

## AZURA® Pump P 6.1L

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



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



For pump accessories  
 see p. 36

### Specifications

#### Solvent delivery

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

#### Degasser module

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

#### Communication

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

#### Technical parameters

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

#### General

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

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

### Pump specifications

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

### Ordering details:

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

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

### Pump specifications

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

### Ordering details:

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

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

### Pump specifications

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

### Ordering details:

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

## AZURA® Pump P 6.1L metal-free

### Pump specifications

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

### Ordering details:

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