

Analytics



DOUBLE BARREL OVEN BUNDLE

FOR THERMO FISHER FLEX ION SOURCE ES071 AND ES072

DBO-TF-FIS71 | DBO-TF-FIS72

OPERATORS MANUAL

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1 General information

1.1 Preface

Thank you for choosing this column oven, which has been specially developed for the simultaneous temperature control of two nano-ESI columns. With this innovative device, you will be able to increase the performance of your mass spectrometer, achieve more precise results and increase your analysis throughput.

These operating instructions have been carefully prepared to help you make optimum use of the column oven. It contains detailed information on the various functions, the recommended operating parameters and the necessary safety measures. Please take the time to read these instructions carefully to ensure efficient and safe operation of your column oven.

The column oven enables the simultaneous temperature control of two nano-ESI columns. By processing two samples in parallel, the oven significantly increases the utilization of your mass spectrometer and enables you to significantly improve the productivity and efficiency of your analysis processes.

Another advantage of the column oven is its ability to keep the column temperature precisely at a constant value. This enables reliable and reproducible results.

These operating instructions contain all the essential information you need to operate the appliance safely and effectively. If you have any questions or uncertainties, please do not hesitate to contact our customer service department.

We wish you every success with your analytical investigations and hope that this device will provide you with valuable findings and results.

Yours sincerely,

Christof Völkle
CEO, Sonation GmbH.

1.2 Disclaimer

The operating instructions contain all relevant information about your product. However, due to product variations, your product may not be equipped with all the functions described here. Use the operating instructions supplied with the product. Sonation accepts no responsibility or liability for damage resulting from the use or utilization of the product that does not correspond to the intended use or is explicitly defined as foreseeable misuse.

1.3 Copyright notice

This document is the intellectual property of Sonation GmbH. This document and all its contents are protected by copyright. They may not be copied, modified, reproduced or published in whole or in part without the prior written consent of Sonation.

The information and technical data in this document are subject to change without notice.

1.4 About these instructions

These operating instructions are a document from Sonation GmbH. The product specified on the title page is described in its function. In addition, you will receive the most important information for the safe use of this device.



IMPORTANT

- Read carefully before use.
- Keep for future reference.

2 Safety instructions

2.1 General (product-independent) safety instructions

- Please read these operating instructions carefully before using the product. It contains important notes on Installation and usage.
- The user manual is part of the product. Keep it in a safe place. If the product is sold, rented or passed on in any other way, the user manual must be included.
- Heed all warnings. These point out dangers and give recommendations for accident prevention.
- Only install and operate the unit in locations expressly recommended by the manufacturer.
- If there is a risk of condensation forming after unpacking, an acclimatization period of at least 2 hours must be waited for.

2.2 Product-specific safety instructions and intended use



DANGER!

The applied high voltage must not exceed 7.5 kV DC and the current must be limited to 100 μ A. The total capacitance of the high voltage path must not exceed 5nF.

When operating the Sonation column oven in accordance with these operating instructions, using the internal high voltage source of a Thermo Fisher mass spectrometer and using commercially available columns, unions, fittings and emitters, it can be assumed that these values are complied with.



DANGER!

The power supply unit supplied is operated at mains voltage.

If the power supply unit is dropped, visibly damaged or malfunctions, the oven must be taken out of operation immediately and the power supply unit must be replaced.

- The oven is exclusively designed for the heating and tempering of separation columns in nano-ESI applications.
- The oven must be installed as described in this manual.
- The fan must be able to turn free and may not be blocked.
- No non-heat-resistant materials may be used inside the oven, with the exception of our enclosed cable flags. These are designed for temperatures from -30° C to +120° C.
- The oven is constructed as technical work equipment and not intended for private use.
- The device may only be used in clean and dry rooms.
- The limit values for temperature and humidity during transportation, storage and operation specified under 9 „Technical data“ on page 20 must not be exceeded.
- The oven must not be used in potentially explosive atmospheres, especially in areas enriched with oxygen, combustible anesthetics (class AP) or combustible anesthetics with oxidizing agents (class APG).
- The column oven may only be operated with the components supplied. In particular the oven regulator, power supply unit, connection cable and Y-holder.
- The mains cable serves as the mains disconnecting device. This must be easily accessible at all times.
- High voltage may only be applied to the high-voltage selector switch if all of the following points are permanently fulfilled:
 - The high-voltage selector switch is connected to the supplied regulator via the supplied control cable.
 - The column oven is connected to the supplied regulator via the supplied cable.
 - The regulator is connected to the power supply unit supplied.
 - The power supply unit is connected to a properly earthed socket outlet with a protective earth conductor.
 - The applied high voltage must not exceed the values specified in the technical specifications (chapter 9).

- The oven must be kept away from easily inflammable and combustible liquids.
- If a liquid should penetrate the electrical part of the oven or regulator it is to be set immediately out of operation and must be checked by a specialist.
- Use the oven only within the specifications specified in this manual.
- The valid accident guarding regulations according to each country must be considered.
- If parts are damaged, the appliance must no longer be operated. The damaged parts must be repaired professionally or replaced with original spare parts. Damage includes, for example, cracks or fractures in housing parts, damaged insulation. Loose or missing screws. Bent or missing connector pins.
- The device may only be repaired by a specialist.

2.3 Non-intended use

- A non-intended use is given when the equipment is treated in any way that is contrary to any of the points from the chapter 2.2 „Intended use“ on page 5.
- If the oven is not used as intended, handled improperly and used, assembled or handled by untrained personnel, hazards may arise for personnel from the oven.

2.4 Target group

These operating instructions are intended for persons who are involved in the following activities with the product and have appropriate technical training or have received appropriate training:

- Transportation
- Installation
- Operation
- Decommissioning

Persons under the influence of narcotics or medication that impair the operation of machines must not perform any actions on the devices described in these instructions. This also applies to private individuals and children.

Misuse will invalidate any liability and warranty claims

2.5 Examples of foreseeable misuse

- Operation outside the specified ambient conditions.
- Operation by unqualified persons.
- Operation under the influence of narcotics or medications that impair the operation of machines.

2.6 Risk levels

If dangers may arise when carrying out the steps described, appropriate warning notices will indicate this. The warnings are divided into 4 classes, which are described below:

These different degrees of risk are used to illustrate the level of hazard.

High risk level



DANGER!

This signal word indicates a hazard with a high degree of risk which, if not avoided, will result in death or serious injury.

Medium risk level



WARNING!

This signal word indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Low risk level



CAUTION!

This signal word indicates a hazard with a low level of risk which, if not avoided, may result in minor or moderate injury.

Information



INFORMATION

This signal word indicates a condition which, if not avoided, can lead to undesirable behavior without further danger.

3 Product description

3.1 Scope of delivery

Depending on the Thermo Fisher Flex Ion Source used, special mounting kits are required.

The DBO-TF-FIS71 bundle is used for the Thermo Fisher Flex Ion Source ES071. The DBO-TF-FIS72 is required for the Thermo Fisher Flex Ion Source ES072.

DBO-TF-FIS

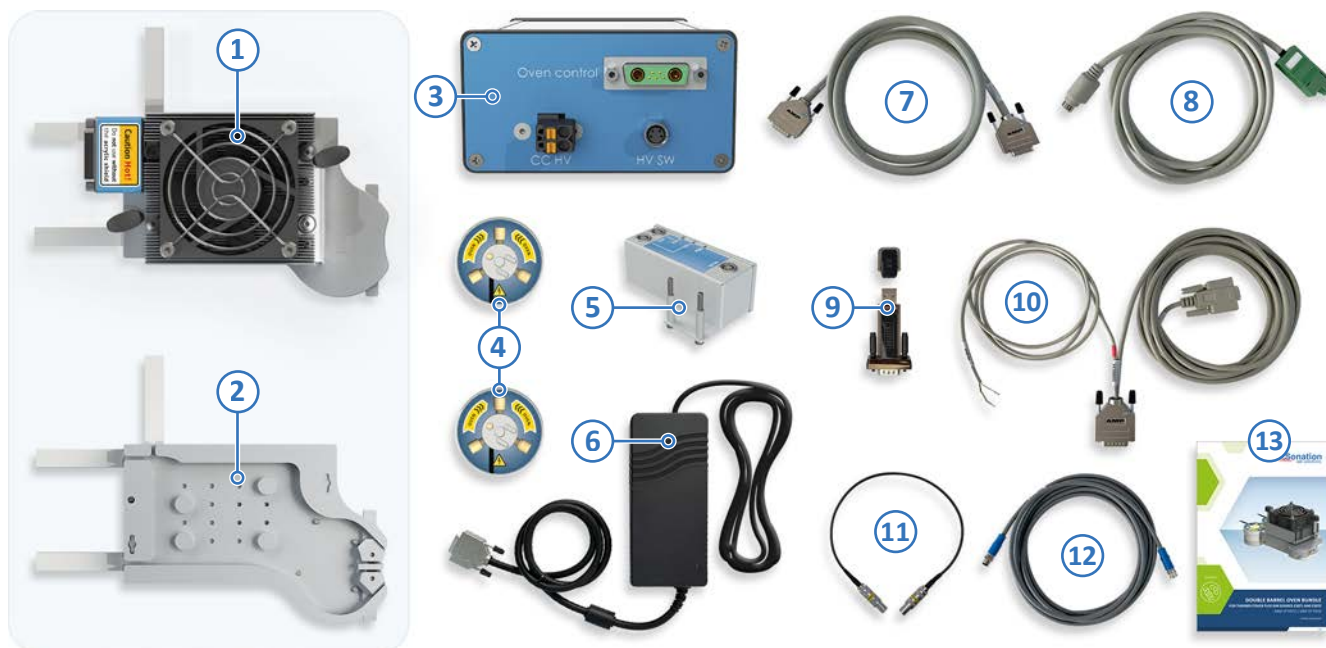


Fig. 1: Scope of delivery

1 x **Oven DBO-OVN** – consisting of:

- ① Top part
- ② Bottom part Including M5 screw and nut for mounting on the source and 4 x column pins (pre-assembled)

③ 1 x **Regulator DBO-REG** (004.002.01)

- + 1x plug for CC HV changeover (Plugged in to the „CC HV“ socket)

④ 2 x **Y-holder** (in extra box with quick guide)(004.800.01)

- Y-holder upper section with permanently attached HV cable and affixed label
- Y-holder lower section
- Sticker sheet for column labeling

⑤ 1 x **HV-Switch** incl. screws and sleeves (attached to HV-Switch when shipped) DBO-HVS (004.003.01)

⑥ 1 x **power supply unit** 24V >=200W incl. power cable (country-specific) (004.802.02)

⑦ 1 x **connection cable oven - regulator** (004.801.03)

⑧ 1 x **data cable HPLC - regulator** (004.801.02)

⑨ 1 x **USB-Serial Converter**

⑩ 1 x **data cable regulator - PC** (004.902.01)

⑪ 1 x **HV cable source - HV-Switch** (004.801.04)

⑫ 1 x **data cable regulator - HV-Switch**

⑬ 1 x **Manual**

Mounting Kit for Thermo Fisher Flex Ion Source ES071

(Only included with the DBO-TF-FIS71 bundle)

Allows the oven to be mounted on a Thermo Fisher Flex Ion Source ES071. Consists of:



Fig. 2: Mounting kit ES071

Mounting Kit for Thermo Fisher Flex Ion Source ES072

(Only included with the DBO-TF-FIS72 bundle)

Allows the oven to be mounted on a Thermo Fisher Flex Ion Source ES072. Consists of:

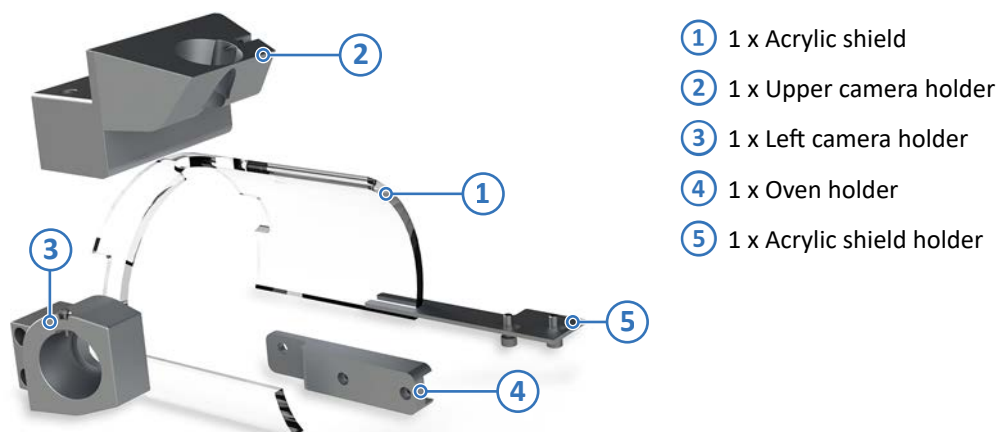


Fig. 3: Mounting kit ES072

3.2 Overview

The double barrel oven DBO-TF-FIS allows the parallel usage of two independent analytical columns. As loading, equilibration and washing steps can be alternated, the utilization and throughput of the mass spectrometer can be significantly increased.

Column Oven DBO-OVN (upper and lower part) with mounted Y-holders

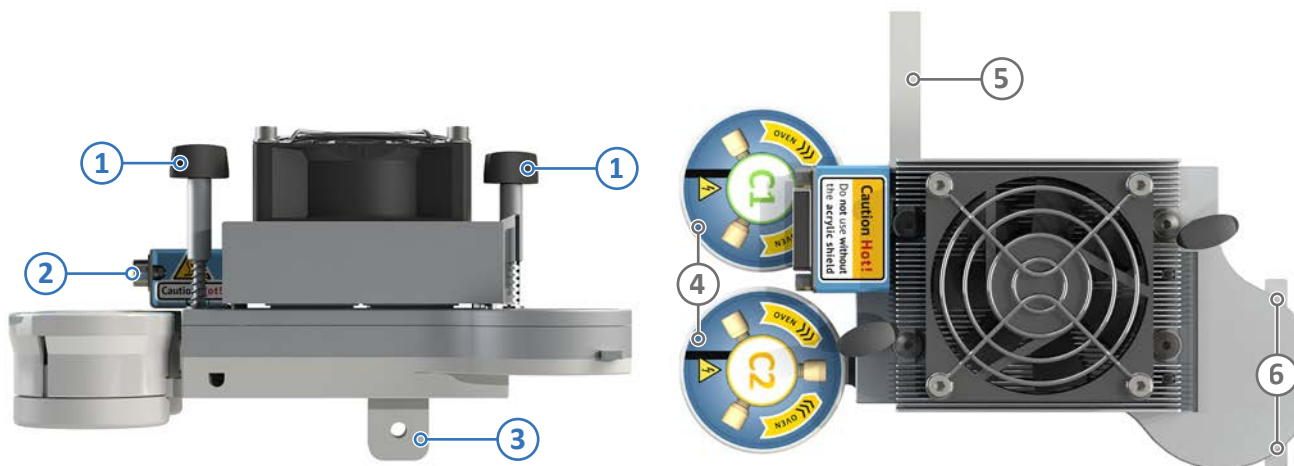


Fig. 4: Column Oven (top and bottom part)

- ① Locking bars
- ② Receptacle for oven control cable
- ③ Mounting bar
- ④ Y-holder on slide rails
- ⑤ Lateral sliding rail
- ⑥ Column clamp handles

Regulator DBO-REG

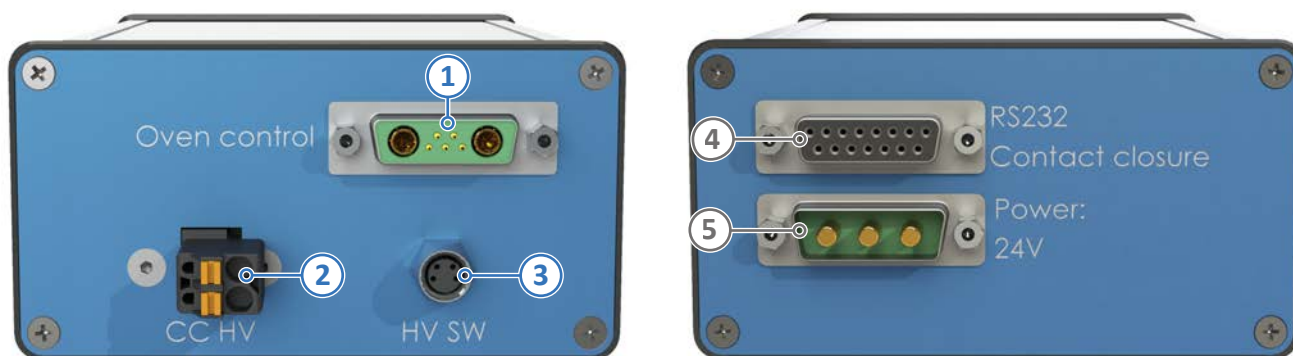
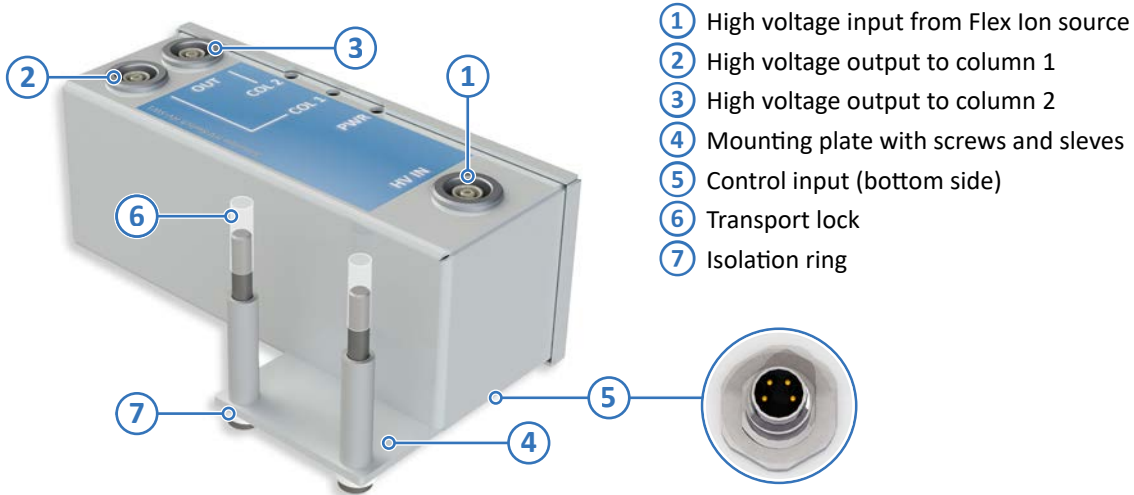


Fig. 5: Regulator

- ① "Oven control" connector
- ② High voltage switch input
- ③ High voltage switch output
- ④ "RS232/Contact closure" connector
- ⑤ Power in connector

HV-Switch DBO-HVS



- ① High voltage input from Flex Ion source
- ② High voltage output to column 1
- ③ High voltage output to column 2
- ④ Mounting plate with screws and sleeves
- ⑤ Control input (bottom side)
- ⑥ Transport lock
- ⑦ Isolation ring

Fig. 6: HV-Switch

3.3 Illustration of stickers on the product

Type plates

The symbols on the rating plate and their meaning.

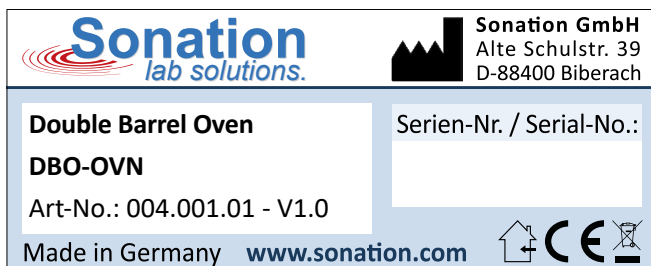


Fig. 7: Type plate: Sonation Oven

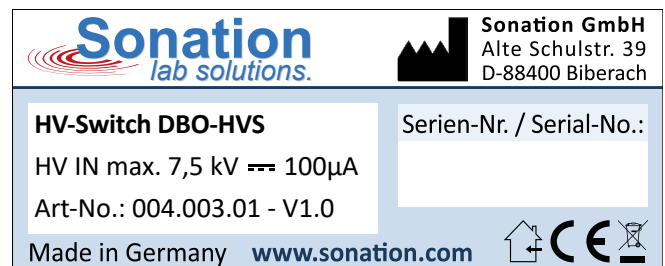


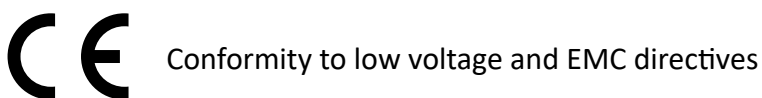
Fig. 8: Typ plate: Sonation HV-Switch



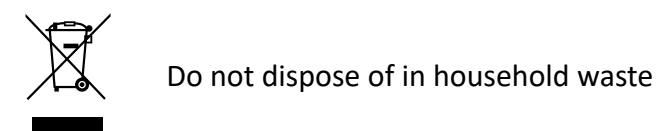
Fig. 9: Type plate: Sonation Regulator



Indoor use only



Conformity to low voltage and EMC directives



Do not dispose of in household waste

4 Installation and commissioning

4.1 Hardware

Please check the scope of delivery for completeness before starting the installation.



CAUTION!

Before installing the oven make sure the high voltage (spray voltage) has been turned off.

The oven can be used with the ES071 and the ES072 version of the Thermo Fisher Flex Ion Source. To be able to use the oven at the respective source, the corresponding mounting kit is required (see „3.3 Available accessories“).

The mounting kits are not part of the scope of delivery of the „DBO-TF-FIS“.

Installation of the PRSO-V2-KES71 mounting kit

- First remove the original acrylic shield from the ES071 source by loosening the two screws and carefully pulling down the shield.
- Also remove the two camera holders. Now replace the upper camera holder with the modified holder from the mounting kit.
- Mount the left camera holder with the supplied M5x20 screws and the spacer block as shown in Fig. 9.
- As a final step, attach the modified acrylic shield.



Fig. 10: Thermo Fisher Flex Ion Source ES071 with mounting kit

Installation of the PRSO-V2-KES72 mounting kit

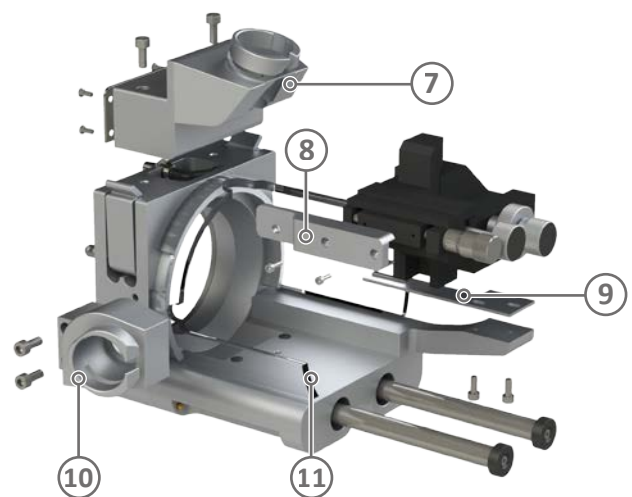
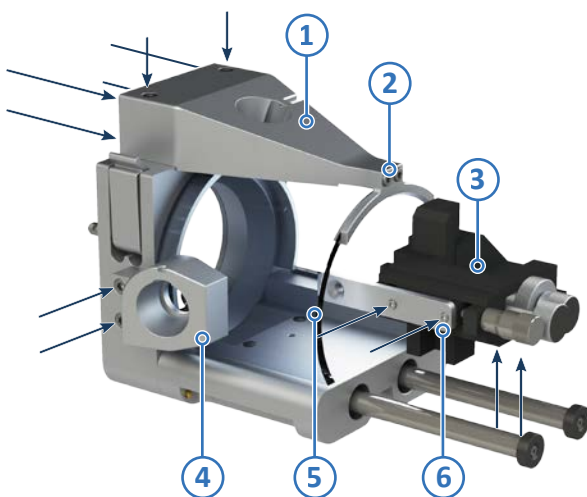


Fig. 11: Installing the mounting kit

- | | | |
|--------------------------------|---------------------------|-------------------|
| ① Upper camera holder | ② Shield clamp | ③ XYZ-Manipulator |
| ④ Left camera holder | ⑤ Acrylic shield | ⑥ Mounting bar |
| ⑦ Modified upper camera holder | ⑧ Oven holder | ⑨ Shield holder |
| ⑩ Modified left camera holder | ⑪ Modified acrylic shield | |

- Remove the shield clamp, the upper and left camera holder, the acrylic shield, the XYZ-manipulator and the attached mounting bar by loosening the screws marked in Fig. 10.
- Slide the modified acrylic shield from the conversion kit onto the source. You might have to bend it carefully to make it slip over the flange.
- Install the oven holder onto the XYZ-manipulator.
- Reinstall the XYZ-manipulator onto the source by putting the shield holder between the manipulator and the manipulator holder using the original screw.
- Install the modified left and upper camera holders by reusing the original screws.

Installation of the HV-Switch

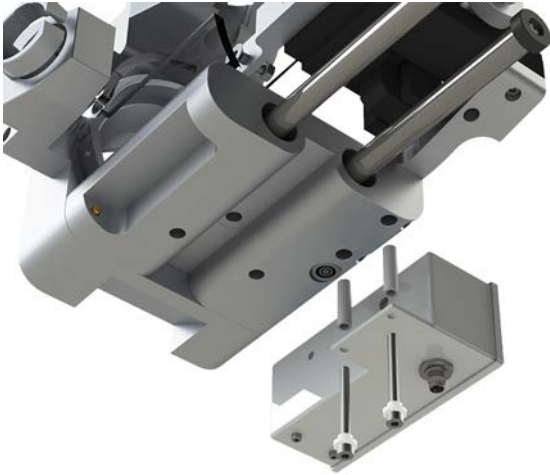


Fig. 12: Mounting the HV-Switch to the source

The HV switch must be attached to the source as shown in Fig. 12. Firstly, the transport lock must be removed. Then remove the original screws on the underside of the source, insert the sleeves and mount the HV switch using the screws supplied.

Attaching the oven to the source

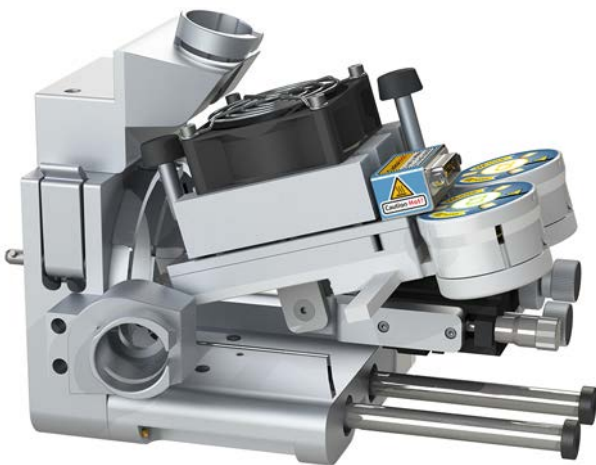


Fig. 13: Attaching the oven to the source

Place the mounting bar of the oven onto the XYZ-manipulator and fix it with the provided screw and nut as shown on Fig. 13. If the XYZ-manipulator won't stay in place, this is due to the weight of the oven. The friction of the manipulator can be regulated with adjusting screws. So just increase the friction until the oven stays in position.

Connecting the cables

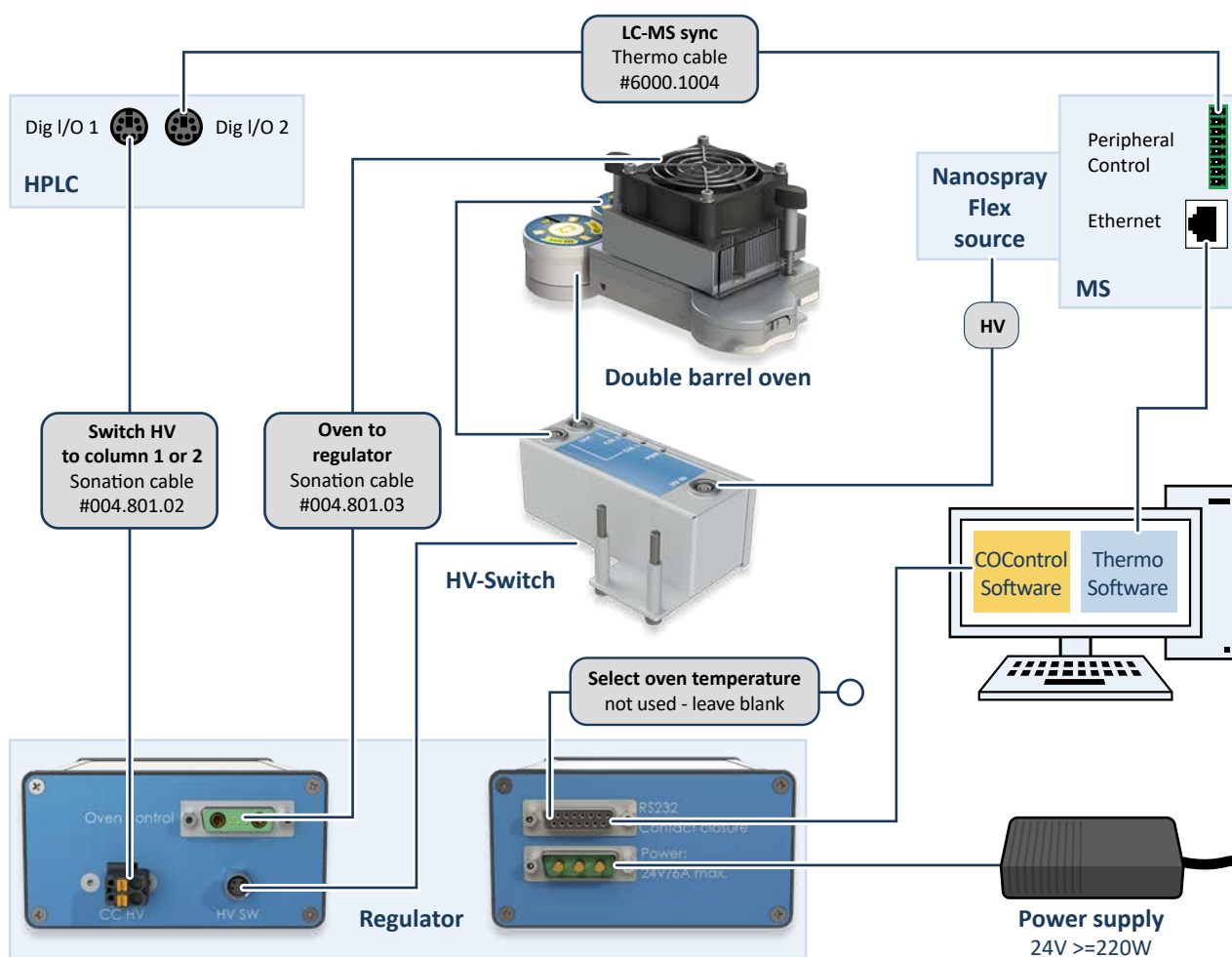


Fig. 14: Connection of the double column oven

- Connect the regulator unit to the PC with which you want to control the oven using the provided cable. If there is no COM-port available, please use the provided USB to serial adapter.
- The remaining two open leads of this cable can be connected to the "contact closure out" of your instrument to switch between two preset temperatures. This is only needed if you want to switch automatically between two preset temperatures. Switching can also be done with the provided oven control software.
- Connect the oven to the regulator with the provided oven control cable (004.801.03).
- Connect the HV cable from the HV output of your Flex Ion Source to "HV IN" on the HV-Switch.
- Connect the high-voltage cables of the Y-holders (004.800.01) to the „COL1 OUT“ and „COL2 OUT“ outputs on the HV-Switch.
- For a better overview and to prevent confusion, you can attach the „C1“ and „C2“ stickers supplied to the Y-holders and the columns.
- Remove the supplied plug from the CC HV regulator input (Fig.13).
- Connect the CC HV input to Digital I/O 1 on your HPLC device using the (004.801.02) cable supplied.
- The supplied plug is only required if the signal for switching the high voltage on the columns is not to be provided via the supplied cable.
- Connect the 24-Volt power supply to the power connector on the regulator. **The wide side of the plug faces the top of the control module, do not force it in twisted.** The power supply will be connected to a wall outlet later.

4.2 Software

Installing the CO-Control application software

- Navigate to the download area of our website under: <https://sonation.com/en/downloads.php>
- Download CO-Control, located in the section “Column oven”.
- To install the oven control software, run the file “setup.exe” and follow the steps of the installation wizard.

CO-Control needs Microsoft .NET which in most cases is already installed. If CO-Control does not start and displays a corresponding error message, install .NET accordingly

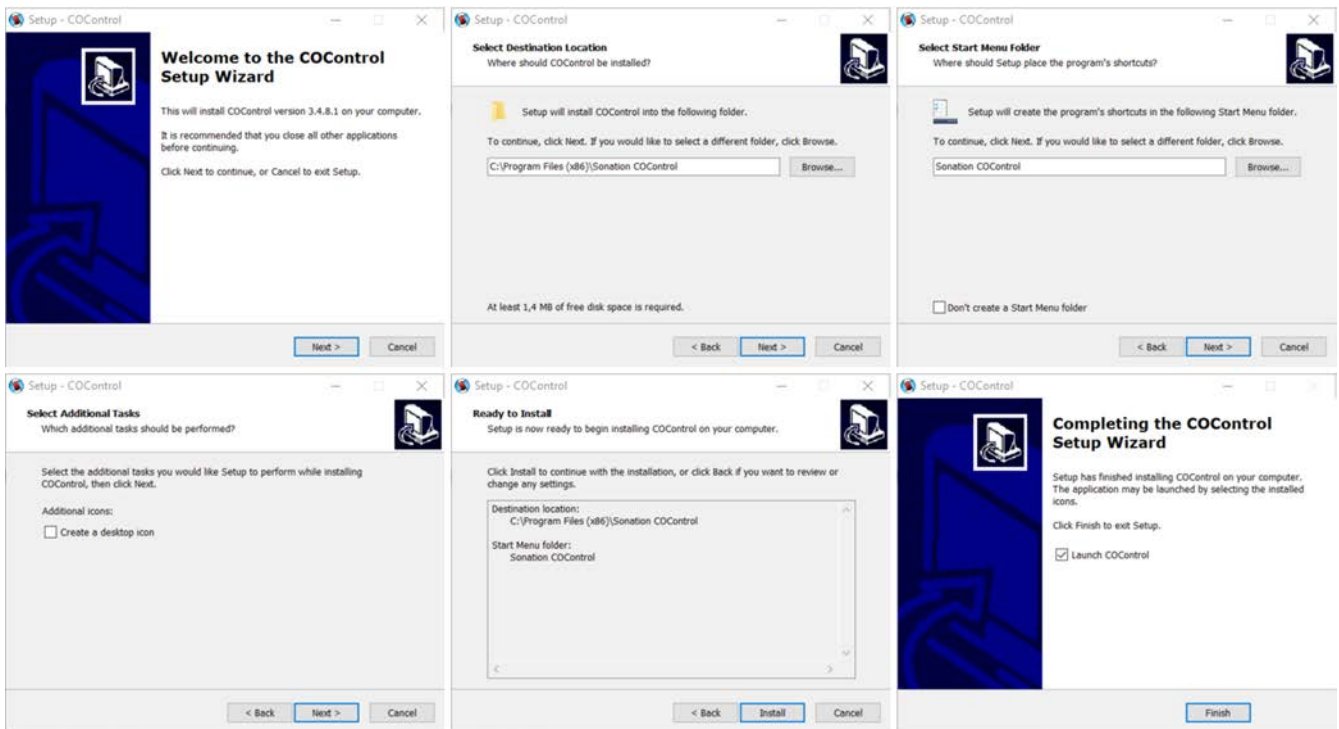


Fig. 15: Software installation

5 Usage

5.1 Column loading and applying the HV via liquid junction



WARNING!

- Make sure that the high voltage (spray voltage) is switched off during the installation of the columns and during any subsequent plugging or unplugging of high voltage cables.



CAUTION!

During operation the surface of the oven can get very hot!



INFORMATION!

- Do not use any temperature sensitive materials in or on the column oven, except for our enclosed cable flags.
- The tip of the emitter is very sensitive. Be careful not to hit anything when inserting the columns.

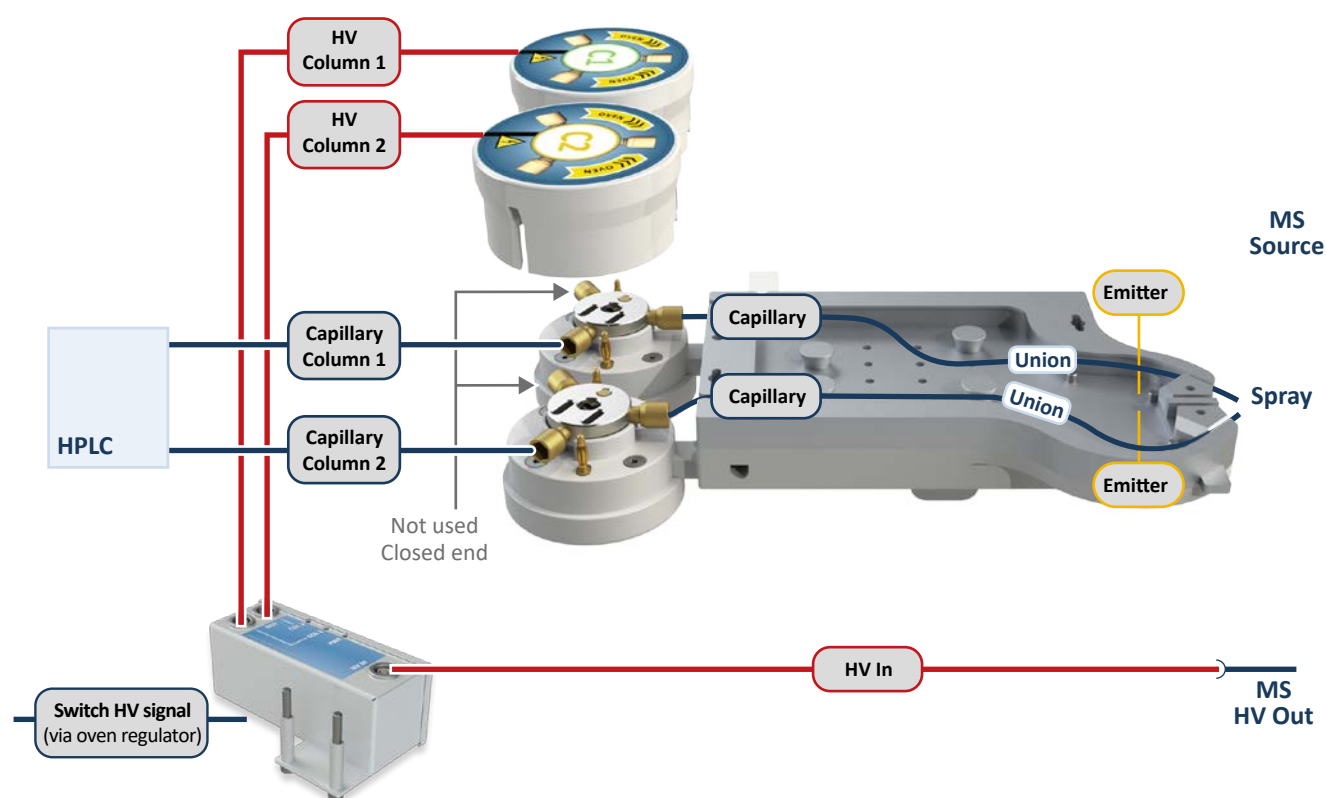


Fig. 16: Double oven - HV connection

- Open the oven by turning the two spring-loaded locking rods by about 90°. The top part of the oven can now be removed.
- The pins serve to guide the column in the oven and at the same time prevent it from jumping out. The pins can be placed anywhere on the threaded holes.
- Open the Y-holder by pulling off the upper part. No tools are required for this.
- Slide the lower parts of the two Y-holders onto the rail of the desired column entrance and tighten the clamping screws slightly.

Now you can connect the columns and connectors as described in Thermo Fisher technical notes 001939 and 73671 and insert and align them in the oven.

For a better overview and to prevent confusion, you can attach the „C1“ and „C2“ stickers supplied to the columns.

- Attach the upper parts of the Y-holders.



Now replace the upper part of the column oven and lock it in place by pushing in the locking rods and turning them through 90°. Make sure that the upper part rests directly and flat on the lower part and that nothing is trapped in between. For example, it is possible that a part of the column may become trapped between the upper and lower parts, which may result in the control unit no longer functioning properly.

- Connect the power supply unit to the socket.
- The oven is now ready to use.

5.2 Using CO-Control

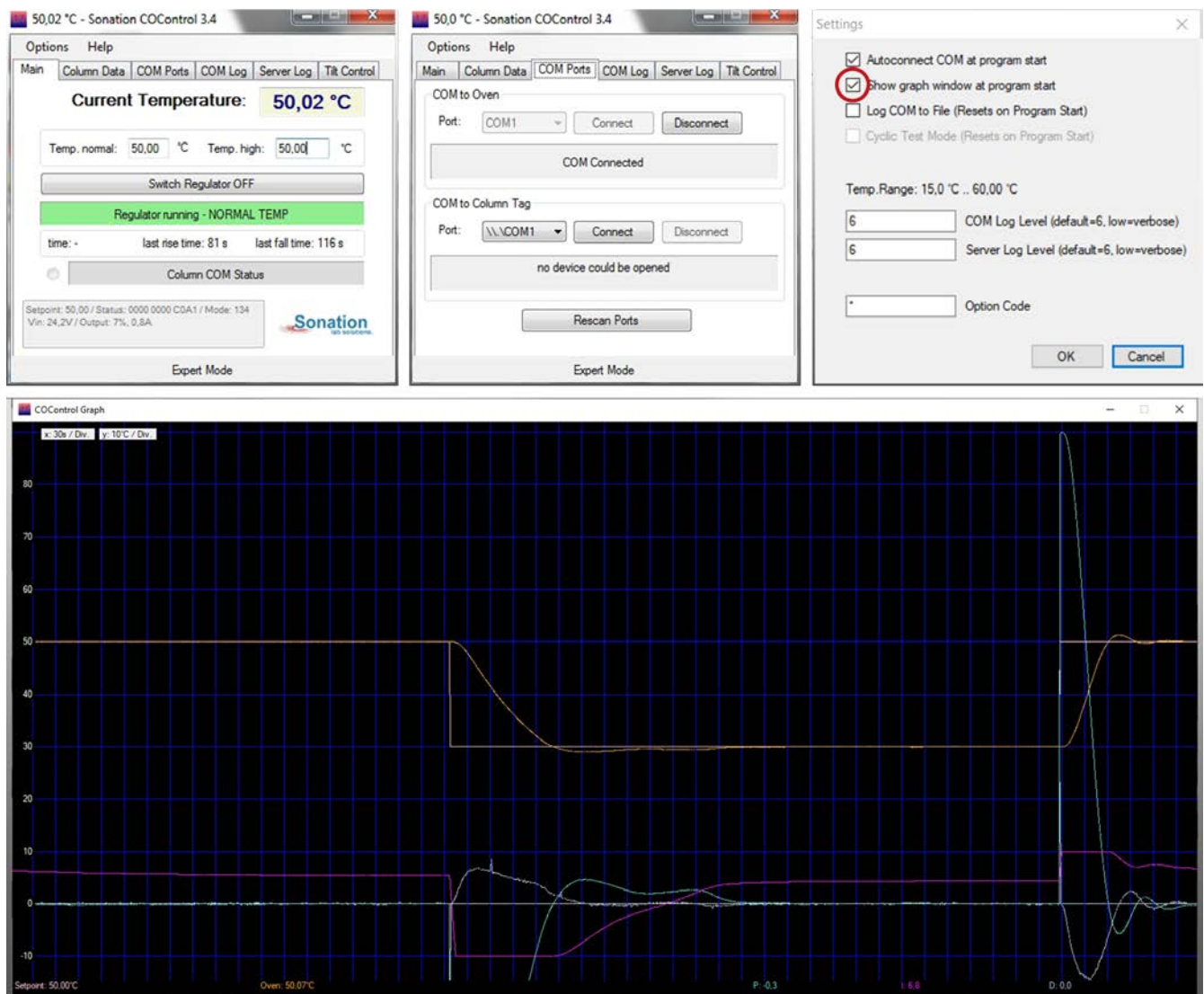


Fig. 17: Oven control software co-control

- After starting COControl, the „Main“ tab is displayed.
- When you start COControl for the first time, you must first select the port to which the oven is connected in the COM Ports tab. After clicking on „Connect“, the current temperature of the oven should be displayed in the „Main“ tab.
- Two temperatures can be specified in the „Main“ tab: „Temp normal“ and „Temp high“. Depending on whether the control input is open or closed, one or the other temperature is regulated. After clicking on „Switch Regulator ON“, the regulation starts. To visualize the temperature curve, a corresponding graph can be displayed via the „Options->Show Graph“ menu. The graph can also be displayed automatically when the software is started under „Options->Settings“.
- It is possible to unlock an extended temperature range. If your application requires higher or lower temperatures, please ask Sonation for an option code. But also keep in mind that a higher temperature range is stress for the Peltier-modules and can lead to a shorter lifetime.

6 Maintenance and Care

Maintenance

The product is basically maintenance-free but not wear-free. If a wear-related defect should occur, please contact your dealer or Sonation directly to clarify the further steps.

Cleaning and care

Use a soft, damp cloth to clean the surfaces. Aggressive solvents, bases or acids must not be used for cleaning. If you have any questions about the compatibility or applicability of cleaning agents, please contact your dealer or Sonation before use. If the device comes into contact with hazardous substances, it is the user's responsibility to ensure appropriate decontamination.

7 Faults & troubleshooting

FAQ - Frequently Asked Questions

Question: My PC does not have any COM ports / no available COM ports. Can I run the oven anyhow?

Answer: Yes. Please use the provided USB to serial converter to install a virtual com-port.

Question: Is it possible to set up higher temperatures than 50°C or lower temperatures than 15°C?

Answer: Yes, it is possible. Please ask Sonation for an option code, but remember that the lifetime of the Peltier-elements will be lowered because of the additional thermal stress.

Question: The temperature of the oven fluctuates / oscillates some degrees around the setpoint. What's wrong?

Answer: The most common cause is that the upper part of the oven sits not properly on the lower part, so the thermal connection is bad. Please check if the column or other things are trapped between the upper and lower part.

8 Decommissioning

Disposal

Dispose of the product in accordance with local and national safety and environmental regulations.

The product contains electronic components, cables, metals, plastics, etc. and must be disposed of in accordance with the applicable environmental regulations of the respective country. The disposal of the product is subject to the Elektro-G (RoHS) in Germany and the EU Directive 2002/95/EC or the respective national legislation in Europe.

The product can also be returned to the seller for disposal. In this case, the transportation costs, including packaging costs, shall be borne by the buyer. Please inform the seller of the return within 14 days before the expected arrival.

9 Technical data

Temperature control range		
Standard range:	15°C - 60°C (59°F - 140°F)	
Extended range:	15°C - 80°C (59°F - 176°F)	
Temperature control rate		
Heating:	30°C to 50°C: Less than 90s	
Cooling:	50°C to 30°C: Less than 180s	
Control accuracy	±0,1°C	
Usable column lengths	From 130mm	
Usable column diameter	Up to 2mm	
Oven weight	0,9kg	
Permissible ambient conditions	Temperature	Humidity
Transport	-20 - 60°C / -4 - 140°F	5-90% (non-condensing)
Storage	10 - 40°C / 50 - 104°F	10-80% (non-condensing)
Operation	10 - 30°C / 50 - 86°F	20-80% (non-condensing)
Installation altitude	Up to 3000 m above sea level	
Permissible degree of soiling	2 (Non-conductive soiling that can become conductive due to occasional condensation (condensation) or e.g. hand perspiration.)	
Power cable		
EU	CEE 7/4 plug (Schuko plug) to IEC 60320 C13, length: 1,8m	
CH	T12 plug (according to SEV 1011:2009) to IEC 60320 C13, length: 1,8m	
UK	Type G plug (BS 1363) to IEC 60320 C13, length: 1,8m	
US	NEMA-5 plug to IEC 60320 C13, length: 1,8m	
Supply voltage	100-240VAC / 50-60Hz	
Max power input	220W	
Mains disconnecter	Power cable	
Protection class	Class III (protection by extra-low voltage)	
HV-Switch		
Maximum input voltage:	7,5kV DC / 100µA	
Typical capacity:	19 pF	
Y-Holder		
Maximum input voltage:	7,5kV DC / 100µA	
Typical capacity:	15 pF	

CE-Konformitätserklärung
CE Declaration of Conformity
CE Déclaration de Conformité
CE Dichiarazione di Conformità



Der Hersteller / The manufacturer / Le fabricant / Il fabbricante

Sonation GmbH
Alte Schulstr. 39 – 88400 Biberach - Deutschland

erklärt hiermit, dass die Produkte
herewith declares that the products
déclare par la présente que le produits
dichiara che il prodotti

DBO-TF-FIS

den Anforderungen der folgenden EG-Richtlinien entspricht.

meets the provisions of following EC-Directives.

remplit les exigences des Directives CE suivantes.

soddisfa tutte le disposizioni dalle Direttive CE.

Richtlinie Directive Directive Direttiva	gültig bis valid until valable jusqu'à con validità fino al	gültig ab valid after valable à partir de applicabile dal
2006/95/EG, EC, CE	19.04.2016	
2014/35/EU		20.04.2016
2004/108/EG, EC, CE	19.04.2016	
2014/30/EU		20.04.2016
2011/65/EU		03.01.2013

Angewandte Normen: Applied standards: Normes appliquées: Norme applicate :	EN 61326-1:2013 - Basic requirements EN 61010-1 :2010 + Cor. :2011
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Diese Erklärung gilt für die oben genannten Produkte ab dem Unterzeichnungsdatum.

This declaration is valid for the above mentioned products after the signature date below.

La présente déclaration est valable à partir de la date de signature.

Questa dichiarazione vale per il suddetto prodotti dalla data di firma.

Biberach 04. Dec. 2020

Ort / place / lieu / luogo
Datum / date / date / data


Unterschrift / signature / signature / firma

Name / name / nom / nome: Christof Völkle
(Geschäftsführer / management / directeur / delegato)



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