

Smartline

► Systems



Smartline – HPLC by Design

Modern technology for high performance and practical design are prominent features of the Smartline series of HPLC instruments. Its thoughtful design not only conserves valuable bench space, but also allows the length of the capillaries between instruments to be kept to a minimum, resulting in a marked decrease in the dead volume of the complete HPLC system.

The display panel is integrated into the front door which hides components such as the pump head and flow cell from view. These important elements are also thereby protected against external influences. The uniform Smartline design offers extended adaptability for flexible combination of individual modules.

Whether you would like to put together a system for isocratic or gradient HPLC, or an HPLC system with more than one detector, KNAUER Smartline can accommodate all of your requirements.

Our offer to you

- You let us know which substances you would like to separate or analyze.
- We work together with you to find the right application and the corresponding column.
- We will then put together a complete HPLC system for you from our Smartline components which is best suited to your specific needs.

The following is a brief overview of our assortment of Smartline HPLC instruments, including autosamplers, pumps and detectors, as well as software.



Smartline Pump 1000

Our versatile dual-piston pump offers outstanding flow rate precision ($RSD \leq 0.1\%$) and accuracy. Its optimized mechanics and automatic piston seal wash provide for lower maintenance costs. Up to four eluents can be mixed in either a low pressure (LPG) or a high pressure gradient (HPG) system. For an LPG system, the Smartline Manager 5000 is required while for an HPG system, up to four pumps can be combined. The entire range from micro- to semi-preparative HPLC (0.01 to 50 ml/min) is covered with our assortment of different pump heads, also available in biocompatible versions.



Smartline Manager 5000

This extension to the Pump 1000 can be equipped with up to 3 modules: a quaternary low pressure gradient valve module, a low hysteresis four-channel degasser with innovative membrane technology (Teflon® AF), as well as an interface board for integration of analog or third-party instruments.



Smartline Pump 100

Probably the most compact high pressure pump on the market, the Pump 100 is available with or without pressure sensor for a variety of solvent delivery tasks such as direct feeding of large sample volumes to the column inlet, automated column preconditioning or backflushing, dosing of postcolumn derivatization eluents, or for use as an isocratic HPLC pump. It is specified up to a maximum of 400 bar when equipped with a 10 ml/min pump head (150 bar with 50 ml/min pump head) and can be digitally controlled from a PC via RS-232 or through analog signals.



Smartline PDA Detector 2800

This diode array detector covers the entire wavelength range from UV up to the near IR (190 to 1020 nm) by combining a deuterium and a tungsten-halogen lamp. It has a very high resolution at 0.8 nm per pixel and offers a wavelength accuracy of < 0.5 nm and a wavelength reproducibility (precision) of < 0.1 nm. Three-dimensional data can be recorded to discover full spectral information for the peaks in your chromatograms as well as the spectra of each of the substances separated. If you only perform measurements in the UV range, this detector is also available as a one lamp device.

The Smartline PDA Detector 2800 is equipped with fiber optics, making it possible to spatially separate the measurement cell from the detector.



Smartline UV Detector 2600

This multiple-wavelength detector based on PDA technology works in the range of 190 to 500 nm and offers outstanding noise and drift specifications. With a fast wavelength scanning speed of 0.1 sec/scan it can be used in all standard HPLC applications. It features automatic wavelength verification via a built-in holmium oxide filter. Special versions of the detector are available for the VIS wavelength range and for fiber optics flow cells. Standalone solvent recycling is supported by simply adding a valve. If you want to acquire data for more than one wavelength per run, this is the detector of choice.



Smartline UV Detector 2550

This multi-channel UV-VIS detector for HPLC and fast HPLC combines the advantages of a spectrophotometer (high spectral resolution, high sensitivity and low drift) with high speed scanning technology. The detector is available with different lamp options and covers the wavelength range from 190 to 900 nm. With a remarkable linear range of 3 AU, simultaneous determination of main analytes and impurities can be carried out without recalibration. Its high data acquisition rate of up to 80 Hz allows for use in fast chromatography applications.

detection



Smartline UV Detector 2500

This wavelength-programmable detector is ideal for use in routine micro-HPLC, analytical, and preparative HPLC with flow rates up to 10 l/min. As with all KNAUER detectors, the Smartline UV Detector 2500 is very robust and service-friendly. The optical bench can be pulled out from the front of the instrument for easy lamp exchange. The detector can be equipped with either a deuterium or tungsten-halogen lamp and offers a wavelength range of 190 to 740 nm. An alternative model with fiber optics is available for measurements at extreme temperatures or in hazardous environments.



Smartline UV Detector 200

This 254 nm fixed-wavelength detector is extremely compact and features exchangeable flow cells, enabling its use for a wide range of concentrations and flow rates. The mercury vapor lamp has a long lifespan of approx. 6000 h.



Smartline RI Detector 2300 / 2400

This refractive index detector is the best choice for detecting substances not absorbing in the UV range such as carbohydrates or for the analysis of polymers in size exclusion chromatography. The analytical model of this detector (RI Detector 2300) is designed for flow rates up to 5 ml/min and the preparative model (RI Detector 2400) for flow rates up to 100 ml/min.

sample injection/automated switching



Smartline Autosampler 3950

This fast and flexible HPLC autosampler supports up to 768 samples in 2 microtiter plates, or up to 96 samples in 2 ml standard sample vials. An interior and exterior needle wash feature significantly minimizes sample carryover. One complete sample injection cycle takes less than one minute, including needle wash. Precolumn derivatization is supported, as well as various injection modes (full loop and partial loop filling for dilution series, »µl pickup« for lossless injection of extremely small sample volumes). Options include sample tray cooling (4 to 22°C), biocompatible sample path, and a preparative version for sample volumes up to 10 ml.



Smartline Valve Drives

These electrical valve drives can be used for various switching tasks such as automatic injection, column switching, sample preparation, or fractionation. Available for switching between 2, 6, 12, or 16 positions, these electrical valve drives can be equipped with a range of different valve heads, including injection valves and switching valves with up to 17 ports. Most valves are also available in biocompatible PEEK versions.

fractionation



Smartline Fraction Collector 3050

This flexible fraction collector works extremely fast, allowing for collection of fractions from very narrow peaks. It can collect up to 384 fractions in 4 microtiter plates or up to 192 fractions in standard 2 ml vials. Fractions collected in 2 ml vials can be transferred directly to the Smartline Autosampler 3950 since the sample trays are the same size. This fraction collector is available in two versions: »analytical« for flow rates up to 5 ml/min, or »semi-preparative« for flow rates up to 50 ml/min. The semi-preparative version can use special racks for test tubes, beakers or flasks up to 250 ml. This collector supports solvent and peak recycling and is controlled by current KNAUER chromatography software packages.

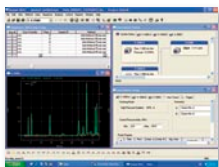
temp. control



Smartline Column Oven 4050

Optimally suited for the majority of HPLC applications. This oven features heating and active Peltier cooling in the range from 10° below room temperature up to 140°C. Its contact oven design and thermostating of the mobile phase before the column inlet ensure an even temperature distribution over the entire column for improved separation results. Active column eluate cooling minimizes peak broadening and noise/drift in subsequent detection.

ChromGate® software



Based on the well-known EZChrom Elite™ kernel, ChromGate® is an advanced chromatography software, scalable for standalone installations as well as large networked laboratories via client/server functionality. It provides the highest available level of data security and GLP compliance and fully implements the guidelines specified by FDA 21 CFR Part 11 for the storage and protection of electronic archived data and electronic signatures.

Besides analytical HPLC, a wide range of instruments is supported including GC, GPC/SEC systems, preparative purification systems, as well as KNAUER simulated moving bed systems (additional licenses may be required). Since the software is sold as license options, you only buy the software that you really need.



ClarityChrom® software

This chromatography data system provides an economical solution for the demands of modern small and medium-sized laboratories. Users of this software will especially appreciate its ease-of-use. A large base of instruments can be controlled with ClarityChrom®, including PDA, GC, GPC systems. ClarityChrom® *Prep*, a special version for advanced fractionation control in HPLC purification systems, is also available.



Preparative HPLC systems

KNAUER offers complete systems for the reliable purification of value products by HPLC. Pressure stability up to 400 bar, flow rates up to 1 000 ml/min, piston seal wash, a gradient option, eluent recycling, as well as a variety of detection principles are available. All components are optimally matched to each other and can also be controlled through software, enabling precise fraction collection and unique features. GLP compliance is also provided.



Simulated moving bed systems (SMB)

KNAUER has many years of experience with this chromatography technology for the continuous extraction of pure substances.

SMB from KNAUER is used with great success in many areas of chemistry and biochemistry. Compared to preparative HPLC, up to 90% of eluent costs can be saved and column packing materials are also more economical. Up to 1 000 kg of pure substance can be produced per year by using a KNAUER SMB system.



HPLC columns

KNAUER offers separation columns from 2 to 62 mm inner diameter and stationary phases for a large variety of applications, including our newest phase BlueOrchid for ultra high performance (UHPLC) separations using sub-2 µm particles. Other phases include Eurocel, our polysaccharide-based stationary phase for chiral separations, Eurokat, a polymer-based material for aqueous separations, and Eurospher, a silica-based phase for reversed phase and normal phase separations. Every column is individually tested to ensure the highest quality and reproducibility of your results.

Technical data are subject to change without notice.

Visit www.knauer.net for details on complete HPLC systems, HPLC columns, and osmometers.

Wissenschaftliche Gerätebau
Dr. Ing. Herbert Knauer GmbH
Hegauer Weg 38
14163 Berlin, Germany



Your local distributor:

Phone: +49-(0)30-80 97 27-0
Telefax: +49-(0)30-8 01 50 10
E-Mail: info@knauer.net
Internet: www.knauer.net