Instructions for Use (Handbook)

MagPurix® Viral RNA Extraction Kit

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Manual No.: IFU-MP02-311B05
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48





For *in vitro* diagnostic use



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Read and follow these Instructions for Use prior to using this product. The latest revision of this document can be found at www.zinexts.com

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Intended Use

The MagPurix® Viral RNA Extraction Kit provides a complete set of reagents and consumables for the automated purification of viral RNA from human cell-free biospecimen, such as serum, plasma, urine, etc. using the MagPurix system.

The product is intended to be used by professional users, such as technicians and physicians who are trained in molecular biology techniques.

Introduction

Product Name	MagPurix® Viral RNA Extraction Kit
Catalogue Number	311B051A, 311B053A, 311B054A
Product Overview	The MagPurix® Viral RNA Extraction Kit is specially designed to extract viral RNA from cell-free samples, such as serum, plasma, CSF, urine and other cell-free body fluids using MagPurix® series automatic instruments. The kit is applied with unique magnetic ZiBeads® technology, which achieves consistent and high product yield and reproducible results. The final product is suitable for a wide range of diagnostic and research applications, such as sequencing, genotyping, qPCR, ddPCR and NGS assays.
Applicable Instruments Model	All MagPurix® Instruments
Display Protocol Name on the Instrument	2013 VIRAL RNA (For MagPurix® 12/24) Viral RNA (For MagPurix® EVO)
Applicable Instrument Firmware	Check and download the latest firmware from www.zinexts.com

Kit Contents and Storage

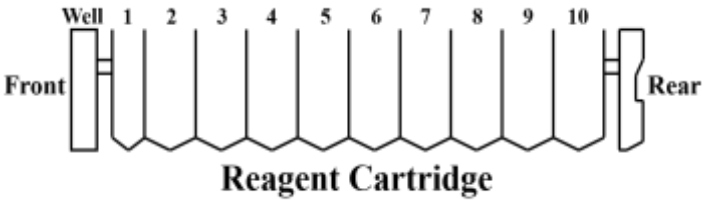
Shipping and Storage	The kit is shipped at room temperature. Upon receipt, store the kit at room temperature. All kit components are stable when stored properly until the expiration date shown on the kit box.
Kit Content	The components supplied in the kit are listed below. Sufficient reagents are supplied to perform 48 purifications.

Contents	Amount
1 Reagent Cartridge	8 pcs
2 Reaction Chamber (For MagPurix® 12/24, EVO)	8 pcs
3 Tip Holder (For MagPurix® 12/24, EVO)	8 pcs
4 Piercing Pin	50 pcs
5 Filter Tip	50 pcs
6 Sample Tube (2 ml)	50 pcs
7 Elution Tube (1.5 ml)	50 pcs
8 Process Rack (For MagPurix® N.E.O. only)	48 pcs
RNA Carrier (1 mg)	1 pc
Barcode Sticker (For MagPurix® EVO, N.E.O.)	50 pcs

Reagent Cartridge Contents

Each Reagent Cartridge has 10 positions with 10 sealed wells.
Positions 1–10 contain the reagents required for this protocol.

Reagent	Well No.
Proteinase K Solution	1
Lysis Buffer 42	2
Binding Buffer 1	3
Magnetic Bead Solution	4
Washing Buffer 2F	5
Washing Buffer A	6
Washing Buffer B	7
RNase-free water	8
RNase-free water	9
Empty	10



Reagent Cartridge

Materials Required but not Provided

The following general laboratory equipment and consumables are required to perform the extraction. All laboratory equipment should be installed, calibrated, operated, and maintained according to the manufacturer's recommendations. The following table lists the required equipment and consumables.

For all purification procedures:
1. MagPurix® / MagPurix® EVO series / MagPurix® N.E.O. instrument
2. 1.5 or 2.0 ml microcentrifuge tubes
3. Pipettes and filter tips
4. Phosphate-buffered saline (PBS, may be required for diluting samples)
5. **Optional**: Plastic consumables

Warnings and Precautions

For *in vitro* diagnostic use only. Read all the instructions carefully before using the kit. Use of this product should be limited to trained personnel in the techniques of DNA purification. Strict compliance with the user manual is required for optimal results. Attention should be paid to expiration dates printed on the box and labels of all components. Do not use a kit after its expiration date.

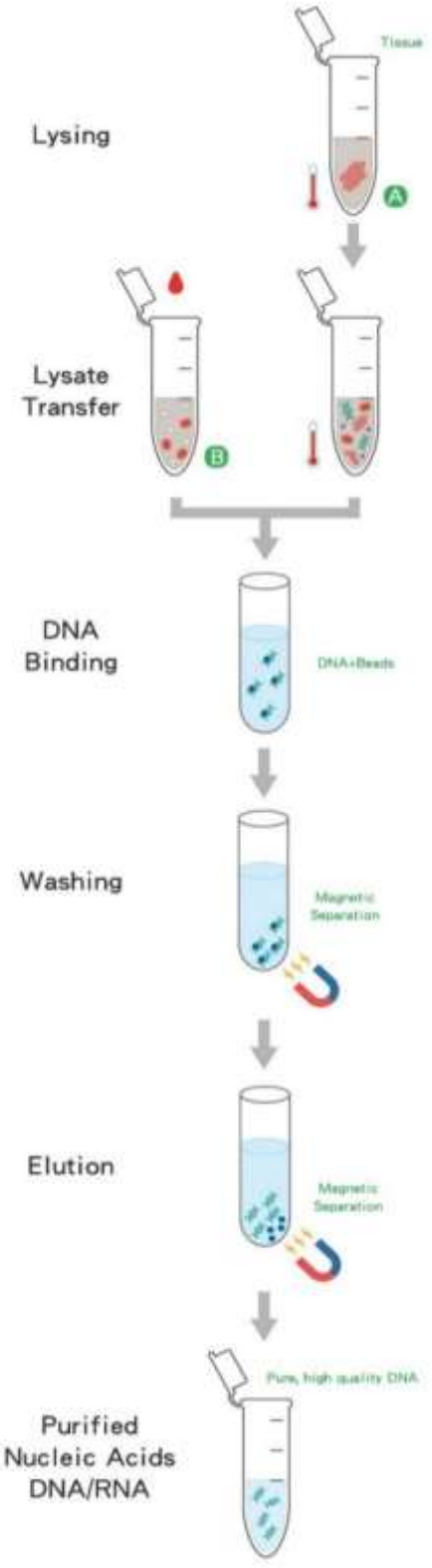
When working with chemicals, always wear a suitable lab coat, disposable gloves, and protective goggles. For more information, please consult the appropriate safety data sheets (SDSs). These are available online in convenient and compact PDF format at **MSDS (Material Safety Data Sheets) – Downloads – www.zinexts.com**.

Please report any serious incident occurred in relation to the device to your local representative/ agent or the manufacturer, and to the competent authority of your country/state.



CAUTION: DO NOT add bleach or acidic solutions directly to the sample preparation waste.

Purification Principle



Ⓐ Perform certain pretreatment process before extraction.
Ⓑ Transfer sample to extraction directly.

Things to Do Before Starting

Sample Preparation

The purification procedure is optimized for the use of 100-500 µl (EVO 100-400 µl) serum, plasma, CSF, pretreated urine or other cell-free body fluid samples.

Serum	a. Add an appropriate volume of RNA Carrier into each Sample Tube. b. Dispense 100-500 µl (EVO 100-400 µl) of sample into each Sample Tube. c. If the sample volume is lower than described, please complete the volume with appropriate amount of PBS.
Plasma	a. Add an appropriate volume of RNA Carrier into each Sample Tube. b. Dispense 100-500 µl (EVO 100-400 µl) of sample into each Sample Tube. c. If the sample volume is lower than described, please complete the volume with appropriate amount of PBS.
Cerebrospinal fluid (CSF)	a. Add an appropriate volume of RNA Carrier into each Sample Tube. b. Dispense 100-500 µl (EVO 100-400 µl) of sample into each Sample Tube. c. If the sample volume is lower than described, please complete the volume with appropriate amount of PBS.
Urine	a. Centrifuge sample at 20,000 x *g* for 10 minutes to concentrate virus into a pellet. b. Discard supernatant and re-suspend the pellet in 220 µl PBS. c. Transfer 200 µl concentrated sample into each Sample Tube.
Cell-free body fluid(s)	a. Add an appropriate volume of RNA Carrier into each Sample Tube. b. Dispense 100-500 µl (EVO 100-400 µl) of sample into each Sample Tube. c. If the sample volume is lower than described, please complete the volume with appropriate amount of PBS.

Note:

Plasma must be prepared from fresh or frozen blood samples collected in tubes that contain common anti-coagulants like EDTA and citrate. (Heparin has inhibitory effects on nucleic acid amplification reaction).

RNA Carrier has two roles in the purification process. First, it enhances the binding of viral nucleic acids to the silica surface of magnetic particles, especially when there are few target molecules in the sample. Second, in the rare cases that chaotropic salts and detergents in the lysis buffer may not denature RNase, RNA Carrier can help to protect RNA from degradation. If RNA Carrier is not added to the reaction, recovery of DNA or RNA may be reduced.

Using fresh sample (stored at 2-8°C for up to 6 hours) for extraction is recommended. Total nucleic acid yield and quality will decrease with time or after multiple freeze-thaw cycles. For longer storage time, samples should be frozen at -20°C or lower and avoid freeze-thaw cycles. Thaw samples at room temperature (15-25°C) and process the sample immediately after the temperature reaches to room temperature. Do not refreeze sample after thawing. If precipitation is visible in sample, centrifuge at 6,800 x *g* for 3 minutes and transfer supernatant to a new tube without disturbing the precipitate, and immediately start the purification procedure.

For large volume liquid samples with low or unknown bacterial content, e.g., urine or other, follow the “Urine” preparation concentrate procedure.

Preparation of RNA Carrier

RNA Carrier	a. Gently spin the RNA Carrier tube before opening it. b. Add 1 ml RNase-free water to lyophilized RNA Carrier and mix by vortex. c. Store RNA Carrier at 4°C (short-term, up to 1 month) or -20°C (long-term, aliquots before freezing). Avoid freeze-thaw more than 3 times. d. Before extraction, add 5 µl (for 100 µl sample), 10 µl (for 200 µl sample) or 20 µl (for 400 µl sample) RNA Carrier into each Sample Tube.

Procedure of MagPurix System



* Download the run record (MagPurix EVO & MagPurix N.E.O. series)

Purification Protocol - MagPurix® series

1	Turn on the Instrument	a. Turn on the power switch and wait for the screen to turn on.
2	Load new Consumable(s) and Cartridge(s)	a. Open the door and remove the Sample Rack from the instrument. b. Load 1 Reagent Cartridge, and all plastic disposables (2 Reaction Chamber, 3 Tip Holder, 4 Piercing Pins, 5 Filter Tips and other components presented in the kit intended to use). c. Place 6 Sample Tubes and 7 Elution Tubes into the Sample Rack.
3	Load the Samples	a. Transfer appropriate volume of sample into each Sample Tube on the Sample Rack. b. Put the Sample Rack back into the instrument and close the door.
4	Program Set up	a. Scan the protocol barcodes to select the purification protocol, sample volume and elution volume.
5	Start Extraction	a. Follow the instructions displayed on the screen to double check the operating steps being completed before program running. b. Press "**ENTER**" to start the experiment. Instrument will run the protocol program automatically until the whole process is completed. c. At the end of the run (approximately 12 series 40-60 minutes, 24 series 45-65 minutes), instrument alarms briefly.
6	Collect the Elution Tubes	a. Open the instrument door. b. Collect the Elution Tubes containing the purified nucleic acids. c. The purified nucleic acids are ready for immediate use. Store the purified nucleic acids at 4°C (short-term, less than 10 days) or aliquot and store at -70°C (long-term) before performing downstream analysis. d. Discard the used cartridges and all plastic consumables into biohazard waste. *Do not reuse the cartridges. e. If you are not using the instrument immediately, place the Sample Rack back to the workplace, close the instrument door and press "Start" button for 2 seconds to enter sleep mode. Moreover, if the instrument will not be used in an extended period of time, please turn off the power switch.

Purification Protocol - MagPurix® EVO series

1	Turn on the Instrument	a. Turn on the power switch and wait for the screen to turn on. b. Login the instrument and enter the Home Page.
2	Load new Consumable(s) and Cartridge(s)	a. Open the door and remove the Sample Rack from the instrument. b. Open the Tip-Holder Lid. c. Load 1 Reagent Cartridge and all plastic disposables (2 Reaction Chamber, 3 Tip Holder, 4 Piercing Pins, 5 Filter Tips and other components presented in the kit intended to use). d. Close the Tip-Holder Lid. e. Paste the Barcode Stickers on Elution Tubes. f. Place 6 Sample Tubes and 7 Elution Tubes into the Sample

			Rack.
3	Load the Samples	a. b.	Transfer appropriate volume of sample into each Sample Tube on the Sample Rack. Put the Sample Rack back into the instrument and close the door.
4	Program Set up	a. b. c. d. e. f. g.	Select the appropriate protocol program on the instrument. Press **NEXT**. Select the appropriate Sample Volume and Elution Volume and press **NEXT**. Press the number button to select the right Sample Numbers. Scan/Edit each primary Sample ID directly. After finished, press **NEXT**. Scan/Edit each Elution Tube ID directly. After finished, press **NEXT**. Scan Reagent Cartridge Barcode. Press **NEXT**. *If the cartridge is expired, the next step cannot be performed. Follow the instructions on the screen to double-check the operating steps being completed before running the program. Press **NEXT**.
5	Start Extraction	a. b. c. d.	Check "**PROGRAM CONFIRMATION**" on the screen. Press "**START**" to start the experiment. Instrument will run the protocol program automatically until the whole process is completed. At the end of the run (approximately 40-50 minutes), instrument alarms briefly and the screen indicates "**PROGRAM FINISH**". If you want to perform the same protocol, press "**RERUN**" to perform the same experiment. If you do not need to re-run the experiment, press the function button "**HOME**" to exit the experiment mode.
6	Collect the Elution Tubes	a. b. c. d. e.	Open the instrument door. Collect the Elution Tubes containing the purified nucleic acids. The purified nucleic acids are ready for immediate use. Store the purified nucleic acids at 4°C (short-term, less than 10 days) or aliquot and store at -70°C (long-term) before performing downstream analysis. Discard the used cartridges and all plastic consumables into biohazard waste. *Do not reuse the cartridges. If you are not using the instrument immediately, please put the Sample Rack back into the instrument, close the instrument door, and press the "**POWER**" function button to enter sleep mode. If the instrument will not be used in an extended period of time, please turn off the power switch.

Purification Protocol - MagPurix® N.E.O.

1	Turn on the Instrument	a. b.	Turn on the power switch and wait for the screen to turn on. Scan the user personal barcode to Login the instrument and enter the Home Page.
2	Program set up	a. b.	Scan the barcode of the MagPurix® Extraction kit. For optimum results, always use a kit within the expiry time mentioned on the kit box. Use the +/- buttons or manually enter the input total volume of sample after facultative pretreatment and the elution volume required. Press . **ATTENTION: the drawer will open immediately, keep clear**

		from the drawer opening area. c. Look at the 2 pop-up animations windows that teach how to 1- Select sample position, 2- scan sample IDs, press "**NEXT".** d. Select whether your samples belong to a "working list". If yes, MagPurix® N.E.O. will recognize the samples by connecting to your organization LIS network. e. Select a sample position between 1-12, scan all sample tube barcodes and elution tube barcodes. Press when all samples are edited.
3	Load new Consumable(s) and Cartridge(s)	a. Verify that all samples are all set properly, place onto the worktable all consumables, 1 Reagent Cartridge and all plastic disposables (4 Piercing Pins, 5 Filter Tips, 8 Process Rack and other components presented in the kit intended to use).
4	Load the Samples	a. Transfer appropriate volume of sample into each Sample Tube on the Sample Rack. b. Place the 6 Sample Tubes and 7 Elution Tubes on the MagPurix® N.E.O. Sample Rack, following the same order as set on the MagPurix® N.E.O. system. c. Press "Close drawer", the drawer will close automatically.
5	Start Extraction	a. Press after the drawer has closed **NOTE:** It is possible to Pause the extraction process. Press to resume or to abort the extraction process.
6	Collect the Elution Tubes	a. The Extraction process is finalized (approximately 40-45 minutes) when alarm rang and the MagPurix® N.E.O. will display the extraction process report. b. Press "Export" to export the Data report to an USB drive. Data reports are stored in Toolbox>data archive c. Press to terminate the experiment. **ATTENTION: the drawer will open immediately, keep clear from the drawer opening area.** d. Collect the Elution Tubes containing the purified nucleic acids. e. The purified nucleic acids are ready for immediate use. Store the purified nucleic acids at 4°C (short-term, less than 10 days) or aliquot and store at -70°C (long-term) before performing downstream analysis. f. Discard the used cartridges and all plastic consumables into biohazard waste. *Do not reuse the cartridges. g. Press **"Close drawer"** then , the MagPurix® N.E.O. system will automatically redirect to the UV decontamination page. h. Press **"UV Decontamination"**, and select the desired time using +/- buttons. Press **"Start".** **NOTE:** It is possible to Pause the decontamination process. Press to resume or to abort the decontamination process. i. Press **"OK"** when the decontamination process is finished. MagPurix® N.E.O. will redirect to the **LOGIN** page.

Troubleshooting

***This table is helpful for solving common problem. If you need other technical support, please contact Zinexts team (sales@zinexts.com) or your distributor.**

Problem	Possible Cause	Comments and suggestions
Poor RNA quality or yield	Deterioration or contamination of reagents.	Please ensure that the kit reagents are still within the effective shelf-life period before use. Discard any kit reagent that shows discoloration or evidence of microbial contamination.
	Kit stored under non-optimal conditions.	Store kit at 15-25°C at all time after arrival. If either reagent or buffer precipitate upon shipping in cold weather or during long-term storage, dissolve precipitates by gently warming and stirring the solution. Please do not freeze the Reagent Cartridges.
	Insufficient sample input.	DNA yield depends on the sample type and the number of nucleated cells in the sample. Please proportionally adjust the total input amount of sample to increase the DNA yield.
	Too much of elution buffer was used.	The elution volume can be reduced proportionally.
	The eluate of final product(s) is not enough.	Please collect issue information and provide it to your Support Representative/Technical Support as soon as possible.
Clogging issue	Too much sample material was used.	Decrease the input amount of sample material or dilute your sample.
No results in downstream analysis	No signal/The PCR was inhibited.	Using appropriate controls for analysis. Check the positive control, negative control, water (NTC) and internal control to clarify the possible causes.
Instrument malfunction/abnormal sound	Abnormal consumables: 1. Deformed Filter Tips 2. Deformed Reaction Chamber 3. Deformed Tip Holder	Please replace the batch with normal consumables.
	Abnormal action of instrument: 1. Inaccurate correction value 2. Spare parts or components damaged	Please collect issue information (videos and pictures) and provide it to your Support Representative/Technical Support as soon as possible to calibrate or replace any other damaged or worn parts.

Related Products

Product Name	Cat. no.
MagPurix® Blood DNA Extraction Kit 200 (48) ST	311A011A
MagPurix® Blood DNA Extraction Kit 200 (48) DP	311A013A
MagPurix® Blood DNA Extraction Kit 200 (48) N.E.O.	311A014A
MagPurix® Blood DNA Extraction Kit 1200 (48) ST	311A021A
MagPurix® Blood DNA Extraction Kit 1200 (48) DP	311A023A
MagPurix® Blood DNA Extraction Kit 1200 (48) N.E.O.	311A024A
MagPurix® Viral Nucleic Acid Extraction Kit (48) ST	311B011A
MagPurix® Viral Nucleic Acid Extraction Kit (48) DP	311B013A
MagPurix® Viral Nucleic Acid Extraction Kit (48) N.E.O.	311B014A
MagPurix® Tissue DNA Extraction Kit (48) ST	311D011A
MagPurix® Tissue DNA Extraction Kit (48) DP	311D013A
MagPurix® Tissue DNA Extraction Kit (48) N.E.O.	311D014A
MagPurix® Cultured Cell DNA Extraction Kit (48) ST	311E011A
MagPurix® Cultured Cell DNA Extraction Kit (48) DP	311E013A
MagPurix® Bacterial DNA Extraction Kit (48) ST	311C011A
MagPurix® Bacterial DNA Extraction Kit (48) DP	311C013A
MagPurix® Bacterial DNA Extraction Kit (48) N.E.O.	311C014A
MagPurix® HPV DNA Extraction Kit for Swab Samples (48)	311F011A
MagPurix® HPV DNA Extraction Kit for Swab Samples (48) DP	311F013A
MagPurix® HPV DNA Extraction Kit for Swab Samples (48) N.E.O.	311F014A
MagPurix® TB DNA Extraction Kit (48) ST	311G011A
MagPurix® TB DNA Extraction Kit (48) DP	311G013A
MagPurix® TB DNA Extraction Kit (48) N.E.O.	311G014A
MagPurix® FFPE DNA Extraction Kit (48) ST	311H011A
MagPurix® FFPE DNA Extraction Kit (48) DP	311H013A
MagPurix® FFPE DNA Extraction Kit (48) N.E.O.	311H014A
MagPurix® Forensic DNA Extraction Kit (48) ST	311I011A
MagPurix® Forensic DNA Extraction Kit (48) DP	311I013A
MagPurix® Forensic DNA Extraction Kit (48) N.E.O.	311I014A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit A (48) ST	311B031A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit A (48) DP	311B033A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit A (48) N.E.O.	311B034A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit B (48) ST	311B041A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit B (48) DP	311B043A
MagPurix® Viral/Pathogen Nucleic Acids Extraction Kit B (48) N.E.O.	311B044A
MagPurix® Viral RNA Extraction Kit (48) ST	311B051A
MagPurix® Viral RNA Extraction Kit (48) DP	311B053A
MagPurix® Viral RNA Extraction Kit (48) N.E.O.	311B054A
MagPurix® Plant DNA Extraction Kit (48) ST	311J011A
MagPurix® Plant DNA Extraction Kit (48) DP	311J013A
MagPurix® Plant DNA Extraction Kit (48) N.E.O.	311J014A
MagPurix® Total RNA Extraction Kit (48) ST	311K011A
MagPurix® Total RNA Extraction Kit (48) DP	311K013A

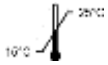
MagPurix® Total RNA Extraction Kit (48) N.E.O.	311K014A
MagPurix® Viral Nucleic Acid Extraction Kit LV (48) ST	311B021A
MagPurix® Viral Nucleic Acid Extraction Kit LV (48) DP	311B023A
MagPurix® Viral Nucleic Acid Extraction Kit LV (48) N.E.O.	311B024A
MagPurix® CFC DNA Extraction Kit (48) ST	311L011A
MagPurix® CFC DNA Extraction Kit (48) DP	311L013A
MagPurix® CFC DNA Extraction Kit (48) N.E.O.	311L014A
MagPurix® Coronavirus RNA Extraction Kit (48) ST	311B061A
MagPurix® Coronavirus RNA Extraction Kit (48) DP	311B063A
MagPurix® Urine cfDNA Extraction Kit (48) ST	311L041A
MagPurix® Urine cfDNA Extraction Kit (48) DP	311L043A
MagPurix® Plasma cfDNA Extraction Kit (48) ST	311L051A
MagPurix® Plasma cfDNA Extraction Kit (48) DP	311L053A

References

- Tan SC *et al.* J Biomed Biotechnol. (2009)

Symbols

The following symbols are used on labels and in Instructions for Use (IFU), in compliance with EN ISO 15223-1 standard.

Symbol	Explanation
	CE mark
	For In Vitro Diagnostic Use
	Catalogue number
	Lot/Batch number
	Sufficient for [n] samples
	Instructions for Use
	Expiry date
	Storage temperature (15°C - 25°C)
	For single use only
	Manufacturer
	European Authorized Representative
	Caution

Limited Product Warranty

Zinexts Life Science Corp. is committed to provide customers with high-quality products and services. Our goal is to ensure that every customer is 100% satisfied with our products and services. If you have any question or concerns, contact our Technical Support Representatives.

Zinexts Life Science Corp. guarantees the performance of all products according to the specifications stated in our product literature. The purchasers/users must determine the suitability of the product for their particular use. We reserve the right to change, alter, or modify any product to enhance its performance and design.

This warranty limits the liability of Zinexts Life Science Corp. to only the cost of the product. No warranty is granted for products beyond their listed expiration date. No warranty is applicable unless all product components are stored and used in accordance with instructions.

Revision History

Version	Date	Description
3.3	26 Jun. 2026	1. Update symbol for European Authorized Representative 2. Update the Display Protocol Name