

AZURA Analytical HPLC

► What is your HPLC challenge today?



**CHROMATOGRAPHIC
SPECIALTIES INC.**

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AZURA

Analytical HPLC

Flexible and adjustable to your needs

The new AZURA[®] Analytical HPLC instruments are designed to meet your everyday challenges with versatility and reliability. These systems are flexible in many ways. Available in a range of materials, flow rates and complexity levels, AZURA uses cutting edge technology. Accomplish your demanding analytical tasks with a selection of detectors, pumps, and columns. Control and monitor your system and process your data with one of our chromatography data systems OpenLAB or ClarityChrom. AZURA[®] Analytical HPLC is our complete solution for your daily HPLC routine.

AZURA Analytical HPLC features

- ▶ Isocratic, binary high pressure gradient or quaternary low pressure gradient pump
- ▶ Pump heads allowing flow rates of up to 10 or even 50 ml/min also allow semi-preparative HPLC
- ▶ Bio-inert ceramic and stainless steel pump heads available
- ▶ Autosampler with 0.1 µl sample aspiration
- ▶ Highly sensitive diode array detector with intelligent temperature control
- ▶ Wide range of flow cells available, including remote cells with fiber optics
- ▶ Extensive safety features such as leak management and sensors

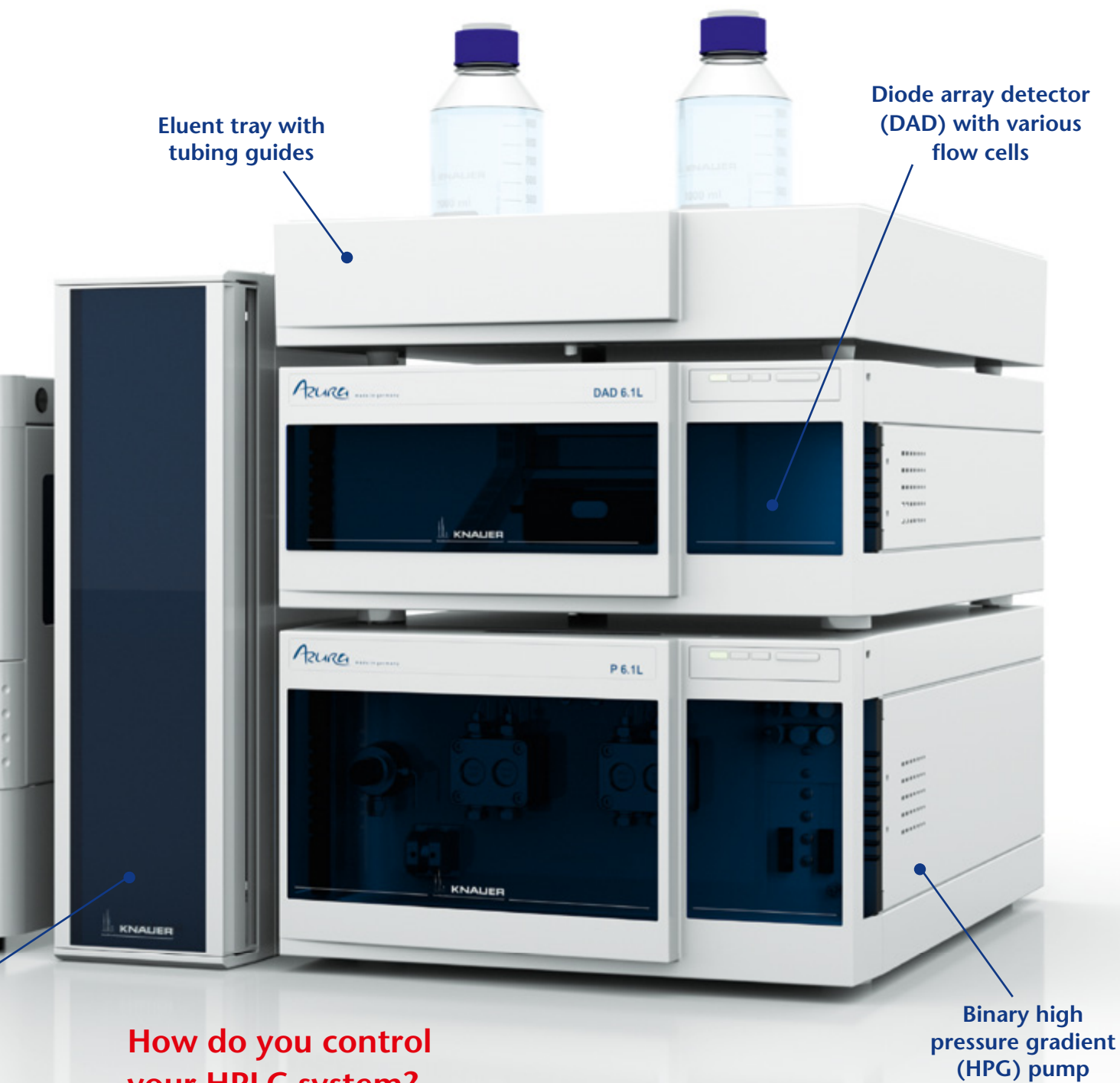
Autosampler
0.1 µl – 5000 µl
injection volume



Column thermostat
with pre-column eluent
tempering



www.knauer.net/azuraanalytical



- ▶ Control Unit for controlling one device via cable connection
- ▶ Mobile Control: A KNAUER App for tablets (Android 4 or Windows 8) controls selected AZURA devices



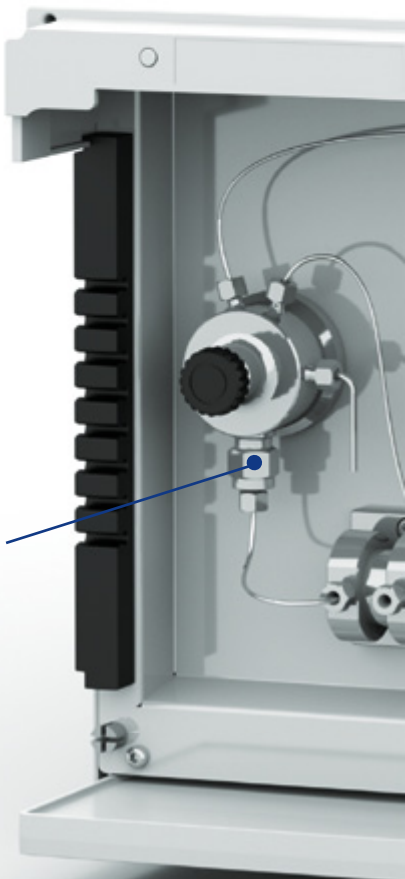
What do you need for analytical HPLC?

The new AZURA Pump P 6.1L combines all essential components of a first class HPLC pumping system. Three different configurations are available: A high pressure gradient for high accuracy blending of up to two eluents; a low pressure gradient for reliable blending of four eluents and a very cost-effective isocratic version for easy routine analyses. An excellent separation with small particle size columns can be achieved with the newly developed pump heads featuring an extended back pressure range of 700 bar up to 5 ml/min.

Features

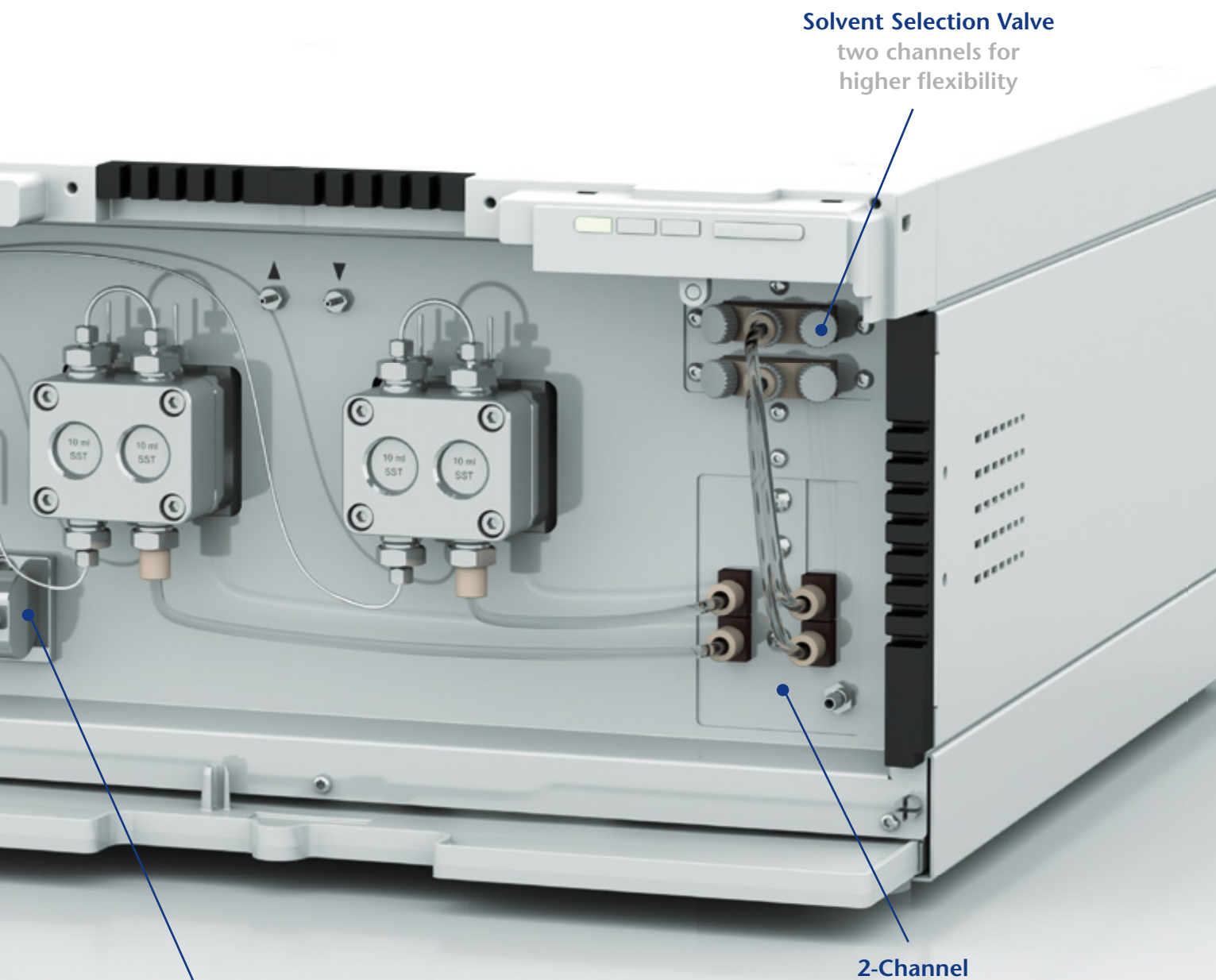
- ▶ Isocratic, binary HPG or quaternary LPG
- ▶ Flow rates up to 50 ml/min
- ▶ Material of flow path adapted to your application

Pump head (type): material, max. pressure	P 6.1L Isocratic	P 6.1L HPG	P 6.1L LPG
10 ml (standard) (SST, 700 bar)	✓	✓	✓
10 ml (biocompatible) (Ceramic, 400 bar)	✓	✓	✓
50 ml (semi-prep.) (SST, 200 bar)	✓	✓	
50 ml (semi-prep., biocompatible) (Ceramic, 200 bar)	✓	✓	



AZURA Inline Filter
protecting the column
from contamination

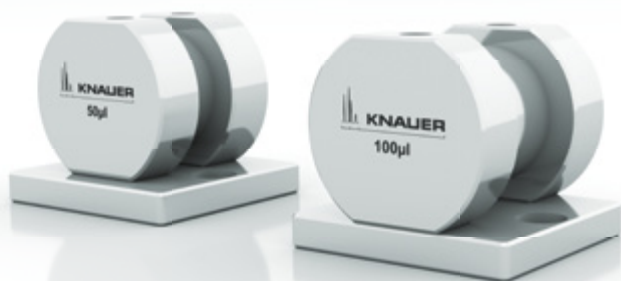
▶ **AZURA Pump P 6.1L**
Binary HPLC pump



Solvent Selection Valve
two channels for
higher flexibility

AZURA Mixer
highest solvent mixing efficiency

**2-Channel
Online Degasser**
reduced baseline noise



Selectable 50, 100 or 200µl mixing volume

**“Flexibility regarding wetted parts,
pump type and flow range”**

► **AZURA Pump P 6.1L**
Quaternary HPLC Pump

AZURA Inline Filter
protecting the column
from contamination

Multi-proportioning valve
precise blending
of eluents

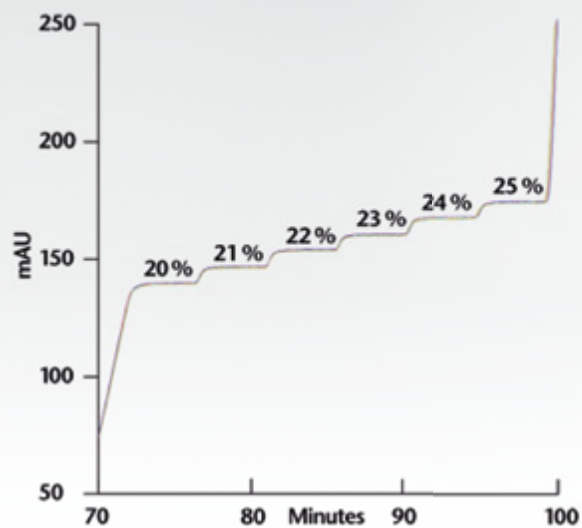
**4-Channel
Online Degasser**
reduced baseline noise

AZURA Mixer
highest solvent
mixing efficiency

Inline filter in pressure sensor

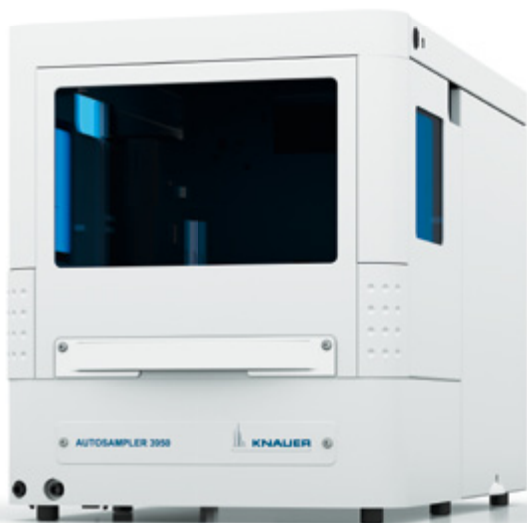


www.knauer.net/azurap6



Excellent gradient reproducibility of 0.3% RSD.
Overlay of 6 repetitions at 1 ml/min run with pump
P 6.1L low pressure gradient version

AZURA HPLC components



► Autosampler 3950

- Up to 1000 bar
- Cooling/heating option (4–40 °C)
- 0.1 µl–5000 µl sample injection volume
- Up to 768 samples (microtiter plates) or 96 standard vials
- Intermediate Loop Decompression – ILD™

“Established technology with competitive injection volume”

► Column Thermostat CT 2.1

- Temperature range 5–85 °C
- Pre-column eluent tempering
- Up to 4 columns with 350 mm max. length
- Column switching option with ASM 2.1L
- Operation via software or in stand-alone mode

“Price attractive basic column thermostat”



AZURA high performance detection

The next generation of KNAUER DAD detectors begins with the new AZURA DAD 6.1L. It features a novel light path and flow cell architecture with improved handling and excellent performance. The frontal lamp and cell change ensures easy and secure maintenance. The temperature controlled optical bench minimizes signal drift. The wide flow cell selection allows the DAD 6.1L to be easily adapted to your needs. An optional fiber optics adaptor offers the possibility to separate the flow cell spatially from the device and thus provides enhanced security for hazardous, explosive or toxic work processes.



Application flexibility

Path length (mm)

50

10

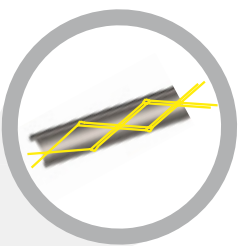
3

< 2.1 mm
column ID

2.1–4.6 mm
column ID

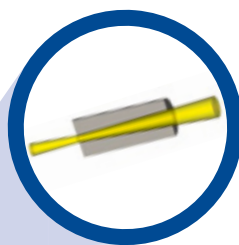
> 4.6 mm
column ID

Cell
volume (µl)



Premium

High light transmission due to total internal reflection principle. Highest sensitivity (S/N) with small cell volumes. Optimized for UHPLC.



Standard

Optimized for conventional HPLC applications featuring an increased pressure stability (up to 300 bar) and extended flow rate range (up to 20 ml/min).



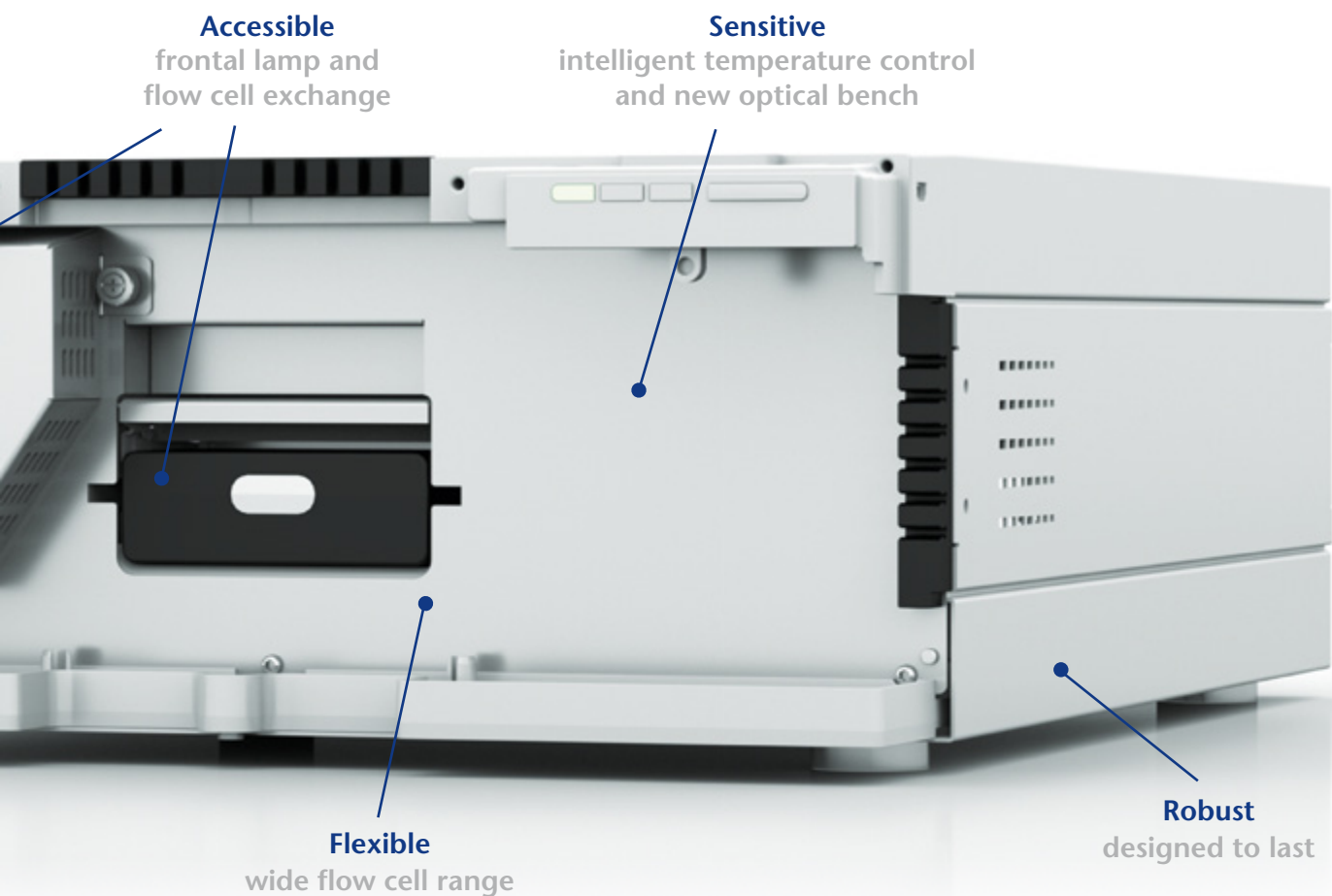
Bio-inert

Metal-free wetted parts



Remote

Fiber optics cables enable flow cells to be operated remotely from the detector



► AZURA Detector DAD 6.1L

- User friendly
- Extended wavelength range 190–1020 nm
- Impressive sensitivity/price ratio
- Data acquisition rate up to 100 Hz
- 1024 diodes

“Versatility through a wide flow cell range”



www.knauer.net/azuradad

AZURA flexible UV/VIS detection

The AZURA UV/VIS Detector UVD 2.1L is a competitively priced HPLC spectrophotometer for routine HPLC applications including fast LC methods. Besides

offering excellent technical specifications, this robust detector features a highly flexible and compact design.



► AZURA Detector UVD 2.1L

- Variable single wavelength range from 190–750 nm
- Large choice of flow cells
- Flow rates up to 10 l/min
- Fiber optics version available

“Reliable UV/VIS detector for a wide spectrum of applications”

Application support

KNAUER HPLC experts

Environmental

Separation of phenolic pollutants

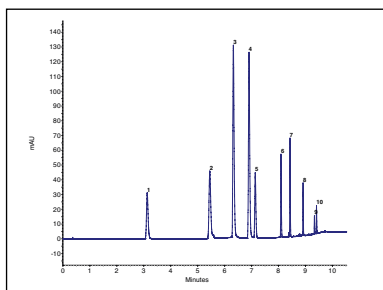


Separation column

BlueShell classic 80-4.5 C18 core-shell, 150x3mm ID

Separation conditions

Eluent:	A: Water + 0.1 % acetic acid; B: Acetonitrile + 0.1 % acetic acid	
Gradient:	0.0–4.2 min	5% B
	4.2–7.0 min	5–35% B
	7.0–9.0 min	35–95% B
	9.0–10.0 min	95% B
Flow rate:	1.6 ml/min	
Mode:	RP-Mode	
Injection volume:	1 µl	
Detection:	UV 275 nm, 20 Hz, 0.05 s	
Temperature:	40 °C	



1	Phenol
2	4-Nitrophenol
3	2,4-Dinitrophenol
4	2-Chlorophenol
5	2-Nitrophenol
6	2,3-Dimethylphenol
7	4-Chloro-3-methylphenol
8	2,4-Dichlorophenol
9	2,4,6-Trichlorophenol
10	Pentachlorophenol

Environmental

Determination of 17 PAH

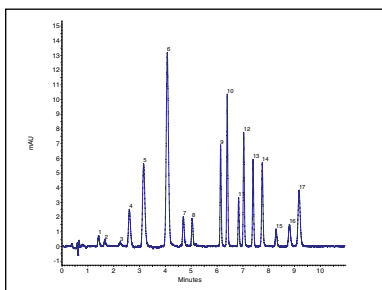


Separation column

BlueOrchid PAH, 150x2mm ID

Separation conditions

Eluent:	A: Methanol/water 75:25 (v/v) B: Acetonitrile	
Gradient:	0.0–4.2 min	5% B
	4.2–7.0 min	5–35% B
	7.0–9.0 min	35–95% B
	9.0–10.0 min	95% B
Flow rate:	0.6 ml/min	
Mode:	RP-Mode	
Injection volume:	10 µl	
Detection:	UV 254 nm, 20 Hz, 0.05 s	
Temperature:	25 °C	



1	Naphthalene	12	Benzo(b)fluoranthene
2	Acenaphthylene	13	Benzo(k)fluoranthene
3	Acenaphthene	14	Benzo(a)pyrene
4	Fluorene	15	Dibenzo(a,h)anthracene
5	Phenanthrene	16	Benzo(g,h,i)perylene
6	Anthracene	17	Indeno(1,2,3-cd)pyrene
7	Fluoranthene		
8	Pyrene		
9	Benzo(a)anthracene		
10	Chrysene		
11	Benzo(j)fluoranthene		

Food/Pharmaceutical

Determination of ginsenosides

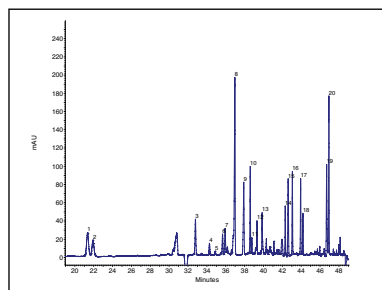


Separation column

Bluespher 100-2 C18, 150x2mm ID

Separation conditions

Eluent:	A: Water B: Acetonitrile	
Gradient:	0.0–21.4 min	17–20% B
	21.4–26.5 min	20–25% B
	26.5–36.4 min	25–35% B
	36.4–44.8 min	35–60% B
	44.8–46.2 min	60–70% B
	46.2–47.6 min	70–100% B
Flow rate:	0.5 ml/min	
Mode:	RP-Mode	
Injection volume:	5 µl	
Detection:	UV PDA-1, 204 nm, 50 Hz, 0.02 s	
Temperature:	45 °C	



1	Rg ₁	11	Rg ₆
2	Re	12	F ₄
3	Rf	13	Rk ₃
4	Rb ₁	14	Rh ₄
5	Rg ₂	15	(20S) Rg ₃
6	Rc	16	(20R) Rg ₃
7	Rh ₁	17	Rk ₁
8	Rb ₂	18	Rg ₅
9	F ₁	19	Compound K
10	Rd	20	Rh ₂

AZURA

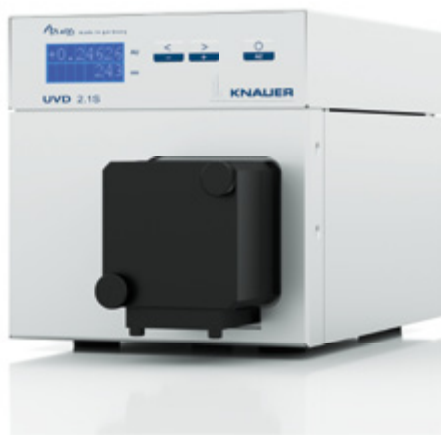
S-sized elements

We love things that can be combined to create fascinating new things. This is true for cooking, for clothing, for playing with building blocks – so why not do the same with our HPLC elements? Flexibly group, stack, and combine AZURA elements to create your individual HPLC solution.

Although AZURA S-elements are small, they are very strong performers. The modules available in S-size include pumps, a UV detector, a conductivity monitor, a degasser and valves for various tasks such as injecting and fraction collection, enabling a multitude of solutions. With a footprint of just 12 x 19 cm (W x D) AZURA S-sized elements fit easily on every lab bench. They can be operated via software or via analog connection. Most of these elements can be combined in the AZURA Assistant ASM 2.1L. KNAUER is known for providing smart and compact devices, well-suited for many applications that require reliable and robust equipment – also apart from HPLC.

AZURA elements are highly adaptable due to a selection of:

- ▶ Pump heads: flow rate range and material
- ▶ Valve heads: switching options, inner diameter, and material
- ▶ Flow cells: sensitivity range, flow rate range and material



▶ AZURA UVD 2.1S Variable wavelength detector

The AZURA UVD 2.1S detector is a highly competitive HPLC detector for routine laboratory work. It offers excellent technical specifications and the typical reliability of KNAUER detectors. Its small footprint makes it one of the smallest variable wavelength UV detectors for HPLC on the market. The installed deuterium lamp covers a wavelength range from 190 to 500 nm.



► AZURA P 4.1S and P 2.1S

Compact high pressure pump

AZURA P 4.1S pump was developed for eluent delivery up to 400 bars and for flow rates up to 50 ml/min in HPLC and other applications where a compact easy-to-integrate pump is required. The S-sized pumps are available with pressure transducer (P 4.1S) or without pressure transducer (P 2.1S).



► AZURA V 2.1S

Valve Drive

Valves are ubiquitous in all HPLC applications. Multi-position valves can be used for fraction collection, eluent selection or column switching. KNAUER offers a wide range of valve heads in different materials. The AZURA V 2.1S requires only little bench space. If more than one valve is needed for your application, up to three valve elements can be combined in a stackable AZURA ASM 2.1L device.



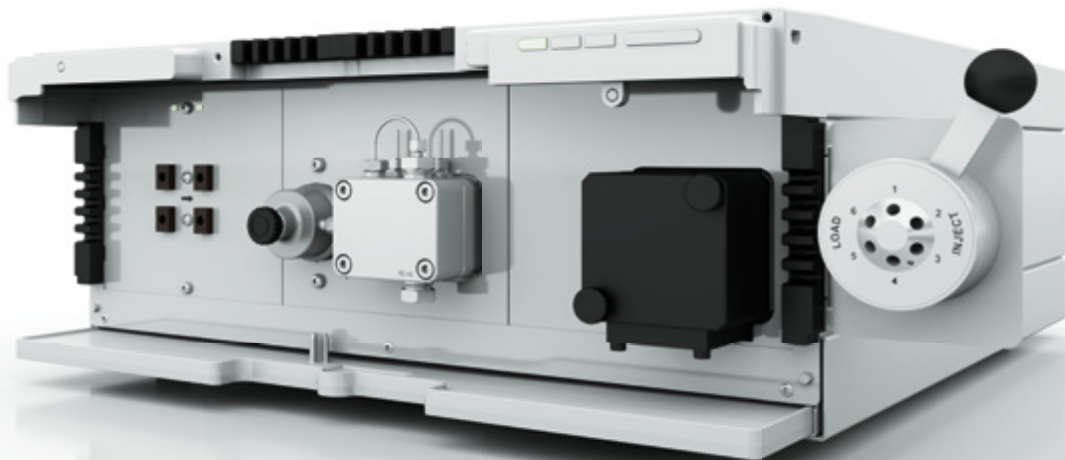
► AZURA DG 2.1S

Degasser

Dissolved gases in the solvent can cause bubbles in pumps and the detector. Good chromatographic separation therefore requires degassing of the solvent. The small analytical 2-channel degasser DG 2.1S is equipped with two degassing chambers and can thus degas two solvents simultaneously.

AZURA

Combining S-sized elements



► AZURA Assistant ASM 2.1L Multifunctional device

- Three AZURA S-sized elements are combinable in an ASM 2.1L
- Can accommodate pump, valve, detector, and degasser elements

“Maximum flexibility for your individual system solution with assistant ASM 2.1L”



► AZURA CM 2.1S Conductivity monitor

- For the measurement of conductivity and pH
- Flow rates up to 100 ml/min
- 1 μ S/cm – 999 mS/cm
- pH measurement 2–12

“Basic and versatile monitor for biopurification applications”



[www.knauer.net/
azuracomponents](http://www.knauer.net/azuracomponents)

Software solutions



► OpenLAB CDS EZChrom Edition^{*} Chromatography data system

OpenLAB CDS EZChrom Edition is the next generation of chromatography data systems and the successor of ChromGate. OpenLAB CDS EZChrom Edition provides chromatography data acquisition, processing and control of GC and LC chromatographs and is used in chromatography operations ranging from single user/single instrument to multi-user/multi-instrument laboratories. The optional Client/Server functionality allows for use it as a company-wide chromatography software solution with access from all computers in the companies network. The fraction collection control offers advanced fractionation options.

^{*}) Packages available as a preparative Edition – an option exclusively offered by KNAUER

► ClarityChrom CDS^{*} Chromatography data system

ClarityChrom is an easy-to-use chromatography data system for workstations. The optional control extensions for GC, PDA and GPC allow to use the software for a wide range of applications. Most KNAUER devices can be controlled with ClarityChrom. Additionally, devices and systems from more than 45 manufacturers are supported.

The ClarityChrom Preparative includes the drivers for several fraction collectors and supports the peak recognition by level and/or slope. The manual fraction control and the option to use the KNAUER electrical valves for fractionation gives you flexibility.

Drivers for other chromatography data systems available. Please contact us.



www.knauer.net/software

The AZURA[®] liquid chromatography range

- ▶ **AZURA[®] Analytical HPLC**
High resolution analysis, max. 700 bar.
Adaptable to small-scale purifications, max. 50 ml/min.
- ▶ **AZURA[®] Preparative HPLC**
Flexible automated purification systems with a capacity of up to 1000 ml/min
- ▶ **AZURA[®] Bio LC**
FPLC systems for protein purification tasks up to 1000 ml/min
- ▶ **AZURA[®] Compact HPLC**
Space saving systems and components



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