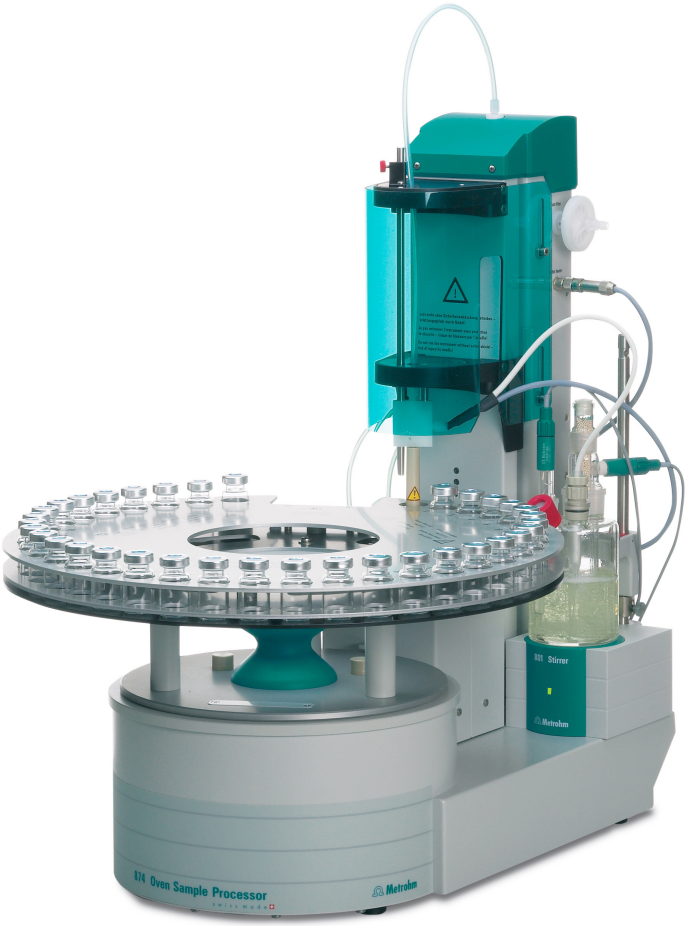
874 Oven Sample Processor



Manual
8.874.8002EN

Metrohm

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

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8.874.8002EN 06/2011 dm

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

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.

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1 Introduction

1.1 Instrument description

The 874 Oven Sample Processor is used whenever the heating up of a sample and/or the thermal expulsion of moisture in solid substances or liquids is required. In combination with a coulometric or volumetric KF titrator, the 874 Oven Sample Processor is the ideal analysis system for water determination in samples that contain disruptive components or from which moisture can be removed only with difficulty.

One of its decisive advantages is the reduction of sample preparation to a minimum. Thanks to the use of hermetically sealed sample vessels ("headspace vials"), the filling of the samples can be accomplished directly on-site. The PTFE-coated septa guarantee a constant, non-falsified water content, even after prolonged holding times.

The sample heated in the oven module releases its moisture in the form of water vapor, which is conveyed into a measuring cell with the aid of a gas flow. An air pump is installed for the purpose of generating the gas flow. An inlet valve is available for nitrogen or other inert gases. The determination of the moisture can be accomplished in the measuring cell either coulometrically or volumetrically according to Karl Fischer.

The operation and control of the 874 Oven Sample Processor is accomplished by means of the ***tiamo***™ PC software. This enables convenient programming of method runs, ranging from the simple to the complex. The integration of the 874 Oven Sample Processor together with other instruments (e. g. with a coulometer) using one user interface, makes not only simple operation possible, but also the evaluation and storage of the measurement data from all of the linked instruments in one single database.

1.1.1 Instrument versions

The 874 Oven Sample Processor is available in two versions with different accessories.

- **Version 2.874.0010** with accessories for the usage of standard vials (volume 6 mL)
- **Version 2.874.0020** without accessories for the usage of standard vials. Appropriate accessories can be ordered for specific vessel sizes.

1.1.2 Instrument components

The 874 Oven Sample Processor has the following components:

- **Oven**
  Oven module made of aluminum with software-operated temperature control for heating the sample vessel.
- **Fan**
  Propeller fan for cooling the oven module.
- **Inlet valve**
  Valve for switching over the source of the gas flow.
- **Air pump**
  Pump for generating the gas flow.
- **Outlet heater**
  Heating tube for preventing the condensation of moisture.
- **Lift with rods**
  Guidance device with needle adapter and tubing for the gas flow.
- **Turntable**
  For the standard sample rack with a capacity of 36 sample vials (6 mL) or the special sample rack with a capacity of 25 sample vials (⌀ = 16 … 32 mm).

1.1.3 Intended use

The 874 Oven Sample Processor is designed for usage as an auxiliary device for sample preparation in analytical laboratories. Its main area of application is the moisture determination according to Karl Fischer (coulometric or volumetric). The 874 Oven Sample Processor enables the application of thermal gas extraction technique.

The present instrument is suitable for processing chemicals and flammable samples. The usage of the 874 Oven Sample Processor 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.

1.2 About the documentation

Caution

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

1.2.1 Notation and Pictograms

The following notations and pictograms (symbols) are used in these Instructions for Use:

*(5-**12**)*	**Cross-reference to illustration legend number** The first number stands for the number of the illustration, the second for the legend number.
1	**Instruction step** Follow these steps.
Methode	**Dialog**, **Parameter** in the software
[Weiter]	**Button** in the software or **Key** on the keyboard.
	**Warning** This symbol draws attention to a possilbe danger of life or injury.
	**Warning** This symbol draws attention to a possilbe danger through electrical current.
	**Warning** This symbol draws attention to a possible danger through heat or hot instrument parts.

	**Warning** This symbol draws attention to a possible biological hazard.
	**Caution** This symbol draws attention to possible damage of instruments or instrument parts.
	**Comment** This symbol marks additional information and tips.

1.3 Safety instructions

1.3.1 General notes on safety

Warning

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

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

1.3.2 Electrical safety

The electrical safety when working with the instrument is ensured as part of the international standard IEC 61010.

Warning

Only personnel qualified by Metrohm are authorized to carry out service work on electronic components.

Warning

Never open the housing of the instrument. The instrument could be damaged by this. There is also a risk of serious injury if live components are touched.

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

Mains voltage

Warning

An incorrect mains voltage can damage the instrument.

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

Protection against electrostatic charges

Warning

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

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

1.3.3 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.

1.3.4 Personnel safety

Warning

Wear protective goggles and working clothes suitable for laboratory work while operating the 874 Oven Sample Processor. It is also advisable to wear gloves when caustic liquids are used or in situations where glass vessels could break.

Warning

Always install the safety shield supplied with the equipment before using the instrument for the first time. Pre-installed safety shields are not allowed to be removed.

The 874 Oven Sample Processor may not be operated without a safety shield!

Warning

Personnel are not permitted to reach into the working area of the instrument while operations are running!

A **considerable risk of injury** exists for the user.

Warning

In the event of a possible blockage of a drive, the mains plug must be pulled out of the socket immediately. Do not attempt to free jammed sample vessels or other parts while the device is switched on. Blockages can only be cleared when the instrument is in a voltage-free status; this action generally involves a **considerable risk of injury**.

Warning

The 874 Oven Sample Processor is **not** suitable for utilization in biochemical, biological or medical environments in its basic equipment version.

Appropriate protective measures must be implemented in the event that potentially infectious samples or reagents are being processed.

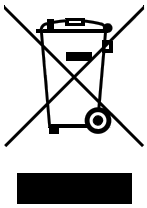
1.3.5 Flammable solvents and chemicals

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.
- Keep all sources of flame far from the workplace.
- Clean up spilled fluids and solids immediately.
- Follow the safety instructions of the chemical manufacturer.

1.3.6 Recycling and disposal



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

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

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

2 Overview of the instrument

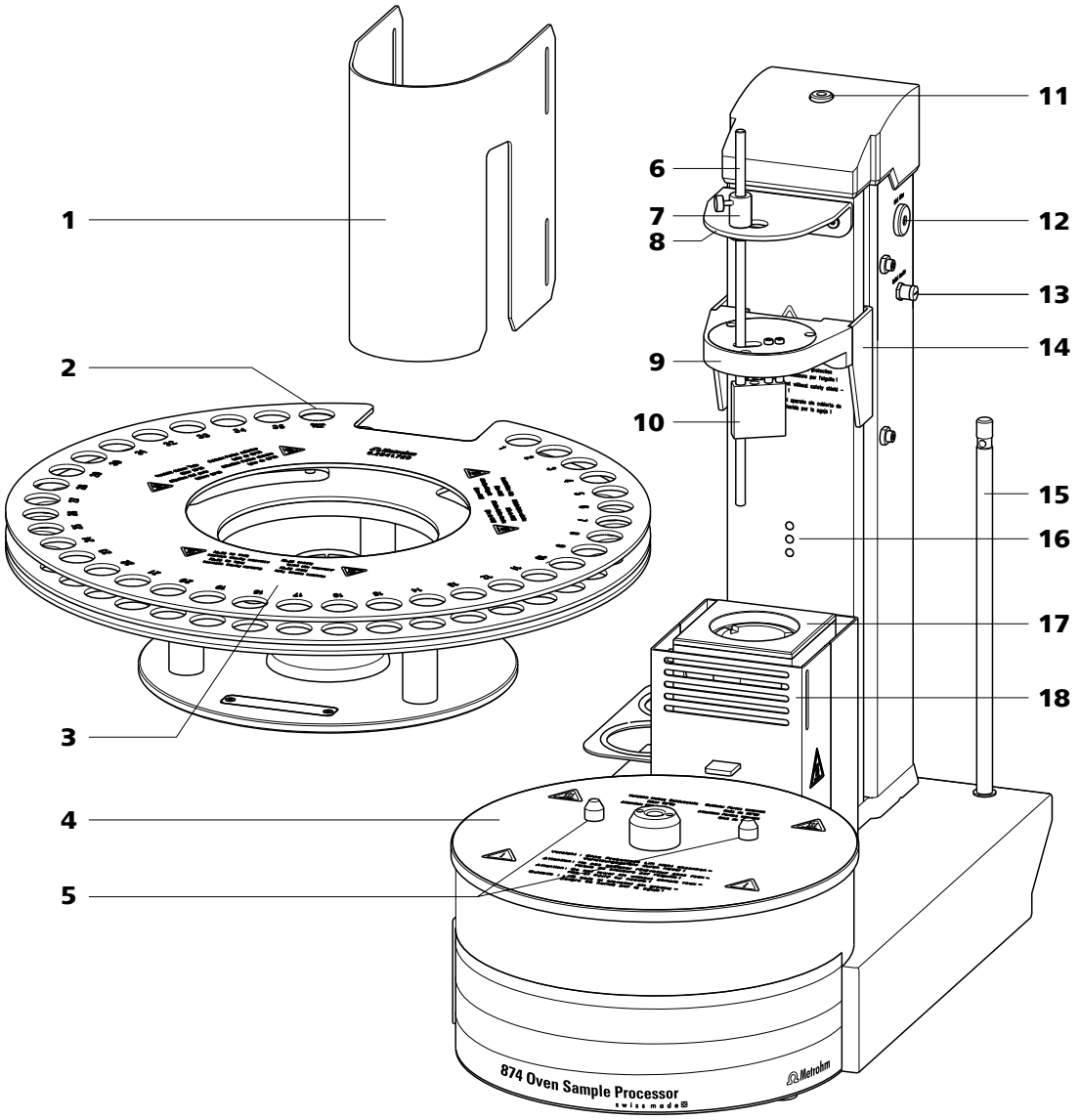


Figure 1 Front 874 Oven Sample Processor

1	**Safety shield (6.2751.140)**
2	**Conditioning position** For the conditioning vessel.
3	**Sample rack (6.2041.720)** For 36 sample vials (6 mL).
4	**Turntable**
5	**Guide bolts** For the sample rack.
6	**Guide rod** For stripping off the sample vessel.
7	**Rod holder** With knurled screw.
8	**Guide head**
9	**Working head**
10	**Distributor**
11	**Gas outlet** With M6 thread.
12	**Air pump inlet** For the 6.2724.010
13	**Heating tube connector**
14	**Lift**
15	**Support rod (6.2016.030)** For fixing the titration cell.
16	**Beaker sensor**
17	**Oven module** With PTFE covering.
18	**Oven housing** With ventilation slits.

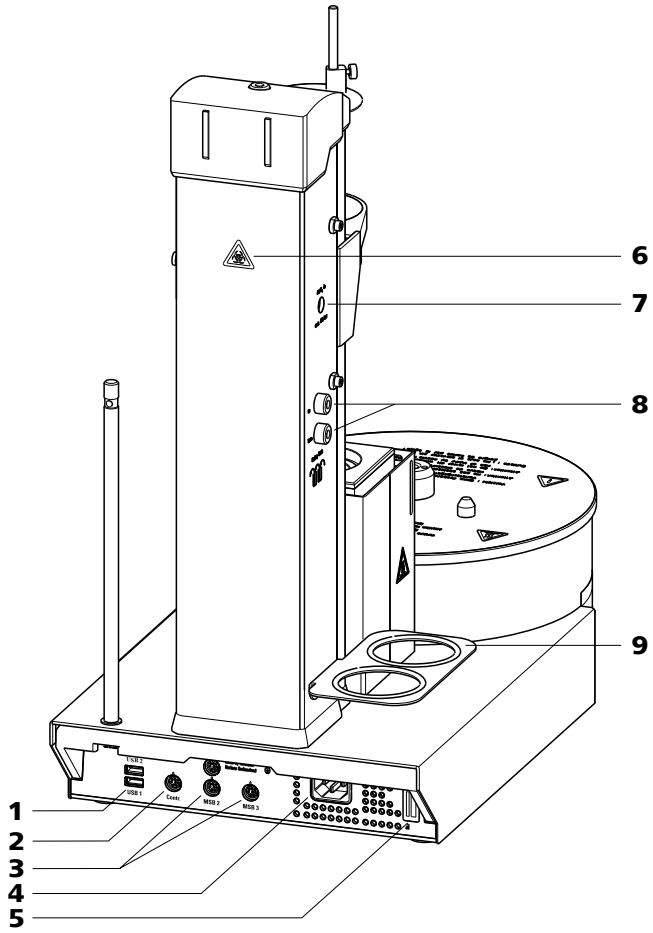


Figure 2 Rear 874 Oven Sample Processor

1	**USB connector (USB 1 and USB 2)** USB ports (type A) for connecting a printer, USB hub, Titrandos, additional USB devices etc.	**2**	**Controller connector (Controller)** For connecting a computer with installed PC software.
3	**MSB connector (MSB 1 to MSB 3)** Metrohm Serial Bus. For connecting external dosing devices, stirrers or remote boxes. Mini DIN, 9-pin.	**4**	**Mains connection socket**
5	**Type plate** Contains specifications concerning mains voltage, instrument type and serial number.	**6**	**Warning symbol** Biological hazard.*(see Chapter 1.3.4, page 5)*
7	**Air/nitrogen connector** With M6 interior thread. Inlet for external gassing.	**8**	**Gas inlet and outlet** For connecting drying flasks, with M6 inner thread.
9	**Drying flask holder**		

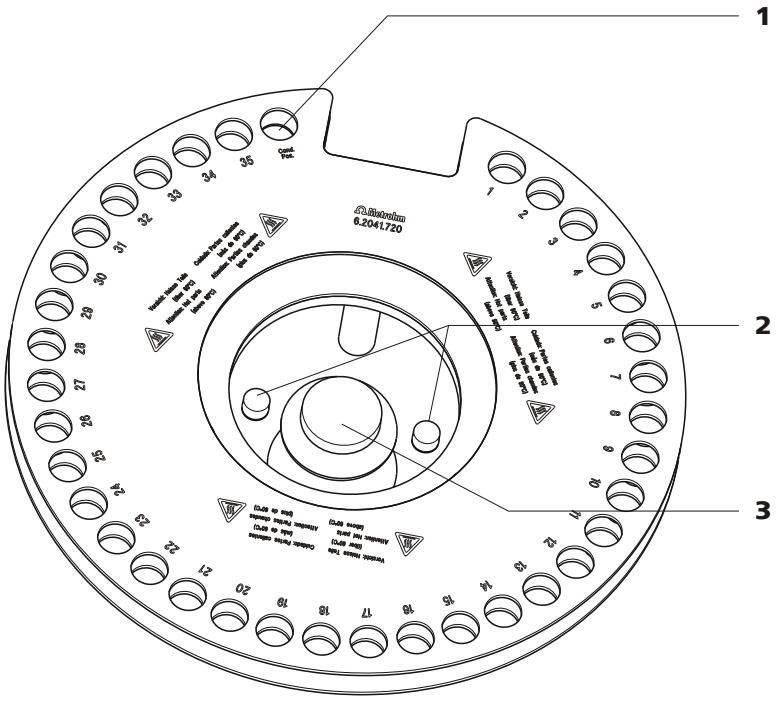


Figure 3 6.2041.720 sample rack

1 Conditioning position For the conditioning vessel.	**2 Guide pins**
3 Handle With fixing screw.	

3 Installation

3.1 Setting up the instrument

3.1.1 Packaging

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

3.1.2 Checks

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

3.1.3 Location

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

Place the instrument in a location of the laboratory which is suitable for operation, free of vibrations, protected from corrosive atmosphere, and contamination by chemicals.

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

3.2 Connecting a mains cable

Warning

This instrument must not be operated except with the mains voltage specified for it (see rear panel of the instrument).

Protect the connection sockets against moisture.

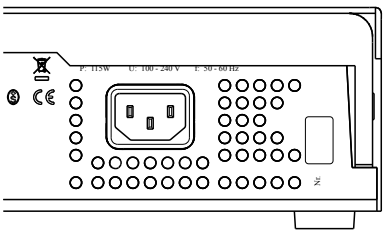


Figure 4 Connecting the mains cable

3.3 Mounting the sample insert

The dimensions of the supplied sample insert are optimized for the usage of **6.2419.007 sample vials (6 mL)** from Metrohm . This ensures the best possible transfer of heat between oven and sample.

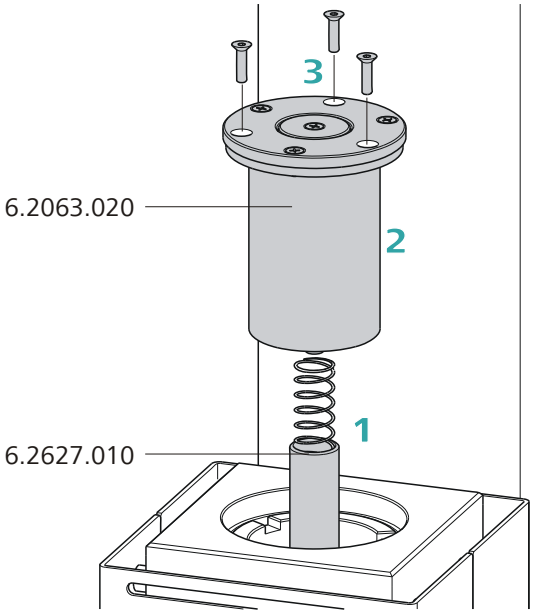


Figure 5 Mounting the sample insert

Note

The sample insert may not be inserted or removed unless it has been cooled down.

Proceed as follows:

1. Insert the **6.2627.010 oven insert** with the spring in place into the oven from above and slide it all the way to the bottom.
2. Place the **6.2063.020 sample insert** into the oven from above.
3. Tighten the sample insert with the supplied hexagon screws. The required hexagon key is part of the accessories.

Note

If vessels with other dimensions are to be used, then individually modified sample inserts can be ordered. **The precise vessel dimensions (including tolerances)** will be required when ordering. Non-standard sample vessels may not exhibit dimensions outside of the following limit values:

- Diameter 10.0…32.0 mm
- Immersion depth 20.0…45.0 mm

3.4 Mounting the needles

Two different types of needle holders are available for mounting needles. The length of the needle holder defines how deeply the injection needle penetrates the sample vessel. The **6.2049.040 needle holder**, which is 58 mm in length, ensures that the needle penetrates the liquid or powdery sample. The carrier gas can flow through the sample and effect an efficient expulsion of the moisture it contains.

If there is a danger that the heated sample could clog the needle, then use the **6.2049.050 needle holder** with 73 mm length. In this case the injection needle penetrates the sample vessel only slightly deeper than the outlet needle and has no contact with the sample itself.

Needle holders with the dimensions required for situations calling for special sample vessels can be supplied by Metrohm upon request.

Mounting the injection and outlet needle

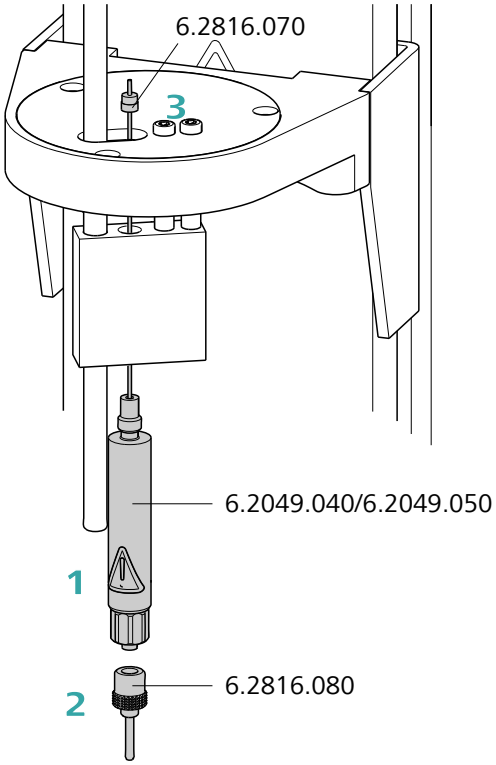


Figure 6 Mounting the needles

Mount the needles as follows

1 Screw the needle holder (6.2049.040 or 6.2049.050) into the distributor on the guide head.

2 Screw the **6.2816.080 outlet needle** onto the Luer connector of the needle holder.

3 Carefully guide the **6.2816.070 injection needle** into the opening of the distributor from above and allow it to drop down.

Note

Take care to ensure that the white PTFE seal is positioned securely on the needle.

4 Screw the **6.1805.470 FEP tubing** by hand onto the opening of the distributor. Screw the other end of the tube into the opening of the gas outlet on the upper side of the tower.

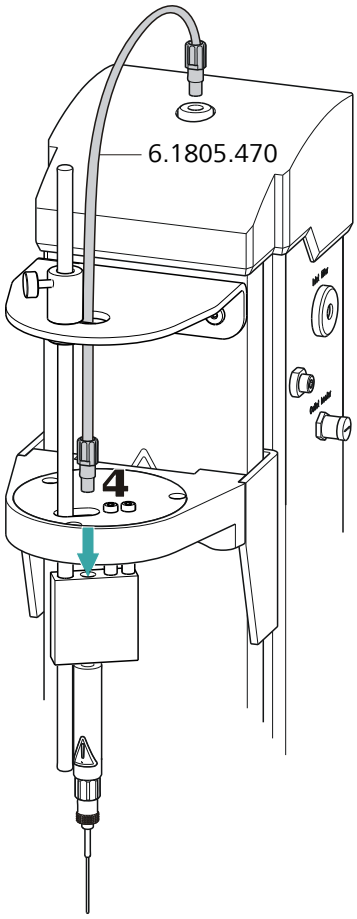
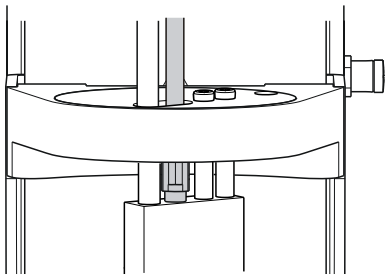


Figure 7 Mounting the tubing



3.5 Mounting the heating tube

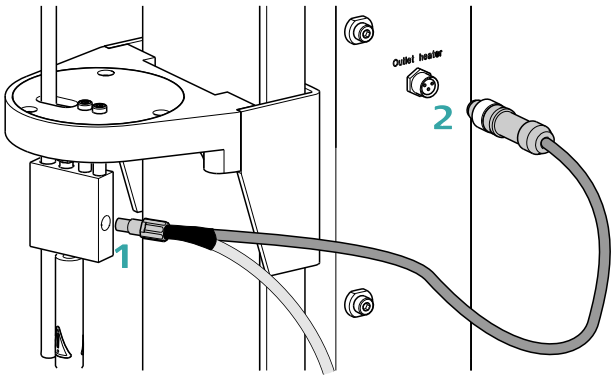


Figure 8 Mounting the heating tube

Proceed as follows:

1. Screw the M6 connector of the **6.1830.030 heating tube** into the side opening of the distributor on the guide head.

2. Connect the heating tube cable to the **Outlet heater** connector on the right-hand side of the tower.

   Rotate the plug in such a way that the three contact pins match the alignment of the corresponding openings on the socket. Press the plug against the socket and rotate the front knurled screw in clockwise direction.

Note

The heating jacket of the heating tube is heated up to approx. 40...50 °C as soon as the instrument is switched on. This prevents the condensation of moisture in the tubing when this is expelled from the sample and transferred with the aid of a carrier gas into a KF titration cell.

3.6 Mounting the drying flasks

Two drying flasks with desiccant are integrated into the gas flow in order to dry the gas that is conveyed. Dust (e.g. from the desiccant) must be prevented from finding its way into the sample vessel.

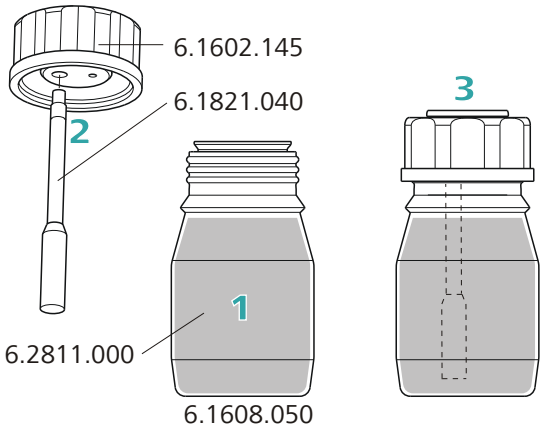


Figure 9 Preparing the drying flasks

Prepare both drying flasks as follows:

1. Fill both **6.1608.050 drying flasks** with **6.2811.000 molecular sieve**.

2. Screw one **6.1821.040 filter tube** into each of the **6.1602.145 drying flask covers** from below. Tighten the filter tubes well by hand.

3. Screw the two drying flask covers with the filter tubes onto the drying flasks. Tighten the covers well by hand.

Note

If the drying flask covers or the filter tubes are not sufficiently tightly screwed on, then this will prevent a precise, regular flow of gas. An error message displaying a wrong gas flow rate appears as a rule when there are leaks in the threaded connections.

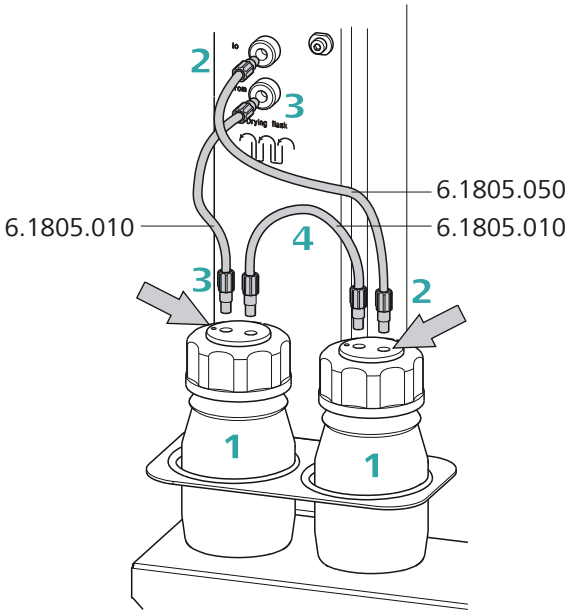


Figure 10 Mounting the tubings

Mount the FEP tubings as follows:

1 Load the two drying flasks that have been prepared into the holders, see previous illustration.

2 Screw one **6.1805.050 FEP tubing** (18 cm length) to the gas outlet (left-hand side of the tower, labeled **to**). Screw the other tubing end on the front drying flask to the M6 connector **without** a dot mark (see right-hand arrow).

3 Screw one **6.1805.010 FEP tubing** (13 cm length) to the gas inlet (left-hand side of the tower, labeled **from**). Screw the other tubing end on the rear drying flask to the M6 connector **with** a dot mark (see left-hand arrow).

4 Screw the second **6.1805.010 FEP tubing** (13 cm length) tightly onto the remaining M6 connectors of the drying flasks.

The marking **Drying flask** on the left-hand side of the tower displays the diagram for the tubing.

Note

Tighten the screw connections well by hand.

3.7 Mounting the dust filter

The built-in air pump must be protected against dust. A **6.2724.010 dust filter** must be placed on the air inlet (**inlet filter**) on the right-hand side of the tower for this reason.

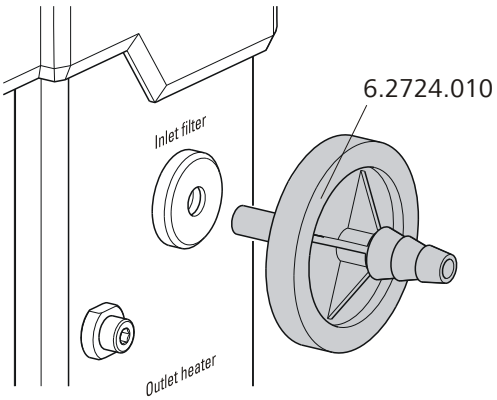


Figure 11 Mounting the dust filter

Note

The dust filter should be replaced approx. once a year.

3.8 Mounting the air/nitrogen connector

If compressed air, nitrogen or another gas is to be used for transferring of expelled moisture, then a separate connector is available.

A tube with M6 thread can be connected directly to the connector **Air/N_2 in** on the left-hand side of the tower. Enclosed with the instrument is the **6.1808.040 M6/M8 tubing adapter** for tubing with an M8 thread. The **6.1808.050 M8/tubing olive** can also be put in place in order to connect a simple tube.

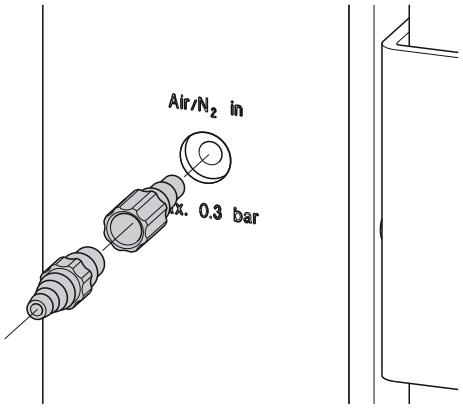


Figure 12 External gas connector

Warning

If gas is supplied from a pressure line or a pressure vessel, then it is imperative that a pressure reduction valve be placed upstream. The gas pressure may not exceed a maximum overpressure level of 0.3 bar.

3.9 Mounting the safety shield

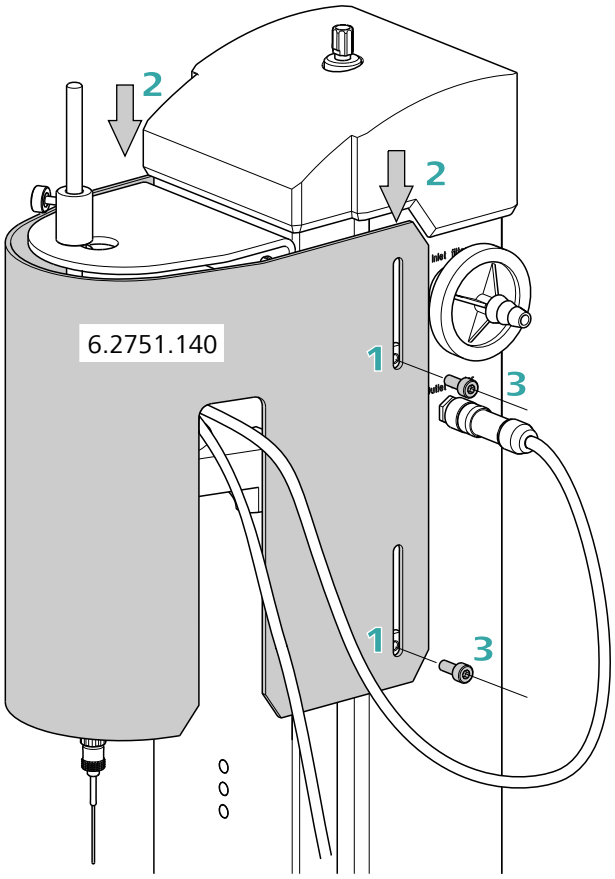


Figure 13 Mounting the safety shield

Warning

It is imperative that the safety shield be installed before the first time the 874 Oven Sample Processor is used. The device is not permitted to be operated without a safety shield.

Proceed as follows:

1 Undo the hexagon screws on both sides of the tower with the enclosed hexagon key.

2 Move the **6.2751.400 safety shield** into position, starting from the top. Observe the corresponding illustration.

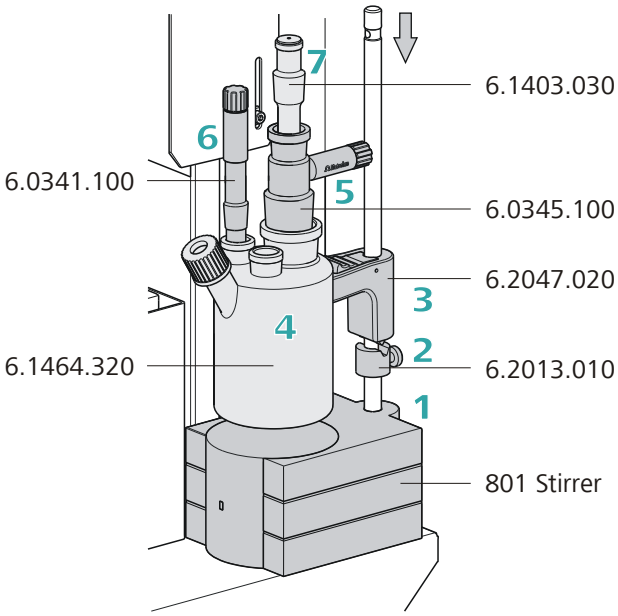
3 Fix the safety shield in place with the hexagon screws.

Note

You can adjust the vertical position of the safety shield at any time by loosening the screws. Take care to ensure that is not possible to reach into the working area of the needles while the instrument is in operation.

3.10 Mounting the KF titration cell

The following description is provided as an example for the mounting of a coulometric KF titration cell. The necessary accessory parts are, with the exception of the 6.2013.010 clamping ring, **not** included in the scope of delivery of the 874 Oven Sample Processor.



Proceed as follows:

1. Insert the magnetic stirrer **801 Stirrer** from above by means of the support rod at the right-hand side of the tower. Connect the cable to the coulometer.

2. Screw the **6.2013.010 clamping ring** tightly to the support rod, with the indent facing upward.

3. Fix the **6.2047.020 titration vessel holder** to the support rod. Actuate the fixing lever of the holder while doing so.

4 Fasten the **6.1464.320 coulometric KF titration cell** to the titration vessel holder. Hook the metal clip of the titration cell to the holder.

The height of the titration vessel holder can now be adjusted in such a way that the titration vessel hangs slightly above the magnetic stirrer. Use the clamping ring to fix the position of the holder. If the fixing lever of the holder is now pressed, then the titration cell can be raised slightly and swiveled. The correct positioning of the titration cell continues to be maintained by the clamping ring.

5 Insert the **6.0345.100 generator electrode** (or 6.0344.100) into the titration cell and connect a **6.2104.120 electrode cable** to it.

6 Insert the **6.0341.100 indicator electrode** into the titration cell and connect a **6.2104.020 electrode cable** to it.

7 Fill a **6.1403.030 KF adsorber tube** with **6.2811.000 molecular sieve**. Place a small piece of absorbent cotton underneath and above the molecular sieve to serve as a dust filter. Insert the filled drying tube into the titration cell.

8 Place a **6.1903.030 stirring bar** into the titration cell.

3.11 Inserting the heating tube into the KF titration cell

The 874 Oven Sample Processor can be used in combination with a KF coulometer or a volumetric KF titrator. The mounting of the tip of the heating tube is accomplished in different ways for the respective KF titration cells.

Coulometric KF titration cell

- Remove the protective cover from the tip of the heating tube and the E.3010.032 O-ring.
- Disassemble the accompanying **6.1446.170 heating tube stopper** into three parts.

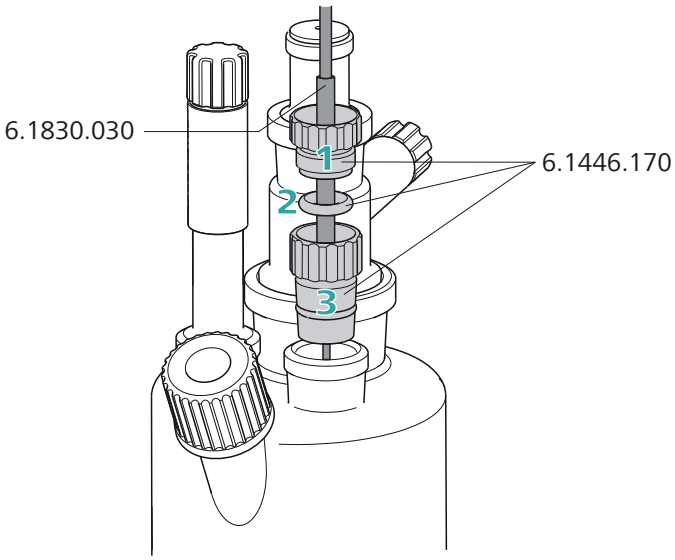


Figure 14 Coulometric KF titration cell

Proceed as follows:

1 Guide the upper part of the heating tube stopper over the tip of the **6.1830.030 heating tube** as shown in the illustration.

2 Guide the O-ring of the heating tube stopper over the heating tube.

3 Guide the lower part of the heating tube stopper over the heating tube and screw the three parts together (not too tightly).

4 Insert the stopper with the tip of the heating tube into one of the two SGJ openings of the KF titration cell

5 Shift the tip vertically in such a way that the outlet opening of the tubing is immersed as deeply as possible. The tip must not however be permitted to get in the way of the stirring bar in the KF titration cell. Afterwards give the heating tube stopper its final tightening.

Volumetric KF titration cell

- Remove the protective cover from the tip of the heating tube and the E.3010.032 O-ring. The latter you will still need.
- A **6.2730.020 septum stopper** is enclosed with every KF titrator made by Metrohm. Disassemble this septum stopper into three parts and remove the septum. It will not be required.

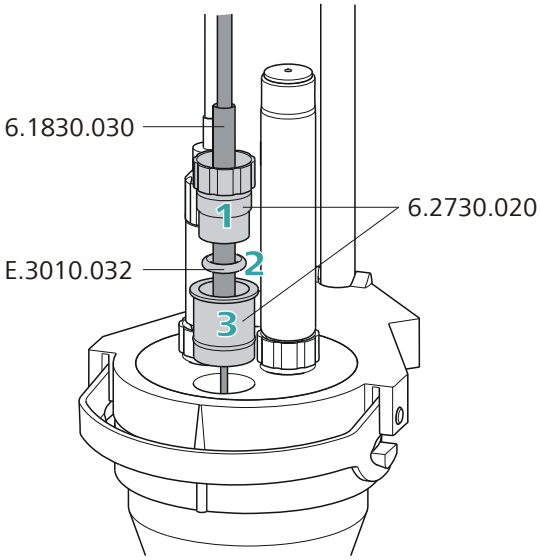


Figure 15 Volumetric KF titration cell

Proceed as follows:

1 Guide the upper part of the septum stopper over the tip of the **6.1830.030 heating tube** as shown in the illustration.

2 Guide the **E.3010.032** O-ring over the heating tube.

This O-ring is also part of the 6.1244.040 set of seals that is enclosed with each KF titrator. It cannot be reordered individually.

3 Guide the lower part of the septum stopper over the heating tube and screw the three parts together (not too tightly).

4 Insert the stopper with the tip of the heating tube into the front opening of the KF titration cell

5 Shift the height of the tip of the heating tube vertically in such a way that the outlet opening of the tubing is immersed as deeply as possible. The tip must not however be permitted to get in the way of the stirring bar in the KF titration cell. Afterwards give the septum stopper its final tightening.

3.12 Attaching the sample rack

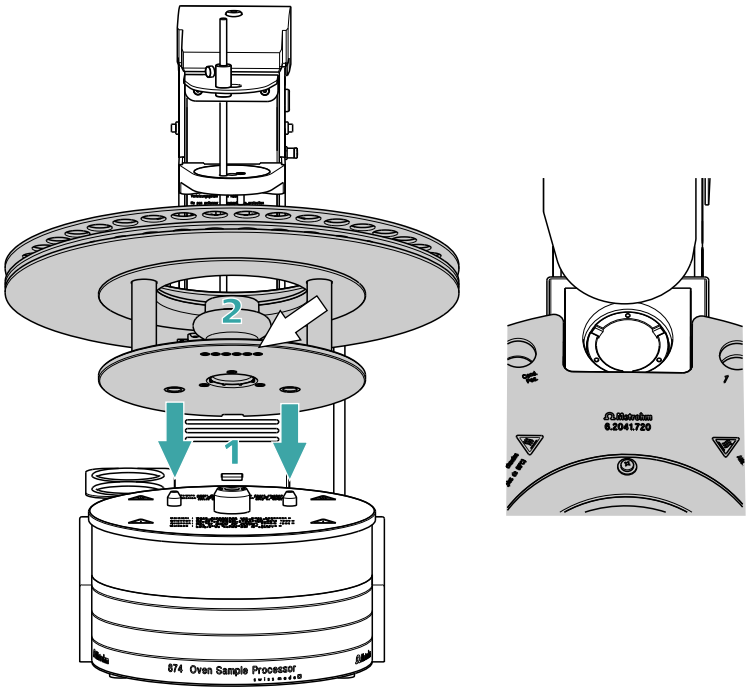


Figure 16 Attaching the rack

The turntable of the 874 Oven Sample Processor must be in initial position before the sample rack can be removed or put into place. To accomplish this, carry out the **[Rack Reset]** function in the manual operation of the control software.

Put the rack into place as follows:

1 Carefully center the rack on the turntable. The guide bolts on the turntable must engage with the openings in the bottom of the rack. Tip: hold the rack in such a way that the printed Metrohm logo is legible horizontally.

2 Carry out the **[Rack Reset]** function in the manual operation of the control software.

The rack is moved into starting position. The magnet code of the rack is read by the instrument during this process. The white arrow in *figure 16* indicates the position of the magnet holder. The six-digit magnet code is used to identify the rack type. The sample positions and any special positions on the rack are defined along with the rack type.

3.13 Adjusting the guide rod

The needle is pulled out of the sample vial by the upward movement of the lift. The sample vial is not permitted to remain hanging on the needle during this procedure. The rod that is fixed to the guide head with a knurled screw is used to push off the vial. The vertical positioning of the guide rod must be adjusted, depending on the height of the sample vial. The guide rod is not permitted to obstruct the sample vial when the rack is rotated.

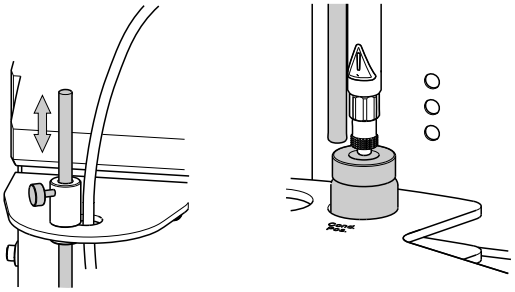


Figure 17 Adjusting the guide rod

Undo the red knurled screw on the guide head and adjust the height of the guide rod.

3.14 Connecting a computer

The 874 Oven Sample Processor requires a USB connection to a computer in order to be able to be controlled by a PC software. When a 6.2151.000 controller cable is used, the instrument can be connected directly, either to a USB socket on a computer, to a connected USB hub or to a different Metrohm control instrument.

Cable connection and driver installation

A driver installation is required in order to ensure that the 874 Oven Sample Processor is recognized by the PC software. To accomplish this, you must comply with the procedures specified. The following steps are necessary:

1 Installing the software

- Insert the PC software installation CD and carry out the installation program directions.
- Exit the program if you have started it after the installation.

2 Establishing cable connections

- Connect all peripheral devices to the instrument *(see Chapter 3.15, page 30)*.
- Connect the 874 Oven Sample Processor to the mains supply if you have not already done this.
- Connect the instrument to your computer through a USB connector (Type A) (see Instructions for Use for your computer). The 6.2151.000 cable is used for this purpose.

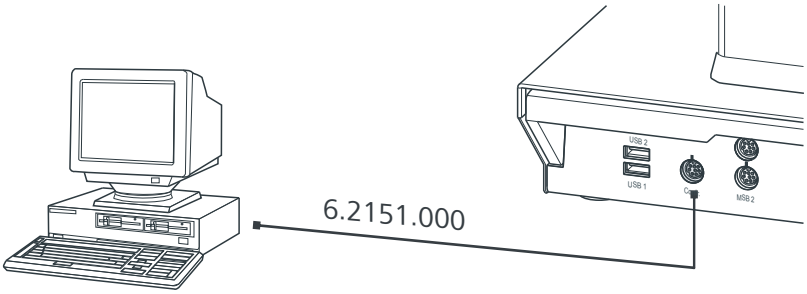


Figure 18 Connecting the computer

For Windows 2000: The instrument is recognized and the driver is installed automatically.

For Windows XP: The instrument is recognized and the installation assistant for the driver is started automatically. Select the option "Install software automatically" and click on **[Continue]**. Exit the assistant with **[Finish]**.

For Windows Vista: The instrument is recognized and the installation assistant for the driver is started automatically. Select the option "Find and install driver software". Agree to all subsequent requests. The installation assistant will be exited automatically.

Note

The plug on the instrument end of the 6.2151.000 controller cable is protected with an anti-pull device to prevent the cable from being pulled out accidentally. If you wish to pull out the plug, then you must first retract the outer plug sleeve marked with arrows.

Registering and configuring the instrument in the PC software

The instrument must be registered in the configuration of your PC software. Once that has been done, you can then configure it according to your requirements. Proceed as follows:

1 Setting up the instrument

- Start up the PC software.
  The instrument is recognized automatically. The configuration dialog for the instrument is displayed.
- Make configuration settings for the instrument and its connectors.

More detailed information concerning the configuration of the instument can be found in the documentation for the respective PC software.

3.15 Connecting MSB devices

In order to connect MSB devices, e.g. stirrers or dosing devices, Metrohm instruments are equipped with up a maximum of four connectors at what is referred to as the *Metrohm Serial Bus* (MSB). Various kinds of peripheral devices can be connected in sequence (in series, as a "daisy chain") at a single MSB connector (8-pin Mini DIN socket) and controlled simultaneously by the respective control instrument. In addition to the connection cable, stirrers and the remote box are each equipped with their own MSB socket for this purpose.

The following illustration provides an overview of the devices that can be connected to an MSB socket, along with a number of different cabling variations.

The question of which peripheral devices are supported depends on the control instrument.

Note

When connecting MSB devices together, the following must be observed:

- Only one device of the same type can be used at a single MSB connector at one time.
- Type 700 Dosino and 685 Dosimat dosing devices cannot be connected together with other MSB instruments on a shared connector. These dosing devices must be connected separately.

Caution

Exit the control software before you plug MSB instruments in. The control instrument recognizes when it is switched on which instrument is connected at which MSB connector. The operating unit or the control software enters the connected MSB devices into the system configuration (Device manager).

MSB connections can be extended with the 6.2151.010 cable. The length of the connection must not exceed a maximum of 15 m.

3.15.1 Connecting dosing devices

Three dosing devices can be connected to the instrument.

The types of dosing devices that are supported are:

- 800 Dosino
- 700 Dosino
- 805 Dosimat
- 685 Dosimat

Warning

If a Dosino is connected to the 874 Oven Sample Processor, then the connection cable must be equipped with a ferrite core T.2400.102. The ferrite core reduces any interference voltages that may occur and thus ensures compliance with strict EMC standards pursuant to applicable technical norms, see Chapter "Technical Data".

Proceed as follows:

1 Mounting ferrite core

Fasten a ferrite core T.2400.102 to the Dosino connection cable near to the plug.

2 Connect a dosing device

- Exit the control software.
- Connect the connection cable to one of the sockets marked with **MSB** on the rear of the control instrument.
- Start the control software.

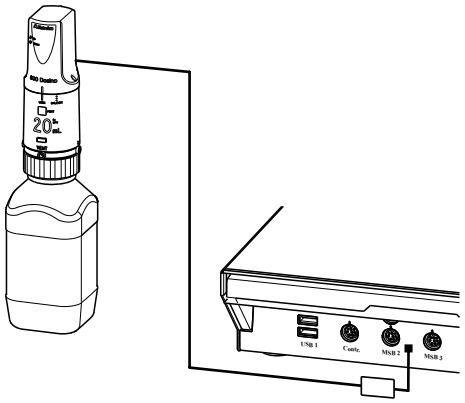


Figure 19 Connecting a dosing device

3.15.2 Connecting a stirrer or titration stand

You can use a magnetic stirrer 801 Stirrer or 803 Ti Stand (stirring "from below") or the 804 Ti Stand with a rod stirrer 802 Stirrer (stirring "from above").

Connect a stirrer or a titration stand as follows:

1 Connect a stirrer or titration stand

- Exit the control software.
- Connect the connection cable of the magnetic stirrer or of the titration stand to one of the sockets marked with **MSB** on the rear of the control instrument.
- If desired, connect the rod stirrer to the stirrer socket (with stirrer symbol) of the titration stand.
- Start the control software.

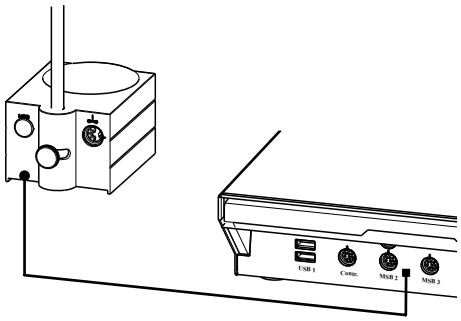


Figure 20 Connecting MSB stirrer

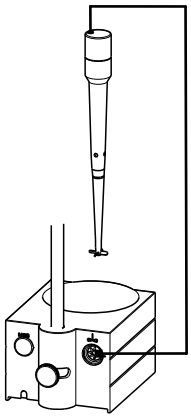


Figure 21 Rod Stirrer and titration stand

3.15.3 Connecting a remote box

Instruments that are controlled via remote lines and/or which send control signals via remote lines can be connected using the 6.2148.010 remote box. In addition to Metrohm, other instrument manufacturers also use similar connectors that make it possible to connect different instruments together. These interfaces are also frequently given the designations "TTL Logic", "I/O Control" or "Relay Control" and generally have a signal level of 5 volts.

Control signals are understood to be electrical line statuses or brief (> 200 ms) electrical pulses which display the operational state of an instrument or which trigger or report an event. Sequences on a variety of instruments can thus be coordinated in a single complex automation system. No exchange of data is possible, however.

Proceed as follows:

1 Connect a remote box

- Exit the control software.
- Connect the remote box connection cable to one of the sockets marked with **MSB** on the rear of the control instrument.
- Start the control software.

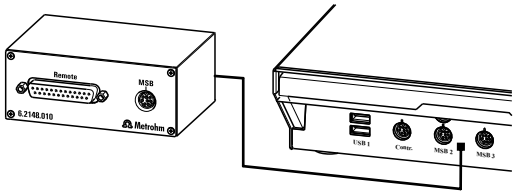


Figure 22 Connecting a remote box

You can, for example, connect an 849 Level Control Box (fill level monitor in a waste canister) or a 731 Relay Box (switch box for 230/110 volt alternating current sockets and low-voltage direct current outlets). The remote

box also has an MSB socket at which a further MSB instrument, e.g. a dosing device or a stirrer, can be connected.

You will find precise information concerning the pin assignment of the interface on the remote box in Appendix *(see Chapter 7.1, page 40)*.

3.16 Connecting USB devices

Two USB connectors (Type A sockets) are available for connecting devices with USB interfaces. The 874 Oven Sample Processor functions then as a USB hub (distributor). If you wish to connect more than two USB devices, you can also use an additional commercially available USB hub.

Note

When a USB device is connected, the control instrument recognizes which device is connected. The control software automatically enters a connected USB device into the system configuration (Device manager).

3.16.1 Connecting a barcode reader

A barcode reader is used as an input aid for entering text and numbers. You can connect a barcode reader to a USB interface.

Connect a barcode reader as follows:

1 Connecting the cable

- Plug the USB plug (Type A) of the barcode reader into one of the USB sockets on the rear side of the instrument.

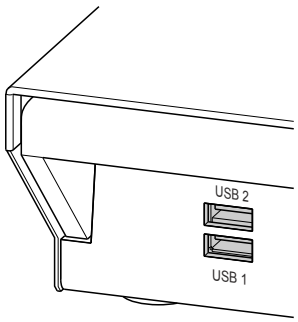


Figure 23 USB connectors

2 Configuring the barcode reader in the control software

- Configure the barcode reader in the configuration part of the control software as described in the online Software Help.

Settings of the barcode reader

The barcode reader requires certain basic settings. You will find directions in the Instructions for Use as to how you can program the barcode reader. Switch the barcode reader to programming mode and make the following settings:

1

- Select the keyboard layout for the desired country (USA, Germany, France, Spain, Switzerland (German)). This setting must match the setting in the control software.
- Make sure that the Ctrl characters (ASCII 00 to 31) are allowed to be sent.
- Adjust the settings so that the ASCII character 02 (STX or Ctrl B) is sent as the first character as "Preamble" or "Prefix Code".
- Adjust the settings so that the ASCII character 04 (EOT or Ctrl D) is sent as the last character as "Postamble" or "Record Suffix" or "Postfix Code".
- Exit programming mode.

4 Processing a sample series

Moisture determinations according to the heating method require the conditioning of the entire tubing system and of the KF titration cell before a determination can be carried out. Because the sample vials and the septum seals may contain small amounts of moisture, three to five blank value determinations must be carried out with sealed, empty vessels. For conditioning, blank value and sample determinations, example methods for ***tiamo***™ are to be found in the installation directory of the software.

Preparing

Weigh solid or liquid samples into sample vials and seal these securely with the septum crimping tongs. We recommend the use of the 6.2419.007 sample vial with the 6.1448.057 septum seals. The silicone septum of the aluminum cap is resistant to temperatures of up to 250 °C and has shown iself to be exceptionally reliable. In addition to the sample vials, you will also require for a sample series an empty, tightly sealed vial as a conditioning vessel, in addition to three to five vials (which are also empty and tightly sealed) as blank samples.

Place an empty, sealed vial as **conditioning vessel** at the **Cond. Pos.** position on the sample rack of the 874 Oven Sample Processor. The empty **blank samples** are placed on **Positions 1 to 3** (or 5) on the sample rack. Place the vials filled with samples on the following positions.

In the sample table of ***tiamo***™ one line must be filled out with the associated method and sample data for each vial on the sample rack. Observe in this connection the explanations contained in the Application note for the individual methods. The vials must be processed in the correct sequence. It is for this reason that the sample table must be filled out as follows:

- **Line 1:** conditioning method
- **Lines 2 to 4 (6, resp.)**: method for blank value determination
- **Lines 5 (7, resp.) to x**: method for water content determination

Observe the following during conditioning:

- In the KF titration cell, the shaft of the heating tube should not be immersed in the working medium.
- Align the tip of the heating tube against the vessel wall.
- Set the stirring rate to high. The carrier gas should emerge from the tip of the heating tube into the working medium as tiny bubbles and be spun there forcefully. It is advantageous for air bubbles to be stirred into the working medium and forcefully broken up in the process. The air in the KF titration cell must also be dried.

5 Handling and maintenance

5.1 General

The 874 Oven Sample Processor 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 of the instrument.

Severe contamination can also have an influence on the measured results. Regular cleaning of exposed parts can prevent this to a large extent.

Spilled chemicals and solvents must be removed immediately. In particular, the mains plug should be protected from contamination.

5.2 Care

- Replace exhausted molecular sieve promptly. You should replace the molecular sieve as soon as increased drift values appear in the Karl Fischer cell.
- Check all tubing connections regularly for leaks.
- Flush out the tubing connections from time to time. Carefully dry the tubing afterward. The tubing must be replaced after prolonged usage.
- Clean the sample insert regularly with a damp cloth.
- Replace the dust filter once a year.

5.3 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
The drift is very high during conditioning.	*Molecular sieve of drying flasks and/or the titration cell exhausted.*	Replace molecular sieve.
	The titration cell is leaking.	Check seals. If necessary, replace.
The titration time is too long.	*The sample is non-homogenous*	Reduce the size of the sample or homogenize it before weighing in.
	Not the entirety of the moisture is expelled.	Select more stringent switch-off criteria on the KF titrator: lower stop drift, higher switch-off delay time.
	Tubing connections leaking	Inspect tubing and replace as necessary.
The results are spread widely.	*Molecular sieve of drying flasks exhausted.*	Replace molecular sieve.
	Condensate in the heating tube.	▪ Dry the tubing. ▪ Reduce the gas flow. ▪ Perhaps lower the oven temperature.
	Gas flow too high.	Reduce the gas flow.
	The sample is non-homogenous	Reduce the size of the sample or homogenize it before weighing in.
Selected gas flow is not achieved.	*System is leaking*	Check all tubing connections and drying flasks for leaks.
	Pressure from external gas supply either too low or too high.	Adjust gas pressure (max. 0.3 bar).
	Pump defective	Contact a service technician.

7 Appendix

7.1 Remote interface

The 6.2148.010 remote box allows devices to be controlled which cannot be connected directly to the MSB interface of the Sample Processor.

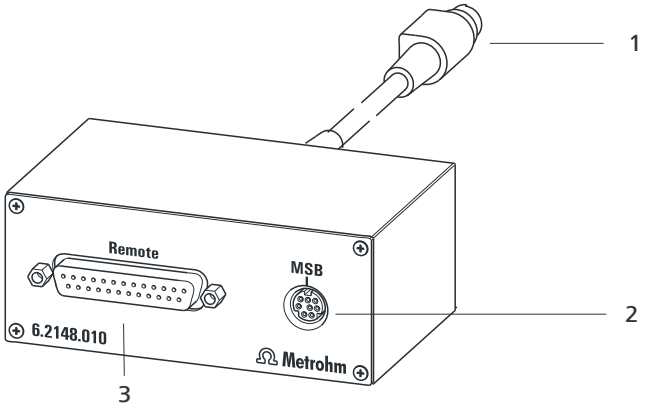


Figure 24 Connectors of the remote box

1 **Cable** For connecting the Sample Processor.	**2** **MSB connector** Metrohm Serial Bus. For connecting external dosing devices or stirrers.
3 **Remote connector** For connecting devices with a remote interface.	

7.1.1 Pin assignment of the remote interface

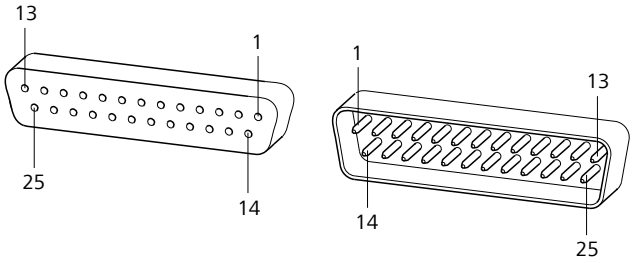
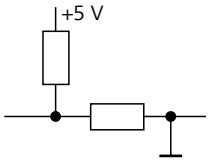


Figure 25 Pin assignment of the remote socket and plug

The above presentation of the pin assignment of a Metrohm remote interface applies not only for the remote box, but also for all Metrohm devices with 25-pin D-Sub remote connection.

Inputs



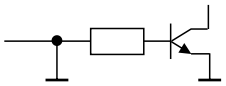
approx. 50 kΩ Pull-up

t_p >20 ms

active = low, inactive = high

The input lines can be scanned with the **SCAN** command.

Outputs



Open Collector

t_p >200 ms

active = low, inactive = high

I_C = 20 mA, V_{CEO} = 40 V

+5 V: maximum load = 20 mA

The output lines can be set with the **CONTROL** command.

Table 1 Inputs and outputs of the remote interface

Assigment	Pin No.	Assigment	Pin No.
Input 0	21	Output 0	5
Input 1	9	Output 1	18
Input 2	22	Output 2	4
Input 3	10	Output 3	17
Input 4	23	Output 4	3
Input 5	11	Output 5	16
Input 6	24	Output 6	1
Input 7	12	Output 7	2
0 volts / GND	14	Output 8	6
+5 volts	15	Output 9	7
0 volts / GND	25	Output 10	8
		Output 11	13
		Output 12	19
		Output 13	20

7.2 Stirring rate

The stirring rate can be adjusted in steps of –15 to +15.

The approximate rotational speed can be calculated with the following formula:

Rotational speed/min (r/min) = 125 · stirring rate

Example:

Stirring rate set: 8

Rotational speed in rpm = 125 · 8 = 1000

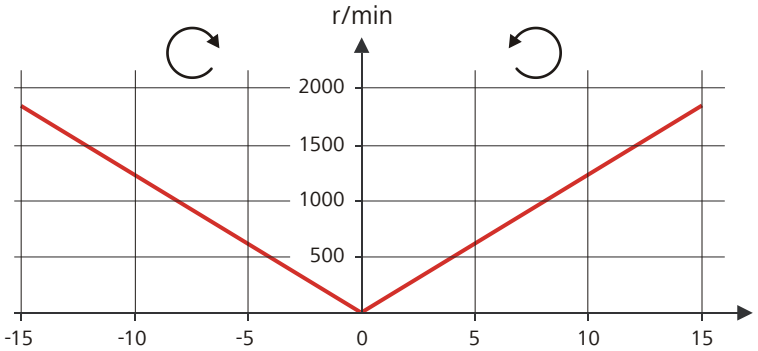


Figure 26 Rotational speed depending on stirring rate

8 Technical specifications

8.1 Lift and turntable

Stroke path	154 mm
Maximum lift load	Approx. 30 N
Lift rate	Adjustable, 5…25 mm/s
Shift rate	Adjustable, 3...20 angular degrees/sec

8.2 Oven

Temperature range	50…250 °C
Accuracy	±3 °C
Correction range	-10…+10 °C
Heating cartridge performance	Typically 165 W (with 230 V) Depending on mains voltage
Heating rate	Typically 15 °C/min (with 80…180 °C, 230 V) Dependent on temperature, mains voltage, sample amount and vessel dimensions
Cooling rate	Typically 9 °C/min (with 80…180 °C) Dependent on temperature, sample amount and vessel dimensions

8.3 Gas flow

Flow range	10…150 mL/min Under normal conditions

8.4 Outlet heater

Socket connection	U = 16 ±1 V I≤ 0.8 A
Typical tubing temperature	Approx. 50 °C

8.5 Interfaces and connectors

Controller connection	USB upstream port (9-pin Mini DIN socket) for connecting a computer to the control system of the device.
MSB connectors MSB1…MSB3	Three 9-pin Mini DIN sockets for connecting dosing devices, stirrers, etc.
USB connectors 1/2	Two USB downstream ports (type A sockets), each 500 mA, for connecting Metrohm instruments or USB peripheral devices of other manufacturers.

8.6 Mains connection

Voltage	100…120 / 220…240 V Note: It is not allowed to run the instrument between the stated ranges.
Frequency	50 / 60 Hz (± 3%)
Power consumption	200 W
Fuse	2.0 ATH

8.7 Safety specifications

Design and testing	According to EN/IEC 61010-1, UL 61010-1, CSA-C22.2 No. 61010-1, EN/IEC 61010-2-010, EN/IEC 61010-2-081, protection class I
Safety instructions	This document contains safety instructions which have to be followed by the user in order to ensure safe operation of the instrument.

8.8 Electromagnetic compatibility (EMC)

Emission

Standards fulfilled
- EN/IEC 61326-1
- EN/IEC 61000-6-3
- EN 55022 / CISPR 22
- EN/IEC 61000-3-2
- EN/IEC 61000-3-3

Immunity

Standards fulfilled
- EN/IEC 61326-1
- EN/IEC 61000-6-2
- EN/IEC 61000-4-2
- EN/IEC 61000-4-3
- EN/IEC 61000-4-4
- EN/IEC 61000-4-5
- EN/IEC 61000-4-6
- EN/IEC 61000-4-8
- EN/IEC 61000-4-11
- EN/IEC 61000-4-14
- EN/IEC 61000-4-28
- NAMUR

8.9 Ambient temperature

Nominal function range	5…45 °C Humidity < 80 %
Storage	–20…70 °C Humidity < 95 %
Transport	–40…70 °C Humidity < 95 %

8.10 Reference conditions

Ambient temperature	25 °C (±3 °C)
Relative humidity	≤60 %
Mains voltage	230 V

8.11 Dimensions

Width	0.28 m
Height	0.55 m
Depth	0.49 m
Weight (without accessories)	15.50 kg
Material	
Housing	Metal housing, surface-treated Oven covering: PTFE

9 Conformity and warranty

9.1 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

874 Oven Sample Processor

Sample Processor with temperature-controlled oven unit for the automatic sample treatment in coulometric or volumetric water determinations.

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, EN/IEC 61000-3-2: 2006, EN/IEC 61000-3-3: 2005
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, EN/IEC 61000-4-5: 2001, EN/IEC 61000-4-6: 2001, EN/IEC 61000-4-8: 2001, EN/IEC 61000-4-11: 2004, EN/IEC 61000-4-14: 2004, EN/IEC 61000-4-28: 2004, NAMUR: 2004

Safety specifications

EN/IEC 61010-1: 2001, UL 61010-1: 2004,
CSA-C22.2 No. 61010-1: 2004, EN/IEC 61010-2-081: 2003, protection class I

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	Electrical equipment for measurement, control and laboratory use – EMC requirements

EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
EN 61010-2-010	Particular requirements for laboratory equipment for the heating of materials
EN 61010-2-081	Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes

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, 27 November, 2007

D. Strohm

Vice President, Head of R & D

A. Dellenbach

Head of Quality Management

9.2 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.

9.3 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.

10 Accessories

Note

Subject to change without notice.

10.1 Scope of delivery 2.874.0010

Qty.	Order no.	Description
1	1.874.0010	**874 Oven Sample Processor** Sample Changer for driving out the moisture contained in liquid or solid samples, followed by coulometric or volumetric moisture determinations according to Karl Fischer. For standard vials (6 mL).
1	6.1446.170	**Heating tube stopper** for coulometric KF vessels in connection with heatable tubing connection Material: PP Height (mm): 34 Outer diameter (mm): 13
3	6.1448.057	**Aluminum septum caps / 100 pieces** Including Al sealing. Material: Aluminum Material 2: Silicone Height (mm): 7.4 Outer diameter (mm): 20.7
2	6.1602.145	**Drying flask cover** Screw cap with GL45 thread for 6.1608.050 drying bottle.

Qty.	Order no.	Description	
2	6.1608.050	**Drying bottle / 100 mL / GL 45**	
		Material: Clear glass	
		Height (mm): 100	
		Outer diameter (mm): 56	
		Volume (mL): 100	
2	6.1805.010	**FEP tubing / M6 / 13 cm**	
		With light and kink protection.	
		Material: FEP	
		Inner diameter (mm): 2	
		Length (mm): 130	
1	6.1805.050	**FEP tubing / M6 / 18 cm**	
		With light and kink protection	
		Material: FEP	
		Inner diameter (mm): 2	
		Length (mm): 180	

Qty.	Order no.	Description
1	6.1805.470	**FEP tubing / M6 / 44 cm**

With light and kink protection

Material:	FEP
Inner diameter (mm):	2
Length (mm):	440

Qty.	Order no.	Description
1	6.1808.040	**Thread adapter M6 outer / M8 inner**

Outer thread M6, inner thread M8.

Material:	PTCFE

Qty.	Order no.	Description
1	6.1808.050	**Tubing adapter olive / M8 outer**

1 M8 outer thread and 1 tubing olive. E.g. for thermostat jacket of exchange units and stability measuring instruments.

Material:	PVDF
Length (mm):	31.5

Qty.	Order no.	Description
2	6.1821.040	**Filter tube**

Filter tube for 6.1608.050 drying bottle. For Rancimats and Karl Fischer ovens.

Length (mm): 112

Qty.	Order no.	Description
1	6.1830.030	**Heatable outlet tubing**

Heatable outlet tubing for 860 KF Thermoprep and 874 USB Oven Sample Processor.

Qty.	Order no.	Description
1	6.2013.010	**Clamping ring**

For stand rods of 10 mm diameter

Material: Metal
Width (mm): 20
Height (mm): 16

Qty.	Order no.	Description
1	6.2041.720	**Sample rack 36 x 6 mL for 874**

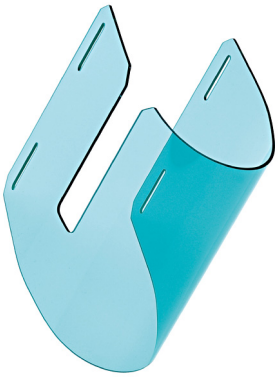
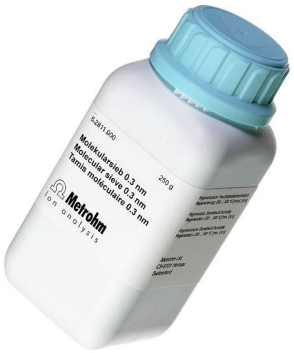
Sample rack for 36 x 6 mL sample vials (6.2419.000), one-row

Hole diameter (mm): 22

Qty.	Order no.	Description	
1	6.2049.040	**Needle holder with Luer-lock** Length (mm): 58	
1	6.2049.050	**Needle holder with Luer-lock** Length (mm): 73	
1	6.2053.000	**Cable clip** Cable clip for fastening cables and tubes	
1	6.2063.020	**Sample holder** Sample holder for 6 mL sample vials (6.2419.000), for 874	

Qty.	Order no.	Description	
1	**6.2151.000**	**Cable USB A – Mini-DIN 8 pins** Controller cable Length (m): 1.8	
3	**6.2419.007**	**Sample vial 6 ml / 100 pieces** 6.1448.050 septum caps. Used for KF-determinations with oven. Volume (mL): 6	
1	**6.2621.100**	**Hexagon key 3 mm** Hexagon key 3 mm for IC Sample Processors Length (mm): 73	
1	**6.2621.110**	**Crimping tongs** Crimping tongs for sealing 6 mL sample vials (6.2419.000, 6.2419.007). Length (mm): 210	

Qty.	Order no.	Description	
1	6.2621.130	**Hexagon key 2 mm** 2 mm.	
1	6.2621.140	**Hexagon key 2.5 mm**	
1	6.2627.010	**Oven insert** Used with 874 USB Oven Sample Processor	
1	6.2724.010	**Dust filter** Dust filter for Rancimats and Karl Fischer ovens. Outer diameter (mm): 44 Length (mm): 53	

Qty.	Order no.	Description	
1	6.2739.000	**Wrench** For tightening connectors Length (mm): 68	
1	6.2751.140	**Splash protection** Splash protection for 874 USB Oven Sample Processor, made of PMMA	
1	6.2811.000	**Molecular sieve** Molecular sieve. Bottle containing 250 g. Pore size: 0.3 nm. Without moisture indicator. For Rancimats and Karl Fischer instruments.	
1	6.2816.070	**Injection needle** Used with Karl Fischer ovens. Material: Stainless steel (AISI 304)	

Qty.	Order no.	Description
1	6.2816.080	**Outlet needle** Used with KF Thermoprep and Oven Sample Processor. Material: Stainless steel (AISI 304)

Qty.	Order no.	Description
1	6.6056.202	**tiamo 2.0 Full** Program for controlling complex titration systems. - Graphical method editor with numerous templates - Layout Manager for display adjustment - Professional database with recalculation - Export to LIMS, NuGenesis, Cyberlab etc. - Powerful report generator - Complies with FDA 21 CFR Part 11.

Qty.	Order no.	Description
1	6.2122.0x0	**Mains cable with C13 line socket IEC-60320-C13** Cable plug according to customer requirements. Switzerland: Type SEV 12 6.2122.020 Germany, …: Type CEE(7), VII 6.2122.040 USA, …: Type NEMA/ASA 6.2122.070
1	8.874.8002EN	**874 Oven Sample Processor Manual**

10.2 Scope of delivery 2.874.0020

Qty.	Order no.	Description
1	1.874.0010	**874 Oven Sample Processor** Sample Changer for driving out the moisture contained in liquid or solid samples, followed by coulometric or volumetric moisture determinations according to Karl Fischer. For user-defined sample vials (6 mL).

Qty.	Order no.	Description	
1	6.1446.170	**Heating tube stopper**	
	for coulometric KF vessels in connection with heatable tubing connection		
	Material:	PP	
	Height (mm):	34	
	Outer diameter (mm):	13	
2	6.1602.145	**Drying flask cover**	
	Screw cap with GL45 thread for 6.1608.050 drying bottle.		
2	6.1608.050	**Drying bottle / 100 mL / GL 45**	
	Material:	Clear glass	
	Height (mm):	100	
	Outer diameter (mm):	56	
	Volume (mL):	100	
2	6.1805.010	**FEP tubing / M6 / 13 cm**	
	With light and kink protection.		
	Material:	FEP	
	Inner diameter (mm):	2	
	Length (mm):	130	

Qty.	Order no.	Description
1	**6.1805.050**	**FEP tubing / M6 / 18 cm**

With light and kink protection

Material:	FEP
Inner diameter (mm):	2
Length (mm):	180

Qty.	Order no.	Description
1	**6.1805.470**	**FEP tubing / M6 / 44 cm**

With light and kink protection

Material:	FEP
Inner diameter (mm):	2
Length (mm):	440

Qty.	Order no.	Description
1	**6.1808.040**	**Thread adapter M6 outer / M8 inner**

Outer thread M6, inner thread M8.

Material:	PTCFE

Qty.	Order no.	Description
1	6.1808.050	**Tubing adapter olive / M8 outer**

1 M8 outer thread and 1 tubing olive. E.g. for thermostat jacket of exchange units and stability measuring instruments.

Material: PVDF
Length (mm): 31.5

Qty.	Order no.	Description
2	6.1821.040	**Filter tube**

Filter tube for 6.1608.050 drying bottle. For Rancimats and Karl Fischer ovens.

Length (mm): 112

Qty.	Order no.	Description
1	6.1830.030	**Heatable outlet tubing**

Heatable outlet tubing for 860 KF Thermoprep.

Qty.	Order no.	Description
1	6.2013.010	**Clamping ring**

For stand rods of 10 mm diameter

Material: Metal
Width (mm): 20
Height (mm): 16

Qty.	Order no.	Description	
1	6.2053.000	**Cable clip** Cable clip for fastening cables and tubes	
1	6.2063.020	**Sample holder** Sample holder for 6 mL sample vials (6.2419.000), for 874	
1	6.2151.000	**Cable USB A – Mini-DIN 8 pins** Controller cable Length (m): 1.8	
1	6.2621.100	**Hexagon key 3 mm** Hexagon key 3 mm for IC Sample Processors Length (mm): 73	
1	6.2621.130	**Hexagon key 2 mm** 2 mm.	

Qty.	Order no.	Description	
1	6.2621.140	**Hexagon key 2.5 mm**	
1	6.2627.010	**Oven insert** Used with 874 USB Oven Sample Processor	
1	6.2724.010	**Dust filter** Dust filter for Rancimats and Karl Fischer ovens. Outer diameter (mm): 44 Length (mm): 53	
1	6.2739.000	**Wrench** For tightening connectors Length (mm): 68	

Qty.	Order no.	Description	
1	6.2751.140	**Splash protection** Splash protection for 874 USB Oven Sample Processor, made of PMMA	
1	6.2811.000	**Molecular sieve** Molecular sieve. Bottle containing 250 g. Pore size: 0.3 nm. Without moisture indicator. For Rancimats and Karl Fischer instruments.	
1	6.2816.070	**Injection needle** Used with 832 KF Thermoprep. Material: Stainless steel (AISI 304)	

Qty.	Order no.	Description
1	6.2816.080	**Outlet needle** Used with KF Thermoprep and Oven Sample Processor. Material: Stainless steel (AISI 304)
1	6.6056.202	**tiamo 2.0 Full** Program for controlling complex titration systems. - Graphical method editor with numerous templates - Layout Manager for display adjustment - Professional database with recalculation - Export to LIMS, NuGenesis, Cyberlab etc. - Powerful report generator - Complies with FDA 21 CFR Part 11.
1	6.2122.0x0	**Mains cable with C13 line socket IEC-60320-C13** Cable plug according to customer requirements. Switzerland: Type SEV 12 6.2122.020 Germany, …: Type CEE(7), VII 6.2122.040 USA, …: Type NEMA/ASA 6.2122.070
1	8.874.8002EN	**874 Oven Sample Processor Manual**

10.3 Optional accessories

Order no.	Description
2.756.0110	**756 KF Coulometer including diaphragmless generator electrode** KF Coulometer with titration cell without diaphragm and integrated printer for water determination right down to trace levels. The 756 KF Coulometer has established itself for the determination of very small amounts of water. Thanks to its reliability, backlit graphical display, multilingual dialog and easy operation, the 756 KF Coulometer has become standard equipment in many laboratories.

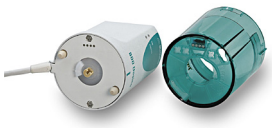
Order no.	Description

The clear display provides information about the relevant titration parameters and gives an unmistakable presentation of the course of titration in the form of a curve showing µg water against time. Recommended measuring range: 10 µg...200 mg absolute water

Dimensions in mm (W/H/D): 145/ 194/ 307

2.800.0010 800 Dosino

Drive with write/read hardware for intelligent dosing units. With fixed cable.



2.801.0010 801 Stirrer

Magnetic stirrer without stand for use with Titrino plus, Titrandos, Sample Processors, 805 Dosimats and 780/781 pH Meters. With permanently attached cable for MSB (Metrohm Serial Bus).

2.831.0110 831 KF Coulometer incl. diaphragmless generator electrode

Economical KF Coulometer with diaphragmless titration cell for water determination right down to trace levels. The KF Coulometer has established itself for the determination of very small amounts of water. Thanks to its reliability, backlit graphical display, multilingual dialog and easy operation, the 756 KF Coulometer has become standard equipment in many laboratories. The clear display provides information about the relevant titration parameters and gives an unmistakable presentation of the course of titration in the form of a curve showing µg water against time. Recommended measuring range: 10 µg...200 mg absolute water

Dimensions in mm (W/H/D): 145/ 169/ 307

2.841.0010 841 Titrando

The Karl Fischer Titrando for the modern titration laboratory. In addition to the Karl Fischer mode (KFT), this high-end titrator also includes the SET mode, which means that titrations can be carried out to a predefined endpoint. The high-resolution, galvanically separated measuring interface means that it is also possible to make high-precision pH measurements. Thanks to its four MSB connections up to four 800 Dosino dosing systems can be connected to the 841 Titrando. These can be used for titration as well as for the automated addition of sample, standard and auxiliary solutions such as solubility promoters. All liquid handling commands are also available, which means that the aspiration of used reagent and the addition of fresh solvent can be automated.

Order no.	Description
	Dimensions in mm (W/H/D): 142/ 227/ 231

6.2041.730 Sample rack 25 x 2-30 mL, for 874 USB Oven Sample Processor

Sample rack with 25 positions. Can be adapted to sample vials (diameter: 16 to 32.9 mm).

Hole diameter (mm): 33

6.1448.050 Aluminum septum caps / 1000 pieces

Including Al sealing.

Material: Aluminum
Material 2: Silicone
Height (mm): 7.4
Outer diameter (mm): 20.7

6.2419.000 Sample vial 6 mL / 1000 pieces

For 6.1448.050 septum caps.

Height (mm): 38
Outer diameter (mm): 22
Volume (mL): 6

6.3032.120 Dosing Unit 2 mL

Dosing unit with integrated data chip with 2 mL glass cylinder and light protection, mountable on reagent bottle with ISO/DIN GL45 glass thread. FEP tubing connection, antidiffusion buret tip.

Volume (mL): 2

6.3032.150 Dosing Unit 5 mL

Dosing unit with integrated data chip with 5 mL glass cylinder and light protection, mountable on reagent bottle with ISO/DIN GL45 thread. FEP tubing connection, antidiffusion buret tip.

Volume (mL): 5

6.3032.210 Dosing Unit 10 mL

Dosing unit with integrated data chip with 10 mL glass cylinder and light protection, mountable on reagent bottle with ISO/DIN GL45 thread. FEP tubing connection, antidiffusion buret tip.

Volume (mL): 10

Order no.	Description
6.3032.220	**Dosing Unit 20 mL** Dosing unit with integrated data chip with 20 mL glass cylinder and light protection, mountable on reagent bottle with ISO/DIN GL45 thread. FEP tubing connection, antidiffusion buret tip. Volume (mL): 20
6.3032.250	**Dosing unit 50 mL** Dosing unit with integrated data chip with 50 mL glass cylinder and light protection, mountable on reagent bottle with ISO/DIN GL45 thread. FEP tubing connection, antidiffusion buret tip. Volume (mL): 50
6.5618.000	**Measuring equipment for checking the temperature** Measuring equipment for checking the temperature of 774/874 Oven Sample Processor, 832/860 Thermoprep.

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