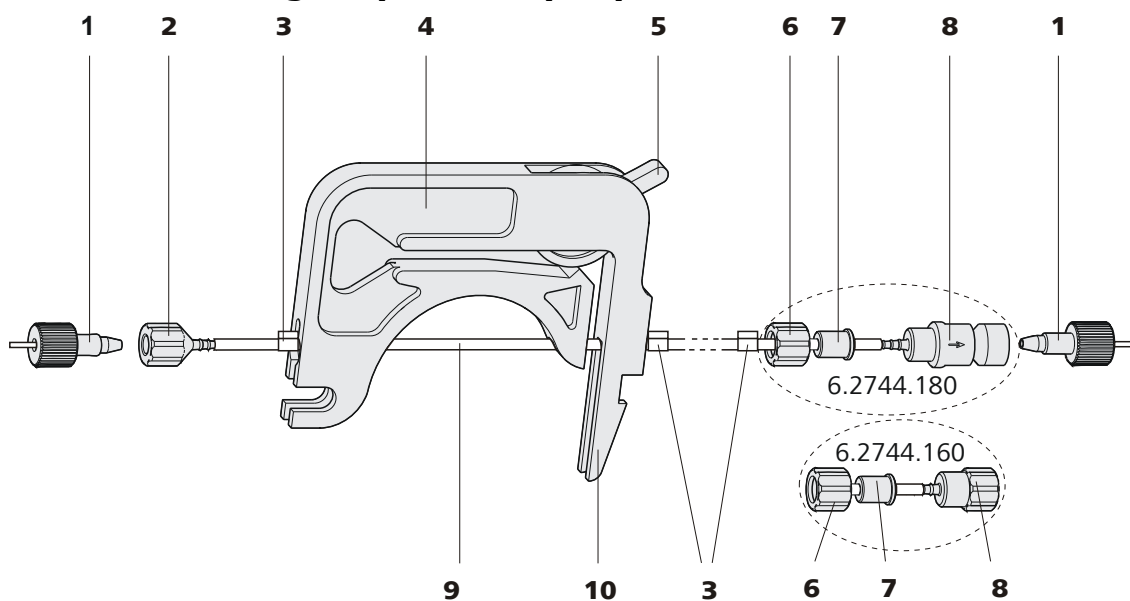


Figure 19 Installing the pump tubing

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

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 (18-1).

#### 2 Connecting the aspiration side

Place a 6.2744.034 tubing olive (19-2) 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 20, page 31) or
- **Case B:** a 6.2744.160 pump tubing connection **without filter** (see Figure 21, page 32).

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:

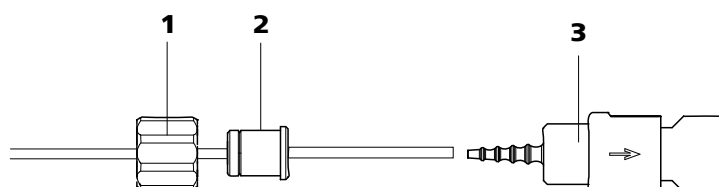


Figure 20 Install pump tubing connection with filter

**1 Union nut**

**2 Adapter**

**3 Tubing olive with filter holder**

- Slide union nut (20-1) onto the pump tubing.
- Select a suitable adapter (20-2) and slide it onto the pump tubing. The type of adapter depends on the pump tubing (see Table 1, page 32).
- Place the tubing olive with filter holder (20-3) onto the pump tubing.
- Screw the union nut (20-1) onto the tubing olive (20-3).

or

**Case B:** 6.2744.160 pump tubing connection without filter:

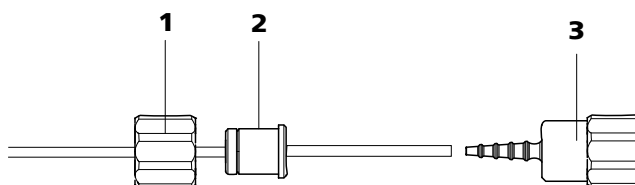


Figure 21 Install pump tubing connection without filter

**1 Union nut**

**2 Adapter**

**3 Tubing olive**

- Slide union nut (21-**1**) onto the pump tubing.
- Select a suitable adapter (21-**2**) and slide it onto the pump tubing. The type of adapter depends on the pump tubing (see Table 1, page 32).
- Place the tubing olive (21-**3**) onto the pump tubing.
- Screw the union nut (21-**1**) onto the tubing olive (21-**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 (19-**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 (19-**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)	

Pump tubing	Adapter
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 (*19-5*), 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.



The sample loop can be replaced, depending on the volume needed.

### Replacing the sample loop



#### NOTE

Use only 6.2744.010 PEEK pressure screws for connecting capillaries and sample loop to the injection valve.

#### 1 Removing existing sample loop

- Loosen 6.2744.010 pressure screws at connector 3 and connector 6.
- Remove sample loop.

#### 2 Mounting new sample loop

- Fasten one end of the sample loop (22-2) with a 6.2744.010 PEEK pressure screw (22-7) to connector 3.
- Fasten the other end of the sample loop (22-2) with a second 6.2744.010 PEEK pressure screw (22-7) to connector 6.

### 5.6.2 Mode of operation of the injection valve

The injection valve (22-1) can adopt two valve positions - **FILL** and **INJECT**. Switching back and forth between the two valve positions determines whether the sample path or the transfer solution path is guided through the sample loop. The following figure provides a schematic display of the flow paths of the two valve positions.

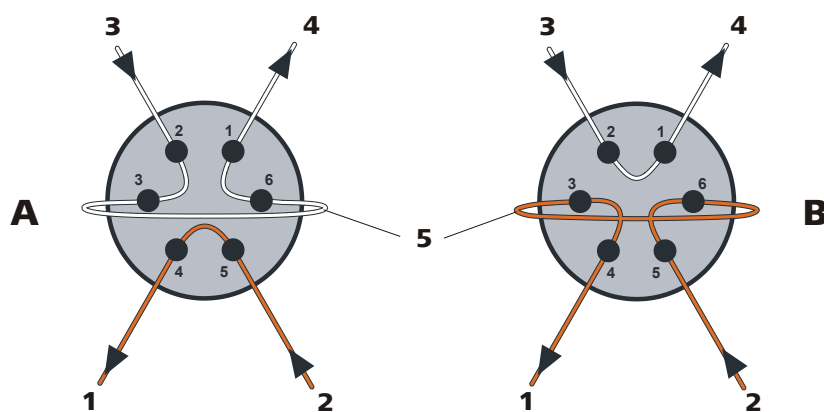


Figure 23 Injection valve – Positions

**A** Position FILL

**1** Transfer solution outlet

**B** Position INJECT

**2** Transfer solution inlet

**3** Sample inlet**4** Sample outlet**5** Sample loop**Position A**

In the position **FILL**, the sample solution flows through the sample loop to the waste container.

**Position B**

In the position **INJECT**, the Dosino aspirates the transfer solution through the sample loop to the 10-port valve. If sample solution is to be found in the sample loop at the time of the valve switching, then this will be conveyed along with the transfer solution, thus making its way via the 10-port valve to the transfer tubing.

## 6 Start-up

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

### Putting IC instrument into operation with extension module

- 1 Start MagIC Net.
- 2 Connect IC instrument to PC and switch on.

The extension module is recognized automatically by MagIC Net.

Additional information can be found in the *Start-up* chapter in the manual for the IC instrument as well as in the MagIC Net online Help.



### 7.1.4 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.

## 7.2 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.

## 7.3 Peristaltic pump

### 7.3.1 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 (**19-10**) 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.

**7.3.2 Maintenance****7.3.2.1 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.

### 7.3.2.2 Pump tubing connection with filter

The 6.2821.130 filters (24-2) should be changed every 3 months, more frequently at higher backpressure.

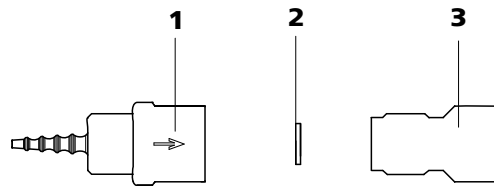


Figure 24 Pump tubing connection – Changing the filter

**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 (24-3) out of the tubing olive (24-1) with the aid of two 6.2621.000 adjustable wrenches.

#### 2 Replacing the filter

- Remove the old filter (24-2) with tweezers.
- Place the new filter (24-2) flat in the tubing olive (24-1) with tweezers.



### 3 Mounting filter screw

- Screw the filter screw (24-3) back into the tubing olive (24-1) and tighten by hand. Then additionally tighten with two 6.2621.000 adjustable wrenches.

## 7.4 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**.

## 8 Troubleshooting

### 8.1 Problems and their solutions

<b>Problem</b>	<b>Cause</b>	<b>Remedy</b>
<b>Peristaltic pump – insufficient or no delivery rate</b>	<i>Peristaltic pump – contact pressure too weak.</i>	Correctly set contact pressure (see "Set flow rate", page 33).
	<i>Peristaltic pump – filter blocked.</i>	Replace the filter (see Chapter 7.3.2.2, page 41).
	<i>Peristaltic pump – pump tubing defective.</i>	Replace pump tubing (see Chapter 7.3.2.1, page 40).



## 9 Technical specifications

### 9.1 Reference conditions

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

<i>Ambient temperature</i>	+25 °C ( $\pm 3$ °C)
<i>Instrument status</i>	> 40 minutes in operation (equilibrated)

### 9.2 Instrument

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

### 9.3 Ambient conditions

#### Operation

<i>Ambient temperature</i>	+5...+45 °C
<i>Humidity</i>	20...80 % relative humidity

#### Storage

<i>Ambient temperature</i>	-20...+70 °C
----------------------------	--------------

#### Transport

<i>Ambient temperature</i>	-40...+70 °C
----------------------------	--------------

## 9.4 Housing

### Dimensions

<i>Width</i>	365 mm
<i>Height</i>	131 mm
<i>Depth</i>	380 mm

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

## 9.5 10-port valve

<i>Connections</i>	1 out of 10
<i>Resistance to solvents</i>	No restrictions
<i>Switching time</i>	typ.100 ms
<i>Pressure resistance</i>	2.0 MPa (20 bar) Valve function prevents damage at overpressure

## 9.6 Peristaltic pump

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



## 9.7 Injection valve

<i>Actuator time</i>	typ. 100 ms
<i>Max. operating pressure</i>	35 MPa (350 bar)
<i>Material</i>	PEEK

## 9.8 Interfaces

<i>Auxiliary</i>	1 DSUB plug 15-pin (female)
------------------	-----------------------------

## 9.9 Safety specification

<i>Design / testing</i>	<ul style="list-style-type: none"><li>▪ EN/IEC 61010-1</li><li>▪ UL 61010-1</li><li>▪ CSA-C22.2 No. 61010-1</li><li>▪ Protection class III</li></ul>
-------------------------	--

## 9.10 Electromagnetic compatibility (EMC)

<i>Emission</i>	<ul style="list-style-type: none"><li>▪ EN/IEC 61326-1</li><li>▪ EN/IEC 61000-6-3</li><li>▪ EN 55011 / CISPR 11</li></ul>
<i>Immunity</i>	<ul style="list-style-type: none"><li>▪ EN/IEC 61326-1</li><li>▪ EN/IEC 61000-6-1</li><li>▪ EN/IEC 61000-4-2</li><li>▪ EN/IEC 61000-4-3</li></ul>

## 9.11 Weight

1.872.0060	7.7 kg (without accessories)
------------	------------------------------

## 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*

---

#### **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 55022 / CISPR 22: 2006

Immunity: EN/IEC 61326-1: 2006, EN/IEC 61000-6-2: 2005, EN/IEC 61000-4-2: 2001, EN/IEC 61000-4-3: 2002, EN/IEC 61000-4-4: 2004

*Safety specifications*

EN/IEC 61010-1: 2001, 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, 31 March, 2008



D. Strohm

Vice President, Head of R&amp;D

Ch. Buchmann

Vice President, Head of Production

Responsible for Quality Assurance

## 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



### NOTE





Subject to change without notice.

### 11.1 Scope of delivery





#### 2.872.0060 872 Extension Module – Liquid handling

Qty.	Order no.	Description
1	1.872.0060	872 Extension Module – Liquid handling
1	6.1562.160	<b>Transfer tubing 15 mL, 2 x M6</b> For liquid handling in ion chromatography. To avoid contamination of the Dosino.
5	6.1608.100	<b>PE bottle 50 mL</b> Bottle to Extension Module Liquid Handling
1	6.1803.020	<b>PTFE capillary 0.97 mm i.d. / 5 m</b> For all IC instruments Material: PTFE Outer diameter (mm): 1.57 Inner diameter (mm): 0.97 Length (m): 5



Qty.	Order no.	Description	
1	6.1825.230	<b>PEEK sample loop 10 µL</b> For injection valve, with 2 PEEK pressure screws Material: PEEK (metal-free) Outer diameter (inches): 1/16 Volume (mL): 0.01	
2	6.1826.340	<b>Pump tubing LFL (black/black), 3 stoppers</b> For the sample solution in inline dialysis	
1	6.1831.010	<b>PEEK capillary 0.25 mm i.d. / 3 m</b> For all IC components. Material: PEEK Outer diameter (inches): 1/16 Inner diameter (mm): 0.25 Length (m): 3	
1	6.2057.200	<b>Bottle holder to Extension Module - Liquid Handling</b>	
1	6.2156.060	<b>Cable Extension Module - Professional IC, 40 cm</b> Cable connecting the extension module with the Professional IC instrument Length (m): 0.4	




Qty.	Order no.	Description	
1	6.2744.010	<b>Pressure screw 5x</b>	
		With UNF 10/32 connection. For the connection of PEEK capillaries	
		Material: PEEK	
		Length (mm): 26	
1	6.2744.034	<b>Coupling nozzle - UNF 10/32, 2 pieces</b>	
		Connection pressure screw and pump tubing. 2 pieces. For IC instruments with peristaltic pumps	
2	6.2744.070	<b>Pressure screw short</b>	
		Short version. With UNF 10/32 connection. 5 pieces. For the connection of PEEK capillaries	
		Material: PEEK	
		Length (mm): 21	
6	6.2744.090	<b>Pressure screw long</b>	
		Long version. With UNF 10/32 connection. 2 pieces. For the connection of PEEK capillaries (MCS and Sample degasser)	
		Material: PEEK	

Qty.	Order no.	Description
2	6.2744.160	<b>Nozzle/UNF 10/32 coupling with security device</b> Security device for connecting pump tubing to a nozzle. Material: PEEK
		
1	6.2744.200	<b>Adapter UNF 10/32 outer / M6 inner</b> Connecting 1/16 in. PEEK capillaries and transfer tubing (M6) Material: PEEK
		
1	6.2762.000	<b>Mixing vessel 50 mL to Extension Module - Liquid Handling</b>
1	6.2762.010	<b>Cover to mixing vessel 6.2762.000</b>

## 11.2 Optional accessories

### 2.872.0060 872 Extension Module – Liquid handling

Order no.	Description
6.2061.100	<b>Bottle holder (ProfIC)</b> Bottle holder to Professional IC instruments
	



Order no.	Description
-----------	-------------

6.2061.110	Tray with sensor for Professional IC Instruments
------------	--



6.2103.170	Adaptor to Leak Sensor at Professional IC
------------	---

Adaptor to connect two leak sensors to one Professional IC instrument



6.2156.070	Cable Extension Module - Professional IC, 1 m
------------	---

Cable connecting the extension module with the Professional IC instrument

Length (m): 1.0

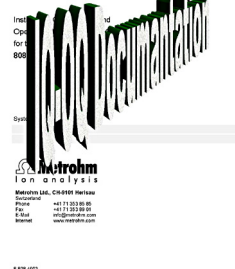


6.5332.000	IC tubing kit for second extension module
------------	---



Order no.	Description
6.9988.503	Validation Documentation for 850 (English / German) – CD

Quality Management with Metrohm





# Index

## Numbers/Symbols

10-port valve .....	1
Installation .....	28
Technical specifications .....	45

## A

Accessories .....	50
Optional .....	53
Scope of delivery .....	50
Ambient conditions .....	44
Assembly .....	12

## D

Diagram .....	
Installation .....	27
Dimensions .....	45
Door .....	39

## F

Fill .....	
Injection valve .....	36
Front .....	5
Front of the instrument .....	5

## G

GLP .....	42
Guarantee .....	49

## H

Housing .....	45
Humidity .....	44

## I

Inject .....	
Injection valve .....	36
Injection valve .....	1
Fill .....	36
Inject .....	36

Installation .....	34
Technical specifications .....	46
Installation .....	
10-port valve .....	28
Overview .....	26
Peristaltic pump .....	30
Pump tubings .....	30
Installation diagram .....	27
Instrument .....	
Front .....	5
Rear .....	5

## M

Maintenance .....	
Peristaltic pump .....	39
Material .....	45

## O

Operation .....	
Peristaltic pump .....	39
Optional accessories .....	53
Overview of the instrument .....	5

## P

Peristaltic pump .....	
Installation .....	30
Maintenance .....	39
Operation .....	39
Principle .....	29
Technical specifications .....	45
Pump tubing .....	
Overview .....	40
Pump tubings .....	
Installing .....	30
Service life .....	39

## Q

Quality Management .....	42
--------------------------	----

## R

Rear .....	5
Rear of the instrument .....	5
Reference conditions .....	44
Regeneration .....	38
Rinsing .....	
Pump tubings .....	40

## S

Safety instructions .....	3
Scope of delivery .....	50
Service .....	3, 38
Service Agreement .....	42
Shutting down .....	39
Storage .....	44

## T

Technical specifications .....	
10-port valve .....	45
Injection valve .....	46
Peristaltic pump .....	45
Reference conditions .....	44
Temperature .....	44
Transport .....	44
Tubing pump .....	
See also "Peristaltic pump" .	29

## V

Validation .....	42
Valve .....	34
see also "10-port valve" .....	28

## W

Warranty .....	49
----------------	----