NIRS Vial Heater

Manual

8.921.8009EN / 2020-09-30

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This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

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1 Introduction

The NIRS Vial Heater is operated in combination with the NIRS XDS Transmission OptiProbe Analyzer.

The NIRS Vial Heater is used to pre-heat samples and control their temperature during the data collection process. Controlled temperature can be selected and maintained above room temperature and below 200 °C.

The NIRS Vial Heater consists of a temperature controller and a vial heating block.

1.1 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** Carry out these steps in the sequence shown.
Method	**Dialog text**, **parameter** in the software
File ▶ New	Menu or menu item
[Next]	**Button** or **key**
	**WARNING** This symbol draws attention to a possible life-threatening hazard or risk of injury.
	**WARNING** This symbol draws attention to a possible hazard due to electrical current.
	**WARNING** This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	**WARNING** This symbol draws attention to a possible biological hazard.

CAUTION

This symbol draws attention to possible damage to instruments or instrument parts.

NOTE

This symbol highlights additional information and tips.

2 Intended use

The NIRS Vial Heater is used for heating samples that are solid or very viscous at room temperature. It is installed once and remains in place until a calibration is necessary. If a calibration needs to be carried out, the NIRS Vial Heater needs to be replaced by the calibration fixture.

Only use the provided disposable glass vials with a diameter of 8 mm (6.7402.000). If you use different vials, the sample may not be heated properly.

The NIRS Vial Heater is designed to operate at high temperatures. Follow normal safety procedures as required for high temperature operations. Metrohm NIRSystems is not responsible for any misuse of the Vial Heater, incorrect wiring methods from those stated in this manual, or changes in the system without written authorization and approval by Metrohm.

3 Safety instructions

3.1 General notes on safety

WARNING

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

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

3.2 Electrical safety

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

WARNING

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

WARNING

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

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

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.

3.3 Tubing and capillary connections

CAUTION

Leaks in tubing and capillary connections are a safety risk. Tighten all connections well by hand. Avoid applying excessive force to tubing connections. Damaged tubing ends lead to leakage. Appropriate tools can be used to loosen connections.

Check the connections regularly for leakage. If the instrument is used mainly in unattended operation, then weekly inspections are mandatory.

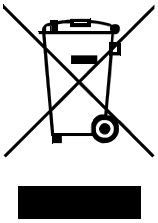
3.4 Flammable solvents and chemicals

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.

3.5 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.

4 Overview of the instrument

4.1 Front

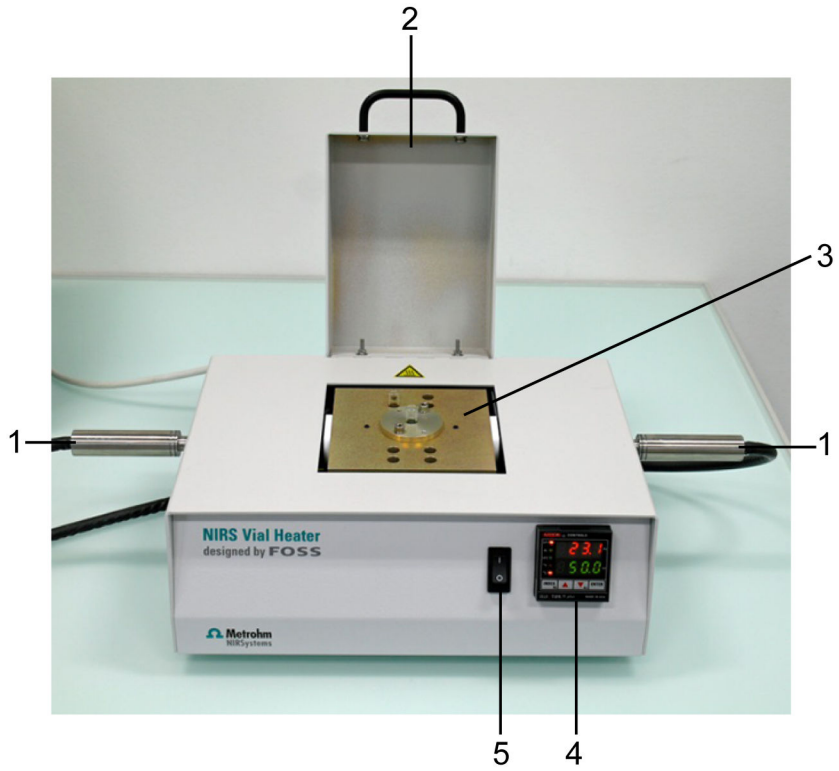


Figure 1 Front NIRS Vial Heater

1	**Transmission probes**	**2**	**Cover**
3	**Heating block**	**4**	**Controller**
5	**On/off switch**		

4.2 Rear

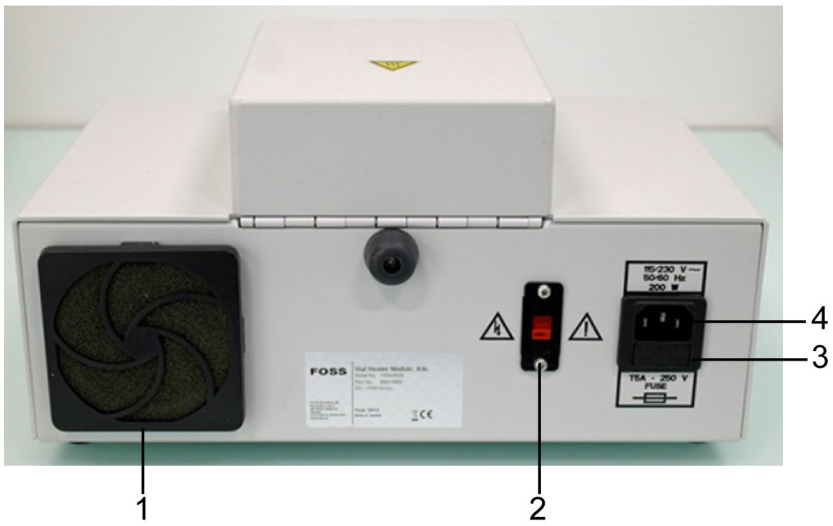


Figure 2 Rear NIRS Vial Heater

1	**Fan filter**	**2**	**Voltage selection switch**
3	**Fuse compartment**	**4**	**Power socket**

5 Installation

5.1 Unpacking and inspecting the instrument

5.1.1 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.

5.1.2 Checks

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

5.2 Location

The NIRS Vial Heater should be placed in a work area with adequate room for normal use, including loading and unloading of vials, and sufficient room for fan circulation behind the instrument.

The system should be mounted on a bench or work location free from vibration, direct sunlight, drafts and sudden changes in temperature or humidity.

Leave room for an adequate bend radius of the fiber bundles. Fiber bundles should not be kinked, and should not be bent in a radius of less than 15 cm (6”).

5.3 Installing the NIRS Vial Heater

Installing the Vial Heater

Required accessories:

- 5/64 in. ball driver from the NIRS XDS accessory kit (6.7400.000)

1 Positioning the Vial Heater

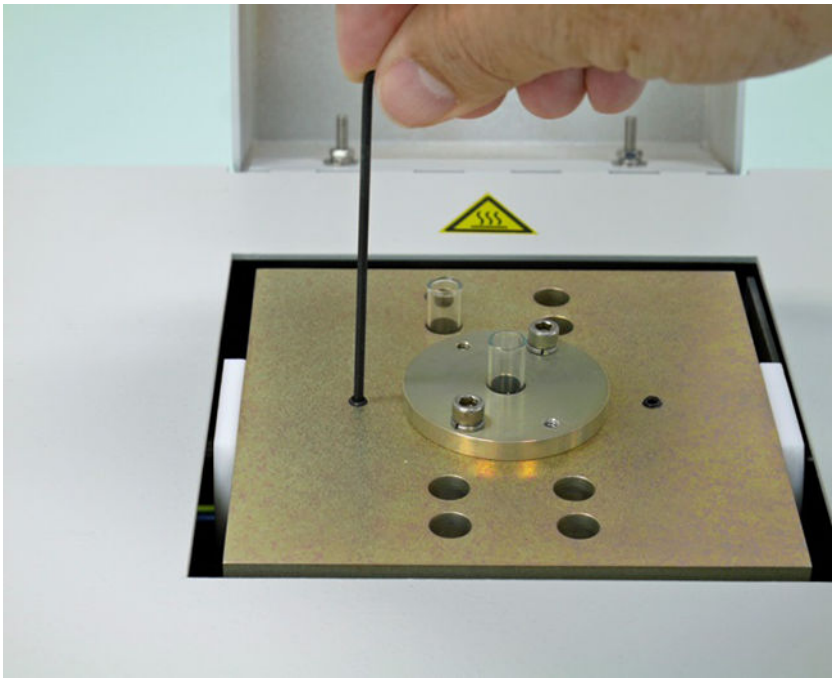
- Place the Vial Heater near the instrument so that the transmission probes will reach the heating block.

2 Connecting the transmission probes

- Insert the 2 transmission probes into the holes on the left and right side of the Vial Heater.
- Press firmly until both probes bottom in the heating block.

3 Securing the heating block

- Tighten the 2 setscrews that are located at the top of the heating block with the ball driver.



5.4 Connecting the NIRS Vial Heater to the power grid

The NIRS Vial Heater is supplied with power cords for both North American and international use. The cord for international use is a “Harmonized International Power Cord” with color-coded, stripped leads for use with approved local wiring connectors.

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.

Connecting the power cord

Prerequisite:

The correct voltage setting is selected *(see "Changing the voltage selection", page 12)*.

Required accessories:

- AC power cord for international use
  Or
- AC power cord for North American use

1 Plug the correct power cord into the power socket on the back of the Vial Heater.

2 Plug the power cord into an outlet that supplies the correct line voltage, according to the voltage setting. This connection provides correct earth grounding.

3 Turn the on/off switch in the front of the Vial Heater to "I".

The controller display will illuminate to indicate successful power-on.

Changing the voltage selection

Required accessories:

- Small coin or other suitable object

1 Insert the coin into the horizontal slot.

2 Move the selector switch up or down.

- Operating voltage of 100–120 VAC: set to 115 V
- Operating voltage of 220–240 VAC: set to 230 V.

Figure 3 Operating voltage 115 V

Figure 4 Operating voltage 230 V

6 Operation

If vials are loaded in the immediate vicinity of other equipment, take care to avoid spills or drippage onto the Vial Heater. Provide a lab sink or other facilities.

Vials must be filled prior to loading into the Vial Heater. Do not fill the vial to the very top, or it may spill sample onto the heating block.

CAUTION

If sample is spilled onto the heating block, it may be baked on, which must be avoided. Use caution when loading and unloading vials to prevent any spills or drips. If sample is spilled onto the Vial Heater, immediately turn power off, unplug the unit and let it cool to ambient temperature. Once cool, the sample spill should be cleaned using appropriate solvents and following all recommended safety precautions.

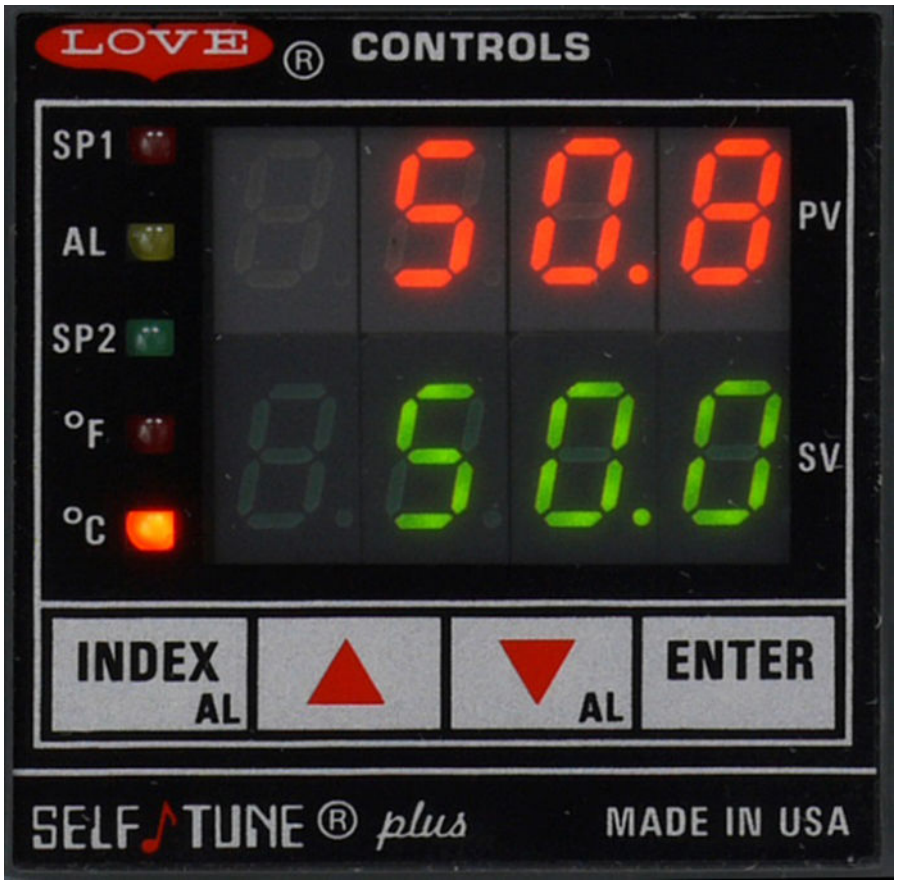


Figure 5 NIRS Vial Heater – Controller

The controller display consists of 2 4-digit displays, one red and one green. The current setpoint is the lower, green display. The current temperature of the vial block is the top, red display. There are 4 buttons below the display:

- INDEX button – changes display mode
- UP arrow – used to raise a setpoint
- DOWN arrow – used to lower a setpoint
- ENTER key – confirms a setting change

At power-on, all display segments will illuminate. The display will quickly change to SELF-TEST. Once self-test is complete, the red segments (upper display) display the current temperature of the heating block. The green segments (lower display) display the setpoint.

WARNING

Hot surfaces

The NIRS Vial Heater can reach temperatures of up to 250 °C during operation. Touching it may cause burns, and nearby objects may ignite or become damaged. Overheated samples may cause the vial to burst and thus may injure persons. The heating block retains heat and may be dangerously hot even when the Vial Heater is turned off or unplugged.

- Do not touch the heating block.
- Do not place objects in the immediate vicinity.
- Wear protective gloves and protective glasses.
- Remove plastic plugs from vials.
- Always handle vials with an appropriate holding device.

Changing the setpoint

1. Press the INDEX button.

   The setpoint is displayed in red and SP1 is displayed in green.

2. Select the desired temperature using the UP and DOWN arrows.

3. When the correct temperature is displayed, press ENTER to set the new value. This ENTER is required to establish the correct set-point. If not performed, the setpoint will not be stored in the controller memory and the unit will not function properly.

4. After the value has been set, press INDEX to return to the normal operation mode.

The actual temperature will now be displayed in red and the desired temperature will be displayed in green.

5 Once the displayed temperature of the Vial Heater stabilizes, analyze the sample according to your established analytical protocol.

7 Maintenance

Maintenance consists of cleaning the fan filter and replacing blown fuses.

Cleaning the fan filter

Prerequisite: The Vial Heater is disconnected from the power grid.

1 Removing the fan filter

- Grasp the outer black cover of the fan filter and gently pull it away from the instrument.
- Remove the filter material from the cover.

2 Cleaning the fan filter

- Blow out the dirty filter with a compressed air duster spray.

3 Reinstalling the fan filter

- Reinsert the filter material in the cover.
- Snap the cover of the fan filter back into place.

4 Switching the Vial Heater on

Turn the on/off switch in the front of the Vial Heater to "I".

The Vial Heater is ready for operation again.

Replacing the fuse

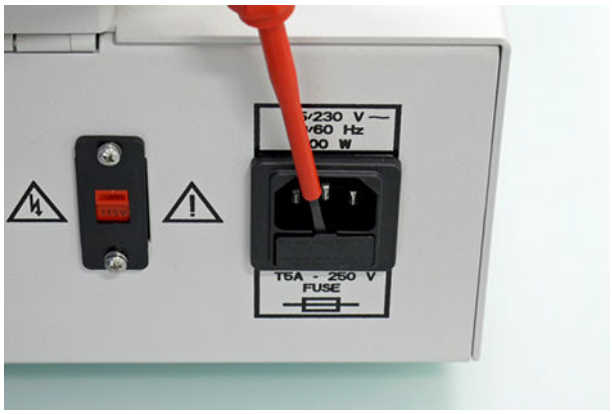
Required accessories:

- Flat-blade screwdriver
- Spare fuse

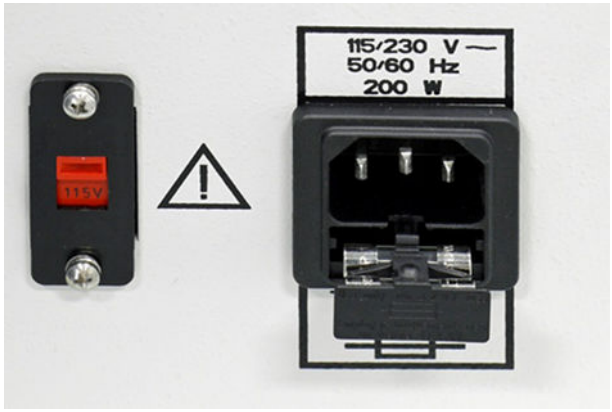
NOTICE

A blown fuse may be an indication of an electrical fault or may be caused by electrical transients. Whenever replacing a blown fuse, always inspect the system for items like frayed wires, damage, or unsafe conditions. If any of these conditions are present, repair them before use of the Vial Heater.

1. Turn the Vial Heater off by using the on/off switch on the front.
2. Remove the power cord from the socket.
3. Open the fuse door using a small flat-blade screwdriver.



4. Lift out the old fuse and discard.



5. Insert the new fuse into the fuse clip and snap in place by closing the fuse door.

6 Reinstall the power cord *(see chapter 5.4, page 11)*.

7 Turn the on/off switch in the front of the Vial Heater to "I".

8 Order a spare fuse *(see chapter 9, page 20)*.

8 Technical specifications

8.1 Ambient conditions

Nominal function range	15–32 °C

8.2 Energy supply

Nominal voltage	100–120 VAC or 220–240 VAC, 50–60 Hz
Power consumption	max. 200 W

8.3 Dimensions

Width	317 mm (without probes)
Height	172 mm (cover closed)
Height	324 mm (cover open)
Depth,	248 mm (front to back)
Weight	2.9 kg

9 Accessories

Up-to-date information on the scope of delivery and optional accessories for your product can be found on the Internet. You can download this information using the article number as follows:

Downloading the accessories list

1. Enter *https://www.metrohm.com/* into your Internet browser.
2. Enter the article number (e.g. **2.921.9010**) into the search field.
   The search result is displayed.
3. Click on the product.
   Detailed information regarding the product is shown on various tabs.
4. On the **Included parts** tab, click on **Download the PDF**.
   The PDF file with the accessories data is created.

NOTICE

Once you have received your new product, we recommend downloading the accessories list from the Internet, printing it out and keeping it together with the manual for reference purposes.

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