863 Compact Autosampler



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863 Compact Autosampler

Manual

Technical Communication Metrohm AG CH-9100 Herisau

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1 Introduction

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 as the central control instrument in an independent automation system or as an integrated sample changer in a PC-controlled automation system.

1.1.1 Model versions

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

863 Compact IC Autosampler 2.863.0010

With ion chromatography accessories.

863 Compact VA Autosampler 2.863.0020

With voltammetry accessories.

1.1.2 Instrument components

The 863 Compact Autosampler has the following components:

Turntable

Permanently mounted sample rack with 36 positions for sample vessels.

Lift with lift head

With needle holder for PEEK needles.

Single channel peristaltic pump

For transporting sample solutions.

USB (OTG) connector

For connecting a computer, a printer, or a USB flash drive (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 via a USB connection using the **MagIC Net** computer software, then any automation runs can be programmed. This allows optimal use of the instrument components which the instrument has available. The software can actuate the instrument components directly and can use them more flexibly.

1.2 Displaying accessories

1.1.4 Stand-alone operation

The 863 Compact Autosampler can be used as a central control instrument in an automation system which can include various types of ion chromatography instruments or the 797 VA Computrace. In this role, the 863 Compact Autosampler acts as a reliable sample changer.

Specified method runs can be individually parameterized and saved as sample-specific methods. Methods can be exported on a USB flash drive and then copied onto another instrument quickly and easily.

1.2 Displaying accessories

Up-to-date information on the scope of delivery and on optional accessories can be found on the Metrohm website.

1 Searching for a product on the website

- Go to https://www.metrohm.com.
- Click on Q.
- Enter the article number of the product (e.g. **2.1001.0010**) into the search field and press **[Enter]**.

The search result is displayed.

2 Displaying product information

- To display the products matching the search term, click on **Product models**.
- Click on the desired product.

Detailed information regarding the product is displayed.

3 Displaying accessories and downloading the accessories list

- To display the accessories, scroll down to Accessories and more.
 - The **scope of delivery** is displayed.
 - Click on **[Optional parts]** for the optional accessories.
- To download the accessories list, click on [Download accessories PDF] under Accessories and more.



NOTE

Metrohm recommends keeping the accessories list for reference purposes.

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1 Introduction

1.3 Symbols and conventions

The following symbols and formatting may appear 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	
	Perform the steps one after the other.	
Method	Dialog text , parameter in the software	
File ► New	Menu or menu item	
[Continue]	Button or key	
	WARNING	
	This symbol draws attention to a possible life-threat- ening hazard or risk of injury.	
	WARNING	
77	This symbol draws attention to a possible hazard due to electrical current.	
	WARNING	
<u></u>	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.	
	WARNING	
秦	Warning of optical radiation	
Ω	CAUTION	
	This symbol draws attention to possible damage to instruments or instrument parts.	
f	NOTICE	
	This symbol highlights additional information and tips.	

2.1 Intended use

2 Safety



WARNING

Operate this instrument only according to the information contained in this documentation.

This instrument exhibited no flaws in terms of technical safety at the time it left the factory. To maintain this state and ensure non-hazardous operation of the instrument, the following instructions must be observed carefully.

2.1 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.

2.2 Responsibility of the operator

The operator must ensure that basic regulations on occupational safety and accident prevention in chemical laboratories are observed. The operator has the following responsibilities:

- Instruct personnel in the safe handling of the product.
- Train personnel in the use of the product according to the user documentation (e.g. install, operate, clean, eliminate faults).
- Train staff on basic occupational safety and accident prevention regulations.
- Provide personal protective equipment (e.g. protective glasses, gloves).
- Provide suitable tools and equipment to carry out the work safely.

The product may be used only when it is in perfect condition. The following measures are required to ensure the safe operation of the product:

- Check the condition of the product before use.
- Remedy defects and malfunctions immediately.
- Maintain and clean the product regularly.

2 Safety

2.3 Requirements for operating personnel

Only qualified personnel may operate the product. Qualified personnel are persons who meet the following requirements:

- Basic regulations on occupational safety and accident prevention for chemical laboratories are known and complied with.
- Knowledge of handling hazardous chemicals is present. Personnel have the ability to recognize and avoid potential dangers.
- Knowledge regarding the application of fire prevention measures for laboratories is available.
- Safety-relevant information is communicated and understood. The personnel can operate the product safely.
- The user documentation has been read and understood. The personnel operate the product according to the instructions in the user documentation.

2.4 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.

Supply voltage



WARNING

An incorrect supply voltage can damage the instrument.

Only operate this instrument with a supply 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.

Do not fail to pull the power cord out of the power socket before you set up or disconnect electrical plug connections at the rear of the instrument.

2.5 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.

2.6 Personnel safety



WARNING

Wear protective glasses 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. Never remove the pre-installed safety shields.

The 863 Compact Autosampler may not be operated without a safety shield!

 2 Safety



WARNING

Personnel may not 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 jamming of a drive, the power plug must be pulled out of the socket immediately. Do not attempt to free jammed sample vessels or other parts while the instrument is switched on. Jamming can only be cleared when the instrument is in a de-energized state; this action is generally associated with a **considerable risk of injury**.



WARNING

The 863 Compact Autosampler is **not** suitable for usage 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.

2.7 Flammable solvents and chemicals



WARNING

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

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

2.8 Danger from biological substances

If the instrument is used for biological hazardous substances, it must be marked in accordance with regulations.

In case of a return shipment to Metrohm or a Metrohm Service partner, the instrument or component has to be decontaminated and the hazard symbol for biological hazardous substances must be removed. A declaration of decontamination must be enclosed.



WARNING

Danger of infection and poisoning from biological hazardous substances

Poisoning from toxins and/or infections from samples contaminated with microorganisms.

- Wear protective equipment.
- Use exhaust equipment when working with vaporizing hazardous substances.
- Dispose of biologically contaminated substances properly.

2.9 Recycling and disposal



This product is covered by European Directive 2012/19/EU, WEEE – Waste Electrical and Electronic Equipment.

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

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

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3 Overview of the instrument

3 Overview of the instrument

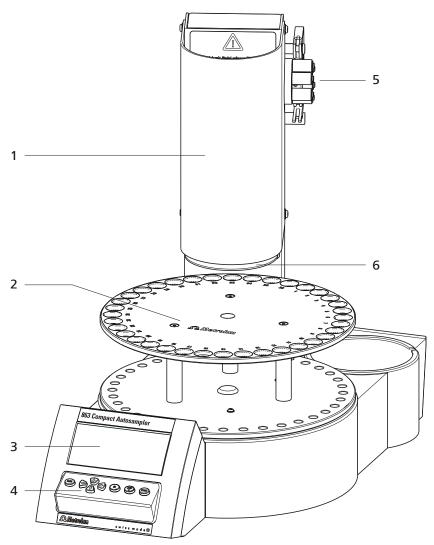


Figure 1 Front 863 Compact Autosampler

Safety shield
 Sample rack
 For 36 sample vials.
 Display
 Keypad
 Peristaltic pump
 Retaining plate

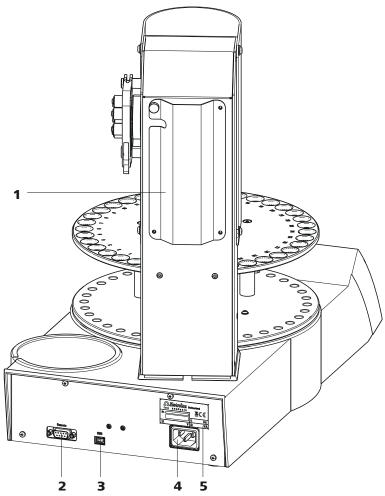


Figure 2 863 Compact Autosampler rear

1 Tubing and cable cover

3 USB (OTG) connector

For connecting computers, printers, USB flash drives, USB hubs, etc.

5 Type plate

Contains specifications concerning supply voltage and serial number.

2 Remote connector

For connecting instruments with a remote interface. D-sub, 9-pin.

4 Power socket

3 Overview of the instrument

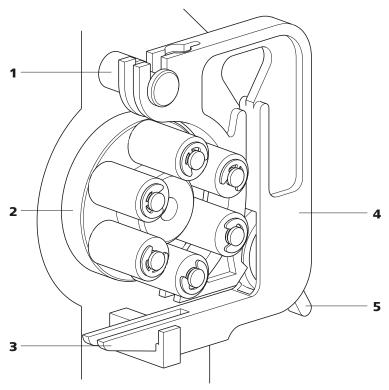


Figure 3 Peristaltic pump

- Mounting boltFor engaging the tubing cartridge.
- **3 Snap-action lever** For loosening the tubing cartridge.
- **5 Contact pressure lever** For regulating the contact pressure.
- 2 Pump drive Roller hub with pressure rollers.
- **4 6.2755.000 tubing cartridge** For 6.1826.xx0 pump tubings.



WARNING

Do not attempt to make any manipulation on the tubing cartridge or pump drive while the instrument is running. **A considerable risk of injury exists.**

The pump tubing may only be changed when the instrument is switched off.

Switch off the instrument immediately if the roller drive jams. Only afterwards you may attempt to fix the problem.

4.1 Setting up the instrument

4.1.1 Packaging

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

4.1.2 Checks

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

4.1.3 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 and free of vibrations and which provides protection against corrosive atmosphere and contamination by chemicals.

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

4.2 Connecting the instrument to the power grid



WARNING

Electric shock from electrical potential

Risk of injury by touching live components or through moisture on live parts.

- Never open the housing of the instrument while the power cord is still connected.
- Protect live parts (e.g. power supply unit, power cord, connection sockets) against moisture.
- Unplug the power plug immediately if you suspect that moisture has gotten inside the instrument.
- Only personnel who have been issued Metrohm qualifications may perform service and repair work on electrical and electronic parts.

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Connecting the power cord

Accessories

Power cord with the following specifications:

- Length: max. 2 m
- Number of cores: 3, with protective conductor
- Instrument plug: IEC 60320 type C13
- Conductor cross-section 3x min. 1.0 mm² / 18 AWG
- Power plug:
 - according to customer requirement (6.2122.XX0)
 - min. 10 A



NOTE

Do not use a not permitted power cord!

1 Plugging in the power cord

- Plug the power cord into the instrument's power socket.
- Connect the power cord to the power grid.

4.3 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 Installing 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 Establishing the cable connections

- Connect the instrument to the power grid 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.

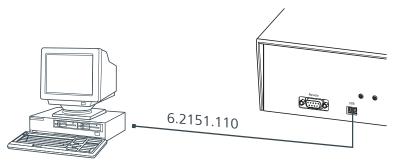


Figure 4 Connecting the computer

The instrument is recognized. Depending on the version of the Windows operating system used, the driver installation proceeds differently afterwards.

- Either the necessary driver software is installed automatically or an installation wizard is started.
- **3** Follow the instructions of the installation wizard.

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

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:

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1 Setting 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 computer software.

4.4 Installing the sample needle

Needles made of zirconium oxide or PEEK can be used for aspirating samples.



WARNING

When a 6.1835.050 sample needle or a blunt PEEK needle is used, **no stoppers** are permitted to be used on the sample vessels. These stoppers cannot be penetrated by such needles. The needle can become damaged if this is attempted! **Perforated stoppers** can be used with double-bevel needles.

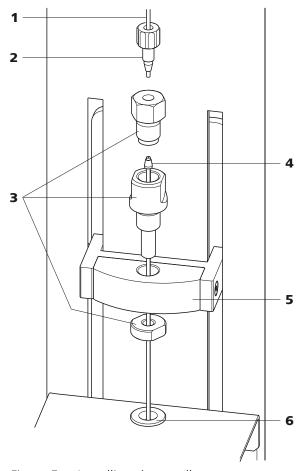


Figure 5 Installing the needle

- **1 PEEK capillary** 6.1831.050 (40 cm) or 6.1831.060 (100 cm)
- 3 Needle holder (6.2833.030)

 Comprising pressure screw, needle guide and nut
- **5 Lift**With lift head

2 PEEK pressure screw (6.2744.070)

- 4 Sample needle 6.2846.000 (made of zirconium oxide) or 6.1835.020 / 6.1835.040 / 6.1835.050 (made of PEEK)
- **6** Centering aid

This is how you install the needle and the capillary:

1 Opening the safety shield

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

2 Remove the nut

Loosen and remove the nut screwed onto the needle holder.

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3 Inserting the needle holder

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

4 Inserting the needle

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

5 Fastening the needle

- Screw the pressure screw into the needle holder from above.
 Lightly push the needle upwards from below during the process.
- Tighten the pressure screw firmly.

6 Connecting the capillary

- Slide a 6.2744.070 PEEK pressure screw over the end of the capillary.
- Manually tighten the PEEK pressure screw with the capillary on the nut of the needle holder. The capillary must be pushed in while doing so.

7 Closing 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.

4.5 Installing the peristaltic pump

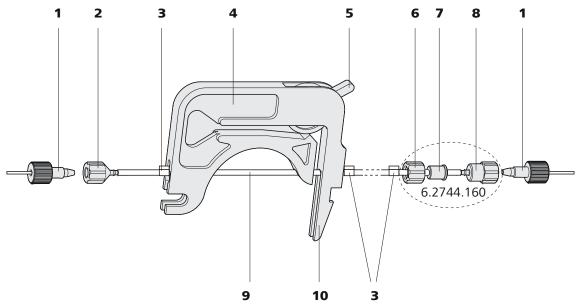


Figure 6 Installing the pump tubing

_			
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 11).

2 Connecting the aspiration side

Place a 6.2744.034 tubing olive (6-2) on the aspiration side of the pump tubing.

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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 (6-**6**) of the 6.2744.160 pump tubing connection (without filter) onto the pump tubing.
- Select a suitable adapter (6-7) and slide it onto the pump tubing.
 The type of adapter depends on the pump tubing (see table 1, page 20).
- Place the tubing olive (6-8) onto the pump tubing.
- Screw the union nut (6-6) tight on the tubing olive (6-8).

4 Inserting the pump tubing

- Press the contact pressure lever all the way down.
- Place the pump tubing in the tubing cartridge. The stoppers (6-3) 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.

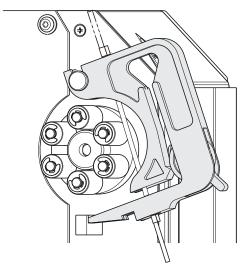


Figure 7 Inserting the tubing cartridge

6 Connecting the capillaries

• Screw the respective capillaries tightly to the two tubing olives with PEEK pressure screws (6-1).

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 (6-**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.

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NOTE

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

4.6 Tubing and capillary connections

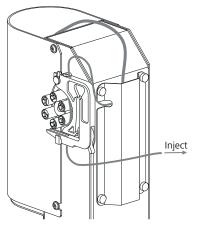


Figure 8 Arrangement of tubing

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.

4.7 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.

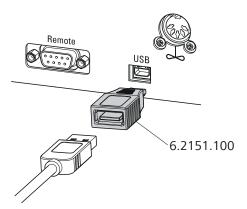


Figure 9 Connecting USB devices



NOTE

Up to and including program version 5.863.0022:

Switch the device off before connecting or removing a USB device or a USB flash drive.

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

Starting with program version 5.863.0030:

USB flash drives and printers can be connected or removed at any time.

A double beep is heard when connecting and removing a USB stick.

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

- USB flash drives (for the backup or storing of methods)
- 6.2147.000 numerical USB keypad
 The 6.2147.000 numerical USB keypad is used for convenient numerical input and for navigating in the dialog. In addition, it provides two USB connectors. Connect additional USB devices to the keyboard.
- USB hub (with or without its own power supply)

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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 scanner (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:

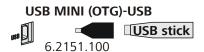


Figure 10 Connecting the USB flash drive

4.8 Remote connections

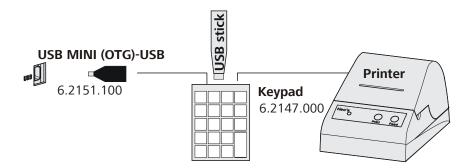


Figure 11 Connecting the 6.2147.000 USB keyboard with USB flash drive and printer

4.8 Remote connections

The 863 Compact Autosampler can be used as a control instrument 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.

4.8.1 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.

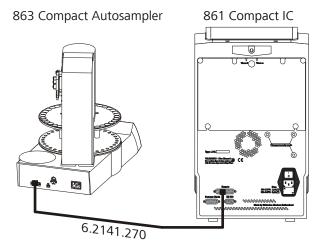


Figure 12 Remote connection 863 Compact Autosampler - 861 Compact IC

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4.8.2 Connecting a 797 VA Computrace

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

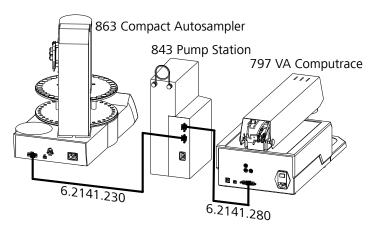


Figure 13 Remote connection 863 Compact Autosampler - 843 Pump Station - 797 VA Computrace

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.

5.1 Sample with air gap

5 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.

5.1 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

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5 Automation sequences

- 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

5.2 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

5.3 Double injection

- Switch off the peristaltic pump
- Wait for the stepping pulse

5.3 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

28 ******* 863 Compact Autosampler

5 Automation sequences

5.4 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

5.5 VA 797 Remote start

- Switch off the peristaltic pump
- Wait for the stepping pulse

5.5 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

5 Automation sequences

5.6 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**.
- 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

6 Operation

6.1 Switching the instrument on and off

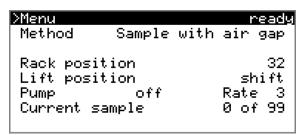
Switching on the instrument

Proceed as follows:



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

The main dialog is displayed:



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.

6 Operation

6.2 Fundamentals of operation

6.2.1 The keypad

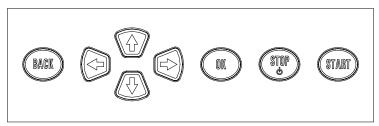


Figure 14 Keypad 863 Compact Autosampler

BACK Apply the input and exit the dialog.

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 func-

tion. Switch the instrument on or off.

START Start method runs.

6.2.2 Structure of the dialog windows



The current dialog title is displayed on the left-hand side of the title bar. 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 $[\Leftarrow]$ or $[\Rightarrow]$ and executed with [OK].



6.2.3 Navigating in the dialog

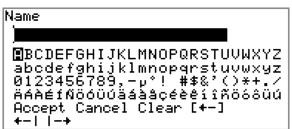
The selection bar is displayed in inverted style. Use the arrow keys [1] and [4] to move the selection bar upward or downward one line at a time. If a dialog text is marked with ">", then additional settings are available in a subordinate dialog. Use [0K] to access this dialog.

Example: System settings



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

6.2.4 Entering text and numbers



In the editing dialog for text input or numerical input, 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.

6 Operation

Editing function	Description
[+-]	The character left of the cursor is deleted (back-space).
+ -1	Text editor only
	The cursor within the input field is shifted to the left by one character each time that [OK] is pressed.
I →	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**.

6.3 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 configured individually, depending on the application. An optimized method run can be saved as a reusable method.



NOTE

Methods which were created on a program version starting with **5.863.0030** are not reverse-compatible with program versions **5.863.0022** and earlier.

6.3.1 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.

6.3 Methods

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 VA Computrace.

VA 797 Manual Sample transfer for VA applications with manual

start start of the 863 Compact Autosampler.

You can find a detailed description of the methods in chapter 5 Automation sequences, page 26 and subsequent pages.

6.3.2 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**.

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6 Operation

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

6.3.3 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 Opening the method table

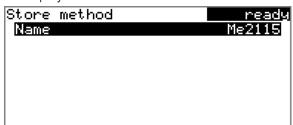
• In the main dialog, select **Method** and press **[OK]**.

The method table opens:



2 Modifying/applying 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:



Applying the name:

Press [BACK].

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

Entering 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.

6.3 Methods

6.3.4 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**.

6.3.5 Exporting a method

The methods can be exported to a connected USB flash drive.



NOTE

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

To export a method, proceed as follows:

1 Opening the method table

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

The method table with the stored methods opens:

6 Operation



2 Selecting the method

• Select the desired method.

3 Exporting the method

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

The method is being exported. The directory structure on the USB flash drive is listed in *chapter 7.2, page 49*.

The method is being exported. The directory structure on the USB flash drive is described in the more detailed manual.

6.4 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.

6.4.1 Starting the sample series

Starting a sample series

A suitable method must be loaded before a sample series is started (see chapter 6.3.4, page 38). The necessary parameters) can then be modified.



1 Defining a sample series

Press the [START] key.



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

2 Entering the number of samples

- 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 Entering the rack position of the first sample

- 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 stored 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 Closing the sample series dialog

Close the dialog with the [BACK] key.

5 Starting 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.

6 Operation

Stopping a sample series

A sample series can be canceled at any time.



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

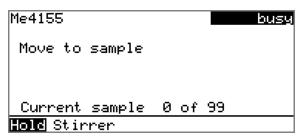
The method run is stopped. The sample series cannot be resumed.

6.4.2 Stopping and continuing the sample series

Pausing a sample series

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

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 interrupted. 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 a 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 "**Hold**" status, a method run, and thus the entire sample series, can be canceled in its entirety, 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 canceling it.



- Press the **[OK]** key and enter the number of samples that still need to be processed. The current sample must be included at this time.
- 3 Press the [START] key.

The sample series continues.

6.5 Printing a report manually

Menu ► Print reports

Proceed as follows to print a report manually:

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

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6 Operation



2 Opening the print dialog

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

The dialog window with the available reports opens:



3 Selecting the report

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

The report is 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,

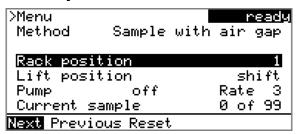
external devices, etc.

6.6 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.

6.6 Manual control

6.6.1 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 highest

rack position is placed in front of the lift.

If the **[OK]** key remains pressed, the rack auto-

matically moves to the next position.

Previous The lift is moved upward and the next lowest

rack position is placed in front of the lift.

If the **[OK]** key remains pressed, the rack auto-

matically moves to the next position.

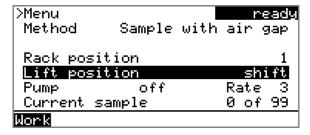
Reset The rack is being initialized. The lift is moved

upward and the sample rack is rotated to the starting position. At the same time, the starting position is reset (**Next sample pos.**) 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.

6.6.2 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 .

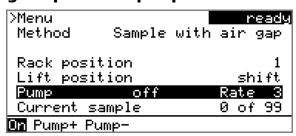
6 Operation

Shift pos. The rotation height. The lift moves all the way to

the top.

The current lift position is displayed. Each other possible position is provided in the function bar.

6.6.3 Controlling the peristaltic pump



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

On Switch on the peristaltic pump if it is switched

off.

Off Switch off the peristaltic pump if it is switched

on.

Pump+ Increase the rotational speed by one step.Pump- Reduce the rotational speed by one step.

The status and the configured rotational speed 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 rpm.

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

"+": clockwise rotation

"-": counterclockwise rotation

Input range -7 to 7
Default value 3

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

7.1 Basic settings

7 System settings

7.1 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.

Entry	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.

Entry	max. 10 characters
Default value	Empty

Serial number

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

Program version

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

Time

Current time. Only numbers that make sense can be entered.

Format: hh:mm:ss

Date

Current date. Only numbers that make sense can be entered.

Format: YYYY:MM:DD

Language

Set the dialog language.

Up to and including program version 5.863.0022:

One additional language can be selected besides English.

7 System settings



NOTE

In order to ensure that a second language can be selected, it must first be installed. This installation must be carried out by specialist personnel. In chapter *Loading program versions and language files, page 52*, you will find details regarding the installation of a second language.

Starting with program version 5.863.0030:

All available languages are installed on the device. No additional languages can be installed.

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 will take effect as soon as you exit the main menu.

The limitation of the dialog results in the following:

- 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 for routine operation is activated, then the expert dialog cannot be activated during ongoing operation. To change the dialog type, the 863 Compact Autosampler must be switched off and then back on again. The expert dialog can be forced as soon as the instrument is started up again. 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

7.1 Basic settings

Expert

Complete dialog.

Routine

Limited dialog for routine operations.

Contrast

The contrast of the display can be adjusted with the arrow keys $[\Leftarrow]$ and $[\Rightarrow]$.

- [�]: 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.

Input range 150 to 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 $[\mbox{\em ψ}]$ or $[\mbox{\em Ω}]$ repeatedly.

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

Beep

If this parameter is enabled, then a short beep will sound at the press of a key.

Selection	on off
Default value	on

7 System settings

7.2 File management

Menu ► System ► File management



NOTE

This menu item is visible only if a USB flash drive has been connected as an external storage medium.

Methods can be imported and deleted from a USB flash drive in this dialog. Only methods located in the **Files** directory are displayed in the list (see "Directory structure on the USB flash drive", page 49).

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



NOTE

Methods and backups which were created on a program version starting with **5.863.0030** are not reverse-compatible with program versions **5.863.0022** and earlier.

Import

Import the selected method.

Delete

Delete the selected method.

Backup

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



NOTE

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

If a backup is already stored on the flash drive, then this will be overwritten as soon as the function is executed again.

Restore

Load the backup from a connected USB flash drive.

Directory structure on the USB flash drive

A directory with the instrument number will be created on the USB flash drive. The structure within this directory appears as follows:

7.3 Lift settings (Lift)

Backup All of the files of the backup are stored in this

directory. The directory is created as soon as a

backup is created for the first time.

Files Exported methods are stored in this directory.

The directory is created as soon as a method is

exported for the first time.

Only methods located in this directory can be

imported.

7.3 Lift settings (Lift)

Menu ► System ► Lift



Work position

The working height of the lift can be set to the desired value. This is carried out by directly operating the lift.

Three functions can be selected from the function bar with $[\Leftarrow]$ and $[\Rightarrow]$ 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 closed, the respective current lift position will be applied as **Work position**.

Input range	0 to 126 mm (Increment: 6)
Default value	60 mm

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

Adjusting the needle position

First move the lift to working height.

1 Opening the safety shield

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

7 System settings

2 Loosening the nut

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

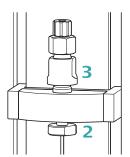


Figure 15 Adjusting the needle

3 Adjusting 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 Tightening the nut

Using the wrench, fasten the nut again.

5 Closing the safety shield

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

7.4 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

7.5 Instrument diagnosis

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.

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

7.5 Instrument diagnosis

7.5.1 Loading program versions and language files

Menu ► System ► Diagnosis

New program versions or language files can be loaded from a USB flash drive. The corresponding file must be saved on the USB flash drive in the following directory:

- Program file
 - Up to and including program version **5.863.0026**:
 Directory **863**
 - Starting with program version 5.863.0030:
 Directory 863 ➤ SwUpdates
- Language file
 - Up to and including program version **5.863.0026**:
 Directory **863**
 - Starting with program version **5.863.0030**:
 All available languages are installed on the device. No additional languages can be installed.

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

Program files

Program files are device-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

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

5848xxxxYY.bin where

7 System settings

xxxx = Version number

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

Loading a file

Proceed as follows:

1 Connecting the USB flash drive

- Plug in the USB flash drive with the 6.2151.100 adapter (USB MINI (OTG) - USB A) at the instrument's USB port.
- Switch on the instrument.

2 Opening the update dialog

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



3 Opening the file selection

Press [OK].

The selection list with the program and language files present on the USB flash drive opens.

4 Selecting the file

- Use the arrow keys to select the required file.
- Press [OK].

5 Starting the update

Press [START].

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

7.5 Instrument diagnosis

7.5.2 Diagnosis functions

The electronic and mechanical functional groups of Metrohm devices can and should be checked by specialist personnel from Metrohm as part of a regular maintenance schedule. Please ask your regional Metrohm representative regarding the precise terms and conditions involved in concluding a corresponding maintenance agreement.

8 Parameters

8 Parameters

8.1 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.

Input range	0 to 999 s
Default value	120 s

Air gap pump time

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

Input range	0 to 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.

Input range	-7 to 7	
Default value	3	

8.2 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.

Input range	0 to 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.

Input range	-7 to 7		
Default value	3		

8.3 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.

Input range	0 to 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.

Input range	-7 to 7	
Default value	3	

8.4 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.

Input range	0 to 999 s	
Default value	120 s	

8 Parameters

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.

8.5 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.

Input range	0 to 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.

8.6 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.

Input range	0 to 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.

Input range	-7 to 7	
Default value	3	

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9 Operation and maintenance

9.1 Peristaltic pump

9.1.1 Operation

The flow rate of the peristaltic pump depends on the drive speed, the contact pressure and, above all, the inner diameter of the pump tubing. Depending on the application, different pump tubing is used.



CAUTION

The service life of the pump tubings also depends on the contact pressure . Therefore, lift the tubing cartridges by loosening the snap-action lever if the peristaltic pump is to be switched off for a longer period. This ensures that the contact pressure will be maintained once it has been set.



CAUTION

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

9.1.2 Pump tubings

Pump tubings used for the peristaltic pump are consumables with a limited lifetime.

LFL pump tubings with three stoppers are inserted into the tubing cartridge in such a way that the cartridge is located between two stoppers. This results in two possible positions for the tubing cartridge. If the pump tubing was to show pronounced signs of wear, you can insert it a second time in the other position.

Replace the pump tubings periodically, approx. every four weeks if used continuously.

Pump tubing selection

Pump tubing can differ in terms of material, diameter and thus flow rate. Different pump tubing is used depending on the application.

The following table shows the properties and areas of application of the pump tubings:

9.1 Peristaltic pump

Table 2 Pump tubings

Order number	Name	Material	Inner diameter	Use
6.1826.020	Pump tubing (blue/ blue), 2 stoppers	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 stoppers	PVC (Tygon [®])	0.38 mm	Pump tubing for bromate determination using the triiodide method.
6.1826.320	Pump tubing LFL (orange/yellow), 3 stoppers	PVC (Tygon [®])	0.48 mm	For acceptor solutions for Inline Dialysis and for Inline Ultrafiltration.
6.1826.330	Pump tubing LFL (orange/white), 3 stoppers	PVC (Tygon [®])	0.64 mm	No special applications.
6.1826.340	Pump tubing LFL (black/black), 3 stop- pers	PVC (Tygon [®])	0.76 mm	For sample solution in Inline Dialysis.
6.1826.360	Pump tubing LFL (white/white), 3 stop- pers	PVC (Tygon [®])	1.02 mm	For sample transfer.
6.1826.380	Pump tubing LFL (gray/gray), 3 stoppers	PVC (Tygon®)	1.25 mm	For Inline Dilution.
6.1826.390	Pump tubing LFL (yellow/yellow), 3 stoppers	PVC (Tygon®)	1.37 mm	For sample solution in Inline Ultrafiltration.

10 Troubleshooting

10 Troubleshooting

10.1 Problems and their solutions

Problem	Cause	Remedy	
The peristaltic pump is pumping too little.	Peristaltic pump – Contact pressure too weak.	Correctly set the contact pressure (see "Set the contact pressure", page 20).	
	Peristaltic pump – Pump tubing defective.	Replace the pump tubing (see figure 6, page 18).	

11.1 Remote interface

11 Appendix

11.1 Remote interface

11.1.1 Pin assignment of the remote interface

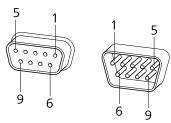


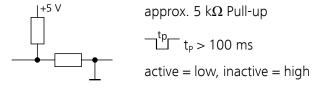
Figure 16 Pin assignment of remote socket and remote plug

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

Table 3 Inputs and outputs of the remote interface

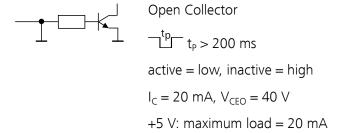
Pin no.	Assignment	Function
1	Output 0	Ready
2	Output 1	
3	Output 2	
4	Output 3	
5	Output 4	Error
6	0 volt (GND)	
7	+5 volt	
8	Input 0	Start/Continue
9	Input 1	Stop

Inputs



11 Appendix

Outputs



11.1.2 Status diagram of the remote interface

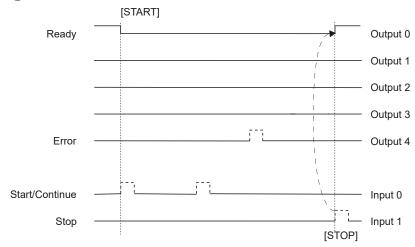


Figure 17 Remote status diagram

11.2 USB devices



NOTE

USB peripheral devices that are to be connected must support either the *USB 1.0/1.1 (Full Speed)* or the *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.

11.2 USB devices

11.2.1 6.2147.000 numerical USB keypad

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

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

Table 4 Key assignment

Key of the 863 Compact Auto- sampler or function in the editing dialog	Key on the numerical USB keypad
[BACK]	[Home]
[4][4]	[↑] [↓]
[⇔][⇒]	[←] [→]
[OK]	[Enter]
[+-]	[BS] (backspace)
Clear	[Del]
Accept	[Home]

11.2.2 **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.

11 Appendix

11.3 System initialization

In very rare instances, a faulty file system (e.g. because of a program crash) may lead to an impairment of program functioning. The internal file system must 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 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 the system initialization:

1 Switching 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 Switching 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.

System reset request detected. >> Press [BACK] key twice to confirm ! >> Time remaining: 8 sec

11.3 System initialization

3 Confirming the initialization



NOTE

If the request is not confirmed within 8 s, then the procedure will be canceled.

• Press [BACK] twice.

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

12 Technical specifications

12 Technical specifications

12.1 Lift

Stroke path 132 mm

Maximum load 5 N

Lift rate 15 mm/s (typical)

12.2 Turntable

Rack positions 36

Maximum load 17 N

Turntable speed 13 degrees/s (typical)

12.3 Peristaltic pump

Speed 0 - 42 rpm

Adjustable in 7 levels with 6 rpm each

Rotation direction Clockwise/counterclockwise

Typical flow rate Typical flow rate Typical flow rate depends on the contact pressure and the type of

tubing.

with 0.3 mL/min at 18 rpm

6.1826.320

with 16 mL/min at 42 rpm

6.1826.150

with 3.3 mL/min at 18 rpm

6.1826.020

Tubing material Recommended: Tygon Long Flex Life

12.4 Interfaces and connectors

12.4 Interfaces and connectors

USB (OTG) connec-

For connecting USB devices or PCs.

tor

Remote connector For connecting instruments with a remote interface.

12.5 Power connection

Voltage $100-240 \text{ V} \pm 10\%$

Frequency $50-60 \text{ Hz} \pm 3 \%$

Power consump-

45 W

tion

Fuse 1.0 ATH

12.6 Ambient conditions

Nominal function +5 to +45 °C

range at max. 80% relative humidity, non-condensing

Storage +5 to +45 °C

at max. 80% relative humidity, non-condensing max. 2,000 m above sea level / min. 800 mbar

Altitude / Pressure

range

Overvoltage cate-

gory

Pollution degree 2

12.7 Reference conditions

Ambient temp-

+25 °C (±3 °C)

erature

Relative moisture ≤ 60%

68 ------ 863 Compact Autosampler

-----12 Technical specifications

Dimensions 12.8

Width 0.26 m Height 0.47 m Depth 0.43 m

Weight (without

accessories)

Material

Lower part: Crastin PBT Housing

9.82 kg

Lift: Metal, surface-treated

Rack PVC

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