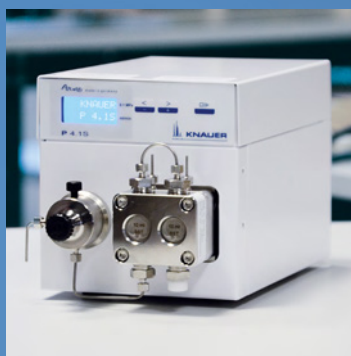


Science Together



# KNAUER Product Selection Guide 2020

Instruments, accessories and services for  
HPLC/UHPLC, Prep LC, FPLC and osmometry



## Get in touch

### Sales

If you want to learn more about our products and services or get a quote, the experts from our Sales team are happy to assist you with your request.

Phone: +49 30 809727-0 (workdays 9-17h CET)

Fax : +49 30 8015010

Email: [sales@knauer.net](mailto:sales@knauer.net)

### Support

Do you have questions about the installation or the operation of your instrument or software?

#### International Support:

Contact your local KNAUER partner for support:  
[www.knauer.net/en/Support/Distributors-worldwide](http://www.knauer.net/en/Support/Distributors-worldwide)

#### Support in Germany (Austria & Switzerland on case-to-case basis):

Phone: +49 30 809727-111 (workdays 9-17h CET)

Fax : +49 30 8015010

Email: [support@knauer.net](mailto:support@knauer.net)

# Welcome to KNAUER



**Made in Germany  
since 1962**

Based in Berlin, KNAUER is a medium-sized, owner-managed company that has been serving the sciences since 1962.

We develop and manufacture scientific instruments of superior quality for liquid chromatography. The range includes systems and components for analytical HPLC / UHPLC, preparative HPLC, fast protein liquid chromatography (FPLC), multi-column chromatography / simulated moving bed (SMB), and osmometry.



**Independent and  
family owned**

The founder Dr. Herbert Knauer and his wife Roswitha are still active as advisers in the company to this day. The couple's daughter, Alexandra Knauer, has been managing director and owner of the company since 2000.

Several awards for outstanding products and innovations as well as entrepreneurial excellence make KNAUER a „leading employer“.



**Comprehensive service  
from the manufacturer**

Our wide-ranging services complement our excellent instruments: The trainings are performed by experts and cover a variety of topics for beginners to experienced users.

The high-performance customer support and repair service provide fast and spot on solutions.

If you need support for your research project, we help you to develop applications, transfer and optimize methods or develop software.



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## AZURA® Pump P 6.1L

The AZURA® Pump P 6.1L uses technology to overcome the challenges of pumping LC solvents at high pressure with low pulsation. This pump is designed to fulfil the needs for high pressure and low pressure mixing tasks. The pump can deliver flow in the range of 0.001 - 50 ml/min at pressures up to 1000 bar (depending on model and flow rate). The AZURA® binary pump contains two identical high-pressure pumps, a 2 × 2-channel solvent selection valve and the new developed AZURA® mixer, a low-volume microfluidic mixing device. The AZURA® quaternary pump contains one high-pressure pump and an integrated LPG mixing block with a 4 channel valve and mixer. The integrated degasser and AZURA® inline filter are completing the analytical AZURA® HPLC pump and turn this pump into a working horse in the lab. For biocompatible applications or ion chromatography, this pump is also available with a complete metal-free design.



KNAUER offers various software control options:

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



For pump accessories see p. 36

### Specifications

#### Solvent delivery

<b>Pump type</b>	Analytical HPLC pump
<b>Delivery system</b>	Double Serial Piston Pump
<b>Pulsation compensation</b>	Active Pulsation Compensation
<b>Piston seal washing</b>	Active Wash
<b>Flow rate accuracy</b>	< 1%, measured at 5 - 50% of max. flow range using ethanol/water 10:90
<b>Flow rate precision</b>	≤ 0.1%
<b>System protection</b>	Soft start, Pmin und Pmax are programmable
<b>Gradient range</b>	0 - 100 % in 0,1 % increments
<b>Solvent selection valve</b>	HPG only
<b>Gradient formation</b>	LPG / HPG
<b>Liquid temperature range</b>	4–60 °C (39.2–140 °F)
<b>HPG: gradient accuracy</b>	± 0.3 % at 1 ml/min, 150 bar (ethanol/caffeine tracer) ± 1 % (5 - 95 %, measured at 0.1 - 10 ml/min, water/caffeine tracer)
<b>HPG: gradient precision</b>	< 0.1 % RSD at 1 ml/min, 0.3% RSD overall, based on retention time at constant room temperature
<b>LPG: gradient accuracy</b>	± 0.3 % at 1 ml/min, 150 bar (ethanol/caffeine tracer) ± 2 % (1 - 99 %, measured at 5 - 50 % of the flow range, water/caffeine tracer)
<b>LPG: gradient precision</b>	< 0.1% RSD at 1 ml/min, 0.5% RSD overall, based on retention time at constant room temperature

#### Degasser module

<b>Degasser channels</b>	4 channels (LPG Versions), 2 / 4 channels (HPG Versions); optional
<b>Max. flow rate/channel</b>	10 ml/min
<b>Degassing method</b>	Gas Permeation trough Teflon(R) AF amorphous fluoropolymer membrane
<b>Degassing efficiency</b>	< 0.5 ppm dissolved O <sub>2</sub> at 1 ml/min
<b>Degassing chamber volume</b>	280 µl volume per channel
<b>Solvent applicability</b>	Universal, with exception of hydrochloric acid and halogenated hydrocarbons
<b>Wetted materials</b>	PEEK, Tefzel® (ETFC), Systec AF™

#### Communication

<b>Display</b>	Mobile Control (optional)
<b>Inputs</b>	LAN, Pin header connectors (Analog IN, Start In, Error IN)
<b>Analog inputs</b>	Flow rate, 0 - 10 V via pin header connectors
<b>Analog control input</b>	Flow Rate
<b>Level/event outputs</b>	8 event outputs (TTL, OC, Relais) and 24 V
<b>Control</b>	LAN, Analog and event control, Mobile Control

#### Technical parameters

<b>Leak sensor</b>	Yes
<b>Special features</b>	Pump Head is detected automatically using Radio frequency identification (RFID)
<b>Ambient conditions</b>	4-40 °C (39.2-104 °F) Air humidity below 90%, non-condensing

#### General

<b>Power supply</b>	100 - 240 V; 50 - 60 Hz; Maximum power consumption 100 Watt
<b>Dimensions</b>	361 mm x 208.2 mm x 523 mm (W x H x D)
<b>Weight</b>	14.1 kg

## AZURA® Pump P 6.1L with 10 ml pump head

### Pump specifications

<b>Pump head</b>	10 ml
<b>Flow rate range</b>	0.001 - 10 ml/min
<b>Maximum delivery pressure</b>	12500 psi / 862 bar / 86.2 MPa up to 2 ml/min / 10150 psi / 700 bar / 70 MPa up to 5 ml/min; 5800 psi / 400 bar / 40 MPa up to 10 ml/min
<b>Wetted materials</b>	GFP, Stainless Steel, FKM, PEEK, Sapphire, Aluminiumoxide, Ruby, Zirconiumoxide
<b>Mixing volume</b>	100 µl HPG, 200 µl LPG
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	0.1 - 8.0 ml/min
<b>Continuous working conditions</b>	0.1 - 4.0 ml/min
<b>Pumphead material</b>	Stainless Steel

### Ordering details:

APH30EA	AZURA® Pump P 6.1L isocratic, without degasser, with 10 ml pump head (stainless steel)
APH30ED	AZURA® Pump P 6.1L isocratic, without degasser, with 10 ml NP pump head (stainless steel)
APH31EA	Isocratic Pump P 6.1L, with degasser, with 10 ml pump head (stainless steel) and solvent selection valve
APH34EA	AZURA® Pump P 6.1L (LPG), with 10 ml pump head (stainless steel), degasser and mixer (200 µl)
APH35EA	AZURA® Pump P 6.1L (HPG), with 10 ml pump head (stainless steel), degasser and mixer (100 µl)
APH35ED	AZURA® Pump P 6.1L (HPG), with 10 ml NP pump head (stainless steel), degasser and mixer (100 µl)
APH38EA	AZURA® Pump P 6.1L (HPG), without degasser, with 10 ml pump head
APH38ED	AZURA® Pump P 6.1L (HPG), without degasser, with 10 ml NP pump head and mixer (100 µl)
APH39EA	AZURA® Pump P 6.1L (LPG), without degasser, with 10 ml pump head (stainless steel) and mixer (100 µl)

## AZURA® Pump P 6.1L with 50 ml pump head

### Pump specifications

<b>Pump head</b>	50 ml
<b>Flow rate range</b>	0.01 - 50 ml/min
<b>Maximum delivery pressure</b>	4350 psi / 300 bar / 30 MPa up to 10 ml/min; 2900 psi / 200 bar / 20 MPa up to 50 ml/min
<b>Wetted materials</b>	GFP, FKM, PEEK, Sapphire, Aluminiumoxide, Ruby, Zirconiumoxide
<b>Mixing volume</b>	200 µl
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	0.1 - 40 ml/min
<b>Continuous working conditions</b>	0.1 - 20 ml/min
<b>Pumphead material</b>	Stainless Steel

### Ordering details:

APH30FA	AZURA® Pump P 6.1L isocratic, without degasser, with 50 ml pump head (stainless steel)
APH30FD	AZURA® P 6.1L Isocratic Pump
APH38FA	AZURA® Pump P 6.1L (HPG), without degasser, with 50 ml pump head (stainless steel) and mixer (200 µl)

## AZURA® Pump P 6.1L with 5 ml pump head

### Pump specifications

<b>Pump head</b>	5 ml
<b>Flow rate range</b>	0.001 - 5 ml/min
<b>Maximum delivery pressure</b>	14500 psi / 1000 bar / 100 MPa up to 2 ml/min, 10150 psi / 700 bar / 70 MPa up to 5 ml/min
<b>Wetted materials</b>	GFP, Stainless Steel, FKM, PEEK, Sapphire, Aluminiumoxide, Ruby, Zirconiumoxide
<b>Mixing volume</b>	100 µl (HPG) / 200 µl (LPG)
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	0.02 - 5 ml/min
<b>Continuous working conditions</b>	0.1 - 4 ml/min
<b>Pumphead material</b>	Stainless Steel

### Ordering details:

APH34GA	AZURA® Pump P 6.1L (LPG), with 5 ml pump head (stainless steel), degasser and mixer (100 µl)
APH35GA	AZURA® Pump P 6.1L (HPG), with 5 ml pump head (stainless steel), degasser and mixer (100 µl)

## AZURA® Pump P 6.1L metal-free

### Pump specifications

<b>Pump head</b>	10 ml / 50 ml
<b>Flow rate range</b>	0.001 - 10 ml/min / 0.01 - 50 ml/min
<b>Maximum delivery pressure</b>	5800 psi / 400 bar / 40 MPa for 10 ml head, 2900 psi / 200 bar / 20 MPa for 50 ml head
<b>Wetted materials</b>	GFP, FKM, PEEK, Sapphire, Aluminiumoxide, Ruby, Zirconiumoxide
<b>Mixing volume</b>	250 µl
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	for 10 ml pump heads: 0.1 - 8.0 ml/min; for 50 ml pump heads: 0.1 - 40 ml/min
<b>Continuous working conditions</b>	for 10 ml pump heads: 0.1 - 4.0 ml/min; for 50 ml pump heads: 0.1 - 20 ml/min
<b>Pumphead material</b>	Ceramic

### Ordering details:

APH60EB	AZURA® Pump P 6.1L, isocratic, without degasser, with 10 ml pump head (ceramic)
APH60FB	AZURA® Pump P 6.1L, isocratic, without degasser, with 50 ml pump head (ceramic)
APH64EB	AZURA® Pump P 6.1L (LPG), with 10 ml pump head (ceramic), degasser and mixer (250 µl)
APH65EB	AZURA® Pump P 6.1L (HPG), with degasser, with 10 ml pump head (ceramic) and mixer (250 µl)
APH68EB	AZURA® Pump P 6.1L (HPG), without degasser, with 10 ml pump head (ceramic) and mixer (250 µl)
APH68FB	AZURA® Pump P 6.1L (HPG), without degasser, with 50 ml pump head (ceramic) and mixer (250 µl)
APH69EB	AZURA® Pump P 6.1L (LPG), without degasser, with 10 ml pump head (ceramic) and mixer (250 µl)



# AZURA® Pump P 2.1L

AZURA® preparative HPLC pump P 2.1L covers wide flow rate range and pressure capabilities. It has been designed for purification of mg and gram samples. The pump can deliver flow in the range of 0.01 - 1000 ml/min at pressures up to 400 bar (depending on model). The integrated automatic recognition of the pump head with RFID technology allows fast adaptations of the pump for various applications.



## Specifications

### Solvent delivery

<b>Pump type</b>	Preparative HPLC pump
<b>Delivery system</b>	Dual Piston Pump with Al <sub>2</sub> O <sub>3</sub> pistons parallel
<b>Pulsation compensation</b>	Active Pulsation Compensation
<b>Piston seal washing</b>	Active Wash
<b>Flow rate accuracy</b>	± 2 %, measured at 5 - 50% of flow range using ethanol/water 10:90
<b>Flow rate precision</b>	< 0.1% RSD
<b>System protection</b>	Soft start, Pmin und Pmax are programmable
<b>Gradient range</b>	0 - 100 %
<b>Gradient formation</b>	LPG / HPG
<b>Liquid temperature range</b>	4–60 °C (39.2–140 °F)
<b>HPG: gradient accuracy</b>	± 2 % (5 - 95 %, measured at 5 - 50% of flow range, water/caffeine tracer)
<b>Leak management</b>	Yes
<b>HPG: gradient precision</b>	< 1 % RSD based on retention time at constant room temperature
<b>LPG: gradient accuracy</b>	± 3 % (5 - 95 %, measured at 5 - 50% of flow range, water/caffeine tracer)
<b>LPG: gradient precision</b>	2% RSD, based on retention time at constant room temperature



KNAUER offers various software control options:

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



For pump accessories see p. 36

### Communication

<b>Display</b>	Mobile Control (optional)
<b>Inputs</b>	LAN, Pin header connectors (Analog IN, Start In, Error IN)
<b>Analog inputs</b>	Flow rate, 0 - 10 V via pin header connectors
<b>Analog control input</b>	Flow Rate
<b>Level/event outputs</b>	8 event outputs (TTL, OC, Relais) and 24 V
<b>Control</b>	LAN, Analog and event control, Mobile Control

### Technical parameters

<b>Leak sensor</b>	Yes
<b>Special features</b>	Pump Head is detected automatically using Radio frequency identification (RFID)
<b>Ambient conditions</b>	10 - 40 °C (50-104 °F), Air humidity below 90%, non-condensing

### General

<b>Power supply</b>	100 - 240 V; 50 - 60 Hz; Maximum power consumption 320 Watt
<b>Dimensions</b>	361 mm x 208.2 mm x 523 mm (W x H x D)
<b>Weight</b>	19 kg
<b>Optional accessories</b>	ternary low pressure gradient valve block, 10 - 220 ml/min, binary low pressure gradient valve block, 10 - 800 ml/min, pump head heating and cooling device

## AZURA® Pump P 2.1L with 100 ml pump head

### Pump specifications

<b>Pump head</b>	100 ml
<b>Flow rate range</b>	0.01 - 100 ml/min
<b>Maximum delivery pressure</b>	5800 psi / 400 bar / 40 MPa
<b>Wetted materials</b>	aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ), FKM, graphite fiber reinforced PTFE, PEEK, sapphire, stainless steel, titanium
<b>Flow rate increment</b>	0.01 ml/min
<b>Best working conditions</b>	1 - 80 ml/min
<b>Continuous working conditions</b>	1 - 40 ml/min
<b>Pumphead material</b>	stainless steel / titanium

### Ordering details:

APE20KA	AZURA® Pump P 2.1L with 100 ml pump head (stainless steel)
APE20KB	AZURA® Pump P 2.1L with 100 ml pump head (titanium)

## AZURA® Pump P 2.1L with 250 ml pump head

### Pump specifications

<b>Pump head</b>	250 ml
<b>Flow rate range</b>	0.01 - 250 ml/min
<b>Maximum delivery pressure</b>	3260 psi / 225 bar / 22.5 MPa up to 100 ml/min, 2900 psi / 200 bar / 20 MPa up to 250 ml/min
<b>Wetted materials</b>	aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ), FKM, graphite fiber reinforced PTFE, PEEK, sapphire, stainless steel, titanium
<b>Flow rate increment</b>	0.01 ml/min
<b>Best working conditions</b>	2.5 - 200 ml/min
<b>Continuous working conditions</b>	2.5 - 100 ml/min
<b>Pumphead material</b>	stainless steel / titanium

### Ordering details:

APE20LA	AZURA® Pump P 2.1L with 250 ml pump head (stainless steel)
APE20LC	AZURA® Pump P 2.1L with 250 ml pump head (titanium)

## AZURA® Pump P 2.1L with 500 ml pump head

### Pump specifications

<b>Pump head</b>	500 ml
<b>Flow rate range</b>	0.01 - 500 ml/min
<b>Maximum delivery pressure</b>	1450 psi / 100 bar / 10 MPa
<b>Wetted materials</b>	aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ), FKM, graphite fiber reinforced PTFE, PEEK, sapphire, stainless steel, titanium
<b>Flow rate increment</b>	0.1 ml/min
<b>Best working conditions</b>	5 - 400 ml/min
<b>Continuous working conditions</b>	5 - 200 ml/min
<b>Pumphead material</b>	stainless steel / titanium

### Ordering details:

APE20MA	AZURA® Pump P 2.1L with 500 ml pump head (stainless steel)
APE20MC	AZURA® Pump P 2.1L with 500 ml pump head (titanium)

## AZURA® Pump P 2.1L with 1000 ml pump head

### Pump specifications

<b>Pump head</b>	1000 ml
<b>Flow rate range</b>	1 - 1000 ml/min
<b>Maximum delivery pressure</b>	1080 psi / 75 bar / 7.5 MPa up to 350 ml/min, 720 psi / 50 bar / 5 MPa up to 1000 ml/min,
<b>Wetted materials</b>	aluminium oxide (Al <sub>2</sub> O <sub>3</sub> ), FKM, graphite fiber reinforced PTFE, PEEK, sapphire, stainless steel, titanium
<b>Flow rate increment</b>	0.1 ml/min
<b>Best working conditions</b>	10 - 800 ml/min
<b>Continuous working conditions</b>	10 - 400 ml/min
<b>Pumphead material</b>	stainless steel / titanium

### Ordering details:

APE20NA	AZURA® Pump P 2.1L with 1000 ml pump head (stainless steel)
APE20NB	AZURA® Pump P 2.1L with 1000 ml pump head (titanium)

## LPG modules

### Ordering details:

AZZ00AA	LPG module for Pump P 2.1L binary up to 800 ml/min (stainless steel)
AZZ00AB	LPG module for Pump P 2.1L ternary up to 220 ml/min (stainless steel)
AZZ10AB	LPG module for Pump P 2.1L ternary up to 220 ml/min (PEEK)

## AZURA® Pump P 4.1S

The AZURA® Pump P 4.1S was developed for eluent delivery up to 400 bar and for flow rates up to 50 ml/min in HPLC and other applications where a compact easy-to-integrate pump is required. Apart from serving as a compact isocratic pump for small HPLC systems, it can also be used as a sample pump for preparative chromatography. This pump is the perfect choice for dosing applications as the exchangeable pump heads are compatible to a wide range of chemicals.



### Specifications

#### Solvent delivery

<b>Pump type</b>	Ultra-compact high pressure pump
<b>Delivery system</b>	Double Serial Piston Pump
<b>Piston seal washing</b>	Passive Wash
<b>Flow rate accuracy</b>	± 2%, measured at 5 - 50% of flow range using ethanol/water 10:90
<b>Flow rate precision</b>	≤ 0.5% RSD, measured at 1/5 ml/min using ethanol/water 10:90
<b>System protection</b>	Pmin und Pmax are programmable
<b>Liquid temperature range</b>	4–60 °C (39.2–140 °F)

#### Communication

<b>Display</b>	Yes
<b>Inputs</b>	LAN, Pin header connectors (Analog IN, Start In, Error IN), RS-232
<b>Analog inputs</b>	0 - 10 V
<b>Analog control input</b>	Flow Rate
<b>Control</b>	LAN, RS-232, analog, standalone

#### Technical parameters

<b>Display</b>	Yes
<b>Ambient conditions</b>	10-40 °C (50-104 °F) Air humidity below 90%, non-condensing

#### General

<b>Power supply</b>	100 - 240 V; 50 - 60 Hz; Maximum power consumption 100 Watt
<b>Dimensions</b>	121 x 129 x 220 mm (W x H x D)
<b>Weight</b>	2.4 kg



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For pump accessories  
 see p. 36

## AZURA® Pump P 4.1S with 10 ml pump head

### Pump specifications

<b>Pump head</b>	10 ml
<b>Flow rate range</b>	0.001 - 10 ml/min
<b>Maximum delivery pressure</b>	5800 psi / 400 bar / 40 MPa up to 10 ml/min
<b>Wetted materials</b>	Graphite fiber reinforced PTFE, FKM (FFKM for APG20EC), PEEK (PCTFE for APG20EC), sapphire, ruby, zirconium oxide, titanium and pump head material
<b>Maximum viscosity</b>	100 mPa s (at reduced max. flow)
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	0.1 - 8.0 ml/min
<b>Continuous working conditions</b>	0.1 - 4.0 ml/min
<b>Pumphead material</b>	Stainless steel / ceramic / Hastelloy® C

### Ordering details:

APG20EA	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min stainless steel pump head, stainless steel connections
APG20EB	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min ceramic pump head, PEEK connections
APG20EC	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min Hastelloy® C pump head, Titanium pressure sensor, Hastelloy® C connections
APG20EF	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min ceramic pump head, Ti connections.
APG20EG	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min stainless steel pump head, stainless steel connections, recommended for aqueous solutions
APG20EH	AZURA® Pump P 4.1S compact HPLC pump with 10 ml/min ceramic pump head, Titanium connections, recommended for aqueous solutions

## AZURA® Pump P 4.1S with 50 ml pump head

### Pump specifications

<b>Pump head</b>	50 ml
<b>Flow rate range</b>	0.01 - 50 ml/min
<b>Maximum delivery pressure</b>	2180 psi / 150 bar / 15 MPa up to 50 ml/min
<b>Wetted materials</b>	Graphite fiber reinforced PTFE, FKM (FFKM for APG20FC), PEEK (PCTFE for APG20FC), sapphire, ruby, zirconium oxide, titanium and pump head material
<b>Maximum viscosity</b>	100 mPa s (at reduced max. flow)
<b>Flow rate increment</b>	0.01 ml/min
<b>Best working conditions</b>	0.5 - 40.0 ml/min
<b>Continuous working conditions</b>	0.5 - 20 ml/min
<b>Pumphead material</b>	Stainless steel / ceramic / Hastelloy® C

### Ordering details:

APG20FA	AZURA® Pump P 4.1S compact HPLC pump with 50 ml/min stainless steel pump head, stainless steel connections
APG20FB	AZURA® Pump P 4.1S compact HPLC pump with 50 ml/min ceramic pump head, PEEK connections
APG20FC	AZURA® Pump P 4.1S compact HPLC pump with 50 ml/min Hastelloy® C pump head, Hastelloy® C connections
APG20FG	AZURA® Pump P 4.1S compact HPLC pump with 50 ml/min stainless steel pump head, stainless steel connections, recommended for aqueous solutions
APG20FI	AZURA® Pump P 4.1S compact HPLC pump with 50 ml/min ceramic pump head, PEEK connections, recommended for aqueous solutions

## AZURA® Pump P 2.1S

AZURA® Pump P 2.1S was developed for eluent delivery up to 400 bar and for flow rates up to 50 ml/min in HPLC and other applications where a compact easy-to-integrate pump is required. This pump is the perfect choice for dosing applications as the exchangeable pump heads are compatible to a wide range of chemicals.



### Specifications

#### Solvent delivery

<b>Pump type</b>	Ultra-compact high pressure pump
<b>Delivery system</b>	Double Serial Piston Pump
<b>Pulsation compensation</b>	No
<b>Piston seal washing</b>	Passive Wash
<b>Flow rate accuracy</b>	± 5%, measured at 5 - 50% of flow range using ethanol/water 10:90. ±2% at calibration point (one point calibration), measured at 5 - 50% of flow range
<b>Flow rate precision</b>	≤ 0.5% RSD, measured at 1/5 ml/min using ethanol/water 10:90
<b>System protection</b>	Imin und Imax are programmable (I ~ pressure)
<b>Liquid temperature range</b>	4–60 °C (39.2–140 °F)



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For pump accessories  
see p. 36

#### Communication

<b>Display</b>	Yes
<b>Inputs</b>	LAN, Pin header connectors (Analog IN, Start In, Error IN), RS-232
<b>Analog inputs</b>	0 - 10 V
<b>Analog control input</b>	Flow Rate
<b>Control</b>	LAN, RS-232, analog, standalone

#### Technical parameters

<b>Display</b>	Yes
<b>Ambient conditions</b>	10-40 °C (50-104 °F) Air humidity below 90%, non-condensing

#### General

<b>Power supply</b>	100 - 240 V; 50 - 60 Hz; Maximum power consumption 100 Watt
<b>Dimensions</b>	121 x 129 x 220 mm (W x H x D)
<b>Weight</b>	2.3 kg

## AZURA® Pump P 2.1S with 10 ml pump head

### Pump specifications

<b>Pump head</b>	10 ml
<b>Flow rate range</b>	0.001 - 10 ml/min
<b>Maximum delivery pressure</b>	5800 psi / 400 bar / 40 MPa up to 10 ml/min
<b>Wetted materials</b>	Graphite fiber reinforced PTFE, FKM (FFKM for APG90EC), PEEK (PCTFE for APG90EC), sapphire, ruby, zirconium oxide and pump head material
<b>Maximum viscosity</b>	100 mPa s (at reduced max. flow)
<b>Flow rate increment</b>	0.001 ml/min
<b>Best working conditions</b>	0.1 - 8.0 ml/min
<b>Continuous working conditions</b>	0.1 - 4.0 ml/min
<b>Pumphead material</b>	Stainless steel / ceramic / Hastelloy® C

### Ordering details:

APG90EA	AZURA® Pump P 2.1S compact HPLC pump with 10 ml/min stainless steel pump head
APG90EB	AZURA® Pump P 2.1S compact HPLC pump with 10 ml/min ceramic pump head
APG90EC	AZURA® Pump P 2.1S compact HPLC pump with 10 ml/min Hastelloy® C pump head
APG90EG	AZURA® Pump P 2.1S compact HPLC pump with 10 ml/min stainless steel pump head, recommended for aqueous solutions

## AZURA® Pump P 2.1S with 50 ml pump head

### Pump specifications

<b>Pump head</b>	50 ml
<b>Flow rate range</b>	0.01 - 50 ml/min
<b>Maximum delivery pressure</b>	2180 psi / 150 bar / 15 MPa up to 50 ml/min
<b>Wetted materials</b>	Graphite fiber reinforced PTFE, FKM (FFKM for APG90FC), PEEK (PCTFE for APG90FC), sapphire, ruby, zirconium oxide and pump head material
<b>Maximum viscosity</b>	100 mPa s (at reduced max. flow)
<b>Flow rate increment</b>	0.01 ml/min
<b>Best working conditions</b>	0.5 - 40.0 ml/min
<b>Continuous working conditions</b>	0.5 - 20 ml/min
<b>Pumphead material</b>	Stainless steel / ceramic / Hastelloy® C

### Ordering details:

APG90FA	AZURA® Pump P 2.1S compact HPLC pump with 50 ml/min stainless steel pump head
APG90FB	AZURA® Pump P 2.1S compact HPLC pump with 50 ml/min ceramic pump head
APG90FC	AZURA® Pump P 2.1S compact HPLC pump with 50 ml/min Hastelloy® C pump head
APG90FG	AZURA® Pump P 2.1S compact HPLC pump with 50 ml/min stainless steel pump head, recommended for aqueous solutions

## AZURA® Assistant ASM 2.2L

### Docking station for pumps, valves and detectors

The Assistant ASM 2.2L is a docking station for up to three compact devices. Valves, pumps and UV detectors can be combined in one housing.

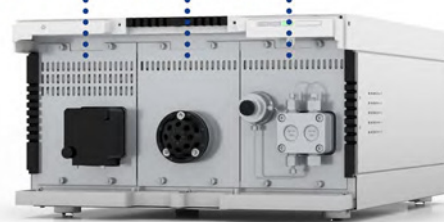
The plug-in modules are removed by loosening four screws allowing the user to exchange modules in case of service within minutes. Likewise, the configuration of the LC system can be adapted to new requirements. Routine maintenance work e.g. replacing the lamp of a detector are easily performed by the user.

Depending on the integrated modules the assistant fulfills many different tasks like eluent delivery, detection, sample and solvent selection, sample injection, column switching or fraction collection. An assistant including a pump, injection valve, and detector features a complete, compact chromatographic system. As a part of a larger system, the ASM 2.2L is extremely versatile in analytical, preparative and continuous liquid chromatography.

Select your desired plug-in modules for the left, middle and right position in the assistant and you will get your perfect assistant for chromatography and beyond.

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

○ Freely combine pumps, valves and detectors in one housing



KNAUER offers various software control options:

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

### Specifications

#### General

Power supply	100 - 240 V, 50 - 60 Hz, maximum 130 W
Dimensions	361 x 208 x 523 mm (W x H x D)
Weight	about 17 kg (depending on integrated modules)
Leak sensor	Yes
Ambient conditions	Temperature range: 4 - 40 °C, 39,2 - 104 °F Humidity: 10 - 90 % not condensing

#### Communication

Interfaces	LAN
Control	Mobile Control, Software
Inputs	Error (IN), Start (IN), Autozero, 0-10 V Analog IN
Outputs	Event 1-2, Error (OUT) (OC), + 5 V, + 24 V
Analog inputs	Integrator output (detector signal)

### Software functions

**Assistant configuration:** The ASM 2.2L is supported as complete device. Modules are addressed via the assistant.

	ClarityChrom®	OpenLAB®	Mobile Control (version 6)
Two pumps (independent)	yes	no	yes
Fraction valve	one	one	yes, one valve
Injection module*	no	no	yes, but part of a method

**Single device configuration:** The ASM 2.2L is not supported as device. Integrated modules are addressed as separate devices via IP port.

	ClarityChrom®	OpenLAB®	PurityChrom®
Two pumps (independent)	no	yes	yes
Fraction valve	no	cascading (Multi valve fraction collector)	one
Injection module*	yes, but part of a method	yes, fully automatic module with trigger for data acquisition	yes, but part of a method

\* An injection module is a combination of one pump and one 6 port 2 position valve.



## Plugin modules

The Assistant ASM 2.2L can be equipped with following plug-in modules. Use the web-based configurator to customize your assistant: [www.knauer.net/assistantconfigurator](http://www.knauer.net/assistantconfigurator).

Select the chosen plug-in modules for the left, middle and right position of the assistant to receive the article number of your assistant variant.

### Configuration note

An assistant with following configuration is not allowed:

- more than two pump modules - a high-pressure gradient is not supported
- more than one UV detector
- without a plug-in module

### Basic device

ASM 2.2L basic device	AY*
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### Plug-in modules

Basic plug-in modules	Article number of modules integrated in ASM 2.2L*
Empty module	G2022
AZURA® Valve Unifier VU 4.1**	EWA04
AZURA® UV Detector UVD 2.1S	EDA03XA
AZURA® UV Detector UVD 2.1S, fiber optics	EDA07XA
<b>Compact pump without pressure sensor</b>	
AZURA® Pump P 2.1S, 10 ml, stainless steel	DPG92EA
AZURA® Pump P 2.1S, 10 ml, Hastelloy C	DPG92EC
AZURA® Pump P 2.1S, 10 ml, ceramic	DPG92EB
AZURA® Pump P 2.1S, 50 ml, stainless steel	DPG92FA
AZURA® Pump P 2.1S, 50 ml, Hastelloy C	DPG92FC
AZURA® Pump P 2.1S, 50 ml, ceramic	DGP92FB
<b>Compact pump with pressure sensor</b>	
AZURA® Pump P 4.1S, 10 ml, stainless steel	DPG22EA
AZURA® Pump P 4.1S, 10 ml, stainless steel, normal phase	DPG22ED
AZURA® Pump P 4.1S, 10 ml, ceramic	DPG22EB
AZURA® Pump P 4.1S, 50 ml, stainless steel	DPG22FA
AZURA® Pump P 4.1S, 50 ml, stainless steel, normal phase	DPG22FD
AZURA® Pump P 4.1S, 50 ml, ceramic	DPG22FB
AZURA® Pump P 4.1S, 50 bar, 10 ml, stainless steel	DPG12EA
AZURA® Pump P 4.1S, 50 bar, 10 ml, ceramic	DPG12EB
AZURA® Pump P 4.1S, 50 bar, 50 ml, stainless steel	DPG12FA
AZURA® Pump P 4.1S, 50 bar, 50 ml, ceramic	DPG12FB

\* No article numbers for direct order. Use the listed article numbers in the configurator to find your desired module combination: [www.knauer.net/assistantconfigurator](http://www.knauer.net/assistantconfigurator). To purchase a single plug-in module, replace the first letter of its article number for an "A". Example: EWA04 is the valve drive which is integrated in an assistant. Use the article number AEWA04 to order it as a single module. An exception is the empty module which can separately be ordered as AG2022.

\*\* Note that valves V 4.1 must be ordered in addition to the valve drive VU 4.1. **For valves, see p. 33**

### Accessories

Column holder - replacing empty module	AG2022B
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AZURA® Valve Unifier VU 4.1\*\*



AZURA® Detector UVD 2.1S



AZURA® Pump P 4.1S

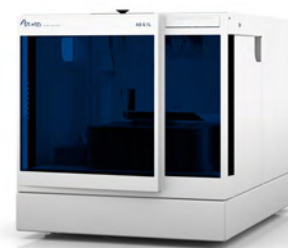


Column holder

## AZURA® Autosampler AS 6.1L

The Autosampler AS 6.1L can inject from up to 768 positions when equipped with microtiter plates (either high or low formats) or from up to 108 standard 2 ml sample vials. Sample carryover is significantly minimized thanks to a highly-effective interior and exterior needle wash procedure. This autosampler is also fast and flexible: one complete sample injection cycle takes less than one minute, including needle wash. Three different injection modes are supported; "full loop filling" (highest reproducibility), "partial loop filling" (variable volumes, e.g. for dilution series) and "µl pickup" (loss-free injection of extremely small sample volumes), allowing the user to optimize sample usage. The headspace pressure function prevents bubbles from forming in the vial during sample uptake. Precolumn derivatization is supported.

For high-pressure injections of up to 1240 bar, the autosampler is equipped with a so-called ILDTM valve (Intermediate Loop Decompression). This valve consists of a rotor-stator combination and includes a central port for depressurizing. For highpressure applications, the sample loop is depressurized prior to receiving the sample. This way, the sample is not diluted with solvent. Because the valve is switched extremely fast, pressure spikes are reduced. Analyses are more precise and wear of the column is reduced.



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For autosampler accessories see p. 40

### Specifications

#### Sample injection

Maximum back pressure	see device versions
Vial/plate dimensions	max. plate/vial height: 47 mm (incl. septa or capmat)
Injection volume range	0.1 µl - 10 ml depending on sample loop
Sample loop	see device versions
Dispenser syringe	see device versions
Headspace pressure	built-in compressor, only for sample vials with septum
Switching time inj. valve	< 100 ms
Piercing needle precision	± 0.6 mm
Sample tray cooling	optional
Vial detection	missing vial/well plate detection by sensor
Needle wash	programmable: wash between injections and wash between vials
Wetted materials	Tefzel® (ETFE), Glass, Teflon® (PTFE), Kel-F® (PCTFE), stainless steel, PEEK, Vespel

#### Analytical performance

Injection modes	full loop filling, partial loop filling and microliter pickup
Injection precision	full loop filling: < 0.3 % RSD partial loop injection at injection volumes > 5 µl: < 0.5% RSD microliter pickup at injections > 5 µl: < 1.0% RSD
Sample carryover	< 0.01 % under typical conditions using needle wash; < 0.0003 % under special conditions with extended needle wash (s. Technical Note VTN0004)
Injections per vial	max. 9 injections
Injection cycle time	minimum 7 s from the same vial, 14 s from different vials; < 60 s for > 100 µl sample injection in all injection modes, incl. 300 µl needle wash
Analysis time	max. 9 h, 59 min, 59 s

#### Communication

Inputs	2 programmable TTL inputs (next injection, freeze, stop)
Outputs	1 programmable relay output (inject marker, auxiliary, alarm)
Control	Ethernet (LAN)
Interfaces	LAN, analog

#### Technical parameters

Ambient conditions	temperature range: 10-40 °C; 50-104 °Fair humidity: 20 - 80%
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#### General

Power supply	95-240 V AC
Dimensions	361 x 375 x 570 mm (W x H x D)
Weight	30 kg

## Device versions

	HPLC+	UHPLC	Bio	Prep
<b>Maximum back pressure</b>	862 bar	1240 bar	345 bar	200 bar
<b>Sample needle</b>	15 µl	15 µl	15 µl	60 µl
<b>Dispenser syringe</b>	250 µl	250 µl	250 µl	2500 µl
<b>Buffer tubing</b>	500 µl	500 µl	1000 µl	2000 µl
<b>Sample loop</b>	100 µl, 0.4 mm ID	10 µl, 0.18 mm ID	100 µl, 0.4 mm ID	10 ml
<b>Order number</b>	AAA50AA	AAA10AA	AAA20AA	AAA40AA
<b>Order number (cool/heat option)</b>	AAA51AA	AAA11AA	AAA21AA	AAA41AA*

\* also available as biocompatible version: AAA31AA

## Ordering details:

AAA50AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 862 bar
AAA51AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 862 bar, with sample cooling/heating
AAA10AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 1240 bar
AAA11AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 1240 bar, with sample cooling/heating
AAA20AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 345 bar, with biocompatible flow path
AAA21AA	AZURA® Autosampler AS 6.1L analytical HPLC autosampler, 345 bar, with biocompatible flow path and sample cooling/heating
AAA40AA	AZURA® Autosampler AS 6.1L preparative HPLC autosampler, 200 bar
AAA41AA	AZURA® Autosampler AS 6.1L preparative HPLC autosampler, 200 bar, with sample cooling/heating
AAA31AA	AZURA® Autosampler AS 6.1L preparative HPLC autosampler, 200 bar, with biocompatible flow path and sample cooling/heating

## AZURA® Column Thermostat CT 2.1

The AZURA® CT 2.1 is a price attractive basic column thermostat. It allows temperature control in the range of 5 °C and 85 °C and thus is appropriate for most HPLC applications. For advanced purification and analysis purposes, the oven can optionally be equipped with an eluent pre-heating cartridge. This ensures even more constant separation conditions leading to higher selectivity and an improved peak shape.

The instrument operates with a microprocessor controlled Peltier element for precise temperature settings. In combination with its high temperature stability, this allows programming of linear as well as non-linear temperature gradients.



### Specifications

#### Thermostatting

<b>Heating and cooling system</b>	microprocessor controlled Peltier element for heating and cooling, fan supported 2-way air circulation
<b>Temperature range</b>	5-85 °C
<b>Heating/cooling rate</b>	2 °C/min
<b>Temperature accuracy</b>	± 0.2 °C
<b>Temperature stability</b>	± 0.1 °C



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)

#### Column compartment

Column dimensions	max. number	max. length*	max. outer diameter*	matching column
	8	160 mm	12 mm	125 mm x 4.6 mm ID with precolumn
	4	325 mm	12 mm	300 mm x 4.6 mm ID
	1	325 mm	35 mm	300 mm x 16 mm ID

\*total outer dimensions of the column including screw caps

<b>Dimensions, internal</b>	90 x 390 x 47 mm (W x H x D)
<b>Safety</b>	self-check and auto-calibration at power-on, selectable turn-off temperature
<b>Leak sensor</b>	gas sensor, adjustable sensitivity, acoustic signal, turn-off switch

#### Communication

<b>Control</b>	optional for Stand-alone functionality: - keyboard unit with LCD - Mobile Control
<b>Interfaces</b>	LAN Interface

#### General

<b>Power supply</b>	90-230 V, 50-60 Hz, 100 W
<b>Dimensions</b>	150 x 470 x 310 mm (W x H x D)
<b>Weight</b>	8.4 kg

#### Other

<b>Optional accessories</b>	Cartridge for Eluent pre-heating for capillary with an ID of 0.1 or 0.18 mm
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### Ordering details:

#### Device

A05852 Column thermostat AZURA® CT 2.1 for constant temperatures and reproducible results

#### Accessories

A05852-3 Cartridge for eluent Pre-heating ID 0.1 mm, ~5.5 µl  
 A05852-2 Cartridge for eluent Pre-heating ID 0.18 mm, ~18 µl  
 A05852-1 Keyboard unit for stand-alone operation

## AZURA® Detector DAD 6.1L

The AZURA® DAD 6.1L is a high-end diode array detector (DAD) which combines outstanding performance with easy handling.

A wide range of easily exchangeable flow cells make this device the right choice for fast, standard analytical, semi-preparative and preparative separations with bio-compatible or stainless steel wetted parts.

State-of-the-art total reflection flow cells (LightGuide technology) are available for this detector providing maximum light throughput (due to total internal reflection) with minimal peak dispersion (due to small cell volume) to guarantee an optimized signal to noise (S/N) ratio.

An optional fiber optics adapter offers the possibility to separate the flow cell spatially from the device and thus provides enhanced security for hazardous, explosive or toxic work processes, as well as protecting the device from leakages at high flow rates.

The newly developed optical unit with KNAUER Polka-Dot technology and intelligent temperature management ensure maximum sensitivity combined with minimal baseline drift over the whole spectrum.

Furthermore, easy frontal access and improved safety features enable effortless lamp replacement. This eases maintenance and guarantees short downtimes.

The DAD 6.1L comes installed with a high brightness deuterium and tungsten halogen lamps, which cover a wavelength range from 190 to 1000 nm.



### Key features

- Wide application range
- Large choice of flow cells
- Fiber optics adapter available
- Attractively priced
- Made in Germany



KNAUER offers various software control options:

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



For detector accessories  
see p. 42

### Specifications

#### Detection

<b>Detector type</b>	Diode array detector
<b>Number of diodes</b>	1024
<b>Pixel pitch</b>	0.8 nm/diode
<b>Detection channels</b>	8 (Digital)/4 (Analog)
<b>Light source</b>	High brightness deuterium (D <sup>2</sup> ) lamp and halogen lamp with integrated GLP chip
<b>Wavelength range</b>	190 - 1000 nm
<b>Spectral bandwidth</b>	< 3.5 nm at H <sub>α</sub> line (FWHM) /Note: digital bandwidth 1 - 32 nm
<b>Wavelength accuracy</b>	± 1 nm
<b>Noise</b>	± 3.5 μAU at 254 nm (ASTM E1657-98)
<b>Drift</b>	300 μAU/h at 254 nm (ASTM E1657-98)
<b>Linearity</b>	> 2.5 AU at 274 nm (ASTM E1657-98)
<b>Maximum data rate</b>	100 Hz (LAN)/12.5 Hz (analog)
<b>Flow cell</b>	Not included (see Accessories / Spare parts)
<b>Time constants</b>	0.00 / 0.01 / 0.02 / 0.05 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
<b>Integration time</b>	Automatic
<b>Wavelength verification</b>	Internal holmium filter and deuterium lines
<b>Leak sensor</b>	Yes

#### Communication

<b>Inputs</b>	Error (IN), Start (IN), Autozero
<b>Outputs</b>	Events 1 - 2 (Relay and TTL compatible, respectively), Error (OUT), + 5 V, Valve + 24 V, Valve (OUT)
<b>Analog outputs</b>	4 x 0 - 5 V, 20 bit, offset adjustable
<b>Control</b>	Mobile Control, software, event control, analog, terminal protocol
<b>Interfaces</b>	LAN (RJ-45), USB (service only), multi-pin connector, analog (RCA cinch connector)

#### Technical parameters

<b>GLP</b>	Detailed report including lamp recognition, operating hours, lamp operating hours, number of lamp ignitions
<b>Display</b>	Mobile Control (optional)
<b>Ambient conditions</b>	Temperature range: 4 - 40 °C, 39.2 - 104 °F, Humidity: below 90 % non-condensing

### General

Power supply	100 - 240 V, 50 - 60 Hz, 75 W
Dimensions	361 x 158 x 523 mm (W x H x D)
Weight	13.8 kg

### Ordering details:

#### Device

ADC11	AZURA® Detector DAD 6.1L Diode array detector DAD 6.1L without flow cell 190 - 1000 nm, incl. test cell
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#### Accessories

AMC19XA	10 mm path length, 2µl, 1/16", 50 bar, LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD
AMD59XA	50 mm path length, 6µl, 1/16", 50 bar, High Sensitivity LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD
AMC38	10 mm path length, 10µl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD
AMB18	3 mm path length, 2µl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD
AZL01	HBST deuterium lamp for AZURA® Detector DAD 6.1L
AZL02	Halogen lamp for AZURA® Detector DAD 6.1L
AMKX8KIT	Fiber optics adapter kit for AZURA® Detector DAD/MWD, with fiber optic cables (1x 400 mm and 1x 750 mm) and mounting bracket
AMLX8	Test cell for AZURA® Detector DAD/MWD

## AZURA® Detector DAD 2.1L & MWD 2.1L

The AZURA® DAD 2.1L is a highly competitive diode array detector which combines high performance with easy handling at an affordable price.

A wide range of easily exchangeable cartridge flow cells make this device the right choice for fast, standard analytical, semi-preparative and preparative separations with bio-inert or stainless steel wetted parts.

State-of-the-art total reflection flow cells (LightGuide technology) are available for this device providing maximum light throughput (due to total internal reflection) with minimal peak dispersion (due to the small cell volume) to guarantee an optimized S/N ratio.

An optional fiber optics adapter offers the possibility to separate the flow cell spatially from the device and thus provides enhanced security for hazardous, explosive or toxic work processes, as well as protecting the device from leakages at high flow rates.

The newly developed optical unit and intelligent temperature management ensure for maximum sensitivity combined with minimal baseline drift.

Furthermore, easy frontal access and improved safety features enable effortless lamp replacement. This eases maintenance and guarantees short downtimes.

The DAD 2.1L comes installed with a deuterium lamp which covers a wavelength range from 190 to 700 nm.



### Key features

- Wide application range
- Large choice of flow cells
- Fiber optics adapter available
- Leak management
- Made in Germany



KNAUER offers various software control options:

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



For detector accessories  
see p. 42

## Specifications

### Detection

<b>Detector type</b>	Diode array detector
<b>Number of diodes</b>	256
<b>Pixel pitch</b>	2 nm/diode
<b>Detection channels</b>	8 (Digital)/4 (Analog)
<b>Light source</b>	Deuterium (D <sup>2</sup> ) lamp with integrated GLP chip
<b>Wavelength range</b>	190 - 700 nm
<b>Spectral bandwidth</b>	<10 nm at H <sub>α</sub> line (FWHM) /Note: digital bandwidth 1 - 32 nm
<b>Wavelength accuracy</b>	± 1 nm
<b>Noise</b>	± 5 μAU at 254 nm (ASTM E1657-98)
<b>Drift</b>	400 μAU/h at 254 nm (ASTM E1657-98)
<b>Linearity</b>	> 2.0 AU at 274 nm (ASTM E1657-98)
<b>Maximum data rate</b>	100 Hz (LAN)/12.5 Hz (analog)
<b>Flow cell</b>	Not included (see Accessories / Spare parts)
<b>Time constants</b>	0.00 / 0.01 / 0.02 / 0.05 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
<b>Integration time</b>	Automatic
<b>Wavelength verification</b>	Internal holmium filter and deuterium lines
<b>Leak sensor</b>	Yes

### Communication

<b>Inputs</b>	Error (IN), Start (IN), Autozero
<b>Outputs</b>	Events 1 - 2 (Relay and TTL compatible, respectively), Error (OUT), + 5 V, Valve + 24 V, Valve (OUT)
<b>Analog outputs</b>	4 x 0 - 5 V, 20 bit, offset adjustable
<b>Control</b>	Mobile Control, software, event control, analog, terminal protocol
<b>Interfaces</b>	LAN (RJ-45), USB (service only), multi-pin connector, analog (RCA cinch connector)

### Technical parameters

<b>GLP</b>	Detailed report including lamp recognition, operating hours, lamp operating hours, number of lamp ignitions
<b>Display</b>	Mobile Control (optional)
<b>Ambient conditions</b>	Temperature range: 4 - 40 °C, 39.2 - 104 °F, Humidity: below 90 % noncondensing

### General

<b>Power supply</b>	100 - 240 V, 50 - 60 Hz, 75 W
<b>Dimensions</b>	361 x 158 x 523 mm (W x H x D)
<b>Weight</b>	12.2 kg

## Ordering details:

### Device

ADC01	AZURA® Detector DAD 2.1L Diode array detector DAD 2.1L without flow cell 190 - 700 nm, incl. test cell
ADB01	AZURA® Detector MWD 2.1L Multiwavelength detector MWD 2.1L, without flow cell 190 - 700 nm, incl. test cell

### Accessories

AMC19XA	10 mm path length, 2μl, 1/16", 50 bar, LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD
AMD59XA	50 mm path length, 6μl, 1/16", 50 bar, High Sensitivity LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD
AMC38	10 mm path length, 10μl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD
AMB18	3 mm path length, 2μl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD
A5193	Deuterium lamp, replacement, for S25 20, 10D, 40D, UVD 2.1S, UVD 2.1L, DAD 2.1L, MWD 2.1L
AMKX8KIT	Fiber optics adapter kit for AZURA® Detector DAD/MWD, with fiber optic cables (1x 400 mm and 1x 750 mm) and mounting bracket
AMLX8	Test cell for AZURA® Detector DAD/MWD

## AZURA® Detector UVD 2.1L

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.

The UVD 2.1L comes with an installed deuterium lamp which covers a wavelength range from 190 to 750 nm.

Due to a smart design the flow cell is easily accessible and can be changed very quickly. You can choose between a wide range of flow cells for analytical or preparative LC applications with flow rates from 10 µl/min up to 10 l/min.



### Specifications

#### Detection

<b>Detector type</b>	Variable single wavelength UV detector
<b>Detection channels</b>	1
<b>Light source</b>	Deuterium (D <sup>2</sup> ) lamp with integrated GLP chip
<b>Wavelength range</b>	190 - 750 nm
<b>Spectral bandwidth</b>	11 nm at H <sub>α</sub> line (FWHM)
<b>Wavelength accuracy</b>	± 2.5 nm
<b>Wavelength precision</b>	0.3 nm (ASTM E275-93)
<b>Noise</b>	± 15 µAU at 254 nm (ASTM E1657-98)
<b>Drift</b>	300 µAU/h at 254 nm (ASTM E1657-98)
<b>Linearity</b>	> 2.0 AU at 274 nm (ASTM E1657-98)
<b>Maximum data rate</b>	50 Hz (LAN)/20 Hz (Analog)
<b>Flow cell</b>	Not included (see Accessories / Spare parts)
<b>Time constants</b>	0.0 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
<b>Integration time</b>	Automatic
<b>Leak sensor</b>	Yes

#### Communication

<b>Inputs</b>	Error (IN), Start (IN), Autozero, 0 - 10 V Analog IN
<b>Outputs</b>	Events 1 - 3, + 5 V, 24 V Valve
<b>Analog outputs</b>	1 x 0 - 5 V scalable, 20 bit, offset adjustable
<b>Control</b>	Digital: LAN, remote connector/Analog: wavelength control/Manual: Mobile Control (optional)
<b>Programming</b>	Timed: wavelength, events, fraction valve, links, wake up (program, link); 9 programs, 50 program lines

#### Technical parameters

<b>GLP</b>	Detailed report including lamp recognition, operating hours, lamp operating hours, number of lamp ignitions
<b>Display</b>	Mobile Control (optional)
<b>Ambient conditions</b>	Temperature range: 4 - 40 °C, 39.2 - 104 °F, Humidity: below 90 % noncondensing

#### General

<b>Power supply</b>	100 - 240 V, 50 - 60 Hz, 65 W
<b>Dimensions</b>	361 x 158 x 523 mm (W x H x D)
<b>Weight</b>	5.9 kg

### Key features

- Large choice of flow cells
- Leak management
- 55 years experience
- Made in Germany



KNAUER offers various software control options:

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



For detector accessories see p. 42



## Ordering details:

### Device

ADA01XA	AZURA® Detector UVD 2.1L with deuterium lamp without flow cell, incl. test cell
ADA04XA	AZURA® Detector UVD 2.1L Fiber Optics Version with deuterium lamp without flow cell

### Accessories

A4061XB	10 mm path length, 10 µl, 1/16", 300 bar, stainless steel, with heat exchanger one sided inlet and outlet, classical KNAUER flow cell
A4042	3 mm path length, 2 µl, 1/16", stainless steel, classical KNAUER flow cell
A5193	Deuterium lamp, replacement, for S25 20, 10D, 40D, UVD 2.1S, UVD 2.1L, DAD 2.1L, MWD 2.1L
A4126	Test cell Holmium Oxid Filter
A4146	Test cell, WG 280 filter stray light
A4123	Test cell

## AZURA® Detector UVD 2.1S

The AZURA® UVD 2.1S is a highly competitive single variable wavelength UV detector for HPLC. It offers excellent technical specifications for routine laboratory work. With its small footprint, it is one of the smallest detectors for HPLC on the market.

The UVD 2.1S comes in the novel small AZURA® housing. The installed deuterium lamp covers a wavelength range from 190 to 500 nm. The UV detector can be controlled with OpenLab EZChrom Edition®, ChromGate®, PurityChrom Bio and ClarityChrom® software, as well as from the front panel (stand-alone operation), via LAN, via RS-232, or through analog input/output; allowing it to be integrated into almost any LC system.

Due to a smart design, the flow cell is easily accessible and can be changed very quickly. You can choose between a wide range of flow cells for analytical or preparative LC applications with flow rates from 10 µl/min up to 10 l/min.

Also available as a module for the new AZURA® ASM 2.2L.

### Specifications

#### Detection

<b>Detector type</b>	Variable single wavelength UV detector
<b>Detection channels</b>	1
<b>Light source</b>	Deuterium (D <sup>2</sup> ) lamp with integrated GLP chip
<b>Wavelength range</b>	190 - 500 nm
<b>Spectral bandwidth</b>	13 nm at H <sub>α</sub> line (FWHM)
<b>Wavelength accuracy</b>	± 3 nm
<b>Wavelength precision</b>	0.7 nm (ASTM E275-93)
<b>Noise</b>	± 20 µAU at 254 nm (ASTM E1657-98)
<b>Drift</b>	300 µAU/h at 254 nm (ASTM E1657-98)
<b>Linearity</b>	> 2.0 AU at 274 nm (ASTM E1657-98)
<b>Maximum data rate</b>	50 Hz (LAN)/20 Hz (Analog)/10 Hz (RS-232)
<b>Flow cell</b>	Not included (see Accessories / Spare parts)
<b>Time constants</b>	0.00 / 0.02 / 0.05 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 s
<b>Integration time</b>	Automatic



#### Key features

- Compact
- Large choice of flow cells
- 55 years experience
- Made in Germany



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For detector accessories  
 see p. 42

### Communication

<b>Inputs</b>	Autozero, Start (IN), Error (either IN or OUT)
<b>Outputs</b>	Error (either OUT or IN)
<b>Analog inputs</b>	Wavelength 0 - 10 V
<b>Analog outputs</b>	1 x $\pm 2.5$ V scalable, 20 bit
<b>Control</b>	Front panel, Mobile Control, software, event control, analog, terminal protocol
<b>Interfaces</b>	LAN (RJ-45), RS-232 (SUB-D 9), multi-pin connector, analog (RCA cinch connector)

### Technical parameters

<b>GLP</b>	Lamp operating hours
<b>Display</b>	LED
<b>Ambient conditions</b>	Temperature range: 4 - 40 °C, 39.2 - 104 °F, Humidity: below 90 % noncondensing

### General

<b>Power supply</b>	External: input 100 - 240 V, output 24 V DC, 60 W
<b>Dimensions</b>	121 x 129 x 187mm (W x H x D)
<b>Weight</b>	1.5 kg

### Ordering details:

#### Device

ADA00	AZURA® Detector UVD 2.1S with deuterium lamp without flow cell, incl. test cell
ADA05	AZURA® Detector UVD 2.1S Fiber Optics Version with deuterium lamp without flow cell

#### Accessories

A4061XB	10 mm path length, 10 $\mu$ l, 1/16", 300 bar, stainless steel, with heat exchanger one sided inlet and outlet, classical KNAUER flow cell
A4045	3 mm path length, 2 $\mu$ l, 1/16", 30 bar, biocompatible, classical KNAUER flow cell
A4042	3 mm path length, 2 $\mu$ l, 1/16", stainless steel, classical KNAUER flow cell
A5193	Deuterium lamp, replacement, for S25 20, 10D, 40D, UVD 2.1S, UVD 2.1L, DAD 2.1L, MWD 2.1L

## AZURA® Detector RID 2.1L

The AZURA® RID 2.1L is a sensitive and competitively priced differential refractometer. It is suitable for detecting compounds with little or no UV activity such as alcohols, sugars, lipids or polymers. This instrument is designed for use in analytical HPLC (high performance liquid chromatography) as well as under certain conditions for GPC (gel permeation chromatography) applications.

The intelligently designed optical unit with advanced temperature control ensures high sensitivity, fast baseline stabilization, and excellent reproducibility. Furthermore, the long-life LED, highly pressure resistant flow cell, improved safety features and enhanced diagnostics functions guarantee easy handling and minimal maintenance. The wide linear dynamic range and 10 ml/min maximum flow rate make the AZURA® RID 2.1L the perfect choice for most laboratory tasks.



### Key features

- Temperature controlled optical unit
- Long-life LED
- Pressure resistant flow cell
- 55 years experience
- Made in Germany

### Specifications

#### Detection

<b>Detector type</b>	Refractive index detector
<b>Version</b>	analytical (RID 2.1L) / preparative (RID 2.1L HighFlow)
<b>Light source</b>	Long-life LED
<b>Detection channels</b>	1
<b>Refractive index range</b>	1.00 - 1.75 RIU
<b>Noise</b>	± 2.5 nRIU (RID 2.1L) / ± 50 nRIU (RID 2.1L HighFlow)
<b>Drift</b>	200 nRIU/h (RID 2.1L) / 2000 nRIU/h (RID 2.1L HighFlow)
<b>Linearity</b>	> 1000 µRIU (RID 2.1L) / > 4000 µRIU (RID 2.1L HighFlow)
<b>Flow cell</b>	5 bar back pressure resistance Flow cell included
<b>Max. flow rate</b>	10 ml/min (pure water) (RID 2.1L) / 100 ml/min (pure water) (RID 2.1L HighFlow)
<b>Flow cell volume</b>	15 µl
<b>Wetted materials</b>	Stainless steel / fused silica / PTFE / PEEK
<b>Temperature control</b>	OFF, 30 - 55 °C (1 °C increment)
<b>Time constants</b>	0.00 / 0.01 / 0.02 / 0.05 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
<b>Maximum data rate</b>	100 Hz (LAN)/20 Hz (Analog)
<b>Autozero</b>	Full range
<b>Leak sensor</b>	Yes (internal and external leak management)



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For detector accessories  
see p. 42

#### Communication

<b>Inputs</b>	Error (IN), Start (IN), Autozero, Flush (IN)
<b>Outputs</b>	Event 1, Start (OUT), Error (OUT), + 5 V, 24 V Valve
<b>Analog outputs</b>	1 x 0- 2.5 V scalable, 20 bit, offset adjustable
<b>Control</b>	Mobile Control, software, event control, analog, terminal protocol
<b>Interfaces</b>	2 x LAN (RJ-45, dual IP-stack), USB (service only), multi-pin connector, analog (cinch connector)

#### Technical parameters

<b>GLP</b>	Detailed report including operating hours, light source operating hours
<b>Display</b>	Mobile Control (optional)
<b>Ambient conditions</b>	Temperature range: 4 - 40 °C, 39.2 - 104 °F, Humidity: below 90 % noncondensing

#### General

<b>Power supply</b>	100 - 240 V, 50 - 60 Hz, 65 W
<b>Dimensions</b>	361 x 158 x 523 mm (W x H x D)
<b>Weight</b>	10.8 kg

#### Other

<b>Optional accessories</b>	Mobile Control
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### Ordering details:

ADD31	AZURA® Detector RID 2.1L analytical refractive index detector with flow cell
ADD38	AZURA® Detector RID 2.1L HighFlow preparative refractive index detector with flow cell and external pressure release valve

## Mass spectrometer 4000 MiD®

The 4000 MiD is a miniaturized chip-based single quadrupole mass spectrometer suitable for a broad range of applications. An integrated oil-free pump system enables a small footprint and thereby the installation of this detector nearly everywhere.

The easy to use concept with plug and play consumable results in low maintenance costs and a completely tool-less front end. Due to its small design, the nitrogen consumption of the 4000 MiD is reduced leading to low operating costs. With the MiDas automated sampling unit, the 4000 MiD is the ideal addition for preparative HPLC systems and mass-directed purification.

With the integrated vacuum system and integrated electronics inside of one box the KNAUER 4000 MiD brings mass spectrometry to places where no other spectrometer can be deployed.

With a mass range of 50 to 800 m/z, the KNAUER 4000 MiD can be used for a broad variety of applications. In combination with the KNAUER MiDas, it is the ideal choice for preparative chromatography and direct introduction methods.

The mass spectrometer can be controlled with ClarityChrom® 7.4.1 and higher, as well as with PurityChrom® 5.09.069 and higher allowing it to be integrated into KNAUER LC systems.



### Key features

- Wide application range
- Compact



KNAUER offers various software control options:

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



For detector accessories see p. 42

### Specifications

#### Detection

**Detector type** Mass spectrometer

#### MS Detection

**MS type** Single Quadrupole  
**Ionization modes** ESI (positive and negative)  
**Mass range** 50 m/z to 800 m/z

#### Mass sensitivity

**Mass resolution** m/z 0.7 (FWHM)  
**Mass accuracy** m/z ± 0.3 (Full scan)

#### Gas requirements

**Gas** Nitrogen  
**Gas flow rate** 2.5 l/min  
**Gas inlet pressure** 2-6 bar

#### General

**Dimensions** 550 x 350 x 250 mm (L x W x H)  
**Weight** 32 kg (4000 MiD only)

### Ordering details:

#### Device

A66900 Chip-based miniaturized mass spectrometer with flow split module MiDas

#### Accessories

A66921 Solaris Air Compressor for Solaris nitrogen gas generator

A66920 Nitrogen gas generator Solaris without air compressor, 10 l/min

A0000MSEU Installation and instruction in Europe, 2 days, including flight and hotel. Training in MS basics not included.

A0000MSIN Installation and instruction International, 2 days, including flight and hotel. Training in MS basics not included.

# Fluorescence Detector RF-20A/Axs

The fluorescence detector RF-20A provides world-class sensitivity, excellent maintainability and diverse validation / support functions. It supports a wide range of applications in the wavelength range of 200 to 650 nm from conventional analysis to high-performance analysis. With a signal-to-noise ratio of 1200 for the water-Raman band, the fluorescence detector is well suited for trace analysis. The xenon lamp and flow cell are directly accessible on the device, thus allowing a quick and easy handling and maintenance of the device by the user, thereby minimizing downtime. The lamp life is 2000 hours. When replacing the xenon lamp, no adjustment is required.



## Key features

- Pressure resistant flow cell



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For detector accessories  
 see p. 42

## Specifications (for RF-20A)

### Detection

<b>Detector type</b>	Fluorescence detector
<b>Detection channels</b>	1
<b>Number of signals</b>	1
<b>Light source</b>	xenon lamp
<b>Wavelength range</b>	200 - 650 nm
<b>Spectral bandwidth</b>	20 nm
<b>Wavelength accuracy</b>	± 2 nm
<b>Wavelength precision</b>	± 0.2 nm Indicates the precision performance when the power is turned ON in the single wavelength mode and the wavelength is changed.
<b>Sensitivity</b>	can be set at three levels: HIGH (x 1), MED (x 32), LOW (x 1024)
<b>Wetted materials</b>	SUS316L, PTFE (fluorocarbon polymers), quartz
<b>Flow cell volume</b>	12 µl
<b>Time constants</b>	11 levels can be selected, equivalent to "no filter", 0.05, 0.1, 0.5, 1.0, 1.5, 2.0, 3.0, 6.0, 8.0 and 10.0 seconds
<b>Autozero</b>	auto zero function, baseline shift function

### Communication

<b>Gain</b>	can be set at three levels: x 1, x 4, x 16
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### Technical parameters

<b>Ambient conditions</b>	operating temperature: 4 to 35 °C, relative humidity: 20 to 85 % (no condensation)
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### General

<b>Power supply</b>	AC220-240 V, 400 VA, 50/60 Hz
<b>Dimensions</b>	260 x 210 x 420 mm (W x H x D)
<b>Weight</b>	16 kg

## Ordering details:

### Device

A59200	Fluorescence detector RF-20 A 200 - 650 nm incl. accessories and flow cell
A59201	Fluorescence detector RF-20 Axs 200 - 750 nm incl. accessories and flow cell
A59203	Fluorescence detector RF-20 A with photomultiplier from 200 - 900 nm incl. accessories and flow cell
A59204	Fluorescence detector RF-20 Axs with photomultiplier from 200 - 900 nm incl. accessories and flow cell

### Accessories

A59210	Xenon lamp for RF-20A/Axs fluorescence detector
A59211	Flow cell for Semi micro LC cell capacity 3 µl, supports temperature control (RF-20Axs only)
A59212	Inert flow cell for RF-20A/Xs, cell capacity 12 µl, contact materials: PEEK, PTFE
A59300	CBM-20A Interface CE/IVD PC Interface (request software control option via KNAUER)
A1783-3	Shimadzu LC Driver for Chromeleon 7.2 Shimadzu CBM-20A required

## Light scattering detector Sedex LC/85LT/90LT/100LT

Evaporative Light Scattering Detection (ELSD) is a universal modern technology with which every analyte that is less volatile than the mobile phase can be detected. Using the unique Low Temperature technology, this detector allows the achievement very high sensitivity. The technology is gradient compatible and is independent of the absorption characteristics of the eluents. Compounds can be universally measured with this detector (carbohydrates, proteins, peptides, polymers, lipids, steroids, etc.), regardless of their fluorescence, absorption or refractive-index characteristics. Comprehensive SOP protocols for GLP conformity and validation procedures are available.



### Specifications (for Sedex 85 LT)

#### Detection

<b>Detector type</b>	Light scattering detector
<b>Detection channels</b>	1
<b>Light source</b>	selected high efficiency blue LED (470 nm), elapsed-time counter
<b>Sensitivity</b>	< 1 ng caffeine (LOD)
<b>Maximum data rate</b>	Analog: 100 Hz/Digital: 30 Hz

#### Gas requirements

<b>Gas</b>	nitrogen preferred
<b>Gas flow rate</b>	< 3 l/min
<b>Gas inlet pressure</b>	3.5 bar
<b>HPLC flow rate</b>	standard HPLC with 4 nebulizers: 0.2 - 2.5 ml/min ultra high performance LC with 1 nebulizer
<b>Maintenance</b>	easily accessible from the front for cleaning

#### Heated zone

<b>Temperature range</b>	ambient to 100 °C
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#### Communication

<b>Gain</b>	1 to 12 - factor 2 <sup>11</sup> (2048)
<b>Filter</b>	moving average (0 - 10 s)
<b>Analog outputs</b>	0 - 1 V
<b>Analog control input</b>	contact closure, TTL for ready, autozero, power down
<b>Control</b>	RS-232
<b>Power-down methods</b>	shut-off: gas, LED, heating and/or PMT cleaning mode

#### Technical parameters

<b>Display</b>	LCD and keypad
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#### General

<b>Power supply</b>	230 V/50 Hz, 1.7 A - 115 V/60 Hz, 1.8 A
<b>Dimensions</b>	250 mm x 480 mm x 550 mm (W x H x D)
<b>Weight</b>	16 kg

### Ordering details:

#### Device

A0754-1	Sensitive Light scattering detector ELSD 85LT for univ. detection 0.2 - 2.5 ml/min, 100 Hz including accessories
A0754-3	High sensitive ELSD 90LT for univ. detection for HPLC and ultrafast HPLC, low temperature technology, supports high data rates
A0754-5	Preparative Light scattering detector ELSD SEDEX LC for univ. detection 200 µl/min - 2 ml/min
A0754-6	Ultra high sensitive light scattering detector ELSD SEDEX 100LT for univ. detection 200 µl/min - 2 ml/min 100 Hz including accessories, SAGA

#### Accessories

A2618-01	OpenLAB® CDS EZChrom Edition drivers for 80LT, 85LT, 90LT, 100LT and LC from Sedex
A1783-4	Sedex Driver for Chromeleon 7.2; For Sedex 85LT / 90LT; Instrument Controller Class 3 necessary
A1783-5	Sedex Driver for Chromeleon 7.2; For Sedex FP / LC / 100LT; Instrument Controller Class 3 necessary

### Key features

- Attractively priced
- Wide application range
- Large choice of nebulizers



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For detector accessories  
 see p. 42

# Electrochemical Detector AZURA® ECD 2.1

With its measurement frequency up to 100 Hz, this electrochemical detector is specially designed for super-fast highly sensitive and selective measurement of oxidisable and reducible substances in (U)HPLC. The AZURA® ECD 2.1 comprises of a thermostat-controlled Faraday's cage, accommodating column and flow cell. The AZURA® ECD 2.1 unites the three operating modes DC, Pulse and Scan in one instrument. The DC mode covers about 90% of all applications. The pulse mode is important for PAD (Pulsed Amperometric Detection) of e.g. carbohydrates. The scan mode is used to obtain a voltammogram in method optimization. A digital low-pass filter provides an excellent signal-to-noise ratio. For highest sensitivity, the SenCell flow cell is recommended. The correct flow cell can be chosen from a broad variety of flow cells after our advice.



## Specifications

### Puls mode

Measuring range	10 pA-200 µA in steps of 1, 2 and 5
Filter (cut off)	Advanced Digital Filter, 0.5 -0.001 Hz in steps of 1, 2 and 5
Pulse times	t1: 100-2000 ms; t2: 0-2000 ms; t3: 0-2000 ms in steps of 10 ms
Data recording	20, 40, 60, 80 and 100 ms

### DC mode

Measuring range	10 pA-200 µA in steps of 1, 2 and 5
Filter (cut off)	Advanced Digital Filter, 0.5 -0.001 Hz in steps of 1, 2 and 5
Noise	< 2 pA with dummy cell

### Scan mode

Measuring range	10 pA-200 µA in steps of 1, 2 and 5
Scan speed	1-50 mV/s in steps of 1, 2 and 5
Scan cycle	half, complete, continuous

### Detection

Detector type	Electrochemical detector
Version	DC, pulse, scan operating modes
Detection channels	1
Working potential	-2.0 V to +2.0 V
Maximum data rate	10 Hz
Autozero	triggered via key, TTL, RS-232

### Heated zone

Thermostatting	oven included
Temperature range	from 7°C above ambient temperature to 45°C

### Communication

Control	Parametric control and data-acquisition via LAN port (USB service port)
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## Ordering details:

### Device

A1651	Electrochemical detector AZURA® ECD 2.1 without flow cell
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### Flow cells

Art. no.	Flow cell type	Typical applications
A1652	SenCell 2 mm GC Salt-Bridge	DC mode for Catecholamines
A1652-1	FlexCell Au HyREF	3-Step PAD for Carbohydrates
A1652-3	SenCell Au HyREF	DC mode for Phenols, Polyphenols, Bisphenol A
A1652-2	SenCell GC HyREF	4-Step PAD for Carbohydrates

## Key features

- Compact
- Thermostat included



KNAUER offers various software control options:

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



For detector accessories see p. 42

## Conductivity detector CDD-10 Avp

The CDD-10AVP is a highly sensitive conductivity detector applicable to ion chromatography or organic acid analysis. Low noise, low drift and wide dynamic range assure proven performance of the CDD-10AVP detector. A special feature is the VP key for validation.

Flow cell 0.25 µl included.



### Specifications

#### Detection

Detector type	Conductivity detector
Detection channels	1
Measurement range	0.01 - 52000 µS/cm
Noise	< 4 nS/cm
Drift	< 25 nS/cm per hour
Flow cell volume	0.25 µl
Time constants	0.05, 0.1, 0.5, 1.0, 1.5, 2.0, 3.0, 6.0, 8.0, 10.0 s



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For detector accessories  
 see p. 42

#### Communication

Outputs	10 mV recorder terminal, integrator
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### Ordering details:

#### Device

A1252-1	Conductivity detector CDD-10 Avp with flow cell 0.25 µl
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#### Accessories

AZB00XA	AZURA® Interface Box IFU 2.1 LAN, A/D converter, 4 channels
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# AZURA® Conductivity Monitor CM 2.1S

The AZURA® CM 2.1S is a reliable conductivity monitor which is utilized in FPLC to follow salt gradients. Optionally pH values can be measured. Wetted parts are completely biocompatible. The contactless measurements of conductivity reduces the risk of carryover to a minimum. The flow cells covers a flow rate up to 100 ml/min and is delivered with the CM 2.1S.

Please order the pH measuring kit in addition to the conductivity monitor. Note that the flow cell for up to 10 ml/min generates a certain back pressure (approximately 1 bar at 1 ml/min). Choose the device with the 100 ml/min flow cell for minimal back pressure.



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)

## Specifications

### Flow cell features

<b>Biocompatible</b>	Yes
<b>Capillary connection</b>	1/16"
<b>Wetted materials</b>	PEEK

### Flow cell features by device

Device order number	ADG30GC	ADG30GD
<b>Flow cell volume</b>	30 µl	300 µl
<b>Max. flow rate</b>	10 ml/min	5 - 100 ml/min
<b>Maximum pressure</b>	160 bar	100 bar
<b>Back pressure</b>	1 bar at 1ml/min	-

### Detection

<b>Detector type</b>	Conductivity monitor
<b>Measurement accuracy</b>	Conductivity accuracy: < 5 % full scale end value pH accuracy: +/-0.5 pH in temperature range of 4 - 25°C Temperature sensor accuracy: ± 1.0 °C
<b>Measurement precision</b>	Conductivity precision: measured in range 0.1 - 300 mS/cm: < 2% of end value or ≤ 5 mS/cm of higher values pH precision: +/-0.2 pH in temperature range 4 - 25°C
<b>Measurement range</b>	0.1 - 999 mS/cm
<b>pH measurement</b>	2 - 12
<b>Maximum data rate</b>	5 Hz
<b>Supported electrodes</b>	all pH electrodes with BNC connector

### Communication

<b>Analog outputs</b>	2 channels (Conductivity value and pH Value) DAC 18 bit
<b>Digital outputs</b>	LAN; RS-232

### Technical parameters

<b>GLP</b>	electronic Serial No.
<b>Ambient conditions</b>	operating temperature: 4 to 35 °C, relative humidity: 45 to 85 %
<b>Display</b>	LCD, 2 x 8 characters

### General

<b>Power supply</b>	100 - 240 V, 50 - 60 Hz, max. 20W
<b>Dimensions</b>	121 x 129 x 187 mm (W x H x D)

## Ordering details:

### Device

ADG30GC	AZURA® CM 2.1S with flow cell - up to 10 ml/min - conductivity monitor with optional pH measurement
ADG30GD	AZURA® CM 2.1S with flow cell - up to 100 ml/min - conductivity monitor with optional pH measurement

### Accessories

A4156	Flow cell CM 2.1S for flow rates up to 10 ml/min
A4157	Flow cell CM 2.1S for flow rates up to 100 ml/min
A70091	pH measuring kit for conductivity monitor CM 2.1S for flow rates up to 80 ml/min, delay volume 80 µl, max. pressure 5 bar
A5813	Flow splitter for CM 2.1S when used with flowrates over 100 ml/min
A9854-3	Mounting bracket AZURA® L for AZURA® Valve Unifier VU 4.1(both-sided) or AZURA® UVD 2.1S and AZURA® CM 2.1S (left-sided on AZURA® L)

## Foxy® R1 / R2

The Foxy® fraction collector can be adapted to a broad spectrum of applications. Fractions can be collected into small tubes, standard tube sizes, and bottles. For essentially unlimited volumes, funnel racks can direct fluids to any collection vessel or downstream process.



### Specifications

#### Fraction collection

<b>Brand</b>	Foxy R1 / Foxy R2
<b>Fractionation modes</b>	drop counting, time intervals, volume intervals, level, slope
<b>Max. flow rate</b>	25 ml/min or 125 ml/min
<b>Fraction capacity</b>	see list of racks in accessories (next page)
<b>Diverter valve</b>	yes (R1) / no (R2)
<b>Wetted materials</b>	valve: PEEK and perfluoroelastomer (FFKM), supplied ferrules: ETFE, supplied valve tubing: PTFE, supplied drain tubing: viny
<b>Fractionation control</b>	operator: front panel control via touch screen LCD integrated systems: direct communication via Ethernet (TCP/IP) and RS-232 serial communications
<b>Maximum test tube height</b>	160 mm(R1) / 1/8" - 196 mm; 1/4" - 180 mm (R2)
<b>RFID rack recognition</b>	no (R1) / yes (R2)
<b>Number of racks</b>	1(R1) / 2 (R2)
<b>Capillary connection</b>	1/16" : 25 ml/min 1/8" : 125 ml/min 1/4" : 1000 ml/min



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For purification accessories  
see p. 48

#### Communication

<b>Control</b>	LAN, RS-232
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#### Technical parameters

<b>Conformity</b>	CE, CSA
<b>Display</b>	touch screen LCD displays
<b>Ambient conditions</b>	0-40 °C, 32-104 °F

#### General

<b>Power supply</b>	100-240 VAC, 50-60 Hz, max. 1 A
<b>Dimensions</b>	R1: 311 x 330 x 355 mm (W x D x H) R2 1/8": 311 x 533 x 378 mm (W x D x H) R2 1/4": 311 x 533 x 394 mm (W x D x H)
<b>Weight</b>	R1: 7.1 kg R2 1/8": 10.3 kg R2 1/4": 10.4 kg

## Ordering details:

### Device

A59100	Fraction collector Foxy® R1 for 1/16" or 1/8" tubing
A59102	Fraction collector Foxy® R2 for 1/16" or 1/8" tubing
A591021	Fraction collector Foxy® R2 for 1/4" tubing

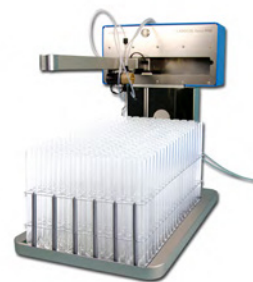
### Accessories

A59122	Cooling option for Foxy® R1 with cooling hood, cooling plate and accessories
A59117	Cooling rack for 144 tubes 1.5 ml for Foxy® R1 *
A59118	Cooling rack for 72 Falcons 15 ml for Foxy® R1 *
A59119	Cooling rack for 96-Well Microplates for Foxy® R1 *
A59105	Rack for 100 vials 16 mm/max. 20 ml for Foxy® R1/R2
A59104	Rack for 144 vials 13 mm/max. 9 ml for Foxy® R1/R2
A59111	Rack for 2 microwell plates 96 well for Foxy® R1/R2
A59114	Rack for 2 x 9 bottles 480 ml for Foxy® R2 (not suitable for Foxy® R1, bottles too tall)
A59110	Rack for 36 Falcon 50 ml for Foxy® R1/R2
A59108	Rack for 36 vials 25 mm/max. 70 ml for Foxy® R1/R2
A59107	Rack for 60 tubes 1.5 ml for Foxy® R1/R2
A59106	Rack for 72 Falcons 15 ml for Foxy® R1/R2
A591091	Rack with 26 funnels with vinyl tubing for Foxy R2, up to 1000 ml/min
A59109	Rack with 36 funnels with vinyl tubing for Foxy® R1/R2
A591092	Scintillation rack for 36 vials 28 mm for Foxy® R1/R2
A70055	Thermostatting unit -20° to 40°C
A70050	Thermostatting unit -40° to 200°C

\* for Foxy R1 with cooling option

## LABOCOL Vario-4000 / Plus

The LABOCOL Vario-4000 fraction collectors are characterized by their high robustness and optimal ratio of dimensions/benefit. The user is not limited to given rack types. The rack layout can be designed according to individual needs. Freely define the number of fraction vessels and their position. The wide application area make the Vario-4000 series ideal for use in research and development as well as in production. The Vario-4000 models differ in the base area and the flow rate range.



### Specifications

#### Fraction collection

<b>Brand</b>	LABOCOL Vario-4000 / Plus
<b>Max. flow rate</b>	100 ml/min for 1/16"; 500 ml/min for 1/8"
<b>Fraction capacity</b>	consider list of racks in accessories below
<b>Wetted materials</b>	PEEK and PTFE
<b>Number of racks</b>	3 (Vario-4000) / 5 (Vario-4000 Plus)
<b>Capillary connection</b>	1/16" : 100 ml/min 1/8" : 500 ml/min 1/4" : 1000 ml/min



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For purification accessories see p. 48

#### Communication

<b>Control</b>	LAN, RS-232
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#### Technical parameters

<b>Ambient conditions</b>	0-40 °C, 32-104 °F
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#### General

<b>Power supply</b>	100-240 VAC, 50-60 Hz, max. 2.5 A			
<b>Dimensions</b>	Vario-4000	30 x 50 cm (WxD)	Max. floor space	
	Vario-4000 Plus	46 x 50 cm (WxD)	Vario-4000	24 x 41 cm (WxD)
	min. H *: 52 cm max. H *: 67 cm		Vario-4000 Plus	40 x 41 cm (WxD)
<b>Weight</b>	8 kg (Vario-4000) / 10 kg (Vario-4000 Plus)			

\* with touchpanel

### Ordering details:

#### Device

A591023	Fraction collector LABOCOL Vario-4000 Plus, for 1/16" or 1/8" tubing
A591026	Fraction collector LABOCOL Vario-4000 Plus, for 1/4" tubing
A591022	Fraction collector LABOCOL Vario-4000, for 1/16" or 1/8" tubing
A591024	Fraction collector LABOCOL Vario-4000, for 1/4" tubing

#### Accessories

A59134	Rack for 24 Falcon® tubes of 50 ml for LABOCOL Vario-4000/Vario-4000 Plus
A59131	Rack micro for 125 tubes 10.5 mm/max. 9 ml for LABOCOL Vario-4000/Vario-4000 Plus
A59132	Rack prep for 20 tubes 36 mm/max. 140 or 240 ml for LABOCOL Vario-4000/Vario-4000 Plus
A59133	Rack semiprep for 39 tubes 26 mm/max 80 ml for LABOCOL Vario-4000/Vario-4000 Plus
A59130	Rack standard for 80 tubes 18 mm/max. 36 ml for LABOCOL Vario-4000/Vario-4000 Plus
A591029	Touchpanel for LABOCOL Vario-4000/Vario-4000 Plus

# AZURA® Degasser DG 2.1S

Dissolved gases in the solvent can cause bubbles in the flow path of pumps and detectors. Reliable 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.



## Specifications

### Degasser module

Degasser channels	2
Max. flow rate/channel	10 ml/min
Recommended flow rate/channel	2.8 ml/min
Degassing method	Gas permeation through a fluoropolymere membrane
Degassing chamber volume	285 µl
Solvent applicability	universal, except hydrochloric acid, halogenated hydrocarbons, hexafluoro isopropanol (HFIP), tetrahydrofuran, hexane, heptane
Wetted materials	PTFE, PPS, PEEK, Systec AF™
Maximum pressure stability	70 psi



KNAUER offers various software control options:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)

### Technical parameters

Display	1 LED
Ambient conditions	temperature range: 4 - 40 °C, 39.2 - 104 °F air humidity: below 90%, non-condensing

### General

Power supply	85 - 265 V, 50 - 60 Hz, 20 W
Dimensions	121 x 138 x 190 mm (W x H x D)
Weight	2.3 kg

## Feature overview

Order no.	Degasser type	Channels	Max. flow rate	Chamber volume
AZE02	analytical	2	10 ml/min (recommended 2 ml/min)	285 µl per channel
AZE03-1	analytical	4	10 ml/min (recommended 2 ml/min)	285 µl per channel
A5335	analytical, for GPC	2	10 ml/min (recommended 3 ml/min)	480 µl per channel
A5328	semi-preparative	2	30 ml/min (recommended 15 ml/min)	5.3 µl per channel
AZE02-1	preparative	2	200 ml/min (recommended 75 ml/min)	23 ml per channel
AZE03	preparative	4	200 ml/min (recommended 75 ml/min)	23 ml per channel

## Ordering details:

AZE02	Biocompatible 2 channel degasser
AZE03-1	Analytical 2 channel GPC Degasser
A5335	Semi-preparative 2 channel Degasser
AZE03-1	Analytical 4 channel Degasser, biocompatible
AZE02-1	Preparative 2 channel degasser, biocompatible
AZE03	Preparative 4 channel degasser, biocompatible

# AZURA® Valve Unifier VU 4.1

The valve drive AZURA® Valve Unifier VU 4.1 enables automatic valve switching. Due to its low switching time, the flow path is blocked only for a very short time, and pressure peaks are reduced to a minimum. Valves are identified via RFID technology, which guarantees an easy valve exchange of KNAUER valves with RFID technology. This RFID technology allows to easily check GLP data. and this way to simplify maintenance such as the exchange of a rotor seal. The display enables user-friendly standalone operation. In addition, the valve drive can be operated with software as well with an optional touch display (Mobile Control), via LAN or analog input/output, by which it can be integrated into nearly every LC system.

## Specifications

### Communication

<b>Interfaces</b>	LAN, display, terminal strip
<b>Control</b>	Display, software, event control
<b>Inputs</b>	Binary control; Home, Backward/Inject, Forward/Load, Start IN
<b>Outputs</b>	Trigger out, Event

### General

<b>Power supply</b>	External DC 24V, 65 W
<b>Dimensions</b>	80 x 123 x 192 mm (W x H x D)
<b>Weight</b>	1.9 kg
<b>Ambient conditions</b>	Temperature range: 4-40 °C; 39.2-104 °F below 90 % humidity (non condensing)

### Key features

- One valve drive for all valves
- Ultra fast switching cycle
- Easy maintenance
- Compact
- Multiple interfaces and drivers available



KNAUER offers various software control options:

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



For valve accessories see p. 45



Valve drive VU 4.1 (AWA01) with 6 port 2-position valve (AVC28AC)



AVS34CE

AVN94CE

AVR38AC

AVC38AC

AVS62CE

## Ordering details:

### Valve drive

Device	Order number
VU 4.1 valve drive for V 4.1 valves	AWA01

### Mounting bracket

Device	Order number
Mounting bracket to mount VU 4.1 to AZURA L device	A9854-3

## Valves for valve drive VU 4.1

### Manual valves\*

\*the mounting bracket A9853 is required to mount the manual valves to an AZURA L device

Ports	Stator material	Rotor material	Capillary connection	Max. pressure [bar]	Bore size [mm]	Order number
6	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVJ26AE
6	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVI28AC
6	PEEK	PEEK	1/16" (UNF 10-32)	240	0.75	AVG24CE
6	SST DLC <sup>1</sup>	PEEK	1/8" (UNF 1/4-28 coned)	300	1.5	AVK25AE
6	PEEK	PEEK	1/8" (UNF 1/4-28 coned)	50	2	AVL22CE
8	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVJ36AE
8	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVI38AC

### 2-position valves

Ports	Stator material	Rotor material	Capillary connection	Max. pressure [bar]	Bore size [mm]	Order number
6	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVD26AE
6	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVC28AC
6	PEEK	PEEK	1/16" (UNF 10-32)	240	0.75	AVD24CE
6	SST DLC <sup>1</sup>	PEEK	1/8" (UNF 1/4-28 coned)	300	1.5	AVE25AE
6	PEEK	PEEK	1/8" (UNF 1/4-28 coned)	50	2	AVF22CE
8	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVD36AE
8	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVC38AC

### Multiposition valves

Ports	Stator material	Rotor material	Capillary connection	Max. pressure [bar]	Bore size [mm]	Order number
6	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVR28AC
6	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVS26AE
6	SST DLC <sup>1</sup>	PEEK	1/8" (UNF 1/4-28 coned)	300	1.5	AVT25AE
8	SST DLC <sup>1</sup>	Vespel	1/16" (UNF 10-32)	1200	0.3	AVR38AC
8	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.75	AVS36AE
8	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	300	0.75	AVS35AE
8	PEEK	PEEK	1/16" (UNF 10-32)	240	0.75	AVS34CE
8	SST DLC <sup>1</sup>	PEEK	1/8" (UNF 1/4-28 coned)	200	1.5	AVU34AE
8	PEEK	PEEK	1/8" (UNF 1/4-28 coned)	50	2	AVU32CE
12	SST DLC <sup>1</sup>	PEEK	1/8" (UNF 1/4-28 coned)	50	1.5	AVT52AE
16	SST DLC <sup>1</sup>	PEEK	1/16" (UNF 10-32)	500	0.6	AVQ66AE
16	PEEK	PEEK	1/16" (UNF 10-32)	50	0.75	AVS62CE

### Special purpose valves\*

\*for detailed information please check our website: [www.knauer.net/valves](http://www.knauer.net/valves)

Valves	Capillary connection	Max. pressure [bar]	Bore size [mm]	Order number
Column selection valve, biocompatible Allows switching of up to 5 columns incl. bypass and reverse flow option.	1/16" (UNF 10-32)	50	0.4	AVZ52CE
Multi-injection valve, biocompatible Allows manual and automated sample loading as well as direct injection.	1/16" (UNF 10-32)	240	0.75	AVN94CE
Multi-injection valve, stainless steel Allows manual and automated sample loading as well as direct injection.	1/16" (UNF 10-32)	500	0.75	AVN96AE

<sup>1</sup> stainless steel coated with diamond-like carbon

## K-7400S Semi-Micro Osmometer

KNAUER is one of the pioneers in the field of osmometry and known for its reliable and user friendly instruments for many decades.

Our newest freezing point osmometer K-7400S allows the easy and fast determination of the osmolality of various aqueous solutions. Also, the freezing point depression of the samples can be read. The proven technology of freezing point determination in combination with the robust and intelligent design of the device allows reproducible measurements. The instrument is equipped with a peltier cooler and an integrated microprocessor controlling the automated measurement. The freezing point osmometer is a standalone device that optionally can be equipped with a printer. Furthermore, the device can be controlled via the EuroOsmo 7400 software. The software automatically plots the temperature curve for each measurement and calibration and allows saving of the measured values. In addition, the data can optionally be exported into various file formats for archival storage.

The K-7400S freezing point osmometer meets the requirements of the European Pharmacopoeia for osmolality (2.2.35, 01/2012).



### Key features

- Made in Germany
- 55 years experience
- fast measurements

### Specifications

#### Technical parameters

Sample volume	50 - 150 µl
Osmolality range	0 - 2000 mOsmol/kg
Resolution	osmolality: integer value without decimal part, e.g. 850 mOsmol temperature: value with three digits, e.g. -1.576 °C
Test time	~ 2 min
Precision	SD ≤ 4 mOsmol/kg [0 – 400 mOsmol/kg] RSD ≤ 1 % [400 – 2000 mOsmol/kg]
Linearity	± 1 % [0 -1500 mOsmol/kg] ± 1.5 % [0 - 2000 mOsmol/kg]
Calibration	Two-point calibration (0 mOsmol/kg and one freely selectable osmolality) optional: Three-point calibration (0 Osmol/kg and two free selectable osmolalities)

#### General

Power supply	100 - 240 V, 50 - 60 Hz, 70 W
Dimensions	160 x 182 x 340 mm (W xH x D)
Weight	5.3 kg
Ambient conditions	Temperature range: 10-35 °C Rel. humidity: 20-80 % (non-condensing)

#### Communication

Interfaces	RS-232 port
Control	Keypad (LED display, 2 rows with 24 characters) optional: EuroOsmo7400 Software

#### Ordering details:

##### Device

A0006AC Osmometer for the determination of osmolality or freezing point of aqueous solutions

##### Accessories

A0840-2 Measuring head for plastic sample tubes; compatible with the K-7400 and the K-7400S Semi-Micro Osmometer

A3705 EuroOsmo 7400 - software for K-7400 and K-7400S osmometers

A3711 Plain paper printer for freezing point osmometer K-7400 and K-7400S

A13270 Barcode Scanner with USB cable, for EuroOsmo 7400

A0011XB Upgrade Kit for K-7400 required to use measuring head for sample tubes (A0840-2)

For more osmometry  
accessories and standards  
see p. 47



## Pump accessories

### Eluent trays & bottles

250 ml Bottle for Piston Back Flushing	A2056
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)	AZC00
Eluent supply bottle 1000 ml, GL45 thread, square, Clear glass, with screw cap with 2 holes for tubing	A5325
Eluent supply bottle plastic 2 L incl. cap and tubing for IC and ECD systems	A70038
GL45 thread, round, 2000ml, Clear glass, without screw cap	A59158-1
Set of eluent supply bottles, 2 x 1 L bottles and 1 x 250 ml bottle for piston backflushing, includes closed screw caps	A5324-4
Set of eluent supply bottles, 2 x 1 L bottles, includes screw caps with holes for eluent tubing	A5324-1
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	A70037
Set of eluent supply bottles, 4 x 1 L bottles for Eluents and 1 x 250 ml bottle for piston backflushing, includes closed screw caps	A5324-3
Set of eluent supply bottles, 4 x 1 L bottles for Eluents and 1 x 250 ml bottle for piston backflushing, includes screw caps with holes for eluent tubing	A5324-2
Set of eluent supply bottles, 4 x 1 L bottles, includes screw caps with holes for eluent tubing	A5324



AZC00



A70037

A5324  
A5324-1  
A5324-2

A2056

### Mass flow controllers\*

Mini CORI-Flow (M13) Mass flow controller incl. mounting block, Flow: 1 - 50 ml/min, stainless steel 316	A5390
Mini CORI-Flow (M14) Mass flow controller incl. mounting block, Flow: 2 - 833 ml/min, stainless steel 316	A5391
Mini CORI-Flow (M13) Mass flow controller incl. mounting block, Flow: 1 - 50 ml/min, stainless steel 316, Profibus	A5393
Mini CORI-Flow (M12) Mass flow controller incl. mounting block, Flow: 0,03 - 3,3 ml/min, stainless steel 316	A5394
Mini CORI-Flow (M13) Mass flow controller incl. mounting block, Flow: 1 - 50 ml/min, Hastelloy-C22	A5395
HI-TEC Bright display for Mini CORI-Flow mass flow controller (display, setpoint and counter)	A5396

\*analog and bus versions on request



### Static mixers

AZURA® HPLC mixer up to 100 MPa, 50 µl mixing volume, stainless steel	AZZ00MB
AZURA® HPLC mixer up to 100 MPa, 100 µl mixing volume, stainless steel	AZZ00MC
AZURA® HPLC mixer up to 100 MPa, 200 µl mixing volume, stainless steel	AZZ00MD
AZURA® HPLC mixer up to 40 MPa, 250 µl mixing volume, PEEK (biocompatible)	AZZ10ME
HyperShear Static Mixer, (1.5mL), high flow series, 414 bar max. pressure, stainless steel and PEEK	A5830
Mounting bracket AZURA® L for Hypershear mixing chambers	A9853-8



AZZ00MB  
AZZ00MC  
AZZ00MD



AZZ10ME

A5830

## Dynamic mixers

Dynamic mixing chamber (250 V), stainless steel, analytical, 1/16", up to 420 bar, 1740 µl mixing volume	A0285
Dynamic mixing chamber (115 V), stainless steel, analytical, 1/16", up to 420 bar, 1740 µl mixing volume	A02851
Dynamic mixing chamber (250 V), stainless steel, preparative, 1/8", up to 250 bar, 5.9 ml mixing volume	A0581
Dynamic mixing chamber (115 V), stainless steel, preparative, 1/8", up to 250 bar, 5.9 ml mixing volume	A05811
Dynamic mixing chamber (250 V), titanium, analytical, 1/16", up to 420 bar, 1740 µl mixing volume	A0275
Dynamic mixing chamber (115 V), titanium, analytical, 1/16", up to 420 bar, 1740 µl mixing volume	A02751
Dynamic mixing chamber (250 V), titanium, preparative, 1/8", up to 250 bar, 5.9 ml mixing volume	A70581
Dynamic mixing chamber (115 V), titanium, preparative, 1/8", up to 250 bar, 5.9 ml mixing volume	A705811
Mixing chamber extension unit for A70581/ A705811, 1 intermediate section, titanium, 4.8 ml, 3 screws 6 x 60 mm	A2515



## Solvent filters & inlet tubing

Mobile Phase Filter, stainless steel, 2 µm, 1/8" pipe OD, suitable for all analytical HPLC systems	A3373
Mobile Phase Filter, stainless steel, 20 µm, for 1/8" OD, compatible with the AZURA® Tubing Kit (A9650), suitable for all analytical and semi preparative HPLC systems, max. flow rate 100 ml/min	A3374
Mobile Phase Filter, stainless steel, 10 µm, for 1/8" OD, compatible with the AZURA® Tubing Kit (A9650), suitable for all analytical HPLC systems, max. flow rate 10 ml/min	A3375
Mobile Phase Filter, Biocompatible PE, 20 µm, 1/8" pipe OD, suitable for all FPLC systems, max. flow rate 500 ml/min	A3364
AZURA® Tubing kit with cap and solvent filter (A3375, stainless steel, 10 µm), suitable for all analytical HPLC systems	A9650
AZURA® Tubing Kit bio with cap and insert, solvent filter inlet and fittings, 1set	A96507
Filter Cartridge for pump P 6.1L, Titanium frit, 2 µm pore size. 50 ml/min maximum flow, High capacity filter, 60 µl volume, 3 pcs.	A9661
Filter Cartridge for pump P 6.1L, Stainless steel frit, 2 µm pore size. 10 ml/min maximum flow, Volume optimized filter, 20 µl volume, 3 pcs.	A96601



A3374  
A3375      A3364



A9650



A96507

## Pulse dampers

KNAUER Pulse Damper, high volume, stainless steel	AZZ00NB
KNAUER Pulse Damper, low volume, stainless steel	AZZ00NA
Mounting Bracket KNAUER Pulse Damper	FZZ2



## Pump head inlet fittings

Pump head inlet for AZURA® Pump P 2.1L, BlueShadow 80P, 1/4" (NPT), stainless steel, max. flow 250 ml/min	A9861
Pump head inlet for AZURA® Pump P 2.1L, Set, 1/2"-20 UNF, PEEK with CTFE (Kel-F) adapter, including tubing 1/4" PTFE	A9868
Inlet bushing for prep pump heads, adapter to 3/8" tube stub	A98611
Inlet bushing for binary LPG prep pump heads, LPG inlet to 3/8" tube stub	A98612
Inlet bushing for LPG prep pump heads, LPG ternary inlet to 3/8" tube stub	A98613
Male connector to connect a 1/4" OD capillary to a 1/4" male NPT adapter (material: stainless steel) for A9861	A58267
Male connector to connect a 4 mm OD capillary to a 1/4" male NPT adapter (material: stainless steel) for A9861	A58268
Male connector to connect a 1/8" OD capillary to a 1/4" male NPT adapter (material: stainless steel) for A9861	A58269
Inlet-bushing kit for P 2.1S, P 4.1S, P6.1L, 40P and S1050 pumps for pump heads 10 ml (1/8" capillaries)	A58202
Inlet-bushing kit for P 2.1S, P 4.1S, P6.1L, 40P and S1050 pumps for pump heads 10 ml (1/16" capillaries)	A58203
Inlet-bushing kit for P 2.1S, P 4.1S, P6.1L, 40P and S1050 pumps for pump heads 50 ml (1/8" capillaries)	A58204
Inlet-bushing kit for P 2.1S, P 4.1S, P6.1L, 40P and S1050 pumps for pump heads 50 ml (1/16" capillaries)	A58205
Solvent Filter 1/4"-PTFE Tubing up to 250 ml/min	A58207



A9861



A9868



A58267  
A58268  
A58269

A98611  
A98612  
A98613



A58203

## Pump head outlet fittings

Outlet-bushing kit 1/8" tube stub for S1800, 80P and P 2.1L pumps	A5822
Adapter to connect a capillary with 1/16" OD (thread: 10-32 UNF) to AZURA® Pump P2.1L or BlueShadow Pump 80P outlet (1/8", M8x1 thread), material: stainless steel	A7200



A5822

## Replacement pump heads for analytical AZURA® pumps

Pump head 5 ml, stainless steel (1000 bar)	AHA60
Pump head 10 ml, stainless steel	AHB40
Pump head, 10 ml, stainless steel, for aqueous solutions	AHB40FA
Pump head 10 ml, stainless steel, for high temperature dosing applications	AHB40CA
Pump head 10 ml, stainless steel, for normal phase applications	AHB40BA
Pump head 10 ml, ceramic	AHB32
Pump head 10 ml, ceramic with Ti-bushings	AHB32DA
Pump head 10 ml, ceramic, Titanium bushings, for aqueous solutions	AHB32GA
Pump head 10 ml, Hastelloy-C, for corrosive chemicals	AHB43
Pump head 50 ml, stainless steel	AHC20
Pump head 50 ml, stainless steel, for aqueous solutions	AHC20FA
Pump head 50 ml, stainless steel, for normal phase applications	AHC20BA
Pump head 50 ml, stainless steel, for high temperature dosing applications	AHC20CA
Pump head 50 ml, ceramic	AHC22
Pump head 50 ml, ceramic, for aqueous solutions	AHC22
Pump head 50 ml, Hastelloy-C, for corrosive chemicals	AHC23



AHB32



AHB32

## Replacement pump heads for preparative AZURA® pumps

Pump head 100 ml, stainless steel	A4029-1
Pump head 100 ml, titanium	A4029V2
Pump head 250 ml, stainless steel	A4021-1
Pump head 250 ml, titanium	A4021V2
Pump head 500 ml, stainless steel	A4038-1
Pump head 500 ml, titanium	A4038V2
Pump head 1000 ml, stainless steel	A4022-1
Pump head 1000 ml, titanium	A4022V2



A4029-1

## Check valves

Check valve unit for 10 and 50 ml pump heads, for dosing applications	A06840
Check valve unit for 10 ml (AZURA® Pump P 6.1L/P 4.1S/ P 2.1S, BlueShadow 40P)	A06841
Check valve unit (spring-loaded) for 10 ml and 50 ml pump head (AZURA® Pump P 6.1L/P 4.1S/ P 2.1S, BlueShadow 40P)	A068411
Check valve unit (KEL-F) for 10 ml pump head (AZURA® Pump P 2.1S/P4.1S, BlueShadow 40P)	A068412
Check valve unit for 50 ml (AZURA® Pump P 6.1L/P 4.1S/ P 2.1S, BlueShadow 40P)	A06842
Check valve unit (KEL-F) for 50 ml pump head (AZURA® Pump P 2.1S/P4.1S, BlueShadow 40P)	A068422
Check valve unit PEEK/stainless steel for 500 ml and 1000 ml pump heads (AZURA® Pump P 2.1L, BlueShadow 80P)	A1080
Check valve unit PEEK/titanium for 500 ml and 1000 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1080V1
Check valve unit (Kel-F/titanium) for 500 ml and 1000 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1080V2
Check valve unit Kel-F/stainless steel for 500 ml and 1000 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1080V3
Check valve unit stainless steel/PEEK for 100 ml and 250 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1122
Check valve unit titanium/PEEK for 100 ml and 250 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1122-1
Check valve unit titanium/KEL F for 100 ml and 250 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1122-2
Check valve unit stainless steel/KEL F for 100 ml and 250 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)	A1122-3

## Maintenance kits

Maintenance kit for AZURA® Pump P 2.1S/ P 4.1S, AZURA® Pump P 6.1L, BlueShadow 40P, 10 ml pump head, including 1 set of gaskets, 2 piston rods, 2 sapphire backing rings, 2 O-rings	A96423
Maintenance kit for AZURA® Pump P 4.1S & P 2.1S, AZURA® Pump P 6.1L, BlueShadow 40P, 50 ml pump head, including 1 set of gaskets, 2 piston rods, 2 sapphire backing rings, 2 O-rings	A96424
Maintenance kit 100 ml for AZURA® Pump P 2.1L and BlueShadow 80P, including 2 sets of gaskets, 2 piston rods, 2 springs	A96425
Maintenance kit 250 ml for AZURA® Pump P 2.1L and BlueShadow 80P, including 2 sets of gaskets, 2 piston rods, 2 springs	A96426
Maintenance kit 500 ml for AZURA® Pump P 2.1L and BlueShadow 80P, including 2 sets of gaskets, 2 piston rods, 2 springs	A96427
Maintenance kit 1000 ml for AZURA® Pump P 2.1L and BlueShadow 80P, including 2 sets of gaskets, 2 piston rods, 2 springs	A96428

## Maintenance kits

Rebuild-Kit for one pump head AZURA® Pump P 2.1L and BlueShadow 80P (100ml/250 ml), Venting screw KEL-F, Check valve unit KEL-F, O-ring	A58211
Rebuild-Kit for one pump head AZURA® Pump P 2.1L and BlueShadow 80P (500ml/1000 ml), Venting screw KEL-F, Check valve unit KEL-F, O-ring	A58212
Rebuild-Kit Kel-F for AZURA® Pump P 4.1S/P 2.1S/P6.1L/40P, 10 ml/min pump head	A5821-1
Rebuild-Kit Kel-F for AZURA® Pump P 4.1S/P 2.1S/P6.1L/40P, 50 ml/min pump head	A5821-2
Maintenance tool kit for 10 ml pump heads	A9670
Maintenance tool kit for 50 ml pump heads	A9671
Maintenance tool kit for 100 ml pump heads	A9672
Maintenance tool kit for 250 ml pump heads	A9673
Maintenance tool kit for 500 ml pump heads	A9674
Maintenance tool kit 1000 ml pump heads	A9675

## LPG modules

LPG module for Pump P 2.1L binary up to 800 ml/min (stainless steel)	AZZ00AA
LPG module for Pump P 2.1L ternary up to 220 ml/min (stainless steel)	AZZ00AB
LPG module for Pump P 2.1L ternary up to 220 ml/min (PEEK)	AZZ10AB



AZZ00AB

## Temperature control

Pump head cooling and heating device for 100/250/500/1000 ml/min pump heads	A2034-1
Pump head cooling and heating device for 10 and 50 ml/min pump heads	A2035-1
Temperature controller for column heating sleeve	A57024
Heating solution for 10 and 50 ml/min pump heads, includes heating plate and insulation sleeve	A57036
Heating solution for 10 and 50 ml/min pump heads, includes heating plate and insulation sleeve (without temperature controller)	A57037

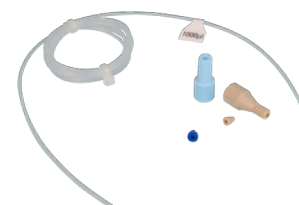


A57036

## Autosampler accessories

### Buffer tubings

Buffertubing for AS 6.1L, 500 µl; Spare part for AAA00AA, AAA01AA, AAA10AA, AAA11AA, AAA50AA & AAA51AA	A500525
Buffertubing for AS 6.1L, 1000 µl; Spare part for AAA20AA & AAA21AA	A500526
Buffertubing for AS 6.1L, 2000 µl; Spare part for AAA31AA, AAA40AA & AAA41AA	A500527



A500526

### Rotor seals

Rotor seal for AS 6.1L, 700 bar; Spare part for AAA00AA & AAA01AA	A500519
Rotor seal for AS 6.1L, 862 bar; Spare part for AAA50AA & AAA51AA	A500520
Rotor seal for AS 6.1L, 1240 bar; Spare part for AAA10AA & AAA11AA	A500521
Rotor seal for AS 6.1L, 345 bar; Spare part for AAA20AA & AAA21AA	A500522
Rotor seal for AS 6.1L, 200 bar; Spare part for AAA40AA & AAA41AA	A500523
Rotor seal for AS 6.1L, 200 bar; Spare part for AAA31AA	A500524



A500521

## Syringes

250 µl Syringe for AS 6.1L; Spare part for AAA00AA, AAA01AA, AAA10AA, AAA11AA, AAA50AA & AAA51AA	A500512
500 µl Syringe for AS 6.1L; Spare part for AAA20AA & AAA21AA	A500513
2500 µl Syringe for AS 6.1L; Spare part for AAA31AA, AAA40AA & AAA41AA	A500514



A500512

## Sample loops

Sample loop incl. fittings, 100 µl, stainless steel; Spare part for AAA00AA, AAA01AA, AAA50AA & AAA51AA	A50077
Sample loop incl. fittings, 10 µl, stainless steel; Spare part for AAA10AA & AAA11AA	A50078
Sample loop incl. fittings, 10 ml, stainless steel; Spare part for AAA40AA & AAA41AA	A500509
Sample loop incl. fittings, 100 µl, PEEK; Spare part for AAA20AA & AAA21AA	A500510
Sample loop incl. fittings, 10 ml, PEEK; Spare part for AAA31AA	A500511



A50077

## Sample needles

Sample needle for preparative autosampler AS 6.1L; Spare part AAA40AA & AAA41AA	A500516
Sample needle for biocompatible autosampler AS 6.1L; Spare part AAA20AA & AAA21AA	A500517
Sample needle for bio-preparative autosampler AS 6.1L; Spare part AAA31AA	A500518
Sample needle for analytical autosampler AS 6.1L; Spare part for AAA00AA, AAA01AA, AAA10AA, AAA11AA, AAA50AA & AAA51AA	A64700

## Vial kits for analytical & preparative HPLC

Vials: Screw neck vials N9 (ø 11.6 mm), 1.5 ml, clear glass, flat bottom, wide opening, with label & scale, Caps: Screw caps blue with septum silicone beige/PTFE white, 100 pcs each	A0638-6
Vials: Screw neck vials N9 (ø 11.6 mm), 1.5 ml, amber glass, flat bottom, wide opening, with label & scale, Caps: Screw caps blue with septum silicone beige/PTFE white, 100 pcs each	A0638-7
Vials: Screw neck vials N9 (ø 11.6 mm), 1.5 ml, clear glass, flat bottom, wide opening, with label & scale, Caps: Screw caps blue with septum rubber red/TEF colourless, 100 pcs each	A0638-8
Vials: Screw neck vials N9 (ø 11.6 mm), 1.5 ml, amber glass, flat bottom, wide opening, with label & scale, Caps: Screw caps blue with septum rubber red/TEF colourless, 100 pcs each	A0638-9
Microinserts 0.1 ml for Screw neck vials N9, 1.5 ml, 100 pcs.	A18201-3
Vials: Screw neck vials N18 (ø 22.5 mm), 10 ml, clear glass, round bottom Caps: Screw caps, magnetic, with septum rubber red/TEF colourless 100 pcs each	A15854



A0638-9

## Air needles

Air needle for AS 6.1L; 50 mm protrusion length	A500529
Air needle for AS 6.1L; 56 mm protrusion length	A500530
Air needle for AS 6.1L; 62 mm protrusion length	A50058
Air needle for AS 6.1L; 68 mm protrusion length	A500531
Air needle for AS 6.1L; 74 mm protrusion length	A500532
Air needle for AS 6.1L; 80 mm protrusion length	A500533
Set of air needles for autosampler AS 6.1L, 1 pc. of each length	A50059



A500533

## Maintenance kits

Preventive maintenance kit for AS 6.1L/3950 (1240 bar/1000 bar) AAA10AA/AAA11AA/A50060/A500601/A50070/A500701	A5009-1
Preventive maintenance kit for AS 6.1L/3950 (700 bar) AAA00AA/AAA01AA/A50080/A50081	A5009-2
Preventive maintenance kit for AS 6.1L/3950 (345 bar, Bio) AAA20AA/AAA21AA/A50052-1/A50053/A50053-1	A5009-3
Preventive maintenance kit for AS 6.1L/3950 (200 bar, Prep) AAA40AA/AAA41AA/A50054-1/A50056-1	A5009-4
Preventive maintenance kit for AS 6.1L/3950 (200 bar, Prep-Bio) AAA31AA/A50055-2	A5009-5
Preventive maintenance kit for AS-1 (1000 bar) A63500/A63501/A63502	A5009-6
Preventive maintenance kit for AS 6.1L (862 bar) AAA50AA/AAA51AA	A5009-7

## Vial plates

Vial plate for 48x 1.5 ml vials for autosampler 3950 and AZURA® AS 6.1L, 1 pcs.	A50050
Vial plate for 84x1.5ml and 3x10ml vials for autosampler 3950 and AZURA® AS 6.1L, 1 pcs.	A500501
Prep vial plate for 12 x 10ml for autosampler 3950 and AZURA® AS 6.1L, 1 pcs.	A500502
Vial plate for 108x 1.5ml vials for Autosampler AZURA® AS 6.1L, 1 pcs.	A500505
Prep vial plate for 30 x 10ml for autosampler 3950 and AZURA® AS 6.1L, 1 pcs.	A500507



A500505

## Optional accessories

Fuse (2.5 A) for AS 6.1L, 2 pcs.	A500534
Rectangular bottle (250 ml, PE) for wash or transport solution	A500535
Waste tube for AS 6.1L, silicone, 1 m	A500536
Waste tube for AS 6.1L, PTFE, 1 m	A500537

## Detector accessories

### Flow cells 1/16"

3 mm path length, 2 µl, 1/16", stainless steel, classical KNAUER flow cell	A4042
3 mm path length, 2 µl, 1/16", 30 bar, biocompatible, classical KNAUER flow cell	A4045
10 mm path length, 10 µl, 1/16", 300 bar, stainless steel, for 50D, S2550 and MW-1	A4061V2
10 mm path length, 10 µl, 1/16", 300 bar, stainless steel, with heat exchanger one sided inlet and outlet, classical KNAUER flow cell	A4061XB
3 mm path length, 2µl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD	AMB18
10 mm path length, 2µl, 1/16", 50 bar, LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD	AMC19XA
10 mm path length, 10µl, 1/16", 300 bar, PressureProof Flow cell cartridge for AZURA® Detector DAD/MWD	AMC38
50 mm path length, 6µl, 1/16", 50 bar, High Sensitivity LightGuide Flow cell cartridge for AZURA® Detector DAD/MWD	AMD59XA
10 mm path length, 2.4 µl, 1/16", 100 bar, biocompatible, fiber optic connectors, for PDA-1	A64150



AMC19XA  
AMD59XA

### Flow cells 1/16"

50 mm path length, 10 µl, 1/16", 100 bar, biocompatible, fiber optics connectors, for PDA-1	A64151
0.5 mm path length, 3 µl, 1/16", 200 bar, stainless steel, classical KNAUER flow cell	A4069
0.5 mm path length, 3 µl, 1/16", 100 bar, biocompatible, classical KNAUER flow cell	A4095

### Flow cells 1/8"

2 mm path length, 1/8", 200 bar, stainless steel, changeable to 0.5/1.25 mm, classical KNAUER flow cell	A4066
2 mm path length, 1/8", 100 bar, biocompatible, changeable to 0.5/1.25 mm, classical KNAUER flow cell	A4067

### Flow cells 1/4"

2 mm path length, 1/4" angular connections, 200 bar, stainless steel, changeable to 0.5/1.25 mm, without fittings, classical KNAUER flow cell	A4068
2 mm path length, 1/4" straight connections, 200 bar, stainless steel, changeable to 0.5/1.25 mm, without fittings, classical KNAUER flow cell	A4068-2



A4068

### Flow cells 1/16" fiber optics

3 mm path length, 2 µl, 1/16", 300 bar, stainless steel, fiber optic connectors, classical KNAUER flow cell	A4044
3 mm path length, 2 µl, 1/16", 300 bar, 85 °C, stainless steel, fiber optic connectors, classical KNAUER flow cell	A4044HT
Fiber optics adapter kit for AZURA® Detector DAD/MWD, with fiber optic cables (1x 400 mm and 1x 750 mm) and mounting bracket	AMKX8KIT
3 mm path length, 2 µl 1/16", 30 bar, biocompatible, fiber optic connectors, classical KNAUER flow cell	A4047
10 mm path length, 10 µl, 1/16", 300 bar, stainless steel, fiber optic connectors, classical KNAUER flow cell	A4074
0.5 mm path length, 3 µl, 1/16", 200 bar, stainless steel, fiber optic connectors, classical KNAUER flow cell	A4089
0.5 mm path length, 3 µl, 1/16", 100 bar, biocompatible, fiber optic connectors, classical KNAUER flow cell	A4096



A4044  
A4044HT  
A4074  
A4089

### Flow cells 1/8" fiber optics

2 mm path length, 1/8", 200 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm, classical KNAUER flow cell	A4078
2 mm path length, 1/8", 100 bar, biocompatible, fiber optic connectors, changeable to 0.5/1.25 mm, classical KNAUER flow cell	A4079



A4079

### Nano flow cell

3 mm path length, 6 nl, 375 µm OD, 50 µm ID, 300 bar, fused silica, fiber optic connectors	A4104
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A4104



## Flow cells larger than 1/8" fiber optics

2 mm path length, 1/4" angular connections, 200 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm	A4081
2 mm path length, 1/4" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm	A4153
2 mm path length, 3/8" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm	A4152
7 mm path length, 3/8" TRI-Clamp connections, 10 bar, biocompatible, fiber optic connectors	A4152-1
2 mm path length, 1/2" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm	A4154
10 mm path length, 3/8" TRI-Clamp connections, 10 bar, biocompatible, fiber optic connectors	A4154-1
2 mm path length, 3/4" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors, changeable to 0.5/1.25 mm	A4155



A4152  
A4153  
A4154  
A4155

## Fiber optic cables

Fiber optic cables (2 pc), 750 mm, 2x SMA 905 600/660, polymicro	A0740
Fiber optic cables (2 pc), custom made sizes,, 2x SMA 905 600/660, polymicro	A0743
Fiber optic cables (2 pc), 750 mm, 2x SMA 905 600/660, polymicro, up to 85°C	A0740HT



A0740

## Lamps

Deuterium lamp for Smartline S2500 and S2600 detectors	A4071
Deuterium lamp for Smartline PDA detectors K-2800, S2800 and S2850	A4447V1
HBST deuterium lamp for AZURA® Detector DAD 6.1L	AZL01
HBST deuterium lamp for PLATINblue MW-1 and PDA-1 detectors	A64210
Deuterium lamp, replacement, for S2520, 10D, 40D, UVD 2.1S, UVD 2.1L, DAD 2.1L, MWD 2.1L	A5193
HBST deuterium lamp for Smartline UV and UV/VIS detectors 2550 and BlueShadow 50D	A5194
Halogen lamp for AZURA® Detector DAD 6.1L	AZL02
Halogen lamp for converting Smartline UV 2500 detector into Smartline VIS 2500 detector	A4073
Halogen lamp for converting Smartline UV 2600 detector into Smartline VIS 2600 detector	A4073XA
Halogen lamp for PLATINblue MW-1 detector	A64200
Halogen lamp for PLATINblue PDA-1 detector	A64201
Halogen lamp for Smartline 2500 detector, VIS version	A4072
Halogen lamp for Smartline 2600 detector, VIS Version	A4072XA
Halogen lamp for Smartline PDA 2800 and 2850 detectors	A4448
Halogen lamp for Smartline UV/VIS detector 2550	A5195
Halogen lamp for upgrading Smartline UV detector 2550 to Smartline UV/VIS detector 2550	A5197
LED for Sedex 80LT and Sedex 85LT light scattering detectors	A07541
Xenon lamp for RF-10AXL fluorescence detector	A0753
Xenon lamp for RF-20A/Axs fluorescence detector	A59210



AZL01

## Waste tubing kits

Waste tubing kit for AZURA® RID 2.1L, 1/16"	A9841
Waste tubing kit for LightGuide flow cells, 1/16"	A9842
Waste tubing kit for UV flow cells, 1/16"	A9843
Waste tubing kit for UV flow cells, 1/8"	A9844



A9844

## Flow splitters

Adjustable preparative post column flow splitter. Calibrated on customer flow rate, split ratio and eluent.	A5815
Adjustable semi-preparative post column flow splitter. Calibrated on customer flow rate, split ratio and eluent.	A5816
Passive post column flow splitter for analytical applications. Calibrated with water for split ratios of 15:1 - 250:1	A1770
Flow splitter for CM 2.1S when used with flowrates over 100 ml/min	A5813



A5816

## Valve accessories

### Valves, rotors, stators

Description	Valve	Rotor seal	Stator
6 Port 2-position valve, 1200 bar	AVC28AC	A0611.2	A205118
8 Port 2-position valve, 1200 bar	AVC38AC	A0611.3	A205120
6 Port 2-position valve, 240 bar, bioinert	AVD24CE	A205101	A205102
6 Port 2-position valve, 500 bar	AVD26AE	A205145	A205140
8 Port 2-position valve, 500 bar	AVD36AE	A205144	A205142
6 Port 2-position valve, 300 bar	AVE25AE	A205147	A205146
Manual 6 Port 2-position valve, 240 bar, bioinert	AVG24CE	A205101	A205102
Manual 6 Port 2-position valve, 1200 bar	AVI28AC	A0611.2	A205118
Manual 8 Port 2-position valve, 1200 bar	AVI38AC	A0611.3	A205120
Manual 6 Port 2-position valve, 500 bar	AVJ26AE	A205145	A205140
Manual 8 Port 2-position valve, 500 bar	AVJ36AE	A205144	A205142
Manual 6 Port 2-position valve, 300 bar	AVK25AE	A205147	A205146
8 Port multi-injection valve, 240 bar, bioinert	AVN94CE	A205131	A205132
16 Port multiposition valve, 500 bar	AVQ66AE	A205151	A205152
6 Port multiposition valve, 1200 bar	AVR28AC	A0880.2	A205118
8 Port multiposition valve, 1200 bar	AVR38AC	A0880.4	A205120
6 Port multiposition valve, 500 bar	AVS26AE	A205139	A205140
8 Port multiposition valve, 240 bar, bioinert	AVS34CE	A205103	A205104
8 Port multiposition valve, 300 bar	AVS35AE	A205141	A205142
8 Port multiposition valve, 500 bar	AVS36AE	A205141	A205142
16 Port multiposition valve, 50 bar, bioinert	AVS62CE	A250105	A205106
6 Port multiposition valve, 300 bar	AVT25AE	A205148	A205146
8 Port multiposition valve, 50 bar, bioinert	AVU32CE	A205129	A205130
8 Port multiposition valve, 200 bar	AVU34AE	A205149	A205150



Rotor Seals



Valve AVD26AE

### Sample loops 1/16" SST incl. fittings

Sample Loop VICI, 1 µL, stainless steel, 0.1 mm ID	A05641
Sample loop, 1 µl, stainless steel, 0.1 mm ID	A05642
Sample loop, 2 µl, stainless steel, 0.1 mm ID	A05643
Sample loop, 5 µl, stainless steel, 0.25 mm ID	A05644
Sample loop, 10 µl, stainless steel, 0.25 mm ID	A05645
Sample loop, 20 µl, stainless steel, 0.25 mm ID	A05646
Sample loop, 50 µl, stainless steel, 0.45 mm ID	A05647
Sample loop, 100 µl, stainless steel, 0.45 mm ID	A05648
Sample loop, 200 µl, stainless steel, 1 mm ID	A0565
Sample loop, 500 µl, stainless steel, 1 mm ID	A0566
Sample loop, 1000 µl, stainless steel, 1 mm ID	A0567
Sample loop, 2000 µl, stainless steel, 1 mm ID	A0568
KNAUER VariLoop S, 10 ml, 1/16", stainless steel, variable injection volume and multiple injections	A1054-2
KNAUER VariLoop L, 40 ml, 1/16", stainless steel, variable injection volume and multiple injections	A1055-1



A1054-2

### Sample loops 1/8" SST incl. fittings

Sample loop, 1 ml, stainless steel, 2.2 mm ID	A1043
Sample loop, 2 ml, stainless steel, 1.6 mm ID	A1044
Sample loop, 5ml, stainless steel, 1.6 mm ID	A0586-2
Sample loop, 10ml, stainless steel, 2.2 mm ID	A0843
KNAUER VariLoop S, 10 ml, 1/8", stainless steel, variable injection volume and multiple injections	A1159-2
KNAUER VariLoop L, 40 ml, 1/8", stainless steel, variable injection volume and multiple injections	A1160-1



A1159-2

### Sample loops 1/16" PEEK incl. fittings

Sample loop, 10 µl, PEEK, 345 bar, 0.25 mm ID	A1058
Sample loop, 50 µl, PEEK, 240 bar, 0.75 mm ID	A1060
Sample loop, 100 µl, PEEK, 240 bar, 0.75 mm ID	A0508
Sample loop, 200 µl, PEEK, 240 bar, 0.75 mm ID	A1061
Sample loop, 500 µl, PEEK, 240 bar, 0.75 mm ID	A1057
Sample loop 1 ml, PEEK, 240 bar, 0.75 mm ID	A0423
Sample loop 2ml, PEEK, 240 bar, 0.75 mm ID	A0785
Superloop, 50 ml, variable injection volumes and multiple injections, movable piston protects against dilution, 1/16", Glass, 40 bar	A1929
Superloop, 150 ml, variable injection volumes and multiple injections, movable piston protects against dilution, 1/16", Glass, 20 bar	A1928



A0423

### Sample loops 1/8" PEEK incl. fittings

Sample Loop 5ml, PEEK, 50 bar, 1/16" ID	A78980
Sample Loop 10ml, PEEK, 50 bar, 1/16" ID	A78985

### Injection syringes for 1/16" injection port

Injection syringe 10 µl	A0723
Injection syringe 25 µl	A0724
Injection syringe 50 µl	A0725
Injection syringe 100 µl	A0726
Injection syringe 250 µl	A0727
Injection syringe 500 µl	A0728
Injection syringe 1000 µl	A0729
Injection syringe 2500 µl	A0730



### Luer-Lock glass syringes for 1/8" injection port

Luer-Lock glass syringe, 10 ml	A0573
Luer-Lock glass syringe, 20 ml	A0653



### Loop filling ports

Loop filling port	A0555
Injection Port, stainless steel, 1/16"	A0328
Injection Port, PEEK, 1/16"	A03281
Injection Port, stainless steel, 1/8"	A0505
Injection Port, PEEK, 1/8"	A05051



## Osmometry accessories and standards

Pack of 12 ampules NaCl calibrating solution, 300 mOsmol/kg	A01240
Pack of 12 ampules NaCl calibrating solution, 400 mOsmol/kg	A01241-1
Pack of 12 ampules NaCl calibrating solution, 850 mOsmol/kg	A01250
Pack of 12 ampules NaCl calibrating solution, 2000 mOsmol/kg	A01248
Cleaning tissue, lint-free, for thermistor cleaning	A02330
Ribbon cartridge for the plain paper printer A3711 (black)	A7014
Printer paper for the plain paper printer A3711 (60 m roll)	A7013
100 Pack of plastic sample tubes for Semi-Micro Osmometer K-7400S	A02721
500 Pack of plastic sample tubes for Semi-Micro Osmometer K-7400S	A0272
100 Pack of plastic sample tubes for the Semi-Micro Osmometer K-7400S	A0720



A0720  
A02721  
A0272

## Purification accessories

### Eluent & column heating

Eluent heating device to control the temperature of eluent (1-Channel). Cleanroom compatible.	A70054V3
Eluent heating device to control the temperature of eluent and a column heating sleeve (2-Channel). Cleanroom compatible.	A70054V4
Temperature controller for column heating sleeve	A57024
Heating sleeve for HPLC column 150 x 20 mm HM D=25..57*L=193 mm 100 °C, 230V, 200W, Pt100	A57026
Heating sleeve for HPLC column 250 x 20 mm HM D=25..57*L=293 mm 100 °C, 230V, 200W, Pt100	A57027
Heating sleeve for HPLC column 150 x 30 mm HM D=38..70*L=203 mm 100 °C, 230V, 400W, Pt100	A57028
Heating sleeve for HPLC column 250 x 30 mm HM D=38..70*L=303 mm 100 °C, 230V, 500W, Pt100	A57029
Heating sleeve for HPLC column 150 x 50 mm HM D=60..100*L=211 mm 100 °C, 230V, 500W, Pt100	A57030
Heating sleeve for HPLC column 250 x 50 mm HM D=60..100*L=311 mm 100 °C, 230V, 800W, Pt100	A57031
Heating sleeve for HPLC costum made up to 350 x 50 mm	A57032



A57026

### Purification

Pressure control for delta pressure measurement up to 250 ml/min for 1/16" and 1/8". Includes interface box.	AZG10
External pressure sensor up to 250 ml/min for 1/16" and 1/8".	AZG10-1
External pressure sensor for up to 1000 ml/min for 1/4", 0 - 10 bar, analog output	AZG10-2
External pressure sensor for up to 1000 ml/min for 1/4", 0 - 10 bar, LAN	AZG10-3
External pressure sensor for up to 1000 ml/min for 1/4", 0 - 10 bar, LAN, biocompatible	AZG10-4
Air sensor (1/16") for AZURA® Bio LC with one air sensor and wiring for up to 4 air sensors	A70092
Additional air sensor for AZURA® Bio LC for 1/16" tubing	A70092-1
Air sensor (1/8") for AZURA® Bio LC with one air sensor and wiring for up to 4 air sensors	A70093
Additional air sensor for AZURA® Bio LC for 1/8" tubing	A70093-1
Air sensor (1/4") for AZURA® Bio LC with one air sensor and wiring for up to 4 air sensors	A70083
Additional Air Sensor	A70083-1
<b>Don't forget to order!</b> Power Supply: Distribution Box 24 V for 6 devices like air sensor, external pressure sensor, IFU 2.1 LAN	AZS80SA
AZURA® Organizer Holder for AZURA® Click for attaching falcons, columns (5 mm - 26 mm OD) and the pH Flow Cell	A70085
Clamp for AZURA® Organizer 12 mm	A70085-1
Clamp for AZURA® Organizer 16 mm	A70085-2
Clamp for AZURA® Organizer 25 mm	A70085-3
AZURA® Click rail for AZURA® L devices for attaching IFU 2.1 LAN, air sensor, pressure Control and the AZURA® Organizer	A70089



AZG10



AZG10-2

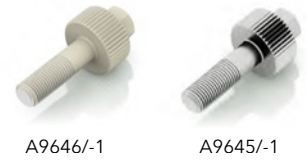


A70092

## Consumables

### K-Connect system

K-Connect Fingertight Fitting, PEEK, long, Set of 2, incl. ferrule, UNF 10/32 Thread for 1/16 inch K-Connect and PEEK Capillaries	A9646
K-Connect Fingertight Fitting, PEEK, long, Set of 10, incl. ferrule, UNF 10/32 Thread for 1/16 inch K-Connect and PEEK Capillaries	A9646-1
K-Connect Fingertight Fitting, Stainless Steel, long, Set of 2, incl. ferrules, UNF 10/32 Thread for 1/16 inch K-Connect Capillaries	A9645
K-Connect Fingertight Fitting, Stainless Steel, long, Set of 10, incl. ferrules, UNF 10/32 Thread for 1/16 inch K-Connect Capillaries	A9645-1
K-Connect Standard Fitting, Stainless Steel, Set of 2, incl. ferrule, UNF 10/32 Thread for 1/16 inch K-Connect Capillaries	A9647
K-Connect Standard Fitting, Stainless Steel, Set of 10, incl. ferrule, UNF 10/32 Thread for 1/16 inch K-Connect Capillaries	A9647-1



A9647/-1

### DYNASEAL system

DYNASEAL connection system, 1/16", 4 short bushings, 4 clamping rings and 8 sealing rings	A0108
DYNASEAL connection system, 1/16", 3 long bushings, 3 clamping rings and 4 sealing rings	A0181
DYNASEAL connection system, 1/16", 10 short bushings, 10 biconical sealing rings	A1020
DYNASEAL connection system, 1/16", 5 long bushings, 5 biconical sealing rings	A1069
DYNASEAL connection system, 1/8", M8x1, 4 long bushings, 4 clamping rings and 8 sealing rings	A0736
DYNASEAL connection system, 1/8", M8x1, 4 short bushings, 4 clamping rings and 8 sealing rings	A0644



A0108

A0181



A1020

A1069

### Bushings for capillaries - DYNASEAL

DYNASEAL connection system, bushings for 1/16" capillaries, stainless steel, fingertight, short, 10 pcs.	A1021
DYNASEAL connection system, bushings for 1/16" capillaries, stainless steel, fingertight, long, 5 pcs.	A1064
DYNASEAL connection system, bushings for 1/8" capillaries, stainless steel, fingertight, short, 4 pcs.	A1067
DYNASEAL connection system, bushings for 1/8" capillaries, stainless steel, fingertight, long, 4 pcs.	A0735



A1021

A0735



A1064

A1067

### Split-grooved clamping rings

4 Split-grooved clamping rings for capillaries with 1/16" OD	A0484
4 Split-grooved clamping rings for capillaries with 1/8" OD	A1239
100 Split-grooved clamping rings for capillaries with 1/16" OD	A0482



### Sealing rings

30 Sealing rings for capillaries with 1/16" OD, PETP	A0139
100 Sealing rings for capillaries with 1/16" OD, PETP	A0140
10 Sealing rings for capillaries with 1/16" OD, PEEK	A1062
10 Sealing rings for capillaries with 1/8" OD, PETP	A0232
10 Sealing rings for capillaries with 1/8" OD, PEEK	A1063



### Biconical sealing rings

10 Biconical sealing rings with 1/16", PEEK	A1070
10 Biconical sealing rings with 1/16", PETP	A1022
10 biconical sealing rings 1/8" PETP	A0738



### Bushings for capillaries, SST

10 Bushings for capillaries with 1/8" OD, M8x1, wrench caliber 10, stainless steel	A0830
3 Bushings for capillaries with 1/16" OD, stainless steel, wrench caliber 1/4", UNF 10-32, long	A0115
10 Bushings for capillaries with 1/16" OD, stainless steel, wrench caliber 1/4", UNF 10-32, long	A0116
10 Bushings for capillaries with 1/16" OD, stainless steel, wrench caliber 1/4", UNF 10-32, short	A0112
25 Bushings for capillaries with 1/16" OD, stainless steel, wrench caliber 1/4", UNF 10-32, short	A0113



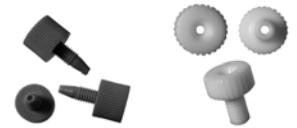
### Ferrules for capillaries

30 Ferrules for capillaries with 1/16" OD, stainless steel	A0110
100 Ferrules for capillaries with 1/16" OD, stainless steel	A0111
10 Ferrules for capillaries with 1/8" OD, stainless steel	A0874
10 Ferrules, Hastelloy, for capillaries with 1/16" OD	A01101
10 Ferrules, Titanium, for capillaries with 1/16" OD	A01102



### Bushings for capillaries, PEEK & polymer

Bushing for 1/16" capillaries, PEEK, long Hex, with integrated sealing cone, 5 pcs	A25021
Bushing for 1/16" capillaries, PEEK, short Hex, with integrated sealing cone, 5 pcs.	A25011
Bushings for 1/8" capillaries, PETP, with integrated sealing cone, M8x1, knurled, short, 10 pcs.	A0733
Bushings for 1/16" capillaries, with integrated sealing cone, knurled, PEEK, UNF 10-32, 10 pcs.	A0584
Bushings for 1/16" capillaries, PETP, with integrated sealing cone, knurled, UNF 10-32, short, 10 pcs.	A0145
Bushings for 1/16" capillaries, PETP, UNF 10-32, long, 10 pcs.	A0144
Bushings for 1/16" capillaries, PETP, knurled, UNF 10-32, short, 10 pcs.	A0141
Bushings for 1/16" capillaries, PETP, knurled, UNF 10-32, short, 30 pcs.	A0142



A0584

A0142



A0733

A25021

### Flat bottom fittings and adapters

Bushings flat bottom for 1/8" capillaries, PEEK, Super flangeless, 1/4-28, 10 pcs.	A5829
Bushings flat bottom for 1/16" capillaries, PEEK, Super flangeless, 1/4-28, 10 pcs.	A58291
Ferrules for 1/16" capillaries and flat bottom bushings, PEEK, with lock ring (stainless steel), for Super flangeless bushings, 10 pcs.	A58292
Ferrules for 1/8" capillaries and flat bottom bushings, PEEK, with lock ring (stainless steel), for Super flangeless bushings, 10 pcs.	A58293
Ferrules for 1/8" capillaries and flat bottom bushings, ETFE, with lock ring (stainless steel), for Super flangeless bushings, 10 pcs.	A58294
Adapter PEEK 1/8" flat bottom internal on 1/16" external 10/32 thread	A1982
Adapter PEEK 1/8" external thread on 1/16" flat bottom internal thread	A05841



A58294

## Blind fittings

Blind fittings, 1/16", PETP, knurled, UNF 10-32, short, 10 pcs.	A0146
Blind fittings, 1/16", PETP, knurled, UNF 10-32, short, 30 pcs.	A0147
Blind fittings, 1/16", PEEK, knurled, UNF 10-32, short, 10 pcs.	A0582
Blind fittings, 1/8", PETP, knurled, M8x1, short, 10 pcs.	A0734



## Adapters

Luer Adapter to 10-32, ETFE, female Luer to male 10/32 threads for injection, simply screw the adapter in the port of your injection valve	A1980
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A1980

## Couplings, polymer/PEEK

Coupling to connect 2 capillaries with 1/16" OD (material: PEEK/PETP, thread: UNF10-32), including 2 bushings and sealing rings, 0.5 mm bore, suitable for classical HPLC, 1 pc.	A0148
Coupling to connect 2 capillaries with 1/16" OD (material: PEEK/PETP, thread: UNF10-32), including 2 bushings and sealing rings, 0.5 mm bore, suitable for classical HPLC, 5 pcs.	A0149
Coupling to connect 2 capillaries with 1/16" OD (material: PEEK, thread: 10-32 UNF), including 2 one-piece PEEK fittings, 0.5 mm bore, suitable for classical HPLC	A0233
Coupling to connect 2 capillaries with 1/16" OD (material: PEEK, thread: 10-32 UNF), without fittings, 0.5 mm bore, suitable for classical HPLC	A0233-1
Coupling to connect 2 capillaries with 1/16" and 1/8" OD (material: PEEK, thread: 10-32 UNF, M8x1), including 2 one piece fittings (1x 1/16", 1x 1/8"), 1 mm bore	A1407
Coupling to connect 2 capillaries with 1/8" OD (material: PEEK, thread: M8x1), including 2 one piece fittings 1/8", 2 mm bore, suitable for preparative HPLC	A14071



## Couplings, SST/Titanium

Coupling to connect 2 capillaries with 1/16" OD (material: titanium, thread: 10-32 UNF), including 2 bushings and ferrules, 0.5 mm bore, suitable for classical HPLC	A0117V1
Coupling to connect 2 capillaries with 1/16" OD (material: stainless steel, thread: 10-32 UNF), including 2 bushings and ferrules, 0.5 mm bore, suitable for classical HPLC	A0117
Coupling to connect 2 capillaries with 1/16" OD (material: stainless steel, thread: 10-32 UNF), including 2 bushings and ferrules, 0.5 mm bore, suitable for classical HPLC, 5 sets	A0118
Coupling to connect 2 capillaries with 1/16" OD (material: stainless steel, thread: 10-32 UNF), including 2 bushings and ferrules, 0.5 mm bore, suitable for classical HPLC, 25 sets	A0119
Coupling to connect 2 capillaries with 1/8" OD (material: stainless steel, thread: M8x1), including 2 bushings and ferrules, 2 mm bore, suitable for preparative HPLC	A2512
Coupling to connect a capillary with 1/16" OD to a capillary with 1/8" OD (material: stainless steel, thread: M8x1, 10-32 UNF), 1 mm bore	A2513
Coupling Dynaseal to connect a capillary with 1/16" OD to a capillary with 1/8" OD (material: stainless steel, thread: M8x1, 10-32 UNF), including Dynaseal bushings and ferrules (1x 1/16", 1x 1/8"), 1 mm bore	A0485
Coupling Dynaseal to connect 2 capillaries with 1/8" OD (material: stainless steel, thread: M8x1), including 2 Dynaseal bushings and ferrules, 2 mm bore, suitable for preparative HPLC	A0480





## Swagelok® unions & reducing unions, SST

Union to connect 2 capillaries with 1/4" OD, material: stainless steel, Swagelok®	A58263
Reducer to connect a capillary with 3/8" OD to a capillary with 1/4" OD, material: stainless steel, Swagelok®	A58264
Reducer to connect a capillary with 8 mm OD to a capillary with 1/4" OD, material: stainless steel, Swagelok®	A58265
Reducer to connect a capillary with 1/8" OD to a capillary with 1/4" OD, material: stainless steel, Swagelok®	A58266
Reducer to connect a capillary with 1/16" OD to a 1/8" OD pipe, material: stainless steel, Swagelok®	A58270
Reducer to connect a capillary with 1/8" OD to a 1/4" pipe union, material: stainless steel, Swagelok®	A58271
Reducer to connect a capillary with 4 mm OD to a 1/8" pipe union, material: stainless steel, Swagelok®	A58282



## T-connectors, SST/titanium

T-connector to connect 3 capillaries with 1/8" OD (material: stainless steel, thread: M8x1), including 3 bushings and ferrules	A2511
T-connector to connect 3 capillaries with 1/16" OD (material: stainless steel, thread: 10-32 UNF), including 3 bushings and ferrules	A0120
T-connector to connect 3 capillaries with 1/8" OD (material: stainless steel, Swagelok®)	A58260
T-connector to connect 3 capillaries with 1/4" OD (material: stainless steel, Swagelok®)	A58261
T-connector to connect 3 capillaries with 1/4" OD (material: titanium, Swagelok®)	A58262



A58260  
A58261  
A58262

## T-connectors, polymer

T-connector to connect 3 capillaries with 1/16" OD (material: PEEK, thread: 10-32 UNF), without bushings	A150-1
T-connector to connect 3 capillaries with 1/8" OD (material: PEEK, thread: M8x1), including 2 one piece PEEK fittings 1/8"	A2511-1
T-connector to connect 3 capillaries with 1/16" OD (material: PETP/POM, thread: 10-32 UNF), inclusive 2 bushings and sealing rings	A0150

## X-connectors, SST

X-connector to connect 4 capillaries with 1/16" OD (material: stainless steel, thread: 10-32 UNF), including 4 bushings and ferrules	A0121
X-connector to connect 4 capillaries with 1/8" OD (material: stainless steel, thread: M8x1), including 4 bushings and ferrules	A1096
X-connector to connect 4 tubings with 1/4" OD (material: stainless steel, Swagelok®) for 1000 ml/ min Systems	A58272



## X-connectors, polymer

X-connector to connect 4 capillaries with 1/16" OD (material: PEEK, thread: 10-32 UNF), including 4 one piece fittings	A0151
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### Pressure release valves

Pressure Release Valve Kit for AZURA® pump P 2.1L and Pump 1800 (25 to 50 bar), 1/8", stainless steel, cross piece titanium	A5800
Pressure Release Valve Kit for AZURA® pump P 2.1L and Pump 1800 (3,4 to 24 bar), 1/8", stainless steel, cross piece titanium	A5801
Pressure Release Valve for AZURA® pump P 2.1L and Pump 1800 (without spring), 1/4", stainless steel	A5802
Back-Pressure Regulator/pressure relief valve kit for 1/16" OD tubing, stainless steel, provides a constant back-pressure of 3 bar, contains pressure relief valve tee and fittings for 1/16"	A5805
Spring for pressure release valve, 25 - 50 bar	M1070
Spring for pressure release valve, 3.4-24 bar	M1080



A5802



M1080

### Backpressure regulators

Back-Pressure Regulator for 1/16" OD tubing, 10-32 threads, PEEK, Range 1-20 bar (15-300 psi)	A70087
Back-Pressure Regulator for 1/16" OD tubing, 10-32 threads, PEEK, Range 20-103 bar (300-1500 psi)	A70088
Back-Pressure Regulator for 1/16" OD tubing, 10-32 threads, stainless steel, Range 90-300 bar (1300-4200 psi)	A70084
Back-Pressure Regulator/pressure relief valve for 1/16" OD tubing, stainless steel, provides a constant back-pressure of 52 bar, contains pressure relief valve tee and fittings for 1/16"	A5805-1
Spare membranes for Back-Pressure Regulators A70084, A70087, A70088	A70082
Back-Pressure Regulator/pressure relief valve for 1/8" and 1/16" OD tubing, 134 µl volume, PEEK, provides a constant back-pressure of 1.4 bar (20 psi), contains pressure relief valve tee and fittings for 1/8" and 1/16"	A5804
Back-Pressure Regulator for 1/16" OD tubing, 134 µl volume, PEEK, provides a constant back-pressure of 0.3 bar (5 psi), contains Y assembly and fittings	A5804-1



A70087

### Capillaries 1/16", SST

Stainless steel, 1/16" OD, 0.1 mm ID, 300 cm length, 1 pcs.	A0130
Stainless steel, 1/16" OD, 0.25 mm ID, 300 cm length, 1 pcs.	A0131
Stainless steel, 1/16" OD, 0.5 mm ID, 300 cm length, 1 pcs.	A0132
Stainless steel, 1/16" OD, 0.7 mm ID, 300 cm length, 1 pcs.	A0133
Stainless steel, 1/16" OD, 1 mm ID, 300 cm length, 1 pcs.	A0134
Stainless steel, 1/16" OD, 0.1 mm ID, 10 cm length, 10 pcs.	A0123
Stainless steel, 1/16" OD, 0.1 mm ID, 20 cm length, 10 pcs.	A0124
Stainless steel, 1/16" OD, 0.1 mm ID, 30 cm length, 10 pcs.	A0125
Stainless steel, 1/16" OD, 0.25 mm ID, 10 cm length, 10 pcs.	A0126
Stainless steel, 1/16" OD, 0.25 mm ID, 20 cm length, 10 pcs.	A0127
Stainless steel, 1/16" OD, 0.25 mm ID, 30 cm length, 10 pcs.	A0128

### Capillaries 1/16", titanium

Titanium, 1/16" OD, 0.7 mm ID, 50 cm length, 1 pcs.	A0506
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## Capillaries 1/8", SST

Stainless steel, 1/8"OD, 1.6 mm ID, 150 cm length, 1 pcs.	A0639
Stainless steel, 1/8" OD, 2.2 mm ID, 150 cm length, 1 pcs.	A0640



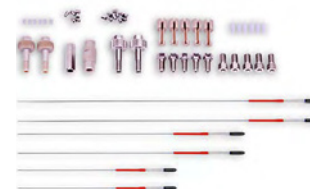
## Capillaries, AZURA® Analytical K-Connect, stainless steel, 1/32" with fitting sleeve for 1/16" connections

Material	Color code	ID [mm]	length [mm]	Included in Capillary Kit	Article no.
Stainless steel	red	0.10	150	-	AZF41
Stainless steel	red	0.10	300	1 x in AZF40	AZF42
Stainless steel	red	0.10	400	2 x in AZF40, 1 x in AZF80	AZF43
Stainless steel	red	0.10	700	2 x in AZF40, 1 x in AZF80	AZF44
Stainless steel	red	0.10	900	1 x in AZF40	AZF45
Stainless steel	yellow	0.18	150	-	AZF51
Stainless steel	yellow	0.18	300	1 x in AZF50, 1 x in AZF80	AZF52
Stainless steel	yellow	0.18	400	2 x in AZF50, 1 x in AZF80	AZF53
Stainless steel	yellow	0.18	700	2 x in AZF50, 1 x in AZF80	AZF54
Stainless steel	yellow	0.18	900	1 x in AZF50, 1 x in AZF80	AZF55
Stainless steel	black	0.45	150	-	AZF61
Stainless steel	black	0.45	300	1 x in AZF60	AZF62
Stainless steel	black	0.45	400	2 x in AZF60	AZF63
Stainless steel	black	0.45	700	2 x in AZF60	AZF64
Stainless steel	black	0.45	900	1 x in AZF60	AZF65



## AZURA® Analytical K-Connect start-up kits, stainless steel, 1/32" capillaries with fitting sleeves for 1/16" connections

Set of precut capillaries 0.1 mm, fittings, connectors and adapters, red	AZF40
Set of precut capillaries 0.18 mm ID, fittings, connectors and adapters, yellow	AZF50
Set of precut capillaries 0.45 mm, fittings, connectors and adapters, black	AZF60
Set of precut capillaries 0.1 and 0.18 mm ID, fittings, connectors and adapters, red/yellow	AZF80



## AZURA® Capillary start-up kit, SST

All kits contain a special amount of capillaries, fittings, ferrules, couplings, connectors and adapters.

AZURA® start-up kit 1/16" stainless steel, 0.25 mm ID precut capillaries	AZF70
AZURA® Start-Up Kit 1/4" HPG, stainless steel, set of capillaries and fittings	A9850-2
AZURA® Start-Up Kit 1/4" LPG, stainless steel, Set of capillaries and fittings	A9850-3
AZURA® start-up kit 1/16", stainless steel, semi-prep, capillary kit	A9849-1
AZURA® start-up kit 1/8" stainless steel, capillary kit	A9850
AZURA® start-up kit 1/16" stainless steel, capillary kit	A9849
Accessory kit for ScaleUp system, 1/16", stainless steel	A9850-1

## AZURA® Capillary start-up kits for special HPLC systems

Dedicated Start up kits for special HPLC systems include anything you need for system build-up.

AZURA® Start-up Kit PEEK, for Analytical HPLC System, up to 5 ml/min or 300 bar	A70501
AZURA® Capillary Start-up kit for educational system 1/16", stainless steel	A9849-2
AZURA® GPC Cleanup Start up kit, Tefzel-(ETFE) tubing, OD 1/16", ID 0.7 mm	A50041
Accessory kit for ScaleUp system, 1/16", stainless steel	A9850-1



## Tubing start-up kits for FPLC

AZURA® FPLC Start-up kit, PEEK, 1/16" for 10 ml/min FPLC systems	A70500
AZURA® FPLC Start-up kit, transparent FEP, 1/16" for FPLC systems up to 10 ml/min and 20 bar	A70500A
AZURA® FPLC Start-up kit, PEEK/Tefzel, 1/16" for 50 ml/min FPLC systems	A70600
AZURA® FPLC Start-up kit, FEP/PEEK, 1/8" for 100 ml/min - 500 ml/min FPLC systems	A70300
AZURA® FPLC Start-up kit, PEEK, 1/8" for 100 ml/min - 500 ml/min FPLC systems, up to 100 bar.	A70300A
AZURA® FPLC Start-up kit, PEEK/Tefzel, 1/16" for FPLC systems up to 100 ml/min	A70300B
AZURA® FPLC Start-up kit, 1/4" for 1000 ml/min FPLC systems	A70400



## Tubing 1/16", PEEK, by the meter

0.13 mm ID, variable length, max. pressure 420 bar, red striped	A2522
0.18 mm ID, variable length, max. pressure 400 bar, yellow striped	A2523
0.25 mm ID, variable length, max. pressure 385 bar, blue striped	A2524
0.50 mm ID, variable length, max. pressure 350 bar, orange striped	A2525
0.75 mm ID, variable length, max. pressure 240 bar, green striped	A2526
1.00 mm ID, variable length, max. pressure 165 bar, grey striped	A2527
1.40 mm ID, variable length, max. pressure 50 bar, black striped	A2528



## Tubing 1/8" OD, PEEK, by the meter

1.59 mm ID, variable length, max. pressure 220 bar, natural	A2540
0.75 mm ID, variable length, max. pressure 345 bar, natural	A2541
2 mm ID, variable length, max. pressure 165 bar, natural	A2542

## Tubing 1/16" OD, Tefzel™, by the meter

0.25 - 0.3 mm ID, variable length, max. pressure 185 bar	A0182-1
0.7 mm ID, variable length, max. pressure 115 bar	A0183-1
1.0 mm ID, variable length, max. pressure 85 bar	A04781-1



## Tubing 1/8" OD, Tefzel™, by the meter

Tubing 1/8" OD, ETFE, by the metre	A0478-1
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## Tubing, various OD, FEP, fixed length

2.1 mm ID, 300 cm length, FEP tubing, 1/8" OD	A9869
0.81 mm ID, 300 cm length, FEP tubing, 1/16" OD	A9869-1

### Tubing, various OD, PFA, by the meter

3.96 mm ID, variable length, PFA tubing 1/4" OD, by the meter	A31891
1.6 mm ID, variable length, PFA tubing 1/8" OD, by the meter	A31892

### Tubing, various OD, PTFE, by the meter

0.9 mm ID, variable length, 1.6 mm OD	A04782-1
1.45 mm ID, variable length, max. pressure < 10 bar, 2 mm OD	A0153-1
1.5 mm ID, variable length, max. pressure 35 bar, 3.2 mm OD	A0732-1
7 mm ID, variable length, 9 mm OD	A1099-1
4.4 mm ID, variable length, 1/4" OD, black, antistatic	A3307
1.6 mm ID, variable length, 1/8" OD, black, antistatic	A3306
2 mm ID, variable length, 1/8" OD	A0873-1
0.45 mm ID, variable length, max. pressure 150 bar, 1.6 mm OD	A0152-1
3 mm ID, variable length, max. pressure 20 bar, 4 mm OD	A0154-1

### Inline filters, SST, for HPLC

Inline Filter (prep.) 5-10 µm, stainless steel, max. flow rate 1000 ml/min (for 1/8" tubing)	A3381
Replacement frit for A3381 5-10 µm, stainless steel, max. flow rate 1000 ml/min	A33811
Inline Filter, PEEK body, Stainless steel frit, 1/16", to protect your column, with 2 µm pore size, 3 pcs., easily connected directly to any column	A00161
UHPLC/HPLC precolumn filter, universal, 0.5 µm titanium frit, set of 5, stainless steel body, up to 1034 bar	B2
Frit 0.5 µm, 0.2 µl for Inline Filter, stainless steel with 0.25 mm bore up to 1375 bar, 5 pcs.	A00164-1
Inline Filter, stainless steel, frit 0.5 µm, 0.2 µl, for 1/16" capillaries, 0.25 mm bore, up to 1375 bar	A00164



A3381



B2

### Inline filters, biocompatible, for FPLC

Inline Filter, PEEK/Titanium, 1/16", biocompatible, to protect your column, with 2 µm pore size titanium frit	A3378
Inline Filter, PEEK/Titanium, 1/16", biocompatible, to protect your column, with 10 µm pore size titanium frit	A3379
Replacement Frits 2 µm for Inline Filter, PEEK/Titanium, biocompatible	A3378-1
Replacement Frits 10 µm for Inline Filter, PEEK/Titanium, biocompatible	A3379-1
Inline Filter, PEEK body, Titanium frit, 1/16", to protect your column, with 0.5 µm pore size, 3 pcs., easily connected directly to any column	A00162
Inline Filter, PEEK body, Titanium frit, 1/16", to protect your column, with 2 µm pore size, 3 pcs., easily connected directly to any column	A00163



A3378  
A3379

### Shut-off valves

Shut-off valve, PEEK, 1/16", including connectors (1/4-28 flat bottom)	A5811
Shut-off valve, PEEK, 1/8", including connectors (1/4-28 flat bottom)	A5812



A5811

## Safety cap sets for analytical systems

All sets include 1 l eluent bottles and Vici eluent caps with safety air inlet filter, 1 waste can and cap with safety exhaust filter and adapter to connect the AS 6.1L waste tubing, 250 ml bottle for piston backflushing

## Safety caps sets for AZURA analytical systems

for isocratic systems, incl. filters, bottles and fittings	A59257
for LPG systems, incl. filters, bottles and fittings	A59257-1
for HPG systems, incl. filters, bottles and fittings	A59257-2
Eluent waste kit for all AZURA® Analytical systems , incl. filter, waste can and cap	A59258



## Safety caps

VICI Cap, GL45 Thread, 3 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59231
VICI Safety Cap with stopcocks, GL45 Thread, 3 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59234
VICI Safety Cap with stopcocks, GL45 Thread, 4 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59235
VICI Waste Cap, GL45 Thread, 3 ports 1/4"-28 connection, 1 x 10M x 1 for barbed hose adapter, including O-ring EPDM, nuts and ferrules	A59236
VICI Cap, GL45 Thread, 2 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59232
VICI Cap, GL45 Thread, 2 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59230
VICI Safety Cap with stopcocks, GL45 Thread, 2 ports, 1/4"-28 connection, including O-ring EPDM, nuts and ferrules	A59233



## Safety caps accessories

VICI 1/4-28 flangeless nuts, PPS, for 1/16" tubing, for VICI caps, 10 pcs.	A59245
VICI plugs, PEEK, 1/4"-28, 1 pcs., for closing unused ports for VICI caps	A59249
VICI Barbed hose adapter for 1/8" tubing, for VICI caps	A59251
VICI Barbed hose adapter for 8 mm ID tubing, for VICI caps	A59254
VICI Safety Air Inlet Valve with 15 mm filter, fit any VICI cap or VICI safety cap	A59241
VICI Safety Exhaust Filter with detector, filled with absorbent, fit any VICI cap or VICI safety cap	A59243
VICI Safety Air Inlet Valve with 4 mm filter, fit any VICI cap or VICI safety cap	A59240
VICI Safety Exhaust Filter filled with absorbent, fit any VICI cap or VICI safety cap	A59242
O-ring FEP coated for sealing all VICI caps or VICI safety caps, improved chemical resistance	A59244
VICI Safety Exhaust Filter for basic solutions in IC, fit any VICI cap or VICI safety cap	A59255
VICI 1/4-28 flangeless nuts, PPS, for 1/8" tubing, for VICI caps, 10 pcs.	A59246
VICI inverted ferrules, ETFE, for 1/16" tubing, suitable for A59245, for VICI caps, 10 pcs.	A59247
VICI inverted ferrules, ETFE, for 1/8" tubing, suitable for A59246, for VICI caps, 10 pcs.	A59248
Cellulose filter, 0.2 µm, 4 mm diameter for VICI Safety Air Inlet Valve, fit any VICI cap or VICI safety cap	A59252
Cellulose filter, 0.2 µm, 15 mm diameter for VICI Safety Air Inlet Valve, fit any VICI cap or VICI safety cap	A59253
AZURA® Tubing kit with cap and solvent filter (A3375, stainless steel, 10 µm), suitable for all analytical HPLC systems	A9650



## Lab equipment

### Wrenches & tightening tools

Torque wrench basic tool, 1-25 Nm, without plug-in head	X0219
Open-jaw plug-in head for Torque wrench X0219, 1-17 mm (for 100 - 1000 ml pump head in-/outlet and LPGblock)	X0220
Open-jaw plug-in head for Torque wrench X0219, 1-10 mm (for Smartline I pump heads)	X0221
Open-jaw plug-in head for Torque wrench X0219, 1-13 mm (for 10 - 50 ml Smartline II/AZURA® pump heads in-/outlet)	X0222
Double open-end wrench, 1/4" and 5/16"	X0003
Double open-end wrench, 8/10 mm	X0030
Double open-end wrenches, 2 pc., 1/4" and 5/16"	A0138
Tightening tools for PEEK fittings, blue, 1/16" fittings 1/4" hex head nut (10-32 threads)	A25030
Tightening tools for PEEK fittings, green, 1/32" fittings 3/16 hex head nut (6-40 threads)	A25031



X0219



X0030



A0138



A25030

### Capillary and tube cutter

Tube cutter, suitable for all tubes	A0569
Capillary cutter for PEEK capillaries and tubings with OD up to 4 mm	A0851
Metal capillary cutting pliers for 1/16" capillaries	A0809
Metal capillary cutter for 1/8" capillaries	A9865



A0569



A0809

### Capillary graters and benders

Capillary grater for degrading of 1/16" stainless steel capillaries, can also be used to remove column filters	A0137
Capillary grater for degrading of 1/8" stainless steel capillaries	A9864
Tube bender for 1/8" and 3/16" tubings with an bend radius of 90°	A9870



A9870

### Tool sets for AZURA® systems

Tool Kit AZURA® for systems with PEEK or pre-cut capillary kits	A1033
Tool Kit AZURA® for 1/16" systems (stainless steel)	A1033-1
Tool Kit AZURA® for 1/8" systems (stainless steel)	A1033-2



A1033  
A1033-1  
A1033-2

### Tool sets for AZURA® pump heads

Tool Kit for 10 ml pump head	A9670
Tool Kit for 50 ml pump head	A9671
Tool Kit for 100 ml pump head	A9672
Tool Kit for 250 ml pump head	A9673
Tool Kit for 500 ml pump head	A9674
Tool Kit for 1000 ml pump head	A9675

## LC racks

Benchtop rack: AZURA® S 300 x 160 x 210 mm (WHD)	A70016
Benchtop rack: AZURA® L low 480 x 190 x 420 mm (WHD)	A70010
Benchtop rack: AZURA® L high 480 x 430 x 420 mm (WHD)	A70011
Benchtop rack: special manufacture with customized dimensions	A70015
Product Riser AZURA®: Set of 4 feet that lift the device to a height of 28 mm for easy handling of the waste tube of the drainage system	A9860



A70011



A9860

## AZURA® mounting brackets

Mounting bracket AZURA® L for KNAUER manual injection valves	A9853
Mounting bracket AZURA® L for Vici valve drives	A9853-2
Mounting bracket AZURA® L for columns with 25 - 29 mm AD	A9853-3
Mounting bracket AZURA® L for KNAUER flow cells	A9853-5
Mounting bracket AZURA® L for prep sample loop	A9853-6
Mounting bracket AZURA® L for Hypershear mixing chambers	A9853-8
Mounting bracket AZURA® L Bio for manual KNAUER injection valve, pH-flowcell and 2 prepacked columns	A9854-1
Mounting bracket AZURA® S for manual KNAUER injection valve	A9854-2
Mounting bracket AZURA® L for AZURA® Valve Unifier VU 4.1(both-sided) or AZURA® UVD 2.1S and AZURA® CM 2.1S (left-sided on AZURA® L)	A9854-3



A9853



A9847



A3983

## LC column holder/multi column base

Column holder: Magnetic clip, for all columns with 1/4" OD, for all KNAUER columns with 3, 4 and 4.6 mm ID, compatible with all AZURA® devices	A9847
Prism column holder for horizontal storage of HPLC columns on the lab bench, the most price attractive alternative to store your HPLC columns	A3983
Glass column holder, Stand, plate and 2 clamps, can hold one glass column in the dimensions of 10-40 mm ID	A1319
Multi Column Base Bio 60 x 40 x 130cm (w x d x h) for up to 3 MPLC columns with conn. for cooling device	A70190
Multi Column Base serves as a holder for up to 3 columns with inner diameter up to 50 mm, especially made for preparative column solutions	A0070A



A1319



A0070A



A4364

## Accessories for LC column holder

3-finger clamps, long shaft, finger with silicone coating, clamp width 12-100 one piece	A4364
3-finger clamps, short shaft, finger with silicone coating, clamp width 12-100, one piece	A4364-1
Clamp for Multi Column Base, short shaft, to fix an HPLC column or other accessories to the Multi Column Base	A4368
Clamp for Multi Column Base, long shaft, to fix an HPLC column or other accessories to the Multi Column Base	A2820
Bosshead squared for Multi Column Base, used in combination with clamps with a long shaft	A2820A



A4368



A2820

## Installation accessories

HPLC Standard accessory kit	A1071
Installation Box Kit, Box for small parts, KNAUER file folder and support sticker	A9862



A9862



## Standards for Performance Verification (PV) of HPLC systems

A PV procedure is recommended for testing newly installed AZURA® HPLC systems as well as for regular monitoring of system performance.

This table gives an overview of the needed PV document, PV Standard and HPLC column for a specific AZURA system.



Backpressure range	Type of detection	Flow cell path length [mm]	Injection: Sympole loop volume [µl]	PV document	Article no. of PV standard	Article no. of HPLC column
UHPLC systems (max. 1000 bar)	UV, DAD	10	1 - 20	VPV-001: Analytical HPLC, UV detection	A01260-3	10BE181E2F
	UV, DAD	10	21 - 100	VPV-001: Analytical HPLC, UV detection	A01260-2	10BE181E2F
	UV, DAD	50	1 - 20	VPV-001: Analytical HPLC, UV detection	A01260-2	10BE181E2F
	UV, DAD	50	21 - 100	VPV-001: Analytical HPLC, UV detection	A01260-1	10BE181E2F
	FLD	all	1 - 20	VPV-004: Analytical HPLC, FL detection	A01262-2	10BE181E2F
	FLD	all	21 - 100	VPV-004: Analytical HPLC, FL detection	A01262-3	10BE181E2F
HPLC Plus systems (max. 862 bar)	UV, DAD	10	1 - 20	VPV-001: Analytical HPLC, UV detection	A01260-4	15WE181E2J
	UV, DAD	10	21 - 100	VPV-001: Analytical HPLC, UV detection	A01260-3	15WE181E2J
	UV, DAD	50	1 - 20	VPV-001: Analytical HPLC, UV detection	A01260-3	15WE181E2J
	UV, DAD	50	21 - 100	VPV-001: Analytical HPLC, UV detection	A01260-2	15WE181E2J
	FLD	all	1 - 20	VPV-004: Analytical HPLC, FL detection	A01262-1	15WE181E2J
	FLD	all	21 - 100	VPV-004: Analytical HPLC, FL detection	A01262-2	15WE181E2J
HPLC & UHPLC systems	RID	all	all	VPV-002: Analytical HPLC, RI detection	A01261-1	05WE184E2J
Preparative HPLC systems	UV, DAD	< 2	all	VPV-007: Preparative HPLC, UV detection	A01264-1	05JE181E2J
	UV, DAD	> 2	all	VPV-007: Preparative HPLC, UV detection	A01264-2	05JE181E2J
	RID	all	all	VPV-008: Preparative HPLC, RI detection	A01265-1	05IE184E2J

# Mobile Control (Chrom) for Windows 10

With the hand-held Mobile Control and Mobile Control Chrom software you have your AZURA devices and systems at your fingertips. Remotely control and monitor your devices and enjoy the touchscreen-optimized user interface. Choose Mobile Control as an easy-to-use and cost-effective device control solution!

**Mobile Control** provides full access to AZURA devices. Change device settings, set operating parameters, automate device control or check the system status... Mobile Control features all functionalities of a device display.

Do you want to acquire data without the overhead of an advanced chromatographic data system? **Mobile Control Chrom** features data acquisition from AZURA detectors in addition to full device control.

## Why to use Mobile Control (Chrom) software

**Only pay for what you use:** Mobile Control features basic functions to operate AZURA devices and systems. Mobile Control can operate dedicated applications which do not require a highly developed and cost-intensive Chromatographic Data System (CDS).

**Save space:** Mobile Control runs on a tablet. Especially in labs with little space avoiding a desktop PC with keyboard and monitor can be a decisive factor. The touch-optimized user interface allows device control using just your fingers.

**Save time:** Mobile Control convinces due to an intuitive user interface and a clearly structured menu function. The training period is minimal in comparison to a complex CDS.

**Free updates:** With every release new features are available in Mobile Control. You can download the current version for free.

**Free trial:** To evaluate if Mobile Control holds up to your expectations, you can download the software and test the free trial option. Perfect for those who'd like to try before they buy.


**Customized software design:** Mobile Control is made by KNAUER and can be adapted to the requirements of our OEM partners.




## Specifications

### Software

<b>Software name</b>	<b>Mobile Control</b> - display software for AZURA devices without data acquisition <b>Mobile Control Chrom</b> - display software for AZURA devices with data acquisition
<b>Operating system</b>	Windows 10
<b>Field of application</b>	Display software, device control, basic LC system operation
<b>Supported instruments</b>	most AZURA® devices

 This software supports a wide range of instruments:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)

 For PC hardware & periphery see p. 67

### Expandability

<b>Stand-alone</b>	yes
<b>Multi-user environment</b>	yes
<b>Report functions</b>	yes



Free demo version:  
[www.knauer.net/mobilecontrol](http://www.knauer.net/mobilecontrol)

### Ordering details:

#### Software

A9607	Mobile Control without data acquisition including tablet and mount
A9608	Mobile Control Chrom with data acquisition including tablet and mount
A9610	Mobile Control without data acquisition
A9612	Mobile Control Chrom with data acquisition
A9613	Mobile Control Chrom with data acquisition and column test option
A9614	Upgrading Mobile Control to Mobile Control Chrom gaining data acquisition

#### Accessories

A96181	USB-LAN ADAPTER Network adapter USB 2.0 <-> 10/100 Ethernet for tablets
A64809	WiFi router, 8x LAN GBit RJ-45 ports, 1x WAN GBit RJ-45 port
A64809INT	WiFi router, 8x LAN GBit RJ-45 ports, 1x WAN GBit RJ-45 port, power plug UK, US or AUS
A64811	Single device WLAN router for Mobile Control - 1x RJ45, 10/100 MBit; WLAN
A9615	Tablet lock with stand for all tablets
A9616	Tablet lock for all tablets
A9617	Mobile Control Mount - flexible tablet mount for tablets

## ClarityChrom®

KNAUER ClarityChrom® is a powerful, yet easy-to-use chromatography software (or chromatography data system, CDS) for instrument control, data acquisition and data processing. ClarityChrom is designed for smaller laboratories. It is an economical solution compared to other more complex chromatography software while still offering FDA 21 CFR Part 11 compliance.

ClarityChrom comes as a complete package with LC control and including autosampler control. It is scalable from 1 up to 4 systems; depending on the desired instruments. The built-in fractionation option as well as the optional extensions as SST for automated system tests, PDA for 3D (UV spectra) data handling, GPC analysis, MS and GC control cover a wide range of the requirements for a CDS on a modern lab. KNAUER additionally offers more advanced fractionation with the KNAUER FRC control module.

ClarityChrom supports all KNAUER devices that can be controlled by software. Please refer to the instrument support list in the Support section of our website, the download link can be found below. Beside this, devices and systems from more than 45 manufacturers can be controlled. Additionally, data acquisition can also be performed with any detector providing a voltage output by simply connecting a KNAUER IFU 2.1 interface box or any other supported A/D converter.

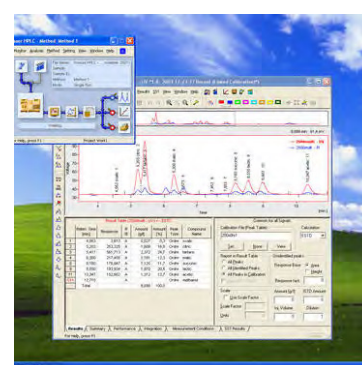
The system suitability (SST) extension automates the calculation of system suitability parameters for system validation and calculates up to 12 parameters and compares the results with the limits the user has set.

The PDA extension allows to acquire and process 3D data from a photo diode array detector (KNAUER PDA detectors are fully supported). The PDA extension provides peak purity analysis and peak identification by spectral library search in self-made or commercial spectra libraries.

The SEC/GPC extension provides interactive and automated gel permeation chromatography analysis, including re-calibration and GPC reporting, as well as simplifies the retrieval of GPC data. The GPC extension allows flow rate and multi-detector delay corrections and includes Narrow, Broad and Broad on Narrow calibrations.

ClarityChrom comes with some basic fractionation functionality. The KNAUER-exclusive Knauser FRC control module for ClarityChrom adds more drivers of several fraction collectors and supports the peak recognition by level and/or slope as well as fractionation by time. Also more advanced functionality as solvent recycling, manual fractionation and rack view with detailed fraction information and chromatogram links are available. The functionality corresponds exactly to the KNAUER preparative functionality of discontinued ClarityChromPrep.

ClarityChrom offers all the necessary operations for an analytical lab. Moreover, the preparative version adds fractionation options to this feature list and allows more flexibility in the lab. ClarityChrom is the best solution for all laboratories searching for an up-to-date and robust software with support of devices from many manufacturers to be flexible in instrumentation but also meet the requirements for modern laboratories.



This software supports a wide range of instruments:  
[www.knauer.net/en/supp\\_cc](http://www.knauer.net/en/supp_cc)



For PC hardware & periphery see p. 67

### Specifications

#### Software

<b>Software name</b>	ClarityChrom
<b>Extensions / Licenses</b>	PDA / 3D UV, System suitability, Fraction collection, SEC/GPC, Mass spectrometry
<b>System architecture</b>	32-bit CDS
<b>Operating system</b>	Windows 10, Windows 8.1, Windows 7, all 32- and 64-bit

#### Expandability

<b>Stand-alone</b>	Workstation version, max. 4 systems controlled by one computer, max. 3 LC systems, max. 2 systems with PDA or 1 system with MS or special devices per computer
<b>Client/server</b>	No Client/Server functionality
<b>Multi-user environment</b>	Selectable system of user accounts with independently customizable behavior and appearance for individual users
<b>Network environment</b>	Easy offline data sharing (at the file level) among all stations in a local network
<b>Fields of application</b>	Analytical and preparative HPLC, GPC/SEC, GC, MS
<b>Supported instruments</b>	All Knauer devices are supported, driver for devices from many other manufacturers are available
<b>Instrument connection</b>	Supports RS-232, Ethernet, PCI interface card, A/D-D/A interface
<b>Recommended PC hardware</b>	Pentium 2 GHz, 4 GB RAM, 80 GB free hard disk space, separate graphics card if one PC should control more than one system, USB for dongle, connectors as LAN, RS-232 etc. for device control
<b>Graphics capabilities</b>	Multiple chromatogram view and overlay, PDA view

## Expandability

<b>Integration</b>	27 integration parameters (peak width, threshold, tangent slope ratio etc.) integration parameters programmable in time, automatic re-integration
<b>Calculation types</b>	with/without calibration (int./ext. standard method)
<b>Security and GLP</b>	Installation qualification test of the software; FDA 21 CFR Part 11 conformance, validation with virtual detector
<b>Instrument control</b>	method-based instrument control, Instrument status display and Direct-Control mode,
<b>Calibration</b>	6 types of calibration curves, up to 20 levels, reference peaks, groups, unlimited number of standards (peaks), LOD, LOQ
<b>Chromatogram operations</b>	Overlay view, custom labels and settings, also applying mathematical operations to chromatograms
<b>Automation</b>	Sequences, automatic launch of selected commands or applications immediately following chromatogram acquisition - Post run, Batch
<b>Presentation of results</b>	Integrated customizable table of results, columns with userdefined calculation, summary table, and export in text or database format
<b>Calculations</b>	Custom: 12 predefined mathematical operators, 15 basic and 4 summary functions, special: Kovats indexes for GC, determination of noise/drift, performance calculations
<b>Data import and export</b>	ASCII, AIA, dBase

## Additional options/extensions

<b>MS option</b>	separate license option; control and data acquisition from supported QUAD-MS
<b>FRC option</b>	separate license option; Control of fraction collectors and KNAUER valve drives as fraction collector, fractionation per time/Level/Slope, rack info with filling level and chromatogram link
<b>PDA option</b>	separate license option; 3D chromatogram, peak purity analysis, spectrum search in self-made or commercial spectra library
<b>GPC/SEC option</b>	separate license option; molecular weight determination in size exclusion chromatography with various calibration methods
<b>System suitability test</b>	separate license option; automates the calculation of system suitability parameters for system validation
<b>Note</b>	Autosampler control included beside Educational license

## Ordering details:

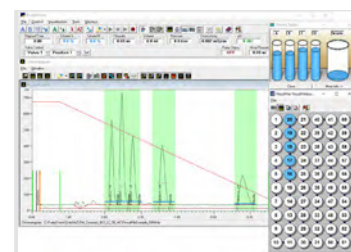
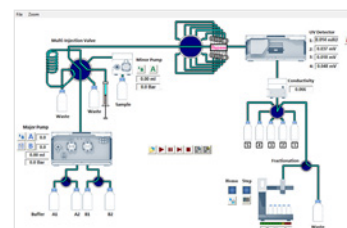
A1670	ClarityChrom® single instrument license for one time base
A1674	ClarityChrom® offline license for data evaluation
A1671	ClarityChrom® additional instrument license on additional time base
A1676	ClarityChrom® option for PDA data processing
A1677	ClarityChrom® system suitability option
A1678	ClarityChrom® option for GPC data processing
A1679	ClarityChrom® option for MS data processing
A1682	ClarityChrom® KNAUER FRC control module for preparative HPLC
A1681	Upgrade for one system from former version to ClarityChrom®
A1687	Upgrade for former ClarityChrom® Prep to latest ClarityChrom® with KNAUER FRC control module
A1690	30-day trial version of ClarityChrom
A1675	ClarityChrom® university package one offline license

# PurityChrom®

PurityChrom is a volume-based chromatography software especially designed for the area of bio purification and FPLC applications. PurityChrom provides a very user friendly and clearly structured interface. The system visualisation offers a graphical representation and easy handling of the complex flow processes. Furthermore each device which is displayed in the fluidic scheme can be manually controlled giving the opportunity to optimize and change and adapt your conditions spontaneously during the run. PurityChrom includes intuitive data evaluation with peak recognition and integration. Due to a very high flexibility methods can be developed according to specific demands. You have the option to create a method based on volume, column volume or time. There is also a possibility to pause the method during the run due to the hold function providing you with complete control over your chromatography process. Solvent visualisation calculates the consumption of solvent for the current run and prevents your column from running dry whereas waste management prevents the loss of your sample. For fractionation you can use a fractionation valve as well as a fraction collector. Current guidelines and regulations like 21 CFR part 11 are entirely supported. PurityChrom allows flexible support of different devices from KNAUER and other manufactures.

In our new Version of PurityChrom you can define important functions in your method with Variable values. This allows you to write methods that can be adapted more flexibly to a specific sample or column, just before the run with only one click. In combination with the also newly implemented Sequence Table a quick and easy method scouting provides you with the best method for your purification problem in less time.

Furthermore we realized the fractionation using a minor pump and the display of lamp lifetime, to give you even more control over you purification System.



## Specifications

### Software

<b>Software name</b>	PurityChrom® 5
<b>Operating system</b>	Windows XP, Windows Vista, Windows 7, Windows 8, Windows 10

### Expandability

<b>Stand-alone</b>	Extension to unlimited number of devices and 8 data channels, autosampler supported
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**Fields of application** FPLC

**Recommended PC hardware**  
 CPU/Memory: Pentium III or higher with at least 1 MHz32 or 64 bit  
 At least 512 MB RAM (Windows XP) and 2 GB (Windows Vista and higher)  
 Graphics: Screen with minimal resolution 1024 x 768  
 Connectors and Slots: USB for license dongle/COM, USB or LAN according to connected instruments

**Integration** Real-time analysis of peaks, automatic or manual integration and baseline correction

**Security and GLP** FDA 21 CFR Part 11

**Chromatogram operations** overlay view

**Automation** Sequences

**Presentation of results** Individual report configuration

**Calculations** Column performance calculations according to DAB

**Data import and export** Comma Separated Value, AIA/ANDI, ChromStar Slice

**Special features** Method creation based on volume or column volume, Hold function, Functionalised visualisation, Direct Control during a run, Display of solvent supply, Waste management



This software supports a wide range of instruments:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For PC hardware & periphery  
 see p. 67

### Additional options/extensions

<b>FRC option</b>	Included
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## Ordering details:

### Device

A2650	Basic License for one system
A2652	Extends the Basic License to an unlimited number of controllable devices and 8 data channels, adds autosampler and stacked injections support
A2654	3D option for a diode-array detector (DAD)
A2656	PurityChrom® Maintenance and Support including free updates and 5 Hours Software support by KNAUER

## OpenLAB® CDS EZChrom Edition

OpenLAB CDS EZChrom Edition is the next generation of chromatography data systems and the successor of ChromGate CDS. 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. It provides support of devices from KNAUER and many other manufacturers.

The basic workstation license can only be installed on one PC and allows for control and data acquisition from one system. The license includes System Suitability, Fraction Collector Control and one year Software Maintenance Agreement (SMA).

The system suitability option allows for test if the system is suitable for particular analysis by testing several parameters as resolution, peak asymmetry and theoretical plates.

The KNAUER fraction collector control option includes the drivers of several fraction collectors and supports fractionation by time, the peak recognition by level and/or slope, also with spectral confirmation. Collet Slices allows for setting a desired volume for each fraction, within the defined fraction vial volume. In the fraction collector configuration the delay volume and the fraction vial volume can be defined. This ensures that the target substance will be collected in the fraction vial and the fraction vial will not overflow. The pump flow rate, which is required for calculation of delay and fraction vial fill level, will be automatically read from the pump's method setup. If a chromatogram of your separation already exists, the required fractionation commands can be derived directly from the chromatogram with a double mouse-click. The rack view gives an overview of the already collected fraction, their volume and retention time. The manual fraction control and the option to use the KNAUER electric valves for fractionation gives you more flexibility. The combination of virtual detector and virtual fraction collector allows for optimizing the fractionation settings from an existing chromatogram of your separations without any physically existing device and, therefore, without the loss of solvent or target substance.

OpenLAB EZChrom Edition and EZChrom Elite are registered trademarks of Agilent Technologies, Inc.



This software supports a wide range of instruments:

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



For PC hardware & periphery see p. 67

### Specifications

#### Software

<b>Software name</b>	OpenLAB CDS EZChrom Edition
<b>Extensions / Licenses</b>	Fraction collection, System suitability, PDA / 3D UV
<b>System architecture</b>	32-bit CDS
<b>Operating system</b>	Depends on CDS version. Latest version, supported by KNAUER drivers, is A.04.08. It runs on Windows Prof/Enterprise 10 64-bit and Windows 7 Prof. 32- and 64-bit.

#### Additional options/extensions

<b>FRC option</b>	always included, for preparative HPLC, adds tools for detector controlled fraction collection, solvent and peak recycling, stacked injection, rack view with information about RT and volume
<b>FRC features</b>	fractionation can be controlled by time (volume), level, slope including AND/OR combination of these criteria, spectra comparison, local maximum and local minimum, slices, full manual control of fractionation during a run
<b>PDA option</b>	3D chromatogram, peak purity analysis, spectrum search in self-made or commercial spectra library (must be converted in OpenLAB spectral library format), separate license option
<b>GPC/SEC option</b>	license is discontinued
<b>System suitability test</b>	license always included, automates the calculation of system suitability parameters for system validation

#### Ordering details:

A2600-1	OpenLAB® CDS EZChrom Edition workstation for one system with SMA and 4x System Suitability
A2610-1	OpenLAB® CDS EZChrom Edition 3D option for UV detectors MW-1, 2550 and 2600
A2611-1	OpenLAB® CDS EZChrom Edition 3D UV Option for DAD DAD6.1L, DAD2.1L, PDA-1, S2850
A2618-01	OpenLAB® CDS EZChrom Edition drivers for 80LT, 85LT, 90LT, 100LT and LC from Sedere
A2602-1	OpenLAB® CDS EZChrom Edition Instrument Control License
A2614-1	OpenLAB® CDS EZChrom Edition for distributed systems - please ask for desired configuration

# Chromeleon™ 7.2 Drivers

Thermo Scientific™ Dionex™ Chromeleon™ is one of the most wide-spread chromatography data systems. Its intuitive handling benefits laboratory workflow and the highly developed algorithms simplify data processing. It offers a broad range of third-party drivers and can be easily used with existing HPLC systems. KNAUER offers drivers for a lot of its devices.



**Disclaimer: KNAUER Wissenschaftliche Geräte GmbH is solely responsible for development, testing and support of Thermo Scientific™ Dionex™ Chromeleon™ Chromatography Data System driver software for KNAUER instruments and therefore solely liable for damages associated with the use of this driver software.**

## Drivers for Chromeleon™



### Specifications

#### Computer requirements

<b>Operating system</b>	Windows 8.1 Professional, 64-bit; Windows 7 SP1 Professional, Enterprise, 64-bit, (32-bit version is not recommended); Windows Vista SP2 Business, Ultimate, 32-bit (Vista is not recommended)
<b>CPU (recommended)</b>	3 GHz Intel Core i7 or better
<b>Memory RAM (recommended)</b>	8 GB
<b>Free Hard Disk Space</b>	120 GB available, for system with PDA detectors
<b>Optical Drive</b>	DVD
<b>Display (recommended)</b>	1280 x 1024, 32-bit color
<b>USB Ports</b>	1 port for USB license key
<b>Ethernet Port</b>	1 port for router (for system connection)



This software supports a wide range of instruments:  
[www.knauer.net/softwarecontrol](http://www.knauer.net/softwarecontrol)



For PC hardware & periphery  
see p. 67

### Ordering details:

#### Drivers

A1783-4	Sedex Driver for Chromeleon 7.2; For Sedex 85LT / 90LT; Instrument Controller Class 3 necessary
A1783-5	Sedex Driver for Chromeleon 7.2; For Sedex FP / LC / 100LT; Instrument Controller Class 3 necessary
A1783-3	Shimadzu LC Driver for Chromeleon 7.2 Shimadzu CBM-20A required
A1783-2	Thermo Scientific™ Dionex™ Chromeleon™ Driver CD (AZURA® only)

#### Enterprise

A1791-1	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Enterprise. Complete Software Package incl. Secure Client Lizenz: Data Client, Instrument Operation, Report Designer Pro, Compliance Tools
A1792-1	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Enterprise license - enables full control of one 3rd Party LC Instrument, includes Instrument Controller, Spectral, Fraction Collection and one Class 3 license

#### Workgroup

A1780-2	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Bundle Workstation Open. Complete Software Package incl. License Dongle
A1782-2	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Instrument Controller Option - Instrument Class 3. Max 2 LC per workstation
A1787-2	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Instrument Controller Option - MS License
A1784-2	Thermo Scientific™ Dionex™ Chromeleon™ 7.2 Instrument Controller Option - PDA License

# PC Hardware & Periphery

## Desktop PCs

Desktop PC (SFF) for OpenLAB® and Chromeleon™ with 24" monitor, English edition Windows 10 Prof. 64-bit English, Intel® Core™ i7, 8 GB RAM, 256 GB SSD, two network cards	A13121
Desktop PC (SFF) for OpenLAB® and Chromeleon™ with 24" monitor, German edition Windows 10 Prof. 64-bit German, Intel® Core™ i7, 8 GB RAM, 256 GB SSD, two network cards	A13111
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	A13120
Desktop PC (SFF) for PurityChrom® and ClarityChrom® with 24" monitor, German edition Windows 10 Prof. 64-bit German, Intel® Core™ i5, 8 GB RAM, 256 GB SSD, two network cards	A13110
Laptop for OpenLAB®, Windows 10 Prof. German, Intel® Core™ i5, 8 GB RAM, 500 GB HDD, german edition	A13113
Laptop for PurityChrom® and ClarityChrom®, Windows 10, min. Intel® Core™ i3, 8 GB RAM, 256 GB SSD, German edition	A13112
Microsoft Surface Pro for PurityChrom®, Windows 10, Core m3, 4GB RAM, 128 GB SSD, german edition with keyboard, Surface Pen and docking station	A13114



## Configuration on request

Tell us your requirements and we will figure out the matching CDS workstation. We offer the complete CDS installation and promise you a smooth operation.	A13130
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## Network devices

WiFi router, 8x LAN GBit RJ-45 ports, 1x WAN GBit RJ-45 port	A64809
WiFi router, 8x LAN GBit RJ-45 ports, 1x WAN GBit RJ-45 port, power plug UK, US or AUS	A64809INT
8-port LAN GBit Switch NetGear GS108GE, 8x RJ-45, GBit, Auto MDI-X	A3119
8-port LAN GBit switch NetGear GS108GE, 8x RJ-45, GBit, Auto MDI-X, power plug UK, US or AUS	A3119INT
5-port LAN Fast Ethernet Switch NetGear FS105, 5x RJ-45 10/100 MBit	A3126
5-port Fast Ethernet switch NetGear FS105 5x RJ-45, 100 MBit, power plug UK, US or AUS	A3126INT
16-port LAN Fast Ethernet switch NetGear FS116 16x RJ-45, 10/100 MBit, Auto MDI-X, power plug UK, US or AUS	A3129



A64809

## IT accessories

VSCOM USB 4 COM 4 x RS-232 DE9 on USB	A3114
AZURA® Interface Box IFU 2.1 LAN, A/D converter, 4 channels	AZB00XA
RS-232 f/f cable 9-pol nullmodem	A0895
RS-232 m/f cable 9-pol	A0884
APC Smart UPS 1500 VA, uninterruptible power supply for up to 8 devices	A3121



AZB00XA

## Power cables

Power cable for Europe, 2 m, with rubber connector type C13, 230 V	M1642
Power cable for Switzerland, 2 m, with rubber connector type C13, 230 V	M1597
Power cable for UK, 2.5 m, with rubber connector type C13, 230 V	M1278
Power cable for USA, 2 m, with rubber connector type C13, 115 V	M1651
Power cable, 1.5 m, with rubber connector for UPS APC Smart connector	M2561
Power Supply: Distribution Box 24 V for 6 devices like air sensor, external pressure sensor, IFU 2.1 LAN	AZS80SA
EU power cable with 4 cold-device plugs and cover caps	A12345



AZS80SA



# KNAUER Services

## Application Services

With profound application knowledge of analytical and preparative HPLC and FLPC, our team is at your service around the world.

Our experts are pleased to receive your inquiries and requests and will offer attractive customized solutions.



## HPLC method development

### Qualify, quantify or purify

Do you plan to separate substances by HPLC in order to qualify, quantify or even purify without spending too much time in developing a suitable method? We offer an application and method development service and supports you to select a suitable system for your lab.

According to your specifications we prepare an efficient HPLC or FPLC method including advice for an appropriate sample preparation.

## HPLC method transfer & optimization

### For optimized quality and speed

Do you intend to perform your analyses faster, more efficient and cost effective? We are happy to support you with its profound expertise and experience in liquid chromatography. The team assists in transferring LC applications and methods.

#### 1. Method transfer

We investigate the transfer of your method to one of our HPLC systems. Especially complex separations can cause trouble when transferring them to a different system.

We ensure continuous and consistent quality after the transfer.

#### 2. Method optimization

Using ultra-pure solvents in HPLC can increase the expenses of an analysis substantially. A shift from classic HPLC columns to smaller inner diameters and smaller particle size could cut costs enormously since considerably less solvent is required. We optimize and transfer your LC analyses in order to obtain identical, or even better and faster results, reduce eluent consumption and operating costs.

## Rent-an-expert

### Get professional assistance in your lab

Some of the numerous chromatographic challenges are better solved in your own lab with your own HPLC equipment. Just order a specialist for your assistance in your lab.

In order to develop the best procedure for your HPLC/FPLC or even purification challenge, we will together compile a concept with you in advance.

## Chiral Column Screening Services

### Chiral column screening and/or method development and optimization

As most chiral separations are not predictable, KNAUER offers a screening service to find the best suiting Eurospher II Chiral column for your chiral separation task.


- Column screening with all available Eurospher II Chiral columns
- Optional: Method optimization
- Results will be reported completely and send as a report
- Method parameters and column specifications will be handed over directly

### Eurokat column screening for the analysis of carbohydrates

Not sure which column separates your saccharides best? We offer a screening service for Eurokat columns that are recommended for the separation of sugars and all types of carbohydrates.

- Column screening with all available Eurokat columns
- Optional: Method optimization
- Results will be reported completely and send as a report
- Method parameters and column specifications will be handed over directly



 **Note:** Details and requirements must be discussed previously with KNAUER's application specialists.

Find more information about chiral columns at: [www.knauer.net/chiralcscreening](http://www.knauer.net/chiralcscreening)

## KNAUER Academy

KNAUER has been successfully leading courses for many years for its customers, dealers and sales staff. Our main goal is to familiarize every participant with the latest chromatographic technologies in small groups with practical examples.

We offer HPLC courses for beginners and advanced users. In additional courses, participants can receive specialized knowledge, e.g. in UHPLC, FPLC or preparative HPLC. Take part in one of the regularly offered courses or book an individual training on special topics.

**Workshops at KNAUER in Berlin or on site** (see dates online: [www.knauer.net/academy](http://www.knauer.net/academy))

Ordering information upon request: Tel. +49 30 8097270, E-Mail [academy@knauer.net](mailto:academy@knauer.net)

### HPLC Workshops

HPLC Basics (1 day)	Practical work in small groups on compact HPLC systems from installation to system performance verification.
HPLC Troubleshooting (1 day)	Participants gain theoretical as well as practical knowledge in troubleshooting detectors, pumps, autosamplers and columns.
HPLC Method Development (1 day)	Learn HPLC method development from the beginning and become a HPLC method development pro with our training.

### FPLC Workshop

FPLC Basics & Troubleshooting (1 day)	Learn protein purification from the beginning and become a FPLC pro with our training.
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### Prep Workshops

Preparative HPLC Basics & Troubleshooting (1 day)	Learn preparative LC from the beginning and become a preparative LC pro with our training.
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### SMB Workshops

SMB Basics (1 day)	The participants will gain basic knowledge on SMB chromatography and be able to perform method development on their own.
SMB Method Development (2 days)	In this course, SMB method development is explained and practiced using a sample application.

### Software Workshops

ClarityChrom® Software (2 days)	Deepen your knowledge and improve your analyses through better software skills. The courses provide step by step explanation of the software and all components including advanced functions.
OpenLAB® EE Software (2 days)	
PurityChrom® Software (1 day)	

### Maintenance Trainings

Maintaining KNAUER instruments (individual duration)	Learn how to perform preventative maintenance on KNAUER equipment by yourself (at KNAUER in Berlin or on site).
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### Individual Workshops (individual duration, at KNAUER in Berlin or on site)

Academy Individual Workshop (individual duration)	Do you wish a different course date or a customized workshop for your department? We will gladly help to achieve your individual goals (at KNAUER in Berlin or on site).
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## Research

Scientific research generates new results and knowledge for industry and society. Currently, KNAUER is involved in different research projects. Obviously, we mostly focus on activities where we can efficiently contribute with our expertise in HPLC technology.

With our research commitments, we intend to generate new knowledge in the field of chromatography as well as learn even more about our own products.

Are you looking for a competent partner in scientific research projects? Do not hesitate to contact us:

[academy@knauer.net](mailto:academy@knauer.net)

## Compliance

### Qualification



**Note:** Standard procedure for IQ and OQ can be handled differently in individual cases for devices.

#### Installation Qualification (IQ)

The customer may request the IQ, which is free of charge. In case of a request, the Technical Support of KNAUER or from a provider authorized by KNAUER performs this functionality test during the installation.

The IQ is a standardized document including:

- confirmation of flawless condition at delivery
- check if the delivery is complete

#### Operation Qualification (OQ)

The Operation Qualification includes an extensive functionality test according to KNAUER standard OQ documents. The Operation Qualification is a standardized document and free of charge. It is not part of the delivery, please contact the Technical Support in case of request.

The OQ includes the following:

- definition of customer requirements and acceptance terms
- documentation on device specifications
- device functionality check at installation site

**Test intervals:** To make sure that the device operates within the specified range, you should test the device regularly. The test intervals are dependent on the usage of the device.

**Execution:** The test can be carried out either by the Technical Support of KNAUER or from a provider authorized by KNAUER (for a fee).



- certification on the functionality of the device

Instrument	IQ Document
all instruments	VIQ-Installation-Qualification

Instrument / Software	OQ Doc.
AZURA® Assistant ASM 2.1L, ASM 2.2L	VOQ-ASM
AZURA® AS 6.1L, AS 3950, PLATINblue AS-1	VOQ-AS
AZURA® CM 2.1S	VOQCM21SA
AZURA® CT 2.1 column thermostat	VOQCT21
AZURA® DAD 6.1L, DAD 2.1L, MWD 2.1L	VOQ-DAD
AZURA® RID 2.1L, Smartline S2300	VOQ-RID-2.1L
AZURA® UVD 2.1L	VOQUVD21LA
AZURA® UVD 2.1S	VOQUVD21SA
Flow cells	VOQ-Flowcells
Fraction collectors	VOQ-FRC
Osmometer K-7400	VOQ-K7400
Osmometer K-7400S	VOQ-K7400S
Pumps AZURA®, Smartline, BlueShadow, Platinblue	VOQ-Pumps
PurityChrom®	VOQ-PUC
RF20A/RF20Axs	VOQ-RF20
System OQ for analytical systems	VOQ-Sys-01
Valves	VOQ-Valves

## Performance Verification (PV)

Definition: The document Performance Verification (PV) is part of the quality management system of KNAUER. The Performance Verification includes a reproducibility test of an AZURA Analytical HPLC system and must be purchased from the manufacturer. The PV is a standardized KNAUER document and includes:

- Documentation on device specifications
- All necessary method parameter to perform the PV


**Goals:** The system runs reliably within the documented specifications and the PV is a summary of the results with comments and evaluations.

**Target group:** The test can be carried out either by the technical support of KNAUER, from a provider authorized by KNAUER or by the customer.

System	Document
AZURA® analytical systems with UV detector used in reversed phase mode	VPV-001-AZURA-UV
AZURA® analytical systems with RI detector used in reversed phase mode	VPV-002-AZURA-RID
AZURA® FPLC systems	VPV-003-AZURA-FPLC
AZURA® analytical systems with FLD detector used in reversed phase mode	VPV-004-AZURA-FLD
AZURA® SMB Lab and Pilot systems	VPV-005-AZURA-SMB
AZURA® preparative systems with UV detector used in reversed phase mode	VPV-007-AZURA-Prep
AZURA® preparative systems with RI detector used in reversed phase mode	VPV-008-AZURA-Prep-RID

## Material certification

Upon request customized material certification for all wetted parts with varying degrees of complexity from manufacturer statement (only material) to full documentation (e.g. material certification 3.1, FDA compliance statements).

 **Note:** Retrospective material certification is not possible.

## FAT / SAT

The factory acceptance test (FAT) refers to the functional test that is performed by upon completion of the manufacturing process to prove the equipment has the same specification and functionality that indicated in the datasheet, specification and purchase order. We are experienced in establishing such test procedures together with you before your equipment is delivered.

The acceptance of the equipment at your site (site acceptance test, SAT) is also possible: A technician comes to you and ensures that everything works to your utmost satisfaction. In addition, we can integrate the equipment into the existing production environment, if necessary.



## Capillary labeling

Complex HPLC systems with a myriad of valves and variable flow paths can be somewhat confusing. We offer professional capillary labeling upon request, to aid end-users in everyday use.

## Support

We are committed to provide the best quality support with experienced staff and technical expertise. All standard user instructions, helpful video tutorials, and a structured section of frequently asked questions is freely accessible on our web page [www.knauer.net](http://www.knauer.net).

If you need further support, our friendly Support team is happy to help you via e-mail, phone or Team Viewer. They will work with you personally until all issues are resolved.

## Contact

Do you have questions about the installation or the operation of your instrument or software?

### Support in Germany

**(Austria & Switzerland on case-to-case basis):**

Phone: +49 30 809727-111 (workdays 9-17h CET)

Email: [support@knauer.net](mailto:support@knauer.net)

### International Support:

Contact your local KNAUER partner for support:

[www.knauer.net/en/Support/Distributors-worldwide](http://www.knauer.net/en/Support/Distributors-worldwide)

## Worldwide Technical Services

Our highest goal is to keep your laboratory work as effective and productive as possible. Therefore, we not only pay attention to the highest quality in the development and production of our components and instruments, but also stand by your side after the purchase. With our wide range of services, we are ready to meet any demands to your full satisfaction.

KNAUER offers worldwide quality service of all products, purchased from KNAUER or our authorized partners. All KNAUER Service technicians have completed a specialized service training in the KNAUER headquarter in Berlin, Germany. They are ready to help on site ensuring efficient operation and minimized downtime.

## Installation & Instruction

Our experienced KNAUER Service technicians can ensure the proper set-up of your instruments. Get in contact whether you want to use a single device, install a complete system or update your chromatography data system.

KNAUER installations always include introduction in proper handling of the devices as well as tips for self-maintenance and imparting of necessary software knowledge.

On request you may add an IQ, OQ, PV or PQ for compliance (see page 71).

## Maintenance

Preventive maintenance has proven to be very successful in ensuring the highest availability of HPLC equipment. Unforeseeable failures of individual system components are thus almost impossible, production processes and laboratory capacities can be planned safely.

We offer maintenance services customized to your needs. You may either ship your instruments to the nearest KNAUER Service facility or contact your local dealer for on-site service of an authorized KNAUER Service technician.

## Repair

KNAUER still repairs and maintains the following product lines: the current AZURA®, the former Smartline and PLATINblue devices and - to our best abilities - the Wellchrom equipment which was introduced in the 90s.

If you discover any malfunction of your device don't worry, we will repair it for you! Please contact your local dealer for shipment matters or ask for an on-site visit of our skilled KNAUER service technicians.

## Development Services

### Software development

#### How does your software limit you?

Many devices rely on some kind of software to run and interact with you, either internal software (firmware) or drivers and application software on your PC.

#### Development of firmware for HPLC devices like

- UHPLC and HPLC pumps
- UV, PDA, RI, detectors
- Autosamplers
- Valves
- Column ovens
- Fraction collectors

#### Development of device drivers for

- OpenLAB® CDS
- Chromeleon™
- HyStar
- ClarityChrom® (Clarity based)



#### Automation of measurement and operation process

#### KNAUER software support for firmware, drivers and software solutions

To provide the most useful tools for your daily work, our team of software engineers combines its expertise in developing firmware, instrument control drivers, as well as application software. KNAUER also has a long experience in customizing instrument operation and in developing drivers for various OEM customers.

Let us know about your software challenges - we will program a solution!

### Hardware development


KNAUER has a long experience in customizing scientific equipment according to your needs. With on-site hardware designers, mechanical production and assembly, we can provide tailor made products under certain conditions. Contact us for more information.

## Storage of instruments and systems

At times equipment must be removed from your laboratory or you are forced to order equipment before your laboratory is up and running. We can offer storage facilities where your equipment can be stored for future use, giving you peace of mind knowing that you are protecting your investment.

## Configuration of your PC

We strongly recommend ordering a KNAUER computer with your HPLC system. However, we understand that sometimes certain constraints do not allow this. We offer a PC configuration service of your PC, in order to assure a safe and reliable installation.

 **Note:** We cannot guarantee installation on a non-KNAUER PC.

# Power Cable Overview

## Allocation of power plug types to devices

Every device is supplied with a power plug of the AZURA® series (cold-device plug) in the suitable country-specific version (see Table 2).

### Exception of allocation (Table 1)

Device	Power plug type
- BlueShadow Pump 40 P - BlueShadow Detector 40D/50D - Smartline Degasser (article no. A5328) - Osmometer	Smartline series (see Table 2)
- Router - Switch	Power plug is supplied. For outside Europe, a suitable adapter is supplied (see Table 2).
Degasser (article no. AZE03, AZE03-1, AZE02-1)	Power plug is supplied for US, UK, Europe, Australia.
- Pressure Control (article no. AZG10) - Pressure Sensor (article no. AZG10-1) - Airsensor (article no. A70092, A70093, A70082) - Interface Box (article no. AZB00XA)	Power distributor (article no. AZS80SA) and accessories kit with 1x power plug (article no. F1518) is needed. The distributor can provide power for up to 6 devices. Only one power distributor per system is required. - Power plug for China: Article no. M3027D - Power plug for Australia: Article no. M3027C
Tablet for Mobile Control	The Tablet includes an european power cable. Order M1279/M1277 in addition for an US/UK power cable.

## Overview of country-specific power plugs, routers and switches

If no suitable adapter is available for a specific country, contact the responsible distributor:  
[www.knauer.net/en/Support/Distributors-worldwide](http://www.knauer.net/en/Support/Distributors-worldwide)

### Overview (Table 2)

Power plugs/ routers/ switches	Article no. USA	Article no. UK	Article no. CH	Article no. Europe	Article no. Argentina
Power plug AZURA® series (cold-device plug)	M1651	M1278	M1597	M1642	M3233
Power plug Smartline series	M1279	M1277	M1479-1	M1479	-
Router (power plug incl.): Router WLAN, 8x LAN	A64809INT Adapter: M0447V2	A64809INT Adapter: M0447V1	-	A64809	-
Switch (power plug incl.): Switch 8x LAN	A3119INT Adapter: M0447V2	A3119INT Adapter: M0447V1	-	A3119	-
Switch (power plug incl.): Switch 5x LAN	A3126INT Adapter: M0447V2	A3126INT Adapter: M0447V2	-	A3126	-





**Note:** For connecting multiple devices, we provide a special power plug for up to 4 AZURA® devices (Europe), Article no. A12345.

## Allocation interfaces to devices

Currently, PCs from KNAUER have no serial interface (RS-232). Thus, to operate the following devices, you must install a serial interface (USB-4COM, Article no. A3114):

- Sedex 85 LT
- Osmometer (only with software)
- Shimadzu RF-20A/Axs, ordered from KNAUER, comes with an RS-232 adapter card PCI-e x1 for desktop computers since this device does not work reliably with USB adapters.



**Note:** If the tablet for Mobile Control should be connected via LAN and not WLAN, the USB-to-LAN Adapter (article no. A96181) is required.

You find the driver on the KNAUER website: [www.knauer.net/en/usb-lan-adapter](http://www.knauer.net/en/usb-lan-adapter)

## Detail overview of devices by power plug type

### AZURA® series (cold-device plug)

All devices of AZURA® series

PCs and monitors

Preparative pumps BlueShadow 80P (Article no. APD20xx)

Micro devices

- BlueShadow Pump 10P/20P
- BlueShadow Detector 10D
- Degasser 20DG (Article no. AZE02)

Detectors

- RF20A (Article no. A59200)
- RF20AXS, CBM-20A (Article no. A59201)
- Gabi Star
- HERM flumo, HERM LB500
- Sedex85LT, Sedex90LT, Sedex100LT, Sedex LC (Article no. A0754-x )
- CHIRALYSER-MP

Autosamplers

AZURA® Column Thermostat CT 2.1 (Article no. A05852)

Fraction collectors

- Foxy® R1/R2 (Article no. A59100/A59102/A591021)
- LABOCOL Vario-4000 (Article no. A591022/ A591024)

External pressure sensor (Article no. AZG10-2)

### Smartline series

Analytical Pumps 40P (Article no. APC30xx)

UV Detector 40D/50D

Smartline Degasser (Article no. A5328)

Osmometers

Document no. V1662, version 2.3. Last accessed on 2020/02/17.

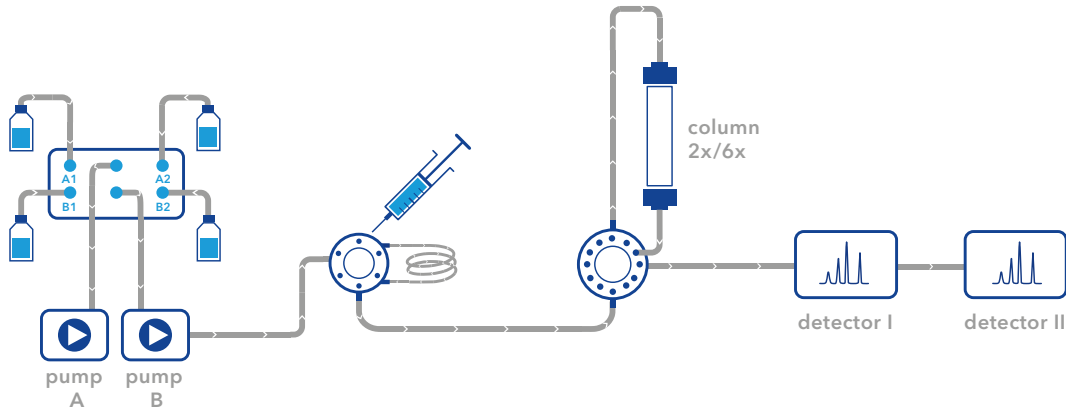
This document is subject to technical changes. For an up-to-date version, please visit: [www.knauer.net/en/cableoverview](http://www.knauer.net/en/cableoverview)

# System configurator

## HPLC/UHPLC by KNAUER

### MAKE YOUR PRESELECTION

- UHPLC**  
 (SST, max. 1000 bar)
- HPLC**  
 (SST, max. 862 bar)
- Bio-Inert**  
 (metal-free, max. 400 bar)



#### ELUENT SELECTION & DELIVERY

- 5 ml/min binary gradient pump P 6.1L (UHPLC)
- 5 ml/min quaternary gradient pump P 6.1L (UHPLC)
- 10 ml/min binary gradient pump P 6.1L
- 10 ml/min quaternary pump P 6.1L
- ..... x solvent selection valve (6 further inlets)

#### SAMPLE INJECTION

- Manual injection valve
- Autosampler AS 6.1L
- Autosampler AS 6.1L cool/heat

#### COLUMN SELECTION & THERMOSTAT

- 2 column selection
- 8 column selection
- Column thermostat
- Column kit HPLC
- Column kit UHPLC
- Eluent pre-heating cartridge 0.1 mm ID UHPLC
- Eluent pre-heating cartridge 0.18 mm ID HPLC

#### DETECTION

- UV/VIS single wavelength
- UV/VIS multiple wavelength
- Conductivity
- Refractive index
- Light Scattering
- A/D-converter (integration of further detectors)
- DAD 2.1L
- DAD 6.1L
- Fluorescence Detector RF-20 A
- Fluorescence Detector RF-20 Axs
- ECD 2.1

#### ACCESSORIES

- 0.1 mm tubing
- 0.18 mm tubing
- PEEK tubing
- ..... x Back pressure regulator
- Workstation (Windows)

#### FLOW CELLS FOR UV-DETECTOR

- 10 mm/10 µl Pressure proof
- 10 mm/2 µl LightGuide®
- 50 mm/6 µl LightGuide®
- 3 mm/2 µl (up to 100 ml/min) Pressure proof

#### SOFTWARE

- ClarityChrom®
- OpenLAB®
- Chromeleon™
- Mobile Control

#### COMMON APPLICATIONS

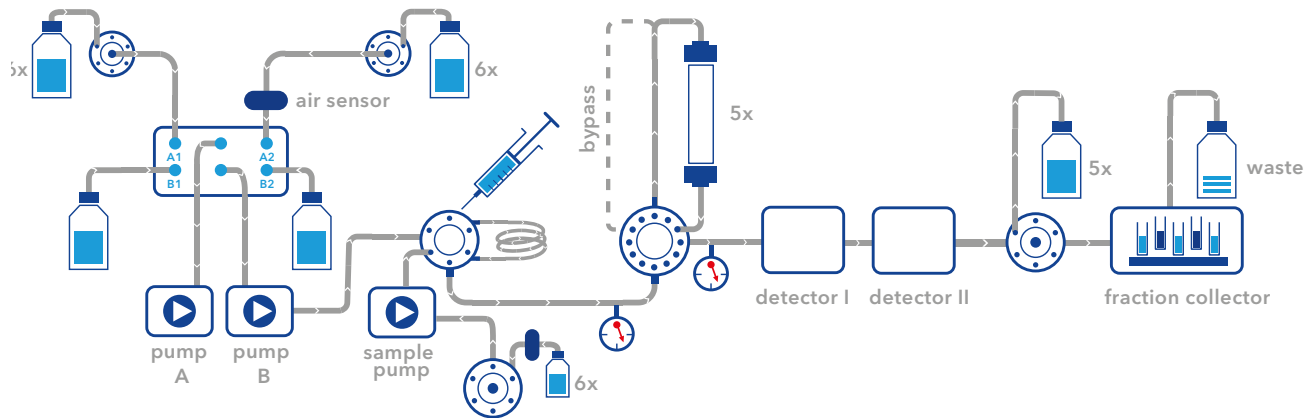
- Reversed phase
- Normal phase
- other...
- System Qualification

# System configurator

## Preparative HPLC by KNAUER

### MAKE YOUR PRESELECTION

 SST

 Titanium


#### BUFFER SELECTION & DELIVERY

- 10 ml/min binary gradient pump P 6.1L
- 10 ml/min quaternary pump P 6.1L
- 50 ml/min binary gradient pump P 6.1L
- ..... x 100 ml/min pump P 2.1L
- ..... x 250 ml/min pump P 2.1L
- ..... x 500 ml/min pump P 2.1L
- ..... x 1000 ml/min pump P 2.1L
- Ternary gradient module for pump P 2.1L
- Binary gradient module for pump P 2.1L
- ..... x solvent selection valve (6 further inlets)

#### SAMPLE INJECTION

- Injection valve
- Sample pump module
- Sample selection valve: ..... x inlets
- Autosampler AS 6.1L
- Autosampler AS 6.1L cool/heat

#### COLUMN SELECTION & THERMOSTAT

- Column selection (two columns or one bypass)
- Column selection high flow (5 columns, one bypass)

#### DETECTION

- UV/VIS single wavelength
- UV/VIS multiwave length
- DAD 2.1L
- Fluorescence Detector RF-20 A
- Conductivity
- pH
- Refractive index
- Light Scattering
- 4000 MiD
- A/D-converter (integration of further detectors)

#### FRACTION COLLECTION

- Fractionation valve
- Foxy fraction collector with fixed rack types
- Labocol fraction collector with individual rack types
- Rack for fraction collector
- Flow splitter

#### ACCESSORIES

- ..... x Airsensor main pump
- ..... x Airsensor feed pump
- Pressure control (2 pressure sensors)
- ..... x Back pressure regulator
- AZURA Organizer
- ..... x Tubing 1/16"
- ..... x Tubing 1/8"
- ..... x Tubing 1/4"
- Workstation (Windows)

#### SOFTWARE

- ClarityChrom®
- OpenLAB®
- PurityChrom®
- Chromeleon™
- Mobile Control

#### COMMON APPLICATIONS

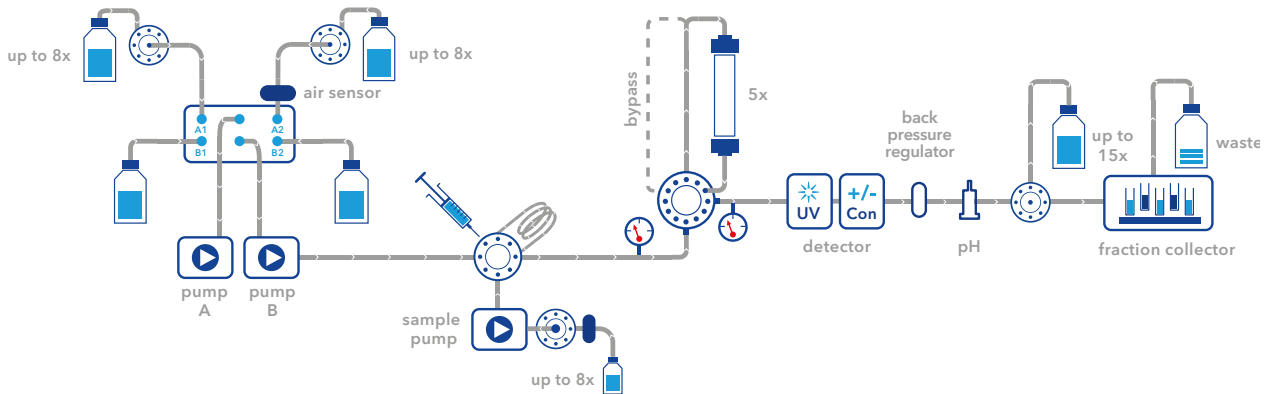
- Reversed phase
- Normal phase
- other...
- System Qualification

# System configurator

## Bio purification by KNAUER

### METHOD

- SEC**  
Size Exclusion Chromatography
- AC**  
Affinity Chromatography
- IEX**  
Ion-Exchange Chromatography
- HIC**  
Hydrophobic Interaction Chromatography



#### BUFFER SELECTION & DELIVERY

- 10 ml/min binary gradient pump P 6.1L
- 10 ml/min quaternary pump P 6.1L
- 50 ml/min binary gradient pump P 6.1L
- ..... x 100 ml/min pump P 2.1L
- ..... x 250 ml/min pump P 2.1L
- ..... x 500 ml/min pump P 2.1L
- ..... x 1000 ml/min pump P 2.1L
- Ternary gradient module for pump P 2.1L
- Binary gradient module for pump P 2.1L
- ..... x Buffer selection valve (8 further inlets)

#### SAMPLE INJECTION

- Multi-Injection valve
- ..... x Injection valve
- Sample pump module
- Sample selection valve: ..... x inlets
- Biocompatible Autosampler AS 6.1L

#### COLUMN SELECTION

- Column selection valve up to 50 ml/min (5 columns, one bypass, reverse flow)
- Column selection (two columns or one bypass)
- Column selection high flow (5 columns, one bypass)
- Column selection high flow (7 columns, one bypass, reverse flow)

#### DETECTION

- UV/VIS single wavelength
- UV/VIS multiwavelength
- Conductivity
- pH
- Fluorescence
- Refractive index
- Light Scattering
- Analog integration of further detectors

#### FRACTION COLLECTION

- Outlet valve
- Foxy fraction collector with fixed rack types
- Labocol fraction collector with individual rack type
- Rack for fraction collector

#### COLUMNS & MEDIA

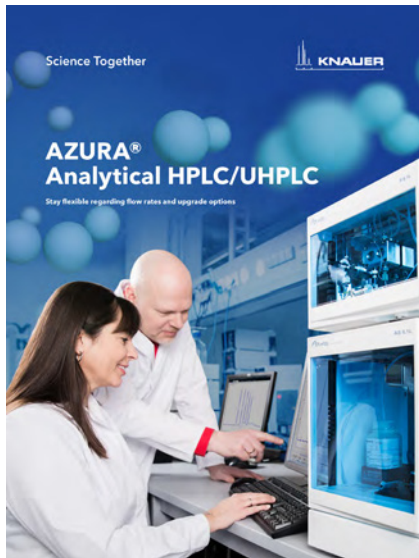
- SEC**: Desalting ..... ml
- SEC**: SEC 75 ..... ml
- SEC**: SEC 200 ..... ml
- AC**: Protein A ..... ml
- AC**: Protein G ..... ml
- AC**: Ni-NTA ..... ml
- AC**: Glutathione ..... ml
- IEX**: DEAE - Weak anion exchange ..... ml
- IEX**: CM - Weak cation exchange ..... ml
- IEX**: Q - Strong anion exchange ..... ml
- IEX**: SP - Strong cation exchange ..... ml

#### ACCESSORIES

- ..... x Air sensor main pump
- ..... x Air sensor feed pump
- Pressure control (2 pressure sensors)
- ..... x Back pressure regulator
- AZURA Organizer
- ..... x Tubing 1/16"
- ..... x Tubing 1/8"
- ..... x Tubing 1/4"
- Workstation (Windows)

# KNAUER Brochures

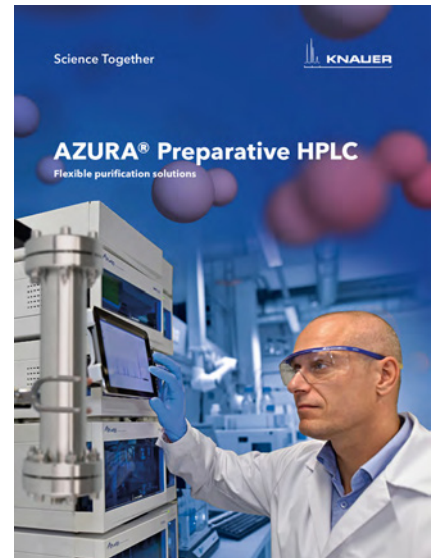
Please visit [www.knauer.net/brochures](http://www.knauer.net/brochures) to find more information about KNAUER products and systems.



AZURA® Analytical HPLC/UHPLC  
(Document no. V7852US)



AZURA® Bio purification  
(Document no. V7855US)



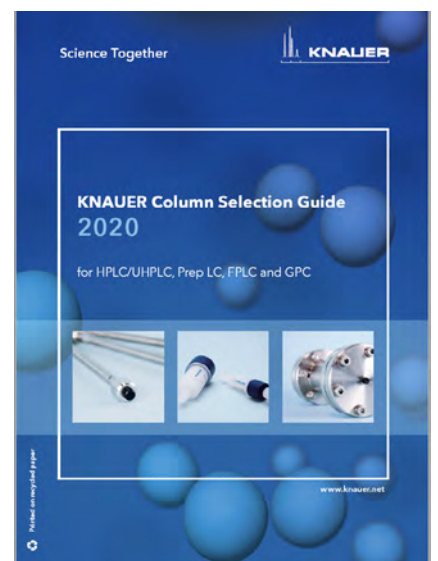
AZURA® Preparative HPLC  
(Document no. V7820US)



AZURA® SMB systems  
(Document no. V7741US)



Freezing point osmometry  
(Document no. V7716US)



KNAUER Column Selection Guide  
(Document no. V7803US)

# Conversion Tables

## Dimensions

mm	inches	inches	mm
0.10	.004"	1/32"	0.8
0.12	.005"	1/16"	1.6
0.15	.006"	1/8"	3.2
0.25	.010"	1/4"	6.4
0.40	.016"	3/8"	9.5
0.50	.020"	1/2"	12.7
0.75	.030"	1"	25.4
1.00	.040"		
1.50	.060"		
2.00	.080"		
4.60	.180"		
6.00	.236"		
6.40	.253"		
7.00	.276"		
10.00	.400"		

## Tubing volume/length

Tubing ID	µl/cm	µl/in
.004"	0.08	0.21
.005"	0.13	0.32
.010"	0.51	1.29
.015"	1.14	2.90
.020"	2.03	5.15
.025"	3.17	8.04
.030"	4.56	11.58
.040"	8.11	20.59
.060"	18.24	46.33
.070"	24.83	63.06
.085"	36.61	92.99

## Pressure

MPa	bar	psi
5	50	725
10	100	1 450
20	200	2 901
30	300	4 351
40	400	5 802
50	500	7 252
60	600	8 702
70	700	10 153
80	800	11 603
90	900	13 054
100	1 000	14 504
110	1 100	15 954
120	1 200	17 405
130	1 300	18 855
140	1 400	20 306
150	1 500	21 756
160	1 600	23 206
170	1 700	24 657
180	1 800	26 107
190	1 900	27 558
200	2 000	29 008

## Temperature

°C	°F	°C	°F	°C	°F
-40	-40	65	149	170	338
-35	-31	70	158	175	347
-30	-22	75	167	180	356
-25	-13	80	176	185	365
-20	-4	85	185	190	374
-15	5	90	194	195	383
-10	14	95	203	200	392
-5	23	100	212	205	401
0	32	105	221	210	410
5	41	110	230	215	419
10	50	115	239	220	428
15	59	120	248	225	437
20	68	125	257	230	446
25	77	130	266	235	455
30	86	135	275	240	464
35	95	140	284	245	473
40	104	145	293	250	482
45	113	150	302	255	491
50	122	155	311	260	500
55	131	160	320	265	509
60	140	165	329	270	518

# Terms & Conditions

## 1. Definition of terms

The following terms and conditions apply to every order received by KNAUER and every delivery of goods. This holds as well in case of contradictory buying conditions of the purchaser. Exceptions are only valid when confirmed by KNAUER in writing. Purchase orders are only binding if confirmed by KNAUER in writing.

## 2. Payment

Deliveries are due and payable, net, within 30 days of invoice date or in advance. Deductions are not allowed. Foreign deliveries must be paid by irrevocable letter of credit or in advance. All bank and transfer fees must be paid by the customer. The consequences arising out of delay are due to statutory provisions. Payments are due irrespective of an eventual notice of defect, except such defects are evidently justified.

## 3. Delivery

Delivery dates are not binding unless expressly stated in the contract as binding dates. Delay in delivery requires a written reminder and an adequate additional grace period set by the customer. KNAUER is only liable for claims for damages under the requirements of no. 6.

## 4. Claims

Condition for any warranty claim is the immediate inspection of the goods upon delivery, and complaint towards and damage assessment together with the carrier, and an immediate written complaint to KNAUER. The complaint must be made within five workdays in case of visible defects or losses.

## 5. Risk liability

Delivery is made at the customer's own risk. As soon as the goods leave KNAUER's plant the risk of accidental loss, destruction or deterioration passes to the customer.

## 6. Warranty and damages

### 6.1. Warranty claims

The warranty begins with receipt of the goods. If commissioning has been ordered, after commissioning. In the case of delayed commissioning, the warranty begins at the latest four weeks after receipt of the goods unless the supplier is responsible for delayed commissioning.

The warranty for osmometers and liquid chromatography instruments is limited to two years, excluding glass breakage, damages due to stoppage and consumable materials such as membranes, light bulbs, columns, bushings, gaskets and valves. KNAUER's liability shall be restricted to the replacement of defective material or repair only. Transportation costs are borne by the customer. In case of failure of replacement or repair the customer may demand a reduction in price or cancellation of the contract with respect to the defective material. The customer has to inspect the goods delivered immediately and shall immediately give written notification of any defects to KNAUER, in case of non-obvious defects within 10 working days after delivery at the very latest.

## 6.2. Claims for damages

The liability of KNAUER shall be restricted to intentional acts and acts of gross negligence and compensation shall only be due for direct, foreseeable damages. Liability for breach of a material, essential duty of the contract, liability because of personal injury, liability according to the stipulations of the German Law on Product Liability and liability for the lack of the condition of the contract goods guaranteed by KNAUER remain unaffected.

## 7. Third party rights on industrial or other intellectual property

KNAUER shall not be liable for the infringement of third party rights founded on industrial or other intellectual property caused by the use of the delivered goods. The customer is fully responsible for the products manufactured with the goods. In particular KNAUER is not obliged to indemnify and hold harmless the customer from all claims raised by third parties based on the infringement of their industrial or intellectual property rights by the use of the goods.

## 8. Property rights

The ownership of the goods shall remain with KNAUER until payment in full for all our claims resulting from our business relation is received. In case of improper treatment of the goods or in case of default KNAUER may demand the return of the delivered goods. This demand entails resignation of the contract only if KNAUER declares it explicitly.

Resellers are allowed to sell the goods to third parties in due course of the business. The customer herewith assigns his resale claims against third parties to KNAUER.

## 9. Export

Instruments and products delivered by KNAUER may not be exported to a country other than of the customer's headquarters without KNAUER's prior written permission.

## 10. Place of settlement and court of jurisdiction

The place of performance is Berlin. Proper venue for all claims is the competent local court at KNAUER's principal place of business - Berlin. KNAUER reserves the right to sue the customer at his principal place of business.

This agreement shall be governed by the laws of the Federal Republic of Germany excluding the UN-Convention on the International Sale of Goods (CISG).

KNAUER Wissenschaftliche Geräte GmbH

Hegauer Weg 38

14163 Berlin, Germany

These terms and conditions apply since June 1, 2016

Analytical  
HPLC

Multi-Column  
Chromatography,  
SMB

Preparative  
HPLC

FPLC

Osmometry

Dosing,  
Metering,  
Pumping

Detection

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