

High pressure dosing pumps

Made in Germany



Welcome to KNAUER

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

KNAUER ("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.

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



Alexandra Knauer (CEO and owner)

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.



KNAUER among Top 100 innovators.

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 substantial 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!

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AZURA® Pump P 2.1S

AZURA® Pump P 2.1S was developed for eluent delivery up to 400 bar and for flow rates up to 50 ml/min in HPLC and other applications where a compact easy-to-integrate pump is required.

Key features

- versatile due to wide flow rate range (0.01-50 ml/min)
- powerful and precise drive, with low pulsation
- compact dimensions
- flexible control via Ethernet, RS-232 and analog signals



Specifications

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	ceramic/SST/Hastelloy C
Maximum delivery pressure	40MPa 10ml & 15MPa 50ml pump head
Maximum flow rate	10 ml pump head: 0.01-10 ml/min (0.1-8.0 ml/min recommended, 0.1-4.0 ml/min continuous operation) 50 ml pump head: 0.01-50 ml/min (1.0-40 ml/min recommended, 0.1-25.0 ml/min continuous operation)
Flow rate increment	0.01 ml/min
Flow rate accuracy	± 5%, measured at 5 - 50% of flow range using ethanol/water 10:90 ± 2% at calibration point (one point calibration), measured at 5 - 50% of flow range using ethanol/water 10:90
Flow rate precision	≤ 0.5 % RSD, measured at 1 / 5 ml/min using ethanol/water 10:90
System protection	I_{min} and I_{max} are programmable, (I ~ pressure, pump without pressure sensor)
Wetted materials	graphite fiber reinforced PTFE, FKM (FFKM for APG90EC and APG90FC), PEEK (PCTFE for APG90EC and APG90FC), sapphire, zirconium oxide (ZrO ₂) and pump head material
Max. viscosity	100 mPa·s (at reduced max. flow)
Liquid temperature range	-10-60 °C
Communication	
Control	LAN, RS-232, 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)
General	
Power supply	100-240 V power supply included, 24 V DC, 60 W
Dimensions	113 x 135 x 225 mm (W x H x D)

Ordering details:

APG90EA	Compact HPLC pump with 10 ml/min pump head, stainless steel
APG90EB	Compact HPLC pump with 10 ml/min pump head, ceramic
APG90EC	Compact HPLC pump with 10 ml/min pump head, Hastelloy C
APG90FA	Compact HPLC pump with 50 ml/min pump head, stainless steel
APG90FB	Compact HPLC pump with 50 ml/min pump head, ceramic
APG90FC	Compact HPLC pump with 50 ml/min pump head, Hastelloy C

AZURA® Pump P 4.1S

AZURA® Pump P 4.1S was developed for eluent delivery up to 400 bar and for flow rates up to 50 ml/min in HPLC and other applications where a compact easy-to-integrate pump is required.

Key features

- integrated pressure sensor
- versatile due to wide flow rate range (0.01-50 ml/min)
- powerful and precise drive, with low pulsation
- compact dimensions
- flexible control via Ethernet, RS-232 and analog signals



Specifications

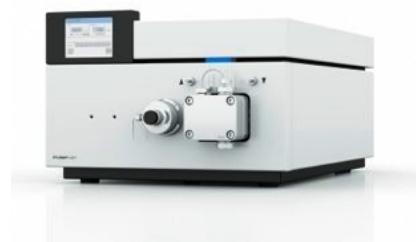
Pump type	Ultra-compact high pressure pump
Delivery system	Dual piston pump with one working piston, one auxiliary
Pump head	10 / 50 ml/min
Pump head materials	ceramic/SST
Maximum delivery pressure	40MPa 10ml & 15MPa 50ml pump head
Maximum flow rate	10 ml pump head: 0.01-10 ml/min (0.1-8.0 ml/min recommended, 0.1-4.0 ml/min continuous operation) 50 ml pump head: 0.01-50 ml/min (1.0-40 ml/min recommended, 0.1-25.0 ml/min continuous operation)
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 1/ 5 ml/min using ethanol/water 10:90
System protection	P _{min} and P _{max} are programmable
Wetted materials	graphite fiber reinforced PTFE, FKM, PEEK, sapphire, zirconium oxide (ZrO ₂), titanium and pump head material
Max. viscosity	100 mPa·s (at reduced max. flow)
Liquid temperature range	-10-60 °C
Communication	
Control	LAN, RS-232, 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)
General	
Power supply	100-240 V power supply included, 24 V DC, 60 W
Dimensions	113 x 135 x 225 mm (W x H x D)

Ordering details:

APG20EA	Compact HPLC pump with 10 ml/min pump head, stainless steel
APG20EB	Compact HPLC pump with 10 ml/min pump head, ceramic
APG20EF	Compact HPLC pump with 10 ml/min pump head, ceramic, with Ti-connections
APG20FA	Compact HPLC pump with 50 ml/min pump head, stainless steel
APG20FB	Compact HPLC pump with 50 ml/min pump head, ceramic

BlueShadow Pump 40P

The pump was designed to provide exceptionally precise and reliable solvent delivery for a wide range of HPLC applications in quality control and testing as well as research and method development. Two exchangeable pump heads allow a wide range of flow rates with one pump. Practically pulse-free flow is achieved by our enhanced smart drive control which actively prevents pressure ripple instead of just dampening it. The improved design also ensures a low dead volume.



Specifications

Pump type	analytical high pressure pump
Delivery system	dual piston pump with one working piston, one auxiliary
Flow properties	0.1-50.00 ml/min
Pulsation compensation	active pulsation compensation
Active piston seal wash	standard
Pump head	10 / 50 ml/min
Pump head materials	ceramic/SST
Maximum flow rate	10 ml pump head: 0.01-10 ml/min (0.1-8.0 ml/min recommended, 0.1-4.0 ml/min continuous operation) 50 ml pump head: 0.01-50 ml/min (1.0-40 ml/min recommended, 0.1-25.0 ml/min continuous operation)
Flow rate range	0.01-50.00 ml/min
Maximum delivery pressure	10 ml PH (SST): 70 MPa (700 bar, 10150 psi) up to 5 ml/min, 40 MPa (400 bar, 5800 psi) 50 ml PH (SST): 30 MPa (300 bar, 4351 psi) up to 10 ml/min, 20 MPa (200 bar, 2900 psi) at 50 ml/min
Flow rate accuracy	< 1 % (0.5-40 ml/min)
Flow rate precision	RSD ≤ 0.4 % (5 ml/min)
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).
System protection	P_{min} and P_{max} programmable
Wetted materials	graphite fiber reinforced PTFE, FKM, PEEK, sapphire, zirconium oxide (ZrO ₂), titanium & pump head material
Max. viscosity	100 mPa·s (at reduced max. flow)
Liquid temperature range	-10-60° C; HT version up to 120° C

Communication

Analog inputs	flow (0-10 V)
Analog control input	flow rate
Control	digital: RS-232, LAN; touchscreen, remote control connections (Stop, Flow, Pressure, Error)
Programming	20 programs + 9 links (to programs) + 1 wake up program

Technical parameters

Special features	The system pump head is detected automatically using radio frequency identification (RFID)
GLP	RFID pump head recognition, detailed report
Display	Touchscreen
Ambient conditions	temperature range: 4-40° C; 39.2-104 °F, air humidity: below 90 % (non-condensing)

General

Power supply	voltage range: 100-240 V, 50-60 Hz
Dimensions	242 x 165 x 399 mm (W x H x D)
Weight	6.1 kg
Optional accessories	mixer

Ordering details:

APC30EA	BlueShadow Pump 40P 10 ml pump head, stainless steel
APC30EB	BlueShadow Pump 40P 10 ml pump head, ceramic
APC30EE	BlueShadow Pump 40P 10 ml pump head, stainless steel (for high temperature applications up to 120 °C)
APC30FA	BlueShadow Pump 40P 50 ml pump head, stainless steel
APC30FB	BlueShadow Pump 40P 50 ml pump head, ceramic
APC30FE	BlueShadow Pump 40P 50 ml pump head, stainless steel (for high temperature applications up to 120 °C)

BlueShadow Pump 80P

The preparative pump 80P delivers stable and precise solvent flow for semi-preparative as well as preparative HPLC applications.

By adding one or more additional pumps, binary, ternary or even quaternary high-pressure gradient systems can be easily configured. The pump can also be equipped with a binary or ternary gradient valve block to configure cost-effective low-pressure gradient systems.

Exchangeable pump heads for flow rates up to 1000 ml/min and pressures up to 40 MPa make it possible to easily optimize the pump to changing performance requirements and allow simple maintenance.

Available in stainless steel or biocompatible titanium versions, the pump heads enable a wide range of applications.



Specifications

Pump type	dual-piston pump with two main piston
Flow rate range	0.1-1000 ml/min
Maximum delivery pressure	400/200/100/50 bar up to 100/250/500/1000 ml/min
Flow rate accuracy	± 2 % at 5-50 % of the flow range with methanol-water mixture (80/20, v/v)
Flow rate precision	RSD < 0.1 % (1 ml/min)
Pulsation	< 0.5 % at 1 ml/min
Gradient support	isocratic HPLC pump pump with binary or ternary LPG valve block (LPG system)
Wetted materials	graphite fiber reinforced PTFE, FKM, PEEK, sapphire, zirconium oxide (ZrO ₂), titanium and pump head material
Max. viscosity	1000 mPa·s
Liquid temperature range	-10-60 °C
System protection	P _{min} and P _{max} adjustable

Communication

Control LAN; RS-232; remote control connections; RFID for automatic pump head detection; touchscreen

Programming 10 programs, 9 program links, WAKE UP program

General

Power supply	pump: 100-240 V binary LPG valve lock: 24 V ternary LPG valve block: 12 V
Dimensions	397 x 242 x 201 mm (length x width x height)
Ambient conditions	temperature range: 4-40 °C; 39-104 °F air humidity: below 90 % humidity (non-condensing)

Ordering details:

APD20KA	BlueShadow Pump 80P with 100 ml pump head, stainless steel
APD20KB	BlueShadow Pump 80P with 100 ml pump head, titanium
APD20LA	BlueShadow Pump 80P with 250 ml pump head, stainless steel
APD20LC	BlueShadow Pump 80P with 250 ml pump head, titanium
APD20MA	BlueShadow Pump 80P with 500 ml pump head, stainless steel
APD20MC	BlueShadow Pump 80P with 500 ml pump head, titanium
APD20NA	BlueShadow Pump 80P with 1000 ml pump head, stainless steel
APD20NB	BlueShadow Pump 80P with 1000 ml pump head, titanium
AZZ00AA-1	LPG Modul for 80P binary, max flow 800 ml/min
AZZ00AB-1	LPG Modul for 80P ternary, max flow 220 ml/min

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 OpenLAB® CDS EZChrom Edition, ChromGate®, PurityChrom® and ClarityChrom® software, as well as from the front panel (stand-alone operation), via LAN, via RS-232, or through analog input/output; allowing it to be integrated into almost any LC system.

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



Specifications

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 H α line (FWHM)
Wavelength accuracy	± 3 nm
Wavelength precision	0.7 nm (ASTM E1657-93)
Noise	20 µAU at 254 nm (ASTM E1657-98)
Drift	300 µAU/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)

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 or Mobile Control (optional)

Technical parameters

GLP	lamp operating hours
Display	LED or Mobile Control (optional)
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

Fiber optics technology

Fiber optic cables offer the possibility to separate the flow cell spatially from the detector and thus enable the measurement of UV/Vis absorption in flow-through mode remotely from the detector.

Key applications of this technology include measuring close to the LC column, measuring in hazardous environments, detection in temperature controlled compartments, and measuring where space is limited. Furthermore, the need to redirect the flow through the detector can be eliminated.



Ordering details:

A0740	Fiber optic cables 2 x 750 mm length, 2 x SMA 600/660, polymicro
A0740HT	Fiber optic cables for high temperature 2 x 750 mm length, 2 x SMA 600/660, 85°C, polymicro
A0743	Fiber optic cables 2 x custom made length, 2 x SMA 600/660, polymicro



Flow cells

Select from an impressive range of easily exchangeable flow cells for KNAUER UV/VIS detectors. KNAUER UV flow cells are distinguished by their outstanding durability and excellent performance. Many can be effortlessly dismantled allowing optical components to be cleaned and replaced. For flow ranges of < 20 ml/min, < 50 ml/min and < 10000 ml/min flow cells are available in a selection of wetted materials with or without fiber optic connectors. Furthermore, certification is available for a number of KNAUER flow cells.

Analytical applications

A4061XB	Analytical 10 mm path length, 1/16", 10 µl volume, 300 bar, stainless steel
A4074	Analytical 10 mm path length, 1/16", 10 µl volume, 300 bar, stainless steel, fiber optic connectors



A4047

Semi preparative applications

A4042	Semi preparative 3 mm path length, 1/16", 2 µl volume, 300 bar, stainless steel
A4045	Semi preparative 3 mm path length, 1/16", 2 µl volume, 30 bar, biocompatible
A4044	Semi preparative 3 mm path length, 1/16", 2 µl volume, 300 bar, stainless steel, fiber optic connectors
A4044HT	High temperature (100 °C) semi preparative 3 mm path length, 1/16", 2 µl volume, 300 bar, stainless steel, fiber optic connectors
A4047	Semi preparative 3 mm path length, 1/16", 2 µl volume, 30 bar, biocompatible, fiber optic connectors



A4074

Preparative 1/16"

A4069	Preparative 0.5 mm path length, 1/16", 3 µl volume, 200 bar, stainless steel
A4095	Preparative 0.5 mm path length, 1/16", 3 µl volume, 100 bar, biocompatible
A4089	Preparative 0.5 mm path length, 1/16", 3 µl volume, 200 bar, stainless steel, fiber optic connectors
A4096	Preparative 0.5 mm path length, 1/16", 3 µl volume, 100 bar, biocompatible, fiber optic connectors



A4068-2

Preparative 1/8"

A4066	Preparative variable path length and volume, 1/8", 200 bar, stainless steel
A4067	Preparative variable path length and volume, 1/8", 100 bar, biocompatible
A4078	Preparative variable path length and volume, 1/8", 200 bar, stainless steel, fiber optic connectors
A4079	Preparative variable path length and volume, 1/8", 100 bar, biocompatible, fiber optics connectors



A4068

Preparative > 1/8"

A4068	Preparative variable path length and volume, 1/4" angular connections, 200 bar, stainless steel
A4068-2	Preparative variable path length and volume, 1/4" straight connections, 200 bar, stainless steel
A4081	Preparative variable path length and volume, 1/4" angular connections, 200 bar, stainless steel, fiber optic connectors
A4081V2	Preparative variable path length and volume, 1/4" straight connections, 200 bar, stainless steel, fiber optic connectors
A4152	Preparative variable path length and volume, 3/8" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors
A4152-1	Preparative 7 mm path length, 3/8" TRI-Clamp connections, 10 bar, biocompatible, fiber optic connectors
A4153	Preparative variable path length and volume, 1/4" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors
A41531	Special flow cell, 1/4", 2mm 0.5/1.25/2mm, fiber optics SSt 1.4404 (316L) certified
A4154	Preparative variable path length and volume, 1/2" TRI-Clamp connections, 80 bar, biocompatible, fiber optic connectors
A4154-1	Preparative 10 mm path length, 3/8" TRI-Clamp connections, 10 bar, biocompatible, fiber optic connectors
A4155	Preparative variable path length and volume, 3/4" TRI-Clamp connections, 80 bar, stainless steel, fiber optic connectors



A4081V2



A4152

Mobile Control for Windows 10

The Mobile Control is an intuitive, simple and cost-effective software solution for controlling and monitoring your KNAUER devices and systems.

The friendly system overview provides instant insight into device and system status and allows you to adjust key parameters with your fingertips. The smart user management makes the Mobile Control safe; ensuring that device parameters only be changed by authorized operators.

The graphical display of GLP data helps you avoid problems and unexpected downtime as well as to plan maintenance controls.

With the hand-held Mobile Control option you can check your system remotely, allowing you to oversee multiple systems from the comfort of your office. Alternatively you can install the Mobile Control directly on your PC.

Free updates enable you to take advantage of new devices, features and functions as soon as they are released with no extra cost. Your license can also be easily upgraded expand functionality to data acquisition and analysis.



System requirements

Operating system:	Windows 10
Communication:	WIFI or LAN
Display size:	minimum 10"
Display resolution:	1024 x 768 or 1280 x 800 (optimized)
RAM:	1 GB (Mobile Control), 2 GB (Mobile Control Chrom)
Processor:	1.5 GHz, Dual-Core
Disc space:	200 MB

Supported devices

AZURA® Pump P 2.1S/P 4.1S - Firmware V01.32 or higher

AZURA® Pump P 6.1L - Firmware V01.03 or higher

AZURA® Pump P 2.1L - Firmware V01.08 or higher

AZURA® Detector UVD 2.1S - Firmware V01.08 or higher

AZURA® Detector UVD 2.1L - Firmware V02.04 or higher

AZURA® Detector MWD 2.1L - Firmware V01.02 or higher

AZURA® Detector DAD 2.1L - Firmware V01.02 or higher

AZURA® Detector DAD 6.1L - Firmware V01.23 or higher

AZURA® Detector RID 2.1L - Firmware V01.10 or higher

AZURA® Valve Drive V 2.1S - Firmware V4.14 or higher

AZURA® Assistant ASM 2.1L - Firmware V01.11 or higher

AZURA® Column Thermostat CT 2.1 - Firmware V01.06 or higher

Autosampler AS 3950 - Firmware V01.16 or higher

Ordering details:

A9607	Mobile Control without data acquisition, including 10" tablet, power supply and tablet mount
A9608	Mobile Control Chrom with data acquisition, including 10" tablet, power supply and tablet mount
A9610	Mobile Control license without data acquisition
A9612	Mobile Control Chrom license with data acquisition
A9614	Upgrade license Mobile Control to Mobile Control Chrom
A9617	Mobile Control Mount flexible tablet mount for 7-10" tablets
A9616	Tablet Lock SecuPaddock (silver)
A9615	Tablet Lock with stand SecuPlus Tablet Lock (silver)
A96181	USB-LAN ADAPTER Network adapter USB 2.0 <-> 10/100 Ethernet for tablets
A64809	Router Netgear ProSafeWireless FVS318N-100EUS 8-port 8xRJ-45, Gigabit, WLAN, VPN, Firewall
A64809INT	Router Netgear ProSafeWireless FVS318N-100EUS 8-port 8xRJ-45, Gigabit, WLAN, VPN, Firewall power plug UK/US/AUS
A64811	Single device WLAN router for Mobile Control 1x RJ45, 10/100 MBit, WLAN, WLAN router for single device Model Nr.: TL-WR810N

AZURA® mixer

AZZ00MB	AZURA® HPLC mixer up to 100 MPa, 50 µl mixing volume
AZZ00MC	AZURA® HPLC mixer up to 100 MPa, 100 µl mixing volume
AZZ00MD	AZURA® HPLC mixer up to 100 MPa, 200 µl mixing volume
AZZ10ME	AZURA® HPLC mixer up to 40 MPa, 250 µl mixing volume (biocompatible)
A5830	HyperShear Static Mixer, (1.5mL), high flow series, SST



Dynamic mixing chamber

A0285	Dynamic mixing chamber, Stainless steel, analytical, 1/16"
A0581	Dynamic mixing chamber, Stainless steel, preparative, 1/8"
A0275	Dynamic mixing chamber, Titanium, analytic, 1/16"
A70581	Dynamic mixing chamber, Titanium, preparative, 1/8"
A2515	Mixing chamber extension unit, 1 intermediate section, titanium, 4.8 ml, 3 screws 6 x 60 mm



Pump head cooling and heating devices

A2034-1	Cooling device for pump heads 100/250/500/1000 ml inlay
A2035-1	Cooling and heating device for 10, 50ml pump head inlay version



A2035-1

Thermostat unit

A70050	Thermostat -40° bis 200°C
A70055	Thermostat Mini-Chiller -20° bis 40°C max. 0.2 bar delivery pressure

AZURA® switching valves

AWA11CA	Valve drive with 6-port 2-position valve, SST, 1/16" (400 bar), Vespel
AWA10AA	Valve drive with 6-port 2-position valve, SST, 1/16" (300 bar), Vespel
AWA10AC	Valve drive with 6-port 2-position valve, PEEK, 1/16" (150bar), PPS
AWA10AD	Valve drive with 6-port 2-position valve, SST, 1/8" (300 bar), Vespel
AWA10AD-1	Valve drive with 6-port 2-positon valve, SST, 1/8" (150 bar) up to 150°C, Vespel
AWA10AE	Valve drive with 6-port 2-position valve, PEEK, 1/8" (150 bar), PPS
AWA11DA	Valve drive with 6-port multiposition valve, SST, 1/16" (400 bar), Vespel
AWA10BA	Valve drive with 6-port multiposition valve, SST, 1/16" (300 bar), Vespel
AWA10BB	Valve drive with 6-port multiposition valve, PEEK, 1/16" (150 bar), PPS
AWA10BC	Valve drive with 6-port multiposition valve, SST, 1/8" (300 bar), Vespel
AWA10BC-1	Valve drive with 6-port multiposition valve, SST, 1/8" (300 bar) up to 150°C, Vespel
AWA10BD	Valve drive with 6-port multiposition valve, PEEK, 1/8" (150 bar), Vespel
AWA20BG	Valve drive with 12-port multiposition valve, SST, 1/8" (25 bar), POM
AWA30BH	Valve drive with 16-port multiposition valve, SST, 1/16" (50 bar), POM



Switching valves 1/4" (low pressure)

A5850	VICI/VALCO Dead-end Selector, 10 Port-MPos, 1/4"connectors, stainless steel, (7 bar), incl. 10 m tubing (1/4" o.d., PTFE)
A5854	VICI/VALCO Dead-end Selector, 6 Port-MPos, 1/4"connectors, Cheminnert, (7 bar), incl. 10 m tubing (1/4" o.d., PTFE)



A5854

Pump head inlet fittings

A9861	Pump head inlet for Pump AZURA® P 2.1L, 80P 3/8" (NPT), stainless steel
A9868	Pump head inlet AZURA® for Pump P 2.1L, Set, 1/2"-20 UNF, PEEK with CTFE (Kel-F) adapter, including tubing 1/4" PTFE
A98611	Bushing inlet for AZURA® Pump P2.1L BlueShadow 80P adapter to 3/8" tube stub
A98612	Bushing inlet for AZURA® Pump P2.1L BlueShadow 80P LPG binary to 3/8" tube stub
A98613	Bushing inlet for AZURA® Pump P2.1L BlueShadow 80P LPG ternary to 3/8" tube stub
A58267	Male Connector, stainless steel, 1/4" Tube OD x 1/4" Male NPT
A58268	Male Connector, stainless steel, 4 mm Tube OD x 1/4" Male NPT
A58269	Male Connector, stainless steel, 1/8" Tube OD x 1/4" Male NPT
A58202	Inlet-bushing kit 1/8" capillary, 10 ml pump heads (P 2.1S, P 4.1S, S1050, P 6.1L, 40P)
A58203	Inlet-bushing kit 1/16" capillary, 10 ml pump heads (P 2.1S, P 4.1S, S1050, P 6.1L, 40P)
A58204	Inlet-bushing kit 1/8" capillary, 10 (ceramic) and 50 ml (all) pump heads (P 2.1S, P 4.1S, S1050, P 6.1L, 40P)
A58205	Inlet-bushing kit 1/16" capillary, 10 (ceramic) and 50 ml (all) pump heads (P 2.1S, P 4.1S, S1050, P 6.1L, 40P)
A58207	Tubing kit for pump head inlet AZURA® for 1/4"-PTFE tubing, for pump P 2.1L, 80P, S1800, including solvent filter



A9861

Pump head outlet fittings

A5822	Outlet-bushing kit 1/8" pipe socket for pumps S1800, 80P and P 2.1L
A7200	Adapter 1/8" external thread on 1/16" internal thread, 2 pieces

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
A3364	Mobile Phase Filter, Biocompatible PE, 20 µm, 1/8" pipe OD, suitable for all FPLC systems, max. flow rate 500 ml/min



A3364



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, max. 100 ml/min
A33801	Inline Filter (Semi-prep.) 10µm, stainless steel, 500 bar, max. 100 ml/min, replacement frit for A3380

Signal transducer

A5835	JUMPFLEX® transducer isolation amplifier configurable with digital output (0-10V to 4-20 mA / 4-20 mA to 0-10V)
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Mass flow controllers*

A5390	Mini CORI-Flow (M13) Mass flow controller incl. mounting block, capacity: 0.2 - 50 ml/min
A5391	Mini CORI-Flow (M14) Mass flow controller incl. mounting block, capacity: 2 - 800 ml/min
A5393	Mini CORI-Flow (M13) Mass flow controller incl. mounting block, capacity: 0.2 - 50 ml/min, Profibus
A5394	Mini CORI-Flow (M12) Mass flow controller incl. mounting block, capacity: 0,03 - 3,3 ml/min
A5395	Mini CORI-Flow (M13) Mass flow controller incl. mounting block, capacity: 0.2 - 50 ml/min, Hastelloy
A5396	HI-TEC Bright display for Mini CORI-Flow mass flow controller (display, setpoint and counter)

*analog and bus versions on request



Fittings for capillaries, SST

A1021	1/16", short; 10 piece
A1064	1/16", long; 5 piece
A1067	1/8", short; 4 piece
A0735	1/8", long; 4 piece



Split-grooved clamping rings, SST

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



Sealing rings

A0139	1/16", polymer; 30 piece
A0140	1/16", polymer; 100 piece
A1062	1/16", PEEK; 10 piece
A0232	1/8", polymer; 10 piece
A1063	1/8", PEEK; 10 piece



Double-cone sealings

A1022	1/16", polymer; 10 piece
A1070	1/16", PEEK; 10 piece
A0738	1/8", polymer; 10 piece



Fittings for capillaries 1/16"

A0112	1/16", short, UNF 10/32, SW 1/4", stainless steel; 10 piece
A0113	1/16", short, UNF 10/32, SW 1/4", stainless steel; 25 piece
A0115	1/16", long, UNF 10/32, SW 1/4", stainless steel; 3 piece
A0116	1/16", long, UNF 10/32, SW 1/4", stainless steel; 10 piece



Fittings for capillaries 1/8"

A0830 1/8", M8 x 1, SW 10, stainless steel; 10 piece



Ferrules for capillaries

A0110 1/16", stainless steel; 30 piece

A0111 1/16", stainless steel; 100 piece

A0874 1/8", stainless steel; 10 piece

A01101 1/16" Ferrules, Hastelloy, 10 piece

A01102 1/16" Ferrules, Titanium, 10 piece



A0110

Plugs (blind fittings)

A0146 1/16", short, UNF 10/32, polymer; 10 piece

A0147 1/16", short, UNF 10/32, polymer; 30 piece

A0582 1/16", short, UNF 10/32, knurled, polymer; 10 piece

A0734 1/8", M8 x 1, polymer; 10 piece



A0146

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

A0141 1/16", short, UNF 10/32, knurled, polymer; 10 piece

A0142 1/16", short, UNF 10/32, knurled, polymer; 30 piece

A0144 1/16", long, UNF 10/32, knurled, polymer; 10 piece

A0145 1/16", short, UNF 10/32, with sealing ring, knurled, polymer; 10 piece

A0584 1/16", short, UNF 10/32, with sealing ring, knurled, PEEK; 10 piece

A0733 1/8", short, M8 x 1, with sealing ring, knurled, polymer; 10 piece

A25011 1/16", short, UNF 10/32, SW 1/4", PEEK with sealing ring 5 piece

A25021 1/16", long, UNF 10/32, SW 1/4", PEEK with sealing ring 5 piece



A0141



A0733

Low dead volume unions, polymer (PET/PEEK)

A0148 1/16" - 1/16"; polymer; 1 piece

A0149 1/16" - 1/16"; polymer; 5 piece

A0233 1/16" - 1/16"; PEEK; 1 piece

A1407 1/16" - 1/8"; PEEK; 1 piece

A14071 1/8" - 1/8"; PEEK; 1 piece



A0148

Low dead volume unions, stainless steel, titanium

A0117V1 1/16" - 1/16"; titanium; 1 piece

A0117 1/16" - 1/16"; stainless steel; 1 piece

A0118 1/16" - 1/16"; stainless steel; 5 piece

A0119 1/16" - 1/16"; stainless steel; 25 piece

A2512 1/8" - 1/8"; stainless steel; 1 piece

A2513 1/16" - 1/8"; stainless steel; 1 piece

A0485 1/8" - 1/16"; Dynaseal; 1 piece

A0480 1/8" - 1/8"; Dynaseal; 1 piece



A0117

Union tee, stainless steel, titanium

A0120	3 capillaries 1/16"; stainless steel; 1 piece
A2511	3 capillaries 1/8"; stainless steel; 1 piece
A58260	T-connector to connect 3 capillaries with 1/8" OD (stainless steel)
A58261	T-connector to connect 3 capillaries with 1/4" OD (stainless steel)
A58262	T-connector to connect 3 capillaries with 1/4" OD (titanium)



Union tee, polymer (PET/PEEK)

A0150	T-connector to connect 3 capillaries with 1/16" OD (material: PETP/POM, thread: 10-32 UNF), inclusive 2 bushings and sealing rings
A2511-1	T-connector to connect 3 capillaries with 1/8" OD (material: PEEK, thread: M8x1), including 2 one piece PEEK fittings 1/8"



Flat-bottom fittings

A58291	Fitting PEEK Fingertight 1/16", 1/4-28 Super Flangeless; 10 piece
A5829	Fitting PEEK Fingertight 1/8", 1/4-28 Super Flangeless; 10 piece
A58292	Ferrule Super Flangeless 1/16" PEEK / natural, SST lock ring; 10 piece
A58293	Ferrule Super Flangeless 1/8" PEEK / black, with SST lock ring; 10 piece
A58294	Ferrule Super Flangeless 1/8" ETFE / yellow, with SST lock ring; 10 piece
A1982	Adapter PEEK 1/16" external 10/32 thread on 1/8" flat bottom internal thread
A05841	Adapter PEEK 1/8" external thread on 1/16" flat bottom internal thread



Pressure relief valves / Back pressure regulators

A70088	Back pressure regulator, 1000 psi (69 bar), PEEK, incl. fittings for 1/16" capillaries
A5808	Back pressure regulator, 20 psi (1,4 bar), PEEK, incl. fittings for 1/16" capillaries
A5805	Pressure Relief Valve Tee for 1/16" OD Tubing, incl. fittings for 1/16" 40 psi (2,8 bar)



Shut-off valves

A5811	PEEK, Natural, 1/16" 0,5mm Thru-hole, 2,5µL Internal Volume, incl. fittings, 34 bar, 500 PSI
A5812	PEEK, Natural, 1/8" 1,0mm Thru-hole, 10µL Internal Volume, incl. fittings, 34 bar, 500 PSI



Union tee

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
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**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 relief 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)



Capillaries, stainless steel

A0130	Stainless steel, 1/16" 0,10 mm ID, 300 cm
A0131	Stainless steel, 1/16" 0,25 mm ID, 300 cm
A0132	Stainless steel, 1/16" 0,50 mm ID, 300 cm
A0133	Stainless steel, 1/16" 0,70 mm ID, 300 cm
A0134	Stainless steel, 1/16" 1,00 mm ID, 300 cm
A0639	Stainless steel, 1/8" 1,60 mm ID, 150 cm
A0640	Stainless steel, 1/8" 2,20 mm ID, 150 cm



Capillaries, Hastelloy C

A01321	Hastelloy C, 1/16" 0,50 mm ID, 100 cm
A01101	Ferrules for capillaries 1/16" Hastelloy C; 10 piece



Capillaries, PEEK

A0685	PEEK, 1/16", 0,25 mm ID, 150 cm, max. pressure*: 385 bar / 5600 psi
A0691	PEEK, 1/16", 0,50 mm ID, 150 cm, max. pressure*: 350 bar / 4500 psi
A0692	PEEK, 1/16", 0,70 mm ID, 150 cm, max. pressure*: 240 bar / 3500 psi
A0737	PEEK, 1/8", 1,6 mm ID, 150 cm, max. pressure*: 220 bar / 3200 psi

Tefzel tubings

A0182	Tefzel Tubing, 1/16", 0,25 mm ID, 300 cm, max. pressure*: 185 bar / 2675 psi
A0183	Tefzel Tubing, 1/16", 0,70 mm ID, 300 cm, max. pressure*: 115 bar / 1625 psi
A0478	Tefzel Tubing, 1/8", 1,60 mm ID, 300 cm, max. pressure*: 110 bar / 1600 psi

PTFE tubings

A0152	PTFE-Tubing, 1/16", 0,45 mm ID, 300 cm
A0732	PTFE-Tubing, 1/8", 1,5 mm ID, 300 cm
A0873	PTFE-Tubing, 1/8", 2,0 mm ID, 300 cm
A08732	PTFE-Tubing, 1/4", 4,75 mm ID, 300 cm
A58276	Teflon tube 1/4" tube sockets stainless steel mantle 122 cm, up to 200 bar
A58277	Teflon tube 1/4" tube sockets stainless steel mantle 183 cm, up to 200 bar
A0154	PTFE-Tubing, 4 mm OD, 3 mm ID, 300 cm
A1099	PTFE-Tubing, 9 mm OD 7 mm ID, 300 cm

Pump inlet tubings

A9650	AZURA® Tubing Kit with solvent filter (stainless steel, 10 µm), suitable for all analytical HPLC systems, max. flow rate 50 ml/min
A96507	AZURA® Tubing Kit with biocompatible mobile phase filter (polyethylene, 20 µm) with inert polymeric fittings for 1/8" tubing, suitable for all FPLC systems, max. flow rate 500 ml/min
A9661	Filter Cartridge for pump P 6.1L, Titanium frit, 2 µm pore size. 50 ml/min maximum flow., High capacity filter, 60 µl volume, 3 pcs.
A96601	Filter Cartridge for pump P 6.1L, Stainless steel frit, 2 µm pore size. 10 ml/min maximum flow, Volume optimized filter, 20 µl volume, 3 pcs

* Recommended permanent maximum working pressure at room temperature for non-destructive solvents. Change of solvents and temperature may result in lowered mechanical stability.

Keep in mind that tight bends of the tubing, use of wrong tools for cutting and bad connections may result in mechanical damage to the tube and by this reduce the pressure stability.

Replacement pump head AZURA® Pump P 4.1S & P 2.1S

AHB40	Pump head 10 ml, stainless steel
AHB32	Pump head 10 ml, ceramic
AHB32DA	Pump head 10 ml, ceramic with Ti-bushings
AHB43	Pump head 10 ml, Hastelloy-C, for corrosive chemicals
AHC20	Pump head 50 ml, stainless steel
AHC22	Pump head 50 ml, ceramic
AHC23	Pump head 50 ml, Hastelloy-C, for corrosive chemicals



Replacement pump head BlueShadow 40P

AHB40	Pump head 10 ml, stainless steel
AHB32	Pump head 10 ml, ceramic
AHC20	Pump head 50 ml, stainless steel
AHC22	Pump head 50 ml, ceramic
AHB40CA	Pump head 10 ml, stainless steel, for high temperature dosing applications
AHC20CA	Pump head 50 ml, stainless steel, for high temperature dosing applications



AHB40CA

Replacement pump head BlueShadow 80P

A4029-1	Pump head 100 ml, stainless steel
A4029V1	Pump head 100 ml, titanium
A4021-1	Pump head 250 ml, stainless steel
A4021V1	Pump head 250 ml, titanium
A4038-1	Pump head 500 ml, stainless steel
A4022-1	Pump head 1000 ml, stainless steel
A4022V1	Pump head 1000 ml, titanium

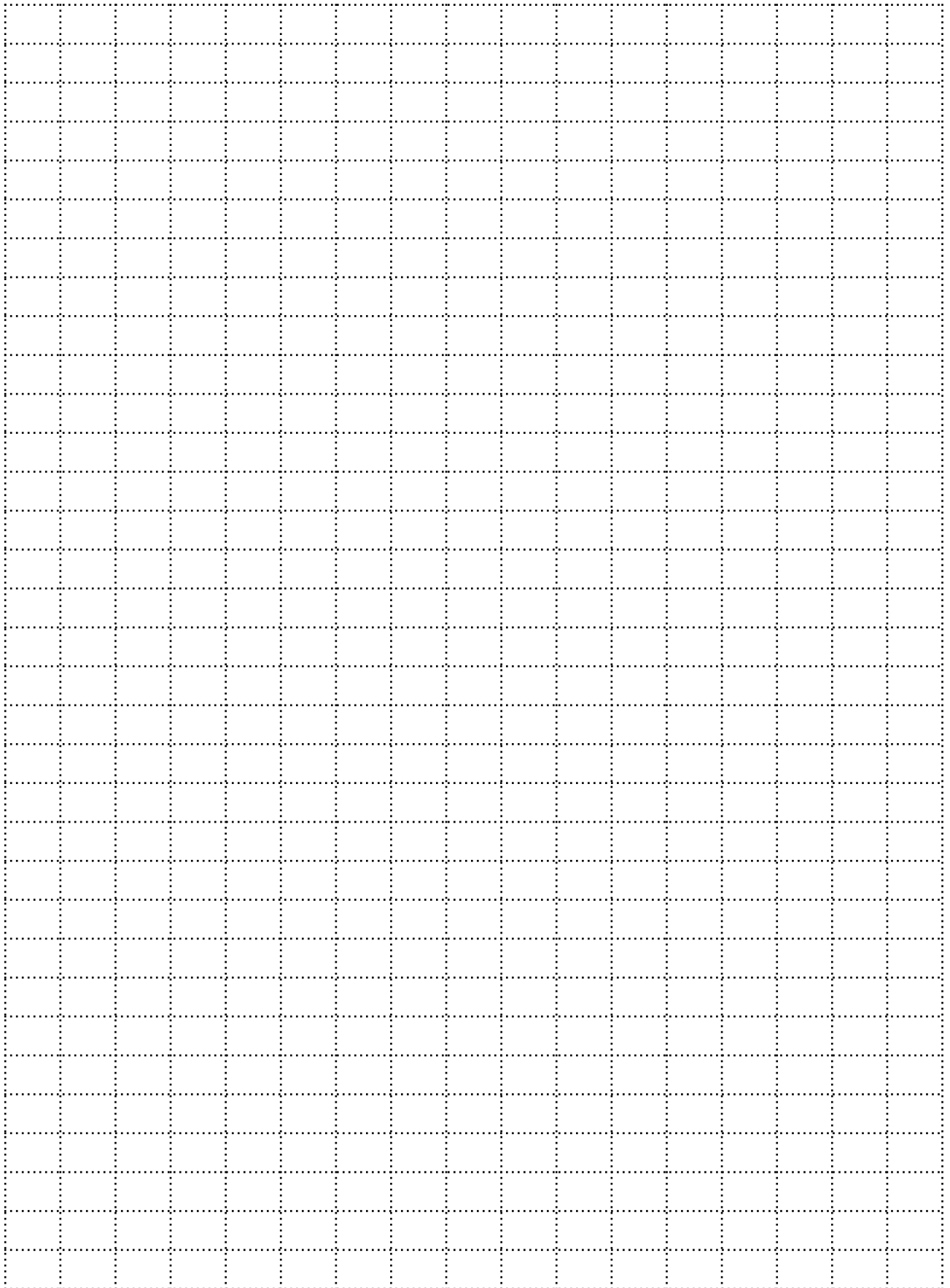


Check valves

A06841	Check valve unit for 10 ml (AZURA® Pump P 4.1S/ P 2.1S, BlueShadow 40P)
A06842	Check valve unit for 50 ml (AZURA® Pump P 4.1S/ P 2.1S, BlueShadow 40P)
A068412	Check valve unit for (KEL-F) 10 ml pump head (AZURA® Pump P 4.1S/ P 2.1S, BlueShadow 40P)
A068422	Check valve unit for (KEL-F) 50 ml pump head (AZURA® Pump P 4.1S/ P 2.1S, BlueShadow 40P)
A068411	Check valve unit (spring-loaded) for 10 ml and 50 ml pump head (AZURA® Pump P 4.1S/ P 2.1S, BlueShadow 40P)
A1122	Check valve unit for 100 ml and 250 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)
A1080	Check valve unit for 500 ml and 1000 ml pump head (AZURA® Pump P 2.1L, BlueShadow 80P)

Maintenance kits

A96423	Maintenance kit for AZURA® Pump P 4.1S & P 2.1S, AZURA® Pump P 6.1L, BlueShadow 40P, 10 ml pump head
A964231	Maintenance kit for AZURA® Pump P 4.1S & P 2.1S, AZURA® Pump P 6.1L, BlueShadow 40P, 10 ml pump head (Hastelloy-C)
A96424	Maintenance kit for AZURA® Pump P 4.1S & P 2.1S, AZURA® Pump P 6.1L, BlueShadow 40P, 50 ml pump head
A96425	Maintenance kit 100 ml for AZURA® Pump P 2.1L & BlueShadow 80P
A96426	Maintenance kit 250 ml for AZURA® Pump P 2.1L & BlueShadow 80P
A96427	Maintenance kit 500 ml for AZURA® Pump P 2.1L & BlueShadow 80P
A96428	Maintenance kit 1000 ml for AZURA® Pump P 2.1L & BlueShadow 80P
A58211	Rebuild-Kit for Pump AZURA® Pump P 2.1L and BlueShadow 80P (100ml/250 ml), Venting screw KEL-F, Check valve unit KEL-F, O-ring
A5821-1	Rebuild-Kit for AZURA® Pump P 4.1S & P 2.1S, 10 ml/min pump head., Venting screw KEL-F, Check valve unit KEL-F, O-ring (FFKM)
A5821-2	Rebuild-Kit for AZURA® Pump P 4.1S & P 2.1S, 50 ml/min pump head., Venting screw KEL-F, Check valve unit KEL-F, O-ring (FFKM)



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	50	115	239	220	428
15	59	120	248	225	437
20	68	125	257	230	446
25	77	130	266	235	455
30	86	135	275	240	464
35	95	140	284	245	473
40	104	145	293	250	482
45	113	150	302	255	491
50	122	155	311	260	500
55	131	160	320	265	509
60	140	165	329	270	518

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