

AZURA® Pump P 6.1L

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



KNAUER offers various software control options:

www.knauer.net/softwarecontrol



For pump accessories see p. 36

Specifications

Solvent delivery

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

Degasser module

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

Communication

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

Technical parameters

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

General

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

AZURA® Pump P 6.1L with 10 ml pump head

Pump specifications

Pump head	10 ml
Flow rate range	0.001 - 10 ml/min
Maximum delivery pressure	12500 psi / 862 bar / 86.2 MPa up to 3 ml/min / 10150 psi / 700 bar / 70 MPa up to 5 ml/min; 5800 psi / 400 bar / 40 MPa up to 10 ml/min
Wetted materials	GFP, Stainless Steel, FKM, PEEK, Sapphire, Aluminiumoxide, Ruby, Zirconiumoxide
Mixing volume	100 µl HPG, 200 µl LPG
Flow rate increment	0.001 ml/min
Best working conditions	0.1 - 8.0 ml/min
Continuous working conditions	0.1 - 4.0 ml/min
Pumphead material	Stainless Steel

Ordering details:

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

AZURA® Pump P 6.1L with 50 ml pump head

Pump specifications

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

Ordering details:

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

AZURA® Pump P 6.1L with 5 ml pump head

Pump specifications

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

Ordering details:

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

AZURA® Pump P 6.1L metal-free

Pump specifications

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

Ordering details:

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