



Article No.: A48022  
Articlename: AZURA RNA Purifier

## RNA Purifier: Preparative HPLC system for batch purification of RNA with ternary pump, UV detection and thermal control

The therapeutic potential of mRNA is extensively discussed in times of search for vaccines in the research of COVID-19. The idea is to provide the human body with mRNA, encoding therapeutic proteins, which the immune system uses to fight the virus.<sup>1</sup>

RNA can be produced and applied much easier compared to the full-length therapeutic proteins it is encoding for. In order to generate pure mRNA to administer, it was found that purification by chromatographic means is highly important.<sup>2</sup>

Key for RNA chromatography is the HPLC system layout. It is highly important that the chromatography is carried out at elevated temperatures in order to denature the RNA itself and hence simplify its structural diversity and yield a successful purification. Elevated temperature in combination with a binary gradient between acetonitrile and water as done in the Reverse Phase Chromatography Method, will effectively separate and also inactivate and unfold RNase.<sup>3,4</sup>

The dedicated **RNA Purifier** is an especially designed system for RNA purification. It consists of a ternary low pressure system pump, which not only gives you a binary gradient between water and acetonitrile, but also a gradient of Tris-EDTA (pH 7) and acetonitrile, but also

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allows the direct sample application of large volume sample onto the column by the system pump via its separate sample inlet port. The flow rate range of this pump lies between 10 to 80 ml/min. Sample Injection via a sample- or Variloop is possible with the integrated injection valve. After the injection valve solvent as well as sample will be heated by an eluent heater and then applied onto the column, which additionally is heated by a heating sleeve to ensure perfect thermal purification conditions. Product identification is realized by the variable single wavelength detector at 260 nm or the wavelength of your choosing. After purification fractionation is carried out by the fractionation valve.

Literature:

1. Schlake et al. *Molecular Therapy*, 2019, 27,4
2. Kariko et al. *Nucleic Acids Research*, 2011, 39 (21) e142
3. Gjerde et al. *RNA purification and analysis 2009*
4. Ketterer T. et al. U.S. Patent 8,383,340 B2.



*RNA Purifier*

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## TECHNICAL DATA

### System specification

<b>System type</b>	Lab
<b>Max. flow rate</b>	100 ml/min
<b>Gradient</b>	lpg
<b>Maximum delivery pressure [psi]</b>	5800 psi
<b>Maximum delivery pressure [bar]</b>	400 bar
<b>Maximum delivery pressure [MPa]</b>	40 MPa
<b>Detector</b>	Variable single wavelength detection UV/VIS
<b>Injection</b>	automatic injection
<b>Fractionation</b>	multi-position valve
<b>Software</b>	PurityChrom

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## SYSTEM COMPONENTS



### AZURA P 2.1L

Article No. APE20KA

AZURA® Pump P 2.1L with 100 ml pump head (stainless steel)

Max. flow rate : **100 ml/min**

Pump head materials : **Stainless Steel**

Gradient : **Isocratic**

Pump features : **Piston seal wash, Leak management, Purge valve (manual), RFID for automatic pump head detection, Active pulsation compensation, Integrated pressure sensor**

Maximum delivery pressure [MPa] : **40 MPa**

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### AZURA LPG ternary module for Pump P 2.1L

Article No. AZZ00AB

LPG module for Pump P 2.1L ternary up to 220 ml/min (stainless steel)

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### Dynamic mixer

Article No. A0581

Dynamic mixing chamber (250 V), stainless steel, preparative, 1/8", up to 250 bar, 5.9 ml mixing volume

Mixing volume : **5.9 ml**

Pressure rating : **max. 250 bar (25 MPa)**

Recommended flow rate : **< 100 ml/min**

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## AZURA Assistant ASM 2.2L

Article No. AY00593

Left module: Valve drive VU 4.1 - EWA04 Middle module: UV detector UVD 2.1S - EDA03XA Right module: Valve drive VU 4.1 - EWA04

Left module : **Valve drive VU 4.1 - EWA04**

Middle module : **UV detector UVD 2.1S - EDA03XA**

Right module : **Valve drive VU 4.1 - EWA04**



## Semi-preparative UV Flow Cell

Article No. A4042

3 mm path length, 2  $\mu$ l, 1/16", stainless steel, classical KNAUER flow cell

Flow cell type : **Semi-preparative UV flow cell**

Path length : **3 mm**

Capillary connection : **1/16"**

Max. flow rate : **50 ml/min**

Flow cell volume : **2  $\mu$ l**



## AZURA V 4.1 Valve

Article No. AVD26AE

2-position valve, 6 Port, DLC stainless steel, PEEK, 1/16", 500 bar, 0.75 mm bore size

Operated : **electrical by VU 4.1**

Port number : **6**

Positions : **2**

Material : **Stainless steel**

Capillary connection : **1/16"**

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### AZURA V 4.1 Valve

Article No. AVS35AE

Multiposition valve, 8 Port, DLC stainless steel, PEEK, 1/16", 300 bar, 0.75 mm bore size

Operated : **electrical by VU 4.1**

Port number : **8**

Positions : **Multiposition**

Material : **Stainless steel**

Capillary connection : **1/16"**



### AZURA L tubing guide

Article No. A5329-3

Sorting of 1/8" and 1/16" tubings single-sided of AZURA L devices – 2 rows with each 16 holes



### Eluent Heating Device (2-Channel)

Article No. A70054V4

Eluent heating device (2 channels), 1/16", temperature range: ambient to 100°C, 5,7" display, cleanroom compatible



### Benchtop Rack AZURA L low

Article No. A70010

Benchtop rack: AZURA® L low 480 x 190 x 420 mm (WHD)

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### Custom made Column Heating Sleeve for HPLC Columns

Article No. A57032

Heating sleeve for HPLC costum made up to 350 x 50 mm

Temperature range : **on request**



### AZURA Eluent tray E 2.1L

Article No. AZC00

AZURA® Eluent tray E 2.1L for AZURA® devices with a capacity of 6 x 1 l bottles or 4 x 2.5 l bottles or 2 x 5 l bottles, (delivery without bottles)

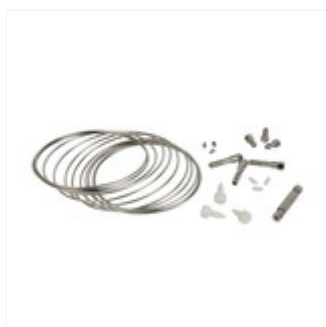
Type : **Eluent tray**



### Inlet-bushing kit LPG

Article No. A58206

Solvent Filter 1/4" PTFE tubing max Flow 250 ml/min



### AZURA Capillary Start-up kit

Article No. A9849-1

AZURA® start-up kit 1/16", stainless steel, semi-prep, capillary kit

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### Adapter 1/16" to 1/8"

Article No. A7204

Adapter to connect a capillary with 1/16" OD (thread: 10-32 UNF) to 1/8" (thread: 1/4-28 UNF coned), SSt



### 5 ml Sample loop

Article No. A0586-2

Sample loop, 5ml, stainless steel, 1.6 mm ID



### Luer-Lock glass syringe

Article No. A0573

Luer-Lock glass syringe, 10 ml



### Tool kit AZURA

Article No. A1033-1

Tool Kit AZURA® for 1/16" systems (stainless steel)

Type : Tool kit

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### Set of eluent supply bottles

Article No. A70037

Set of eluent supply bottles, 3 x 2.5 L brown glass bottles (borosilicate glass) with special round bottom for minimal eluent remainder, for preparative HPLC/FPLC, includes screw-type cap



### 250 ml Bottle

Article No. A2056

250 ml Bottle for Piston Back Flushing



### Installation Box Kit

Article No. A9862

Installation Box Kit, Box for small parts, KNAUER file folder and support sticker



### PurityChrom® Basic

Article No. A2650

Basic License for one system

Software name : **PurityChrom® 5**

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### Chromatography Workstation: PC plus monitor

Article No. A13120

Desktop PC (SFF) for PurityChrom® and ClarityChrom® with 24" monitor, English edition Windows 10 Prof. 64-bit English, Intel® Core™ i5, 8 GB RAM, 256 GB SSD, two network cards



### NETGEAR Switch 5-Port international

Article No. A3126INT

5-port Fast Ethernet switch NetGear FS105 5x RJ-45, 100 MBit, power plug UK, US or AUS

## ACCESSORIES & SPARE PARTS



**Back-Pressure Regulator**  
Back-Pressure Regulator  
for 1/16" OD tubing, 10-32  
threads, PEEK, Range 1-20  
bar (15-300 psi)

**Article No.: A70087**



**Preparative UV Flow Cell**  
2 mm path length, 1/8",  
200 bar, stainless steel,  
changeable to 0.5/1.25  
mm, classical KNAUER  
flow cell

**Article No.: A4066**



**Preparative UV Flow Cell**  
0.5 mm path length, 3 µl,  
1/16", 200 bar, stainless  
steel, classical KNAUER  
flow cell

**Article No.: A4069**

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## Do you need more details or a quote?

We are happy to help you



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