

MACHEREY-NAGEL

NANOCOLOR® VARIO Mini



- Handbuch
- Manual
- Manuel

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1. Introduction

Welcome and thank you for deciding on a heating block from MACHEREY-NAGEL. The *NANOCOLOR® VARIO Mini* is a powerful and compact heating block for the digestion of tube tests from MACHEREY-NAGEL. Due to the intuitive handling and the compact design, it is ideally suited for the analysis in the field.

1.1 Technical description

The *NANOCOLOR® VARIO Mini* is suitable for sample preparation of up to 6 samples in tubes with 16 mm OD (outer diameter). Six temperatures (70 °C, 100 °C, 120 °C, 148 °C, 150 °C und 160 °C) as well as three heating times (30 min, 60 min und 120 min) are preprogrammed. Those can be combined in arbitrary.

1.2 Technical data

<i>NANOCOLOR® VARIO Mini</i> :	Heating block for chemical-analytical digestion with 6 bore holes for tubes with 16 mm OD
Display:	Graphic display 128 x 64 Pixel
Operation:	Icon-based menu guidance via 4 buttons
Temperatures:	70 °C / 100 °C / 120 °C / 148 °C / 150 °C / 160 °C
Temperature stability:	± 1 °C (according to DIN, EN, ISO and EPA methods)
Warm-up time:	from 20 °C to 160 °C within 25 min (at 20 °C)
Heating times:	30 min, 60 min, 120 min
Safety:	Protective cover with magnetic locking; overtemperature protection
Interface:	Mini-USB-OTG (On-The-Go) interface; Connectivity for <i>NANOCOLOR®</i> USB T-Set (REF 919921; Facility for an automated calibration and creation of a test certificate for inspection equipment monitoring)
Update:	Via Internet and USB-Stick
Operating range:	10 °C – 40 °C; max. 80 % relative humidity (without condensation)
Power supply:	12 V DC 5A
Power consumption:	60 W
Dimensions:	105 x 125 x 170 mm
Weight:	670 g
Marking:	CE
Warranty:	2 years
Declaration of conformity: 	This instrument conforms to the following European directives: low voltage directive EMC directive

2. Safety precautions

Please read the instruction manual carefully before setting up and using the instrument. In case the instructions are disregarded, the instrument may malfunction or get damaged. To ensure perfect performance of the instrument, it may only be used as described in this manual. Please pay particular attention to the following warning notices, which indicate special dangers when using the instrument.



Attention:

Indicates actions that pose potential threat to instrument performance or may cause instrument damage.



Warning:

Indicates actions that pose a threat to the user. In case of not adhering to the advice, slight or serious injuries may occur.

2.1 Input supply



To ensure safe functioning of the instrument, please use the included power adapter only (see 7.1 *Spare parts, accessories and consumables*, p. 31)

2.2 Biological risk

When using the instrument, it may be necessary to handle hazardous chemicals. In those cases, please wear safety gloves and exercise caution when handling the samples.

- Please read all information concerning hazards and safety measures in the material safety data sheets and on the packages you work with.
- All utilized compounds need to be disposed in accordance with national rules and regulations.
- The type of safety equipment utilized needs to be in line with the concentration and hazard potential of the given substances used.

2.3 Protective clothing

As protective clothing we recommend to wear protection gloves, safety glasses and a laboratory coat.

2.4 Improper handling and warranty

Improper handling can lead to damage of the instrument. Proper function can then not be guaranteed anymore. In case of improper handling or opening of the instrument MACHEREY-NAGEL declines any warranty claims.

2.5 Damage of casing

If the housing is damaged, the instrument needs to be sent in for repair. In such a case, the proper function of the instrument cannot be guaranteed anymore.

2.6 Damage of cable

In case of a damaged cable, switch of the instrument and replace the cable immediately.

3. Instrument set-up

3.1 Set-up location

Only use the instrument in a suitable location. It should be placed on a dry, clean, leveled and plain surface to avoid overheating of the instruments' bottom.

3.2 Package content

Please open the shipping box carefully with a sharp tool. Make sure, not to damage its contents. Remove the instrument and all other parts carefully. Check the package, instrument and accessories for visible damages. In case a part is damaged, please contact your distributor or MACHEREY-NAGEL (see 7.5 Contact, p. 32). The following list contains all items inside the package. Please ensure that your shipment is complete. In case of missing items, please also contact your local distributor or MACHEREY-NAGEL.

Note: Keep the original box as well as the packaging material from the initial shipment to optimally protect the instrument in case of a return-shipment.

Package content:

- Heating block NANOCOLOR® VARIO Mini
- This manual
- Protective cover
- Power supply unit 100 V – 240 V, 50 Hz – 60 Hz, 12 V DC, 5A
- Certificate

4. Outer appearance



Fig. 1: Front view *VARIO Mini*

- ① Display with operating keys
- ② Protective cover
- ③ Connection for power supply 12 V DC 5A
- ④ Mini-USB-OTG interface



Fig. 2: Back view *VARIO Mini*

5. Operating instructions



Risk of burns: Do not put your fingers in the holes of the heating block. Close the protective cover before the heating block starts to heat. Keep the protective cover closed during the heating process.



Risk of burns: After heating, the tubes are hot. Wear thermally insulating materials when removing the tubes. Do not remove the tubes when the temperature is higher than 70 °C.



Risk by chemicals: In case a sample tube break or leakings, be aware that the chemicals do not get in contact with skin. Wear suitable protective gloves.



Keep the holes of the heating block dry to avoid damage of the device. If necessary dry the outer surface of the tubes.




Immediately disconnect from power supply if any liquid is spilled or if a tube breaks. Afterwards, clean the device as described in chapter 7.4 “Cleaning the device”. Do not cover the ventilation slots. Otherwise overheating may occur. The measurement accuracy can then not be guaranteed anymore.




Use the device only on a plain and leveled surface. Pay attention to sufficient stability. The feet of the instrument must not sink into the underground; otherwise the device might overheat.

5.1 Turning on the instrument

Remove the heating block and all other parts from the package. Place the heating block on a plain and dry surface. Place the correct adaptor for your country on the mains adaptor and connect it with the heating block. Turn on the *NANOCOLOR® VARIO Mini* via the  key.

Info: The Name of the device and the current firmware version are displayed when the instrument is turned on.

The heating block has an integrated warning for the protective cover. If the protective cover is opened and the heating block is turned on, the symbol  appears in the upper area of the display. The icon disappears when the protective cover is closed.

Note: Do not put any other items in the heating block than the tubes from MACHEREY-NAGEL which are designated for this purpose.

5.2 Operation and user guidance

The instrument was designed for simple and intuitive operation. The user guidance is icon-based. The icons can be selected by the four buttons below the screen.





Fig. 3: Action icons and buttons



After pushing one of the keys (🕒, 🌡️ or ▶️), the settings menu can be called up via the ⚙️ button.

The display is divided into three parts. The action icons are located in the lower part. The respective function is activated with the buttons 1–4 below the screen. The features and running programs are displayed in the middle part. In the upper part of the display, the 🚪 icon appears in case of an open protective cover. When a *NANOCOLOR*® USB T-Set is connected, the currently measured temperature is displayed in the upper left corner. A connected USB-Stick is indicated by the icon (📁) in the upper right corner.

5.3 Program selection



Repeated pushing of the  key calls up the preprogrammed temperatures. It is not possible to enter user defined temperatures.





Repeated pushing of the  key calls up the preprogrammed heating times. It is not possible to enter user defined heating times.

The selected program is started via the  button. During the heating process the displayed temperature blinks. The current temperature of the block can be displayed via the  button. When the set temperature is reached, the displayed temperature stops blinking and the countdown is started automatically.










The heating block might get hot during the heating process, especially at the bottom side and inside the boreholes for the tubes. Therefore, do not hold the heating block in your hand during the heating process and do not touch the inside of the bore holes. Wait for at least 10 minutes after the heating process is finished until you move the heating block.


A running program can be stopped at any time by pushing the  button. A blinking "STOP" appears in the display instead of the heating time. To end the program, the  button has to be pushed once more within 5 seconds. If this does not happen, the program continues.

By pushing one of the following buttons (, , ) , the program last used is called up. It can be started via the  button. If the program is not started within 5 seconds, the display goes back to the menu for program selection.

6. Settings

By pushing one of the buttons (,  or ) , the settings menu can be accessed via the  button. The individual levels of the settings menu are displayed by the respective icon in the upper left corner of the display. In the settings menu you can switch between the individual submenus with help of the buttons  and . With the  button, the selected submenu is called up.

6.1 Info

By selecting the info menu  , the system information of the *NANOCOLOR® VARIO Mini* is displayed:







Serial No: NVM 0001

Firmware: V 1.000

Bootloader: V 1.0

With  you get back to the settings menu.








6.2 Contrast

In the contrast menu  , the contrast settings of the display can be changed. Pushing  increases the contrast while the  button reduces it. Confirming with  saves the new settings. Pushing  leads back to the settings menu. Changes which were not saved via the  button are not adopted.

6.3 Tone






The signal tone can be switched on or off in the submenu sound . Activation or deactivation is done via the  button. Pushing  leads back to the settings menu.

6.4 Power supply

The currently used power source of the *NANOCOLOR® VARIO Mini* is selected in the menu power supply . When the heating block is used with an external battery, a warning appears when the battery power is low. Starting a heating program is then not possible anymore. The heating block can be operated with the supplied mains adaptor  or with a connection cable (REF 919938) for usage in a car . In this case, the respective symbol for power supply must be chosen via the keys  and  and confirmed with . Via  you get back to the settings menu.











Note: When using the NANOCOLOR® VARIO Mini via the connection cable for the car, make sure that the capacity of the car battery is sufficient (max. heating power 60 W).

6.5 T-Set

The menu T-SET is for control and calibration of the temperatures in the NANOCOLOR® VARIO Mini. Via the  and  buttons the desired action can be selected. After connection of the NANOCOLOR® USB T-Set the options  and  can be called up by confirming with .


Note: Some features of this menu are only available in combination with the NANOCOLOR® USB T-Set (REF 919921) and the associated adaptor (REF 919937). The NANOCOLOR® RS 232 T-Set (REF 919917) cannot be used with the NANOCOLOR® VARIO Mini.





6.5.1 TEST







In the menu , the correctness of the temperatures in the heating block can be checked with the help of the NANOCOLOR® USB T-Set. If the temperature inside the heating block is higher than 70 °C the test program starts as soon as the heating block has cooled down to less than 70 °C. After calling up the test program, the current date needs to be entered. The date can be entered via the buttons  (next higher number) and  (one digit to the right). For the correction of one digit of the date, the button  can be used multiple times to get to this digit. After confirmation with  all temperatures which are programmed in the heating block, are measured, registered and saved in the heating block (duration up to 40 min). This process starts with the lowest temperature and ends with the highest. During this process, a progress bar is displayed and you can see the  icon blinking (Note: heating block is heating). This process can be stopped at any time by pushing the  button followed by confirming the alternately blinking  and question mark. Without further confirmation, the testing process is continued. The message "OK" is displayed after successful verification of the temperature. Confirming with  saves the test data. In case of an unsuccessful testing process the message "NOT OK" appears. Confirming with  saves the test dates.

Note: In case of deviations during testing it is suggested to calibrate the heating block with the help of the NANOCOLOR® USB T-Sets (see chapter 6.5.2 CAL). For larger deviations please check the correct positioning of the NANOCOLOR® USB T-Set.

6.5.2 CAL


In the menu , the calibration of the heating block can be renewed with the help of the NANOCOLOR® USB T-Set (REF 919921). If the temperature inside the heating block is higher than 70 °C, the calibration process starts as soon as the heating block is cooled down to less than 70 °C.

After calling up the calibration menu the current date needs to be entered. The date can be entered via the buttons  (next higher number) and  (one digit to the right). For the correction of one digit of the date, the button  can be used multiple times to get to this digit. After confirmation with  the calibration process is started (duration up to 40 min).


During this process, a progress bar is displayed and you can see the  icon blinking (Note: heating block is heating). This process can be stopped at any time by pushing the  button followed by confirming the alternately blinking  and question mark. Without further confirmation, the calibration process is continued. The message “OK” is displayed after a successful calibration process. Confirmation with  saves the new calibration data. In case of an unsuccessful calibration an exclamation mark  is shown in the display. By pushing the  key, the new calibration is rejected in both cases and leads back to the T-Set menu.

Note: In case of deviations or a failed calibration, it is suggested to check the correct positioning of the NANOCOLOR® USB-T-Set. After saving new calibration data, the test data which are referring to the old calibration will be deleted automatically.


6.5.3 Info




By calling up the feature  the last calibration and test dates of the heating block are shown. If the heating block was not calibrated or tested before, no data are shown here.

6.5.4 Report

By activating the option  the protocol of the performed test or calibration are sent to a connected USB-Stick. These data can then be used to create a certificate with the software for MACHEREY-NAGEL heating blocks. A USB adaptor (REF 919937) is required for the connection of a USB stick to the heating block.

6.6 Factory settings

In the factory settings menu  the settings of the NANOCOLOR® VARIO Mini can be reset to factory settings. During this process all data generated by the customer regarding tests, calibrations and the basic settings for sounds etc. are set back.

For setting back the device to factory settings push the  button for five seconds. The progress is displayed by the filling of the factory symbol. As confirmation you will hear a sound. If the  button is released within this time, the settings are not reset. Pushing  leads back to the superior menu.

6.7 Service menu

The service menu  is locked by a service code. This menu is only to be used by service staff for maintenance.



7. Service

7.1 Spare parts, accessories and consumables

Description	REF
USB-Adapter Mini-USB to USB A	919937
NANOCOLOR® USB T-Set	919921
Adaptor cable for use in car	919938

7.2 Error messages

The device shows error messages in case of problems. The reason for those messages can be due to improper handling or faults in the device. In case of recurrent errors or limited functionality of the instrument, please contact MACHEREY-NAGEL.

Error message	Cause	Solution
	An external USB device has to be connected to run the chosen option; the connected USB device was not recognized.	Please connect a USB device or check the correct connection of the USB device.
	A connection to a NANOCOLOR® USB T-Set is required for this option; the connected NANOCOLOR® USB T-Set was not recognized.	Please connect a NANOCOLOR® USB T-Set or check the correct connection of the NANOCOLOR® USB T-Set.
“Digestion interrupted”	The temperature during the heating process deviates by > 4 °C to the set temperature. The power connection was interrupted during the heating process.	Do not insert cold tubes during the heating process. Check the power supply.

7.3 Disposal



In compliance with the local and national legal regulations (EU Directive 2012/19/EU), MACHEREY-NAGEL disposes old instruments.

Note: Disposal using public waste disposal facilities is not permitted. In case of disposal, please contact your MACHEREY-NAGEL representative.

7.4 Cleaning the device

The instruments housing can be cleaned with a wet cloth. Splashes and spills need to be immediately removed from the instrument. Generally, the heating block should be kept clean. When contaminations inside the instruments occur which are caused by leakage of a tube, please contact MACHEREY-NAGEL or your local distributor.

7.5 Contact

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