

# 15

## Preparative LC Systems

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## Continuous chromatography systems

## Contichrom

All Contichrom systems are capable of running standard single column batch process with step or gradient elution, including capture and polishing steps. Efficient automation and inline dilution allows integrating two consecutive purification steps. The product elution from the first chromatography step is diluted with buffer allowing to bind to a second column without any holding step. Novel periodic counter-current chromatography (PCC) processes are providing higher efficiency than batch processes.

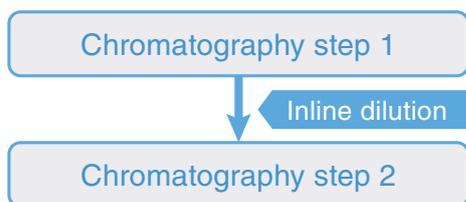
## Features

- Twin-column HPLC/FPLC system configuration
- Single column & integrated two-step batch
- Optimized periodic counter-current chromatography (PCC) operation
- Applicable to high throughput purification of biopharmaceuticals, proteins, peptides, and oligonucleotides
- Seamless scaling up to GMP pilot/production scale

## Twin-column continuous processes

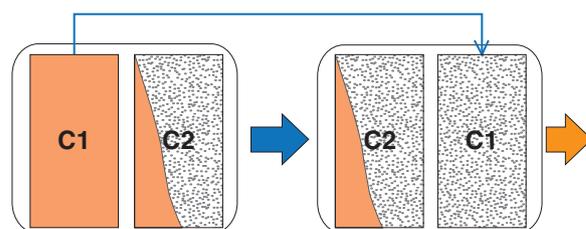
## Integrated Batch

- Connecting two orthogonal batch steps
- Running two process steps consecutively with inline dilution, and sparing a time-consuming 'holding' step



## CaptureSMB

- Increase in throughput with better utilization of affinity resins

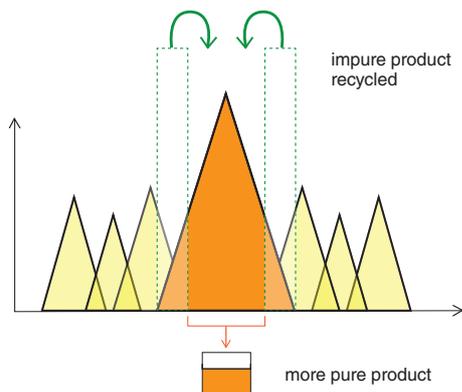


- Loading product on C1 column fully and capturing product breakthrough on C2 column
- Eluting the product from C1 column and washing the column

Reversing role of the columns

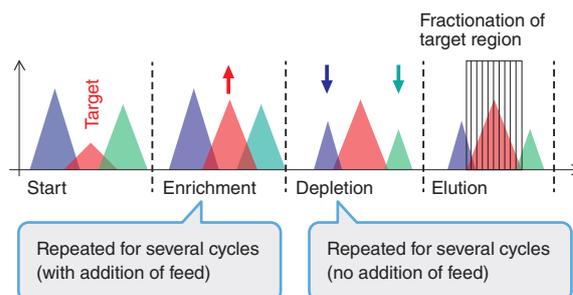
## MCSGP

- Internally recycling the impure product-containing side fractions while continuously loading fresh feed and discarding impurities
- Higher yield and purity



## N-Rich

- Automated isolation of minor components and product-related impurities overnight



## Lineup

		Contichrom HPLC	Contichrom CUBE	Contichrom CUBE Combined	Contichrom Discovery
Appearance					
Process capability	Single Column Batch	✓	✓	✓	✓
	Integrated Batch	✓	✓ (isocratic)	✓	✓
	MCSGP	✓	–	✓	–
	N-Rich	✓	–	✓	–
	CaptureSMB	✓	✓	✓	–
Pressure limit (MPa)		10	5		
Flow rate range (mL/min)		0.1-36 0.1-100			0.1-36
Target component		Peptides Oligonucleotides Small molecules	Monoclonal antibodies Other proteins		

## Scale up systems 'EcoPrime Twin'

The EcoPrime Twin is a GMP-ready, multi-column chromatography system offering continuous chromatography, and enable to smoothly scale up from Contichrom. The two-column EcoPrime Twin achieves the same productivity improvements as systems with more columns but with significantly less complexity. This accelerates validation, significantly simplifies maintenance, and minimizes costly downtime and operating expenses.

### Features

- Scale up systems from Contichrom
- Increased productivity compared to batch purification using single column
- Compliance with GMP
- Sanitary design
- Easy maintenance with simple system configuration



## Lineup of preparative systems

### Preparative LPLC Systems

Name	Biochromatography Systems			
	BioStream			
Model	BSTP-800	BSTP-03K BSTS-03K	BSTS-10K	BSTS-30K
Appearance				
Flow rate range (mL/min)	1-800	1-3000	1-10000	1-30000
System pressure limit (MPa)	0.5 (Max. 0.6)			
Dimension (W X D X H)	800 X 900 X 1300 mm	900 X 1100 X 1800 mm	1300 X 1200 X 1800 mm	1800 X 1500 X 1800 mm
Control	Programmable logic controller			
GMP/CSV compliance	Yes			
Explosion proof type	No			
Feature	Sanitary design 3 wavelengths measurable at a time			
Page	152			

Name	Biochromatography Columns							
	YMC Pilot				YMC Pilot <sup>PLUS</sup>			
Model	PI100/500 PI100/850	PI140/500 PI140/850	PI200/500 PI200/850	PI300/500 PI300/850	PPL70/500PE10 PPL70/850PE10	PPL100/500PE10 PPL100/850PE10	PPL140/500PE10 PPL140/850PE10	PPL200/500PE10 PPL200/850PE10
Appearance								
Inner diameter (φ, mm)	100	140	200	300	70	100	140	200
Column length (mm)	500, 850				500, 850			
Pressure limit (MPa)	1.0	0.7	0.5	0.3	1.6	1.0	0.7	0.5
Page	153							

Before use (installation, operation, maintenance or check-up) of our products, instruction manuals should be carefully read and understood, and safety rules and precautions followed as outlined in the manuals.

## Preparative HPLC Systems

Name	Versatile Preparative HPLC System	Preparative HPLC Systems			
	LC-Forte/R-II	K-Prep LAB		K-Prep FC	
Model	LC-Forte/R-II	K-Prep LAB100S K-Prep LAB100G	K-Prep LAB300S K-Prep LAB300G	K-Prep FC750S K-Prep FC750G	K-Prep FC1500S K-Prep FC1500G
Appearance					
Flow rate range (mL/min)	0.1-80	1-100	1-300	1-750	1-1500
System pressure limit (MPa)	30 (0.1-50 mL/min) 20 (50-80 mL/min)	15	10	10	
Dimension (W X D X H)	270 X 570 X 675 mm	920 X 600 X 700 mm		700 X 750 X 1250 mm	
Control	LC-Forte/R-II software	Programmable logic controller			
GMP/CSV compliance	No	Yes		Yes	
Explosion proof type	No	No		No	
Feature	Recycle function 3 wavelengths measurable at a time	Equipped with injectors for preparative separation		Equipped with HPLC pumps to load samples	
Page	155	156		156	

Name	Explosion Proof Preparative HPLC Systems			
	K-Prep EX			
Model	K-Prep EX03KS K-Prep EX03KG	K-Prep EX06KS K-Prep EX06KG	K-Prep EX12KS K-Prep EX12KG	K-Prep EX25KS K-Prep EX25KG
Appearance				
Flow rate range (mL/min)	30-3000	60-6000	125-12500	250-25000
System pressure limit (MPa)	10			
Dimension (W X D X H)	1100 X 1100 X 1800 mm	Contact us.		
Control	Programmable logic controller			
GMP/CSV compliance	Yes			
Explosion proof type	Yes			
Feature	Custom made systems are available upon request.			
Page	157			

Before use (installation, operation, maintenance or check-up) of our products, instruction manuals should be carefully read and understood, and safety rules and precautions followed as outlined in the manuals.

## Preparative HPLC Columns

Name	Semi-Preparative Columns	Self-Packed Axially Compressible Preparative Columns	Dynamic Axial Compression Columns		
	YMC-Actus Series	SB Columns	DAD Series		
Model	See p.114	See p.160	DAD-50-700S	DAD-100-700	DAD-150-700
Appearance					
Inner diameter (φ, mm)	20, 30	50, 70, 100, 150, 200	50, 100, 150		
Column length (mm)	50, 75, 100, 150, 250	250, 500	700		
Pressure limit (MPa)	30	10- 5	10		
Page	110-114	160	158-159		

Name	Dynamic Axial Compression Columns					
	DAD Series					
Model	DAD-200-700	DAD-300-700	DAD-450-700	DAD-600-700	DAD-800-700	DAD-1000-700
Appearance						
Inner diameter (φ, mm)	200-1000					
Column length (mm)	700					
Pressure limit (MPa)	10		7*			
Page	158-159					

\*DAD-450-700 with pressure limit 10 MPa is also available.

Before use (installation, operation, maintenance or check-up) of our products, instruction manuals should be carefully read and understood, and safety rules and precautions followed as outlined in the manuals.

# Guide for selection systems and columns

Target component	Separation mode	Recommended chromatography system	Recommended column	
<b>Low molecular weight organic compounds</b> <b>Pharmaceutical products</b> <b>Agricultural chemicals</b> <b>Food additives</b> <b>Natural products</b> <b>Optical isomers</b>	Reversed-phase Normal-phase Size exclusion	<b>LC-Forte/R-II</b> p.155	Recommended column size : $\phi 10 - \phi 30$ mm ECO / ECO <sup>PLUS</sup> p.154 YMC-Actus Series pp.110-114 Preparative Columns p.115	
		<b>K-Prep LAB</b> p.156	Recommended column size : $\phi 20 - \phi 50$ mm DAD Series pp.158-159 ECO / ECO <sup>PLUS</sup> p.154 YMC-Actus Series pp.110-114 Preparative Columns p.115	
		<b>K-Prep FC</b> p.156	Recommended column size : $\phi 50 - \phi 150$ mm DAD Series pp.158-159 Preparative Columns p.115	
		<b>K-Prep EX</b> p.157	Recommended column size : more than $\phi 100$ mm DAD Series pp.158-159	
<b>Biomolecules</b> <b>Proteins</b> <b>Peptides</b> <b>Nucleic acids</b>	Ion exchange Size exclusion Hydrophobic interaction Affinity	<b>BioStream</b> p.152	YMC Pilot / YMC Pilot <sup>PLUS</sup> p.153 ECO / ECO <sup>PLUS</sup> p.154	
		Reversed-phase Normal-phase	<b>LC-Forte/R-II</b> p.155	Recommended column size : $\phi 10 - \phi 30$ mm ECO / ECO <sup>PLUS</sup> p.154 YMC-Actus Series pp.110-114 Preparative Columns p.115
			<b>K-Prep LAB</b> p.156	Recommended column size : $\phi 20 - \phi 50$ mm DAD Series pp.158-159 ECO / ECO <sup>PLUS</sup> p.154 YMC-Actus Series pp.110-114 Preparative Columns p.115
			<b>K-Prep FC</b> p.156	Recommended column size : $\phi 50 - \phi 150$ mm DAD Series pp.158-159 Preparative Columns p.115
	<b>K-Prep EX</b> p.157		Recommended column size : more than $\phi 100$ mm DAD Series pp.158-159	
	<b>Synthetic high-polymer</b> <b>Macromolecule polymer</b>	Size exclusion	<b>LC-Forte/R-II</b> p.155	YMC-GPC pp.117-118

## Biochromatography Systems

## BioStream

BioStream is a biochromatography system and has been developed with YMC's experience and technology. This system is superior in operability, performance and quality and it achieves hygiene, speed and high purification which are required by the separation and purification of biopharmaceuticals.

## Features

- Suitable for downstream processing for biopharmaceutical manufacturing
- Compliance with cGMP
- Sanitary design superior in cleaning
- Excellent operability provided by the largest 21.5-inch touch panel screen in this industry
- Low flow pumping provided by the quintuplex diaphragm pump\*
- Compliance with IQ/OQ validation and CSV

\*The pump for BSTP-800 is a triple diaphragm pump.



## Specifications

Model	BSTP-800	BSTP-03K	BSTS-03K	BSTS-10K	BSTS-30K
Max. flow rate (mL/min)	800	3000	3000	10000	30000
System pressure limit (MPa)	0.5 (Max. 0.6)				
Ambient temperature (°C)	5 - 30				
Wetted material	PFA, PTFE, Quartz, Glass, EPDM		SUS316L, PTFE, Quartz, Glass, EPDM		
Sensor	pH sensor, Conductivity sensor, Pressure sensor, Flowmeter sensor, UV sensor (3 variable-wavelengths measurable)				
Other function	Air trap, Air sensor, Column bypass and Column switching				
Control	Programmable logic controller				
Dimension (W X D X H mm)	800 X 900 X 1300	900 X 1100 X 1800	900 X 1100 X 1800	1300 X 1200 X 1800	1800 X 1500 X 1800
Weight (kg)	200	250	300	400	600
Utility	Single-phase 100 V (15 A)	Three-phase 200 V (20 A)		Three-phase 200 V (30 A)	Three-phase 200 V (40 A)
	Instrument air, Dry air				

## Advanced flow control

BioStream is equipped with quintuplex diaphragm pumps and can pump at a low flow rate. The pumps are composed of oil-free materials. It is safe to use BioStream at production lines. A high-accuracy servo motor and a flowmeter feedback system are combined to achieve extremely high flow-rate precision.

## Biochromatography Columns

### YMC Pilot

YMC Pilot is biochromatography column designed for use in pilot and production scale. YMC Pilot are available in AB version, which is suitable for applications with aqueous buffer and in SR version, which are designed for applications requiring solvent resistant. All AB version wetted parts are made of nonmetals. Column design and care in construction avoids causing extra dead volumes and serves to allow the column to be cleaned easily. YMC Pilot are widely used from standard normal-phase/reversed-phase chromatography to use with resins designed for biochromatography.

#### Features

- For aqueous buffers and organic solvents
- Wide selection of inner diameters
- Stainless steel versions available
- Custom-made columns



#### Specifications

Model	PI100/500	PI100/850	PI140/500	PI140/850	PI200/500	PI200/850	
Inner diameter (mm)	100	100	140	140	200	200	
Packing bed height (mm)	50 - 430	400 - 780	55 - 420	405 - 770	70 - 435	420 - 785	
Volume (L)	min.	0.39	3.14	0.85	6.23	2.20	13.2
	max.	3.38	6.13	6.47	11.9	13.7	24.7
Cross-section (cm <sup>2</sup> )	78.5	78.5	154	154	314	314	
Pressure limit (MPa)	1.0	1.0	0.7	0.7	0.5	0.5	

Other sizes (more than 300 mm I.D.) are available upon request.

## Biochromatography Columns

### YMC Pilot<sup>PLUS</sup>

YMC Pilot<sup>PLUS</sup> is the new standard for your pilot scale applications. It is completely biocompatible and characterized by safe and easy handling. Packing, operating and unpacking the column is a smooth procedure due to a number of significant advantages. The unique sealing principle provides permanent sealing and an extremely low dead volume.

The drain function makes piston assembly fast and clean. Due to the removable column body, unpacking and cleaning of the column is easily performed.

#### Features

- Metal free flow path
- Biocompatible
- Safe and easy handling
- Unique sealing principle
- Removable column body



#### Specifications

Model	PPL70/500PE10	PPL70/850PE10	PPL100/500PE10	PPL100/850PE10	PPL140/500PE10	PPL140/850PE10	PPL200/500PE10	PPL200/850PE10	
Inner diameter (mm)	70	70	100	100	140	140	200	200	
Glass body length (mm)	500	850	500	850	500	850	500	850	
Packing bed height (mm)	100 - 450	250 - 800	100 - 450	250 - 800	100 - 450	250 - 800	100 - 450	250 - 800	
Volume (L)	min.	0.4	1.0	0.8	2.0	1.5	3.8	3.1	7.8
	max.	1.7	3.0	3.5	6.2	6.9	12.3	14.1	25.1
Pressure limit (MPa)	1.6	1.6	1.0	1.0	0.7	0.7	0.5	0.5	

## Glass Columns

## ECO

ECO columns are competitively priced glass columns for almost all types of soft gel and low pressure (pressure limit 0.5 to 3.0 MPa) liquid chromatography application. With a choice of one or two adjustable length plungers, it is available in two forms: AB (Aqueous Buffer) versions for use with aqueous buffers and cold room applications and SR (Solvent Resistant) versions for all forms of normal- and reversed-phase chromatography. A water-jacketed option can be supplied on request.

## Features

- Biocompatible
- Solvent resistant version
- Easy to use
- Two adjustable length plungers supplied on request
- Compatible with any LC system
- Water-jacket version available on request



## Specifications

Model	ECO10	ECO15	ECO25	ECO50	ECO70	ECO80
Inner diameter (mm)	10	15	25	50	70	80
Pressure limit (MPa)	3.0	2.5	1.5	1.0	0.5	0.5
Column length (mm)	120, 200, 450, 750, 1000					
Usable temperature range (°C)	4 - 40					
Connection	1/4" - 28G fittings (1/16" tubing)			1/4" - 28G fittings (1/8" tubing)		
Optional	AB version / SR version					
	One adjustable plunger (Vario)/Two adjustable plungers (Multivario)					
	Water-jacket version					

## Glass Columns

ECO<sup>PLUS</sup>

ECO<sup>PLUS</sup> glass columns are multi-purpose columns for almost all types of liquid chromatography applications (pressure limit 1.5 to 8.0 MPa). They are available in two forms: AB (Aqueous Buffer) versions for aqueous buffer and cold room applications and SR (Solvent Resistant) versions for separations involving organic solvents. With a choice of adjustable length plungers at each ends and a totally inert triple chevron sealing system the SR versions support the complete spectrum of applications from classical normal-phase and reversed-phase chromatography through to biochromatography. The "Quick-Lock" connection system makes it possible to open and seal the column simply and quickly.

## Features

- Biocompatible
- Universal application
- Solvent resistant version
- Low temperature version available with polyethylene plunger and EPDM sealing ring
- Height adjustable plunger at both ends
- Easy to use
- Compatible with any LC system



## Specifications

Model	TAC05	TAC10	TAC15	TAC25	TAC35	TAC50
Inner diameter (mm)	5	10	15	25	35	50
Pressure limit (MPa)	AB	8.0	8.0	7.0	5.0	3.0
	SR	8.0	5.0	5.0	5.0	1.5
Column length (mm)	125, 250, 500					
Usable temperature range (°C)	AB	4 - 40				
	SR	16 - 40				
Connection	1/4" - 28G fittings (1/16" tubing)			1/4" - 28G fittings (1/8" tubing)		
Optional	AB version / SR version					
	short plungers, short/long plunger, long plungers					

## Versatile Preparative HPLC System

# LC-Forte/R-II

LC-Forte/R-II is a laboratory scale preparative LC system with both high-/low- pressure mode. Key features include recycling mode and automatic operation. LC-Forte/R-II is equipped with 3-wavelength UV detector, and ideal for purification of chiral compounds, synthetic reaction products, and natural products.

### Features

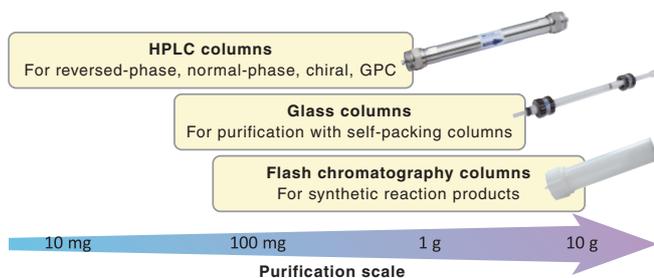
- LC system designed for both preparative HPLC and flash purification
- User friendly operation with a touch screen
- Intuitive method development by Preview Function
- Multiple functions like recycling, auto-injection and auto-replay as a standard feature
- Compact design installable in fume hoods

### Specifications

Model	LC-Forte/R-II
Flow rate range (mL/min)	0.1 - 80
System pressure limit (MPa)	30 (0.1 - 50 mL/min) 20 (50 - 80 mL/min)
Dimension (W X D X H mm)	270 X 570 X 675 *Fraction collector : 300 X 500 X 300 *Buffer rack : 400 X 500 X 420
Control software	LC-Forte/R-II software
Optional	Available detectors (UV, RI) Fraction collector Buffer rack

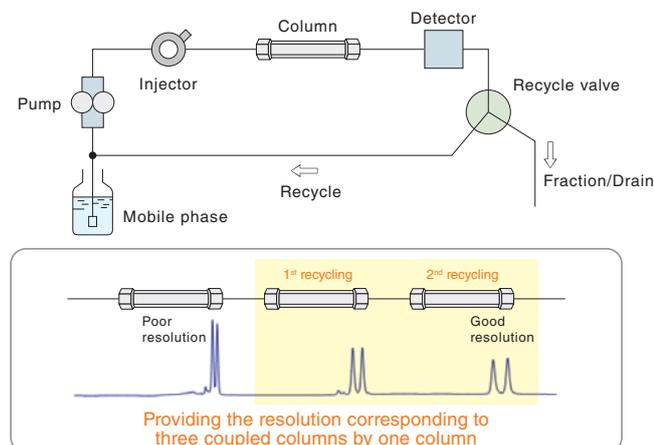


### For purification from several milligrams to 10 grams on lab-scale



LC-Forte/R-II is useful for lab-scale preparative purification with HPLC columns, glass columns and flash chromatography columns. It is applicable for every modes such as reversed-phase, normal-phase, chiral and GPC.

### Increasing separation efficiency by recycling



LC-Forte/R-II is equipped with a recycling function. Under recycling chromatographic separation, higher resolution can be achieved on a sample that is hardly separated, because the sample is repeatedly introduced into the column. Desired purity can be achieved without changing mobile phase conditions or columns. The unique flow path for the recycling system adopted in LC-Forte/R-II enables to reduce the extra-column diffusion and achieves the high efficiency preparative separation. Furthermore, consumption of solvent on purification is greatly reduced since no solvent is consumed during recycling.

## Preparative HPLC Systems

## K-Prep LAB

K-Prep LAB is an easy to use preparative HPLC member of the K-Prep series prep HPLC's developed to achieve seamless scale-up. K-Prep LAB is an easy to learn tabletop preparative system designed for usage at laboratory scale.

## Features

- Automatic preparative purification system usable at laboratory scale provides strong support for exploratory research
- All-in-one system equipped with preparative injectors and fraction collectors
- Fully-automatic operation by PC
- Easy maintenance provided by superior internal structure
- Seamless scaling-up to industrial scale

## Specifications

Mode	LAB100S	LAB100G	LAB300S	LAB300G
Gradient	No	Yes	No	Yes
Flow rate range (mL/min)	1 - 100		1 - 300	
System pressure limit (MPa)	15		10	
Fraction collector	5-channel switching valve method			
Sample injection	Preparative autoinjector			
Detector	UV/VIS (195 - 600 nm)			
Display/Control	Notebook computer/Programmable logic controller			
Dimension (W X D X H mm)	920 (body: 670/fraction collector: 250) X 600 X 700			



## K-Prep LAB100

Max. flow rate 100 mL/min	System pressure limit 15 MPa	UV/VIS 195-600 nm	Gradient mode selectable
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## K-Prep LAB300

Max. flow rate 300 mL/min	System pressure limit 10 MPa	UV/VIS 195-600 nm	Gradient mode selectable
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## Preparative HPLC Systems

## K-Prep FC

K-Prep FC is a preparative HPLC system that allows seamless scale-up from small scale production up to industrial scaling-up processes.

## Features

- Smooth transition from laboratory scale to industrial scale
- Usable for production purpose
- All-in-one system equipped with HPLC pumps to load samples and fraction collectors
- Strong support for preparative purifications provided by fully-automatic operation by PC
- Compliance with IQ/OQ validation and CSV

## Specifications

Model	FC750S	FC750G	FC1500S	FC1500G
Gradient	No	Yes	No	Yes
Flow rate range (mL/min)	1 - 750		1 - 1500	
System pressure limit (MPa)	10			
Fraction collector	5-channel switching valve method			
Sample injection	HPLC pump to load samples (1 - 300 mL/min)			
Detector	UV/VIS (195 - 600 nm)			
Display/Control	Notebook computer/Programmable logic controller			
Utility	AC100 V, 0.5 MPa dry air			



## K-Prep FC750

Max. flow rate 750 mL/min	System pressure limit 10 MPa	UV/VIS 195-600 nm	Gradient mode selectable	CSV compliance
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## K-Prep FC1500

Max. flow rate 1500 mL/min	System pressure limit 10 MPa	UV/VIS 195-600 nm	Gradient mode selectable	CSV compliance
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# K-Prep EX

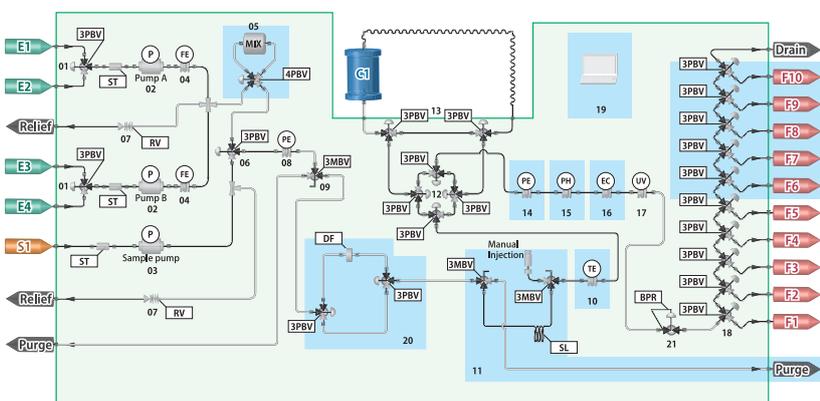
K-Prep EX is an explosion proof HPLC preparative system designed for GMP manufacturing plants.

## Features

- Explosion proof system
- The explosion proof HPLC unit may be installed in a hazardous area and controlled from a safe area
- Operable at hazardous area by operation station (optional)
- Custom-made system available upon request
- Compliance with IQ/OQ validation and CSV
- Documentation maintenance feature allows for adjusting recordkeeping to meet your needs



## Flow diagram



\* Option  
\* Gradient

MARK	NAME
E	Solvent Port
F	Fraction Port
S	Sample Port
C	Column
P	Pump
3PBV	Pneumatic Drive 3-way Ball Valve
4PBV	Pneumatic Drive 4-way Ball Valve
3MBV	Manual 3-way Ball Valve
DF	Disk Filter
SL	Sample Loop
PH	pH Sensor
EC	Electric Conductivity Sensor
TE	Temperature Sensor
PE	Pressure Sensor
FE	Flow Sensor
UV	UV/VIS Detector
RV	Relief Valve
MIX	Mixer
BPR	Back Pressure Regulator
ST	Strainer

## HPLC Pumps

# K series

K series pumps are designed for preparative chromatography employed worldwide for simple and demanding applications. K-Prep dual reciprocating plungers and the high precision servo motor enable highly-accurate pumping with less pulsation.

## Features

- Usable as a high pressure mixing gradient system by adding on a sub-pump
- Gradient and flow rate programmable provided by microcomputer control
- Max. pressure limit can be set enabling column overpressure protection
- Plunger wash ports (optional) to prevent salt deposition and premature seal failure

## Specifications

Model	K-100	K-300	K-500	K-1000
Flow rate range (mL/min)	1 - 100	1 - 300	1 - 500	1 - 1000
System pressure limit (MPa)	15	10	10	10
Pumping mechanism	Dual plunger linear cam driven			
Pumping method	Constant flow			
Wetted material	SUS316, Zirconia, Reinforced Teflon, PEEK			

## Dynamic Axial Compression Columns

## DAD series

DAD series is an automatic self-packing type of dynamic axial compression column (DAC column) that allows for an easy, cost-effective refill of packing material that results in a column bed yielding superior durability and reproducibility. DAD series columns are available in columns for laboratory, pilot, and industrial scale.



## Features

- Suitable for high purification in various fields such as pharmaceuticals, fine chemicals and functional foods
- Cost-effective self-packing dynamic axial compression columns
- Optional slurry container permits automated packing procedures
- Superior column performance, durability and reproducibility provided by usage at constant pressure
- Easy unpacking operation with downward cylinder driving direction
- No need to prepare lifting equipment after installation
- Compliance with IQ/OQ validation

## Specifications

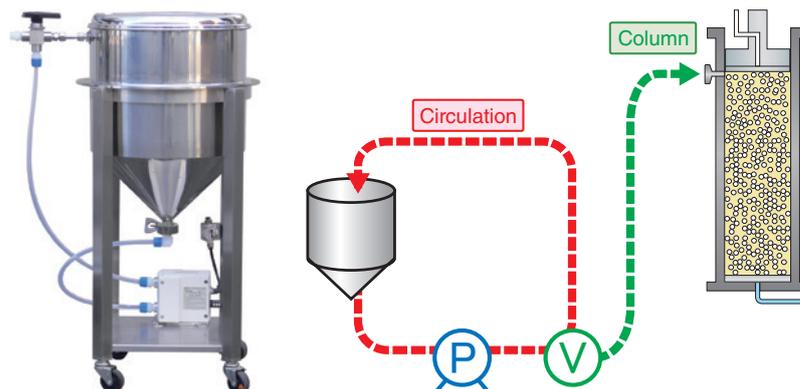
Model	DAD-50	DAD-100	DAD-150	DAD-200	DAD-300	DAD-450	DAD-600	DAD-800	DAD-1000
Inner diameter ( $\phi$ , mm)	50	100	150	200	300	450	600	800	1000
Pressure limit (MPa)	10					7* <sup>2</sup>			
Column length (mm)	700								
Column bed length (mm)	100 - 400								
Slurry container model* <sup>1</sup>	SC-2	SC-10	SC-22	SC-30	SC-80	SC-140	SC-300	SC-500	SC-800

\*<sup>1</sup> Slurry containers are optional.

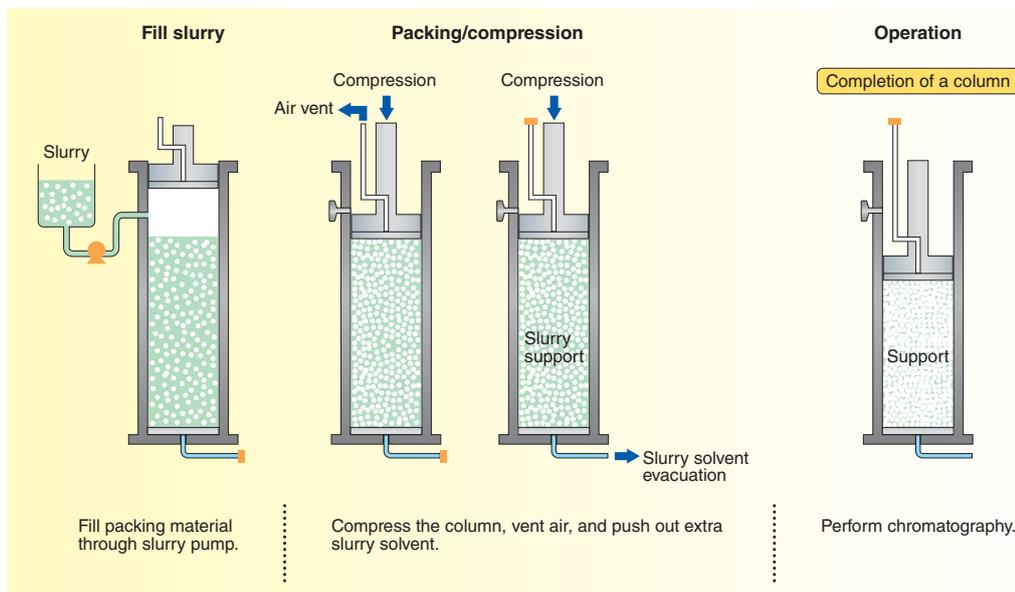
\*<sup>2</sup> DAD-450 with pressure limit 10 MPa is also available.

## Slurry container

The slurry container provides excellent distribution of packing material and allows for a “homogeneous” slurry that can be automatically loaded into the DAD column by simply switching a valve. Throughout the operation from slurry preparation to filling slurry, safety and hygiene can be achieved.

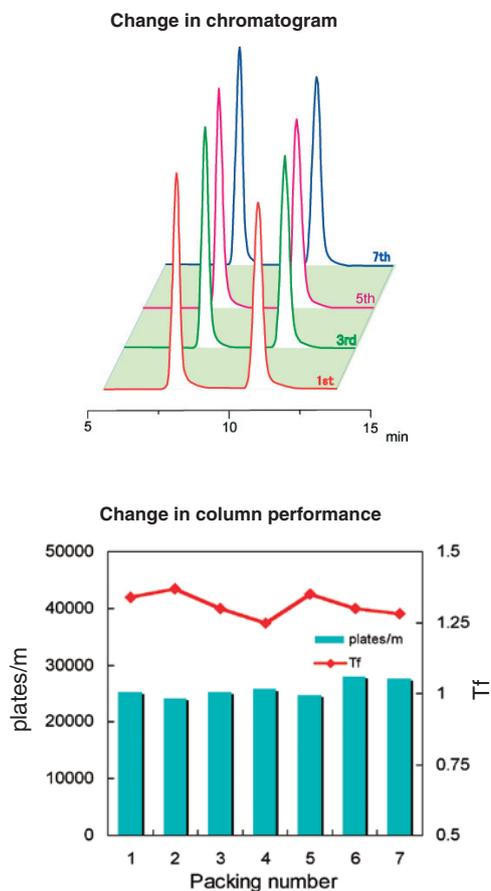


## Packing procedure



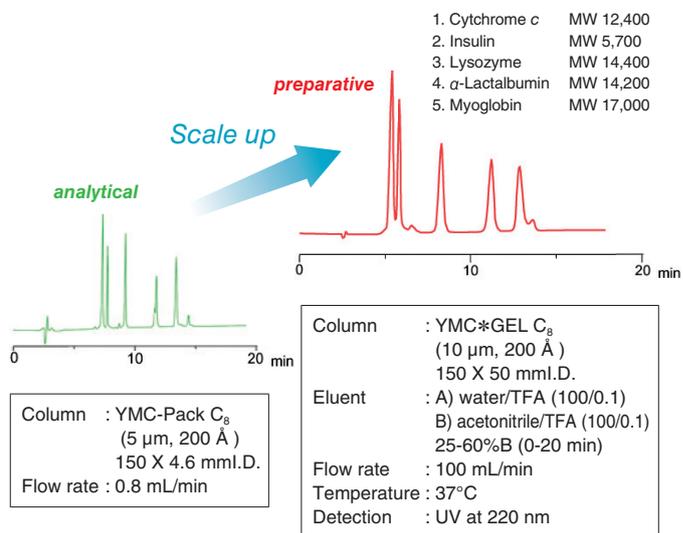
## Column performance

The data shows repacking data obtained by using a 50 mmI.D. DAC column. After 7 times repacking, plates/m and Tf are still as good as the initial state.



## Seamless scale-up

The chromatograms are a scale-up example from an analytical 4.6 mmI.D. column to a 50 mmI.D. DAC column. This indicates that the very similar separation pattern of analytical scale is also reproducible at the preparative scale.



## Self-Packed Axially Compressible Preparative Columns

## SB columns

SB columns are statically compressed cost effective preparative columns which enable convenient self-packing. Tightening screw bolts of the upper flange yields a compressed packing bed. Not only dry packing but also wet (slurry) packing is possible by attaching a column packing extender (optional).

## Features

- Superior column performance and reproducibility provided by high density packing
- Maintains great durability utilizing manual pressurization using screw bolts
- Eliminate voids (occurred by long-term usage) by re-tightening screw bolts
- Cost effective provided by self-repacking
- Packing service (optional) available with YMC's preparative packing materials
- Column packing extender (optional) and column stand (optional) available

## Specifications

Model	SB-50	SB-70	SB-100	SB-150	SB-200
Inner diameter ( $\phi$ , mm)	50	70	100	150	200
Pressure limit (MPa)	10	7	7	5	5
Column length (mm)	250, 500				
Column bed length (mm)	200 - 300, 450 - 550				
Optional	Column packing extender				
	Column stand				

Contact us for SB columns with 300 mm I.D. or larger.



# Software

## K-Prep, BioStream

### Features

- Software allowing seamless scale-up from laboratory scale to process scale
- User friendly, flexible and intuitive programming and operation
- Compliance with FDA 21 CFR Part 11, cGMP and CSV



Software for K-Prep and BioStream are the latest chromatography systems control software. The software has been developed to be intuitive based on the operator's reaction to visual operation. The software enables complicated preparative purifications to be performed easily and automatically.



## LC-Forte/R-II

### Features

- Liquid crystal touch panel allows comfortable visual touch.
- Standard features include software for displaying chromatograms on the touchscreen.
- Various functions are available such as recycling, sample injection (stacking), and automated cleaning.
- When operated in conjunction with optional external PC control software quantitative (area%) and GPC measurement may be employed.



The dedicated software for LC-Forte/R-II has been developed to put the full power of the instrument within your grasp.

