

2.861.0500 Advanced Compact IC Column Heating



Ion analysis

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2.861.0500
Advanced Compact IC Column Heating

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1st Edition 2005

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Although all the information given in these instructions has been checked with great care, errors cannot be entirely excluded. Should you notice any mistakes please inform the author at the address given above

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1 Introduction

1.1 Instrument description

The **2.861.0500 Advanced Compact IC Column Heating** is used to control the temperature of the separating column. The column is built into the column heating and brought to the required temperature within a few minutes.

The 2.861.0500 Advanced Compact IC Column Heating has been specially designed for connection to the 861 Advanced Compact IC. It consists of

- **1.820.0500 Column heating** – the interior of the column heating can be thermostatted. The column is built into the column heating. A holder is used to attach the column heating to the inside wall of the 861 Advanced Compact IC.
- **6.2057.060 Holder** – the holder can be slid into the mounting rails of the 861 Advanced Compact IC. The column heating is then magnetically attached to the holder.
- **1.861.0500 Controller** – the controller controls the column heating and provides it with current. It is itself controlled by the «**IC Net**» PC software, and provided with current by an external power supply.
- **6.2152.010 Power supply** – the controller is connected to the external power supply. It provides current to the controller and column heating.

A controller carries out the **control** of the **column heating**. The «**IC Net**» control and evaluation program is used to control the temperature inside the column heating.

The 2.861.0500 Advanced Compact IC Column Heating can also be used with a **modular system**.

1.2 Parts and controls



In this section you will find the numbers and designations of the parts and controls of the 2.861.0500 Advanced Compact IC Column Heating. The numbering applies throughout the instructions for use, i.e. bold numbers in the text (e.g. **3**) refer to the parts and controls illustrated here.

1.2.1 Column Heating 1.820.0500

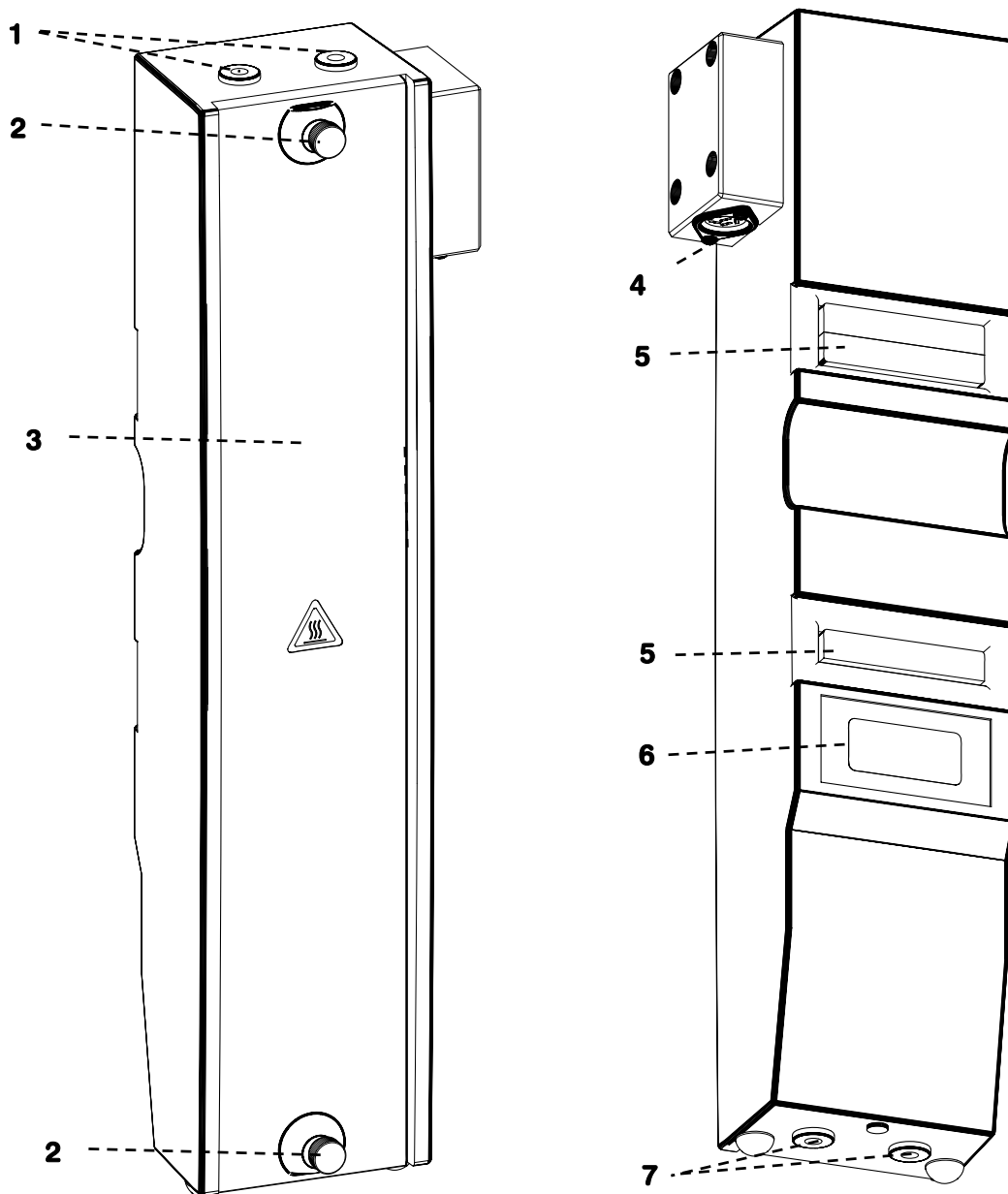


Figure 1: Column heating closed

1 Feedthrough

for the capillary from the separating column to detector

2 Knurled screw

for fastening the heater cover **3**

3 Cover of column heating

4 Electric connection

for connecting the column heating to the controller with 6.2108.150 Cable

5 Magnetic holder

for attaching the column heating to holder **18**

6 Model plate with serial number

7 Feedthrough

for column inlet capillary

1.2.2 1.861.0500 Controller

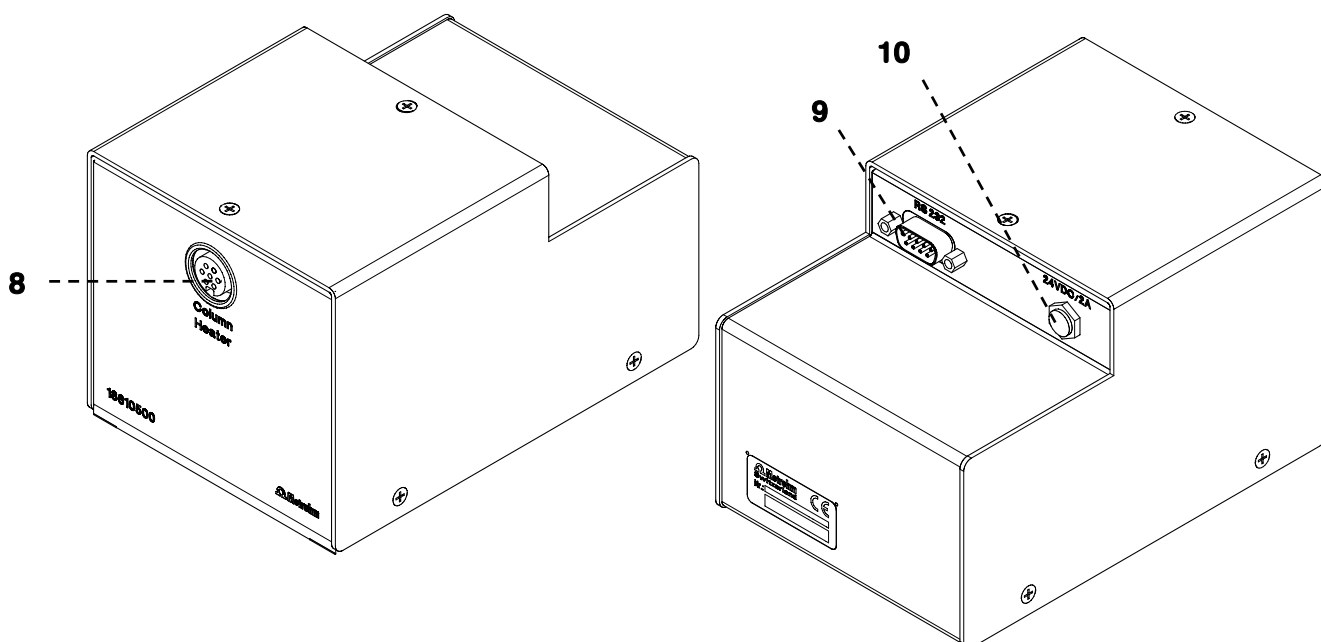


Figure 2: Controller

8 Connection for column heating

connection for 6.2108.150 Cable

9 RS232 connection

connection for 6.2134.040 Cable to COM interface of PC

10 Connection "24VDC/2A"

connection to external power supply

1.3 Information on the Instructions for Use



Please read through these Instructions for Use carefully before you put the 2.861.0500 Advanced Compact IC Column Heating into operation. The Instructions for Use contain information and warnings to which the user must pay attention in order to assure safe operation of the instrument.

1.3.1 Organization

These **Instructions for Use 8.861.1013** for the 2.861.0500 Advanced Compact IC Column Heating provide a comprehensive overview of installation, startup procedure, operation, fault rectification and technical specifications of this instrument. The Instructions for Use are organized as follows:

Section 1 Introduction

General description of instrument, parts and controls and safety notes.

Section 2 Installation

Mains connection, connection to PC, installation of the column.

Section 3 Operation

Control.





Section 4 Appendix

Technical data, standard equipment, validation, warranty and declaration of conformity.

In order to find the information you require about the 2.861.0500 Advanced Compact IC Column Heating you should use the **Contents**.

1.3.2 Notation and pictograms

The following notation and pictograms (symbols) are used in these Instructions:

8	Part or control
	<p>Danger/Warning This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components by electric current.</p>
	<p>Danger/Warning This symbol indicates a possible risk of death or injury to the user and possible damage to the instrument or its components.</p>
	<p>Attention This symbol indicates important information that you should read before continuing.</p>
	<p>Information This symbol indicates additional information and tips which may be of particular use to you.</p>

1.4 Safety information

1.4.1 Electrical safety

Electrical safety when handling the 853 CO₂ Suppressor is guaranteed within the scope of Standard IEC 1010-1 (protection class III). The following points must be observed:

- **Mains connection**



The **mains connection** must be made in accordance with the instructions given in Section 2.1.

- **Opening the controller or power supply**

Neither the controller nor the external power supply contain any parts that need to be adjusted or set by the user.



The controller and external power supply should only be opened by specialists from Metrohm. If they are connected to the mains they must not be opened, nor should any parts be removed from them, otherwise there is a risk of coming into contact with current-carrying components. Always unplug the instrument from all power sources before opening it!

- **Protection against electrostatic charges**



Electronic components are sensitive to electrostatic charges and could be destroyed by discharges. Before you touch any components inside the controller you must ground yourself and your tools by grasping a grounded object (e.g. instrument housing or radiator) to eliminate any electrostatic charge that may be present.

1.4.2 General safety rules

- **Solvent handling**



Check the pump tubing and inlet and outlet connections for leaks at regular intervals. Observe the relevant regulations when handling and disposing of flammable and/or toxic solutions.

2 Installation

2.1 Mains connection

The controller and column heating are provided with a voltage of 24 V by the external power supply (6.2152.010).

1 Connection controller – power supply

- Connect the cable of the external power supply (6.2152.010) to connection "**24VDC/2A**" **10** of the controller.

2 Mains connection

- Plug the mains cable into the mains connection of the external power supply (6.2152.010) and connect it to the mains (100-240 V).



Do not use a different external power supply than the delivered 6.2152.010.

Mains cable

The instrument is supplied with one of the following mains cables

- 6.2122.020 with SEV 12 plug (Switzerland, ...)
- 6.2122.040 with CEE(7), VII plug (Germany, ...)
- 6.2133.070 with NEMA 5-15 plug (USA, ...)

which has three wires and is fitted with a plug with a grounding pin. If a different plug has to be used then the yellow/green wire (IEC standard) must be connected to the grounding pin (Protection class I).



Make sure that the power supply is always in a dry location. Protect it against direct contact with liquids.

2.2 Connection to PC

The controller is connected to an RS232 interface of the PC. Use the 6.2134.040 Cable for connecting RS232 connection **9** of the controller to a COM interface on the PC.



If you want to include the 2.861.0500 Advanced Compact IC Column Heating in a modular system then the controller can also be connected to a COM interface on the 830 IC Interface instead of directly to the PC.

2.3 Inclusion in the «IC Net» system

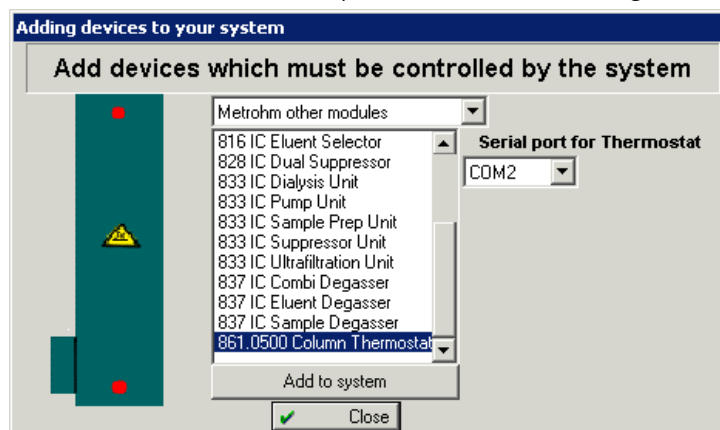
The 2.861.0500 Advanced Compact IC Column Heating must be included in your system before it can be controlled by «IC Net». Proceed as follows:

1 Open the system

- Start the «IC Net» software.
- Open the system in which you would like to include the column heating.

2 Insert column heating

- Open via **Setup / New devices / Install new device...** the **ADDING DEVICES TO YOUR SYSTEM** window.
- In the upper selection list select **Metrohm other modules**.
- Select **861.0500 Column Thermostat** from the list.
- Select the **Serial port for Thermostat** to which you have connected the Advanced Compact IC Column Heating.



- Click on **<Add to system>**. The icon of the 2.861.0500 Advanced Compact IC Column Heating will be included in your system.
- Now close the **ADDING DEVICES TO YOUR SYSTEM** window with **<Close>**.

2.4 Installing the separating column

2.4.1 Column heating exploded view

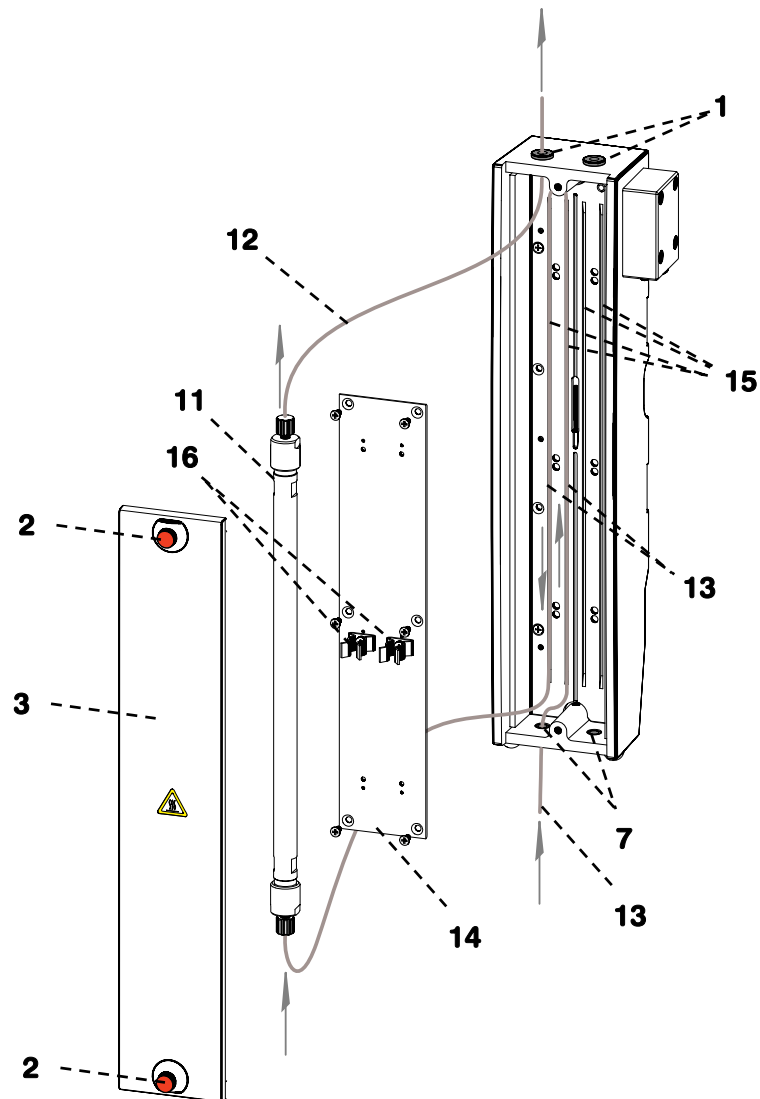


Figure 3: Column heating exploded view

1 Feedthrough

for the capillary from the separating column to detector

2 Knurled screw

for fastening the heater cover **3**

3 Cover of column heating

7 Feedthrough

for the column inlet capillary

11 Separating column

12 Column outlet capillary

to detector, 6.1831.010 PEEK capillary

13 Column inlet capillary

to injection valve, 6.1831.010 PEEK capillary

14 Holder plate

for separating column

15 Capillary prewarming

for column connection capillary **13**

16 Clip holder for column

2.4.2 Installation with PEEK capillaries

Two channels each containing two separating columns can be mounted in the column heating. To connect a column in the column heating using PEEK capillaries proceed as follows:

1 Open column heating

- Loosen knurled screws **2** and remove cover **3** from the column heating.

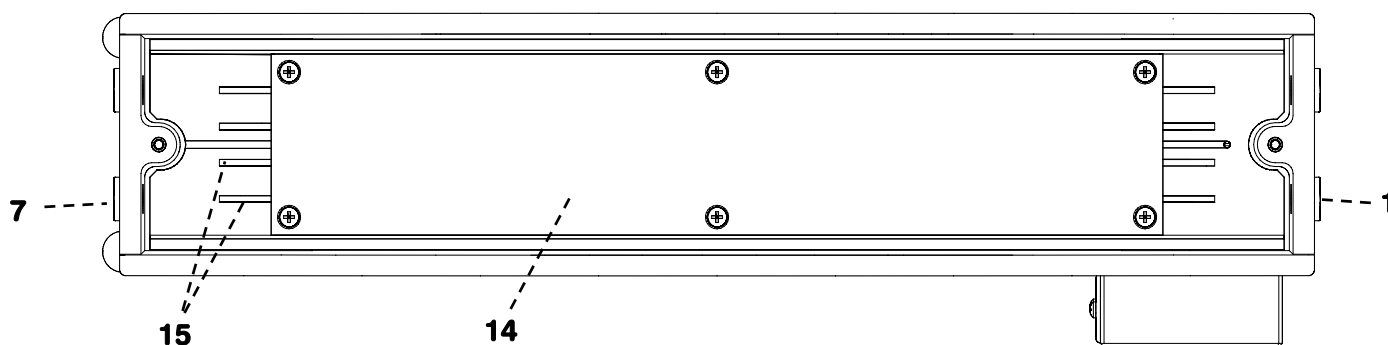


Figure 4: Column heating without cover

2 Insert column inlet capillary

- Lead column inlet capillary **13** into the column heating through feedthrough **7**.
- Push column inlet capillary **13** into the outer one of the two capillary prewarming slots **15** of the channel you have selected. Push column inlet capillary **13** under holder plate **14** until it appears at the other end.
- Now bend column inlet capillary **13** and push it through the inner capillary prewarming slot **15** alongside until it appears at the other end.

3 Insert column outlet capillary

- Lead column outlet capillary **12** into the column heating through feedthrough **1**.

4 Connect separating column

- Connect column inlet capillary **13** column outlet capillary **12** to column **11** using PEEK compression fittings 6.2744.010 (long) or 6.2744.070 (short).
- Click column **11** into clip holder **16**.



If a 250 mm separating column is to be used in combination with a precolumn then S-Guard precolumns, which have been specially developed for this purpose, can be used. In this way both column and pre-column find space within the column heating.

2.4.3 Installation with metal capillaries

To connect a column in the column heating using metal capillaries proceed as follows:

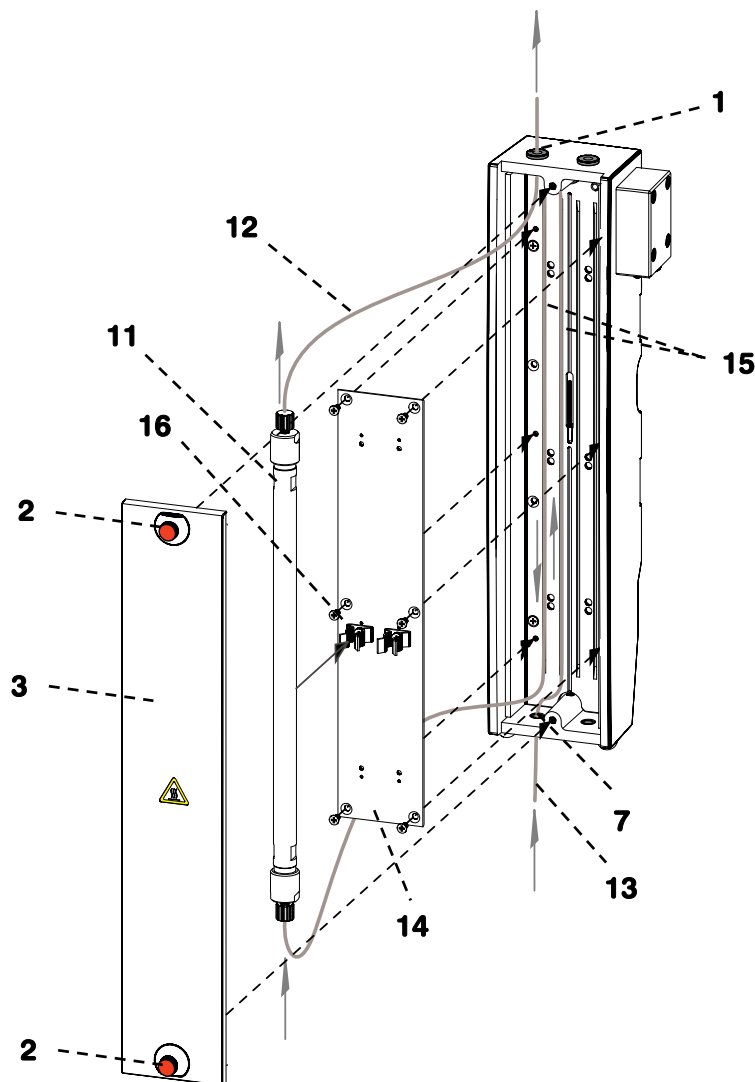


Figure 5: Connecting the separating column and removing the holder plate

1 Open column heating

- Loosen knurled screws **2** and remove cover **3** from the column heating.

2 Prepare column heating

- Loosen the six screws on holder plate **14** and remove the holder plate from the column heating.
- Lead column inlet capillary **13** into the column heating through feedthrough **7** and insert it in capillary prewarming slot **15** as shown in *Figure 5*.
- Then refasten holder plate **14** with the six screws.
- Lead column outlet capillary **12** out through feedthrough **1**.

3 Insert separating column

- Press column **11** into clip holder **16**.
- Attach column inlet capillary **13** to the inlet of the column (bottom) with a compression fitting.
- Attach column outlet capillary **12** (to detector) to the outlet of the column (top) with a compression fitting.

4 Close cover

- Reattach cover **3** to the column heating using knurled screws **2**.

2.4.4 Installation in the 861 Advanced Compact IC

The 6.2057.060 Holder is provided for attaching the column heating to the 861 Advanced Compact IC. Proceed as follows:

1 Insert holder

- Slide holder **18** into the top left mounting rail of the 861 Advanced Compact IC.

2 Attach column heating

- Column heating **17** can now be attached magnetically to holder **18** (see *Figure 6*).



*If you want to include the 2.861.0500 Advanced Compact IC Column Heating in a modular system you can attach the 1.820.0500 Column Heating to the corresponding counterpieces on the left-hand inner side of the 820 IC Separation Center with magnetic holders **5**.*

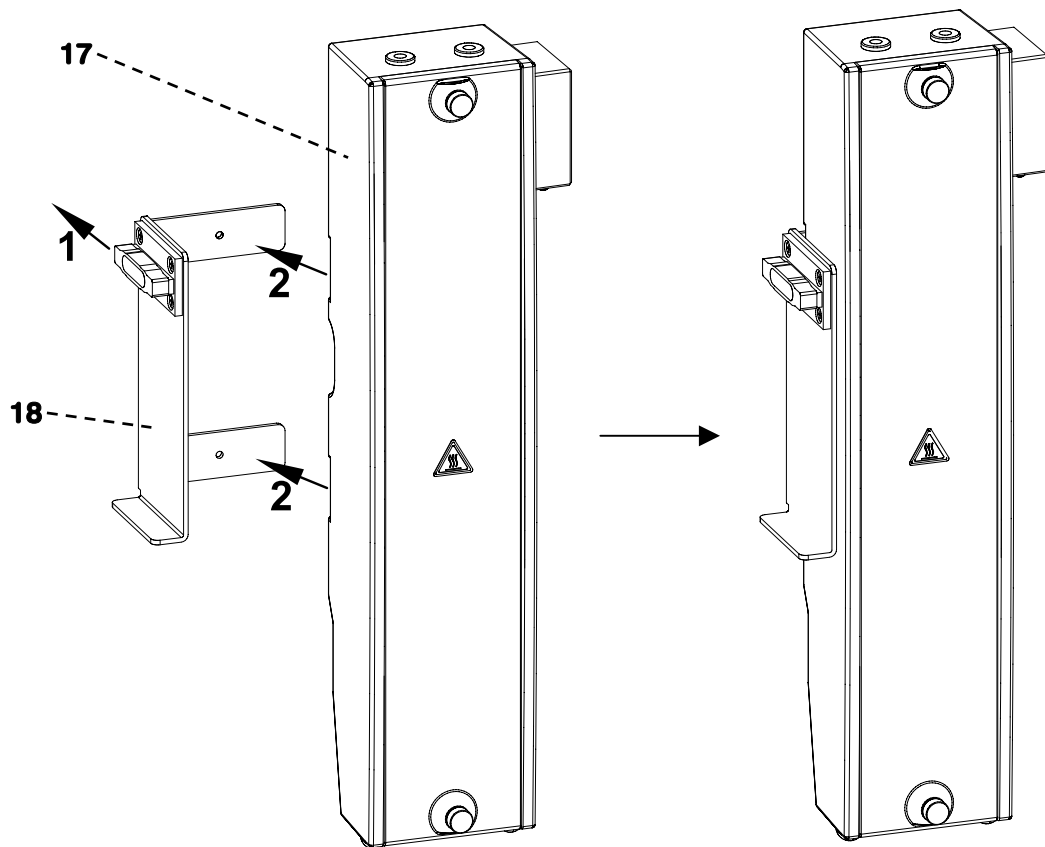


Figure 6: Attaching column heating with holder

17 1.820.0500 Column Heating

18 Holder
for attaching column heating **17**

2.4.5 Connection to controller

The column heating is connected to the controller with the 6.2108.150 Cable. If there is no longer adequate space for the controller within the 861 Advanced Compact IC (e.g. if an 853 CO₂ Suppressor is being used), it can also be placed outside the Compact IC.

If the controller is to be placed inside the Compact IC (beside the detector block):

1 Remove rear panel from 861

- Remove the rear panel of the 861 Advanced Compact IC.

2 Insert controller

- Place the controller inside the 861 Advanced Compact beside the detector block.

3 Connect column heating to controller

- Use the 6.2108.150 Cable to connect the "Connection for column heating" **8** of the controller to "electric connection" **4** of the column heating.

4 Connect column heating to controller

- Replace the rear panel of the 861 Advanced Compact IC. Lead the 6.2134.040 Cable (for connection to PC) and the cable to the power supply through the opening in the rear panel.

If the controller is to be placed outside the Compact IC:

1 Remove rear panel from 861

- Remove the rear panel of the 861 Advanced Compact IC.

2 Connect column heating to controller

- Use the 6.2108.150 Cable to connect the "Connection for column heating" **8** of the controller to "electric connection" **4** of the column heating. Lead the 6.2108.150 Cable out through the rear panel of the 861 Compact Advanced IC.

3 Connect column heating to controller

- Replace the rear panel of the 861 Advanced Compact IC.



If you want to include the 2.861.0500 Advanced Compact IC Column Heating in a modular system the controller can be placed inside or outside the 820 IC Separation Center.

3 Operation

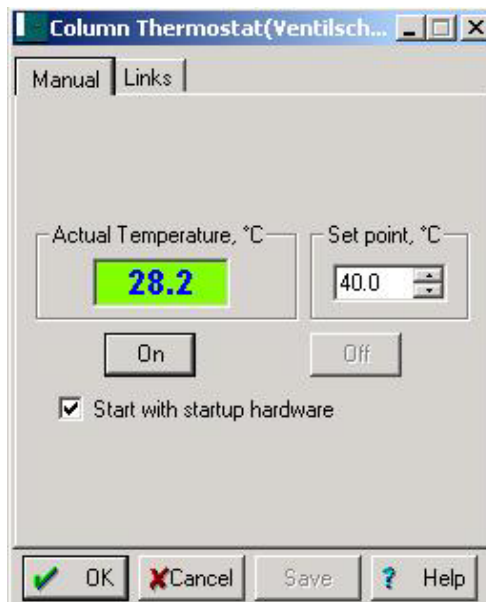


This Section describes only the most important points concerning the operation of the 2.861.0500 Advanced Compact IC Column Heating. For further details please refer to the «IC Net» Instructions for Use and to the on-line help in the PC program.

In the system window double-click on the icon of the 2.861.0500 Advanced Compact IC Column Heating (or via right-hand mouse key **open**):



The column heating control window opens:



Actual Temperature	Display of actual temperature within the column heater in °C.
Set point	Operating temperature of the thermostat within the column heater in °C. Selection: 10.0 ... 80.0.
<On>	Only active if the thermostat is off . Switch the thermostat of the column heater on , and apply the operating temperature specified under Set point, the button turns to <Set> .

<Set>	Only active if the thermostat is on and a new operating temperature is entered at Set point. Sets the new operating temperature.
<Off>	Only active if the thermostat is on. Switch the thermostat of the column heater off .

Start with startup hardware

Automatic start of thermostat with **startup hardware**.

Enabled

The temperature of the column heater is **monitored** by IC Net, an injection is triggered, if the set operating temperature of the column heater is reached.



The operating temperature is reached, when the actual temperature is within $\pm 1\text{ }^{\circ}\text{C}$ of the temperature set above.

Disabled

The temperature of the column heater is **not monitored** by IC Net. The proceeding of a determination or a queue is not affected if the set value is not reached.

4 Appendix

4.1 Technical data



Reference conditions: 25 °C (± 3 °C); > 30 min in operation

Temperature control

<i>Temperature range</i>	Ambient temperature +5°C...80°C, controllable in 0.1 °C steps.
<i>Accuracy</i>	± 0.5 °C
<i>Stability</i>	better than 0.05 °C
<i>Scanning time</i>	250 ms

Ambient temperature

<i>Nominal working range</i>	+5...+45 °C (at max. 85% rel. humidity)
<i>Storage</i>	-20...+65 °C
<i>Transport</i>	-20...+70 °C

Mains supply: 6.2152.010 Power supply

<i>Primary</i>	100...240 VAC / 0.8 A max.
<i>Secondary</i>	24 VDC / 1.5 A max. (3.5 W controller , 21 W heating)

Controller

<i>Power supply</i>	via 6.2152.010 Power supply 24 V DC / 2 A
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Ambient temperature

<i>Nominal working range</i>	+5...+45 °C (at max. 85% rel. humidity)
<i>Storage</i>	-40...+65 °C
<i>Transport</i>	-40...+70 °C

Safety specifications

<i>Construction / Testing</i>	IEC/EN 61010-1, CSA-C22.2 No. 61010-1 Protection class III
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Safety information

These Instructions for Use contain information and warnings that must be observed by the user in order to ensure the safe operation of the instrument.

Electromagnetic compatibility (EMC)*Emitted interference*

Standards met:
- IEC/EN 61326
- EN 55022
- CISPR 22

Immunity to interference

Standards met:
- EN/IEC 61326
- 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

1.861.0500 Controller dimensions*Controller 1.861.0500*

<i>Width</i>	98 mm
<i>Height</i>	94 mm
<i>Depth</i>	143 mm

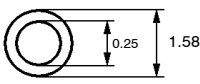
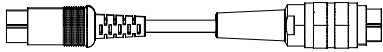
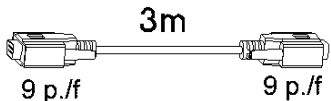
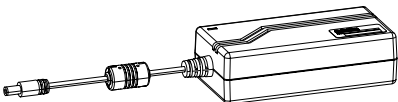
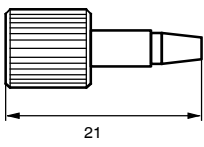
4.2 Standard equipment



Subject to changes!

4.2.1 2.861.0500 Column Heating for 861 Advanced Compact IC

The 2.861.0500 Advanced Compact IC Column Heating includes the following accessories:

Number	Order no.	Description
1	1.861.0500	Controller for 2.861.0500 Advanced Compact IC Column Heating
1	1.820.0500	IC Column Heating
1	6.1831.010	PEEK Capillary Length = 3 m
		
1	6.2057.060	Holder for 2.861.0500 Advanced Compact IC Column Heating
1	6.2108.150	Cable to Column Heating Length = 1.2 m
		
1	6.2134.040	Connection Cable RS 232 connection cable for connecting the controller
		
1	6.2152.010	Power Supply for column heating mains connection
		
1	6.2744.070	PEEK compression fitting-(short) for the connection of 6.1831.010 PEEK capillaries in cramped conditions, e.g. in the column heating, set of 5
		
1	8.861.1013	Instructions for Use (English) for 2.861.0500 Advanced Compact IC Column Heating

4.3 Warranty and Conformity

4.3.1 Warranty

The warranty on our products is limited to defects that are traceable to material, construction or manufacturing error which occur within 12 months from the day of delivery. In this case, the defects will be rectified in our workshops free of charge. Transport costs are to be paid by the customer.

For day and night operation, the warranty is limited to 6 months.

Glass breakage in the case of electrodes or other parts is not covered by the warranty. Checks which are not a result of material or manufacturing faults are also charged during the warranty period. For parts of outside manufacture insofar as these constitute an appreciable part of our instrument, the warranty stipulations of the manufacturer in question apply.

With the regard to the guarantee of accuracy, the technical specifications in the instruction manual are authoritative.

Concerning defects in material, construction or design as well as the absence of guaranteed features, the orderer has no rights or claims except those mentioned above.

If damage of the packaging is evident on receipt of a consignment or if the goods show signs of transport damage after unpacking, the carrier must be informed immediately and a written damage report demanded. Lack of an official damage report releases Metrohm from any liability to pay compensation.




If any instruments and parts have to be returned, the original packaging should be used if at all possible. This applies above all to instruments, electrodes, burette cylinders and PTFE pistons. Before embedment in wood shavings or similar material, the parts must be packed in a dust-proof package (for instruments, use of a plastic bag is imperative). If open assemblies are enclosed in the scope of delivery that are sensitive to electromagnetic voltages (e.g. data interfaces etc.) these must be returned in the associated original protective packaging (e.g. conductive protective bag). (Exception: assemblies with built-in voltage source belong in a non-conductive protective packaging).

No warranty responsibility whatsoever will be accepted by Metrohm for damage which arises as a result of non-compliance with these instructions.

4.3.2 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.

<i>Name of commodity</i>	2.861.0500 Advanced Compact IC Column Heating
<i>Name of manufacturer</i>	Metrohm Ltd., Herisau, Switzerland
<i>Description</i> The 2.861.0500 Advanced Compact IC Column Heating is used to regulate the temperature of the separation column.	
This instrument has been built and has undergone final type testing according to the standards:	
<i>Electromagnetic compatibility: Emission</i> EN/IEC 61326, EN 55022 / CISPR 22	
<i>Electromagnetic compatibility: Immunity</i> EN/IEC 61326, EN/IEC 61000-4-2, EN/IEC 61000-4-3, EN/IEC 61000-4-4, EN/IEC 61000-4-5, EN/IEC 61000-4-6, EN/IEC 61000-4-8, EN/IEC 61000-4-11, EN/IEC 61000-4-14, Namur	
<i>Safety specifications</i> EN/IEC/UL 61010-1, EN/IEC 61010-2-081, CSA-C22.2 No. 61010-1	
It has also been certified by ElectroSuisse, which is member of the International Certification Body (CB/IEC).	
 <i>The instrument meets the requirements of the CE mark as contained in the EU directives 89/336/EEC and 73/23/EEC and fulfils the following specifications:</i>	
EN 61326	Electrical equipment for measurement, control and laboratory use – EMC requirements
EN 61010-1	Safety requirements for electrical equipment for measurement, control and laboratory use
Metrohm Ltd. is holder of the SQS-certificate of the quality system ISO 9001 for quality assurance in design/development, production, installation and servicing.	
The system software, stored in Read Only Memories (ROMs) has been validated in connection with standard operating procedures in respect to functionality and performance.	
The technical specifications are documented in the instruction manual.	
Herisau, March 24, 2005	
 D. Strohm Vice President Head of R&D	 Ch. Buchmann Vice President Head of Production Responsible for Quality Assurance

4.3.3 Quality Management Principles

Metrohm Ltd., CH-9101 Herisau, Switzerland

 **Metrohm**
l o n a n a l y s i s
CH-9101 Herisau/Switzerland
E-Mail info@metrohm.com
Internet www.metrohm.com

Metrohm Ltd. holds the ISO 9001 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 quality system is described in Metrohm's QM Manual, which comprises detailed instructions on the following fields of activity:

Instrument development

The organization of the instrument design, its planning and the intermediate controls are fully documented and traceable. Laboratory testing accompanies all phases of instrument development.

Software development

Software development occurs in terms of the software life cycle. Tests are performed to detect programming errors and to assess the program's functionality in a laboratory environment.

Components

All components used in the Metrohm instruments have to satisfy the quality standards that are defined and implemented for our products. Suppliers of components are audited by Metrohm as the need arises.

Manufacture

The measures put into practice in the production of our instruments guarantee a constant quality standard. Production planning and manufacturing procedures, maintenance of production means and testing of components, intermediate and finished products are prescribed.

Customer support and service

Customer support involves all phases of instrument acquisition and use by the customer, i.e. consulting to define the adequate equipment for the analytical problem at hand, delivery of the equipment, user manuals, training, after-sales service and processing of customer complaints. The Metrohm service organization is equipped to support customers in implementing standards such as GLP, GMP, ISO 900X, in performing Operational Qualification and Performance Verification of the system components or in carrying out the System Validation for the quantitative determination of a substance in a given matrix.