KNAUER

Azura

made in germany

Product Selection Guide 2015

Welcome to KNAUER - manufacturer of liquid chromatography instruments and solutions!

KNAUER (that is the "KNAUER Wissenschaftliche Geräte GmbH") is an owner-managed middle-sized company situated in Berlin, Germany.

Since 1962, we have been developing, manufacturing and distributing laboratory instruments around the world. With more than 120 employees we are the oldest German manufacturer of instruments for HPLC, FPLC, simulated moving bed chromatography (SMB) and osmometry. Our product portfolio ranges from most compact analytical HPLC systems to SMB systems for the extraction of up to 1.000 kg of pure substance per year.

Alexandra Knauer (CEO and Owner)

Products and services offered include state of the art UHPLC/MS systems, biochromatography systems, solutions for the purification of value products and fine chemicals, LC columns, and method development.

The source of our success are numerous world's firsts that have won more than 20 awards for innovation. We strive to grow continuously, to expand our expertises and to discover new market opportunities.

Quality and environmental management

The KNAUER quality management system according to DIN EN ISO 9001 makes sure that we continuously produce products in the best quality possible. As a company, we have to prove ourselves every day in a highly competitive market. Therefore, we can only be successful if every employee contributes his share. Your satisfaction with the quality of our products and services is the key to our success.

In addition to our quality management system, KNAUER contributes to the conservation of a healthy environment by basing our work on an environmental management system according to DIN EN ISO 14001.

Starting with the development of a new product, our designing engineers are bound to use long-lasting materials which allow low maintenance time intervals and minimal downtime. Furthermore, a high energy efficiency and material efficiency in the production process and during the use of our products are important to us. Finally, the products should be able to be disposed of in an environmentally compatible way.

Stefan Leiser and Dr. Serge Mell receive the award from popular TV presentor and mentor Ranga Yogeshwar.

Every single part and original spare part corresponds to our strict criteria for construction, material and safety. This is guaranteed by our quality assurance system. And if your products need replacement or repair, it will be as good as a new with original spare parts from KNAUER.

The quality management system and the working procedures that come with it are being updated on a regular basis. All KNAUER employees know the procedures of the quality management system and its implementation. Continuous improvement is one of our goals and overall basic management principles.

Your remarks and suggestions are a substancial part of our daily work. They help us become even more precise, faster and more customer friendly. Please let us know what your suggestions are and what we can do better.

Please do not hesitate to contact our quality management team at quality@knauer.net!

Table of contents

Table of contents

Table of contents

(U)HPLC pumps

AZURA P 6.1L binary HPG

Binary analytical HPLC pump

The AZURA pump P 6.1L uses technology to overcome the challenges of pumping LC solvents at high pressure and high flow rates. This pump is designed to fulfill 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 700 bar.

The AZURA binary pump contains two identical high pressure pumps, a 2 × 2-channel inlet solvent selection valve and the new developed AZURA mixer, a low-volume mixing device.

The AZURA quaternary pump contains one high pressure pump (700 bar) and an integrated LPG mixing block with a 4 channel inlet solvent selection valve and the new developed AZURA mixer, a low-volume mixing device.

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.

Solvent delivery	
Pump head	10 / 50 ml/min
Pulsation compensation	active pulsation compensation
Pump head materials	stainless steel/ceramic
Maximum delivery pressure	for 10 ml pump head: 70 MPa (700 bar, 10150 psi) up to 5 ml/min, 40 MPa (400 bar, 5800 psi)
	for 50 ml pump head: 30 MPa (300 bar, 4351 psi) up to 10 ml/min, 20 MPa (200 bar, 2900 psi)
Solvent selection valve	2 x 2 channels
Flow rate range	0.001 - 10 ml/min or 0.01 - 50 ml/min
Flow rate increment	0.001 ml/min or 0.01 ml/min
Flow rate accuracy	< 1%, measured at 5 - 50% of flow range using ethanol/water 10:90
Flow rate precision	< 0.1% RSD
Gradient formation	High pressure binary mixing
Gradient range	0 - 100%
HPG: minimum increment	0.1%
HPG: gradient accuracy	± 1% (5 - 95%, measured at 5 - 50% of flow range, water/ caffeine tracer)
HPG: gradient precision	1% RSD, based on retention time at constant room temperature
Piston seal washing	standard
System protection	soft start, Pmin and Pmax are programmable
Wetted materials	stainless steel, graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminium oxide (Al2O3)
Degasser module	for pumps with 10 ml pump heads only
Degasser channels	2 channels, Teflon® AF
Degasser maximum flow rate	10 ml/min
Degassing method	gas permeation through Teflon® AF amorphous fluoropolymer membrane
Degassing efficiency	< 0.5 ppm dissolved O2 at 1 ml/min
Degassing chamber volume	480 µl volume per channel
Solvent applicability	universal, with the exception of hydrochloric acid and halogenated hydrocarbons - in particular hexafluoroisopropanol (HFIP)
Wetted materials	PEEK, Tefzel®, Teflon® AF
Vacuum chamber	polypropylene and stainless steel
Vacuum pump	low hysteresis behavior
Communication	
Control	LAN; analog and event controlled
Analog inputs	0 - 10 V
Analog control input	flow rate
Technical parameters	
Ambient conditions	temperature range: 10 - 40 °C; 50 - 104 °F
	air humidity: below 90% humidity (non condensing)
Leak sensor	yes
General	
Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	361 x 208.2 x 523 mm (W x H x D)

Ordering details:

APH35EA	AZURA P 6.1L Binary analytical HPLC pump with degasser, 10 ml pump head
APH65EB	AZURA P 6.1L Binary analytical HPLC pump with degasser, metal-free, 10 ml pump head
APH35ED	AZURA P 6.1L Binary analytical HPLC pump with degasser, 10 ml pump head, optimized for NP applications
APH38FA	AZURA P 6.1L Binary analytical HPLC pump, 50 ml pump head
APH68FB	AZURA P 6.1L Binary HPLC pump, metal-free, 50 ml pump head

(U)HPLC pumps

AZURA P 6.1L – quaternary LPG

Quaternary analytical HPLC pump

The AZURA pump P 6.1L uses technology to overcome the challenges of pumping LC solvents at high pressure and high flow rates. This pump is designed to fulfill the needs for low pressure mixing tasks.

The pump can deliver flow in the range of 0.001 – 10 mL/min at pressures up to 700 bar. The AZURA quaternary pump contains one high pressure pump (700 bar) and an integrated LPG mixing block with a 4 channel inlet solvent selection valve and the new developed AZURA mixer, a low-volume mixing device.

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.

Solvent delivery

Pump head	10 ml/min
Pulsation compensation	active pulsation compensation
Pump head materials	stainless steel
Maximum delivery pressure	70 Mpa (700 bar, 10150 psi) up to 5 ml/min, 40 MPa (400 bar, 5800 psi)
Flow rate range	0.001 - 10 ml/min 0.02 - 10 ml/min (recommended)
Flow rate increment	0.001 ml/min
Flow rate accuracy	± 1%, measured at 5 - 80% of flow range using ethanol
Flow rate precision	< 0.1% RSD based on retention time at constant room temperature
Pulsation	< 2% amplitude (typically < 1.3%) or < 0.3 MPa (3 bar), whatever is greater, at 1 mL/min ethanol, at all pressures > 1 MPa (10 bar, 147 psi).
Gradient formation	low pressure quaternary mixing
Gradient range	0 - 100%
	1 - 99% (recommended)
LPG: minimum increment	0.1%
LPG: gradient accuracy	± 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)
LPG: gradient precision	< 0.1% RSD at 1 ml/min, 0.5% RSD overall, based on retention time at constant room temperature
Mixing volume	50, 100, 200 µl
Delay volume	210 µl (depending on mixer)
Piston seal washing	standard
System protection	soft start, Pmin and Pmax are programmable
Wetted materials	stainless steel, graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminium oxide (Al2O3)

Degasser module

Degasser channels	4 channels, Teflon® AF
Degasser maximum flow rate	10 ml/min
Degassing method	gas permeation through Teflon® AF amorphous fluoropolymer membrane
Degassing efficiency	< 0.5 ppm dissolved O2 at 1 ml/min
Degassing chamber volume	480 µl volume per channel
Solvent applicability	universal, with the exception of hydrochloric acid and halogenated hydrocarbons - in particular hexafluoroisopropanol (HFIP)
Wetted materials	PEEK, Tefzel®, Teflon® AF
Vacuum chamber	polypropylene and stainless steel
Vacuum pump	low hysteresis behavior

Communication

Control	LAN; analog and event controlled
Analog inputs	0 - 10 V
Analog control input	flow rate

Technical parameters

Ambient conditions	temperature range: 10 - 40 °C; 50 - 104 °F
	air humidity: below 90 % humidity (non condensing)
Leak sensor	yes

General

Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	361 x 208.2 x 523 mm (W x H x D)
Weight	12.7 kg
Special features	automatic adaption of LPG cycle time

Ordering details:

APH34EA	AZURA P 6.1L Quaternary analytical HPLC pump with degasser, 10 ml pump head
APH64EB	AZURA P 6.1L Quaternary analytical HPLC pump with degasser, metal-free, 10 ml pump head

(U)HPLC pumps

AZURA P 6.1L – isocratic
Isocratic HPLC pump

The AZURA pump P 6.1L uses technology to overcome the challenges of pumping LC solvents at high pressure and high flow rates.

The pump can deliver flow in the range of 0.001 – 50 mL/min at pressures up to 700 bar. The integrated AZURA inline filter is completing the isocratic AZURA HPLC pump. Exchangeable pump heads with 10 and 50 ml volume turn this pump into a working horse in the lab for analytical and semi-preparative tasks.

For biocompatible applications or ion chromatography this pump is also available with a complete metal free design.

Solvent delivery

Pump head	10 / 50 ml/min
Pulsation compensation	active pulsation compensation
Pump head materials	ceramic / stainles steel
Maximum delivery pressure	10 ml/min pump head: 70 Mpa (700 bar, 10150 psi) up to 5 ml/min, 40 MPa (400 bar, 5800 psi)
	50 ml/min pump: 30 MPa (300 bar, 4351 psi) up to 10 ml/min, 20 MPa (200 bar, 2900 psi)
Flow rate range	0.001 - 10 ml/min 0.02 - 10 ml/min (recommended)
	0.01 - 50 ml/min 0.1 - 40 ml/min (recommended)
Flow rate increment	0.001 ml/min / 0.01 ml/min 10/50 ml pump head
Flow rate accuracy	± 1%, measured at 5 - 80% of flow range using ethanol
Flow rate precision	< 0.1% RSD based on retention time at constant room temperature
Piston seal washing	standard
System protection	soft start, Pmin and Pmax are programmable
Wetted materials	graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminium oxide (Al2O3), ceramic

Communication

Control	LAN; analog and event controlled
Analog inputs	0 - 10 V
Analog control input	flow rate

Technical parameters

Ambient conditions	temperature range: 10 - 40 °C; 50 - 104 °F
	air humidity: below 90% humidity (non condensing)
Leak sensor	yes

General

Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	361 x 208.2 x 523 mm (W x H x D)
Weight	11.5 kg

Ordering details:

APH30EA	AZURA P 6.1L Isocratic analytical HPLC pump, 10 ml pump head
APH30ED	AZURA P 6.1L Isocratic analytical HPLC pump, 10 ml pump head, optimized for normal phase applications
APH60EB	AZURA P 6.1L Isocratic analytical HPLC pump, metal-free, 10 ml pump head
APH30FA	AZURA P 6.1L Isocratic HPLC pump, 50 ml pump head
APH60FB	AZURA P 6.1L Isocratic HPLC pump, metal-free, 50 ml pump head

Preparative HPLC pumps

AZURA P 2.1L
Preparative HPLC pump

AZURA preparative HPLC pump P 2.1L covers a wide flow rate range and pressure capabilities. It has been designed for purification of mg and gram samples. The control unit allows intuitive control in stand-alone operation. The integrated automatic recognition of the pump head with RFID technology allows fast adaptions of the pump for various applications.

Solvent delivery

Pump type	preparative HPLC pump
Delivery system	double piston pump with Al2O3 pistons
Pump head	100 ml / 250 ml / 500 ml / 1000 ml
Pump head materials	stainless steel /titanium
Maximum delivery pressure	for 100 ml pump head: 40 MPa (400 bar, 5800 psi); for 250 ml pump head: 22,5 MPa (225 bar, 3260 psi) up to 100 ml/min, 20 MPa (200 bar, 2900 psi) up to 250 ml/min; for 500 ml pump head: 10 MPa (100 bar, 1450 psi); for 1000 ml pump head: 7.5 MPa (75 bar, 1080 psi) up to 350 ml/min, 5 MPa (50 bar, 720 psi) up to 1000 ml/min
Flow rate range	0.01 - 100 ml/min / 0.01 - 250 ml/min / 0.01 - 500 ml/min / 0.1 - 1000 ml/min
Flow rate increment	0.01 ml/min (0.1 ml/min for 1000 ml pump head)
Flow rate accuracy	± 2%, measured at 5 - 50% of flow range using ethanol/water 10:90
Flow rate precision	< 0.1% RSD
Gradient support	isocratic, upgradeable to a binary HPG system with additional pump P 2.1L or to a binary or ternary LPG system
HPG: gradient accuracy	± 2% (5 - 95%, measured at 5 - 50% of flow range, water/caffeine tracer)
HPG: gradient precision	1% RSD, based on retention time at constant room temperature
LPG: gradient accuracy	± 3% (5 - 95%, measured at 5 - 50% of the flow range, water/caffeine tracer)
LPG: gradient precision	2% RSD, based on retention time at constant room
System protection	soft start, Pmin and Pmax are programmable
Wetted materials	stainless steel, graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminum oxide (Al2O3), stainless steel

Communication

Control	LAN; analog and event controlled
Analog inputs	0 - 10 V
Analog control input	flow rate
Level/event outputs	8 event outputs (TTL, OC, relays)
Programming	19 programs + 9 links (to programs) + 1 wake up program
Special features	system pump head is detected automatically using radio frequency identification (RFID)

Technical parameters

Ambient conditions	temperature range: 10 – 40 °C; 50 – 104 °F
	air humidity: below 90% humidity (non condensing)
Leak sensor	yes

General

Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	361 x 208.2 x 523 mm (W x H x D)
Weight	19 kg
Optional accessories	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

Ordering details:

APE20KA	AZURA P 2.1L Preparative HPLC pump with 100 ml/min pump head, stainless steel
APE20LA	AZURA P 2.1L Preparative HPLC pump with 250 ml/min pump head, stainless steel
APE20MA	AZURA P 2.1L Preparative HPLC pump with 500 ml/min pump head, stainless steel
APE20NA	AZURA P 2.1L Preparative HPLC pump with 1000 ml/min pump head, stainless steel
APE20KB	AZURA P 2.1L Preparative HPLC pump with 100 ml/min pump head, titanium
APE20LC	AZURA P 2.1L Preparative HPLC pump with 250 ml/min pump head, titanium
APE20MC	AZURA P 2.1L Preparative HPLC pump with 500 ml/min pump head, titanium
APE20NB	AZURA P 2.1L Preparative HPLC pump with 1000 ml/min pump head, titanium
AZZ00AA	AZURA LPG module for pump P 2.1L binary LPG module for flow rates up to 800 ml/min, stainless steel
AZZ00AB	AZURA LPG module for pump P 2.1L ternary LPG module for flow rates up to 220 ml/min, stainless steel

Compact HPLC pumps

AZURA P 4.1S

Ultra-compact high pressure pump, with pressure sensor

AZURA P 4.1S pump 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. Pump heads with volumes of 10 and 50 ml are available.

Solvent delivery

Pump type	ultra-compact high pressure pump
Delivery system	dual piston pump with one working piston, one auxiliary
Pump head	10 / 50 ml/min
Pump head materials	titanium/ceramic/stainless steel
Maximum delivery pressure	40 MPa 10ml pump head & 15 MPa 50 ml pump head
Maximum flow rate	0.01 - 50 ml/min
Flow rate increment	0.01 ml/min
Flow rate accuracy	± 1%, measured at 5 - 50% of flow range using ethanol/water 10:90
Flow rate precision	≤ 0.5% RSD, measured at 5 ml/min using ethanol/water 10:90
System protection	P min and P max are programmable
Wetted materials	titanium, graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminum oxide (Al_2O_3)
Control	LAN; RS-232; analog and event controlled
Analog inputs	0 - 10 V
Analog control input	flow rate
Max. viscosity	100 mPa·s
Liquid temperature range	-10 - 60 °C

Technical parameters

Ambient conditions	temperature range: 10 – 40 °C; 50 – 104 °F air humidity: below 90% humidity (non condensing)
Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	113 x 135 x 225 mm (W x H x D)
Weight	2.4 kg

Ordering details:

APG20AA	AZURA P 4.1S Compact HPLC pump with 10 ml/min pump head, stainless steel
APG20BB	AZURA P 4.1S Compact HPLC pump with 10 ml/min pump head, ceramic
APG20AC	AZURA P 4.1S Compact HPLC pump with 10 ml/min pump head, titanium
APG20DA	AZURA P 4.1S Compact HPLC pump with 50 ml/min pump head, stainless steel
APG20DC	AZURA P 4.1S Compact HPLC pump with 50 ml/min pump head, titanium

Compact HPLC pumps

AZURA P 2.1S

Ultra-compact high pressure pump, without pressure sensor

AZURA P 2.1S pump 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.

Solvent delivery

Pump type	ultra-compact high pressure pump
Delivery system	dual piston pump with one working piston, one auxiliary
Pump head	10 / 50 ml/min
Pump head materials	titanium/ceramic/stainless steel
Maximum delivery pressure	40 MPa 10ml pump head & 15 MPa 50 ml pump head
Maximum flow rate	0.01 - 50 ml/min
Flow rate increment	0.01 ml/min
Flow rate accuracy	± 1%, measured at 5 - 50% of flow range using ethanol/water 10:90
Flow rate precision	≤ 0.5 % RSD, measured at 5 ml/min using ethanol/water 10:90
System protection	P min and P max are programmable
Wetted materials	titanium, graphite fiber reinforced PTFE, FKM, PEEK, sapphire, aluminum oxide (Al2O3)
Control	LAN; RS-232; analog and event controlled
Analog inputs	0-10 V
Analog control input	flow rate
Max. viscosity	100 mPa·s
Liquid temperature range	-10 - 60 °C

Technical parameters

Ambient conditions	temperature range: 10 – 40 °C; 50 – 104 °F air humidity: below 90% humidity (non condensing)
Power supply	voltage range: 100 - 240 V, 50 - 60 Hz
Dimensions	113 x 135 x 225 mm (W x H x D)
Weight	2.3 kg

Ordering details:

APG90AA	Compact HPLC pump with 10 ml/min pump head, stainless steel
APG90BB	Compact HPLC pump with 10 ml/min pump head, ceramic
APG90AC	Compact HPLC pump with 10 ml/min pump head, titanium
APG90DA	Compact HPLC pump with 50 ml/min pump head, stainless steel
APG90DC	Compact HPLC pump with 50 ml/min pump head, titanium
APG90EC	Compact HPLC pump with 10 ml/min pump head, Hastelloy C
APG90BF	Compact HPLC pump with 10 ml/min pump head, stainless steel, titanium free

AZURA ASM 2.1L

AZURA Assistants represent customizable combination modules for the integration of up to three devices in one. They save space and handle a large variety of tasks in a compact solution such as sample feeding, peak monitoring, column switching, or fraction collection.

A leak sensor and the capillary guidance as well as the optional control unit with touch screen facilitate the safe and user friendly operation. Modern design with completely demountable fronts and exchangeable colored side panels turn the system into a visual highlight. The stackable elements of AZURA allow creating complex system solutions requiring only a minimum of space.

Many combinations for AZURA ASM 2.1L are possible, there are only a few restrictions.

1) At least two modules have to be integrated

2) It is not possible two integrate three pumps in the same ASM 2.1L device

3) It is not possible to integrate two detectors in the same ASM 2.1L device

4) It is not possible to integrate valves with 1/4" ports;

5) Max. 2 VICI valves can be integrated

Technical parameters:

Integrated modules	Pump P 2.1S, P 4.1S
	Valve V 2.1S 6P/3C; MPos with 6P/12P/16P
	Detector UVD 2.1S, UVD 2.1S LWL
	Degasser DG 2.1S
Leak management	yes
Leak sensor	yes
Ambient conditions	10 - 40 °C
	10 - 90% humidity, non-condensing
Display	3.5 inch touch screen integrated in optional Control Unit
Dimensions	361 x 158.2 x 523 mm (W x H x D)
Power supply	100 - 240V; 50 - 60 Hz; maximum 100 W
Control	digital: LAN; start, error; analog out: error; integrator output (+− 2.5 V); touch screen

Ordering details:

AYXXXXXX	AZURA ASM 2.1L basic module incl. leak sensor, capillary guide and connection for the control module

Examples of preconfigured Assistants:

AYFAEEBD	AZURA ASM 2.1L for preparative HPLC combination module: 12-port multi position valve, 1/8" connectors, 6-port 3-channel injection valve, 1/8" connectors and pump with pressure sensor, 50 ml pump head
AYGAEABA	AZURA ASM 2.1L for preparative HPLC combination module: 16-port multiposition valve, 1/16" connectors, 6-port 2-position injection valve, 1/16" connectors and pump with pressure sensor, 10 ml pump head
AYEBBAIC	AZURA ASM 2.1L with 6-port 2-channel valve, 1/16"connectors, pump with 10 ml pumphead and analytical degasser
AYHJLXHJ	AZURA ASM 2.1L for column switching: 2x 6-port multiposition valve, 1/16" connectors, 1000 bar
AYELELEL	Column switch assistant ASM 2.1L for Bio-LC with 3x 6 port multiposition valve V 2.1S, 1/8", PEEK
AYEHEHEA	AZURA ASM 2.1L for column switching and column backflushing (300 bar): 2x 6-port multiposition valve, 1/16" connectors, 6-port 2-position injection valve, 1/16" connectors, stainless steel
AYEHLXEH	AZURA ASM 2.1L for column switching (300 bar): 2x 6-port multiposition valve, 1/16" connectors, stainless steel

AZURA ASM 2.1L

Integrated modules:

AZURA P 2.1S Pumps

APG90AA	Compact HPLC pump with 10 ml/min pump head, stainless steel, without pressure sensor
APG90BB	Compact HPLC pump with 10 ml/min pump head, ceramic, without pressure sensor
APG90AC	Compact HPLC pump with 10 ml/min pump head, titanium, without pressure sensor
APG90DA	Compact HPLC pump with 50 ml/min pump head, stainless steel, without pressure sensor
APG90DC	Compact HPLC pump with 50 ml/min pump head, titanium, without pressure sensor
APG90EC	Compact HPLC pump with 10 ml/min pump head, Hastelloy® C, without pressure sensor
APG90BF	Compact HPLC pump with 10 ml/min pump head, stainless steel (titanium free), without pressure sensor

AZURA P 4.1S Pumps

APG20AA	Compact HPLC pump with 10 ml/min pump head, stainless steel
APG20BB	Compact HPLC pump with 10 ml/min pump head, ceramic
APG20AC	Compact HPLC pump with 10 ml/min pump head, titanium
APG20DA	Compact HPLC pump with 50 ml/min pump head, stainless steel
APG20DC	Compact HPLC pump with 50 ml/min pump head, titanium

AZURA V 2.1S Valves

AWA10AA	AZURA V 2.1S valve drive with 6-port/3-channel valve stainless steel, 1/16", including accessories
AWA10AB	AZURA V2.1S with 6-port/2-channel valve head stainless steel, 1/16", including accessories
AWA10AC	AZURA V 2.1S valve drive with 6-port/3-channel valve PEEK, 1/16", including accessories
AWA10AD	AZURA V 2.1S with 6-port/3-channel valve head stainless steel, 1/8", including accessories
AWA10AE	AZURA V 2.1S with 6-port/3-channel valve head PEEK, 1/8", including accessories
AWA10BA	AZURA V 2.1S with 6-port multi-position valve head stainless steel, 1/16", including accessories
AWA10BB	AZURA V 2.1S with 6-port multi-position valve head PEEK, 1/16", including accessories
AWA10BC	AZURA V 2.1S with 6-port multi-position valve head stainless steel, 1/8", including accessories
AWA10BD	AZURA V 2.1S with 6-port multi-position valve head PEEK, 1/8", including accessories
AWA20BG	AZURA V 2.1S with 12-port multi-position valve head stainless steel, 1/8", including accessories
AWA30BH	AZURA V 2.1S with 16-port multi-position valve head stainless steel, 1/16", including accessories
AWB02FA	VICI/VALCO 6-port multi-position valve stainless steel, 1/16", 1000 bar
AWB02FB	VICI/VALCO 6-port multi-position valve stainless steel, 1/16", 700 bar
AWB02EA	VICI/VALCO 6-port/ 3-channel valve stainless steel, 1/16", 1000 bar
AWB02EB	VICI/VALCO 6-port/ 3-channel valve stainless steel, 1/16", 700 bar

AZURA UVD 2.1S Detectors

|	
ADA00	AZURA UVD 2.1S 190 - 500 nm, small variable single wavelength UV detector
ADA05	AZURA UVD 2.1S Fiber Optics 190 - 500 nm, small variable single wavelength UV detector with fiber optics connectors

Flow Cell on page 46

Degassers

AZE34	AZURA DG 2.1S small semi-prep 2 channel degasser
AZE02	AZURA DG 2.1S small analytical 2 channel degasser

Autosampler 3950

The Autosampler 3950 can inject from up to 768 positions when equipped with microtiter plates (either high or low formats) or from up to 96 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 precision and 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. This autosampler is also suitable for UHPLC with pressure stability up to 1000 bar and minimized dead volume for high resolution.
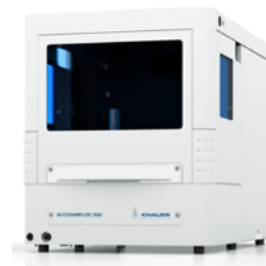
Sample injection

Sample capacity	microtiter plates for max. 768 samples or sample plates for max. 96 vials
Vial/plate dimensions	max. plate/vial height: 47 mm (incl. septa or capmat)
Injection volume range	0.1 – 5000 μl programmable
Sample loop	10 μl standard
Dispenser syringe	250 μl
Headspace pressure	built-in compressor, only for vials with septum
Switching time inj. valve	< 100 ms
Piercing precision needle	± 0.6 mm
Sample tray cooling	4-40 °C
Vial detection	missing vial/well plate detection by sensor
Needle wash	programmable: wash between injections and wash between vials
Wetted materials	stainless steel (SS316), Tefzel®, Vespel®, glass, Teflon® (PTFE).
Pressure stability	1000 bar

Analytical performance

Injection modes	full loop, partial loopfill and μl pickup mode; PASA™ (pressure-assisted sample aspiration)
Injection precision	RSD (Relative Standard Deviation):
	full loop injection: <0.3%
	partial loop injection at an injection volume >10 μl: <0.5%
	microliter pickup injection at an injection volume >10 μl: <1.0%
Injection volumes	full loop: max. 5000 μl
	partial loop: max. 2500 μl (50% loop volume)
	μl pickup: max. 2455 μl (50% loop volume - 1,5x needle volume)
	0,1 μl increment for all injection modes
Sample carryover	< 0.05% with standard wash; typically < 0.01% with extra wash
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)

Technical parameters

Ambient conditions	temperature range: 4 – 40 °C; 39.2 – 104 °F
	air humidity: below 90% humidity (non condensing)

General

Power supply	90 – 230 V AC ± 10%; 50 – 60 Hz; 200 VA
Dimensions	300 x 360 x 510 mm (W x H x D)
Weight	19.0 kg

Ordering details:

A50070	Autosampler 3950 standard version of a fast and very versatile analytical HPLC autosampler, 1000 bar, 0.1 - 5000 μl injection volume
A500701	Autosampler 3950 cooling/heating version of a fast and very versatile analytical HPLC autosampler, 1000 bar, 0.1 - 5000 μl injection volume
A5005-1	Autosampler 3950 standard version of a fast and very versatile analytical HPLC autosampler
A50055-1	Autosampler 3950 preparative HPLC autosampler with biocompatible flow path
A50055-2	Autosampler 3950 preparative HPLC autosampler with biocompatible flow path and cooling/heating option

KNAUER

Autosampler Optimas

The Autosampler Knauer Optimas was developed for optimal automation of routine injections, ideal for combinations with classical HPLC applications up to 400 bar.

With a choice of carousel trays, it provides sample vial flexibility and with the proven PASA™ injection concept, reliable and accurate sample handling is guaranteed. The autosampler also features three distinct injection modes, "full loop filling" (highest precision and 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.

Sample injection

Sample capacity	standard tray: for 84 vials x 1.5 ml + 3 vials x 10 ml
	optional trays: for 96 vials x 1.5 ml or 24 vials x 10 ml
Sample tray cooling	none
Injection volumes	1 – 5 000 µl (preparative option: 10 000 µl when software-controlled)
Sample loop	100 µl standard; 10 ml for preparative option
Dispenser syringe	250 µl standard; 1 000 µl optional; 2500 µl for preparative option
Vial detection	missing vial detection by sensor
Headspace pressure	built-in compressor
Switching time inj. valve	< 100 ms
Piercing precision needle	± 0.6 mm
Wash solvent	external wash solvent bottle
Wetted materials	stainless steel (SS316), PTFE, Tefzel®, Vespel®, glass, Teflon®. For biocompatible version: PEEK
Injection cycle time	73 sec for 10 µl partial loopfill including 250 µl needle wash
Pressure stability	400 bar

Analytical performance

Injection modes	full loop, partial loopfill and µl-pickup mode; PASA™ (pressure-assisted sample aspiration)
Injection volumes	full loop injection max. 5 000 µl
	partial loopfil injection up to ½ loop volume (1 µl increment)
	µl pickup injection: up to ½ loop volume – 1.5 x needle volume
Injections per vial	max. 9 injections
	(unlimited when controlled by software; in sequence mode: max. 9 injections)
Injection precision	full loop injections ≤ 0.3% RSD Partial loopfill ≤ 0.5% (prep. ≤ 1.0%) RSD injection volume > 10 µl
	µl-pickup ≤ 1.0% RSD injection volume > 10 µl
Analysis time	max. 9 h, 59 min, 59 s
Sample carryover	< 0.05% (prep. < 0.1%) with programmable needle wash

Communication

Outputs	2 inject marker (relay, TTL), 2 auxiliary (relay), alarm (relay)
Inputs	next injection, freeze, stop (all TTL)
Control	RS-232, standalone

General

Power supply	115 – 230 Volt AC +10% / -22%; 50 – 60 Hz; 200 VA
Dimensions	300 mm x 500 mm x 340 mm (W x H x D)
Weight	19 kg

Ordering details:

A5007	Autosampler KNAUER Optimas analytical HPLC autosampler standard
A50071	Autosampler KNAUER Optimas analytical HPLC autosampler with sample tray cooling
A50072	Preparative option kit for Autosampler KNAUER Optimas tray for 24 x 10 ml vials, large bore injection valve, 2.5 ml syringe, 10 ml sample loop
A50073	Biocompatible option kit for Autosampler KNAUER Optimas PEEK injection valve, biocompatible needle, 100 µl PEEK sample loop
A50076	Wash bracket for 2 x 250 ml wash bottles (including wash bottles)

AZURA made in germany

Column thermostats

T-1

A stable column temperature considerably improves reproducibility. This column oven provides for accurate thermostatting from 5 to 80 °C for up to six columns. Its internal volume of valves and cartridges is optimized for low dispersion.

The eluent is equilibrated before reaching the column for improved resolution and sharper peaks. The column effluent is cooled before reaching the detector to minimize noise and drift.

With the integrated UHPLC switching valves (option), tasks such as multi column switching and alternating column regeneration are possible. With the RFID column recognition feature for up to six columns simultaneously the T-1 provides most up-to-date GLP compliance.

Column thermostat includes accessories. With column switching valves and touch screen.

Thermostatting
Heating and cooling system	air circulation
Temperature range	5 – 80 °C, 41 – 176 °F
Heating/cooling rate	heating rate:
	5 °C/min, 41 °F/min in the temperaturerange 15 - 60 °C;
	temperature range 15 - 60°, approx. 5 °C/min;above 60 °C, <5 °C/min
	cooling rate:
	4 °C/min, 39,2 °F/min temperature range 10 - 80 °C50-176 °F; dependent on the ambient temperature
Temperature stability	± 0.1°C (32.18 °F)
Eluent preheating	passive tempering; replaceable cartridges 2 µl and 15 µl
Postcolumn cooling	active post-column tempering from 15 – 35 °C, 59 – 95 °F;
	replaceable 2 µl and 30 µl cartridge

Column compartment
Column dimensions	maximum length of columns: 300 mm with precolumn
	max. number of UHPLC columns: 6
	inner diameter of columns: 10 µm to 8 mm
Dimensions, interior	370 x 85 mm (D x H)
Column protection	programmable temperature shut down
Leak sensor	gas sensor for solvent

Communication
Digital control and output	Ethernet and RS-232
Technical parameters	
Special features	housing door: opens to the left ; door sensor: door opens up to an angle of 110°
	RFID: for up to 6 columns, RFID chip in the screw fitting of the column
	valves: maximum 2 automatic switching valves (multi–postion and 2 position switching valve)
Display	3.5" touch sensitive display for manual operation
Ambient conditions	temperature range: 4 – 40 °C; 39.2 – 104 °F
	air humidity below 90% humidity (non-condensing)

General
Dimensions	211 x 567 x 487 mm (W x H x D)
Weight	23.7 kg (with 2 valves)

Ordering details:

A63410	T-1 column thermostat with valves 6-port-multi-position, touch screen including accessories
A63412	T-1 column thermostat including accessories only remote control
A63461	T-1 upgrade kit single valve drive incl. accessories
A63460	T-1 upgrade kit two valve drives incl. accessories
A64611	6-port-2-position valve, 1/32*0.15mm, 15000psi incl. accessorie kit
A64615	6-port-mult- position valve, 1/32*0.15mm, 15000psi incl. accessorie kit
A64613	10-port-2-position valve, 1/32*0.15mm, 15000psi incl. accessorie kit
M5018	Rotor seal 6-multi-position C75N Ventil, 1/32",15 mm, 50C
M5019	Stator 6-multi-position C75N Ventil, 1/32", 15 mm, 50C
A63450	Cartridge for T-1 post column thermostat, ID 0.12 mm, 2 µl
A63451	Cartridge for T-1 post column thermostat, ID 0.25 mm, 30 µl
A63453	Cartridge for T-1 eluent pre-heating, ID 0.12 mm, 2 µl
A63454	Cartridge for T-1 eluent pre-heating, ID 0.25 mm, 15 µl

AZURA made in germany

AZURA CT 2.1

The AZURA CT 2.1 is the new price attractive basic column thermostat. It is suitable for column thermostatization above and below room temperature. The instrument operates with a microprocessor controlled Peltier element for exact temperature settings. It is possible to program linear and non-linear temperature gradients. The AZURA Column Thermostat can hold, depending on the column diameter, up to four liquid chromatography columns with a maximum length of 350 mm each. The maximum outer diameter of the HPLC column is 25 mm.

Thermostatting

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

Column compartment

Column dimensions	analytical and preparative columns up to 25 mm OD and 350 mm length; maximum of 4 columns
Dimensions, interior	90 x 390 x 47 mm (W x H x D)
Safety	self-check and auto-calibration at power-on; selectable turn-off temperature
Leak sensor	adjustable sensitivity; acoustic signal; turn-off switch
Optional accessories	passive pre-column tempering with capillary with 0.1 or 0.25 mm inner diameter

Communication

Control	LAN Interface
Display	optional LCD for Stand-alone functionality

General

Power supply	90 – 230 V, 50 – 60 Hz, 100 W
Dimensions	150 x 470 x 300 mm (W x H x D)
Weight	8.4 kg

Ordering details:

A05852	AZURA CT 2.1 for constant temperatures and reproducible results
A05852-3	Cartridge for CT 2.1 eluent pre-heating ID 0.10 mm
A05852-2	Cartridge for CT 2.1 eluent pre-heating ID 0.25 mm
A05852-1	AZURA Column Thermostat CT 2.1 keyboad unit optional

Diode array detectors

AZURA DAD 6.1L

The next generation of KNAUER DAD detectors begins with the new AZURA DAD 6.1L. It features a novel light path and flow cell architecture with improved handling and excellent performance. The frontal lamp and cell change ensures easy and secure maintenance. The temperature controlled optical bench minimizes signal drift. The wide flow cell selection allows the DAD 6.1L to be easily adapted to your needs.

An optional fiber optics adaptor offers the possibility to separate the flow cell spatially from the device and thus provides enhanced security for hazardous, explosive or toxic work processes.

The DAD 6.1L comes installed with a high brightness deuterium and a tungsten halogen lamp which cover a wavelength range from 190 to 1020 nm. This detector can be controlled with OpenLab® EZChrom and ClarityChrom® software, as well as from an optional touch display (stand-alone operation), via LAN or through analog input/output, allowing it to be integrated into almost any LC system.

Detection

Detector type	Diode array detector
Number of diodes	1024
Detection channels	8
Light source	high brightness deuterium (D2) lamp and halogen lamp with integrated GLP chip
Wavelength range	190 - 1020 nm
Spectral bandwidth	< 3.5 nm at Hα line (FWHM)
Wavelength accuracy	± 1 nm
Wavelength verification	internal holmium filter and deuterium lines
Noise	± 3.5 µAU at 254 nm
Drift	300 µAU/h at 254 nm
Linearity	> 2.0 AU at 274 nm
Time constants	0.0 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
Flow cell	not included (see Accessories / Spare parts)
Integration time	automatic

Communication

Maximum data rate	100 Hz (LAN)
Inputs	Error (IN), Start (IN), Autozero
Outputs	Events 1 - 2, Error (OUT), + 5 V, Valve + 24 V, Valve (OUT)
Analog outputs	4 x 0 - 5 V, 16 bit
Control	digital: LAN-DHCP, remote connector
	manual: control unit (optional)
Programming	wake up

Technical parameters

GLP	detailed report including lamp recognition, operating hours, lamp operating hours, number of lamp ignitions
Display	optional control unit
Ambient conditions	temperature range: 4 - 40 °C, 39.2 - 104 °F
	humidity: below 90 % noncondensing

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
Leak sensor	yes

Ordering details:

ADC11	AZURA DAD 6.1L, Diode array detector 190-1020 nm
AMC19	KNAUER LightGuide flow cell cartridge, 10 mm path length, 1/16", 2 µl volume, biocompatible,
AMD59	KNAUER LightGuide flow cell cartridge, 50 mm path length, 1/16", 6 µl volume, biocompatible
AMC38	KNAUER flow cell cartridge, 10 mm path length, 1/16", 10 µl volume, stainless steel
AMB18	KNAUER flow cell cartridge, 3 mm path length, 1/16", 2 µl volume, stainless steel
AZL01	D2 lamp for DAD 6.1L
AZL02	Halogen lamp for DAD 6.1L
AMKX8	Fiber optics adapter for DAD 6.1L
AMLX8	Test cell for DAD 6.1L

Diode array detectors

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 exchangable 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. This detector can be controlled with OpenLab® EZChrom and ClarityChrom® software, as well as from an optional touch display or Mobile Control (stand-alone operation), via LAN or through analog input/output, allowing it to be integrated into almost any LC system.

Detection

Detector type	DAD 2.1L, Diode array detector / MWD 2.1L, Multiwavelength detector
Number of diodes	256
Detection channels	8 (Digital) 4 (Analog)
Light source	Deuterium (D2) lamp with integrated GLP chip
Wavelength range	190 - 700 nm
Spectral bandwidth	< 8 nm at Hα line (FWHM)
	Note: digital bandwidth 1 - 32 nm
Wavelength accuracy	± 0.5 nm
Wavelength precision	± 0.1 nm
Wavelength verification	Internal holmium filter and deuterium lines
Noise	± 5 µAU at 254 nm
Drift	300 µAU/h at 254 nm
Linearity	> 1.6 AU at 274 nm
Time constants	0.0 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
Flow cell	not included (see Accessories / Spare parts)
Integration time	automatic (5-1000 ms)

Communication

Maximum data rate	100 Hz (LAN) 12.5 Hz (Analog)
Inputs	Error (IN), Start (IN), Autozero
Outputs	Events 1 - 2, Error (OUT), + 5 V, Valve + 24 V, Valve (OUT)
Analog outputs	4 x 0 - 5 V, 16 bit
Control	digital: LAN-DHCP, remote connector
	manual: Control Unit (optional), or Mobile Control (optional)
Programming	Wake up

Technical parameters

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

General

Power supply	100 – 240 V, 50 – 60 Hz, 75 W
Dimensions	361 x 158 x 523 mm (W x H x D)
Weight	12.8 kg
Leak sensor	Yes

Ordering details:

ADC01	AZURA Detector DAD 2.1L, Diode array detector 190-700 nm
ADB01	AZURA Detector MWD 2.1L, Multiwavelength detector 190-700 nm, 8 channel
AMC19	KNAUER LightGuide flow cell cartridge, 10 mm path length, 1/16", 2 µl volume, biocompatible,
AMD59	KNAUER LightGuide flow cell cartridge, 50 mm path length, 1/16", 6 µl volume, biocompatible
AMC38	KNAUER flow cell cartridge, 10 mm path length, 1/16", 10 µl volume, stainless steel
AMB18	KNAUER flow cell cartridge, 3 mm path length, 1/16", 2 µl volume, stainless steel
A5193	Deuterium lamp for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520 detectors
AMKX8	Fiber optics adapter for DAD 2.1L
AMLX8	Test cell for DAD 2.1L

AZURA UV/VIS Detector UVD 2.1L
Variable single wavelength

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. This detector can be controlled with OpenLab® EZChrom Edition and ClarityChrom® software, as well as from an optional control unit with touch display (stand-alone operation), via LAN, via RS-232, or through analog input/output. 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.

Detection

Detector type	variable single wavelength UV/VIS detector
Detection channels	1
Light source	deuterium (D2) lamp with integrated GLP chip
Wavelength range	190 - 750 nm
Spectral bandwidth	11 nm at Hα line (FWHM)
Wavelength accuracy	± 2.5 nm
Wavelength precision	0.3 nm (ASTM E1657-98)
Noise	± 1.5 x 10-5 AU at 254 nm (ASTM E1657-98)
Drift	3.0 x 10-4 AU/h at 254 nm (ASTM E1657-98)
Linearity	> 2.0 AU at 270 nm (ASTM E1657-98)
Time constants	0.0 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
Flow cell	not included (see Accessories / Spare parts)
Integration time	automatic

Communication

Maximum data rate	50 Hz (LAN, Analog)
	10 Hz (RS-232)
Inputs	Error (IN), Start (IN), Autozero, 1 - 10 V Analog IN
Outputs	Events 1 - 3, + 5 V, 24 V Valve
Analog outputs	1 x 0 - 5 V scalable, 16 bit, offset adjustable
Control	digital: LAN-DHCP, RS-232, remote connector
	analog: wavelength control
	manual: control unit (optional)
Programming	timed: wavelength, events, fraction valve, links, wake up (program, link);
	19 programs, 99 program lines

Technical parameters

GLP	detailed report including lamp recognition, operating hours, lamp operating hours, number of lamp ignitions
Display	optional control unit
Ambient conditions	temperature range: 4 - 40 °C, 39.2 - 104 °F
	humidity: below 90 % noncondensing

General

Power supply	100 - 240 V, 50 - 60 Hz, 70 W
Dimensions	361 x 158 x 523 mm (W x H x D)
Weight	5.9 kg
Leak sensor	yes

Ordering details:

ADA01XA	AZURA UV/VIS Detector UVD 2.1L 190 - 750 nm, variable single wavelength UV/VIS detector
ADA04XA	AZURA UV/VIS Detector UVD 2.1L fiber optics 190 - 750 nm, variable single wavelength UV/VIS detector
A4061XB	Analytical flow cell UV 10 mm path length, 1/16", 10 μl volume, 1.1 mm ID
A4042	Analytical flow cell UV 3 mm path length, 1/16", 2 μl volume, 1 mm ID.
A5193	Deuterium lamp for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520 detectors
A4126	Test cell, holmium oxid filter
A4146	Test cell, WG280 filter, stray light
A4123	Test cell

AZURA made in germany

BlueShadow UV/VIS Detector 50D
Variable multiple wavelength

The BlueShadow 50D offers high sensitivity and baseline stability for HPLC applications including fast LC methods. With its high speed scanning design, up to four different wavelengths can be monitored simultaneously while acquiring spectral data from 190 to 900 nm (dual lamp version). Its remarkable values for noise, drift, and linearity are achieved through smart optical bench technology and the use of optimized components.

The detector comes installed with deuterium and halogen lamps which cover a wavelength range from 190 to 900 nm. With its extensive programming and control functions as well as input/output options (front panel, RS-232, LAN, analog), it can be integrated into almost any LC system.

Due to a smart design the flow cell is easily accessible and can be changed very quickly. A wide range of flow cells is available for practically any LC application, including micro flow cells for flow rates up to 10 µl/min and flow cells for preparative HPLC up to 10 l/min.

Detection

Detector type	variable multiple wavelength UV/VIS detector
Detection channels	4
Light source	deuterium (D2) and halogen lamps with integrated GLP chip
Wavelength range	190 – 900 nm
Spectral bandwidth	6 nm at Hα line (FWHM)
Wavelength accuracy	± 2.0 nm (verification with integrated holmium oxide filter)
Wavelength precision	0.4 nm (ASTM E275-93)
Noise	± 0.75 x 10 - 5 AU at 254 nm (ASTM E1657-98)
Drift	1.5 x 10-4 AU/h at 254 nm (ASTM E1657-98)
Linearity	> 2.2 AU at 270 nm (ASTM E1657-98)
Time constants	0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
Flow cell	not included
Integration time	automatic

Communication

Maximum data rate	80 Hz (LAN, Analog) 1 channel 10 Hz (RS–232) 1 channel
Inputs	Error (IN), Start (IN), Autozero, 0 - 10 V Analog IN
Outputs	Events 1 - 3, + 5 V, 24 V Value
Analog outputs	2 x 0 - 5 V scalable, 20 bit, offset adjustable
Control	digital: LAN-DHCP, RS-232, remote connector analog: wavelength control manual: touchpad
Programming	timed: wavelengths, events, fraction valve, links, wake up (program, link); 9 programs, 50 program lines

Technical parameters

GLP	detailed report including lamp recognition, operating hours, lamp(s) operating hours, step motor operating hours, number of lamp ignitions
Display	touchscreen TFT 2.4"
Ambient conditions	Temperature range: 4 – 40 °C; 39.2 – 104 °F Humidity: below 90% noncondensing

General

Power supply	100 – 240 V, 50 – 60 Hz, 75 W
Dimensions	242 x 169 x 399 (W x H x D)
Weight	5.3 kg

Ordering details:

C55191XA.0	BlueShadow UV/VIS Detector 50D 190 - 900 nm, variable multiple wavelength UV/VIS detector
C55190XA.0	BlueShadow UV/VIS Detector 50D 190 - 750 nm, variable multiple wavelength UV/VIS detector
A4061XB	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID
A4042	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID
A5193	Deuterium lamp for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520 detectors
A4126	Test cell, holmium oxid filter
A4146	Test cell, WG280 filter, stray light
A4123	Test cell

AZURA made in germany

AZURA UV Detector UVD 2.1S
Small variable single wavelength

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 penLab® EZChrom Edition and ClarityChrom® software, as well as from the front panel (stand-alone operation), via LAN, via RS-232, or through analog input/output.

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.

Detection

Detector type	small variable single wavelength UV detector
Detection channels	1
Light source	deuterium (D2) lamp with integrated GLP chip
Wavelength range	190 - 500 nm
Spectral bandwidth	13 nm at Hα line (FWHM)
Wavelength accuracy	± 3 nm
Wavelength precision	0.7 nm (ASTM E1657-98)
Noise	$\pm 1.5 \times 10^{-5}$ AU at 254 nm (ASTM E1657-98)
Drift	3.0×10^{-4} AU/h at 254 nm (ASTM E1657-98)
Linearity	> 2.0 AU at 270 nm (ASTM E1657-98)
Time constants	0.00 / 0.02 / 0.05 / 0.1 / 0.2 / 0.5 / 1.0 / 2.0 s
Flow cell	not included (see Accessories / Spare parts)
Integration time	automatic

Communication

Maximum data rate	50 Hz (LAN, Analog)
	10 Hz (RS-232)
Inputs	Autozero, Start (IN), Error (either IN or OUT), 1 - 10 V Analog IN
Outputs	Error (either OUT or IN)
Analog outputs	1 x ± 2.5 V scalable, 20 bit
Control	digital: LAN-DHCP, RS-232, remote connector
	analog: wavelength control
	manual: front panel

Technical parameters

GLP	lamp operating hours
Display	LED
Ambient conditions	temperature range: 4 - 40 °C, 39.2 - 104 °F
	humidity: below 90% noncondensing

General

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

Ordering details:

ADA00	AZURA UV Detector UVD 2.1S, 190 - 500 nm, small variable single wavelength UV detector
ADA05	AZURA UV Detector UVD 2.1S fiber optics 190 - 500 nm, small variable single wavelength UV detector with fiber optics connectors
A4061XB	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID
A4042	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID
A5193	Deuterium lamp for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520 detectors

Refractive index detectors

KNAUER

Smartline RI Detector 2300
Analytical refractive index

The Smartline RI Detector 2300 is a competitively priced differential refractometer suitable for detecting compounds with little or no UV activity such as sugars, lipids or polymers. The instrument is designed for use in analytical HPLC (high performance liquid chromatography) as well as for GPC (gel permeation chromatography) applications.

This detector can be controlled with OpenLab® EZChrom, ChromGate® and ClarityChrom® software via RS-232, as well as from the front panel (stand-alone operation), as well as through analog input/output; allowing it to be integrated into almost any LC system.

Delivery includes a 15 µl flow cell.

Detection

Detector type	analytical refractive index detector
Light source	LED
Wavelength	950 ± 30 nm
Refractive index range	1.00 - 1.75 RIU
Measurement range	± 1 x 10-3 RIU
Sensitivity	3 x 10-8 RIU
Noise	± 1.5 x 10-8 RIU
Maximum flow rate	5 ml/min
Measurement angle	45 °
Flow cell volume	15 µl
Wetted materials	stainless steel (1.4401), quartz glass, PTFE with 25% glass fibers, FFKM perfluor elastomer, PEEK
Time constants	0.1 / 0.2 / 0.5 / 1.0 / 2.0 / 5.0 / 10.0 s
Autozero	full range

Communication

Inputs	Start (IN), Autozero, Flush
Outputs	Error (OUT), signal polarity can be inverted
Analog outputs	1 x ± 1 V scalable
Control	digital: RS–232, remote connector manual: front panel

Technical parameters

GLP	operating hours, serial number
Display	LCD
Ambient conditions	temperature range: 4 - 40 °C, 39.2 - 104 °F humidity: below 90 % noncondensing

General

Power supply	90 - 260 V, 47 - 63 Hz, 30 W
Dimensions	226 x 135 x 410 mm (W x H x D)
Weight	8.0 kg

Ordering details:

A5160	Smartline RI Detector 2300 analytical refractive index detector, 45 °, including flow cell and accessories
A0294	Flow cell RI, 45 degrees, 15 ul, analytical
A0277	Gaskets for cuvette, suitable for A0294

AZURA made in germany

Refractive index detectors

Refractive Index Detector RefractoMax 520

Analytical Refractive Index

The RefractoMax 520 analytical is a sensitive refractive index detector suitable for detecting compounds with little or no UV activity such as sugars, lipids or polymers. The instrument is designed for use in analytical HPLC with flow rates of 0.5 - 5 ml/min.

The handling of this device is easy given that the user can see the working conditions at a glance on the coloured display screen. Also, complex processes such as the change of eluent in the reference cell can be automated via the start-up button. Furthermore, simple instrument validation and calibration can also be carried out via the "HELP" function.

A stable baseline is achieved in the shortest possible time by optimisation of the temperature control and thermal isolation. Due to its baseline stability, the RefractoMax shows a superior signal to noise ratio. Nearly no drift appears even at long analysis times.

The detector is equipped with a leak sensor that switches off the pump automatically. External inlet and outlet ports, as well as the RS 232 interface, allow communication with all chromatography systems.

Delivery includes a 8 µl flow cell.

Detection

Detector type	analytical refractive index detector
Light source	tungsten lamp
Refractive index range	1.00 - 1.75 RIU
Measurement range	0.25 - 512 µRIU
Linearity	≥ 600 µRIU
Noise	2.5 nRIU (Response: 1.5 s)
Drift	0.2 µRIU/h
Maximum flow rate	10 ml/min (pure water)
Flow cell	temperature control: 30 - 50 °C (1 °C steps) type: 2 chamber maximum pressure: 0.5 bar
Flow cell volume	8 µl
Wetted materials	stainless steel 316, teflon, quartz glass
Time constants	0.1 / 0.25 / 0.5 / 1.0 / 1.5 / 2.0 / 3.0 / 6.0 s
Autozero	optical and electrical autozero full refractive index range

Communication

Inputs	Purge On/Off, Autozero, Marker
Outputs	Ready, Leak, Error
Analog outputs	recorder: 0 - 10 mV/FS integrator: DC 0 - 1V
Control	digital: RS232C manual: front panel

Technical parameters

Display	LCD
Ambient conditions	temperature range: 5 - 40 °C humidity: below 80% for temperatures up to 31 °C

General

Power supply	AC 100 - 240 V ± 10%, 50/60 Hz, max. 120 VA
Dimensions	260 x 150 x 450 mm (W x H x D)
Weight	12 kg

Ordering details:

A3280	Refractive Index Detector RefractoMax 520 analytical refractive index detector, 0.5 - 5 ml/min, including flow cell and accessories
A3281	Refractive Index Detector RefractoMax 520 preparative refractive index detector, 5 - 200 ml/min, including flow cell and accessories
A3282	Refractive Index Detector RefractoMax 520 ULTRA analytical refractive index detector, 0.1 - 1 ml/min, including flow cell and accessories
A3283	Refractive Index Detector RefractoMax 520 Semi-preparative refractive index detector, 1 - 50 ml/min, including flow cell and accessories
AZB00	IFU 2.1 Interface Box IFU 2.1 USB

AZURA CM 2.1S

High precision online monitor for measurement of conductivity and optionally pH-value

The AZURA Conductivity Monitor CM 2.1S is a high precision on-line monitor for the measurement of conductivity and pH in biochromatography applications. Contactless conductivity measurement.

Without conductivity flow cell. Flow cell has to be ordered separately.

Detection

Flow cell	10 ml or 100 ml
Detector type	conductivity
Measurement range	1 µS/cm – 999 mS/cm
Drift	temperature sensor ± 0.3 °C per 10 h
pH measurement	2 - 12

Communication

Maximum data rate	approx. 5 Hz
Supported electrodes	conductivity: automatic recognition
	pH: all pH electrodes with BNC connector (compatible) and available flow cell
Autozero	automatic
Measurement accuracy	temperature sensor accuracy: ± 1.0 °C;
	conductivity accuracy: < 2% full scale or ± 5 µS/cm whichever is greater in the range 1 µS/cm – 300 mS/cm
Analog outputs	2 channels
	DAC 18 bit
	conductivity value
	pH Value (only for the stand-alone device)
Digital outputs	LAN; RS-232

Technical parameters

GLP	electronic Serial No.
Display	LCD, 2 x 8 characters
Ambient conditions	operating temperature: 15 to 35 °C, relative humidity: 45 to 85%

General

Power supply	100 – 240 V, 50 – 60 Hz, max. 20W
Dimensions	121 x 129 x 187 mm (W x H x D)

Ordering details:

ADG30	AZURA CM 2.1S high precision online monitor for measurement of conductivity and optionally pH-value
A4156	Analytical flow cell CM 2.1S 10 ml, 1/16", 0,25 mm ID, 160 bar for AZURA CM 2.1S
A4157	Preparative flow cell CM 2.1S 100 ml, 1/16", 0,75 mm ID, 100 bar for AZURA CM 2.1S
A70091	pH-measurement kit for conductivity monitor AZURA CM 2.1S

AZURA made in germany

Conductivity/pH monitors

Conductivity Monitor CM OPTEK
conductivity monitor with pH for flow rates >100 to 1000 ml/min

The conductivity monitor CM OPTEK is a high precision device for the monitoring of salt and pH gradient in biochromatography applications. It is used for FPLC for flowrates up to 1000 ml/min.

The CM OPTEK includes the flow cell for both sensors (conductivity and pH) and two different temperature sensors for conductivity and pH. Conductivity and pH are temperature depending parameters. About an adjustable temperature compensation, the correct values on the display are shown.

Detection

Flow cell	>100-1000 ml/min
Detector type	conductivity and pH monitor
Measurement range	1 µS/cm–850 mS/cm
pH measurement	0-14
Sensitivity	pressure limit of both sensors are 6 bar

Communication

Supported electrodes	conductivity: about conductivity sensor
	pH: about pH sensor (for electrodes with demesions of Ø 12 x 120 mm, PG 13.5 thread)
Measurement accuracy	temperature sensor accuracy: ±0.2 °C;
	conductivity accuracy: ±0.5%
	pH accuracy: ±0.01
Analog outputs	2 channels (conductivity and pH)
	0-10 mA

Technical parameters

Display	backlit LCD, dual 5-digits, 7-segments
Ambient conditions	operating temperature: -10 to 75 °C, relative humidity: up to 95%

General

Power supply	12-30 V DC
Dimensions	310 x 190 x 400 mm (W x H x D)

Ordering details:

A70094	CM OPTEK Conductivity and ph monitor prep., controller for 2 sensors, 24V for >100 bis 1000 ml/min
AZB00	IFU 2.1 Interface Box IFU 2.1 USB

Conductivity detector

KNAUER

Conductivity detector CDD-10 Avp

Conductivity detector with flow cell 0.25 µl for Ionchromatographie.

Detection

Noise Level	less than 4 nScm-1 (BG: F285 µScm-1)
Drift (Time)	less than 25 nScm-1 (BG: F285 µScm-1)
Drift (Temperature)	less than 25 nScm-1 (BG: F285 µScm-1)
Ambient Temperature	4 - 35 deg. C
Response	time constant: 0.05, 0.1, 0.5, 1.0, 1.5, 2.0, 3.0, 6.0, 8.0, 10.0 sec, 10 steps
Zero Adjustment	auto zero, baseline shift
Porality	positive and negative
Measurement Range	0.01 - 51,200 µScm-1 FS

Measurement Sensitivity

Gain	0.01, 0.1, 1, 10, 100 µScm-1 FS/mV, 5 steps
Range	1 - 512, SHORT
Display	LCD with Back-lit

Output

Recorder	10 mV recorder terminal
Integrator	100, 10, 1, 0.1, 0.01 mV/µScm-1
Cell	0.25 µL volme, 2.9 MPa max. pressure, SUS316, PEEK, Teflon
Temperature Control	25 - 55 deg. C (1 deg. C step), OFF
Power Requirements	AC100 - AC240 V, 250 VA
Dimensions	W 260mm x D 420 mm x H 140 mm

Ordering details:

A1252-1	Conductivity detector CDD-10 Avp with flow cell 0.25 µl
AZB00	IFU 2.1 Interface Box IFU 2.1 USB

AZURA made in germany

Fluorescence detector

KNAUER

Fluorescence Detector RF-20A/Axs

The Shimadzu RF-20Axs is a spectrofluorometric detector for HPLC (high performace liquid chromatography) developed for high performance and mulit-functional capabilities.

The RF-20Axs is capable of measurements in single wavlength mode, dual wavelength mode, spectrum scanning mode and using a time program.

Detection

Detector type	spectrofluorometric detector
Detection channels	2
Number of signals	2
Light source	xenon lamp, low-pressure; mercury lamp for wavelength accuracy check (RF-20 Axs only)
Wavelength range	200 to 750 nm RF-20 Axs / 200 to 650 RF-20 A
Spectral bandwidth	20 nm
Wavelength accuracy	± 2 nm
Wavelength precision	± 0.2 nm Indicates the precision performance when the power is turned ON in single wavelength mode and the wavelength is changed.
Sensitivity	can be set at three levels: HIGH (x 1), MED (x 32), LOW (x 1024)
Wetted materials	SUS316L, PTFE (fluorocarbon polymers), quartz
Flow cell volume	12 µm
Time constants	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
Autozero	auto zero function, basline shift function

Heated zone

Temperature range	room temperature (ambient temperature) -10 °C up to 40 °C (at flow rates less than 2 ml/min, column oven temperatures less than 85 °C)

Communication

Gain	can be set at three levels: x 1, x 4, x 16
Technical parameters	
Ambient conditions	operating temperature: 4 to 35 °C, relative humidity: 20 to 85 % (no condensation)

General

Power supply	AC220–240 V, 400 VA, 50/60 Hz
Dimensions	260 x 210 x 420 mm (W x H x D)
Weight	18 kg

Ordering details:

A59200	Fluorescence Detector RF-20 A 200 - 650 nm, fluorescence detector, including accessories
A59201	Fluorescence Detector RF-20 Axs 200 - 750 nm, fluorescence detector, including accessories
A59213	Photomultiplier wavelength range 200 nm to 900 nm for RF-20A and RF-20Axs fluorescence detectors
A59211	Semimicro LC flow cell (Fluorescence Detector) for RF-20A and RF-20Axs fluorescence detectors, 3 µl volume, supports temperature control (RF-20Axs only)
A59212	Inert flow cell (Fluorescence Detector) for RF-20A and RF-20Axs fluorescence detectors, 12 µl volume
A59210	Xenon lamp for RF-20A and RF-20Axs fluorescence detectors

AZURA made in germany

Light scattering detector Sedex LC/85LT/90LT
Universal ELSD detection for HPLC

The Light Scattering Detector Sedex 80LT was developed for HPLC applications. Common fields of application include the analysis of non-UV active compounds such as: sugars, fats, surfactants, polymers, pharmaceuticals, amino acids or peptides as well as natural compounds. The analytes are being detected after evaporation of the mobile phase and thus become nearly independent from eluent composition.

The low temperature technology works in three steps:

Nebulization of the effluent and dicsrimination in favor of small mist droplet fraction in order to minimize background noise.

Evaporate the eluent at low temperatures to avoid thermal decomposition of delicate analytes.

Gas supported focussing of the analyte stream to increase sensitivity during light scattering detection and to avoid contamination of the optical unit.

Detection

Detector type	high sensitivity photomultiplier
Light source	selected high effciency blue LED (470 nm), elapsed-time counter
Sensitivity	< 5 ng caffein (LOD) / < 1 ng caffein (LOD) for 85LT
Maximum data rate	analog: 40 Hz, analog: 100 Hz 85LT, digital: 30 Hz

Nebulizer

Gas	nitrogen preferred
Gas flow rate	< 3 l/min
Gas inlet pressure	3.5 bar (51 psi)
HPLC flow rate (80 LT)	HPLC nebulizer: 100 µl/min–2 ml/min chiral chromatography nebulizer: 0.8 ml/min–5 ml/min flash chromatography nebulizer: 100 µl/min–5 ml/min
Maintenance	easily accessible from the front for cleaning

Heated zone

Temperature range	ambient to 100 °C
Communication	
Gain	factor 1 to 2048 in 12 steps (2 1 to 2 11)
Filter	moving average (0–10 seconds)
Analog outputs	0–1 V
Analog control input	contact closure for ready, auto-zero
Control	RS-232
Power-down methods	shut-off: gas, LED, heating and/or PMT cleaning mode

Technical parameters

Display	liquid crystal

General

Power supply	230 V/50 Hz, 1.7 A; 115 V/60 Hz, 1.8 A
Dimensions	250 mm x 480 mm x 550 mm (W x H x D)
Weight	18.5 kg

Ordering details:

A0754-5	Light scattering detector ELSD SEDEX LC
A0754-1	Light scattering detector Sedex 85LT highly sensitive, universal ELSD detection for HPLC, low temperature technology, supports high data rates
A0754-3	Light scattering detector Sedex 90LT, universal ELSD detection for HPLC, 500 µl- 2 ml/min including accessories
A2618-01	OpenLAB CDS EZChrom Edition drivers for Sedex 80/85/90LT not for fraction collection
A0754INST	Installation ELSD including IQ, OQ, PQ only Germany, Austria and Switzerland

Mass spectrometer

Advion Expression CMS Mass Spectrometer

The Advion Expression CMS enriches every KNAUER LC System. It can be added to a PLATINblue UHPLC System, as well as AZRUA HPLC Systems or preperative LC Systems.

The expression CMS provides essential information quickly and improves the chemist's workflow. Modern organic labs have become automated, yet real-time mass assays remain just out of reach — the expression CMS solves this at an affordable price.

Key features

- The only mass spec which fits in a fume hood with the sash closed
- All necessary components are located on the front of the instrument including 8 IO connections, USB port, and computer connector
- Pump and source exhaust are bi-directional to allow for optimal hood or bench location
- Solvent-resistant exterior
- Enclosed and N2-purged source and enclosed electronics for safety
- The 11 inch wide, 22 inch deep, fume hood-installable expression CMS delivers:
- Mass directed (or mass firmed) fraction collection from Prep LC
- Real-time reaction monitoring of batch reactions: understand kinetics and reach intelligent quench decisions
- Mass confirmation
- A mass detector which can be integrated into existing HPLC/UHPLC or Prep LC system, replacing expensive mass spectrometers purchased from another era

MS detection

MS type	single stage quadrupol
Ionization modes	ESI / APCI or APCI/ASAP
Polarity	positive & negative ion switching in single analysis
Mass range	expression S, m/z 10 to 1,200
	expression L, m/z 10 to 2,000
Scanning speed	10,000 m/z units sec-1 (compatible with UHPLC)
Mass resolution	0.5-0.7 m/z units (FWHM) at 1000 m/z units sec-1 over entire acquisition range
Mass accuracy	± 0.1 m/z units over entire acquisition range

Mass sensitivity

Scan sensitivity	100 pg Reserpine (FIA — 5µL sample injection volume at 100 µL/min) 100:1 S/N (RMS) with full-scan acquisition of m/z 100 to m/z 1200
SIM sensitivity	10 pg Reserpine (FIA — 5µL sample injection volume at 100 µL/min) 100:1 S/N (RMS) with SIM of m/z 609.3
Dimensions	(L x W x H) 56 cm x 28 cm x 66 cm

Ordering details:

A66201	Advion expressION-S CMS APCI version
A66202	Advion expressION-S CMS ESI version
A66206	Advion expressION-L CMS APCI version
A66207	Advion expressION-L CMS ESI version
A66203	APCI source for Advion expression CMS
A66204	ESI source for Advion expression CMS
A66205	Advion CMS Installation and Training
A66501	Nitrogen gas generator N118LA with air compressor
A66502	Nitrogen gas generator NM18L 18 l/min

AZURA made in germany

Electrochemical Detector DECADE II SCC/DCC
single cell control/dual cell control

This detector enables you to perform all applications using electrochemical detection. The DECADE II includes a highly stable Faraday-shielded oven compartment accommodating column and flow cell. This flow cell has surprised researchers for its unsurpassed S/N ratio and provides best possible combination for extremely sensitive EC analyses.

The DECADE II covers the DC, pulse and scan mode. The DC mode covers about 90% of all applications. The pulse mode is important for PAD (Pulsed Amperometric Detection) of for example carbohydrates. The scan mode is used to obtain a voltammogram in method optimization. Important parameters in the DC and pulse mode can be changed on a time base by user-defined commands, which enables maximum control to fully automate the detection. In addition, crucial parameters can be controlled by either relays or TTL.

For highest sensitivity, the SenCell is recommended with carbon electrode with a 5 year warranty.

Key features

- highest sensitivity – down to the low fentomol range (on column)
- excellent precision due to thermostatically controlled Faraday's cage for measuring cell and column
- flexible and efficient due to control of up to 4 cells
- wide selection of working and reference electrodes
- optimized signal to noise ratio via ADF (advanced digital filter)
- can be updated using flash-technology
- well-arranged display, screw connection for sample feed at the front

Detection

Detector type	electrochemical detector (DC, PAD and scan operating modes)
Outputs	between ± 1 V and ± 10 V (20 bit D/A converter)
Autozero	triggered via keypad, TTL or RS-232
Control	RS-232, data transmission with 1, 2, 5 or 10 Hz
Dimensions	220 x 440 x 440 mm (W x H x D)
Weight	14 kg

Ordering details:

A07544	Electrochemical Detector DECADE II SCC/DCC dual cell control, with DC, pulse and scan mode
A07543	Electrochemical Detector DECADE II SCC single cell control, with DC, pulse and scan mode
	Flow cells on inquiry

AZURA made in germany

Amperometric Detector ClinLab EC3000

The "EC3000" is suitable for analytical HPLC and in a wide range of applications. The automatic functions make the detector ideal for routine analysis. Various operation methods ease the optimization of measuring parameters for research applications. In order to avoid hazards from the connection of ground loops to external HPLC components, the individual electronic components and power supply are galvanically separated from each other. The EC3000 is easy to operate due to its menu structure with explanatory text fields, clear keyboard, and large illuminated display.

Flow cell included.

Detection

Detector type	amperometric detector
Working potential	0 – 2.00 V
Wetted materials	stainless steel, PTFE, PEEK, glass carbon, Kel-F, zirkonium oxide
Working electrode	glass carbon in Kel-F
Auxiliiary electrode	high quality stainless steel
Reference electrode	silver/silver chloride refillable
Flow cell volume	1.5 µm mit 30 µm spacer

Communication

Programming	0 – 99

General

Power supply	12 V DC 2 A
Dimensions	260 x 160 x 510 mm (W x H x D)
Weight	8.1 Kg

Ordering details:

A1085	Amperometric Detector ClinLab EC3000 electrochemical detector for clinical diagnostics
	Flow cells on inquiry

AZURA made in germany

Fraction Collectors: Foxy R1 and Foxy R2

The Fraction Collectors Foxy R1 and Foxy R2 can be used universally in research laboratories, for routine investigations, for analytical tasks, for semi-preparative separations and for bio compatible applications. The two-rack Foxy R2 fraction collector uses radio frequency identification to automatically detect collection racks for easy setup.

Software control

Foxy R1 and Foxy R2 can be controlled by chromatography software: ClarityChrom Preparative includes the drivers for several fraction collectors. For OpenLAB and PurityChrom, the Fraction collector control option is included.

The Fraction Collectors Foxy R1 and Foxy R2 feature:

- sturdy cast aluminum frame
- easy to use symbolic touch screen interface
- built-in Ethernet and RS-232 communication capabilities
- faster tube changes
- µL delay volume between diverter valve and drop former

Fraction collector R1

Number of racks	1
RFID rack recognition	no
Capillary connection	1/16"
Fractionation modes	drop counting, time intervals, volume intervals
Fractionation flow rate	max. 25 ml/min
Fraction capacity	12 mm diameter tubes (144/rack), 13 mm diameter tubes (144/rack), 16 mm diameter tubes (100/rack), 18 mm diameter tubes (72/rack), 25 mm diameter tubes (36/rack), 1.5 ml microcentrifuge tubes (60/rack), 50 ml centrifuge tubes (36/rack), 28 mm diameter scintillation vials (36/rack), 96-well microplates (up to 6 plates total), MiniVials (72/rack), funnel racks for fractions larger than 480 ml
Diverter valve	drop former (NC): 110 µl
	waste (NO): 130 µl
Delay volume	diverter valve located at drop former for µl delay volume. compensation only required for length of tubing to the diverter valve.
Wetted materials	valve: PEEK and perfluoroelastomer (FFKM), supplied ferrules: ETFE, supplied valve tubing: PTFE, supplied drain tubing: vinyl
Fractionation control	operator: front panel control via touch screen LCD
	integrated systems: direct communication via Ethernet (TCP/IP) and RS-232 serial communications
Fractionation tubes	12 mm diameter, 13 mm diameter tubes, 16 mm diameter tubes, 18 mm diameter tubes, 25 mm diameter tubes, 1.5 ml microcentrifuge tubes, 50 ml centrifuge tubes, 28 mm diameter scintillation vials, 96-well microplates, MiniVials
Maximum test tube height	150 mm
Communication	
Control	LAN, RS-232
Technical parameters	
Conformity	CE, CSA
Display	touch screen LCD displays
Ambient conditions	0 – 40 °C, 32 – 104 °F
General	
Power supply	100 – 240 VAC, 50 – 60 Hz, max. 1 A
Dimensions	31.1 x 33.0 x 35.5 mm (W x D x H)
Weight	7.1 kg

Azura made in germany

Fraction collectors

Ordering details:

|	
A59100	Fraction Collector FOXY R1 max. 25 ml/min, 1/16" connectors, rack with 13 mm or eligible rack
A59100-1	Fraction Collector FOXY R1 max. 25 ml/min, 1/16" connectors, rack with 13 mm or eligible rack, with fraction cooling
A59100-2	Fraction Collector FOXY R1 max. 125 ml/min, 1/16" connectors, rack with 13 mm or eligible rack
A59100-3	Fraction Collector FOXY R1 max. 125 ml/min, 1/8" connectors, rack with 13 mm or eligible rack
A59102	Fraction Collector FOXY R2 max. 125 ml/min, 1/8" connectors, standard 13 mm or eligible rack
A591021	Fraction Collector FOXY R2 max. 1000 ml/min, 1/4" connectors, 2 racks 25 mm included
A59122	Upgrade Cooling Foxy R1 with Hood, cooling plate and

Racks for Foxy R1/R2

Ordering details:

A59111	Rack for Foxy R1/R2 for 2 Microplates á 96
A59110	Rack for Foxy R1/R2 for 36 tubes (50ml)
A59109	Preparative funnel rack with 36 ETFE* funnels and 50 ft. of 1/4-inch ID vinyl tubing. (Requires 1 for Foxy R1; 2 for Foxy R2). Non-organic
A59108	Rack for Foxy R1/R2 for 25 mm vials
A59107	Rack for Foxy R1/R2 for 1.5ml pipe
A59106	Rack for Foxy R1/R2 for 18 mm vials
A59105	Rack for Foxy R1/R2 for 16 mm vials
A59104	Rack for Foxy R1/R2 for 13 mm vials
A59103	Rack for Foxy R1/R2 for 12 mm vials
A59114	Kit of two Racks for 9 bottles (480 ml)
A59112	Funnel tablet for fraction collector Foxy R1/R2
A59117	Rack for Foxy R1 with cooling option, 144 positions (12x12)
A59118	Rack 8x9 72 positions
A59119	Rack adapter for Foxy R1 with cooling option, for 2 96-well
A70050	Bioline thermostatting unit -40 ° to 200 °C
A70055	Thermostatting unit minichiller -20 ° to 40 °C
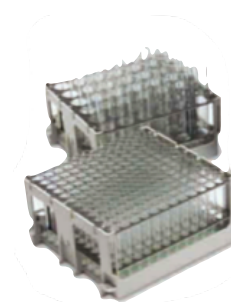
For Foxy R1 with cooling option, Racks A59117, A59118 and A59119 are suitable.

Specification:

article number	max volume (ml)	vessel outer diameter (mm)	vessel length (mm)	Rack	Foxy R1 capaticity	Foxy R2 capaticity
A59103	5	12	75	12 mm test tubes	144	288
A59103	7	12	100	12 mm test tubes	144	288
A59104	9	13	100	13 mm test tubes	144	288
A59105	11,5	16	100	16 mm test tubes	100	200
A59105	15	16	125	16 mm test tubes	100	200
A59105	20	16	150	16 mm test tubes	100	200
A59106	27	18	150	18 mm test tubes	72	144
A59106	32	18	180	18 mm test tubes	n/a	144
A59108	60	25	150	25 mm test tubes	36	72
A59108	70	25	180	25 mm test tubes	n/a	72
A59107	1,5	10	40	1.5 ml mirco-centrifuge or Eppendorf tubes	60	120
A59111	0,33-2,2	n/a	n/a	96-well microplates	2	4 or 6
A59114	480	68	165	bottle	9	18
A59109	unlimited	n/a	n/a	funnel	36	36 or 72

AZURA made in germany

AZURA V 2.1S multi-position valve for fraction collection

Multiposition valves are used for fraction collection, eluent selection or column switching. They have one port in a central position and one channel which connects the central port to one of the peripheric ports.

If more than one valve is needed for your application, it might be helpful two combine these as units in one stackable assistant ASM 2.1L.

AWA30BH

A5851

Valve drive

Control	LAN, RS-232, analog, keypad
Dimensions	105 x 100 x 185 mm (W x H x D), without valve
Display	LCD
Power supply	external DC24V, 60 W
Ambient conditions	temperature range: 4 – 40 °C; 39.2 – 104 °F
	air humidity below 90% humidity (non condensing)

General

Dimensions	valve diameter 47.5 mm
Weight	1.86 kg, without valve

					valve drive			
valve head	channel	valve head material	connection	bore size	6-port	10-port	12-port	16-port
none	—	—	—	—	AWA10	n/a	AWA20	AWA30
multiposition	1-channel	stainless steel	1/16"	0.6 mm	AWA10BA 300 bar	n/a	n/a	AWA30BH 50 bar
		PEEK	1/16"	0.6 mm	AWA10BB 250 bar	n/a	n/a	n/a
		stainless steel	1/8"	1.2 mm	AWA10BC 300 bar	n/a	AWA20BG 25 bar	n/a
		PEEK	1/8"	1.2 mm	AWA10BD 250 bar	n/a	n/a	n/a
		stainless steel	1/16"	0.15 mm	AWB02FA 1000 bar	n/a	n/a	n/a
		stainless steel	1/16"	0.25 mm	AWB02FB 700 bar	n/a	n/a	n/a
		stainless steel	1/4"	4.0 mm	n/a	A5850 7 bar	n/a	n/a
		PPS	1/4"	4.6 mm	A5851 7 bar	n/a	n/a	n/a

Ordering details:

AWA10BA	AZURA V 2.1S with 6-port multi-position valve head stainless steel, 1/16", including accessories (300 bar)
AWA30BH	AZURA V 2.1S with 16-port multi-position valve head stainless steel, 1/16", including accessories (50 bar)
AWA10BB	AZURA V 2.1S with 6-port multi-position valve head PEEK, 1/16", including accessories (250 bar)
AWA10BC	AZURA V 2.1S with 6-port multi-position valve head stainless steel, 1/8", including accessories (300 bar)
AWA20BG	AZURA V 2.1S with 12-port multi-position valve head stainless steel, 1/8", including accessories (25 bar)
AWA10BD	AZURA V 2.1S with 6-port multi-position valve head PEEK, 1/8", including accessories (250 bar)
A5850	VICI/VALCO 10-port multi-position valve 1/4" connectors, stainless steel (7 bar)
A5851	VICI/VALCO 6-port multi-position valve 1/4" connectors, Cheminert (7 bar)

Electric valves

Electric valves for injections and/or switching tasks

2-position valves are used mostly for injections, but can be used for complex switching systems as well. All ports are located in peripheric positions. The channels always connect two of these ports.

If more than one valve is needed for your application, it might be helpful to combine these as units in one stackable assistant ASM 2.1L.

Valve drive

Control	LAN, RS-232, analog, keypad
Dimensions	105 x 100 x 185 mm (W x H x D), without valve
Display	LCD
Power supply	external DC24V, 60 W
Ambient conditions	temperature range: 4 – 40 °C; 39.2 – 104 °F
	air humidity below 90% humidity (non condensing)

General

Dimensions	valve diameter 47.5 mm
Weight	1.86 kg, without valve

					valve drive			
valve head	channel	valve head material	connection	bore size	6-port	10-port	12-port	16-port
none	—	—	—	—	AWA10	n/a	AWA20	AWA30
2-position	2-channel	stainless steel	1/16"	0.6 mm	AWA10AB 300 bar	n/a	n/a	n/a
	3-channel	stainless steel	1/16"	0.6 mm	AWA10AA 300 bar	n/a	n/a	n/a
		PEEK	1/16"	0.6 mm	AWA10AC 250 bar	n/a	n/a	n/a
		stainless steel	1/8"	1.2 mm	AWA10AD 300 bar	n/a	n/a	n/a
		PEEK	1/8"	1.2 mm	AWA10AE 200 bar	n/a	n/a	n/a
		stainless steel	1/16"	0.15 mm	AWB02EA 1000 bar	n/a	n/a	n/a
		stainless steel	1/16"	0.25 mm	AWB02EB 700 bar	n/a	n/a	n/a

Ordering details:

AWA10AB	AZURA V 2.1S with 6-port/2-channel valve head stainless steel, 1/16", including accessories (300 bar)
AWA10AA	AZURA V 2.1S with 6-port/3-channel valve stainless steel, 1/16", including accessories (300 bar)
AWA10AC	AZURA V 2.1S with 6-port/3-channel valve PEEK, 1/16", including accessories (250 bar)
AWA10AD	AZURA V 2.1S with 6-port/3-channel valve head stainless steel, 1/8", including accessories (300 bar)
AWA10AE	AZURA V 2.1S with 6-port/3-channel valve head PEEK, 1/8", including accessories (200 bar)
AWB02EA	VICI/VALCO 6-port/ 3-channel valve stainless steel, 1/16", (1000 bar)
AWB02EB	VICI/VALCO 6-port/ 3-channel valve stainless steel, 1/16" (700 bar)
AWB02FA	VICI/VALCO 6-port multi-position valve, stainless steel, 1/16", including accessories (1000 bar)
AWB02FB	VICI/VALCO 6-port multi-position valve, stainless steel, 1/16", including accessories (700 bar)

Order sample loops from page 44.

AZURA made in germany

Manual injection and multi-position switching valve

Switching and injection valves by KNAUER have impressive performance data and an outstanding long-term stability. The valve is equipped with a REED contact that is closed (magnetically controlled) during injection. The start signal can be easily started with an integrator or HPLC software. The sample loops are also suitable for partial filling due to the fact that they flow in the reverse direction when injected (filled). In turn, this aids in the minimization of peak broadening.

Valves

Valves	injection valve / multi-position valve
Valve type	manual
Valve head material	stainless steel / PEEK
Rotor seal material	vespel /PPS
Capillary connection	1/16" / 1/8"
Ambient conditions	temperature range: 4 – 40 °C; 39.2 – 104 °F
	air humidity below 90% humidity (non condensing)

General

Dimensions	valve diameter 47.5 mm
Weight	0.36 kg

Mounting brackets on page 45

Ordering details:

A1357	Manual 6-port/3-channel injection valve stainless steel, 1/16", (300 bar)
A1358	Manual 6-port/3-channel injection valve PEEK, 1/16", (250 bar)
A1359	Manual 6-port/3-channel injection valve stainless steel, 1/8", (300 bar)
A1360	Manual 6-port/3-channel injection valve PEEK, 1/8", (250 bar)
A1361	Manual 6-port multi-position switching valve stainless steel, 1/16", (300 bar)
A1362	Manual 6-port multi-position switching valve PEEK, 1/16", (250 bar)
A1363	Manual 6-port multi-position switching valve stainless steel, 1/8", (300 bar)
A1364	Manual 6-port multi-position switching valve PEEK, 1/8", (250 bar)
A64601	VCI/VALCO manual injection valve for UHPLC systems, 1 µl sample loop (1000 bar)

Order sample loops from page 44.

Online degassers

AZURA DG 2.1S

The 4-channel degasser module provides outstanding performance through its use of a newly developed micro vacuum pump while taking up only a minimum of space. The gas diffusion rate has been improved by a factor of 200 - 300 times, thanks to a new amorphous fluoropolymer rather than a regular Teflon membrane. Excellent chemical and physical stability parameters, as well as the reduction of the internal chamber volume to less than 0.5 ml are convincing features. The analytical KNAUER online degasser module can be used for flow rates of up to 10 ml/min.

Degasser Module

Degassing method	gas permeation through Teflon® AF amorphous fluoropolymer membrane
Degassing efficiency	< 0.5 ppm dissolved O2 at 1 ml/min
Solvent applicability	universal, except hydrochloric acid and halogenated hydrocarbons especially hexafluoro isopropanol (HFIP)
Wetted materials	PEEK, glass-filled PTFE, Teflon® AF
Chamber material	polypropylene and stainless steel

Technical parameters

Ambient conditions	Ambient temperature: -20 to +60 °C
	Ambient Relative Humidity: 20 to 80% RH (without condensation)

General

Power supply	85 – 265 V, 47–63 Hz, 20 W
Dimensions	85 x 165 x 315 mm (W x H x D)
Weight	2.3 kg

Type	degasser channels	degasser maximum flow rate	degassing chamber volume	vacuum pump
AZE02	2	10 ml/min	285 µL per channel	1.37 mm (Hg /ml /min)
A5327	4	10 ml/min	480 µl per chamber	> 6.2 kPa : 400 cycles/min < 6.2 kPa : 60 cycles/min
A5327-1	4	10 ml/min	480 µl per chamber	> 6.2 kPa : 400 cycles/min < 6.2 kPa : 60 cycles/min
A5328	2	50 ml/min	7.7 ml per chamber	> 6.2 kPa : 400 cycles/min < 6.2 kPa : 60 cycles/min

Ordering details:

AZE02	AZURA DG 2.1S, small analytical 2 channel degasser
A5327	Smartline Online Degasser, 4-channel, analytical
A5327-1	Online degasser, 4-channel, analytical, biocompatible
A5328	Smartline Online Degasser, 2-channel, preparative

Software

ClarityChrom 5.X

ClarityChrom is an easy-to-use Chromatography Data System for workstations. The optional extensions for GC control, PDA and GPC allow to use the software for a wide spectrum of application. All KNAUER devices beside the PLATINblue system can be controlled. Additionally, devices and systems from more than 45 manufacturers are supported. The ClarityChromPrep includes the drivers for several fraction collectors and supports the peak recognition by level and/or slope. The manual fraction control and the option to use the KNAUER electric valves for fractionation gives you more flexibility.

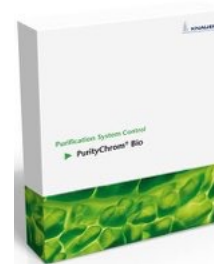|	
Package	ClarityChrom
System architecture	32bit CDS
Operating system	Windows 200 Prof., Windows XP, Windows Vista 32bit and 64bit, Windows 7 32bit and 64bit
Stand-alone	workstation version, max. 4 systems controlled by one computer, max. 3 complete systems recommended
Client/server	no client/server functionality
Multi-user environment	selectable system of user accounts with independently customizable behavior and appearance for individual users
Network environment	easy offline data sharing (at the file level) among all stations in a local network
Fields of application	analytical HPLC, GPC/SEC, GC
Supported instruments	all Knauer devices are supported, driver for devices from many other manufacturers are available
Instrument connection	supports RS-232, Ethernet, PCI interface card, A/D-D/A interface
Recommended PC hardware	Pentium 2 GHz, 2 GB RAM, 10 GB free hard disk space, separate graphics card if one PC should control more than one system
Graphics capabilities	multiple chromatogram view and overlay, PDA view
Integration	27 integration parameters (peak width, threshold, tangent slope ratio etc.) integration parameters programmable in time, automatic re-integration
Calculation types	with/without calibration (int./ext. standard method)
Security and GLP	installation qualification test of the software; FDA 21 CFR Part 11 conformance, validation with virtual detector
Instrument control	method-based instrument control, Instrument status display and direct control mode,
Calibration	6 types of calibration curves, up to 20 levels, reference peaks, groups, unlimited number of standards (peaks), LOD, LOQ
Chromatogram operations	overlay view, custom labels and settings, also applying mathematical operations to chromatograms
Automation	sequences, automatic launch of selected commands or applications immediately following chromatogram acquisition – post run, batch
Presentation of results	Integrated customizable table of results, columns with userdefined calculation, summary table, and export in text or database format
Calculations	custom: 12 predefined mathematical operators, 15 basic and 4 summary functions, special: Kovats indexes for GC, determination of noise/drift, performance calculations
Data import and export	ASCII, AIA, dBase
PDA option	3D chromatogram, peak purity analysis, spectrum search in self-made or commercial spectra library
GPC/SEC option	molecular weight determination in size exclusion chromatography with various calibration methods
System suitability test	automates the calculation of system suitability parameters for system validation

Ordering details:

A1670	ClarityChrom 5.x single instrument license for one time base
A1674	ClarityChrom 5.x offline license for data evaluation
A1671	ClarityChrom 5.x additional instrument license on additional time base
A1676	ClarityChrom 5.x option for PDA data processing
A1681	Upgrade for one sytem from former version to ClarityChrom or ClarityChromPrep 5.x
A1685	ClarityChrom Preparative 5.x single instrument license one time base
A1688	ClarityChrom Preparative offline license for data evaluation
A1686	ClarityChrom Preparative 5.x additional license one additional time base
A1677	System suitability option
A1678	Option for GPC data processing
A1679	Option for MS data processing
A1690	ClarityChrom/Prep demo with 30 day demo license
A1675	ClarityChrom 5.x university package one offline license

Software

PurityChrom Bio

PurityChrom® Bio is a volume-based chromatography software especially designed for the area of bio purification and FPLC applications. PurityChrom® Bio provides a very user friendly and clearly structured interface. The system visualization provides 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® Bio 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 visualization 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® Bio allows flexible support of different devices from KNAUER and other manufactures.

The basic version has limitations regarding the number of devices and data channels.

Package	PurityChrom Bio Basic License: 8 devices (one modul counts) 3 data channels without automatic injection
System architecture	32-bit CDS
Operating system	Windows XP, Windows Vista, Windows 7, Windows 8
Stand-alone	for one system and one computer
Multi-user environment	allows to create users in the system with individual access management
Fields of application	FPLC
Supported instruments	all KNAUER AZURA devices, the Foxy R1/R2 Fraction Collector (see Release Notes) and many other devices, detailed information on request
Instrument connection	supports RS-232, Ethernet, A/D-D/A interface
Recommended PC hardware	CPU/Memory: Pentium III or higher with at least 1 MHz 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
Graphics capabilities	multiple chromatogram view and overlay, PDA view
Integration	real-time analysis of peaks, automatic or manual integration and baseline correction
Security and GLP	FDA 21 CFR Part 11 conformance
Instrument control	method-based instrument control, Instrument status display and Direct-Control mode, Direct Control can also be enabled for a run
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	direct control during a run, stacked injection, display of solvent supply , waste managemant
FRC option	included
FRC features	fractionation can be controlled by time (volume), level, slope including AND/OR combination of these criteria, spectra comparison, local maximum and local minimum, individual limits for fraction size, full manual control of fractionation during a run
PDA option	3D chromatogram, peak purity analysis, spectrum search in self-made or commercial spectra library for this option the full and DAD license is needed

Ordering details:

A2650	PurityChrom Bio Basic License: 8 devices, 3 data channels, no autosampler supported
A2652	PurityChrom Bio extend to unlimited number of devices number and 8 data channels, autosampler supported
A2654	PurityChrom Bio 3D option for DAD

AZURA made in germany

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 Shared Services module is the base of the OpenLAB CDS architecture. The OpenLAB Shared Services Control Panel allows for all administrative activities, as system and interface configuration, administration of users and built-in administrative reports, in a uniform interface.

The OpenLAB CDS EZChrom Edition offers advanced functionality with an interface known from the ChromGate CDS. If you already work with ChromGate or EZChrom Elite, you will find the OpenLAB CDS EZChrom Edition as a simple upgrade regarding usability and workflow.

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).

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

Package	OpenLAB CDS EZChrom Edition
System architecture	32bit CDS
Operating system	workstation or client: Windows XP Professional, Windows Vista Business / Ultimate 32bit and 64 bit, Windows 7 Professional / Enterprise 32bit and 64 bit; Shared Services Server: Windows Server 2003 R2 SP2 or Windows Server 2008 R2
Stand-alone	on a workstation max. 3 systems controlled by computer recommended
Client/server	client/server functionality allows for using license keys from any computer in the network, full control of a control-PC (server) from any other computer (Client) in the network (Distributed System)
Multi-user environment	allows to create users in the system with individual access management or to apply users from the Windows domain or local PC
Network environment	runs on Windows networks based on TCP/IP
Fields of application	analytical HPLC, preparative HPLC, GPC/SEC, GC
Supported instruments	all currently offered KNAUER devices are supported from OpenLAB CDS EZChrom Edition version A.04.05, drivers and licenses from many other manufacturers als available
Instrument connection	supports RS-232, Ethernet, A/D-D/A interface
Recommended PC hardware	workstation or client: Pentium 2 GHz, 2 GB RAM, 40 GB free hard disk space, separate graphics card if one PC should control more than one system; Shared Services Server: Pentium 2 GHz, 4/6 GB RAM (32/64 bit), 40 GB free hard disk space
Graphics capabilities	multiple chromatogram view and overlay, PDA view, arrange all open windows
Integration	real-time analysis of peaks, automatic or manual integration and baseline correction
Calculation types	with/without calibration (int./ext. standard method)
Security and GLP	installation qualification test (IQ) of the software; FDA 21 CFR Part 11 conformance, validation of integration
Instrument control	method-based instrument control, Instrument status display and Direct-Control mode, Direct Control can also be enabled for a run
Calibration	several types of calibration curves, unlimited number of levels, several reference and ISTD peaks possible, groups, unlimited number of standards (peaks), LOD, LOQ
Chromatogram operations	overlay view, mathematical operations and smoothing
Automation	sequences, Run Queue allows submitting of single runs and/or sequences, automatic launch of selected commands, user programs or applications if the data acqusition is finished, post run, batch
Presentation of results	different report templates available, method custom report and advanced reports for individual reports, new Intelligent Reporter allows for creating complex reports in a drag-and-drop editor with pre-configured tables, graphics and matrices, results can be shown in chromatogram
Calculations	mathematical operations and smoothing, column performance calculations USP, DAB...
Data import and export	ASCII, ANDI (AIA) standard, OLE, ODBC
Special features	Direct Control during a run, pretreatment, stacked injection
FRC option	always included, for preparative HPLC, adds tools for detector controlled fraction collection, solvent and peak recycling
FRC features	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
PDA option	3D chromatogram, peak purity analysis, spectrum search in self-made or commercial spectra library
GPC/SEC option	molecular weight determination in size exclusion chromatography with various calibration methods
System suitability test	always included, automates the calculation of system suitability parameters for system validation

AZURA made in germany

KNAUER

OpenLAB CDS EZChrom Edition

Ordering details:

A2600-1	OpenLAB CDS EZChrom Edition Workstation for one system with SMA and 4x System Suitability
A2610-1	OpenLAB CDS 3D-Option for KNAUER scanning UV-detectors
A2611-1	OpenLAB CDS 3D-Option for diode array detectors
A2618-01	OpenLAB CDS EZChrom Edition Sedex 80/85/90LT drivers
A2612-1	OpenLAB CDS SEC/GPC Option
A2607-1	OpenLAB CDS EZChrom Elite Workstation, Upgrade from ChromGate 3.3.2 Standalone with existing Options, includes 4x System Suitability,
A2601-1	OpenLAB CDS EZChrom Edition Workstation license right-to-copy for one system with SMA and 4x System Suitability
A2602-1	OpenLAB CDS EZChrom Edition Instrument control license for one additional chromatography system for Workstation or distributed systems
A2614-1	OpenLAB CDS EZChrom Edition Distributed system license, includes system suitability, and SMA

Direct Control options for AZURA modules

Ordering details:

A9610	AZURA Mobile Control license for Android 4.xx and Windows 8
A9611	AZURA Mobile Control license for Android 4.xx and Windows 8 incl. router for single device
A9601	Tablet 7" (Android 4.xx) with AZURA Mobile Control
A9600	Tablet 10" (Android 4.xx) with AZURA Mobile Control
A9606	Tablet 8" (Windows 8/8.1) with AZURA Mobile Control

Ordering details:

AZD00	Control Unit CU 2.1 Direct control of AZURA devices via touchscreen

AZURA made in germany

EDV accessories

Ordering details:

A1311	MiniTower PC for KNAUER chromatography data system software
A1311E	MiniTower PC for KNAUER chromatography data system software
A1612	Monitor 19-Inch LCD Monitor

Ordering details:

A64809	Netgear ProSafe Router VPN Firewall 8 (WLAN, 1000 Mbit), Germany
A64809INT	Netgear ProSafe Router VPN Firewall 8 (WLAN, 1000 Mbit), Internat
M2637	Netgear ProSafe FS116 10/100 Desktop Switch
A3114	VSCOM USB 4 COM 4 x RS-232 DB9 on USB
A3115	VSCOM USB 2 COM 2 x RS-232 DB9 on USB
A3116	VSCOM USB 8 COM 8 x RS-232 DB9 on USB
AZB00	Interface Box "IFU 2.1" 4 channels, USB connection

Ordering details:

M0447V1	AC Input Plug PSAxxR-plug-UK for PSA-21R-240
M0447V2	AC Input Plug PSAxxR-plug-USA for PSA-21R-240
M0447V3	AC Input Plug PSAxxR-plug-AUS for PSA-21R-240
M1642	Power cable Europe rubber connector with power plug Europe
M1597	Power cable Switzerland rubber connector with power plug Switzerland
M1278	Power cable UK rubber connector with power plug UK
A3121	APC Smart UPS 1500 VA, 1 kW, 230 V, for up to 8 plugs
M2651	EU power plug to non-heating instruments plug

Column kits

RP column kit

BRP_KIT01	RP analytical column kit 5 µm, Eurospher II (C18, C18A, C8) 150 x 4 mm with integrated precolumn
BRP_KIT02	RP analytical column kit 3 µm, Eurospher II (C18, C18A, C8) 100 x 3 mm with integrated precolumn
BRP_KIT03	RP UHPLC column kit 2 µm, Bluespher (C18, C18A, C8) 50 x 2 mm
BRP_KIT04	RP UHPLC column kit 2.6 µm core shell, BlueShell (C18, C18A, PFP) 50 x 2mm
BRP_KIT05	RP semi-prep column kit 5 µm, Eurospher II (C18) 125 x 8 mm with precolumn 30 x 8 mm
BRP_KIT06	RP Scale-up column kit 5 µm, Eurospher II (C18) 150 x 4 mm with integrated precolumn, 150 x 20 mm
BRP_KIT07	RP preparative column kit 5 µm, Eurospher II (C18) 150 x 20 mm with precolumn 30 x 20 mm
BRP_KIT08	RP analytical column kit 3 µm, Eurospher II (C18H, C8, C18A), 150 x 4 mm ID
BRP_KIT09	RP analytical column kit 3 µm, Eurospher II (C18, C18P, C18A), 150 x 3 mm ID
BRP_KIT10	RP UHPLC column kit 1.8 µm, BlueOrchid (C18, C8, C18A), 50 x 2 mm ID
BRP_KIT11	RP UHPLC column kit 1.8 µm, BlueOrchid (C18, C8, C18A), 100 x 2 mm ID
BRP_KIT12	RP UHPLC column kit 2 µm, Bluespher (C18, C8, C18A), 100 x 2 mm ID
BRP_KIT13	RP UHPLC column kit 2.6 µm core-shell, BlueShell (C18, C18A, PFP), 100 x 2 mm ID
BRP_KIT14	RP UHPLC column kit 2.6 µm core-shell zur Validierung, BlueShell C18 (50, 100, 150 x 2 mm)

NP column kit

BNP_KIT01	NP analytical column kit 5 µm, Eurospher II (Si, NH2, Diol) 150 x 4 mm with integrated precolumn
BNP_KIT02	NP analytical column kit 3 µm, Eurospher II (Si, NH2, Diol) 100 x 3 mm with integrated precolumn
BNP_KIT03	NP semi-prep column kit 5 µm, Eurospher II (Si) 125 x 8 mm with precolumn 30 x 8 mm
BNP_KIT04	NP Scale-up column kit 5 µm, Eurospher II (Si) 150 x 4 mm with integrated precolumn, 150 x 20 mm
BNP_KIT05	NP preparative column kit 5 µm, Eurospher II (Si) 150 x 20 mm with precolumn 30 x 20 mm

Mixed column kit

BMIX_KIT01	Mixed analytical column kit 5 µm, Eurospher II (C18, C8, NH2), 150 x 4 mm ID
BMIX_KIT02	Mixed analytical column kit 5 µm, Eurospher II (C18H, Phenyl, Si), 150 x 4.6 mm ID
BMIX_KIT03	Mix UHPLC column kit core-shell
BMIX_KIT04	Mix UHPLC column kit core-shell

AZURA made in germany

Column kits

Eurokat column kit

BEK_KIT01	Carbohydrates analytical column kit, Eurokat Pb 300 x 8 mm and Eurospher II (NH2) 125 x 4 mm
BEK_KIT02	Acids and Carbohydrates analytical column kit, Eurokat H 300 x 8 mm and Eurospher II (NH2) 125 x 4 mm

GPC column kit

BGPC_KIT01	GPC column kit in THF, low MW: 0.1 - 60 kDa, PSS SDV (3 x, 1.000 A, 3 µm) 300 x 8 mm with precolumn 50 x 8 mm
BGPC_KIT02	GPC column kit in THF, medium MW: 0.1 - 1.000 kDa, PSS SDV (1.000 A, 100.000 A, 5 µm) 300 x 8 mm with precolumn 50 x 8 mm
BGPC_KIT03	GPC column kit in THF, high MW: 0.1 - 3.000 kDa, PSS SDV (1.000 A, 100.000 A, 1.000.000 A, 5 µm) 300 x 8 mm with precolumn 50 x 8 mm
BGPC_KIT04	GPC column kit in THF, ultrahigh MW: 0.1 - 30.000 kDa, PSS SDV (1.000 A, 100.000 A, 10.000.000 A, 10 µm) 300 x 8 mm with precolumn 50 x 8 mm

SEC column kit

|	
BSEC_KIT01	SEC column kit aqueous, low MW: 0.1 - 100 kDa, PSS SUPREMA (3 x 1.000 A, 5 µm) 300 x 8 mm with precolumn 50 x 8 mm
BSEC_KIT02	SEC column kit aqueous, medium MW: 0.1 - 1.000 kDa, PSS SUPREMA (30 A, 2 x 1.000 A, 5 µm) 300 x 8 mm with precolumn 50 x 8 mm
BSEC_KIT03	SEC column kit aqueous, high MW: 0.1 - 3.000 kDa, PSS SUPREMA (100 A, 2 x 3.000 A, 10 µm) 300 x 8 mm with precolumn 50 x 8 mm
BSEC_KIT04	SEC column kit aqueous, ultrahigh MW: 0.1 - 30.000 kDa, PSS SUPREMA (3 x Ultrahigh, 10 µm) 300 x 8 mm with precolumn 50 x 8 mm

AZURA made in germany

Pump accessories

Eluent tray and bottles

AZC00	Eluent tray for up to 6 x 1000 ml bottles (delivery without bottles) or 4 x 2.5 l bottles or 2 x 5 l bottles or 1 x 10 l bottle
A5324	Set of eluent supply bottles consisting of 4 one liter bottles with special round bottom for minimal eluent remainder
A5324-1	Set of eluent supply bottles 2 x 1000 ml
A70037	Set of eluent supply bottles 3 x 2500 ml
A9650	AZURA Tubing Kit with solvent filter for analytical LC applications
A5325	Eluent bottle 1000 ml

Pump head inlet fittings

A58202	Inlet-bushing kit 1/8" capillary, pump heads 10 ml (P 2.1S, P 4.1S, 40P)
A58203	Inlet-bushing kit 1/16" capillary, pump heads 10 ml (P 2.1S, P 4.1S, 40P)
A58204	Inlet-bushing kit 1/8" capillary, pump heads 50 ml (P 2.1S, P 4.1S, 40P)
A58205	Inlet-bushing kit 1/16" capillary, pump heads 50 ml (P 2.1S, P 4.1S, 40P)
A9861	Pump head inlet for Pump AZURA P 2.1L, 80P 3/8" (NPT), stainless steel
A58201	Inlet-bushing kit 1/16" capillary, pump heads 10/50 ml (S100, S1000)
A5820	Inlet-bushing kit 1/8" capillary, pump heads 10/50 ml (S100, S1000)
A58267	Male connector, stainless steel, 1/4 inch Tube OD x 1/4 inch Male NPT
A58268	Male connector, stainless steel, 4 mm Tube OD x 1/4 inch Male NPT
A58269	Male connector, stainless steel, 1/8 inch Tube OD x 1/4 inch Male NPT

A9861

A58267
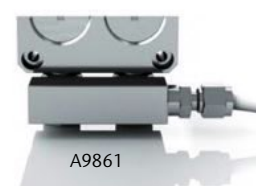
Pump head outlet fittings

A5822	Outlet-bushing kit 1/8" pipe socket for pumps S1800, 80P and P 2.1L
B720	Adapter 1/8" external thread on 1/16" internal thread, 2 pieces

Static mixers

A5350	SmartMix 100 HPLC mixer up to 100 MPa, 100 µl mixing volume
A5351	SmartMix 350 HPLC mixer up to 80 MPa, 350 µl mixing volume
A5830	HyperShear Static Mixer, 1,5 ml mixing volume, up to 100ml/min
A9853-8	Mounting bracket AZURA L for Hypershear mixing chamber
AZZ00MC	AZURA Mixer 100 µl, for AZURA P 6.1L
AZZ00MD	AZURA Mixer 200 µl, for AZURA P 6.1L
AZZ00MB	AZURA Mixer 50 µl, for AZURA P 6.1L

AZZ00MC

A5830

Dynamic mixing chambers

A0581	Dynamic mixing chamber for preparative HPLC, stainless steel
A0275	Dynamic mixing chamber for analytical HPLC, titanium.
A1174	Dynamic mixing chamber for analytical HPLC, PEEK.
A0285	Dynamic mixing chamber for analytical HPLC, stainless steel.
A0701	Set of spare parts containing 4 stainless steel sieves and 6 gaskets
A1051	Set of spare parts 5 gaskets (18,5 mm ID and 21.05 mm OD)

A0285

AZURA made in germany

Pump accessories

Solvent filters

A3373	Mobile Phase Filter, SS, 2µm 1/8" pipe OD, max. 40 ml/min
A3374	Mobile Phase Filter, SS, 20µm 1/8" OD, max. 100 ml/min

A3373   A3374

Inline filters

A3381	Inline filter (prep.) 5-10µm, stainless steel, max. 1000 ml/min
A33811	Replacement frit for A3381 (5-10µm), stainless steel
A3380	Inline filter (semi-prep.) 10µm, stainless steel, 500 bar, max. 100 ml/min
A33801	Replacement frit for A3380 10µm, stainless steel
AZ0109XA	HPLC inline filter Vertex Plus 4 mm ID, stainless steel
A0017	Pack of 50 sieves, 7µm for column ID 3 - 4.6 mm and

AZ0109XA   A3380

A0017

Maintenance kits

|	
A96421	Maintenance kit for P 6.1L with 10 ml pump head
A96422	Maintenance kit for P 6.1L with 50 ml pump head
A96423	Maintenance kit for P 2.1S/P 4.1S with 10 ml pump head
A96424	Maintenance kit for P 2.1S/P 4.1S with 50 ml pump head
A96425	Maintenance kit for P 2.1L/80P with 100 ml pump head
A96426	Maintenance kit for P 2.1L/80P with 250 ml pump head
A96427	Maintenance kit for P 2.1L/80P with 500 ml pump head
A96428	Maintenance kit for P 2.1L/80P with 1000 ml pump head

Check valves

A06841	Check valve unit for P 6.1L with 10 ml pump head
A06842	Check valve unit for P 6.1L with 50 ml pump head
A068411	Check valve unit for 10 ml pump head, spring loaded
A1122	Check valve unit for 100 ml and 250 ml pump head (P 2.1L, 80P)
A1080	Check valve unit for 500 ml and 1000 ml pump head (P 2.1L, 80P)

AZURA made in germany

Autosampler 3950

A500501	Vial plate 84 + 3 for Autosampler 3950 for 84 x 1.5 ml and 3 x 10 ml vials
A500502	Vial plate for Autosampler 3950 for 12 vials à 10 ml
A50050	Vial plate for Autosampler 3950 for 48 vials à 1.5 ml, 2 pc.
A1585	Vial kit for Autosampler 3950 preparative with 10 ml vials (22 mm) and PE caps (1000 pcs. each)
A500503	24 well plate 10 ml Polypropylen, 25 pc.
A500504	Adhesive plate seal for microtiter plates, 100 pc.
A0664	Accessory kit for autosampler with 1.5 ml vials (11 mm; 1000 pcs), caps, septum and pliers for opening and closing
A9863	AZURA System Adapter for Autosampler 3950
M0355	Plunger replacement tip for 250 µl syringe for 3950
M2048	Sample needle for 3950
M2644	Rotor seal for 3950 with 1000 bar valve
A50079	Kit for large injection samples for AZURA Autosampler 3950
A50077	Sample loop 100 µl stainless steel, for AZURA Autosampler 3950
A50078	Sample loop 10 µl stainless steel for AZURA Autosampler 3950
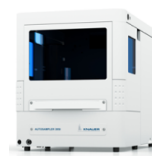
Autosampler Optimas

A50074	Tray for Autosampler KNAUER Optimas 96 positions for 1,5 ml vials
A50075	Tray for Autosampler KNAUER Optimas 24 positions for 10 ml vials
A50076	Wash bracket for 2 x 250 ml wash bottles (including wash bottles)
A0664	Accessory kit for autosampler with 1.5 ml vials (11 mm; 1000 pcs), caps, septum and pliers for opening and closing
M0361	Syringe 250 µl for 3950/Optimas
M0355	Plunger replacement tip for 250 µl syringe for 3950/Optimas
M500829	Preventive maintenance kit for Optimas
A50072	Preparative option kit for Autosampler KNAUER Optimas tray for 24 x 10 ml vials, large bore injection valve, 2.5 ml syringe, 10 ml sample loop
A50073	Biocompatible option kit for Autosampler KNAUER Optimas PEEK injection valve, biocompatible needle, 100 µl PEEK sample loop
A1585	Vial kit for Smartline Autosampler 3950 preparative with 10 ml vials (22 mm) and PE caps (1000 pcs. each)

Loop filling port

A0555	Loop filling port for safe insertion

Autosampler accessories

Sample loop stainless steel, 1/16"

A0561	Sample loop stainless steel, 1/16", 10 µl
A0562-1	Sample loop stainless steel, 1/16", 15 µl
A0562	Sample loop stainless steel, 1/16", 20 µl
A0836	Sample loop stainless steel, 1/16", 30 µl
A0563	Sample loop stainless steel, 1/16", 50 µl
A0837	Sample loop stainless steel, 1/16", 75 µl
A0564	Sample loop stainless steel, 1/16", 100 µl
A0565	Sample loop stainless steel, 1/16", 200 µl
A2565	Sample loop stainless steel, 1/16", 250 µl
A0566	Sample loop stainless steel, 1/16", 500 µl
A0567	Sample loop stainless steel, 1/16", 1000 µl
A0568	Sample loop stainless steel, 1/16", 2000 µl
A1598	Sample loop stainless steel, 1/16", 3000 µl
A0586	Sample loop stainless steel, 1/16", 5000 µl
A1054-2	Sample loop stainless steel, 1/16", 10 ml
A1055-1	Sample loop stainless steel, 1/16", 40 ml

A0568

A0564

Sample loop stainless steel, 1/8"

A1043	Sample loop stainless steel, 1/8", volume up to 1000 µl, preparative
A1044	Sample loop stainless steel, 1/8", volume up to 2000 µl, preparative
A1159-2	Sample loop stainless steel, 1/8", volume up to 10 ml, preparative, with column/piston design
A0843	Sample loop stainless steel, 1/8", volume up to 10 ml, preparative
A1160-1	Sample loop stainless steel, 1/8", volume up to 40 ml, preparative

A1159-2

Sample loop PEEK, 1/16"

A1519	Sample loop PEEK, 1/16", 5 µl
A1058	Sample loop PEEK, 1/16", 10 µl
A1059	Sample loop PEEK, 1/16", 20 µl
A1060	Sample loop PEEK, 1/16", 50 µl
A0508	Sample loop PEEK, 1/16", 100 µl
A1061	Sample loop PEEK, 1/16", 200 µl
A1057	Sample loop PEEK, 1/16", 500 µl
A0423	Sample loop PEEK, 1/16", 1 ml
A0785	Sample loop PEEK, 1/16", 2 ml

A0423

Sample loop PEEK, 1/8"

A1110	Sample loop PEEK, 1/8", volume up to 1 ml, preparative
A1111	Sample loop PEEK, 1/8", volume up to 2 ml, preparative
A1579	Sample loop PEEK, 1/8", volume up to 3 ml, preparative
A1072	Sample loop PEEK, 1/8", volume up to 10 ml, preparative
A78980	Sample loop PEEK, 5 ml, can be used with 1/8" or 1/16" connectors
A78985	Sample loop PEEK, 10 ml, can be used with 1/8" or 1/16" connectors

A1058

AZURA made in germany

Injection syringes

A0723	Injection syringe 10 µl volume
A0724	Injection syringe 25 µl volume
A0725	Injection syringe 50 µl volume
A0726	Injection syringe 100 µl volume
A0727	Injection syringe 250 µl volume
A0728	Injection syringe 500 µl volume
A0729	Injection syringe 1.000 µl volume
A0730	Injection syringe 2.500 µl volume

A0723

Luer-Lock glass syringes

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

AZURA mounting brackets

A9853-3	Mounting bracket AZURA L for axial compressible columns with 20 mm ID
A9853-4	Mounting bracket AZURA L for axial compressible columns with 30 mm ID
A9853-6	Mounting bracket AZURA L for preparative sample loop
A9853-5	Mounting bracket AZURA L for KNAUER flow cells
A9853	Mounting bracket AZURA L for KNAUER injection valves
A9853-1	Mounting bracket AZURA L for manual Vici/Valco injection valves
A9853-2	Mounting bracket AZURA L for Vici/Valco valve drive
A9853-8	Mounting bracket AZURA L for Hypershear mixing chamber
A9853-9	Mounting bracket AZURA L for manual KNAUER multiposition valves
A9854-1	Mounting bracket AZURA L Bio for manual KNAUER injection
A9854-2	Mounting bracket AZURA S for manual KNAUER injection

Detector accessories

Lamps

A4071	Deuterium Lamp for Smartline 2500 and 2600 detectors
A4447V1	Deuterium Lamp for Smartline PDA detectors 2800 and 2850
AZL01	Deuterium Lamp HB for AZURA DAD 6.1L detector
A64210	HBST deuterium lamp kit for MW-1 and PDA-1 E²PROM Connector
A5194	Deuterium Lamp HBST for Smartline UV and UV/VIS detectors 2550
AZL02	Halogen Lamp for AZURA DAD 6.1L
A4073	Halogen Lamp for converting Smartline UV 2500 detector into Smartline VIS 2500 detector
A4073XA	Halogen Lamp for converting Smartline UV 2600 detector into Smartline VIS 2600 detector
A64200	Halogen lamp kit for MW-1 E²PROM Connector SND
A64201	Halogen lamp kit for PDA-1 E²PROM Connector SND
A4072	Halogen Lamp for Smartline 2500 detector, VIS version
A4072XA	Halogen Lamp for Smartline 2600 detector, VIS Version
A4448	Halogen Lamp for Smartline PDA 2800 and 2850 detectors
A5195	Halogen Lamp for Smartline UV/VIS detector 2550
A5197	Halogen Lamp for upgrading Smartline UV detector 2550 to Smartline UV/VIS detector 2550
A07541	LED for Sedex 80LT and Sedex 85LT light scattering detectors
A4142	Mercury Vapor Lamp for Smartline (S200) and WellChrom (K200) fixed wavelength detectors 200
A0753	Xenon Lamp for RF-10AXL fluorescence detector
A59210	Xenon Lamp for RF-20A and RF-20Axs fluorescence detectors
A5193	Deuterium lamp replacement, for Smartline UV Detector 2550 (A5190) and Smartline UV Detector 2520, original spare part

Flow cells 1/16"

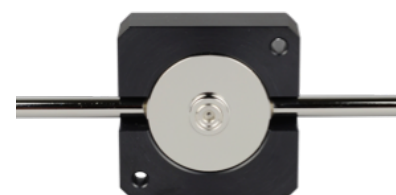|	
A4042	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, stainless steel, for AZURA UVD 2.1L, UVD 2.1S and Smartline 200, 2500, 2520, 2550, 2600 detectors
A4045	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, PEEK, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2600 detectors
A4061V2	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID, stainless steel, for Smartline 2550 and PLATINblue MW-1 detectors
A4061XB	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID, stainless steel, one sided inlet and outlet, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520 and 2600 detectors
AMC19	KNAUER LightGuide flow cell cartridge, 10 mm path length, 1/16", 2 µl volume, biocompatible, for AZURA DAD 6.1L detector
AMC38	KNAUER flow cell cartridge, 10 mm path length, 1/16", 10 µl volume, stainless steel, for AZURA DAD 6.1L detector
AMB18	KNAUER flow cell cartridge, 3 mm path length, 1/16", 2 µl volume, stainless steel, for AZURA DAD 6.1L detector
AMD59	KNAUER LightGuide flow cell cartridge, 50 mm path length, 1/16", 6 µl volume, biocompatible, for AZURA DAD 6.1L detector
A64150	UHPLC flow cell UV 10 mm path length, 2.4 µl volume, 1/16", fiber optic for PLATINblue detector PDA-1
A64151	UHPLC flow cell UV 50 mm path length, 10 µl volume, 1/16", fiber optic for PLATINblue detector PDA-1
A4069	Preparative flow cell UV 0.5 path length, 1/16", 3 µl volume, 0.8 mm ID, stainless steel, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, 2600 detectors
A4095	Preparative flow cell UV 0.5 mm path length, 1/16", 3 µl volume, 0.8 mm ID, PEEK, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, 2600 detectors

AMD59

A4061V2

AZURA made in germany

Flow cells 1/8"

A4066	Preparative flow cell UV variable path length and variable volume, 1/8", 2.3 mm ID, stainless steel, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, and 2600 detectors
A4067	Preparative flow cell UV variable path length and variable volume, 1/8", 2.3 mm ID, PEEK, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, and 2600 detectors

Flow cells 1/4"

A4068	Preparative flow cell UV variable path length and variable volume, 1/4" angular connections, 4 mm ID, stainless steel, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, 2600 detectors
A4068-2	Preparative flow cell UV variable path length and variable volume, 1/4" straight connections, 4 mm ID, stainless steel, for AZURA UVD 2.1S, UVD 2.1L and Smartline 200, 2500, 2520, 2550, 2600 detectors

A4068-2

Flow cells 1/16" fiber optics

A4044	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4131	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, stainless steel, fiber optics, for Smartline 2600, 2800, 2850 detectors
AMKX8	Fiber optics adapter for AZURA DAD
A4047	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, PEEK, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4132	Analytical flow cell UV 3 mm path length, 1/16", 2 µl volume, 1 mm ID, PEEK, fiber optics, for Smartline 2600, 2800 and 2850 detectors
A4074	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4130	Analytical flow cell UV 10 mm path length, 1/16", 10 µl volume, 1.1 mm ID, stainless steel, fiber optics, for Smartline 2600, 2800, 2850 detectors
A4089	Preparative flow cell UV 0.5 mm path length, 1/16", 3 µl volume, 0.8 mm ID, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4096	Preparative flow cell UV 0.5 mm path length, 1/16", 3 µl volume, 0.8 mm ID, PEEK, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors
A4136	Preparative flow cell UV 0.5 mm path length, 1/16", 1.7 µl volume, stainless steel, fiber optics, for Smartline 2600, 2800 and 2850 detectors
A4137	Preparative flow cell UV 0.5 mm path length, 1/16", 1.7 µl volume, PEEK, fiber optics, for Smartline 2600, 2800 and 2850 detectors

A4044

Detector accessories

Flow cells 1/8" fiber optics

A4078	Preparative flow cell UV variable path length and variable volume, 1/8", 2.3 mm ID, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4079	Preparative flow cell UV variable path length and variable volume, 1/8", 2.3 mm ID, PEEK, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4133	Preparative flow cell UV variable path length and variable volume, 1/8", stainless steel, fiber optics, for Smartline 2600, 2800 and 2850 detectors
A4134	Preparative flow cell UV variable path length and variable volume, 1/8", PEEK, fiber optics, for Smartline 2600, 2800 and 2850 detectors
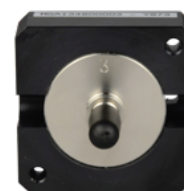
A4078

Flow cells >1/8" fiber optics

A4135	Preparative flow cell UV variable path length and variable volume, 1/4", stainless steel, fiber optics, for Smartline 2600, 2800 and 2850 detectors
A4081	Preparative flow cell UV variable path length and variable volume, 1/4", 4 mm ID, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4153	Preparative flow cell TRI-Clamp variable path length, 1/4" TRI-Clamp connections, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors
A4152	Preparative flow cell TRI-Clamp variable path length, 3/8" TRI-Clamp connections, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors
A4152-1	Preparative flow cell TRI-Clamp 7 mm path length, 3/8" TRI-Clamp connections, PEEK, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors
A4154-1	Preparative flow cell TRI-Clamp 10 mm path length, 3/8" TRI-Clamp connections, PEEK, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2600 detectors
A4154	Preparative flow cell TRI-Clamp variable path length, 1/2" TRI-Clamp connections, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors
A4155	Preparative flow cell TRI-Clamp variable path length, 3/4" TRI-Clamp connections, stainless steel, fiber optics, for AZURA UVD 2.1S, UVD 2.1L and Smartline 2520, 2500 and 2600 detectors

Valve accessories

Valve head 1/16" stainless steel

A1369	6-Port/3-channel valve head stainless steel, 1/16", including accessories
A1373	6-Port multiposition valve head stainless steel, 1/16", including accessories
A1379	16-Port multiposition valve head stainless steel, 1/16", max. 50 bar, including accessories
A1379-1	16-Port multiposition valve head stainless steel, 1/16", max. 100 bar, including accessories

Valve head 1/8" stainless steel

|	
A1371	6-Port/3-channel valve head stainless steel, 1/8", including accessories
A1375	6-Port multi-position valve head stainless steel, 1/8", including accessories
A1378	12-Port multi-position valve head stainless steel, POM-H-TF, 1/8", max. 25 bar, including accessories
A1378V1	12-Port multi-position valve head stainless steel, Tefzel, 1/8", including accessories

Valve head 1/16" PEEK

A1370V1	6-port/3-channel valve head PEEK, Tefzel, 1/16", including accessories
A1374V1	6-Port multi-position valve head PEEK, Tefzel, 1/16" including accessories

Valve head 1/8" PEEK

A1372	6-Port/3-channel valve head PEEK, 1/8", max. 250 bar, including accessories
A1376V1	6-Port multi-position valve head PEEK, Tefzel, 1/8", including accessories
A1378	12-Port multi-position valve head stainless steel, POM-H-TF, 1/8", max. 25 bar, including accessories
A1378V1	12-Port multi-position valve head stainless steel, Tefzel, 1/8", including accessories

Services / Qualification

IQ/OQ documents for pumps

VOQP2_41S	OQ P 2.1S P4.1S AZURA Operation Qualification DE
VOQP2_41SA	OQ P 2.1S P4.1S AZURA Operation Qualification EN
VOQP21L	OQ P 2.1L AZURA Operation Qualification DE
VOQP21LA	OQ P 2.1L AZURA Operation Qualification EN
VOQP61L	OQ P 6.1L AZURA Operation Qualification DE
VOQP61LA	OQ P 6.1L AZURA Operation Qualification EN
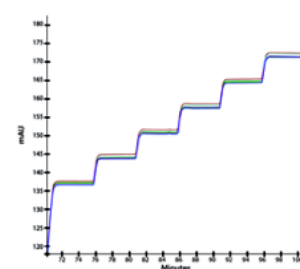
**IQ/OQ documents for fraction collector**

VOQFOXY	OQ Foxy R1 und R2 Operation Qualification DE
VOQFOXYA	OQ Foxy R1 und R2 Operation Qualification EN

IQ/OQ documents for autosampler

VOQ3950	OQ Autosampler 3950 Operation Qualification DE
VOQ3950A	OQ Autosampler 3950 Operation Qualification EN

IQ/OQ documents for detectors

VOQUVD21L	OQ UVD 2.1L AZURA Operation Qualification DE
VOQUVD21LA	OQ UVD 2.1L AZURA Operation Qualification EN
VOQUVD21S	OQ UVD 2.1S AZURA Operation Qualification DE
VOQUVD21SA	OQ UVD 2.1S AZURA Operation Qualification EN
VOQDAD61L	OQ DAD 6.1L AZURA Operation Qualification DE
VOQDAD61LA	OQ DAD 6.1L AZURA Operation Qualification EN
VOQOPTEK	OQ CM OPTEK Operation Qualification DE
VOQOPTEKA	OQ CM OPTEK Operation Qualification EN
VOQCM21S	OQ CM 2.1S AZURA Operation Qualification DE
VOQCM21SA	OQ CM 2.1S AZURA Operation Qualification EN
A59202	IQ/OQ Fluoreszenzdetektor IQ/OQ RF-20A und RF 20-Axs
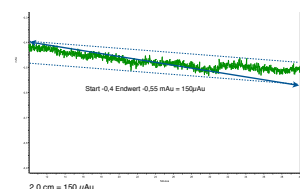
IQ/OQ documents for valves

VOQV21S12	OQ V 2.1S AZURA Operation Qualification DE
VOQV21S12A	OQ V 2.1S AZURA Operation Qualification EN
VOQV21S16	OQ V 2.1S AZURA Operation Qualification DE
VOQV21S16A	OQ V 2.1S AZURA Operation Qualification EN
VOQV21S6	OQ V 2.1S AZURA Operation Qualification DE
VOQV21S6A	OQ V 2.1S AZURA Operation Qualification EN
VOQV21S6M	OQ V 2.1S AZURA Operation Qualification DE
VOQV21S6MA	OQ V 2.1S AZURA Operation Qualification EN
VOQV6M21S	OQ V 2.1S AZURA Operation Qualification DE
VOQV6M21SA	OQ V 2.1S AZURA Operation Qualification EN
VOQVIC6	OQ VICI/VALCO 6-port/2-position DE Operation Qualification
VOQVIC6M1	OQ VICI/VALCO 6 port/mult-iposition 1/4" DE Operation
VOQVIC6M2	OQ VICI/VALCO 6 port/multi-position 1/16" DE Operation
VOQVIC10M	OQ VICI/VALCO 10 port/multi-position 1/4" DE Operation

IQ/OQ documents for column thermostat

VOQCT21	OQ CT 2.1 Operation Qualification DE
VOQCT21A	OQ CT 2.1 Operation Qualification EN

DYNASEAL system

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

Bushings for capillaries - DYNASEAL

A1021	Bushings, 10 pc. for capillaries with 1/16" OD, short
A1064	Bushings, 5 pc. for capillaries with 1/16" OD, long
A1067	Bushings, 4 pc. for capillaries with 1/8" OD, short
A0735	Bushings, 4 pc. for capillaries with 1/8", long

Split-grooved clamping rings

A0484	Split-grooved clamping rings, 4 pc. for capillaries with 1/16" OD
A1239	Split-grooved clamping rings, 4 pc. for capillaries with 1/8" OD

Sealing rings

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

Double-cone sealings

A1022	Biconical sealing rings, 10 pc. for capillaries with 1/16" OD, polymer
A1070	Biconical sealing rings, 10 pc. for capillaries with 1/16" OD, PEEK
A0738	Biconical sealing rings, 10 pc. for capillaries with 1/8" OD, Polymer (PETP)

Bushings for capillaries 1/16"

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

A0112

Bushings for capillaries 1/8"

| A0830 | Bushings, 10 pc. for capillaries with 1/8" OD, M8x1, wrench caliber 10, stainless steel |

A0830

Ferrules for capillaries

A0110	Ferrules, 30 pc. for capillaries with 1/16" OD, stainless steel
A0111	Ferrules, 100 pc. for capillaries with 1/16" OD, stainless steel
A0874	Ferrules, 10 pc. for capillaries with 1/8" OD, stainless steel

A0110

Bushings for capillaries 1/16" / 1/8" PEEK/polymer

A0141	Bushings, 10 pc. for capillaries with 1/16" OD, polymer, knurled, UNF 10-32, short
A0142	Bushings, 30 pc. for capillaries with 1/16" OD, polymer, knurled, UNF 10-32, short
A0143	Bushings, 100 pc for capillaries with 1/16" OD, polymer, knurled, UNF 10-32, short
A0144	Bushings, 10 pc. for capillaries with 1/16" OD, polymer, knurled, UNF 10-32, long
A0145	Bushings, 10 pc. for capillaries with integrated sealing cone, polymer, knurled, UNF 10-32, short
A0584	Bushings, 10 pc. for capillaries with 1/16" OD, PEEK, UNF 10-32
A0733	Bushings, 10 pc. for capillaries with integrated sealing cone, polymer, M8x1, knurled, short
A25011	Bushings, 5 pc. one-piece, head Hex, UNF 10-32, PEEK, short
A25021	Bushings, 5 pc. one-piece, head Hex, UNF 10-32, PEEK, long

A0141

A0733

A25011   A25012

Caps (blind fittings)

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

A0146

Accessories - Flat bottom fittings/unions/tees

Flat bottom fittings

A5829	Bushing, 10 pc., PEEK, for 1/8" capillaries, 1/4-28 Super Flangeless
A58291	Bushing, 10 pc., PEEK, for 1/16" capillaries, 1/4-28 Super Flangeless
A58292	Ferrules, 10 pc., PEEK, for 1/16" capillaries (1/4-28 Super Flangeless), with lock ring stainless steel
A58293	Ferrules, 10 pc., PEEK, for 1/8" capillaries (1/4-28 Super Flangeless), with lock ring stainless steel
A58294	Ferrules, 10 pc., ETFE for 1/8" capillaries (1/4-28 Super Flangeless), with lock ring stainless steel

A58292
A5829
A58291
A58294

Low dead volume unions, polymer

A0148	Low dead volume coupling for two capillaries with 1/16" OD, polymer
A0149	Low dead volume couplings, 5 pc. for two capillaries with 1/16"OD, polymer
A0233	Low dead volume coupling to connect 2 capillaries with 1/16" OD, PEEK

A0148

Low dead volume unions, stainless steel

|	
A0117V1	Low dead volume coupling to connect 2 capillaries with 1/16" OD, titanium
A0117	Low dead volume coupling to connect 2 capillaries with 1/16" OD, stainless steel
A0118	Low dead volume couplings, 5 pc. to connect 2 capillaries with 1/16" OD, stainless steel
A0119	Low dead volume couplings, 25 pc. to connect 2 capillaries with 1/16" OD, stainless steel
A2512	Low dead volume coupling stainless steel, for 2 capillaries, 1/8" OD (M8x1)
A2513	Low dead volume coupling stainless steel, for 2 capillaries, 1/16" OD and 1/8" OD (M8x1)

A0117

Tees, stainless steel / titanium

A2511V1	T-connector for 3 capillaries, titanium, with 1/8"OD (M8 X 1)
A2511	T-connector for 3 capillaries, stainless steel, with 1/8"OD (M8 X 1)
A0120V1	T-connector to connect 3 capillaries with 1/16"OD, titanium
A0120	T-connector to connect 3 capillaries with 1/16"OD, stainless steel

A2511

Tees, polymer

A0150	T-connector to connect 3 capillaries with 1/16"OD, polymer

A0150

AZURA made in germany

Accessories
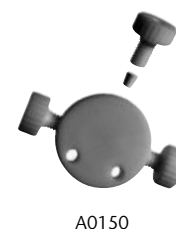
Tees

A58260	Union tee, stainless steel, 1/8 inch tube OD
A58261	Union tee, stainless steel, 1/4 inch tube OD
A58262	Union tee, titanium, 1/4 inch tube OD

Reducing union

A58264	Reducing union, stainless steel, 3/8 inch x 1/4 inch tube OD
A58265	Reducing union, stainless steel, 8 mm x 1/4 inch tube OD
A58266	Reducing union, stainless steel, 1/4 inch x 1/8 inch tube OD

Union

A58263	Union, stainless steel, 1/4 inch tube OD

Male connector (Male NPT)

A58267	Male connector, stainless steel, 1/4 inch Tube OD x 1/4 inch male NPT
A58268	Male connector, stainless steel, 4 mm Tube OD x 1/4 inch male NPT
A58269	Male connector, stainless steel, 1/8 inch Tube OD x 1/4 inch male NPT

Reducer

A58270	Reducer, stainless steel, 1/16 inch x 1/8 inch tube OD
A58271	Reducer, stainless steel, 1/8 inch x 1/4 inch tube OD

High pressure proportional release valve

A5800	Pressure Release Valve (up to 50 bar), 1/8", stainless steel
A5800V1	Pressure Release Valve (up to 50 bar), 1/8", titanium
A5801	Pressure Release Valve (up to 25 bar), 1/8", stainless steel
A5802	Pressure Release Valve (without spring), 1/4", stainless steel
M1070	Spring for Pressure Release Valve (25 - 50 bar)
M1080	Spring Pressure Release Valve (3.4 - 24 bar)

Accessories

Pressure Relief Valves / Back Pressure Regulators

A5807	Back pressure regulator, 1000 psi (69 bar), PEEK, incl. fittings for 1/16"
A5808	Back pressure regulator, 20 psi (1,4 bar), PEEK, incl. fittings for 1/16"
A5809	Back pressure regulator, 40 psi (2,8 bar), PEEK, incl. fittings for 1/16"
M1258	Pressure relief valve tee for 1/16" OD Tubing, incl. fittings for 1/16"

A580*

M1258

BPR holders

M2422	Back pressure holder 1/16" UNF 10-32, w/o cartridge

M2422

BPR cartridges

M2443	Cartridge 40 psi for back pressure regulator 1/16"
M2423	Cartridge 100 psi for back pressure regulator 1/16"
M2449	Cartridge 250 psi for back pressure regulator 1/16"
M2424	Cartridge 750 psi for back pressure regulator 1/16"
M2483	Cartridge 1000 psi for back pressure regulator 1/16"

M244X

Shut-off valves

A5811	PEEK, natural, 1/16" 0,5mm bore, 2,5µL fitting included) <34 bar
A5812	PEEK, natural, 1/8" 1,0mm bore , 10µL fitting included) <34 bar
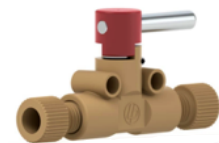
A5811

### Micro-splitter valves - internal volume < 5µL

|	
P-450	Medium pressure, 1/4-28, biocompatible, incl. fittings, <55 bar
P-451	Medium pressure, 10 - 32, biocompatible, incl. fittings, < 55 bar
P-460S	High pressure, 10 - 32, with stainless steel needle, incl. fittings, < 276 bar
P-470	High pressure graduated, 10 - 32, with stainless steel needle, incl. fittings, < 276 bar

P-450

AZURA made in germany

Capillaries, stainless steel

|	
A0130	Capillary stainless steel, 1/16" OD, 0.1 mm ID, 300 cm length
A0131	Capillary stainless steel, 1/16" OD, 0.25 mm ID, 300 cm length
A0132	Capillary stainless steel, 1/16" OD, 0.5 mm ID, 300 cm length
A0133	Capillary stainless steel, 1/16" OD, 0.7 mm ID, 300 cm length
A0134	Capillary stainless steel, 1/16" OD, 1 mm ID, 300 cm length
A0123	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.1 mm ID, 10 cm
A0124	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.1 mm ID, 20 cm
A0125	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.1 mm ID, 30 cm
A0126	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.25 mm ID, 10 cm
A0127	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.25 mm ID, 20 cm
A0128	Capillaries, 10 pc. stainless steel, 1/16" OD, 0.25 mm ID, 30 cm
A0639	Capillary stainless steel, 1/8"OD, 1.6 mm ID, 150 cm length
A0640	Capillary stainless steel, 1/8" OD, 2.2 mm ID, 150 cm length
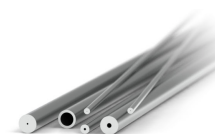
Capillaries, stainless steel with bushings, wrench caliber 1/4", UNF 10-32

AZF10	AZURA HPLC StartUp Kit, set of precut capillaries 0.1 mm and adapters
AZF20	AZURA HPLC StartUp Kit, set of precut capillaries 0.25 mm and adapters
AZF30	AZURA HPLC StartUp Kit, set of precut capillaries 0.45 mm and adapters
AZF11	AZURA Capillary stainless steel, 1/16'' OD, 0.1 mm ID, 150 mm length
AZF12	AZURA Capillary stainless steel, 1/16'' OD, 0.1 mm ID, 300 mm length
AZF13	AZURA Capillary stainless steel, 1/16'' OD, 0.1 mm ID, 600 mm length
AZF14	AZURA Capillary stainless steel, 1/16'' OD, 0.1 mm ID, 900 mm length
AZF21	AZURA Capillary stainless steel, 1/16'' OD, 0.25 mm ID, 150 mm length
AZF22	AZURA Capillary stainless steel, 1/16'' OD, 0.25 mm ID, 300 mm length
AZF23	AZURA Capillary stainless steel, 1/16'' OD, 0.25 mm ID, 600 mm length
AZF24	AZURA Capillary stainless steel, 1/16'' OD, 0.25 mm ID, 900 mm length
AZF31	AZURA Capillary stainless steel, 1/16'' OD, 0.45 mm ID, 150 mm length
AZF32	AZURA Capillary stainless steel, 1/16'' OD, 0.45 mm ID, 300 mm length
AZF33	AZURA Capillary stainless steel, 1/16'' OD, 0.45 mm ID, 600 mm length
AZF34	AZURA Capillary stainless steel, 1/16'' OD, 0.45 mm ID, 900 mm length

1/32"   1/16"
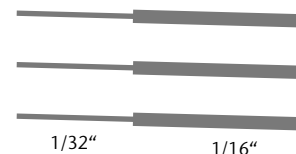
AZURA Capillary Start-up kit

A9849	AZURA Capillary Start-up kit 1/16", stainless steel, 0,25mm ID
A9849-1	AZURA Capillary Start-up kit 1/16", stainless steel, 0,70 / 1,00 mm ID semi-prep for 50/100 ml/min
A9850	AZURA Capillary Start-up kit 1/8", stainless steel, 2,2 mm ID

Accessories
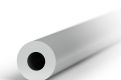
Capillaries, PEEK

A70500	AZURA Bio LC Start-up kit 1/16" PEEK
A70400	AZURA Bio LC Start-up kit 1/4", PEEK
A70300	AZURA Bio LC Start-up kit 1/8", PEEK

Capillaries, PEEK

A0685	Capillary PEEK, 1/16" OD, 0.25 mm ID, 150 cm length
A0685-2	Capillary PEEK, 1/16" OD, 0.25 mm ID, 1000 cm length
A0691	Capillary PEEK, 1/16" OD, 0.5 mm ID, 150 cm length
A0692	Capillary PEEK, 1/16" OD, 0.7 mm ID, 150 cm length
A2522	Capillary PEEK, 1/16" OD, 0.13 mm ID, 300 cm length
A2523	Capillary PEEK, 1/16" OD, 0.18 mm ID, 300 cm length
A2524	Capillary PEEK, 1/16" OD, 0.25 mm ID, 300 cm length
A2525	Capillary PEEK, 1/16" OD, 0.5 mm ID, 300 cm length
A2526	Capillary PEEK, 1/16" OD, 0.75 mm ID, 300 cm length
A2527	Capillary PEEK, 1/16" OD, 1.0 mm ID, 300 cm length
A2528	Capillary PEEK, 1/16" OD, 1.4 mm ID, 300 cm length
A2538	Capillary PEEK, 1/16" OD, 0.13 mm ID, 300 cm length
A0737	Capillary PEEK, 1/8" OD, 1.6 mm ID, 150 cm length
A2540	Capillary PEEK, 1/8" OD, 1.6 mm ID, 100 cm length
A2541	Capillary PEEK, 1/8" OD, 0.75 mm ID, 100 cm length
A2542	Capillary PEEK, 1/8" OD, 2.0 mm ID, 100 cm length

Tefzel tubings

A0182	Tefzel tubing 1/16"OD, 0.25 - 0.3 mm ID, 300 cm length
A0183	Tefzel tubing 1/16"OD, 0.7 mm ID, 300 cm length
A01831	Tefzel tubing 1/16"OD, 0.7 mm ID, 1000 cm length
A0685-3	Tefzel tubing 1/16"OD, 0.25 mm ID, 1000 cm length

PTFE tubings

A0152	PTFE tubing 1.6 mm (1/16") OD, 0.45 mm ID, 300 cm length
A0153	PTFE tubing 2 mm OD, 1.45 mm ID, 300 cm length,
A0732	PTFE tubing 3.2 mm (1/8") OD, 1.5 mm ID, 300 cm length
A0873	PTFE tubing 3.2 mm (1/8") OD, 2 mm ID, 300 cm length
A0154	PTFE tubing 4 mm OD, 3 mm ID, 300 cm length, PTFE (virginal)
U0435	PTFE tubing 6.4 mm (1/4") OD, 4.75 mm ID, 100 cm length
A1099	PTFE tubing 9 mm OD, 7 mm ID, 300 cm length, PTFE (virginal)

KNAUER SafetyAir sets

Complete SafetyAir-Sets for analytical and preparative HPLC systems, containing SafetyCaps and eluent bottles for HPG, LPG or isocratic systems, a SafetyWasteCap and a 5 L waste can. All accessories included.

Ordering details:

A59197-1	KNAUER SafetyAir set isocratic, for analytical HPLC
A59197-2	KNAUER SafetyAir set binary, for analytical HPLC
A59197	KNAUER SafetyAir set quaternary, for analytical HPLC
A59197-3	KNAUER SafetyAir set isocratic, for preparative HPLC
A59197-4	KNAUER SafetyAir set binary, for preparative HPLC

A59197-1

KNAUER SafetyCaps

Ordering details:

A59191	SafetyCap I, GL45, 1 connector 1/8", incl. fittings and air valve
A59179	SafetyCap II, GL45, 2 connectors 1/8", incl. fittings and air valve
A59178	SafetyCap III, GL45, 3 connectors 1/8", incl. fittings and air valve
A59166-1	Air Valve for SafetyCaps analytical
A59166	Air Valve for SafetyCaps preparative
A59170	Plug (blind fittings) PFA for sealing SafetyCap ports 10 pcs.

A59191

A59179

A59166-1

A59166

KNAUER SafetyWasteCaps

Ordering details:

|	
A59174	SafetyWasteCap, with GL45 thread size 2 connectors 2.3/3.2 mm OD, 1x tubing connector 6.4 - 9,0 mm ID; incl. fittings for 2.3/3.2 mm OD; without filter
A59192	SafetyWasteCap, with GL45 thread size 3 connectors (2.3/3.2 mm OD); incl. fittings for capillaries 2.3/3.2 mm OD
A59175	Exhaust filter M Exhaust filter M
A59161	Exchange set exhaust filter M Box of 3
A59165	Plug PTFE for exhaust filter port
A59168	Plug PTFE for tubing connector
A59173	Waste can 2.5 L GL45, UN-approved, 150 x 122 x 194mm
A59196	Waste can 10 L GL45, UN-Y approved, PE-HD

A59174

A59175

A59173
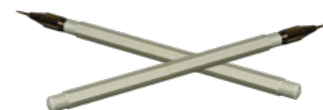
A0569

A0809

A0851

A0137

Ordering details:

|	
A0569	Tube cutter for all tubes
A0809	Cutting pliers for capillaries
A0851	Capillary cutter for PEEK tubings with OD up to 4 mm
A0137	Capillary cleaning set for 1/16" stainless steel capillaries

A9847

A3983

A9860

A9862

Ordering details:

|	
A9847	Magnetic clip for columns with 1/4" OD
A3983	Column holder, prism for horizontal storage of columns up to 50 mm ID
A9860	Product riser AZURA 28 mm height
A9862	Installation Box Kit Box for small parts, KNAUER file folder and support sticker

A1071
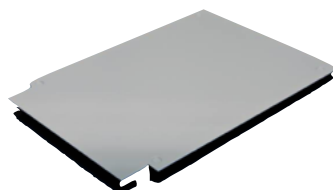
A9863

A1033

A0864

Ordering details:

A1071	Accessory kit for standard HPLC
A9863	AZURA System Adapter for Autosampler 3950
A1033	Tool kit AZURA tool kit for all AZURA devices (PEEK)
A1033-1	Tool kit AZURA tool kit for all AZURA 1/16" systems (SST/PEEK)
A1033-2	Tool kit AZURA tool kit for all AZURA 1/8" systems (SST/PEEK)
A0864	Septum cap closing pliers 11 mm
A0865	Septum cap opening pliers 11 mm
A1660	Septum cap closing pliers 20 mm
A1661	Septum cap opening pliers 20 mm

AZURA made in germany

Notes

Conversion tables
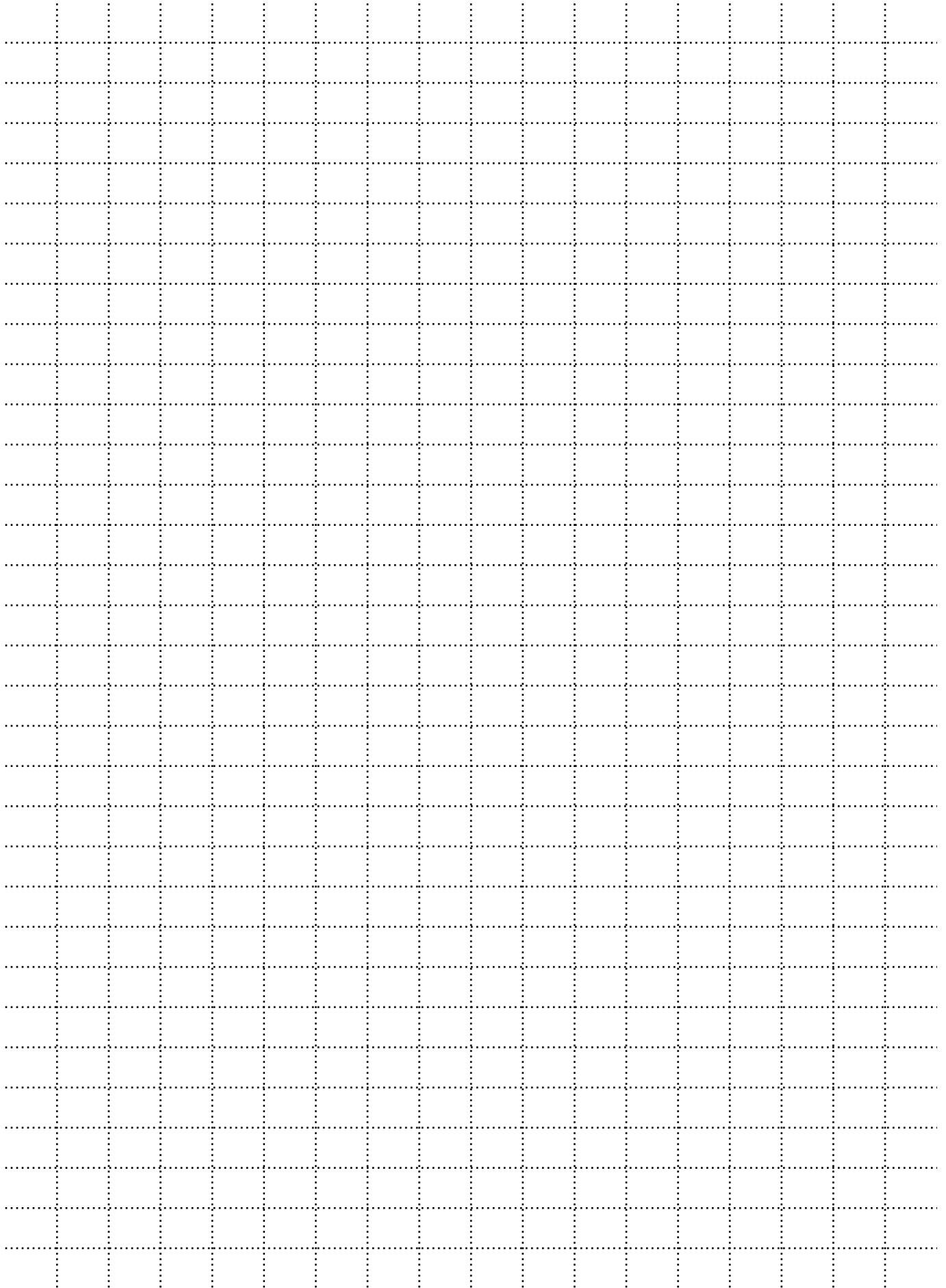
Dimensions

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 conversion chart

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 conversion chart

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 conversion chart

°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	15	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

AZURA made in germany

Accessories and Spare parts

From pump heads and flow cells to capillaries and connections: find here your accessory or spare part.

Autosamplers

Higher injection precision as well as reliable and unattended sample handling are the main benefits of an autosampler.

Assistants

These combination instruments can accomodate up to three "S-sized" AZURA modules including valves, pumps, and UV detectors.
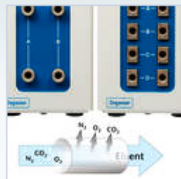
Column thermostats

Thermostatting the column can significantly improve a method's stability. Some HPLC techniques require elevated temperatures. The T-1 provides RF-ID tag support.

Degassers

Dissolved gas in the eluent has a negative impact on reproducibility and may interfere with detection. An online degasser reliably removes dissolved gas.

Detectors

Detectors for sensitve and high resolution chromatography: KNAUER detectors include a mass spectrometer, PDA detectors, and UV/VIS detectors both with and without fiber optics, RI detectors and more.

Dosing pumps

Dosing, metering and pumping liquid: high-pressure pumps for a wide range of tasks in the food, chemical, and pharmaceutical industries.

Eluent mixers

Eluent mixers can be used together with a high or low pressure gradient system to effectively provide a homogeneous eluent mixture.

Flowmeters

Flowmeters are necessary for monitoring the flow rate in chromatography systems.

Fraction collectors

Easy and automatic fraction collecting: reliable fraction collectors are useful for subsequent analysis of peaks or for purification tasks.

LC columns

With a wide range of more than 11,000 columns, KNAUER has the right choice for nearly all HPLC, UHPLC, and FPLC separations.

Managers

Managers are combination modules that include valves for gradient formation from up to 4 eluents, a degasser and/or an A/D-D/A interface.

Osmometers

As one of the pioneers in the field of osmometry, KNAUER offers osmometers for osmolality and molecular weight determination.
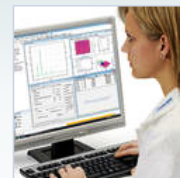
Pumps

Reliable HPLC pumps from KNAUER for a constant eluent flow. The high flow rate accuracy and precision are crucial for the quality of the analysis.

Software

Complete chromatography data system solutions to control a wide range of chromatography systems. Preparative versions available.