863 Compact Autosampler

Manual

8.863.8003EN

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

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

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1 Introduction

1.1 Instrument description

The 863 Compact Autosampler is an autosampler for ion chromatography or voltammetry with a wide variety of applications. It can be used both as a central control instrument in a stand-alone automation system or as an integrated sample changer in a PC-controlled automation system.

1.1.1 Instrument versions

The 863 Compact Autosampler is available in two versions with different accessories.

863 Compact IC Autosampler (2.863.0010)

With accessories for ion chromatography.

863 Compact VA Autosampler (2.863.0020)

With accessories for voltammetry.

1.1.2 Instrument components

The 863 Compact Autosampler has the following components:

- **Turntable**
  Permanently mounted sample rack with 36 positions for sample tubes.
- **Lift with lift head**
  With needle holder for PEEK needles.
- **1-channel peristaltic pump**
  For the transport of sample solutions.
- **USB (OTG) connector**
  For connection to a computer, to a printer or to a USB stick (for system backup or method export).
- **Remote connector**
  For connecting instruments with a remote connector.

1.1.3 PC-controlled operation

If the 863 Compact Autosampler is controlled by means of a USB connection using the PC software **MagIC Net**, then arbitrary automation sequences can be programmed. This allows optimal utilization of the instrument components. The software can trigger the instrument components directly and use them more flexibly.

1.1.4 Stand-alone operation

The 863 Compact Autosampler can be used as the central control instrument in an automation system which can include various ion chromatography instruments or the 797 VA Computrace. The 863 Compact Autosampler thereby plays the part of the reliable sample changer.

The given method sequences can be parameterized individually and saved as sample-specific methods. Methods can be exported on an USB memory stick and then copied onto another instrument quickly and easily.

1.1.5 Intended use

The 863 Compact Autosampler is designed for usage as an automation system in analytical laboratories. It is **not** suitable for usage in biochemical, biological or medical environments in its basic equipment version.

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 Symbols and conventions

The following symbols and styles are used in this documentation:

*(5-**12**)*	**Cross-reference to figure legend** The first number refers to the figure number, the second to the instrument part in the figure.
1	**Instruction step** Carry out these steps in the sequence shown.
Method	**Dialog text**, **parameter** in the software
File ▸ New	Menu or menu item
[Next]	**Button** or **key**
	**Warning** This symbol draws attention to a possible life hazard or risk of injury.

	**Warning** This symbol draws attention to a possible hazard due to electrical current.
	**Warning** This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	**Warning** This symbol draws attention to a possible biological hazard.
	**Caution** This symbol draws attention to a possible damage of instruments or instrument parts.
	**Note** This symbol marks additional information and tips.

1.3 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 863 Compact Autosampler. 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 863 Compact Autosampler 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 863 Compact Autosampler 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.

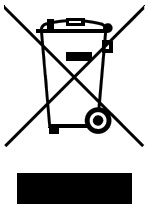
1.3.5 Flammable solvents and chemicals

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

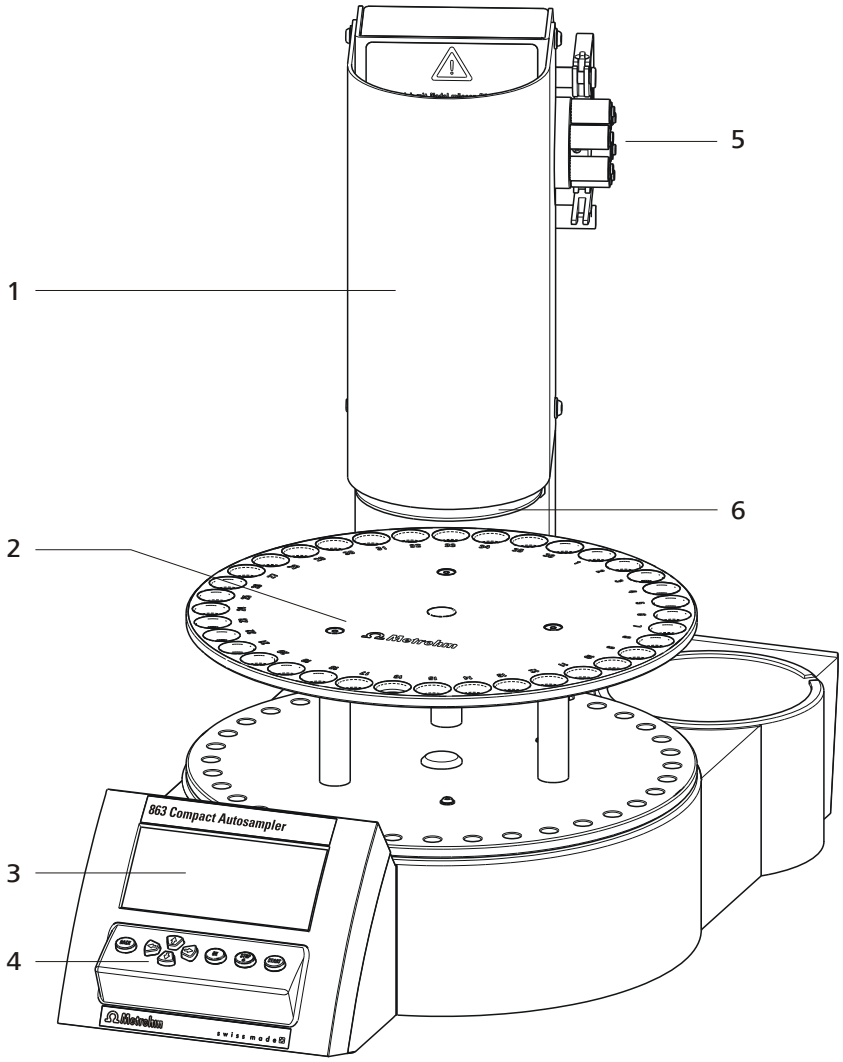


Figure 1 Front 863 Compact Autosampler

1	**Safety shield**	**2**	**Sample rack** For 36 sample tubes
3	**Display**	**4**	**Keypad**
5	**Peristaltic pump**	**6**	**Retaining plate**

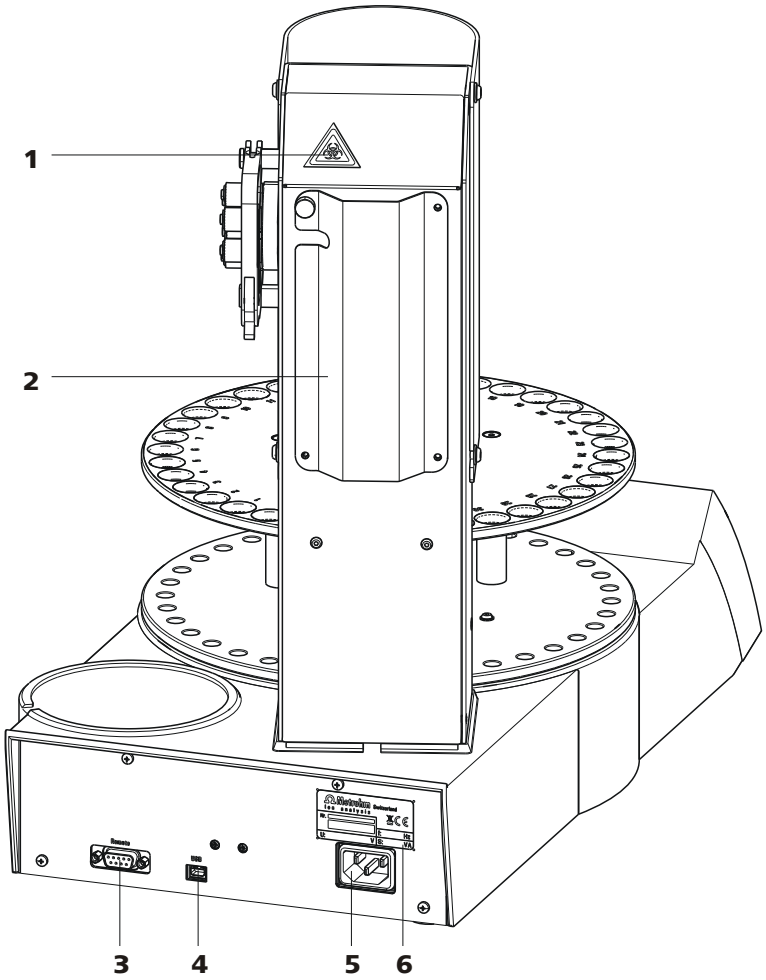


Figure 2 Rear 863 Compact Autosampler

1 **Warning symbol** *(see Chapter 1.3.4, page 5)*	**2** **Tubing and cable cover**
3 **Remote connector** For connecting instruments with a remote interface. D-Sub, 9-pin.	**4** **USB (OTG) connector** For connecting computers, printers, USB sticks, USB hubs, etc.
5 **Mains connection socket**	**6** **Type plate** Contains specifications concerning mains voltage and serial number.

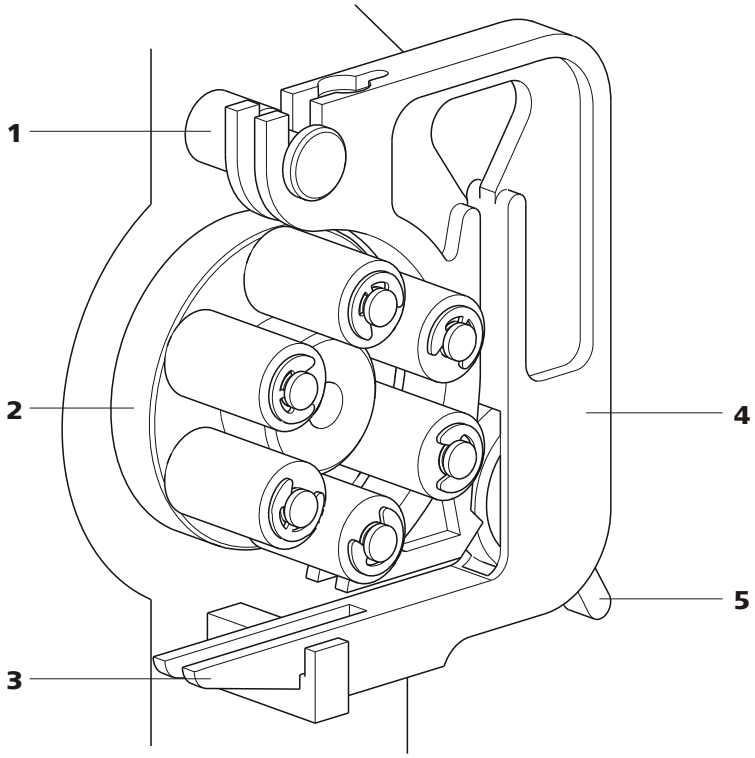


Figure 3 Peristaltic pump

1 **Mounting pin** For engaging the tubing cartridge	**2** **Pump drive** Roller head with contact pressure rollers
3 **Snap-action lever** For releasing the tubing cartridge	**4** **Tubing cartridge 6.2755.000** For 6.1826.xx0 pump tubings
5 **Contact pressure lever** For regulating contact pressure	

Warning

Never attempt to carry out manipulations on the tubing cartridge or on the pump drive while the instrument is running. **There is a considerable risk of injury.**

The pump tubing may not be replaced unless the instrument is switched off.

Switch off the instrument immediately if the roller drive becomes blocked. Only then should you attempt to eliminate the problem.

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 the mains cable

Warning

This instrument may only be used with the mains voltage specified (see rear of the instrument).

Protect the connection sockets against moisture.

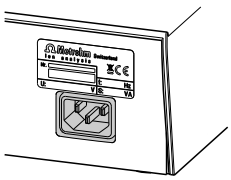


Figure 4 Connecting the mains cable

3.3 Connecting a computer

The 863 Compact Autosampler requires a USB connection to a computer in order to be able to be controlled by the PC software **MagIC Net** (version 1.1 or newer). With a 6.2151.110 USB connection cable (Mini-USB OTG/USB A), the instrument can be connected either directly to a USB socket on a computer, to an attached USB hub or to another suitable Metrohm instrument (e.g. 850 Professional IC, 881 Compact IC pro, 882 Compact IC plus or 883 Basic IC plus).

Note

If the 863 Compact Autosampler is not to be controlled by **MagIC Net**, then no direct connection to a PC is required. In such cases, the instrument is used in so-called stand-alone mode and is connected via remote cable to a corresponding control instrument.

Cable connection and driver installation

A driver installation is required in order to ensure that the 863 Compact Autosampler is recognized by **MagIC Net**. To accomplish this, you must comply with the procedures specified. The following steps are necessary:

1 Install the software

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

2 Establish the cable connections

- Connect the instrument to the mains supply if you have not already done this.
- Connect the instrument to a USB connector (Type A) of your computer (see manual of your computer). The 6.2151.110 cable is used for this purpose.

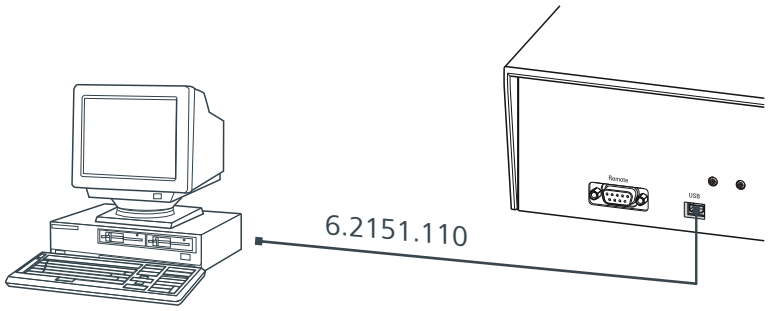


Figure 5 Connecting the computer

The instrument is recognized. The now following driver installation varies, depending on the version of the Windows operating system used.

- Either the required driver is installed automatically, or an installation assistant is started.

3 Follow the instructions of the installation assistant.

If problems should occur during installation, contact your company's IT supporter.

Registering and configuring the instrument in MagIC Net

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

1 Set up the instrument

- Start MagIC Net.
  The instrument is automatically recognized. 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 instrument can be found in the documentation for the respective PC software.

3.4 Setting up the needle holder

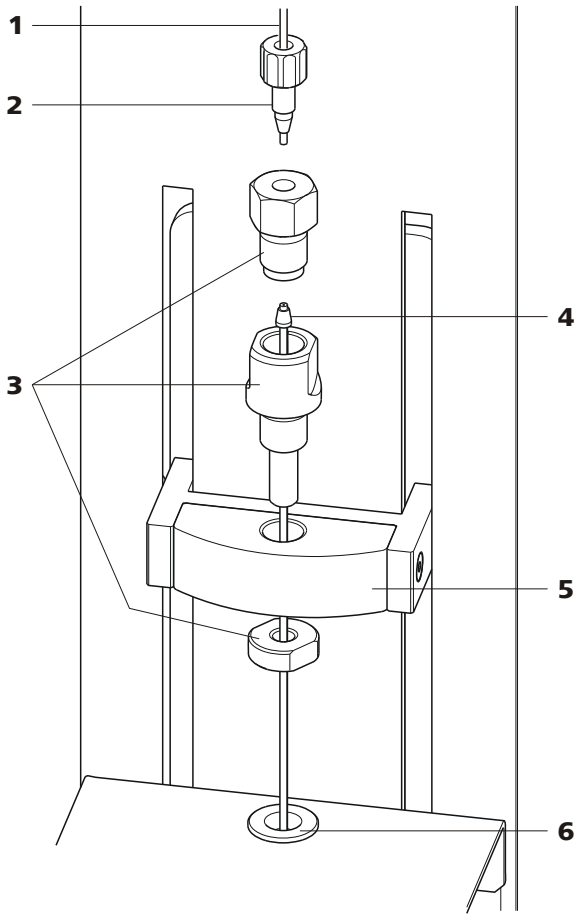


Figure 6 Installing the needle

1	**PEEK capillary** 6.1831.050 (40 cm) or 6.1831.060 (100 cm)	**2**	**PEEK pressure screw (6.2744.070)**
3	**Needle holder (6.2833.030)** Comprising pressure screw, needle guide and nut	**4**	**Sample aspiration needle (6.2846.000)** With PEEK ring wedge, outer diameter 1/8"
5	**Lift** With lift head	**6**	**Centering aid**

This is how you mount needle and capillary:

1 Open the safety shield

Loosen the lower two fastening screws of the safety shield using the hexagon key provided, and tip up the safety shield.

2 Remove the nut

Loosen and remove the nut screwed onto the needle holder.

3 Insert the needle holder

Insert the needle holder in the lift head and screw it tight with the nut from below.

4 Insert the needle

- Loosen the pressure screw from the needle holder and remove it.
- Insert the needle part way from above into the opening of the needle holder.
- Slide the PEEK ring wedge down over the needle from above. The narrow side of the seal must face upwards.

5 Fasten the needle

- Screw the pressure screw into the needle holder from above. At the same time push the needle slightly upward from below to apply a little pressure.
- Tighten the pressure screw firmly.

6 Connect the capillary

- Slide a 6.2744.010 PEEK pressure screw over the end of the capillary.
- Manually screw tight the PEEK pressure screw with the capillary in the pressure screw resting on the needle holder. The capillary must be pressed tight while doing so.

7 Close the safety shield

Tip down the safety shield and fix it with the fastening screws.

Warning

The safety shield must always be closed for safety reasons during operation of the 863 Compact Autosampler.

3.5 Installing the peristaltic pump

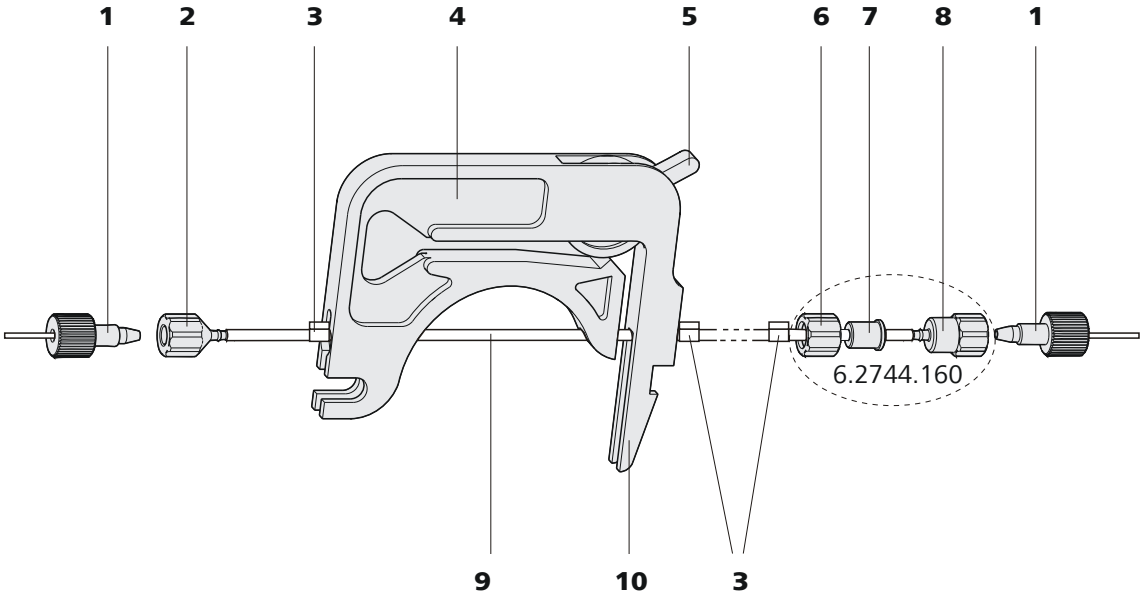


Figure 7 Installing the pump tubing

1	**PEEK pressure screws, short (6.2744.070)**	**2**	**Tubing olive (6.2744.034)**
3	**Stopper** The colors of the stopper indicate the inner diameter of the pump tubing.	**4**	**Tubing cartridge (6.2755.000)**
5	**Contact pressure lever**	**6**	**Union nut**
7	**Adapter**	**8**	**Tubing olive**
9	**Pump tubing (6.1826.xx0)**	**10**	**Snap-action lever**

Mount the pump tubing as follows:

1 Removing the tubing cartridge

Release the tubing cartridge from the cartridge holder by pressing the snap-action lever and unhooking from the mounting pins *(see Figure 3, page 9)*.

2 Connecting the aspiration side

Place a 6.2744.034 tubing olive *(7-**2**)* on the aspiration side of the pump tubing.

Note

For the voltammetry, we recommend connecting the aspiration side the same way as the pressure side, see following section. The necessary second set of the 6.2744.160 pump tubing connection is enclosed.

3 Connecting the pressure side

- Slide the union nut *(7-**6**)* of the 6.2744.160 pump tubing connection (without filter) onto the pump tubing.
- Select a suitable adapter *(7-**7**)* and slide it onto the pump tubing. The type of adapter depends on the pump tubing *(see Table 1, page 17)*.
- Place the tubing olive *(7-**8**)* onto the pump tubing.
- Screw the union nut *(7-**6**)* tight on the tubing olive *(7-**8**)*.

4 Inserting the pump tubing

- Press the contact pressure lever all the way down.
- Place the pump tubing in the tubing cartridge. The stoppers *(7-**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.

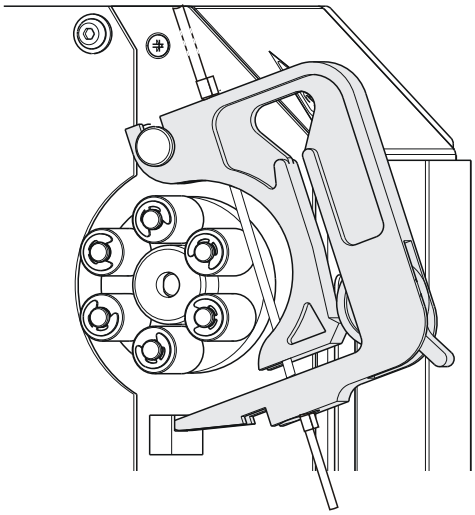


Figure 8 Inserting the tubing cartridge

6 **Connecting the capillaries**

- Screw the respective capillaries tightly to the two tubing olives with PEEK pressure screws *(7-**1**)*.

Table 1 Pump tubings and suitable adapters

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

Set flow rate

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

Set the contact pressure

1

- Fully loosen the contact pressure lever *(7-**5**)*, i.e. press it all the way down.
- Switch on the peristaltic pump.
- Raise the contact pressure lever one step at a time until liquid flows.
- When liquid starts flowing, raise the contact pressure lever by an additional 2 ratchet increments.

The contact pressure is now set optimally.

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

Note

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

3.6 Tubing and capillary connections

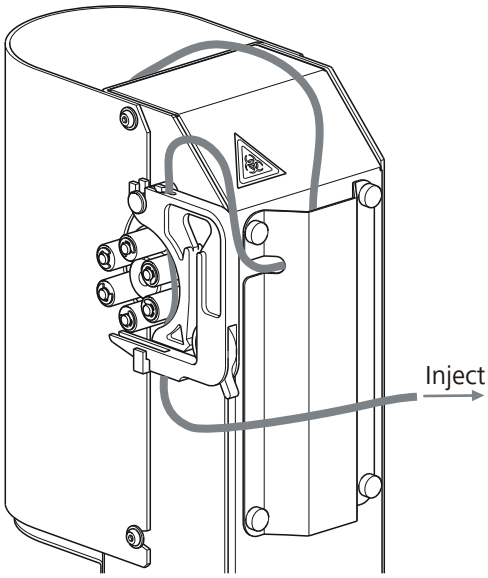


Figure 9 Tubing guide

In order to lay the tubing and capillaries neatly, you can insert them into the tubing cover on the rear side of the tower. The above illustration shows one of the possible variants. The tubing cover can be removed by loosening the four red knurled screws.

3.7 Connecting a keyboard, printer and other USB devices

The 863 Compact Autosampler has a USB (OTG) connector. Use the provided 6.2151.100 adapter USB MINI (OTG) - USB A for connecting USB devices as e.g. printers, keyboards or USB sticks, see the following figure.

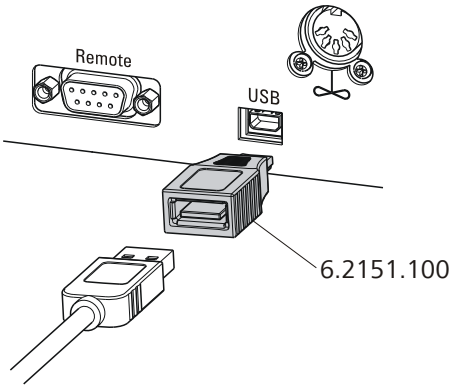


Figure 10 Connecting USB devices

Caution

Switch the instrument off before connecting or disconnecting a USB device or a USB stick.

The 863 Compact Autosampler can only recognize the device immediately after switching on.

The following devices can be operated **directly on the USB connector with the 6.2151.100 adapter**:

- USB sticks (for the backup or storing of methods)
- 6.2147.000 numerical USB keypad
- USB hub (with or without an own power supply)

The **6.2147.000 numerical USB keypad** serves for comfortable numerical input and for navigating in the dialog. In addition, it provides two USB connectors. Connect additional USB devices to the keypad.

Note

Most of the USB devices need a so-called hub in order to work correctly.

A USB hub is a distributor to which several USB devices can be connected. USB hubs are available in specialty stores in a number of different models.

The USB (OTG) connector of the 863 Compact Autosampler has no such hub. The 6.2147.000 numerical USB keypad has a USB hub and two USB connectors.

The following devices can **only be connected to a 6.2147.000 numerical keypad or to a USB hub**:

- Printer (with USB connector, use the 6.2151.020 connecting cable)

- Barcode reader (with USB cable)
- Mouse (PC mouse with USB cable, for navigating in the dialog)

The following devices can **only be connected to a USB hub**:

- PC keyboard (with USB cable, for the comfortable input of letters and numbers)
- Keypad with numerical keypad (with USB cable)

If you wish to connect **several different instruments without own power supply**, then you must possibly use a USB hub with own power supply (*self powered*). The USB (OTG) connector of the 863 Compact Autosampler is not designed for supplying power to several devices with elevated electricity requirements.

Examples:

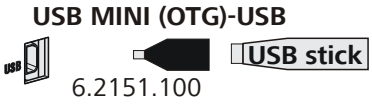


Figure 11 Connecting the USB stick

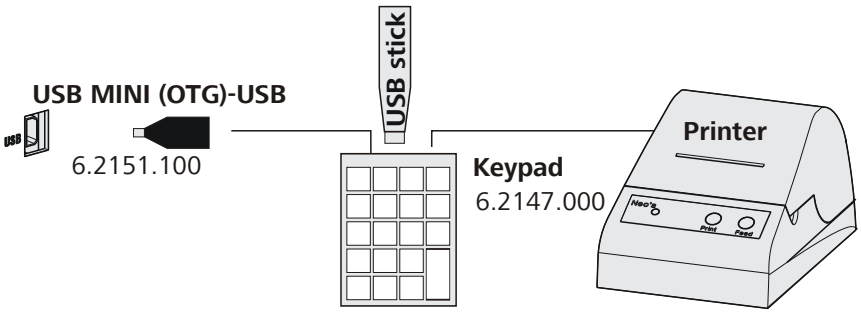


Figure 12 Connecting the 6.2147.000 USB keyboard with USB stick and printer

3.8 Remote connections

The 863 Compact Autosampler can be used as a control device for a simple automation system with a large variety of different instruments. Even older Metrohm instruments can thus be integrated into an automated analysis system.

3.8.1 Connecting IC instruments

The following illustration shows, as an example, the connection of an 861 Compact IC. In addition, the following IC instruments can be connected with the 6.2141.270 remote cable: 732 IC Detector, 761 Compact IC, 790 Personal IC, 819 IC Detector und 844 UV/VIS Compact IC.

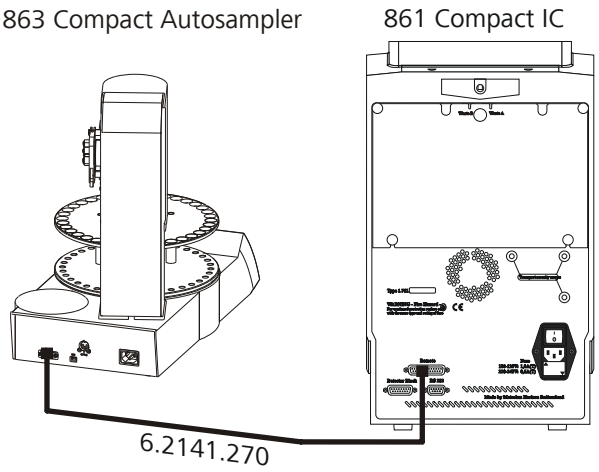


Figure 13 Remote connection 863 Compact Autosampler - 861 Compact IC

3.8.2 Connecting a 797 VA Computrace

An 843 Pump Station is also required for operation with a 797 VA Computrace.

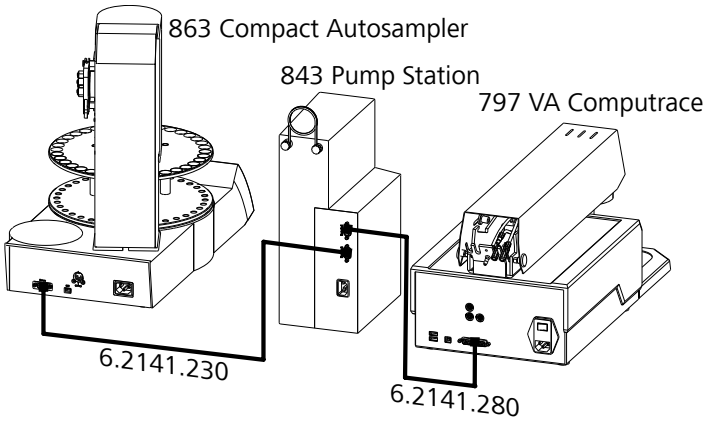


Figure 14 Remote connection 863 Compact Autosampler - 843 Pump Station - 797 VA Computrace

The 863 Compact Autosampler is connected with a 6.2141.230 cable to the **Remote 2** connector of the 843 Pump Station. **Remote 1** is connected to the 797 VA Computrace with the aid of a 6.2141.280 cable.

The pumps of the 843 Pump Station are activated by the 797 VA Computrace.

4 Automation sequences

Note

The following method sequences and parameters can only be used if the 863 Compact Autosampler is **not** controlled by a PC software (e.g. MagIC Net) via USB connection.

4.1 Sample with air gap

This method template is suitable for simple determinations.

An air gap is formed in the transfer tubing between the individual samples.

Preparing and starting the sample series

1. Press **[START]**.
2. Under **Number of samples**, enter the number of samples or the maximum value of **99**.
3. Under **Next sample pos.**, enter the rack position of the first sample to be processed.
4. Press **[BACK]**.
5. Start the sample series in the **IC Net** software.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the end of the method run. The 863 Compact Autosampler must be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Move to the sample

- Lower the lift to the work position
- Switch on the peristaltic pump for the sample transfer
- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Move the lift upward
- Switch on the peristaltic pump
- Wait for the waiting time for air gap to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse

4.2 Sample no air gap

This method template is suitable for simple determinations.

No air gap is formed in the transfer tubing between the individual samples.

Preparing and starting the sample series

1. Press **[START]**.
2. Under **Number of samples**, enter the number of samples or the maximum value of **99**.
3. Under **Next sample pos.**, enter the rack position of the first sample to be processed.
4. Press **[BACK]**.
5. Start the sample series in the **IC Net** software.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the end of the method run. The 863 Compact Autosampler must be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Move to the sample
- Lower the lift to the work position
- Switch on the peristaltic pump for the sample transfer

- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse

4.3 Double injection

This method template enables two sample transfers of the same sample.

No air gap is formed in the transfer tubing between the individual samples.

Preparing and starting the sample series

1 Press **[START]**.

2 Under **Number of samples**, enter the number of samples or the maximum value of **99**.

3 Under **Next sample pos.**, enter the rack position of the first sample to be processed.

4 Press **[BACK]**.

5 Start the sample series in the **IC Net** software.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the end of the method run. The 863 Compact Autosampler must be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Move to the sample
- Lower the lift to the work position
- Switch on the peristaltic pump for the first sample transfer
- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse
- Switch on the peristaltic pump for the second sample transfer
- Wait for the pump time to be completed
- Switch off the peristaltic pump

- Wait for the stepping pulse

4.4 Triple injection

This method template enables three sample transfers of the same sample.

No air gap is formed in the transfer tubing between the individual samples.

Preparing and starting the sample series

1. Press **[START]**.
2. Under **Number of samples**, enter the number of samples or the maximum value of **99**.
3. Under **Next sample pos.**, enter the rack position of the first sample to be processed.
4. Press **[BACK]**.
5. Start the sample series in the **IC Net** software.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the end of the method run. The 863 Compact Autosampler must be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Move to the sample
- Lower the lift to the work position
- Switch on the peristaltic pump for the first sample transfer
- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse
- Switch on the peristaltic pump for the second sample transfer
- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse
- Switch on the peristaltic pump for the third sample transfer

- Wait for the pump time to be completed
- Switch off the peristaltic pump
- Wait for the stepping pulse

4.5 VA 797 Remote start

This method template is suitable for sample transfer to a 797 VA Computrace. The actual pump time is determined by the control software.

The sample series is started on the 797 VA Computrace (Remote Start).

Preparing and starting the sample series

1. Press **[START]**.
2. Under **Number of samples**, enter the number of samples or the maximum value of **99**.
3. Under **Next sample pos.**, enter the rack position of the first sample to be processed.
4. Press **[BACK]**.
5. Start the sample series in the **VA Computrace** software.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the end of the method run. The 863 Compact Autosampler must be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Move to the sample
- Lower the lift to the work position
- Wait for the stepping pulse
- Switch on the peristaltic pump for the sample transfer
- Wait for the minimum pump time to be completed
- Wait for the stepping pulse
- Switch off the peristaltic pump
- 2 seconds waiting time
- Wait for the stepping pulse

4.6 VA 797 Manual start

This method template is suitable for sample transfer to a 797 VA Computrace. The actual pump time is determined by the control software.

Preparing and starting the sample series

1. Press **[START]**.
2. Under **Number of samples**, enter the number of samples or the maximum value of **99**.
3. Under **Next sample pos.**, enter the rack position of the first sample to be processed.
4. Press **[START]**.

Note

The method run will be automatically restarted for every sample via remote connection (Autostart). A stepping pulse of the connected instrument is expected at the beginning of the method run. The 863 Compact Autosampler may need to be stopped manually by means of the button **[STOP]** after the processing of the last sample.

The individual steps of the method:

- Wait for the stepping pulse
- Move to the sample
- Lower the lift to the work position
- Wait for the stepping pulse
- Switch on the peristaltic pump for the sample transfer
- Wait for the minimum pump time to be completed
- Wait for the stepping pulse
- Switch off the peristaltic pump

5 Operation

5.1 Switching the instrument on and off

Switching on the instrument

Proceed as follows:

1 ▪ Press the red **[STOP]** key.
The instrument is initialized and a system test performed. This process takes some time.

The main dialog is displayed:

```
>Menu                          ready
 Method     Sample with air gap

 Rack position                   32
 Lift position                shift
 Pump          off          Rate  3
 Current sample             0 of 99
```

Switching off the instrument

The instrument is switched off with the **[STOP]** key. The fact that the key needs to be pressed down for an extended time prevents accidental switch off.

Proceed as follows:

1 ▪ Keep the red **[STOP]** key pressed down for at least 3 s.

A progress bar is displayed. If the key is released during this time, then the instrument will not be switched off.

5.2 Fundamentals of operation

5.2.1 The keypad

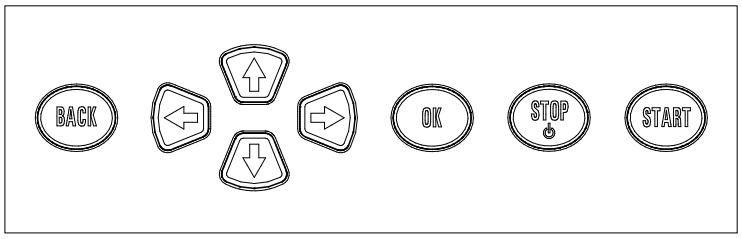
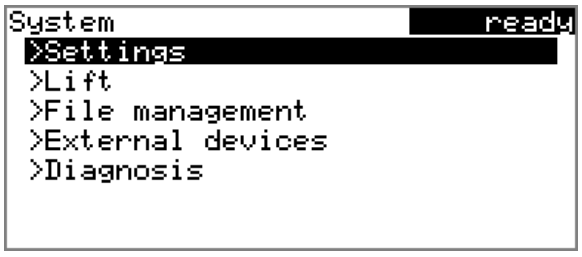


Figure 15 Keypad 863 Compact Autosampler

BACK	Apply the input and exit the dialog.
⇧ ⇩	Move the selection bar either up or down by one line at a time. Select the character to be entered in the text editor.
⇦ ⇨	Select the character to be entered in the text and number editor. Select the individual functions in the function bar.
OK	Confirm the selection.
STOP	Stop an ongoing method run or a manual function. Switch the instrument on/off.
START	Start a method run.

5.2.2 Structure of the dialog windows



The current dialog title is displayed on the left-hand side of the title line. The current status of the system is displayed in the upper right-hand corner:

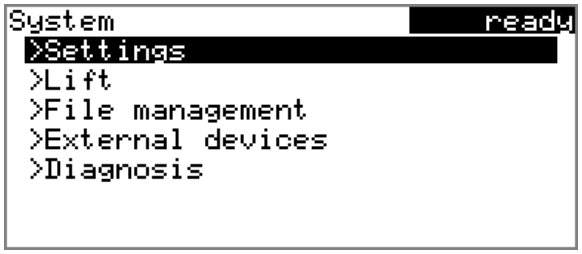
ready	The instrument is in normal status.
busy	A method has been started.
hold	A method has been paused.

Some dialogs have a so-called function bar on the bottom line. The functions contained therein can be selected with the arrow keys **[⇦]** or **[⇨]** and executed with **[OK]**.

5.2.3 Navigating in the dialog

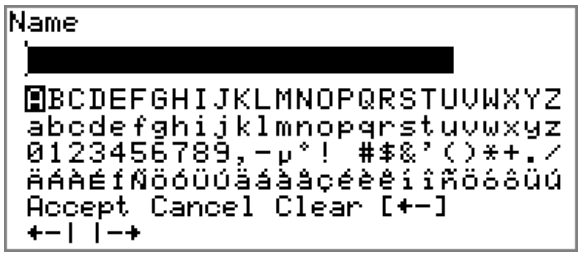
The selection bar is displayed in inverted style. Use the arrow keys **[⇧]** and **[⇩]** to move the selection bar upward or downward one line at a time. If a dialog text is marked with " **>** ", then additional settings are available in a subordinate dialog. Use **[OK]** to access this dialog.

Example: System settings



Use the **[BACK]** key to return to the next higher level.

5.2.4 Entering text and numbers



In the editing dialog for text or numerical input you can select the individual characters with the arrow keys. Use **[OK]** to apply the character in the input field. The following functions are available:

Editing function	Description
Accept	The modification is applied and the editing dialog is exited.
Cancel	The editing dialog is exited without applying the modification.
Clear	The content of the input field is deleted completely.

Editing function	Description
[←–]	The character left of the cursor is deleted (back-space).
←–|	Text editor only The cursor within the input field is shifted to the left by one character each time that **[OK]** is pressed.
|–→	Text editor only The cursor within the input field is shifted to the right by one character each time that **[OK]** is pressed.
[BACK]	The modification is applied and the editing dialog is exited.

The **[BACK]** key has the same function as **Accept**.

5.3 Methods

The 863 Compact Autosampler works with process methods that are based on specified method templates. Individual working steps of a method run can be individually parameterized, depending on the application. An optimized method run can be saved as a reusable method.

5.3.1 Method templates

The 863 Compact Autosampler contains method templates which are already configured except for a few parameters.

The following method templates can be selected:

Sample with air gap Sample transfer for IC with air gap between the samples.

Sample no air gap Sample transfer for IC without air gap between the samples.

Double injection Two-time sample transfer for IC without air gap between the transfers.

Triple injection Three-time sample transfer for IC without air gap between the transfers.

VA 797 Remote start Sample transfer for VA applications with remote start of the 863 Compact Autosampler by the 797 Computrace.

VA 797 Manual start Sample transfer for VA applications with manual start of the 863 Compact Autosampler.

You will find a detailed description of the methods in chapter *4 Automation sequences, page 23ff*.

5.3.2 Creating a new method

Proceed as follows to create a new method:

1 Open the method table

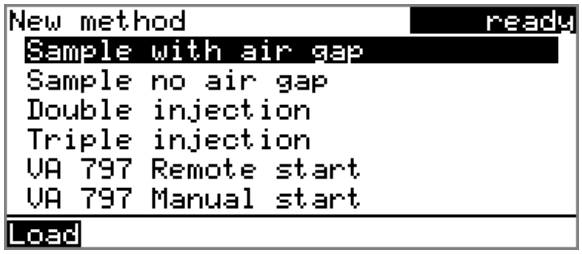
- In the main dialog, select **Method** and press **[OK]**.

The method table opens:

2 Select the method template

- In the function bar, select **New** and press **[OK]**.

The list of method templates opens:



3 Load the method template

- Select the desired template and press **[OK]**.

The method template is now loaded and is displayed in the main dialog under **Method**.

If a new method has been created, then the individual parameters can be modified under **Menu ▸ Parameters**.

5.3.3 Saving a method

If you modify method parameters, then you can save these as your own method. A maximum of 100 methods can be saved.

To save a method, proceed as follows:

1 Open the method table

- In the main dialog, select **Method** and press **[OK]**.

The method table opens:

2 Modify/apply the method name

- In the function bar, select **Store** and press **[OK]**.
  A method name will be suggested for new methods. If the method has already been saved once, then the method name will be displayed:

Apply the name:

- Press **[BACK]**.

The method will be saved and the method table is displayed.

Enter a new name:

- Press **[OK]**.
  The text editor opens.
- Enter a method name (max. 12 characters) and apply with **Accept** or **[BACK]**.
- Press **[BACK]**.

The method will be saved and the method table is displayed.

5.3.4 Loading a method

To load a method, proceed as follows:

1 Open the method table

- In the main dialog, select **Method** and press **[OK]**.

The method table with the stored methods opens:

2 Select a method

- Select the desired method.

3 Load the method

- In the function bar, select **Load** and press **[OK]**.

The method is now loaded and is displayed in the main dialog under **Method**.

5.3.5 Exporting a method

The methods can be exported on a connected USB stick.

Note

This function is possible only if a USB stick is connected as an external storage medium.

To export a method, proceed as follows:

1 Open the method table

- In the main dialog, select **Method** and press **[OK]**.

The method table with the stored methods opens:

2 Select a method

- Select the desired method.

3 Export the method

- In the function bar, select **Export** and press **[OK]**.

The method is being exported. The directory structure on the USB stick is listed in *chapter 6.2, page 47*.

5.4 Performing a sample series

Samples can be placed anywhere on the rack. They are processed according to ascending rack position.

If the 863 Compact Autosampler is used together with the 797 Computrace, each vessel with sample has to be followed by one with ultrapure water.

Note

The following descriptions are only of significance if the 863 Compact Autosampler is operated in stand-alone operation, i.e. not controlled by a PC via a USB connection.

5.4.1 Starting the sample series

Starting a sample series

A suitable method must be loaded before a sample series is started *(see Chapter 5.3.4, page 35)*. The necessary parameters) can then be modified.

1 Define the sample series

Press the **[START]** key.

You can now enter the quantity and the first rack position of the samples to be processed.

2 Enter the number of samples

- Select **Number of samples** and press **[OK]**.
- Enter the number of samples. If the methods to be started via remote connection are used, the maximum value for the number of samples (99) can be entered here.
- Close the input dialog with **[BACK]** or **Accept**.

3 Enter the rack position of the first sample

- Select **Next sample pos.** and press **[OK]**.
- Enter the starting position of the sample series.
- Close the input dialog with **[BACK]** or **Accept**.

The value for the number of samples remains saved for the next sample series. The position of the first sample is increased with each method run.

You can still cancel the start of the sample series at this time with **[BACK]** or **[STOP]**.

4 Close the sample series dialog

Close the dialog with the **[BACK]** key.

5 Start the sample series

Start the sample series in the PC software (IC-Net or VA Computrace).

The sample changer is started automatically by the remote connection.

Note

When using the method template **VA 797 Manual start**, the method has to be started first at the sample changer in the sample series dialog with the **[START]** key. The sample changer then waits for a stepping pulse of the 797 VA Computrace.

Stopping a sample series

A sample series can be canceled at any time.

1 Press the **[STOP]** key.

The method run is stopped. The sample series cannot be resumed.

5.4.2 Pausing a sample series and continuing

Pausing a sample series

A method run of the 863 Compact Autosampler can be paused and then continued again. The connected instruments are however **not** paused.

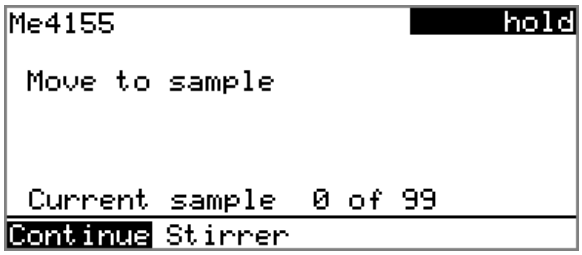
Note

Interruption of the method run is not possible during the execution of commands during which the 863 Compact Autosampler waits for a signal from the connected titrator. This is the case during the conditioning of the titration cell and the execution of the KF titration.

No interruption is possible while the 863 Compact Autosampler waits for a remote signal.

A function bar with the entry "**Hold**" is displayed during the run of a sample series in the so-called "Live" dialog.

1 Press the **[OK]** key.



The method run is paused. However, currently running movements of the sample rack or the lift will be finished.

Instead of the "**Hold**" function, "**Continue**" is displayed in the function bar.

Continuing sample series

If a method run is paused, then the "**Hold**" status is displayed in the title bar, see previous figure. The sequence can be continued with the "**Continue**" function.

In the "**Hold**" status, a method run can be stopped completely, and with it the entire sample series, by pressing the **[STOP]** key.

1 Press the **[OK]** key.

As is also the case at the start of a sample series, a request dialog appears here in which the number of samples to be processed can still be changed. It is thus possible to shorten a sample series or to extend it, without stopping it.

2 Press the **[OK]** key and enter the number of samples that still need to be processed. The current sample must be taken into account.

3 Press the **[START]** key.

The sample series continues.

5.5 Printing a report manually

Menu ▸ Print reports

To print a report manually, proceed as follows:

1 Open the main menu

- In the main dialog, select **Menu** and press **[OK]**.

2 Open the print dialog

- Select the menu item **Print reports** and press **[OK]**.

The dialog window with the available reports opens:

3 Select a report

- Select the desired report and press **[OK]**.

The report is being printed out.

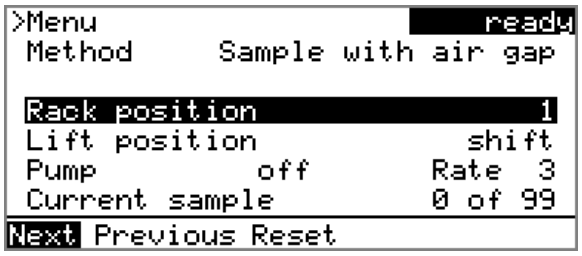
The following reports can be printed out manually:

Parameters	Report with all method parameters of the loaded method.
System	System report with system settings, solution list, external devices, etc.

5.6 Manual control

The manual control of sample rack, lift and peristaltic pump is accomplished directly in the main dialog. If one of the lines **Rack position**, **Lift position** or **Pump** is selected, then a function bar will appear at the lowest line with the selection of available functions.

5.6.1 Rotating the sample rack



If the **Rack position** line is selected, then the arrow keys **[⇨]** and **[⇦]** can be used to select one of the following functions, which can then be run by pressing **[OK]**:

Next — The lift is moved upward and the next-higher rack position is placed in front of the lift.

If the **[OK]** key remains pressed, the rack automatically moves to the next position.

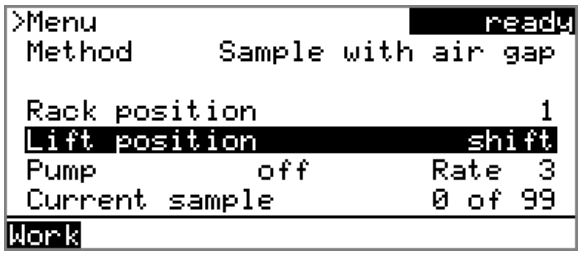
Previous — The lift is moved upward and the next-lower rack position is placed in front of the lift.

If the **[OK]** key remains pressed, the rack automatically moves to the next position.

Reset — The rack is initialized. The lift is moved upward and the sample rack is rotated to the starting position. At the same time, the starting position (**Next sample pos.**) is reset to **1** for the start of the next sample series.

The rack position display is always updated as soon as the rack is in the new position.

5.6.2 Moving the lift



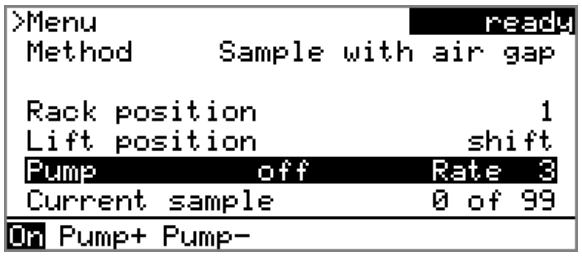
If the **Lift position** line is selected, then the lift can be moved to the position suggested in the function bar by pressing **[OK]**. Only two positions are possible:

Work pos. The working height. It can be set under **Menu ▸ System ▸ Lift** .

Shift pos. The rotating height. The lift moves all the way to the top.

The current lift position is displayed. The respective other possible position is offered in the function bar.

5.6.3 Controlling the peristaltic pump



If the **Pump** line is selected, then the arrow keys **[⇨]** and **[⇦]** can be used to select one of the following functions, which can then be run by pressing **[OK]**:

On Switches on the peristaltic pump if it is switched off.

Off Switches off the peristaltic pump if it is switched on.

Pump+ Increases the rotational speed by one step.

Pump- Reduces the rotational speed by one step.

The status and the rotational speed that has been set are displayed in the main dialog.

Rotational speed and shift direction

Pump+ / Pump-

Setting the rotational speed. It can be set in steps of –7 to +7. The default setting **3** corresponds to approx. 18 U/min.

The shift direction of the roller drive changes as the algebraic sign of the rotational speed changes.

- "'+": clockwise rotation
- "–": counterclockwise rotation

Range	**–7 ... 7**
Default value	**3**

The rotational speed can also be changed when the pump is switched off.

6 System settings

6.1 Basic settings

Menu ▸ System ▸ Settings

This chapter contains a description of general instrument settings.

User name

A user name can be entered here for the report. This parameter will only be printed if a user has been defined.

Input	**max. 12 characters**
Default value	**empty**

Instrument name

An instrument name can be entered here for the report. This parameter will only be printed if a designation has been defined.

Input	**max. 10 characters**
Default value	**empty**

Serial number

Serial number of the instrument. This is printed as a component of the instrument identification in the report header.

Program version

Version number of the instrument software. This is printed as a component of the instrument identification in the report header.

Time

Current time. Only valid numbers can be entered.

Format: hh:mm:ss

Date

Current date. Only valid numbers can be entered.

Format: YYYY:MM:DD

Language

Setting the dialog language. In addition to English one further language can be selected.

Note

A second language must be installed in advance in order to be able to select it here. The installation may only be carried out by competent personnel.

Dialog type

The user dialog can be limited for routine operations. One can operate normally with methods in the limited dialog. However, no settings can be made or methods deleted.

The resetting of the dialog does not take effect until the main menu is exited.

The limitation of the dialog has the following effects:

- The menu items **System** and **Parameters** are not shown in the main menu.
- Methods can only be loaded, but not deleted, exported or created.

Note

If the limited dialog is activated for routine operations, then the expert dialog cannot be switched on during running operations. To change the dialog type, the 863 Compact Autosampler must be switched off and then back on again. The expert dialog can be forced at the time the instrument is started. Then it is possible to enter whatever settings one wishes, e.g. the changing of the dialog type. If the instrument is switched off again without changing the dialog type, then the routine dialog will remain activated.

Forcing the expert dialog:

- Switch on the instrument.
- Wait for the display of the instrument logo with the lettering **easy, safe, precise**.
- Press the **[STOP]** key once again and hold it down while also briefly pressing the **[BACK]** key.
- Release both keys once again.

Selection	**Expert** | **Routine**
Default value	**Expert**

Expert
Complete dialog.

Routine
Limited dialog for routine operations.

Contrast

The contrast of the display can be adjusted with the arrow keys **[⇦]** and **[⇨]**.

- **[⇦]**: the contrast will be decreased by one step each time the key is pressed.
- **[⇨]**: the contrast will be increased by one step each time the key is pressed.

Range	**150 ... 240**
Default value	**212**

Note

Alternatively, the contrast can also be modified in the following manner:

Keep the red **[STOP]** key pressed down. As soon as the progress bar appears, also press the arrow key **[⇩]** or **[⇧]** repeatedly.

This method will however cause the contrast to be modified by several steps.

Beep

If this parameter is activated, then a short beep will be heard in the following cases:

- When a key is pressed.
- At the end of the determination.

Selection	**on** | **off**
Default value	**on**

6.2 File management

Menu ▸ System ▸ File management

Note

This menu item is visible only when a USB stick has been connected as an external storage medium.

Methods can be imported and deleted from a USB stick in this dialog. Only methods located in the **Files** directory are displayed in the list *(see "Directory structure on the USB stick", page 47)*.

A backup can be made of the system (all data and settings). Similarly, an existing backup can be reloaded.

Import

Import the selected method.

Delete

Delete the selected method.

Backup

Create a backup of all data and settings on the USB stick.

Note

Only **one** backup can be created on the same USB stick.

If a backup has already been stored on the stick, then it will be overwritten when this function is carried out again.

Restore

Load the backup from a connected USB stick.

Directory structure on the USB stick

A directory with the instrument number is generated on the USB stick. The structure within the directory appears as follows:

Backup — All of the files of the backup are stored in this directory. The directory will be created the first time a backup is created.

Files

Exported methods will be stored in this directory. The directory will be created the first time a method is exported.

Only methods being located in this directory can be imported.

6.3 Lift settings (Lift)

Menu ▸ System ▸ Lift

Work position

The working height of the lift can be set to the desired value. This is accomplished by means of the direct operation of the lift.

Three functions can be selected from the function bar with **[⇦]** and **[⇨]** and then executed by pressing **[OK]**:

- **Work pos.** moves the lift to the current working height.
- **Up** moves the lift 6 mm upward.
- **Down** moves the lift 6 mm downward.

When this dialog page is exited, the respective current lift position will be applied as **Work position**.

Range	**0 ... 126 mm** (Increment: **6**)
Default value	**60 mm**

The lift can only be moved by steps of 6 mm. If more a accurate setting is required, the needle position can be fine aligned.

Adjusting the needle position

First move the lift to working height.

1 Open the safety shield

Loosen the two lower fastening screws of the safety shield using the hexagon key provided, and tip up the safety shield.

2 Loosen the nut

Slightly loosen the nut below the lift head using a wrench.

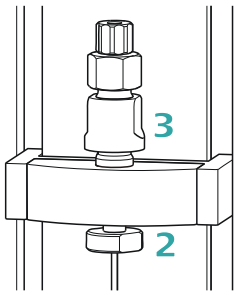


Figure 16 Adjusting the needle

3 Adjust the needle holder

Turn the needle holder a few millimeters out of the lift head (turn counterclockwise).

Now you can redefine the working height of the lift (see previous section), and precisely set the needle position by turning the needle holder.

4 Tighten the nut

Using the wrench, fasten the nut again.

5 Close the safety shield

Tip down the safety shield and fix it with the fastening screws.

6.4 Configuring external devices

Menu ▸ System ▸ External devices

Printer

If a printer is connected, then the printer type needs to be defined here in order for the reports to be printed out correctly.

The printers that have the designation **ESC-POS** are so-called POS printers (point-of-sale printers), i.e. they print on continuous paper.

Selection	**Citizen (ESC-POS)** | **Custom (ESC-POS)** | **Epson** | **Epson (ESC-POS)** | **HP DeskJet** | **HP LaserJet** | **Seiko (ESC-POS)**
Default value	**HP DeskJet**

Keyboard layout

A commercially available USB keyboard can be connected to make it easier to enter text and numbers. Specify the country-specific keyboard layout here.

Selection	**English US** | **French FR** | **German CH** | **German DE** | **Spanish ES**
Default value	**English US**

Editing the COM2 settings

Menu ▸ System ▸ External devices ▸ COM2 settings

6.5 Instrument diagnosis

6.5.1 Loading program versions and language files

Menu ▸ System ▸ Diagnosis

New program versions or language files can be loaded from a USB stick. The corresponding file must be saved on the USB stick in a directory with the instrument number (e.g. 848 or 863).

You can distinguish between language files and program files by noting how the file name is constructed.

Program files

They are instrument-specific. The file name has the following structure:

5XXXyyyy.bin where

XXX = Instrument type (e.g. 848 for the 848 Titrino plus)

yyyy = Program version

Language files

They can be recognized by means of the two-digit language code in the file name. A language file contains the dialog texts for various instrument types. It is not instrument-specific. The file name has the following structure:

5848xxxxYY.bin where

xxxx = Version number

YY = Language, e.g. DE (German), FR (French), ES (Spanish)

Loading a file

Proceed as follows:

1 Connect the USB stick

- Plug in the USB stick with the 6.2151.100 adapter (USB MINI (OTG) - USB A) at the USB connector on the instrument.
- Switch on the instrument.

2 Open the update dialog

- Under **Menu ▸ System ▸ Diagnosis**, select the menu item **Software update**.
- Press **[OK]**.

3 Open the file selection

- Press **[OK]**.

The selection list with the program and language files available on the USB stick is opened.

4 Select the file

- Select the required file with the arrow keys.
- Press **[OK]**.

5 Start the update

- Press **[START]**.

The update process is started, it runs automatically. At the end of the process, the instrument is automatically switched off and then back on again. No user intervention is required.

6.5.2 Diagnosis functions

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.

7 Parameters

7.1 Automation: Sample with air gap

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Sample pump time

The time during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**120 s**

Air gap pump time

The time during which the peristaltic pump aspirates air for an air gap.

Range	**0 ... 999 s**
Default value	**6 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

7.2 Automation: Sample no air gap

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Sample pump time

The time during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**120 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

7.3 Automation: Double injection

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Sample pump time

The time during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**120 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

7.4 Automation: Triple injection

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Sample pump time

The time during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**120 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

7.5 Automation: VA 797 Remote start

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Min. sample pump time

Minimum time, during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**5 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

7.6 Automation: VA 797 Manual start

Menu ▸ Parameters

Automation

Display of the template used for the automation sequence.

Min. sample pump time

Minimum time, during which the peristaltic pump aspirates sample solution.

Range	**0 ... 999 s**
Default value	**5 s**

Pump rate

Rate of the peristaltic pump. One step corresponds to 6 rpm. Positive values = shift direction is clockwise, negative values = shift direction is counterclockwise.

Range	**-7 ... 7**
Default value	**3**

8 Handling and maintenance

8.1 Peristaltic pump

8.1.1 Operation

The pumping capacity of the peristaltic pump depends on the drive speed, 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 tubing also depends on the contact pressure. Therefore fully lift the tubing cartridges by loosening the snap-action lever if the peristaltic pump is to be turned off for a longer period. Once set, the contact pressure remains unaffected.

Caution

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

8.1.2 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.
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.

8.1.3 Quality Management and validation with Metrohm

Quality Management

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

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 = Installation Qualification) and the **Operational** (OQ = Operational Qualification). 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 = Standard Operating Procedure) 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* under **Support/Quality Management**.

9 Troubleshooting

9.1 Problems and their solutions

Problem	Cause	Remedy
Peristaltic pump – insufficient or no delivery rate	*Peristaltic pump – contact pressure too weak.*	Correctly set the contact pressure *(see "Set the contact pressure", page 17)*.
	Peristaltic pump – pump tubing defective.	Replace the pump tubing *(see Figure 7, page 15)*.

10 Appendix

10.1 Remote interface

10.1.1 Pin assignment of the remote interface

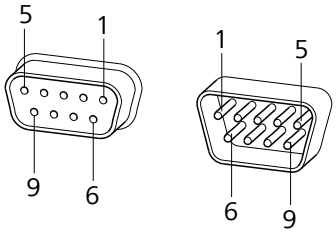


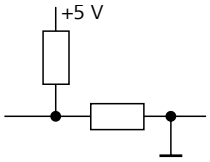
Figure 17 Pin assignment of remote socket and plug

The above figure of the pin assignment applies for all Metrohm instruments with 9-pin D-Sub remote connectors.

Table 3 Inputs and outputs of the remote interface

Pin No.	Assignment	Function
1	Output 0	Ready
2	Output 1	
3	Output 2	
4	Output 3	
5	Output 4	Error
6	0 volt (GND)	
7	+5 volts	
8	Input 0	Start/Continue
9	Input 1	Stop

Inputs

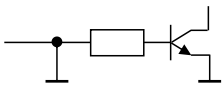


approx. 5 kΩ Pull-up

t_p t_p > 100 ms

active = low, inactive = high

Outputs



Open Collector

t_p t_p > 200 ms

active = low, inactive = high

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

+5 V: maximum load = 20 mA

10.1.2 Status diagram of the remote interface

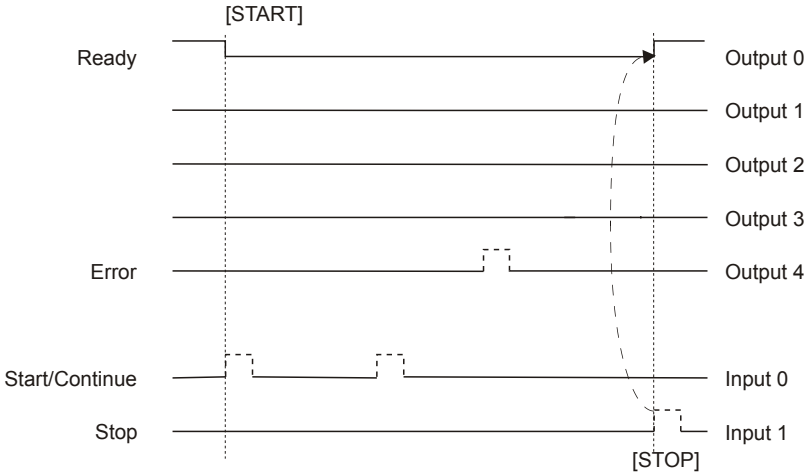


Figure 18 Remote status diagram

10.2 USB devices

Note

USB peripheral devices that are to be connected directly must support the USB 1.0/1.1 (Full Speed) or USB 2.0 (High Speed) standard. The maximum data transfer rate is however in any case 12 MBit/s.

Keyboards, PC mice and barcode readers are so-called HID devices (**H**uman **I**nterface **D**evice) and can be connected via a USB hub **only**.

Printers should also be connected via a USB hub. Depending on the manufacturer or printer type a direct connection is however possible.

10.2.1 Numerical USB keypad 6.2147.000

The key **[Num Lock]** must be pressed for navigating in the dialog. Then the arrow keys are effective.

The respective editing dialog must be opened for the number input.

Table 4 Keyboard assignment

Key of the 863 Compact Autosampler or function in the editing dialog	Key on the numerical USB keypad
[BACK]	**[Home]**
[⇧] [⇩]	**[↑] [↓]**
[⇦] [⇨]	**[←] [→]**
[OK]	**[Enter]**
[⇦]	**[BS]** (backspace)
Delete	**[Del]**
Accept	**[Home]**

10.2.2 Printer

The range of USB printers available is extremely varied and constantly changing. The following points must be taken into account when selecting a printer:

- USB interface necessary
- Printer language: HP-PCL, Canon BJL Commands, Epson ESC P/2 or ESC/POS

Note

Inexpensive printers are often designed solely for use with a PC and may not be equipped with one of the printer languages listed above. Such models are not suitable for this reason.

10.3 System initialization

In very rare instances, it could happen that a faulty file system (e.g. because of a program crash) will lead to an impairment of program functioning. The internal file system needs to be initialized in such cases.

Caution

All user data (methods, solutions, etc.) are deleted if a system initialization is carried out. Afterwards, the instrument will have the factory settings again.

We recommend creating a backup copy of the system at regular intervals in order to avoid data losses.

After a system initialization the program versions and language files do not have to be reloaded. Only the selection of the dialog language may have to be reset in the system settings.

Proceed as follows for system initialization:

1 Switch off the instrument

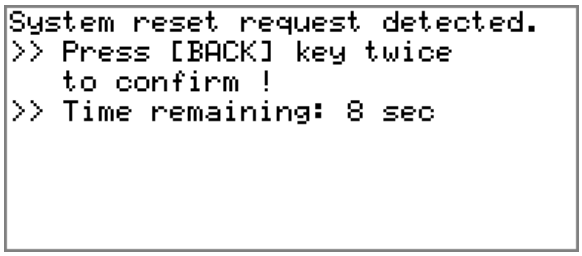
- Keep the red **[STOP]** key pressed down for at least 3 s.

A progress bar is displayed. If the key is released during this time, then the instrument will not be switched off.

2 Switch on the instrument

- Keep the red **[STOP]** key pressed down for approx. 10 s.

The dialog for confirmation of the initialization is displayed for 8 s. The initialization must be confirmed during this time.



3 Confirm the initialization

Note

If the query is not confirmed within 8 s, then the procedure will be interrupted.

- Press **[BACK]** twice.

Initialization is started. The process takes approximately 80 s. The instrument will be automatically restarted after successful initialization.

11 Technical data

11.1 Lift

Stroke path	132 mm
Maximum load	5 N
Lift rate	15 mm/s (typical)

11.2 Turntable

Rack positions	36
Maximum load	17 N
Shift rate	13 degrees/s (typical)

11.3 Peristaltic pump

Rate	0…42 rpm Adjustable in 7 steps of 6 revolutions/min.
Shift direction	Counterclockwise/Clockwise rotation
Typical flow rate	The effective delivery rate is dependent on contact pressure and type of tubing. 0.3 mL/min at 18 rpm (with 6.1826.320) 16 mL/min at 42 rpm (with 6.1826.150) 3.3 mL/min at 18 rpm (with 6.1826.020)
Tubing material	Recommended: Tygon Long Flex Life

11.4 Interfaces and connectors

USB (OTG) connector	For connecting USB devices or a PC.
Remote connector	For connecting devices with a remote interface.

11.5 Mains connection

Voltage	100…240 V
Frequency	50…60 Hz
Power consumption	45 W
Fuse	1.0 ATH

11.6 Safety specifications

Design and testing	According to EN/IEC/UL 61010-1, CSA-C22.2 No. 61010-1, 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.

11.7 Electromagnetic compatibility (EMC)

Emission

Standards fulfilled:

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

Immunity

Standards fulfilled:

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

11.8 Ambient temperature

Nominal function range	5…45 °C Humidity < 80 %
Storage	–20…60 °C
Transport	–40…60 °C

11.9 Reference conditions

Ambient temperature	25 °C (± 3 °C)
Relative humidity	≤ 60 %

11.10 Dimensions

Width	0.26 m
Height	0.47 m
Depth	0.43 m
Weight (without accessories)	9.82 kg
Material	
Housing	Lower part: Crastin PBTP Lift: Metal, surface-treated
Rack	PVC

12 Conformity and warranty

12.1 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

863 Compact Autosampler

Sample changer for automated processing of small sample series in analytical laboratories.

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 61000-6-1: 2001, 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 61000-4-11: 2004, EN/IEC 61000-4-14: 2004, NAMUR: 2004

Safety specifications

EN/IEC 61010-1: 2001, UL 61010-1: 2004, CSA-C22.2 No. 61010-1: 2004, 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 61010-2-081	Particular requirements for automatic and semi-automatic laboratory equipment for analysis and other purposes

This instrument meets the requirements of the ETL Listed Mark for the North American market. It conforms to the electrical safety standards UL 61010-1 and CSA-C22.2 No. 61010-1. This product is listed in Intertek's Directory of Listed Products.

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, 28 September 2009

D. Strohm
Vice President, Head of R&D

A. Dellenbach
Head of Quality Management

12.2 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.

12.3 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 Opera-

tional 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.

13 Accessories

Note

Subject to change without notice.

13.1 Scope of delivery 2.863.0010 for IC applications

Qty.	Order no.	Description	
1	1.863.0010	**863 Compact Autosampler** Compact sample changer for 36 samples.	
2	6.1826.360	**Pump tubing LFL (white/white), 3 stoppers** For Sample Processors	

Qty.	Order no.	Description
1	6.1831.050	**PEEK capillary 0.5 mm i.d., 40 cm**

For inline dialysis and for sample changers. For IC Dialysis Unit, IC Sample Processor, Compact IC Autosampler, IC Dialysis Sample Processor, IC Liquid Handling Dialysis Unit, Compact VA Autosampler

Material:	PEEK
Outer diameter (inches):	1/16
Inner diameter (mm):	0.5
Length (mm):	400

1	6.1831.060	**PEEK capillary 0.5 mm i.d., 1 m**

For inline dialysis and for Sample Changers. For IC Dialysis Unit, IC Sample Processor, Compact IC Autosampler, IC Filtration Sample Processor, IC Dialysis Sample Processor, IC Liquid Handling Dialysis Unit

Material:	PEEK
Outer diameter (inches):	1/16
Inner diameter (mm):	0.5
Length (m):	1

1	6.2151.100	**Adapter USB MINI (OTG) - USB A**

For connecting USB instruments.

Qty.	Order no.	Description	
1	6.2151.110	**Cable USB MINI (OTG) - USB A, 1.8 m** For connecting USB instruments.	
1	6.2621.090	**1/2 in. wrench** For 1/2 in. screws. For IC Sample Processors Length (mm): 140	
1	6.2621.130	**Hexagon key 2 mm** 2 mm.	
1	6.2621.140	**Hexagon key 2.5 mm**	

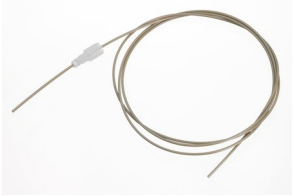
Qty.	Order no.	Description	
1	6.2739.000	**Wrench** For tightening connectors Length (mm): 68	
1	6.2743.057	**Sample tubes 11 mL** 200 pieces. For IC Sample Processors and VA Autosampler Material: PP Outer diameter (mm): 16 Length (mm): 108 Volume (mL): 11	
1	6.2743.077	**Stopper with perforation** 200 pieces. For IC Sample Processors Material: PP	
1	6.2744.034	**Coupling nozzle - UNF 10/32, 2 pieces** Connection pressure screw and pump tubing. 2 pieces. For IC instruments with peristaltic pumps	

Qty.	Order no.	Description	
1	6.2744.070	**Pressure screw short** Short version. With UNF 10/32 connection. 5 pieces. For the connection of PEEK capillaries Material: PEEK Length (mm): 21	
1	6.2744.160	**Nozzle/UNF 10/32 coupling with security device** Security device for connecting pump tubing to a nozzle. Material: PEEK	
1	6.2751.130	**Splash protection for Compact Autosampler and Compact Sample Changer** Splash protection for safe working with needles (Compact Autosampler) and titration equipment (Compact Sample Changer) Material: Plexiglas (PMMA)	
1	6.2833.030	**Needle holder 1/8 in. for 863 Compact Autosampler** Needle holder 1/8 in. for 863 Compact Autosampler Material: PEEK Material 2: Stainless steel 18/10	

Qty.	Order no.	Description
1	6.2846.000	**Sample needle (zirconium oxide)** Sample needle for Sample Processors and Autosamplers in ion chromatography and voltammetry Material: Ceramic Outer diameter (inches): 1/8 Inner diameter (mm): 0.75 Length (mm): 151
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	8.863.8003EN	**863 Compact Autosampler Manual**

13.2 Scope of delivery 2.863.0020 for VA applications

Qty.	Order no.	Description
1	1.863.0010	**863 Compact Autosampler** Compact sample changer for 36 samples.

Qty.	Order no.	Description	
1	6.1822.410	**PEEK connection capillary** Connection capillary for sample transfer with sample changers, 1 x M6, inner diameter 0.5 mm, for trace analysis Material: PEEK Outer diameter (inches): 1/16 Inner diameter (mm): 0.5 Length (mm): 1200	
2	6.1826.020	**PVC pump tubing (blue/blue)** For online IC instruments and automation in voltammetry. Material: PVC (Tygon) Material remark: Tygon ST Inner diameter (mm): 1.65 Length (mm): 400	
1	6.1831.050	**PEEK capillary 0.5 mm i.d., 40 cm** For inline dialysis and for sample changers. For IC Dialysis Unit, IC Sample Processor, Compact IC Autosampler, IC Dialysis Sample Processor, IC Liquid Handling Dialysis Unit, Compact VA Autosampler Material: PEEK Outer diameter (inches): 1/16 Inner diameter (mm): 0.5 Length (mm): 400	
1	6.2141.230	**Remote cable Compact Sample Changer/ Compact Autosampler - Titrino plus/Pump Station** Cable for the remote connection between Compact Sample Changer/Compact Autosampler and Titrino plus and/or Pump Station.	

Qty.	Order no.	Description	
1	6.2151.100	**Adapter USB MINI (OTG) - USB A** For connecting USB instruments.	
1	6.2621.090	**1/2 in. wrench** For 1/2 in. screws. For IC Sample Processors Length (mm): 140	
1	6.2621.130	**Hexagon key 2 mm** 2 mm.	
1	6.2621.140	**Hexagon key 2.5 mm**	

Qty.	Order no.	Description	
1	6.2739.000	**Wrench**	
	For tightening connectors		
	Length (mm):	68	
1	6.2743.057	**Sample tubes 11 mL**	
	200 pieces. For IC Sample Processors and VA Autosampler		
	Material:	PP	
	Outer diameter (mm):	16	
	Length (mm):	108	
	Volume (mL):	11	
1	6.2744.070	**Pressure screw short**	
	Short version. With UNF 10/32 connection. 5 pieces. For the connection of PEEK capillaries		
	Material:	PEEK	
	Length (mm):	21	
2	6.2744.160	**Nozzle/UNF 10/32 coupling with security device**	
	Security device for connecting pump tubing to a nozzle.		
	Material:	PEEK	

Qty.	Order no.	Description
1	6.2751.130	**Splash protection for Compact Autosampler and Compact Sample Changer**

Splash protection for safe working with needles (Compact Autosampler) and titration equipment (Compact Sample Changer)

Material:	Plexiglas (PMMA)

Qty.	Order no.	Description
1	6.2833.030	**Needle holder 1/8 in. for 863 Compact Autosampler**

Needle holder 1/8 in. for 863 Compact Autosampler

Material:	PEEK
Material 2:	Stainless steel 18/10

Qty.	Order no.	Description
1	6.2846.000	**Sample needle (zirconium oxide)**

Sample needle for Sample Processors and Autosamplers in ion chromatography and voltammetry

Material:	Ceramic
Outer diameter (inches):	1/8
Inner diameter (mm):	0.75
Length (mm):	151

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

Qty.	Order no.	Description
	USA, …:	Type NEMA/ASA 6.2122.070
1	**8.863.8003EN**	**863 Compact Autosampler Manual**

13.3 Optional accessories for 2.863.0010

Order no.	Description
6.1826.310	**Pump tubing LFL (orange/green), 3 stoppers** Pump tubing for bromate determination using the triiodide method.

Order no.	Description
6.1826.320	**Pump tubing LFL (orange/yellow), 3 stoppers** For suppressor solutions, acceptor solution in Inline Dialysis and for Inline Ultrafiltration

Order no.	Description
6.1826.330	**Pump tubing LFL (orange/white), 3 stoppers** For all IC instruments with peristaltic pump.

Order no.	Description
6.1826.340	**Pump tubing LFL (black/black), 3 stoppers** For the sample solution in inline dialysis
6.1826.380	**Pump tubing LFL (gray/gray), 3 stoppers** For Inline Dilution
6.1826.390	**Pump tubing LFL (yellow/yellow), 3 stoppers** For the sample solution in Inline Ultrafiltration.
6.2141.230	**Remote cable Compact Sample Changer/Compact Autosampler - Titrino plus/Pump Station** Cable for the remote connection between Compact Sample Changer/Compact Autosampler and Titrino plus and/or Pump Station.
6.2141.270	**Cable Compact IC Autosampler - Remote Connection on IC Instruments** Enables remote control of the Compact IC Autosampler from IC Instruments

Order no.	Description

6.2151.020 **Cable USB A - USB B 1.8 m**

USB connecting cable

Length (m): 1.8

6.2629.000 **Screw nut to needle holder IC**

On Sample Processors

6.2723.310 **Protective cover for Titrino plus**

Protective cover for display and keypad for all instruments of the Titrino plus family. Compatible to: 848 Titrino plus 862 Compact Titrosampler 863 Compact Autosampler 865 Dosimat plus 869 Compact Sample Changer 870 KF Titrino plus 876 Dosimat plus 877 Titrino plus <FONT style="BACKGROUND-COLOR: #fafafa">Material: PVC</FONT>

Material: PVC

6.2743.040 **Sample tubes 2.5 mL**

2.5 mL. 2000 pieces. For IC Sample Processors

Material: PP

Volume (mL): 2.5

Order no.	Description

6.2743.047 Sample tubes 2.5 mL

2.5 mL. 200 pieces. For IC Sample Processors

Material:	PP
Volume (mL):	2.5

6.2743.050 Sample tubes 11 mL

2000 pieces. For IC Sample Processors and VA Autosampler

Material:	PP
Outer diameter (mm):	16
Length (mm):	108
Volume (mL):	11

6.5333.000 IQ/OQ Kit for IC

The IQ/OQ Kit for IC contains all parts and standard solutions required for IQ/OQ in IC.

6.6059.221 MagIC Net™ 2.2 Compact CD: 1 Licence

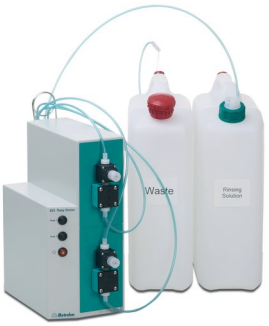
Professional PC program for controlling one intelligent Compact IC instrument and one autosampler or one 771 Compact Interface. The software permits control, data acquisition, evaluation and monitoring as well as report generation for ion chromatographic analyses. Graphic user interface for routine operations, extensive database programs, method development, configuration and manual system control, highly flexible user administration, efficient database operations, extensive data export functions, individually configurable report generator, control and monitoring of all system components and the chromatographic results. MagIC Net™ Compact complies with FDA regulation 21 CFR Part 11 as well as GLP. Dialogue languages: German, English, French, Spanish, Chinese, Korean, Japanese and more. 1 licence.

Order no.	Description
6.6059.222	**MagIC Net™ 2.2 Professional CD: 1 Licence** Professional PC program for controlling intelligent Professional IC systems, Compact IC instruments and their peripherals such as different autosamplers, 800 Dosinos dosing systems, 771 Compact Interface, etc. The software permits control, data acquisition, evaluation and monitoring as well as report generation for ion chromatographic analyses. Graphic user interface for routine operations, extensive database programs, method development, configuration and manual system control, highly flexible user administration, efficient database operations, extensive data export functions, individually configurable report generator, control and monitoring of all system components and the chromatographic results. MagIC Net™ Professional complies with FDA regulation 21 CFR Part 11 as well as GLP. Dialogue languages: German, English, French, Spanish, Chinese, Korean, Japanese and more. 1 licence.
6.6059.223	**MagIC Net™ 2.2 Multi CD: 3 Licences** Professional PC program for controlling intelligent Professional IC systems, Compact IC instruments and their peripherals such as different autosamplers, 800 Dosino, 771 Compact Interface, etc. The software permits control, data acquisition, evaluation and monitoring as well as report generation for ion chromatographic analyses. Graphic user interface for routine operations, extensive database programs, method development, configuration and manual system control; highly flexible user administration, efficient database operations, extensive data export functions, individually configurable report generator, control and monitoring of all system components and the chromatographic results. MagIC Net™ Multi complies with FDA regulation 21 CFR Part 11 as well as GLP. Dialogue languages: German, English, French, Spanish, Chinese, Korean, Japanese and more. Client-Server version with 3 licences.
6.9988.633	**Validation Documentation for 863 (English / German) – CD**
8.862.3003EN	**ETL Certificate 86x Sample changers, English**
8.863.3002EN	**Declaration of conformity: 863 Compact Autosampler (English)**

13.4 Optional accessories for 2.863.0020

Order no.	Description

2.843.0040 843 VA Membrane Pump Station



The 843 Membrane Pump Station is equipped with two membrane pumps that can be directly controlled via remote signals from the 797 VA Computrace. The voltammetry version includes all accessories for the automatic emptying and rinsing of the measuring vessel.

Dimensions in mm (W/H/D): 160/410/310

2.843.0140 843 VA Peristaltic Pump Station

The 843 Peristaltic Pump Station is equipped with two peristaltic pumps that can be directly controlled via remote signals from the 797 VA Computrace. The voltammetry version includes all accessories for the automatic emptying and rinsing of the measuring vessel.

Dimensions in mm (W/H/D): 160/400/300

6.2723.310 Protective cover for Titrino plus

Protective cover for display and keypad for all instruments of the Titrino plus family. Compatible to: 848 Titrino plus 862 Compact Titrosampler 863 Compact Autosampler 865 Dosimat plus 869 Compact Sample Changer 870 KF Titrino plus 876 Dosimat plus 877 Titrino plus <FONT style="BACKGROUND-COLOR: #fafafa">Material: PVC</FONT>

Material: PVC

6.2743.050 Sample tubes 11 mL

2000 pieces. For IC Sample Processors and VA Autosampler

Material: PP
Outer diameter (mm): 16
Length (mm): 108
Volume (mL): 11

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