

## Application Note

MagXtract® 3200, a fully automated nucleic acid extraction and PCR setup system using MACHEREY-NAGEL's NucleoMag® Pathogen kit.



CE IVD FDA



### Magnetic Bead

Fast and efficient automated nucleic acid purifications from various bio-specimens.



### PCR Setup

Automatically and precisely dispense eluates, PCR reagents into PCR plate.



### Open Platform

Comprehensive protocols creation and adaption for purification and PCR setup.



### Whirl Mixing

Patented whirl-and-stir mixing approach to maximize the efficiency of purifications.



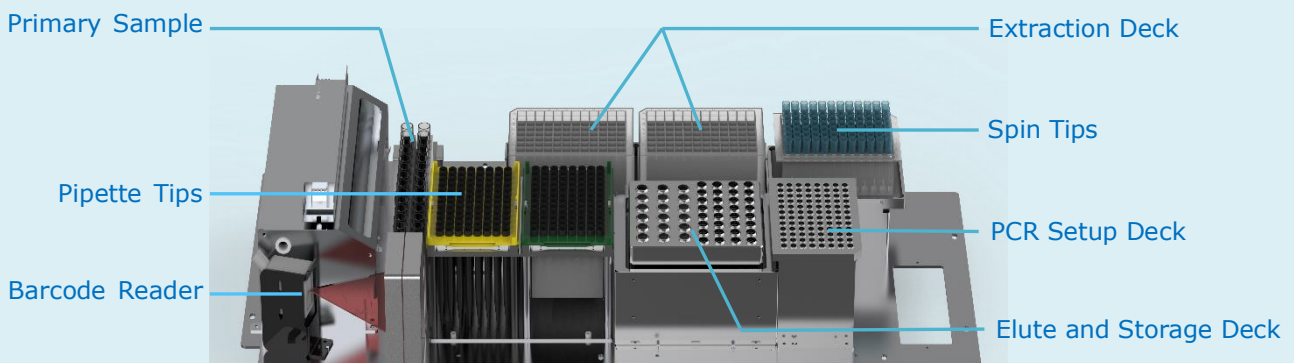
### UV / HEPA

Safeguard against the contamination with UV light and HEPA.



### Cool Station

Cooling control for eluates storage and reagent kits to maintain samples stability.



# NucleoMag® Pathogen

Automated extraction of SARS-CoV-2 RNA from swab matrix on the **MagXtract 3200**

## Introduction

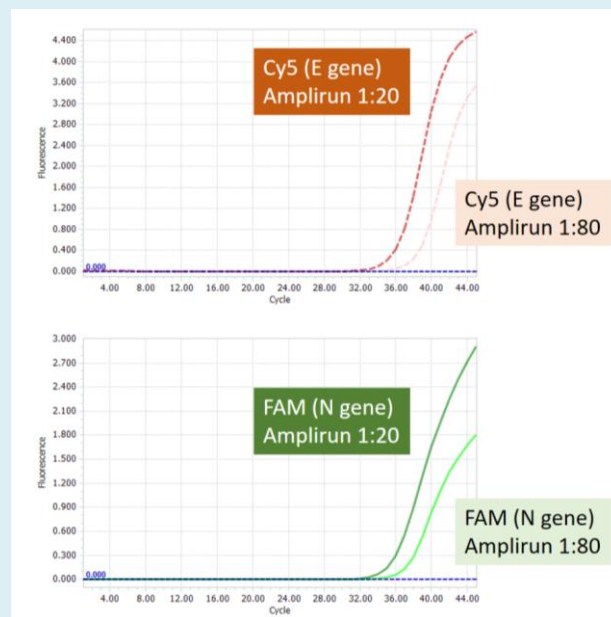
Owing to COVID-19 pandemic, the demands of nucleic acid purification elevate than before and the needs of laboratory automation increase dramatically. MACHEREY-NAGEL developed the magnetic bead based NucleoMag® Pathogen kit allowing the automated purification of nucleic acids from various specimen. Chroma ATE provides high quality automated instrument, MagXtract 3200, for nucleic acid extraction. Through using NucleoMag® Pathogen kit combining with MagXtract 3200, laboratory scientists will conduct clinical examinations in a safe, accurate, and efficient procedure.

## MagXtract 3200 Specification

|                    |   |
|--------------------|---|
| <b>Description</b> | <b>Automated nucleic acid extraction and liquid handling system</b> |
| <b>Capacity</b>    | Max. 32, 16-sample per run  |
| <b>Weight</b>      | 70 kg (± 5kg)   |
| <b>Dimensions</b>  | 721mm x 530mm x 567mm (W x D x H)                                   |

## Excellent Performance

We evaluated the performance of purification of SARS-CoV-2 viral RNA from swab matrix sample using the NucleoMag® Pathogen kit and MagXtract 3200. Highly sensitive target signal was shown as figure.



**Figure. Highly sensitive detection of SARS-CoV-2 RNA in swab matrix.** A serial dilution of inactivated SARS-CoV-2 virus (Amplirun® total SARS CoV-2 Control (Swab), Vircell microbiologists) was added into NucleoMag® Pathogen kit and followed the extraction procedure on the MagXtract 3200 instrument. Viral RNA was detected using qRT-PCR kit (Direct SARS-CoV-2 Realtime PCR kit, Vircell microbiologists) on the thermalcycler, LightCycler 96, Roche (Amplirun 1:20 = 1500 copies/ml, 15 copies/qPCR vial; Amplirun 1:80 = 375 copies/ml, 3.75 copies/qPCR vial).

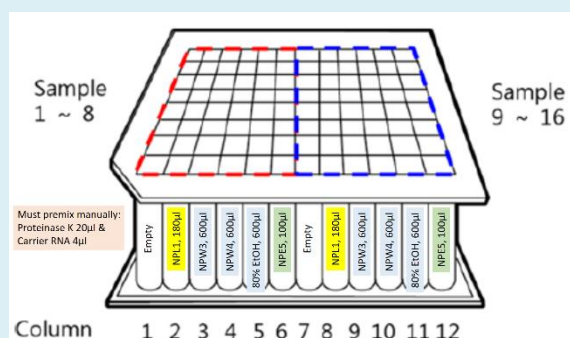
### Open System and Automation Solution

MagXtract 3200 allows the authorized user to edit protocols including nucleic acid extraction and PCR preparation. High flexibility application can fit most magnetic based extraction kits and PCR reagent kits.

**Open System** – Based on MACHEREY-NAGEL extraction kit IFU, optimize the detailed factor to make excellent performance.

**Automation Solution** – Replace the manual steps including not only extraction but also PCR preparation.

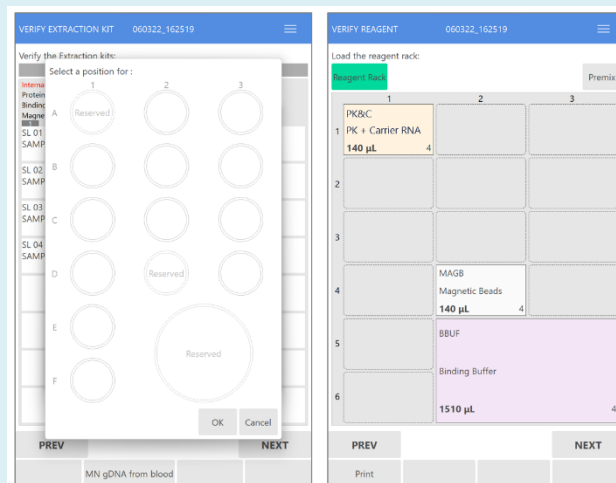
The layout of extraction buffer in 96 deep well plate as below picture.



Please make sure the column 1 and 7 of deep well plate are empty. Because run 1 spin tip will be discarded in these column after lysis and then MagXtract 3200 will automatically add binding buffer and magnetic beads into column 2 and 8.

Each specimen need two spin tips. Please make sure your spin tips are sufficient.

We have customized Elute and Storage Deck for 20 or 30ml bottle to aliquot binding buffer. The layout of reagents as below GUI picture.



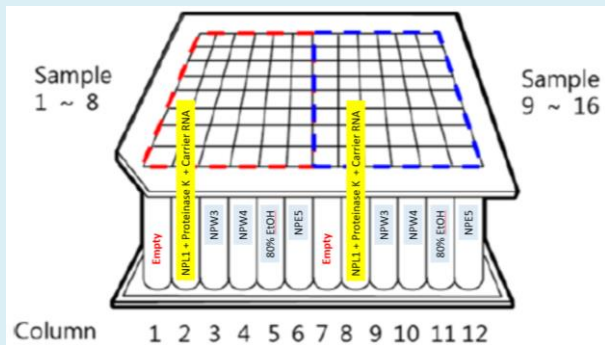
### Fully automatic steps:

1. Adding specimen and proteinase K and carrier RNA to lysis buffer (note. proteinase K and carrier RNA must premix in advance to place on elute and storage deck)
2. Specimen lysis
3. Adding binding buffer and magnetic beads
4. Collecting beads
5. Washing
6. Vaporing (drying)
7. Eluting
8. Transferring eluate to storage vial
9. Dispensing qPCR premix to each vial
10. Adding template to each vial

It saves about 90% hands-on time!

**Semi Automation Solution** – For customer who purchased standard elute and storage deck, we provide an alternative method to conduct semi-auto extraction.

The layout of extraction buffer in 96 deep well plate as below picture.



Please make sure the column 1 and 7 of deep well plate are empty. Because run 1 spin tip will be discarded in these column after lysis and then pause automatically to let user add binding buffer and magnetic beads.

Each specimen need two spin tips. Please make sure your spin tips are sufficient.

Semi automation steps:

1. Adding specimen to lysis buffer (column 2 and 8)
2. Specimen lysis
3. Automatically pause

4. **Manually** added binding buffer and magnetic beads and remember to remove first run spin tip from column 1 / 7.

5. Collecting beads
6. Washing
7. Vaporizing (drying)
8. Eluting
9. Transferring eluate to storage vial
10. Dispensing qPCR premix to each vial
11. Adding template to each vial

**MagXtract 3200 GUI**

Three operating modes: full run, preparation and extraction.

MagXtract 3200 software provides the protocol-based control to streamline the workflows. The stepwise GUI and touchscreen control guide the user through the complication of the assay setup, from sample loading to the consumable placement.

## Order Information

| Product                                 | REF  |
|---|--|
| <b>NucleoMag®</b>                       | 744210.1 (96 preps)                                      |
| <b>Pathogen</b>                         | 744210.4 (384 preps)                                     |
| <b>*NucleoMag® Dx Pathogen (CE-IVD)</b> | 744215.4 (384 preps)                                     |
| <b>MagXtract 3200 (CE-IVD)</b>          | 9-49200002   |
| <b>Spin tip in box</b>                  | A94-000135   |
| <b>Filtered tip (50µl)</b>              | A94-000130   |
| <b>Filtered tip (1000µl)</b>            | A94-000131   |
| <b>96 deep well plate</b>               | Please contact Chroma ATE                                |
| <b>20ml bottle</b>                      | Please contact Chroma ATE                                |
| <b>30ml bottle</b>                      | Please contact Chroma ATE                                |
| <b>Customized accessories</b>           |  |
| <b>Sample drawer</b>                    | 13 x 75 mm / 16 x 100 mm                                 |
| <b>Elute and storage deck</b>           | We can modify the number of hole to fit your application |

**\*NucleoMag® Dx Pathogen (CE-IVD) is used in in-vitro diagnostic workflows,** The NucleoMag Dx Pathogen and MagXtract 3200 kit is not validated as a in-vitro diagnostic workflow. If the NucleoMag® Dx Pathogen kit is used in in-vitro diagnostic workflows with the MagXtract 3200, the use of the kit must be validated by the user in conjunction with the instrument and consumables used and the subsequent in-vitro diagnostic assay (e.g., qRT-PCR). It is recommended to use appropriate controls (e.g. internal controls, extraction controls, positive/negative controls). Individual protocol

steps may vary depending on available consumables, hardware, platform and instrument setup. Please contact MN technical support ([support@mn-net.com](mailto:support@mn-net.com)) for further assistance.

For more information please contact

**MACHEREY-NAGEL** Bioanalysis technical support: [support@mn-net.com](mailto:support@mn-net.com)

**Chroma ATE** Technical support: [tech-support.LSI@chroma.com.tw](mailto:tech-support.LSI@chroma.com.tw)