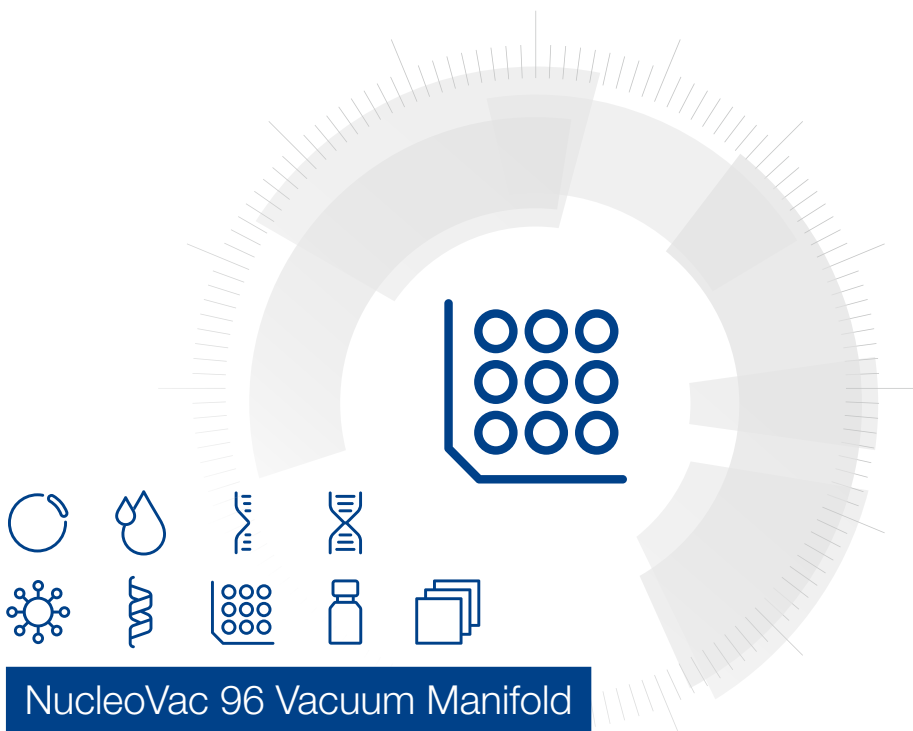


MACHEREY-NAGEL

# User manual



NucleoVac 96 Vacuum Manifold

November 2021 / Rev. 08

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# 1 Contents

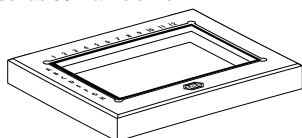
NucleoVac 96 Vacuum Manifold	
REF	740681
NucleoVac 96 Manifold Base	1
NucleoVac 96 Manifold Lid	1
Waste Container	2
Rack of Tube Strips	2
(1 set consists of 1 rack, 12 strips with 8 tubes each, and 12 Cap Strips)	
Spacer Set	2 spacers "MTP/MULTI-96 PLATES"
	2 spacers "ROUND-WELL BLOCKS"
	2 spacers "SQUARE-WELL BLOCKS"
	2 spacers "MICROTUBE RACKS"
User manual	1

*Note: For processing the NucleoSpin® 8-well strips on the NucleoVac 96, Starter Set A is required (see ordering information).*

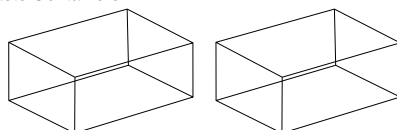
## 2 Product description

The NucleoVac 96 Vacuum Manifold is designed for the rapid manual parallel purification of nucleic acids using the 8-well and 96-well NucleoSpin® kits and the NucleoFast® kits. The **NucleoSpin® 8/96** and **NucleoSpin® Midi/ L** kits are based on MACHEREY-NAGEL's well known NucleoSpin® silica membrane technology and allow rapid simultaneous purification of high-quality nucleic acids. Time consuming centrifugation and decanting steps are eliminated by use of vacuum. The **NucleoFast®** kits are based on ultrafiltration technology and offer a fast and convenient way of nucleic acid purification. The **Protino®** 96 kits as well as the **Protino®** purification plate allow parallel purification of proteins in a highthroughput manner. The NucleoVac 96 manifold provides spacer sets to accommodate suitable microtiter plates, deep-well blocks (round-well and square-well blocks), or microtube racks for collecting samples.

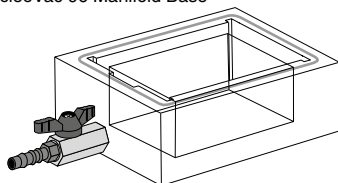
NucleoVac 96 Manifold Lid



Waste Containers



NucleoVac 96 Manifold Base



Spacer Set

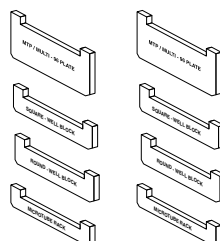


Figure 1 Overview

### 3 Safety instructions

Always place the **NucleoVac 96** vacuum manifold on a secure bench top or work area. Check the manifold before used for cracks or damages.

Always store **NucleoVac 96** clean and dry to prevent any damages.

When working with vacuum use caution and wear safety glasses near a vacuum manifold under pressure.

For additional safety information on kit components, please refer to the kit's MSDS file.

Use a vacuum regulator in order the measure the pressure difference between the inside and outside of the vacuum system.

## 4 General remarks

### 4.1 Assembly of the NucleoVac 96 Vacuum Manifold

Place manifold base on a secure lab bench.

For the use of the **NucleoSpin® 8** kits on the NucleoVac 96, the Starter Kit A is needed (see ordering information). This set contains the Column Holders A and NucleoSpin® Dummy Strips. The Column Holders A are used to hold the desired number of 8-well strips (up to six) during the preparation. The NucleoSpin® Dummy Strips are used to fill the unused rows of the Column Holders A.

If using a **NucleoSpin® 8** kit with filter and binding strips, please refer to section 6.1 for setup of the vacuum manifold. If the **NucleoSpin® 8** kit contains only binding strips, please see figure 6.2.

For the use of **NucleoSpin® 96** or **Protino® 96** kits no additional hardware is necessary. If using a kit with filter and binding plates (e.g., NucleoSpin® 96 Plasmid) the setup is shown in section 5.1. The setup for **NucleoSpin® 96** kits with only binding plates, the setup can be shown in section 5.2.

For use of **NucleoSpin L/ Midi** kits on the NucleoVac 96, the Starter Set Midi is needed (see ordering information, section 10.4). This set contains the column holder Midi, the reusable wash plate, the elution tube holder and dummy midi columns. Up to 24 samples can be processed, whereas the dummy midi columns are used to fill the unused wells of column holder midi.

Please make sure that you place the appropriate spacers into the NucleoVac 96 Manifold Base to insert the binding strips/plate, the MN Wash Plate, the Rack of Tube Strips, or the Elution Plate in the right distance underneath the outlets of the plate inserted into the manifold top.

For the use of **NucleoFast®** kits, insert a waste container into the manifold base. Close the manifold with the lid. Insert the **NucleoFast®** Plate into the manifold lid and start the procedure according to the kit protocol. Unused wells do not have to be taped. The use of the provided spacers is not necessary. For the detailed setup, refer to section 7.

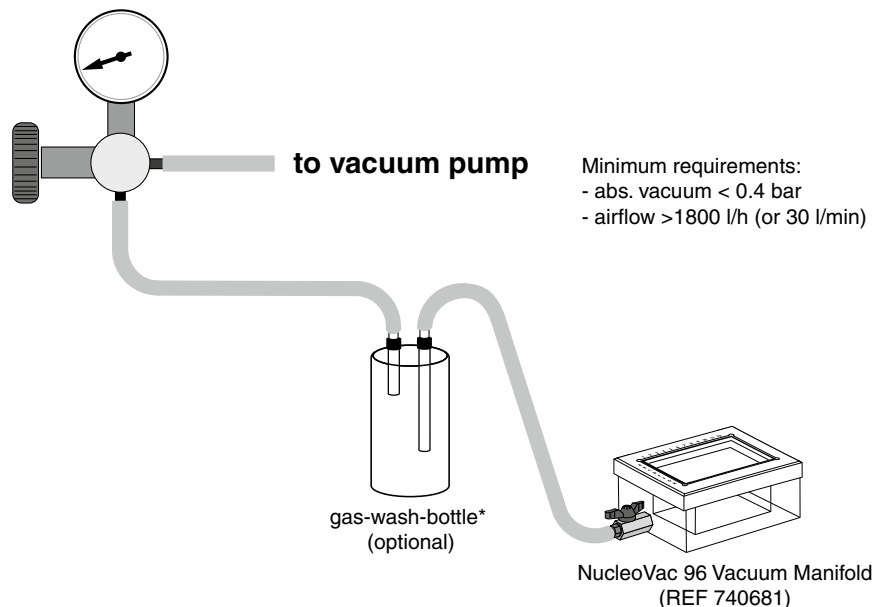
### 4.2 Setting up vacuum

Connect the manifold to a suitable vacuum source such as a water aspirator, house vacuum, or vacuum pump (e.g., KNF Laboport vacuum pump NB 840.3; vacuum pump specifications: final vacuum < 400 mbar\*, max. airflow > 1.8 m<sup>3</sup>/h) via a standard hose (8 mm inner diameter). Use a trap flask between vacuum source and vacuum manifold to protect pumps and vacuum lines. (Contact techsupport for recommendations on vacuum sources). Close the manifold's valve before adjusting vacuum. Adjust vacuum according to the kit protocol by using an appropriate regulator (e.g., REF 740641, see ordering information, section 10.4). Alternatively, open the valve of vacuum regulator and vacuum manifold. Apply vacuum and adjust the vacuum by closing the valve of the vacuum regulator slowly. Alternatively, vacuum can be adjusted by measuring the flowthrough of samples (see kit protocols).

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\* Reduction of atmospheric

## NucleoVac Vacuum Regulator



### 4.3 Vacuum regulator

For optimal kit performance a specific pressure range is necessary. Therefore, it is recommended to use the NucleoVac Vacuum regulator to measure the pressure difference between the inside and outside in millibar.

Use of higher or lower vacuum pressure may alter the kit performance.

The Vacuum regulator can be connected with 8 mm (inner diameter) vacuum tubings to the NucleoVac 96 manifold.

### 4.4 Apply vacuum

Make sure the vacuum regulator is opened, if used. Turn on the vacuum source. Slightly close the regulator valve while pressing down the plate/strips to ensure a good seal with the vacuum top. Close the vacuum regulator until the desired pressure is reached. Once the vacuum is applied the suction should keep the plate/strip on the lid. If not check for vacuum leaks.

Alternatively, vacuum can adjusted directly via the vacuum source.

Load samples into the individual wells of the filter or binding strips/plate. Open valve and if necessary press down the strips/plate shortly until flow starts.

\*Vacuum can cause implosions. Please make sure to use appropriate vessels.

## **4.5 Release vacuum from manifold**

When the samples have passed the wells, close valve (alternatively switch of vacuum source or open vacuum regulator) and wait about 10–20 seconds until the NucleoSpin<sup>®</sup> 96-well plate or the Column Holder A with the 8-well strips can be removed easily. For NucleoFast<sup>®</sup> plates, make sure that the vacuum is released after each vacuum step (60–90 s).

## 5 NucleoVac 96 setup with NucleoSpin® 96 or Protino® 96 kits



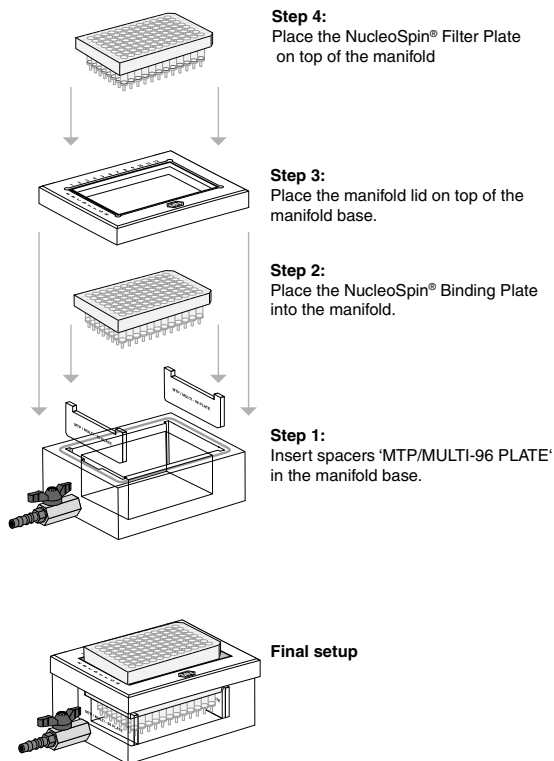
<https://www.youtube.com/watch?v=XeX6aFdjVt0>

### 5.1 Filtration step for plasmid purification

Performing the filtration step of a NucleoSpin® 96 kit procedure, the **NucleoSpin® Filter Plate** and the **NucleoSpin® Binding Plate** are used (e.g., using NucleoSpin® 96 Plasmid, REF 740625.1).

*Note: This setup is only used in **NucleoSpin® 96 Plasmid** purification protocols*

#### Filtration step

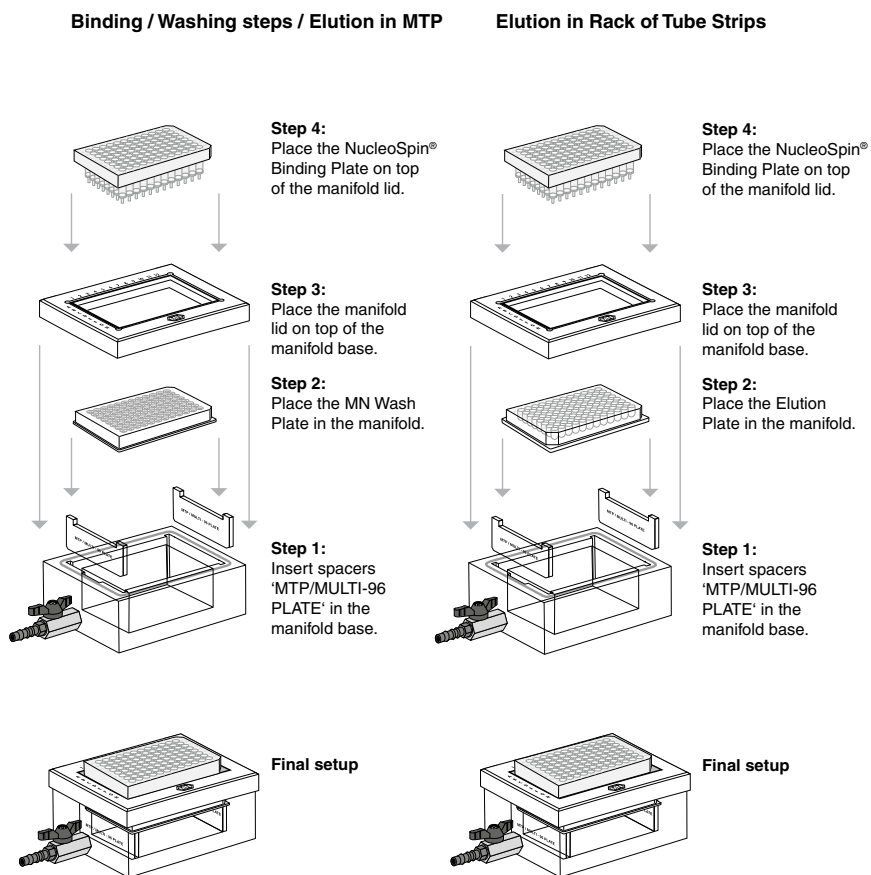


## 5.2 Binding, washing, and elution steps

Performing the binding, washing, or elution step of a NucleoSpin® 96 kit procedure, only the **NucleoSpin® Binding Plate** is used.

*Note: The Protino® 96 procedure follows the same principle as the NucleoSpin 96 kit procedure and can therefore be used as an example.*

Elution can be performed into the Elution plate (microtiter plate format). Alternatively, other plate formats, e.g. deep-well plates, such as the Round-well Block or the Square-well Block or microtube racks, such as the Rack of Tubes Strips, can be used in combination with the appropriate spacers. Please see the relating kit's user manual for more information regarding specific requirements.



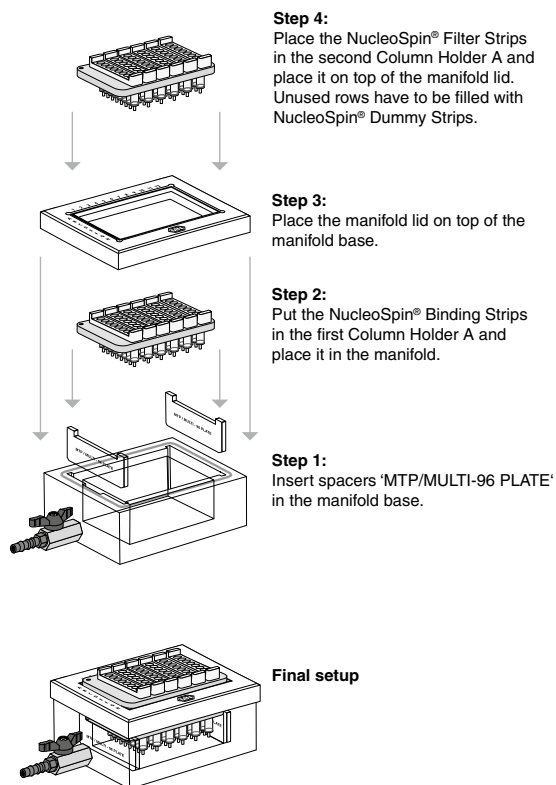
## 6 NucleoVac 96 setup with NucleoSpin® 8 kits

### 6.1 Filtration step

<https://www.mn-net.com/de/nucleovac8wellstrips>

Performing the filtration step of a NucleoSpin® 8 kit procedure, **NucleoSpin® Filter Strips** and **NucleoSpin® Binding Strips** are used (e.g., using NucleoSpin® 8 Plasmid, REF 740621).

#### Filtration step

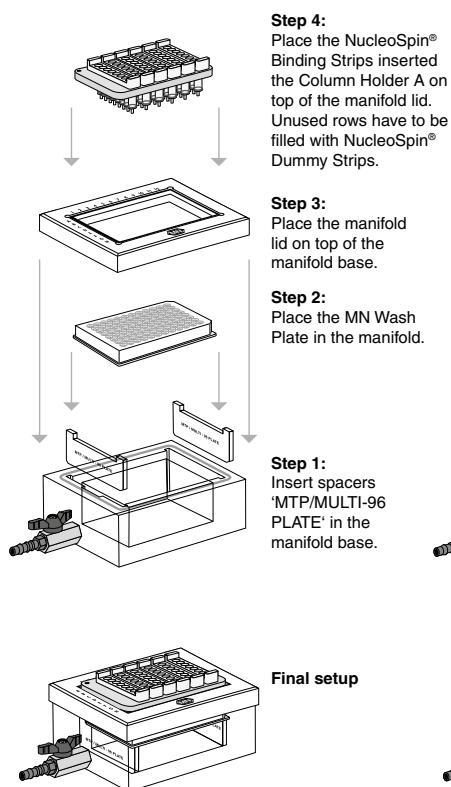


## 6.2 Binding, washing, and elution steps

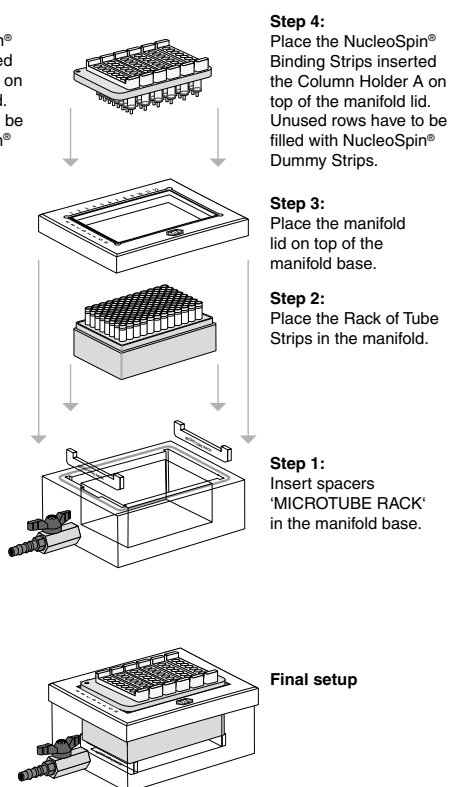
Performing the binding, washing, or elution step of a NucleoSpin® 8 kit procedure, only **NucleoSpin® Binding Strips** are used.

Elution is performed into Tube Strips or Elution Plate. Using the Elution Plate, spacers “MTP/MULTI-96 PLATE” are needed. Please see the relating kit’s user manual for more information regarding specific requirements.

### Binding / Washing / Elution in MTP

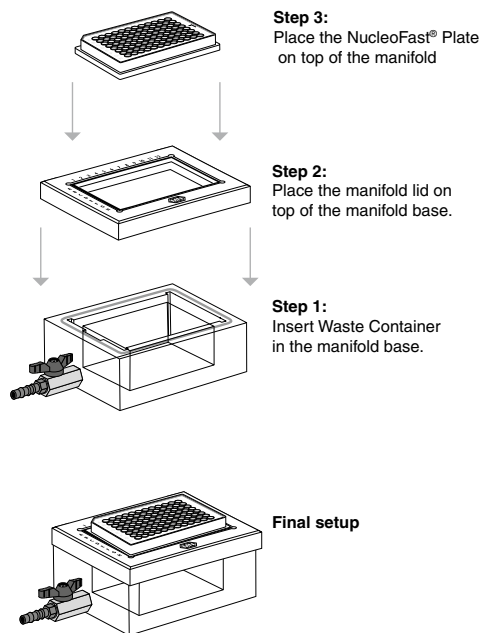


### Elution in Rack of Tube Strips



## 7 NucleoVac 96 setup with NucleoFast® 96 kits

NucleoFast® kits (e.g., NucleoFast® 96 PCR) can easily be used on the NucleoVac 96. The spacers provided with the NucleoVac 96 manifold are not used. Only the waste container is placed inside the vacuum chamber.



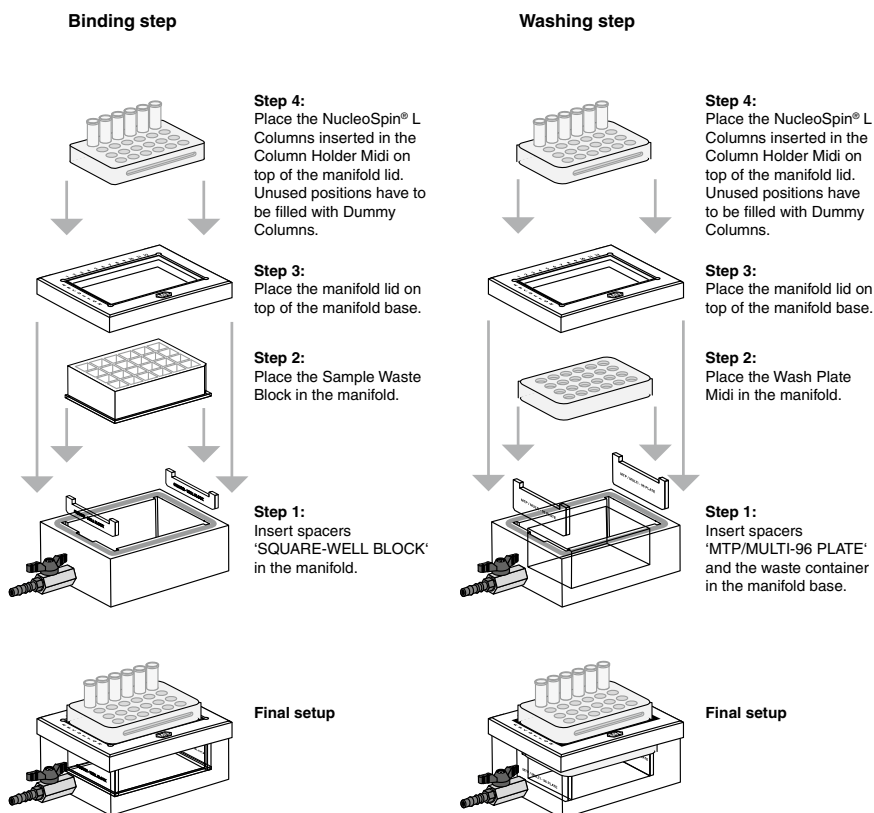
## 8 NucleoVac 96 setup with NucleoSpin® Midi/L kits

### 8.1 Binding and washing steps

**NucleoSpin® Blood L Vacuum** and **NucleoSpin® cfDNA Midi kits** are especially developed to be used with NucleoVac 96 Vacuum Manifold. The use of Starter Set Midi (See ordering information, section 10.4) is required.

Performing the binding and washing steps, the spacers “**SQUARE-WELL BLOCK**” and “**HTP / MULTI-96 PLATE**” are used

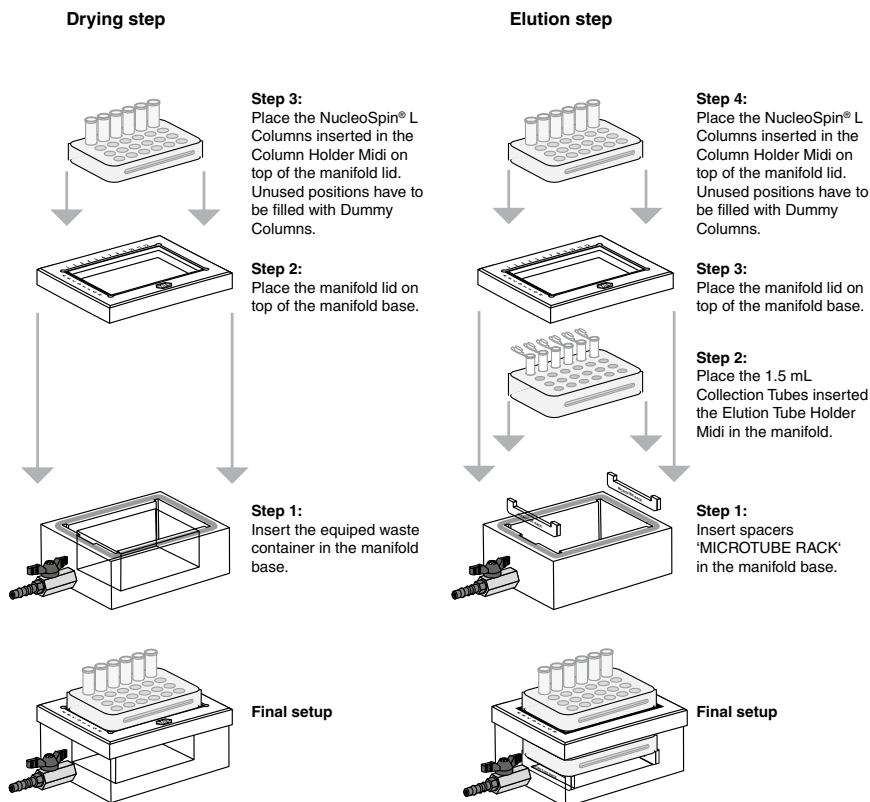
#### Setup of vacuum manifold:



## 8.2 Drying and elution step

For drying step only the waste container is placed inside the vacuum chamber. The elution step requires the use of spacers “MICRO TUBE RACK”.

### Setup of vacuum manifold:



## 9 NucleoVac 96 kit overview

Product	Specification	Pack of (Preps)	REF
NucleoSpin® 8/96 RNA	Isolation of RNA – flexible 8-well strip format for varying throughput and proven 96-well format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740698 / 740709.4
NucleoSpin® 8/96 RNA Blood	Isolation of total RNA from whole blood (human or animal) – flexible 8-well strip format for varying throughput or proven 96-well format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740220 / 740225.4
NucleoSpin® 8/96 Blood	Isolation of genomic DNA from whole blood – flexible 8-well strip format for varying throughput and proven 96-well plate format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740664 / 740665.4
NucleoSpin® 8/96 Tissue	Isolation of genomic DNA from human or animal tissue, cultured cells, or bacteria – flexible 8-well strip format for varying throughput and proven 96-well format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740740 / 740741.4
NucleoSpin 96 DNA RapidLyse	Rapid extraction of total DNA from tissue and organs in 96-well plate format	1 x 96, 4 x 96	740110.1 / 740110.4
NucleoSpin® 96 cfDNA	Isolation of cell-free DNA from up to 2 mL blood plasma in 96-well format	1 x 96, 4 x 96	740873.4
NucleoSpin® 8/96 DNA FFPE	Isolation of total DNA from FFPE samples in flexible 8-well strip or proven 96-well plate Format	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740242 / 740240.4
NucleoSpin® 8/96 Trace	Isolation of genomic DNA from forensic samples – flexible 8-well strip format for varying throughput and proven 96-well plate format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740722.1 / 740726.4
NucleoSpin® 8/96 Plant II	Isolation of genomic DNA from plant cells and tissue – flexible 8-well strip format for varying throughput and proven 96-well format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740669 / 740663.4

NucleoVac 96 Vacuum Manifold

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<b>Product</b>	<b>Specification</b>	<b>Pack of (Preps)</b>	<b>REF</b>
NucleoSpin® 8 / 96 Soil	Isolation of total DNA from soil samples	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740779 / 740787.2
NucleoSpin® 96 Food, 96-well kit for DNA from food	Isolation to total DNA from food samples	1 x 96, 4 x 96	740975 / 740976.4
NucleoSpin® 8 / 96 Virus	Isolation of viral RNA and DNA – flexible 8-well strip format for varying throughput and proven 96-well plate format for high throughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740643 / 740691.4
Protino® 96 Ni-NTA	High throughput purification of His-tag proteins	1 x 96, 4 x 96	745425.4
NucleoSpin® 8 / 96 Plasmid	Isolation of plasmid DNA –flexible 8-well strip format for varying throughput and proven 96-well plate format for high troughput	1 x 96, 4 x 96 / 2 x 96, 4 x 96, 24 x 96	740621 / 740625.4
NucleoSpin® 96 Flash	Time and cost efficient high throughput purification of plasmid DNA	1 x 96, 4 x 96	740618.4
NucleoSpin® 96 Plasmid Transfection-grade	A fast way to purify plasmids for transfection	1 x 96, 4 x 96	740491.4
NucleoBond® 96 Xtra EF	High throughput isolation of endotoxin-free plasmid DNA in 96-well format	1 x 96, 4 x 96	740430.4

## 10 Appendix

### 10.1 Pressure conversions

1 mbar = 100 Pa =  $0.987 \times 10^{-3}$  atm = 0,750 mm Hg =  $14.504 \times 10^{-3}$  psi

### 10.2 Manifold care

The manifold consists of an acrylic base and spacers, a PVC cover lid, and a valve made of stainless steel and other metals. Do not autoclave either manifold or cover lid. The parts of the manifold are resistant to diluted acetic acid, ethanol, guanidine-HCl, NaCl, NaOH, SDS. However, prolonged exposure of the manifold to these chemicals should be avoided. Therefore, after DNA purification rinse all parts of the manifold (particularly the valve) carefully with water and dry them thoroughly. The manifold must not come in contact with acetone, phenol, toluene, or other apolar organic solvents.

Decontaminate or dispose hazardous, infectious or biologically contaminated materials in a safe and acceptable manner and in accordance with all local and regulatory requirements.

### 10.3 Troubleshooting

Problem	Possible cause and suggestions
Vacuum is not build up properly	<p><i>Gasket</i></p> <ul style="list-style-type: none"> <li>Insert a microtiter plate with closed, rectangular bottom into the manifold lid. The gasket of the vacuum manifold must be covered completely by the microtiter plate. Apply vacuum to the manifold and test the vacuum. The microtiter plate should be fixed now by vacuum.</li> </ul>
	<p><i>Vacuum manifold</i></p> <ul style="list-style-type: none"> <li>Are there any cracks on the surface of the vacuum manifold?</li> <li>Check the main valve: is it tightly fixed into the vacuum manifold?</li> <li>Are there any cracks around the valve?</li> </ul>

## 10.4 Ordering information

Product	REF	Pack of
NucleoVac 96 Vacuum Manifold	740681	1
Replacement parts for the NucleoVac 96 are available on request		
NucleoVac Vacuum Regulator	740641	1
Starter Set A (for processing NucleoSpin® 8-well strips on NucleoVac 96 Vacuum Manifold)	740682	1 set
Starter Set Midi	740744	1 set
NucleoSpin® Dummy Strips	740685	6
Rack of Tube Strips (1 set consists of 1 rack, 12 strips with 8 tubes each, and 12 Cap Strips)	740637	5 racks
Elution Plate U-bottom	740486.24	24
Square-well Block	740481 740481.24	4 24
Round-well Block with Cap Strips (set consists of 1 Round-well Block and 12 Cap Strips)	740475 740475.24	4 sets 24 sets
Self adhering PE Foil	740676	50 sheets
Gas-permeable Foil	740675	50 sheets

Visit [www.mn-net.com](http://www.mn-net.com) for more detailed product information.

## 10.5 Product use restriction/warranty

NucleoVac 96 Vacuum Manifold components are intended, developed, designed, and sold FOR RESEARCH PURPOSES ONLY, except, however, any other function of the product being expressly described in original MACHEREY-NAGEL product leaflets.

MACHEREY-NAGEL products are intended for GENERAL LABORATORY USE ONLY! MACHEREY-NAGEL products are suited for QUALIFIED PERSONNEL ONLY! MACHEREY-NAGEL products shall in any event only be used wearing adequate PROTECTIVE CLOTHING. For detailed information please refer to the respective Material Safety Data Sheet of the product! MACHEREY-NAGEL products shall exclusively be used in an ADEQUATE TEST ENVIRONMENT. MACHEREY-NAGEL does not assume any responsibility for damages due to improper application of our products in other fields of application. Application on the human body is STRICTLY FORBIDDEN. The respective user is liable for any and all damages resulting from such application.

DNA/RNA/PROTEIN purification products of MACHEREY-NAGEL are suitable for IN VITRO-USES ONLY!

ONLY MACHEREY-NAGEL products specially labeled as IVD are also suitable for IN VITRO-diagnostic use. Please pay attention to the package of the product. IN VITRO-diagnostic products are expressly marked as IVD on the packaging.

IF THERE IS NO IVD SIGN, THE PRODUCT SHALL NOT BE SUITABLE FOR IN VITRO-DIAGNOSTIC USE!

ALL OTHER PRODUCTS NOT LABELED AS IVD ARE NOT SUITED FOR ANY CLINICAL USE (INCLUDING, BUT NOT LIMITED TO DIAGNOSTIC, THERAPEUTIC AND/OR PROGNOSTIC USE).

No claim or representations is intended for its use to identify any specific organism or for clinical use (included, but not limited to diagnostic, prognostic, therapeutic, or blood banking). It is rather in the responsibility of the user or - in any case of resale of the products - in the responsibility of the reseller to inspect and assure the use of the DNA/RNA/protein purification products of MACHEREY-NAGEL for a well-defined and specific application.

MACHEREY-NAGEL shall only be responsible for the product specifications and the performance range of MN products according to the specifications of in-house quality control, product documentation and marketing material.

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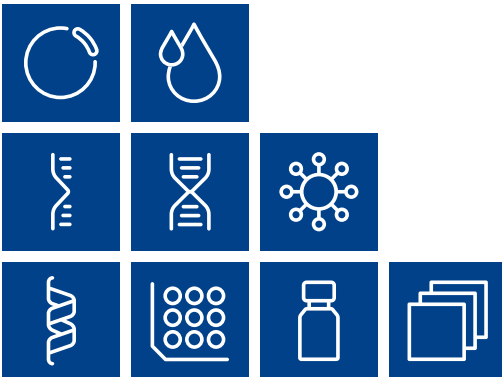
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Plasmid DNA

Clean up

RNA

DNA

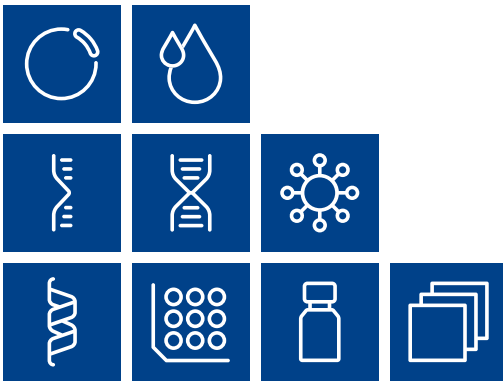
Viral RNA and DNA

Protein

High throughput

Accessories

Auxiliary tools



# MACHEREY-NAGEL

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