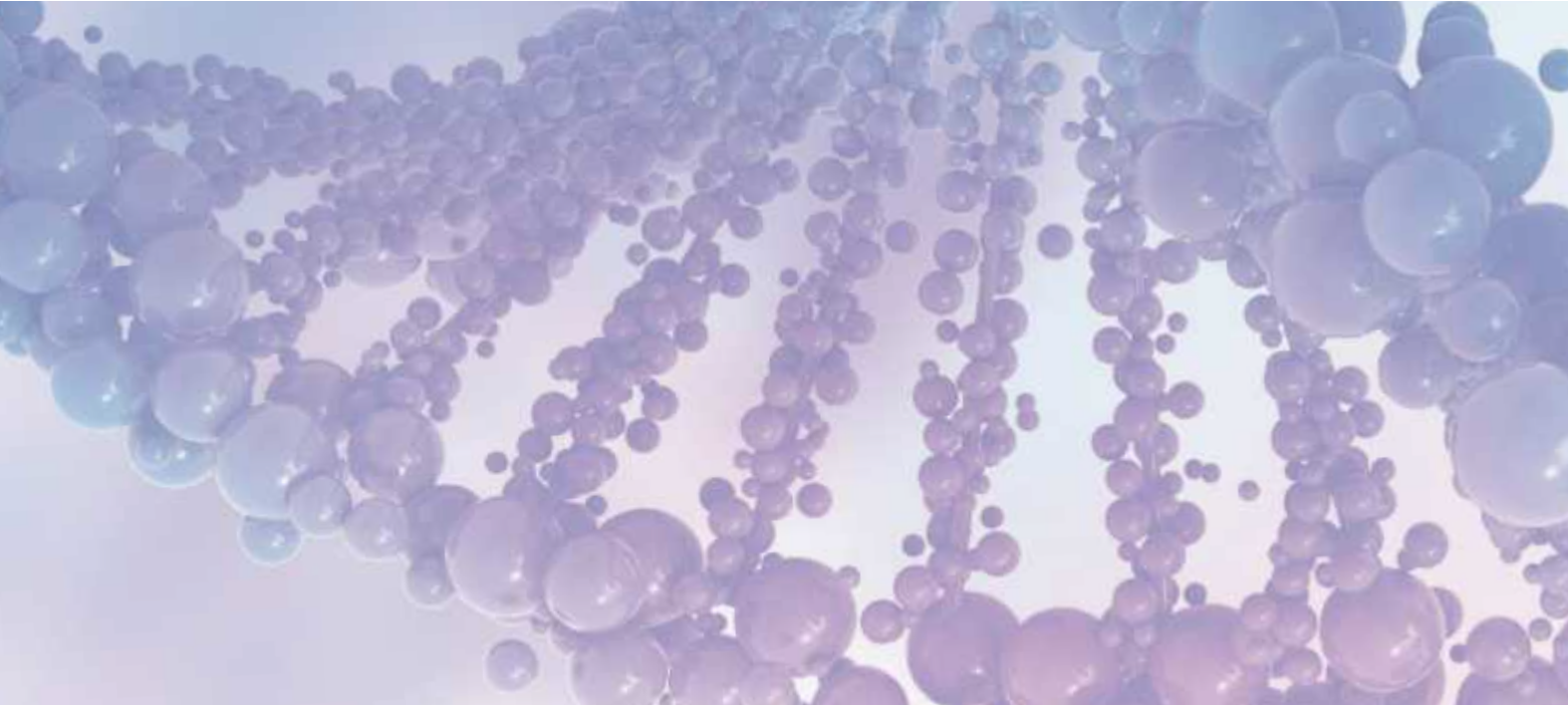




NexTract Protein Chromatography System

About us



YOCELL Biotechnology is your trusted partner in the field of bioprocess. YOCELL has a team of energetic young scientists and engineers. From initial R&D to production, we are committed to providing the most reliable solutions for biotechnology scientists and engineers around the world. Accepting the challenges of continuous innovation in biotechnology and solving problems from multiple perspectives are the most impressive qualities of the team.

Pragmatic

Always listen carefully to your needs and provide the most competitive solutions.

Efficient

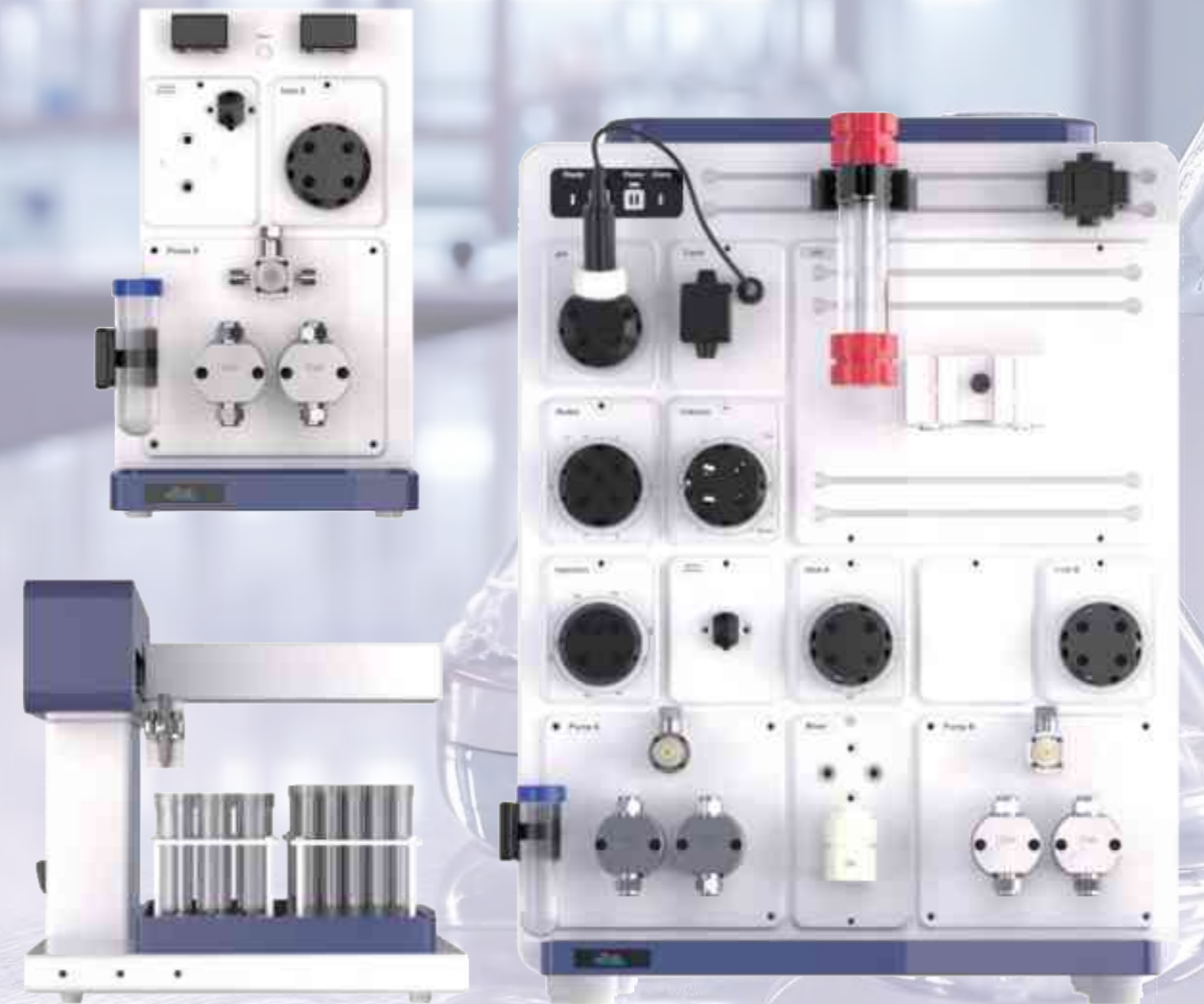
Respond quickly and have a strong supply chain to ensure fast delivery.

Focus

Continuous attention and passion for innovation in the field of biotechnology control.

System Overview

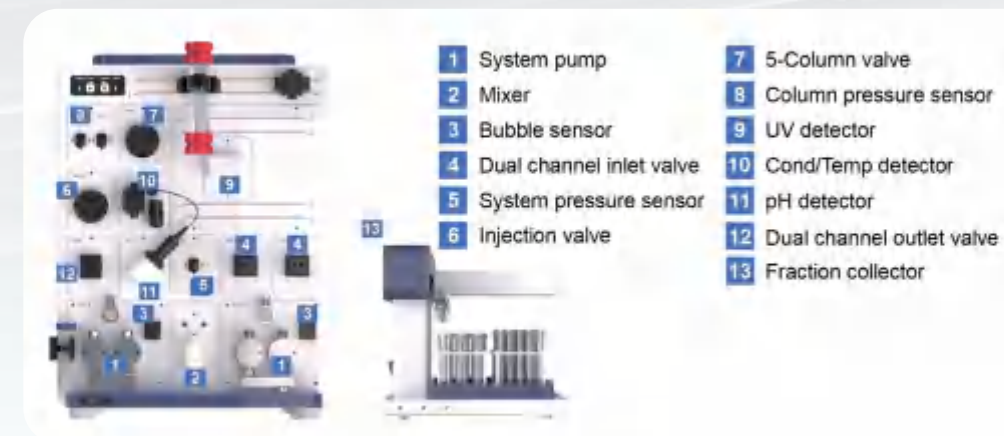
NexTract Protein Chromatography System is a full-featured, flexibly configurable and compactly designed chromatography system for laboratory-level research and method development, capable of efficiently performing separation and purification of complex biological samples ranging from micrograms to tens of grams. The system supports a variety of chromatography techniques and meets the automation requirements required to provide high purity. The system can be freely configured and upgraded at any time, and offers a variety of options based on your purification needs to further improve its performance.



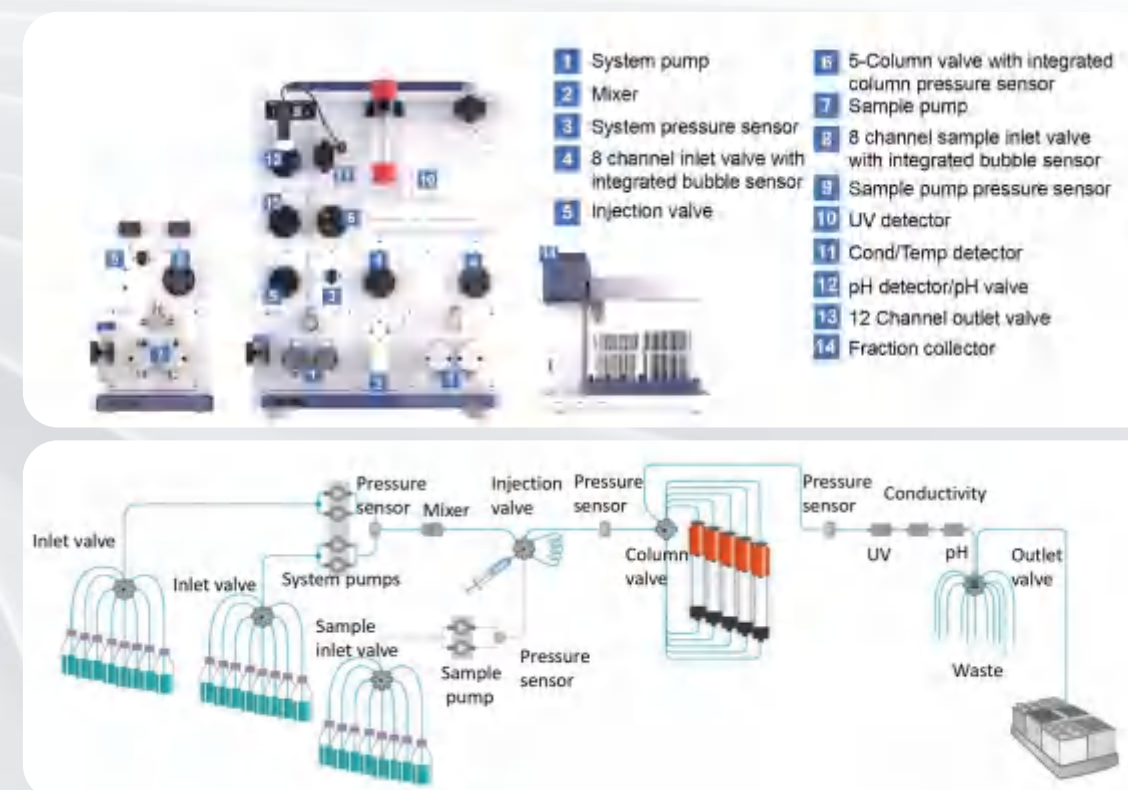
Feature Highlights

- 1 Modular design, flexible expansion
- 2 High-precision plunger pump with titanium alloy pump head, better biocompatibility and corrosion resistance
- 3 Integrated valve design, minimizes the overall delay volume in the flow path, improve the separation efficiency
- 4 pH valve enabling multiple flow path schemes without the need of disassembling during calibrations
- 5 Software integrated DOE functionality, allowing for minimal experimental input and intelligent analysis to achieve optimal process conditions and results.
- 6 Practical size for easy placement on a laboratory bench or in a freezer

NexTract Standard Version



NexTract Advanced Version



Technical Parameters

Model		NexTract025	NexTract150
System pump	Type	Piston pump	
	Flow rate	0.001-25mL/min	0.01-150mL/min
	Flow rate accuracy	±1.2%	±1.2%
	Flow rate precision	RSD<0.5%	RSD<0.5%
	Pressure range	0-30Mpa	0-10Mpa
Mixer	Type	Magnetic stirring electric mixer	
	Volume	Standard: 1.4mL Optional: 0.6mL	Standard: 2mL Optional: 5mL
UV detector	Wavelength range (Choose one of three)	F2-Fixed dual wavelength 254+280nm	
		V2-Variable dual wavelength detector, 190-400nm	
		V4-Variable four wavelength DAD detector, 200-800nm	
Conductivity detector	Detection range	0.001- 999.999mS/ cm	
	Detection accuracy	±2%	
Temperature detector	Detection range	0-100℃	
	Detection accuracy	±1℃	
pH detector	Detection range	0-14	
	Detection accuracy	±0.1	
Valve	Automatic injection valve	Supports load, inject, waste, Max. working pressure: 3000psi	
	Inlet valve	8 channel inlet valve with built-in bubble sensor/2 channel inlet valve	
	Column valve	Single column valve, can be connected to 1 column, support forward and reverse flushing, bypass function, withstand pressure: 20Mpa	
		Five column valve, can be connected to 5 column, support forward and reverse flushing, bypass function, withstand pressure: 20Mpa	
	Outlet valve	2/12 channel	
	pH valve	Five modes, supports pH and flow restrictor online simultaneously, pH online, flow restrictor online, bypass, calibration	
Bubble sensor		External bubble sensor, real-time detection of air bubbles in the pipeline	
Column pressure detector		Monitor pre and post column pressure	
Sample pump (Includes an 8 channel sample selection valve with an integrated bubble sensor)	Flow rate	0.001-25mL/min	0.01-150mL/min
	Flow rate accuracy	±1.2%	±1.2%
	Flow rate precision	RSD<0.5%	RSD<0.5%
	Pressure range	0-30Mpa	0-10Mpa
Accessories	Workstation	Chrom X software	
	Installation toolkit	Includes PEEK/PTFE pipe, pipe connectors, column clamp, back pressure valve, installation manual, common tools	
Fraction collector	Open type	Supports automatic identification of double trays, support 96, 48, 24 deep hole plate, 1.5mL, 15, 50mL centrifugal tube tray collection	
	Fully enclosed temperature control collector	Refrigeration range: 6-20 ℃, support 96, 48, 24 deep hole plate, 1.5mL, 15, 50mL centrifugal tube tray collection	

Components

System pump

NexTract system can be equipped with up to three high- precision pumps: two system (or gradient) pumps (pumps A and B) and one sample pump (pump S). The pump head is made of titanium alloy for better biocompatibility and corrosion resistance. System pumps can produce equal or linear gradients over a precisely controlled flow rate and pressure range. The sample pump can load large quantities of samples onto the column or fill large sample rings. The flow of all pumps can be controlled to avoid overpressure.

	NexTract025	NexTract150
System pump max flow rate	25mL/min	150mL/min
Max operating pressure	30MPa	10MPa
Max flow rate for column packing	50mL/min	300mL/min
Operating viscosity range	0.35-10 cP	0.35-10 cP

The pump head has a self-flushing function , the pumps automatically flush the rear pistons and seals with 20% ethanol at a constant low flow rate. This prolongs the working life of the seal by keeping it moist and preventing salt crystals from settling on the piston.

Dynamic mixer

The mixer uses magnetic induction technology to achieve uniform buffer mixing during gradient operation. The choice of mixing pool volume depends on the flow rate and the type of buffer used. For higher flow rates or buffers that are difficult to mix, a larger mixing pool volume is required. The table shows the available mixing pool volume for each NexTract system.

	NexTract025	NexTract100
Mixer volume(standard)	1.4mL	2mL
Mixer volume(Optional)	0.6mL	5mL

Buffer inlet valve

NexTract system supports up to two buffer inlet valves. 8 Channel buffer inlet valve is equipped with an integrated air sensor that detects bubbles. When bubbles are detected, the system can pause and perform flushing operations, helping to eliminate air from the flow path for the next experimental steps. Dual-channel buffer inlet valve can be configured with an external bubble sensor to detect air bubbles in the flow path.

Bubble sensor

Detect bubbles in buffer or sample valve ports to prevent air or bubbles from entering the column. The NexTract system supports up to three bubble sensor modules. It is based on ultrasonic technology and continuously monitors the presence of air bubbles in the lines of all inlet valves without contact with liquids.

Injection valve

The very small internal flow path volume minimizes the possibility of sample loss and ensures the accuracy of sample injection.

- The injection valve can be used to manually fill the sample with a syringe to the sample ring and then injected into the column by a system pump.
- The sample ring can be filled with samples using a sample pump (if installed) and then injected onto the column by a system pump.
- The sample can be injected directly into the column using a sample pump (if installed).

Max. working pressure	Material
3000psi	PEEK

Column valve

Switching between up to 5 different column/chromatographic media eliminates the need to repeatedly plug in/remove the column for automated method or process development. The module incorporates a backwash flow path for rapid elution, sample concentration and column cleaning. The built- in bypass path enables automatic system initialization and cleaning.

Maximum working pressure	Material	Mode
3000psi	Peek	Internal bypass, forward, reverse

pH valve

The valve supports accurate in- line pH(0-14) monitoring mode and incorporates a bypass path that allows the valve to be switched to bypass when the pH probe is not required for in- line measurement. In addition, the valve has an online pH calibration mode, which allows users to perform quick pH in- place calibration without removing the pH probe from the valve.

Outlet valve

Outlet valves enable the system to direct fluid to a fraction collector, waste, or other user- defined location.
12 Channel outlet valve has 12 outlet ports and one inlet port. The outlet valve enables the system to collect large volume fractions and can be used in conjunction with the fraction collector to complete the small volume component collection task. Dual channel outlet valve has two outlet ports and one inlet port.

Pressure sensor

System pressure sensor - located behind the system pump.
Pre and post column pressure sensors - located in the column switching valve or installed in front and behind the column.
These pressure sensors are used to monitor real- time pressure values at the corresponding position and protect the column and media from pressure exceeding preset limits. A pressure sensor measures the pressure in front of the column to protect the column hardware. Another sensor measures the pressure behind the column and calculates the pressure difference on the medium. If the differential pressure (Delta P) exceeds the preset limit, the run pauses or another operation is applied.
Sample pump (if installed) Pressure sensor - located behind the sample pump.
During operation, the system pressure sensor continuously measures and records pressure. If the system pressure exceeds the pressure limit specified by the user or system, the system pump will shut down.

Max. working pressure	Material
3000psi	Titanium alloy

UV

NexTract system offers either fixed dual-wavelength UV detectors or variable multi-wavelength UV and visible light detectors, known for their high sensitivity and wide linear range.
The fixed dual-wavelength UV detector provides two wavelength options, 254 and 280 nm. allowing for real-time online identification of target components.
Variable dual wavelength UV detector in the 190- 400nm wavelength range that can simultaneously monitor two different wavelengths set by the user.
Variable four wavelength DAD detector in the 200- 800nm wavelength range that can simultaneously monitor four different wavelengths set by the user. The flow cell design of DAD detector, coupled with fiber optic technology, provides a high signal- to- noise ratio without causing any local heating of the UV flow cell. Each time the NexTract instrument is turned on, the UV monitor is automatically calibrated. The UV flow tank for all systems is calibrated at the factory.

Conductivity

The conductivity monitor measures the conductivity of the buffer and sample in order to monitor the true gradient online. The integrated temperature sensor in the conductivity flow cell corrects the conductivity changes caused by temperature in real time. Conductivity monitors have a wide reading range and are therefore able to monitor conductivity in different chromatographic techniques.

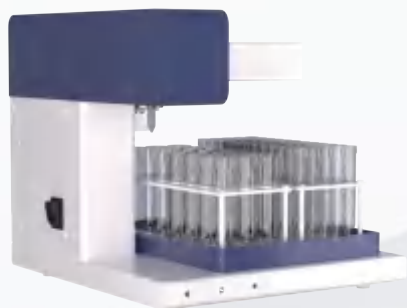
Max. working pressure	Conductivity reading range
300psi	0.001- 999.999mS/ cm

pH detector

Optional pH valves with integrated pH electrodes enable in- line pH monitoring during operation. The pH monitor can be easily calibrated by injecting the calibration buffer directly into the valve with the pH electrode. The current limiter is connected to the pH valve to generate back pressure and prevent bubbles from forming in the UV flow tank. The pH valve is used to control the flow of liquid through the pH electrode. The pH electrode in the bypass means it can be kept on the valve at all times.

Fraction collector

Open type fraction collector



- YCFC fraction collector, utilizes RFID technology to automatically detect the type of collection racks.
- The independent collection arm design prevents liquid splashing during the collection process, and the software includes a built-in delay volume to ensure precise positioning of each component during collection. The built-in collector calibration program facilitates easy maintenance.
- YCFC supports various collection containers, including 1.5mL, 15mL, 50mL and 24/48/96-well plate modes. The collection modes are diverse, allowing for collection based on time, volume, threshold and slope to meet various collection needs.

Fully enclosed temperature control collector

- Refrigeration range: 6-20 °C
- PID proportional integral differential control principle
- The collector adopts double TC temperature control processor and 4-piece TEC Peltier temperature control technology
- It can be reduced to 6°C within 15 minutes. The cooling speed depends on the external room temperature, if the room temperature is lower, the faster the cooling effect.
- The collector has a light inside
- Divided into ordinary refrigeration and rapid refrigeration mode, ordinary mode, only open a TC temperature control processor, 2 pieces of TEC Peltier temperature control. Fast refrigeration mode, open two TC temperature control processor, 4 pieces of TEC Peltier temperature control at the same time refrigeration.
- Support 24, 48, 96 deep-well plate, support 1.5mL * 54, 15mL * 60, 50mL * 21 trays and brackets.
- Support double trays, double trays at random combination Support double pallet automatic identification technology

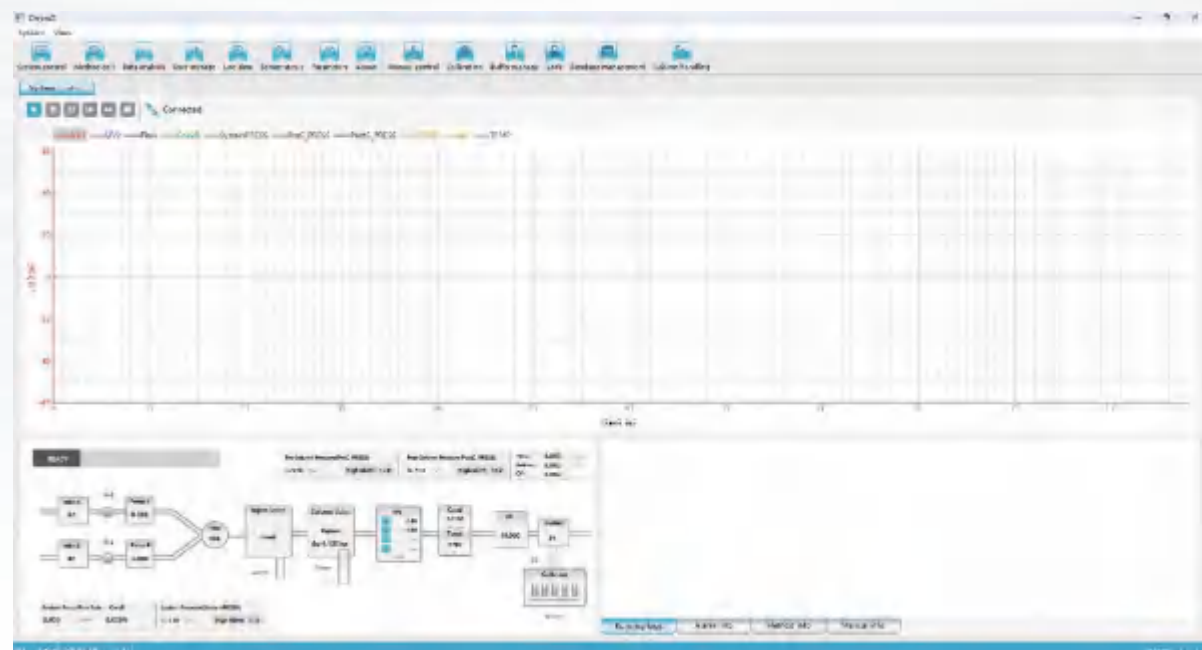


Software

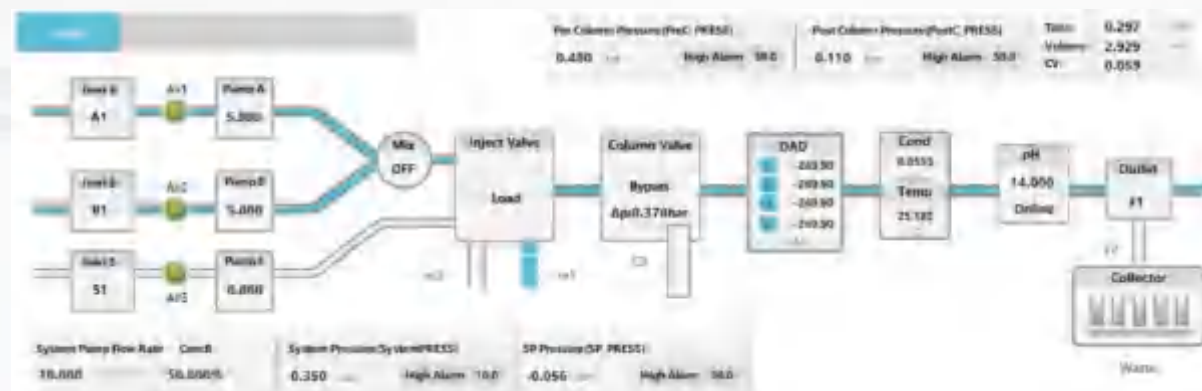
ChromX software provides you with real- time control of your chromatographic system. ChromX consists of four modules: system management module, Method editor module, system control module and result analysis module. This section describes some of the valuable tools included in ChromX, where all modules work together to improve operational safety, efficiency, and productivity.

System control

The System Control module is used to start, view, and control method running. The module consists of three panes that provide an overview of the health status. The Run Data pane displays the current data in numerical form, while the Chromatogram pane displays the data in curve form throughout the method run. The ProcessPicture pane shows the flow path during a run in real time and can be used to control the run.



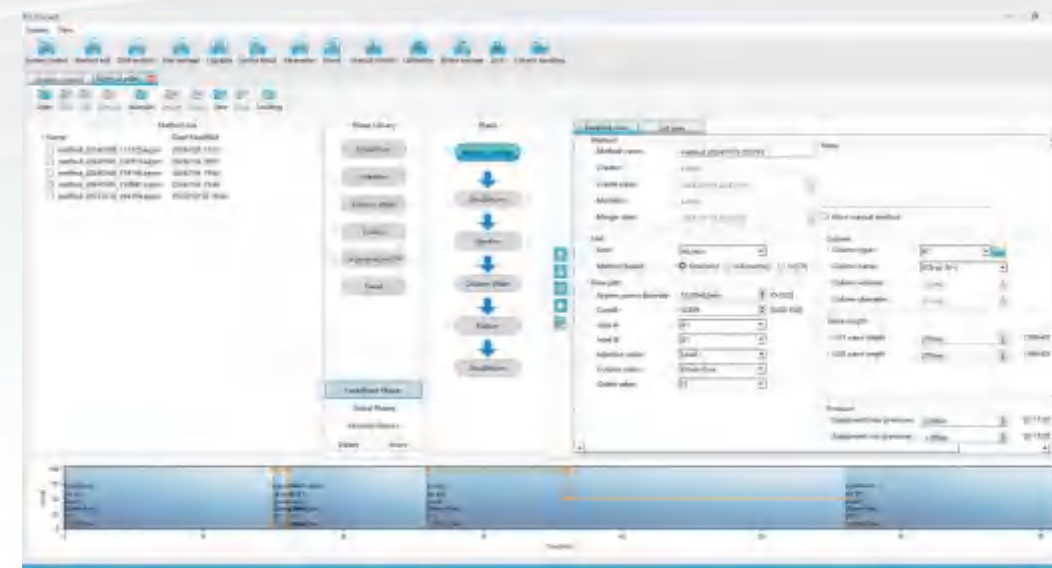
The color indication included in the flowchart shows an open flow path with current flow, a closed flow path, or an open flow path with no flow. Real-time data from the monitor is also displayed in the flowchart pane.



Description: ChromX flowcharts show the current active and inactive flow paths and provide a quick and easy way to control the system

Method editor

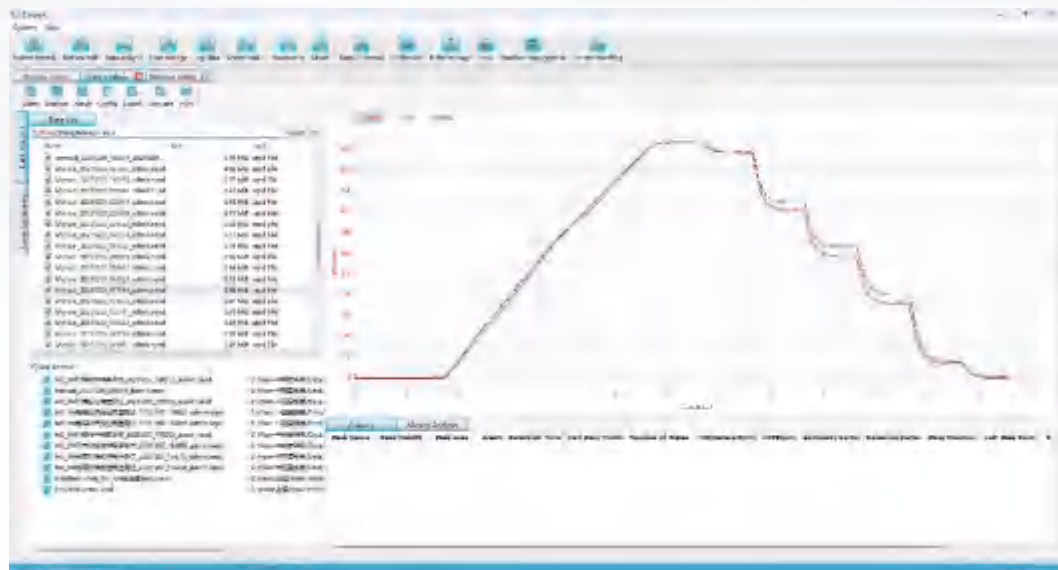
The Metho Editor module allows you to create or adapt methods to suit your application needs. It contains all the instructions used to control the run. The method editor includes built-in application support specifically for chromatographic runs.



- Through this interface, you can easily view and edit the running parameters. The image on the left shows a screenshot of the method editor with customizable panes that provide a comprehensive overview of the operation. The method editor allows you to select predefined methods for different chromatography techniques and maintenance procedures. Methods are built using phases. Each stage reflects a step in the operation, such as loading or cleaning. ChromX includes a pre-defined Phase Library for creating or editing your own methods. Methods are created or edited by dragging and dropping Phases from the phase library to the Method Phases.
- ChromX includes a library of predefined chromatographic columns. By selecting chromatographic columns in the Phase Properties pane, chromatographic column parameters, such as flow rate and pressure limits, are automatically programmed into the method. For added flexibility, advanced users can view programming Instructions directly in the Text Instructions pane.

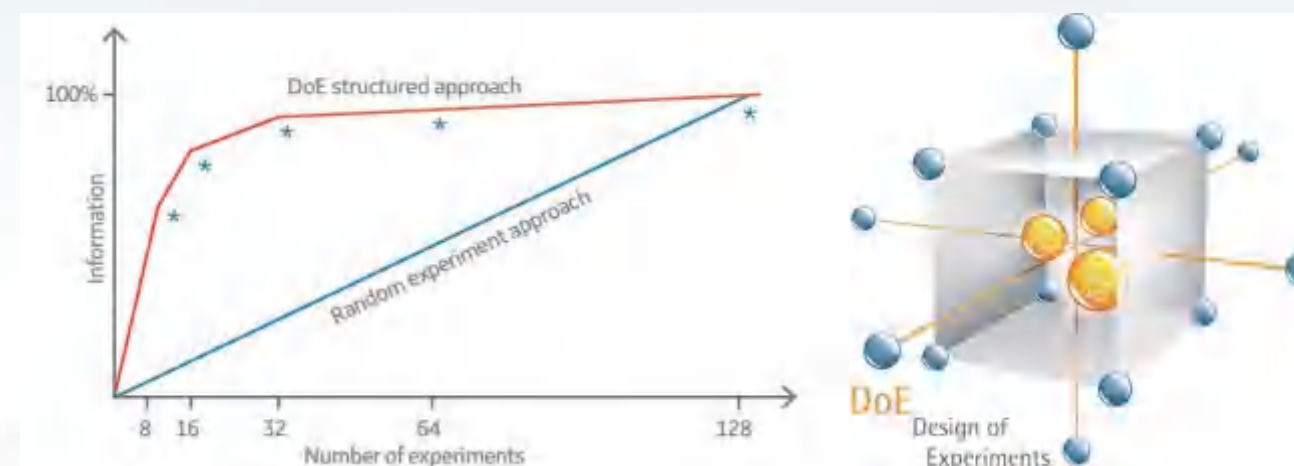
Results analysis

With ChromX, the Results Analysis (Evaluation) module provides a simplified user interface optimized for the most commonly used workflows, such as rapid analysis, results comparison, and processing of peaks and components



Design of experiments

The DOE function is a powerful tool for an efficient approach to method optimization. ChromX software will have an integrated Design of Experiments (DOE) functionality. In the traditional approach, optimal conditions can be determined by varying one parameter at a time while the rest of the parameters are kept fixed. Important information, such as interaction data between different parameters, might be missed. DoE is an organized, statistical approach that varies multiple factors simultaneously to significantly reduce the number of required experiments. The effect of all parameters and their interactions are detected and described in a validated statistical model. Scouting methods are automatically generated from DOE schemes, allowing fast and efficient method optimization. Experimental workflows in DoE include:



Chromatographic column logbook

In order to improve operation safety, the software can be optional Column Logbook function.

The screenshot shows the 'Column Logbook' window. It contains a table with columns for 'Parameter', 'Value', and 'Unit'. The table lists various parameters for different columns, such as 'Hardware', 'Software', 'Flow rate', 'Pressure', 'Temperature', etc. The 'Hardware' column is highlighted in blue.

Parameter	Value	Unit
Hardware	1.0	mm
Software	1.0	mm
Flow rate	1.0	mm
Pressure	1.0	mm
Temperature	1.0	mm
Flow rate	1.0	mm
Pressure	1.0	mm
Temperature	1.0	mm
Flow rate	1.0	mm
Pressure	1.0	mm
Temperature	1.0	mm

The screenshot shows the 'DOE' (Design of Experiments) window. It contains a table with columns for 'name', 'unit', 'low', 'high', 'method_phase', and 'variable'. The table lists various factors and their levels, such as 'Temperature', 'pH', 'Flow rate', etc. The 'Temperature' row is highlighted in blue.

name	unit	low	high	method_phase	variable
温度	°C	22	47	Method Configs	
柱子		a	b	Method Configs	
PH		4	10	Method Configs	
流速		1	-1	Method Configs	