

PREPARATIVE, ANALYTICAL, AND FLASH LIQUID CHROMATOGRAPHY EQUIPMENT







ECOM COMPANY PROFILE

ECOM is an established European manufacturer of scientific and laboratory instruments for liquid chromatography. The company is based in the Czech Republic and headquartered just outside of the capital Prague in Chrastany. Our company strategy is to supply our customers with high-quality, powerful and durable laboratory equipment at good prices. We develop and manufacture our devices in the European Union.



ECOM main focus

ECOM intensely emphasizes research and development and hones the skills and knowledge of our experts. This allows us to constantly expand our product portfolio to provide customers with a wider range of products and to continuously pursue innovations. Besides our standard product offer, we can provide many customer solutions and modifications, in contrast to many other manufacturers, thanks to our enduring focus on innovative development.

Portfolio

We manufacture high-quality instruments for liquid, HPLC, analytical, preparative and flash chromatography. Whether it is for preparative or analytical use, customers can choose from both complete laboratory chromatographic sets and standalone single-function devices – such as HPLC detectors, pumps, fraction collectors and others. We also offer custom flow cells, control software and many other related products. Thanks to our reliable production quality and ongoing development, we are recognized not just as a supplier of standalone devices and systems for end users, but also as a supplier of high-quality built-in units and OEM devices for manufacturing companies.

Worldwide distribution and service support

ECOM successfully supplies its devices and systems all over the world. Over our 34 years of business, we have built a large worldwide network of distributors and service partners who, together with us, ensure that high-quality support is provided for all end customers.

Certifications

One of the ways in which we ensure consistently high performance levels of production process and process management is through our fulfillment of the ISO 9001 standard. Our other certifications include product certifications – e.g. CSA for detectors.

We would also like to mention that sustainability and a strong focus on areas related to the environment, social impact, and governance are among the values we hold in high esteem, which is why we work in accordance with ESG principles.

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HPLC PREPARATIVE AND FLASH SYSTEMS ECOM Preparative and Flash Modular Systems

The highly effective ECOM modular systems are composed of ECOM preparative units, which allows them to be configured according to the needs of the customer. This solution assures fulfillment of all functional requirements and, at the same time, minimizes purchasing expenses. The system can be configured as follows:

Solvent delivery

For solvent delivery, pumps with flow rates up to 50, 100, 250, 300 and 1000 ml/min in isocratic mode can be selected. Also, it is possible to operate in gradient mode using an ECOM gradient module for a low-pressure gradient elution of up to 4 solvents. Furthermore, it is possible to use two pumps for achieving a high-pressure gradient. Pumps are made of 316L stainless steel, but they are also available in Hastelloy, PEEK, and titanium versions.

Sampling

Sample injection can be done using a manual or an automated injection valve with loops in volumes from 1 up to 50 ml. For repeated injecting, one of the gradient valves, or an auxiliary pump, can be used.

Detection

UV and UV-VIS PDA detectors, available in ranges from 190/200 nm up to 400, 600 and 800 nm and in versions allowing measurement at two or four wavelengths at the same time, are normally used. Also, versions which provide continuous data scanning of the entire spectrum and allow the creation of a 3D data view of the complete separation, are available. An ECOM CDPH monitor to measure sample conductivity and pH is offered as an additional detector. For applications where analytes require advanced detection capabilities, refractometric or evaporative light scattering (ELSD) detectors are available.

Controlling and evaluation

ECOM systems are equipped with RS232, USB, and LAN communication ports which offer the choice of required connection to a PC. The control system can be selected from either ECOMAC software, mainly used for preparative applications, or Clarity software, which is **FDA 21 CFR Part 11 compliant.**

...choose your ideal system components...

GRADIENT BOX

- With a gradient valve
- Optionally with a built-in PC

PREPARATIVE PUMP

You can choose a preparative pump with the following flow rates: **50**, **100**, **250**, **300**, **1000 or 3000 ml/min**

DETECTOR TOY20DAD H

Available wavelength range versions: Up to 400, 600, and 800 nm



FRACTION COLLECTOR

Wide assortment of different sizes of tubes, vials, and funnels





FRACTION COLLECTOR
Features a 10-position valve
Large volume fraction collection

HPLC PREPARATIVE AND FLASH SYSTEMS System Configuration Examples Table

To give you a better idea, we have prepared the following sample preparative and flash system configurations. However, we would like to remind you that it is possible to equip our systems with a number of other variants of pumps and detectors, as well as versions with an embedded PC.

Control SW: The following configurations are controlled by ECOMAC chromatography data software. Optionally, you can request Clarity software, which is **FDA 21 CFR Part 11 compliant.**

HPLC Preparative and Flash Systems Examples

Name	Туре	Max. Flow Rate	Max. Pressure	No. of Solvents	Detection	Main System Parts
ECS21	Quaternary Gradient Preparative System	50 ml/min	30 MPa/ 4351 psi	4	• UV-VIS DAD up to 600 nm • 4 channels simultaneously • Scan:informative	Detector Pump Gradient box ECOMAC or Clarity SW - FDA 21 CFR Part 11 compliant
ECS22	Isocratic Preparative System	250 ml/min	30 MPa/ 4351 psi	1	• UV-VIS DAD up to 400 nm • 4 channels simultaneously • Scan:informative	Detector Pump Fraction collector ECOMAC or Clarity SW - FDA 21 CFR Part 11 compliant
ECS23	Quaternary Gradient Preparative System	300 ml/min	15 MPa/ 2176 psi	4	UV-VIS DAD up to 600 nm 4 channels simultaneously Scan:informative	Detector Pump Gradient box Fraction collector ECOMAC or Clarity SW - FDA 21 CFR Part 11 compliant

HPLC Special Preparative and Flash Systems

Name	Туре	Pumps and Max Flow Rates	Max. Pressure	No. of Solvents	Detection	Main system parts	
PrepTower 1000	HPG Chromatogra- phy Separation System	Chromatogra- phy 15 M	15 MPa/	15 MPa/ 2 2176 psi 2	• UV-VIS DAD detector • Up to 800 nm • 4 channels simultaneously • Scan: Full spectrum	 UV-VIS DAD detector 3 pumps: 2 main pumps used for high- pressure gradient (parallel connection) 1 pump used for repetitive sampling of high-volume samples 3 electric valves: One for flow switching between gradient and injection pumps Second for column bypass Third (6 or 10 positions) for fraction collection Loop sample injection valve for small sample injection Embedded PC Display, mouse, keyboard ECOMAC or Clarity SW-FDA 21 CFR Part 11 compliant 	
PrepTower 300		3×300 ml/min	2176 psi				
PrepBox LPG A3L8E Compact Large-scale	Compact	Compact 300 ml/min Large-scale		15 MPa/ 2176 psi	4		 UV-VIS DAD detector 2 pumps Embedded PC Fraction collection
PrepBox A338E		2×300 ml/min				10-position valve • ECOMAC SW	
ECS28	CS58 Preparative Systems	250 ml/min	30 MPa/	6		UV-VIS DAD detector Pump	
ECS58		50 ml/min	4351 psi	0		 Gradient valve Fraction collector Auto-inject valve 	
ECS08		10 ml/min	40 MPa/ 5082 psi	4		Embedded PC Queen SW	

HPLC PREPARATIVE AND FLASH SYSTEMS Modular and Compact Preparative Systems

ECS21 Quaternary Gradient Preparative System

ECS21 is a universal and robust chromatography system. It has been designed for high-pressure sample separations at flow rates up to 50 ml/min, with the possibility of a gradient elution of up to 4 solvents. The system enables manual sample injection by loop, at up to 30 MPa. By connecting flash cartridges it serves as a flash chromatography system. The UV-VIS PDA detector allows measuring at four wavelengths up to 600 nm at the same time. This makes the system universal and also allows conducting peak purity checks and other advanced techniques during the process.

Examples of use: The system is ideal for the separation of reaction mixtures during small molecule development as well as for the purification of peptides, proteins and oligonucleotides.

ECS22 Isocratic Preparative System

ECS22 is a cost-effective chromatography system designed for high-pressure sample separations at flow rates up to 250 ml/min and 30 MPa with an isocratic elution. The fraction collector consists of a 10-position valve, which enables collecting up to 9 fractions of purified compounds at large volumes (as defined by the reservoir size). The system supports manual sample injection by loop up to 30 MPa. By connecting flash cartridges, it serves as a flash chromatography system. The UV-VIS PDA detector allows measuring at four wavelengths up to 400 nm at the same time. This capability enables conducting peak purity checks and other advanced techniques during the process.

Examples of use: The system is ideal for the separation of reaction mixtures during small molecule development as well as for the purification of peptides, proteins and oligonucleotides.

ECS23 Quaternary Gradient Preparative Systems

ECS23 is a powerful chromatography tool for a wide array of preparative and flash applications. It is an ideal solution as a development chromatography system designed for high-pressure sample separations at a flow rate up to 300 ml/min, with a gradient elution of up to 4 solvents. The tube-based fraction collector comes with a variety of tube volumes available from 8 ml to 60 ml. The UV-VIS PDA detector enables measuring absorbance at four wavelengths up to 600 nm at the same time.

Examples of use: The system is used as a high-end automated system for the isolation of peptides, oligonucleotides and proteins.

SW and modifications (All ECOM modular systems): Systems are compatible with ECOMAC and Clarity software. Systems can be extended by additional detectors based on request and purpose. The ECOMAC software has full control over all important device parameters, and the integrated programming of the chromatographic steps facilitates repetitive, automated work that is useful on similar types of samples. To save table space in your laboratory, this unit can be equipped with an embedded PC.

ECS08, ECS28, ECS58 Compact Preparative System



BOTTLE RESERVOIR)	• 200–800 nm
PC DISPLAY		 Scanning 4 channels
EMBEDDED PC		CHROMATOGRAPHY 1
FRACTION COLLECTOR		SOFTWARE
 VARIOUS RACKS For tubes-of 8 ml, 21 ml, 40 ml, or vials of 60 ml, or funnels of 30 mm 		AUTOMATIC INJECTION
GRADIENT VALVE 6 solvent inlets		• 10, 50, or 250 ml/min



HPLC PREPARATIVE AND FLASH SYSTEMS Compact Preparative System

The ECOM Compact System is the true workhorse of any organic synthesis laboratory, which indeed means business, where fast and flawless operation is necessary for a quick turnaround without interruptions. It is also an exceptional choice for academics and R&D laboratories that are developing new organic molecules without a clear path to isolate them. With this instrument, it is now far easier to operate day-to-day in an organic synthesis lab, where performing the isolation of analytes without having a previously known purification path indicating how to do so. It is suitable for preparative work in ranges from milligrams up to a few grams of sample loading, depending on the type of liquid chromatography method performed.

This instrument is suitable for the development of a new purification method from scratch. The knowledge learned about the isolation method from separation on a smaller scale can be transferred to large-scale preparative liquid chromatography instruments, which are also produced by ECOM. These systems have been proven over time with users able to utilize the full performance of the instrument for their research and scientific work. The compact system is very well suited for the separation of small molecules, oligonucleotides, and peptides.

Mobile Phase Delivery and Mixing

• **Pumps** – Three versions of HPLC pumps with a max. flow rate of 10, 50 or 250 ml/min are available.

• Gradient valve - A four-way, low-pressure gradient valve for gradient mixing with

unique six solvent inlets for high flexibility in using mobile phases is provided.
Automatic injection valve – The sample is loaded into the column with an attached sampling loop.

Detection and Fraction Collection

• **Detector** – This consists of an embedded TOY18DAD 4-channel UV-VIS PDA detector with the ability to measure up to 4 wavelengths simultaneously, from 200 nm up to 800 nm.

Detection capabilities can be further extended by a UV-VIS scanning feature that enables 3D-scan drawing across the whole recorded UV-VIS spectrum.

• Flow cell – It is an easily accessible and exchangeable flow cell in the detector to reach a different optical path. This enables flexibility in regulating sensitivity, based on the amount of sample loaded without any instrument downtime. A wide range of flow cells is available.

• **Optional ELSD detector** – Detection capabilities can be extended by adding an additional external evaporation light-scattering detector (ELSD) for the detection of analytes without absorption within the UV-VIS spectrum. The ELSD is highly utilized by organic chemists across the chemical industry, as their analytes of interest often do not absorb UV-VIS light.

• An embedded fraction collector – An integral part of the instrument, it enables five rack options to be used with 8, 21, 40, or 60ml tubes or 12 funnels. Fraction collection can be started manually or at a specific time during the procedure or by exceeding the level/threshold or slope of the detector signal.

Control

• The instrument includes a built-in PC and a touch screen.

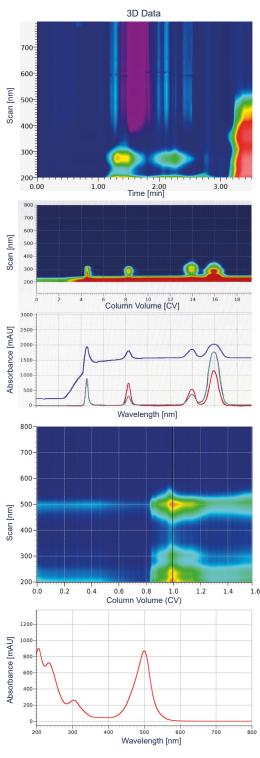
• Software support is provided by Queen Software by ECOM. It allows 3D

UV-VIS spectrum scanning, column equilibrations, and remote control, or possibly ECOMAC SW by ECOM.

• Pausing the preparative method and editing the gradient table during operation are both possible.

• Advanced control features of the separations include, for example, skipping to the next gradient step and holding a constant mobile composition for an extended time period without interrupting the separation.

• Reports of the results are well arranged and detailed with information, including the purification method, records of the solvents used, pressure, flow, the number of fractions, and the volume collected. These reports can be printed or exported to a remote secure server, where the results can be reviewed from the comfort of an office space.



HPLC PREPARATIVE AND FLASH SYSTEMS

PREPBOX A3L8E and A338E

Chromatography Separation Systems – FDA 21 CFR Part 11 Compliant

The PrepBox is a popular instrument in flash and high-pressure preparative liquid chromatography.

Detection and Fraction Collection: It is done by a 4-channel UV-VIS TOY18DAD (200–800 nm) detector, optionally capable of a 3D-scanning function across the spectrum. A configuration with a conductivity and pH monitor for further detailed information can also be used. Fraction collection is done by a multi positional selector valve, which allows large fraction volumes. The selected valve outlet position can be programmed. This includes a possible threshold/level fraction collection triggered by a signal value from the UV-VIS detector. The PrepBox is capable of stacking injections – the advanced automatic purification method. By cycling the timing of switching valve positions during analysis between the preparative and auxiliary loading pumps, the stacking injection method

can be created (in the isocratic mode). **Mobile Phase Delivery and Mixing:** The unit provides a low-pressure gradient valve for precise gradient mixing of mobile-phase composition during purification. A preparative pump (up to 300 ml/min or up to 1000 ml/min) with a four-way low-pressure gradient mixing valve is used, and for sample loading a second auxiliary pump. Pumps are connected to a high-pressure switching valve to achieve exceptional performance, especially in automating the purification process. The auxiliary



Applications: This instrument is ideal for the routine large-scale purification of small molecules,

sample-loading pump allows injection of a large volume of sample into the column.

cannabinoids, oligonucleotides, and peptides. If the chromatography data software (CDS) is Clarity, then the system is compliant with FDA 21 CFR Part 11 regulation. The PrepBox is suitable for manufacturing active pharmaceutical ingredients (API), when following GMP regulation guidelines. Supports countercurrent (CCC) and centrifugal partition chromatography (CPC) in connection with a suitable CCC or CPC instrument.

Control: By using chromatography data software - ECOMAC, Clarity or FlashService. A built-in PC is included.

PREPTOWER Chromatography Separation Systems – FDA 21 CFR Part 11 Compliant



The PrepTower is a high-end compact preparative binary HPLC system with high-pressure gradient mixing. The system has a modular design, which allows for flexibility in device configuration and laboratory operation.



Mobile Phase Delivery and Mixing: The system contains three pumps, two preparative pumps for high-pressure gradient (HPG) mixing, and one auxiliary pump for sample loading. The two preparative pumps for high-pressure gradient mixing minimize gradient delay. The system is used for flash and HPLC chromatography. The binary preparative pump configuration allows the PrepTower to achieve exceptionally accurate and precise gradient mixing even at high flow rates. An additional auxiliary loading pump is used for liquid sample injection into the column. Preparative and sample loading paths are separated by a high-pressure switching valve. The PrepTower has chromatography features, which include stacking injections and a high level of automation method and sequence programming. Based on customer request, more valves can be installed, like a column bypass and an injection loop valve. The system's modular design allows for fast and easy maintenance tasks.

Detection and fraction collection: Detection is done by a four-channel UV-VIS PDA detector with an optical flow cell. This flow cell has a unique design for high-flow applications. A wide range of options for optical flow cells can be selected according to the desired detection sensitivity and flow rates. Optionally, a conductivity and pH monitor may be installed. Fraction collection is performed by using a multi-positional selector valve. Collection can be triggered manually or by a detector signal threshold level or as a timed event.

Applications: The PrepTower is suited for the most demanding and complex separations, including small molecules, cannabinoids, oligonucleotides, and peptides. The PrepTower is suitable for manufacturing active pharmaceutical ingredients (API), when following GMP regulation guidelines. The system has a 15 MPa backpressure rating, which allows its use in applications utilizing a stationary phase with particle sizes down to 5 μ m. The PrepTower is especially useful for applications where a very precise and accurate gradient-mixing composition at a high flow rate is required.

Control: The chromatography data software can be either ECOMAC or Clarity. A Windows PC is built-in. The instrument is controlled by a touchscreen and an industrial keyboard.

HPLC PREPARATIVE AND FLASH UNITS **Detectors**

UV-VIS PDA (DAD) detectors TOY18DAD and TOY20DAD - V, VEX, H and HK versions

• Designed for preparative and flash applications with 2 or 4 wavelengths or for continuous scanning in wavelength ranges of 190-800 nm (TOY20DAD), and 200-800 nm (TOY18DAD).

- The noise level at 254 nm is \pm 50 × 10⁻⁶ AU.
- Communication is via LAN, USB, RS232, and I/O ports.

TOY18DAD V, TOY20DAD V

- Features an internal flow cell
- Equipped with a keyboard, a display and analog outputs

TOY18DAD H, TOY20DAD H



- Most commonly used detector in ECOM preparative systems
- Communication: LAN, USB, RS232 and I/O ports



- Uses an external flow cell connected by optical cables
- Equipped with a keyboard, a display and analog outputs

TOY18DAD HK, TOY20DAD HK

TOY18DAD VEX, TOY20DAD VEX



- Equipped with a keyboard, a display and analog outputs
- Communication: LAN, USB, RS232 and I/O ports

Conductivity and pH Monitor

• Suited for preparative and flash chromatography.

 Thanks to the unique ECOM design of the conductivity cell, it radically improves chromatography process monitoring.

ECDM 2100



- Conductivity monitor (0.01-300 mS/cm) with pH measurement (0-14 pH)
- Pressure resistance: Up to 20 MPa
- Maximum flow rate: 250 ml/min (conductivity)
- High-pressure cell up to 17 MPa
- Simple conductivity calibration
- Compact size
- Wetted parts: Titanium and PEEK (conductivity) monitor)
- Communication: RS232, Ethernet (LAN), USB

HPLC PREPARATIVE AND FLASH UNITS OEM Detectors

ECOM OEM UV-VIS DAD DETECTORS

• In addition to manufacturing stand-alone instruments, ECOM is a major OEM manufacturer of detectors with a global and growing customer base.

- Compact and powerful built-in ECOM UV-VIS PDA (DAD) detectors, available in many mechanical and optical versions.
- 2 or 4 wavelengths or continuous scanning, in wavelength ranges 190-400, 190-600, or 190-800 nm
- Noise of ± 50 × 10⁻⁶ AU at 254 nm.

OEM DETECTOR TOY I

- Features compact flow cell housing
- Dimensions: 220 × 120 × 70 mm (8.67 × 4.72 × 2.75 in.)

OEM DETECTOR BABY



- Features most compact unit among ECOM detectors
- Dimensions: 182 × 59 × 67 mm (7.17 × 2.32 × 2.64 in.)



OEM DETECTOR TOY L

- Easy maintenance: Flow cell and lamp accessible from front panel
- Dimensions: 220 × 120 × 110 mm (8.67 × 4.72 × 4.33 in.)

OEM DETECTOR TOY U



- Features a compact detector of 130 mm width
- With a cell accessible from the front
- 130 × 130 × 200 mm (5.19 × 5.19 × 7.87 in.)

OEM UV-VIS DAD EX Detectors

- With SMA 905 connectors
- For an external cell connected by optical cables

OEM DETECTORS TOY EXR, EXL





- Improved versions of previous versions of EX detectors with SMA 905 connectors
- External flow cell connected by optical cables (flow cell not included)
- Wide range of flow cell available, including custom made flow cells
- Communication of TOY EXR and EXL detectors by version: EXL-RS232, LAN, USB, EXR-RS232
- Supplied within a transport chassis

HPLC PREPARATIVE AND FLASH UNITS LED Detectors

- ECOM standalone and OEM built-in detectors with a UV LED diode as a light source
- Suitable for preparative and flash chromatography
- A cost-effective and reliable choice of UV-VIS detector

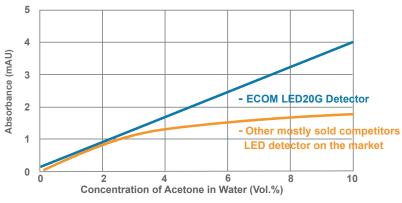
LED20 G

• The LED20 G OEM detector has unique parameters on the market of LED detectors. Thanks to **ECOM's patented technology,** it cuts out 4 nm halfwidth and an exact wavelength from the LED spectrum.

• The energy of the light passing through the sample is very low (lower than other detectors on the market). This feature has the advantage of not damaging the sample.

- Single or dual fixed wavelengths.
- Wavelengths: 254–280 nm (±1 nm), others on request.

Comparison: Outstanding linearity of ECOM LED20G detectors ($R^2 \ge 0.999$ up to 4 AU) in comparison with a competitors' detector



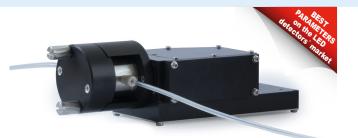


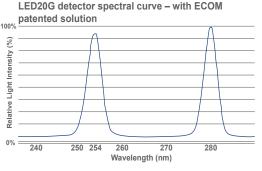
- Standalone single or dual fixed wavelength detectors with LEDs
- For flash chromatography and use with a **glass column**
- Practical LED display with numerical and graphical view modes
- USB-C communication and power port
- Wavelengths: 255 and 280 nm, others available on request
- Low cell heating due to LEDs
 Easy and convenient detection within the UV-VIS range
- Long lifespan of LEDs

- OEM single or dual fixed
- wavelengths detectors with LEDs

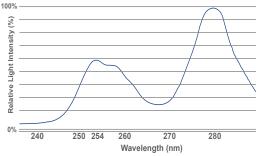
• Wavelengths: 255 and 280 nm, others available on request

- Low noise of $\pm 5 \times 10^{-6} \text{ AU}$
- Low cell heating due to LEDs
- Compact size
- Easy flow cell replacement
- Higher sampling speed
- Sophisticated diagnostic software
- Communication: I/O interface





LED spectral curve – without ECOM solution







• OEM single or dual fixed

- wavelength detectors with LEDs
- For use with an external cell
- Wavelengths: 255 and 280 nm, others available on request
- Low noise of \pm 5 × 10⁻⁶ AU
- Low cell heating due to LEDs
- Compact size
- Easy flow cell replacement
- Higher sampling speed
- Sophisticated diagnostic software
- Communication: I/O interface

HPLC PREPARATIVE AND FLASH UNITS Pumps

- ECOM powerful and reliable pumps with pulsation suppression for use in preparative HPLC and flash chromatography
- Flow rates from 50 ml/min up to 3000 ml/min, maximum pressures up to 30 MPa (2176 psi)
- NEW: Most pumps also available in PEEK, titanium, or Hastelloy wetted-material design

• NEW: ECOM SEPARTRIX pump, primarily used in systems with industrial-scale prep columns, also for ATEX environments

ECP Pumps

50, 100, 250, 300 ml/min



- Isocratic version
- Optionally, also configurable with a gradient box, to serve as gradient pumps
- NEW: Wetted materials also in PEEK, titanium, or Hastelloy

ECP Pump 1000 ml/min



- One of the latest ECOM preparative pumps, features outstanding parameters
- Flow rates: Up to 1000 ml/min
- Maximum pressure: 15 MPa (2176 psi)

ECP Pump 3000 ml/min





- New preparative unit with outstanding parameters
- Very high flow rates up to 3000 ml/min
- Maximum pressure: 5 MPa (725 psi)
- Smart controls and diagnostics
- An innovative, powerful, and cost-effective unit

ECOM Separtrix PP03 Pump Series



- Pulse-less triplex piston pumps for preparative
- chromatography applications, also versions for ATEX
- Flow rates: Up to 3000 ml/min
- Maximum pressure: 26 MPa, 3771 psi
- Also, configurations for a high-pressure gradient
- Supported by ECOMAC or Clarity SW

ECP LG Gradient Pumps 1000 ml/min



- One of the latest ECOM preparative pumps features outstanding parameters
- Flow rates: Up to 1000 ml/min
- Maximum pressure: 15 MPa (2176 psi)
- New gradient module, up to 4 solvents for lowpressure gradient mixing

Pump Head Thermostat ACZ Series



- Heats pump heads to the required temperature
- •Temperature range: From ambient temperature up to 110 °C (230 °F)
- Used for pumps ECP201L, ECP2050, ECP2100, ECP2200, ECP2300, and IOTA

HPLC PREPARATIVE AND FLASH UNITS Pumps • Gradient Boxes • Fraction Collectors

ECP Built-in Pump

1000 ml/min



- New ECOM preparative pump with outstanding parameters
- Flow rates: Up to 1000 ml/min
- Maximum pressure: 15 MPa (2176 psi)
- Provides very stable run even at low flow rates

Gradient Box ECB Series



- Suited for liquid handling within ECOM gradient preparative systems
- Accommodates a container for solvent bottles,
- a 4-way gradient valve
- Pump controlled
- Available versions with/without built-in PC

Fraction Collector ECV 2010



- For automation of flash and preparative purification
- ECV 2010 is equipped with a 10-position rotary valve
- Easy programming of fraction collection using ECOMAC software
- Compact size

ECP Built-in Pumps

50, 250, 300 ml/min



- OEM preparative pumps with pulsation compensation
- Controlled by RS232 and LAN
- Work as isocratic pumps

• Also, optionally configurable with a gradient box to serve as gradient pumps

Fraction Collector Separflow FC X-Y



- Also used for ATEX environments
- Wetted materials: Stainless steel, PTFE
- (polytetrafluoroethylene), and UHMW polyethylene
- Communication: RS232 or from independent display
- Maximum operating pressure: 2 bar (29 psi)

Fraction Collector ECF 2096



- Controlling: Keyboard and display on front panel
- Analog input for collecting based on detector signal
- Racks for different numbers and sizes of vials, tubes and funnels
- Control SW: ECOMAC or Clarity

DAC INDUSTRIAL-SCALE COLUMNS AND SYSTEMS

In recent years we have acquired production of industrial-scale preparative columns and systems of the Separlab brand. These products conveniently complement ECOM's standard product assortment. They are employed for laboratory use and production plants, where the isolation or purification of various compounds is needed. These systems and columns are suitable for ATEX environments. These systems, which are implemented worldwide in many operations, feature perfect functionality, reliability, ease of use, quality craftsmanship, good pricing, and flexibility in customization.

THE PRODUCT LINE

• Industrial-scale preparative HPLC columns and systems

• High-pressure pulseless pumps

- Complete LC systems equipped with gradient mixers
- Fraction collectors
- Column temperature control

THE ECOM DAC COLUMNS ADVANTAGES

• The flow distributors are designed with regard to sorbent and column sizes. Shape of flow channels prefers laminar flow and their outputs are situated in centers of hexagons – the densest possible arrangement of circles formed by flowing liquid. The problems of equidistant T shaped distributor channels with outputs in a square grid (solution used by competition) is thus eliminated.

• Self-closing cone seal design, proven for 20 years in demanding operations, special design of longlife screwless gripping of the frits, significantly high level of safety due outstanding level of operation control.

• Ease of use and maintenance, a high degree of reproducibility, reliability and separation efficiency, economical spare parts with the possibility of delivery even after 20 years.

Dynamic Axial Compression Columns (DAC) for High Performance Liquid Chromatography ECOM Separchrom PC01

ECOM SEPARCHROM PC01 HPLC industrial-scale columns meet the highest requirements of preparative liquid chromatography. They are designed to be used in axial compression mode with a moving input piston.

The PC01 columns are equipped with identical pistons on both input and output (biaxial compression is an option). Also, a modification is available, where the lower piston is replaced by a fixed plate. Pistons and plates are equipped with frits. A liquid distributing system is installed under each frit. The design guarantees perfect piston flow and high efficiency – even at a high injection volume – and the simple accessibility of frits for cleaning.

Materials and design: ECOM SEPARCHROM PC01 columns are made of stainless steel AISI 316L (tube inner surface is polished to reach Ra < 0.3 μ m) with stainless steel pistons and UHMWPE (PTFE on request) sealing rings. The stroke of the main piston is proportional to the hydraulic cylinder used or the length of the flange bolts. The pistons are sectional. The frit (sintered mesh disc 3 μ m pore size, 5 mm thickness) with the frit ring can be removed. The output plate in the FE version is made of UHMWPE, and the frit is fixed with a simple frit ring. Column flanges are not welded, but they are screwed onto the column tube. No temperature increases during their manufacture guarantee that there are no changes in their steel properties. The column stand, made of stainless-steel profiles, is included for columns over 100 mm I.D. Hydraulic cylinders fitted onto the upper flange are offered with manual oil pumps as well as with fully automated electric motor-driven devices for column packing/unpacking procedures.

Column packing methods: Columns can be packed by the dynamic slurry method, by sedimentation, or by sorbent in a dry state.

Accessories: Available in a broad range, such as filling adapters, slurry mixing vessels, slurry transporting pumps, etc.



DAC INDUSTRIAL-SCALE COLUMNS AND SYSTEMS

Dynamic Axial Compression Columns (DAC) for Medium-Pressure Liquid Chromatography ECOM Separchrom PC02

ECOM SEPARCHROM PC02 medium-pressure stainless-steel industrial-scale columns are intended for separation where high pressure is not necessary, but excellent efficiency is still required.

Materials and design: Stainless steel tubes, UHMWE piston with stainless steel support and mesh frit.

The flow distributor with grooves is incorporated into the piston to guarantee piston flow with nearly zero pressure drop. The frits are simply accessible for easy cleaning.

Column packing methods: Columns can be packed by the dynamic slurry method, by sedimentation, or by sorbent in a dry state.

For soft polymer sorbents, ECOM Separchrom PC02 oil systems can be equipped with a special software application to compensate for the swelling and unswelling of sorbents in different mobile phases.

(The column piston is moved in very small up-and-down increments during use.)

Non-metal Columns ECOM Separchrom PC04

Polyethylene cartridge columns are usually intended for flash chromatography, especially in biochromatography and some other special applications.

Materials and design: Columns are made of high-quality ultra-high molecular weight polyethylene. They are equipped with moving pistons with no metal coming into contact with the mobile phase.

They are equipped with the same pistons on the input and the output. The input piston is moved either by flange bolts, or by a central stainless steel threaded rod.

ECOM SEPARCHROM PC04 plastic columns arrive unfilled.

Hydraulic Systems for DAC Columns ECOM Separpress

The ECOM SEPARPRESS hydraulic system for preparative chromatographic columns is used to compress the piston inside the column and to compact the sorbent.

Supplied as a kit that includes a hydraulic double-action cylinder or a spring, connecting hoses, oil pump-manual or driven by motor, with a mechanical manometer control device or an electronic system with a pressure gauge. Small single-action cylinders are not able to pull a column piston out of the tube, so liquid pressure has to be used instead.

Bigger cylinders (D30 +) are delivered only with an electric oil pump, since a high oil-flow rate is necessary.

All EE systems can be ordered in versions for hazardous environments.







HPLC ANALYTICAL SYSTEMS ECOM Analytical Modular System

We offer high-performance liquid chromatography analytical systems. Each configuration contains the following basic or optional components:

- A high-performance analytical pump with a high backpressure rating
- A low-pressure gradient box with degasser can optionally be embedded with PC
- A column thermostat with a cooling and heating option or a column oven with heating only
- A multichannel PDA or a variable UV-VIS detector with ranges from 200 nm up to 800 nm
- Injection of samples: An autosampler for 96 vials with high accuracy and linearity of injections, or an injection valve with an injection loop
- Optional: A high-sensitivity analytical refractive index detector
 - A single quadrupole mass spectrometer

The system is variable and allows for the different configurations of components. You can choose from various wetted pump head materials. Detectors can be equipped with flow cells with different parameters and materials (including bio-inert). All units have implemented support for ECOMAC and Clarity software.

...choose your ideal analytical system components...

GRADIENT BOX

- With a degasser and a
- gradient valve
- Optionally with a built-in PC

HPLC PUMP

With maximum flow rate of 10 ml/min
Max. back pressure rating up to 60 MPa (8703 psi)

COLUMN OVEN

Features heating and cooling 0–80 °C
Or with heating only, up to 99 °C

PDA/UV-VIS DETECTOR

• A multichannel PDA or a variable UV-VIS detector with ranges from 190 nm up to 820 nm



SAMPLE INJECTION VALVE

Stainless-steel sample loop



AUTOSAMPLER AS96

Features excellent accuracy and linearity.
Versions:
With/without sample heating and cooling module
Maximum backpressure:
60 or 40 MPa



HPLC ANALYTICAL SYSTEMS ECOM Modular Analytical System

Configuration Examples

HPLC Analytical Systems	Name	Туре	Max. Flow Rate	Max. Pressure	No. of Solvents	Detection	Main System Parts			
ini a ini a ini a ani a	ECS01	HPLC Analytical Gradient System				4	 UV-VIS up to 800 nm High speed up to 100 Hz 	 Detector: UV-VIS HPLC pump Gradient box with degasser Column oven with heating 		
111 0 111 0 111 0 111 0	ECS02	HPLC Analytical Gradient System	40 MPa/ 5802 PSI 10 ml/min					4	• UV-VIS up to 600 nm	and coolingAnalytical injection valveChromatography SW Clarity- FDA 21 CFR Part 11 Compliant
ii 1	ECS03	HPLC Analytical Isocratic System		5802 PSI	1	• High speed up to 100 Hz	 Detector: UV-VIS HPLC pump Analytical injection valve Chromatography SW Clarity- FDA 21 CFR Part 11 Compliant 			
	ECS06	HPLC Analytical Gradient System with Autosampler			4	 UV-VIS or UV-VIS PDA up to 820 nm High speed up to 100 Hz 	 Detector: UV-VIS or UV VIS PDA HPLC pump Gradient box with degasser Autosampler versions with/ without cooling and heating 			
	ECS07	HPLC Analytical Gradient System with Autosampler		60 MPa/ 8702 PSI	4	 UV-VIS or UV-VIS PDA up to 820 nm 8 channels simultaneously 3D scan of full spectrum, high speed up to 100 Hz 	 Column oven with cooling and heating Analytical injection valve Chromatography SW Clarity- FDA 21 CFR Part 11 Compliant 			

ECS06 and ECS07

Gradient Analytical Systems

ECS06 and ECS07 are superior-quality, highly efficient analytical gradient HPLC systems. Configuration of these systems support demand for high-end laboratory automation. They are used in the analysis and quality control of pharmaceutically active substances, peptides and

products of the chemical industry.

The systems include a high-precision analytical pump; a four-way, lowpressure gradient module with an integrated efficient degasser; and a reservoir for mobile phases.

The temperature of the column is regulated by a thermostat within ranges from 0 to 80 °C with a capacity of up to three columns. A sensitive UV-VIS PDA detector is installed for continuous detection. This multichannel detector enables high-frequency scanning of the entire UV-VIS spectrum within a wide range of wavelengths from 200 to 800 nm. A UV-VIS detector is an option as well.

Utilization of the autosampler guarantees high accuracy and the linearity of injections. There are versions available with or without a sample heating and cooling module.

Customers can also choose according to the required maximum backpressure, parameters – of 60 or 40 MPa.



HPLC ANALYTICAL UNITS Detectors • Pumps • Gradient Boxes

UV-VIS PDA Detector ECDA 2801



UV-VIS Detector ECD 2600/2800, ECD 2600/2800 CE



- UV-VIS photodiode array detector
- Measures at 8 wavelengths simultaneously or provides a scan of the full spectrum
- Noise level at 254 nm ± 5 × 10⁻⁶ AU
- Wavelength ranges: 190-820 nm
- Sampling speed: Up to 100 Hz
- Clarity PDA module support for 3D measurement
- Easy flow cell replacement from the side of the

detector

• ECD 2600/2800 - UV-VIS variable wavelength detector

- Wavelength ranges: Continuously variable within
- 190-800 or 190-600 nm (depending on version)
- Noise level at 254 nm: \pm 3 × 10⁻⁶ AU
- Automatic wavelength calibration by deuterium spectral lines
- ECD 2600/2800 CE modification suitable for capillary electrophoresis
- Easy flow cell replacement
- Noise level at 254 nm: 10 × 10⁻⁶ AU

UV-VIS EX Detector ECD 2600/2800 EX



- Features a configuration of the basic ECD 2600/2800 units used with external flow cells connected by optical cables with SMA 905 connectors
- Noise level at 254 nm: ± 15 × 10⁻⁶ AU
- Wide assortment of external cells available upon request

Single-Piston Pump ECP 2011



- Used for column washing and column regeneration process
- Maximum flow rate: 10 ml/min
- ECP2011 P features a pressure sensor
- Piston back-washing function

Analytical Pump ECP 2010 (H)



- ECP 2010 (H) with a max. flow rate up to 10 ml/min
- Maximum pressure: 40 (60) MPa

• Works as an isocratic pump, optionally also configurable with a gradient box with degasser to serve as a gradient pump

• Head materials: Stainless steel. NEW options: Also now in PEEK, titanium, and Hastelloy materials

Gradient Boxes ECB line



- Suitable for liquid handling within ECOM gradient systems
- Container for solvent bottles
- 4-way gradient valve
- Powerful built-in vacuum degasser
- Optionally, ECB2004 BP includes a built-in PC

HPLC ANALYTICAL UNITS Column Ovens • Valves • Autosampler • Column Washing System

Column Oven ECO 2080L, ECO 2099L



- Peltier heating/cooling column oven (0-80 °C)
- Alternative configuration as a dedicated heating unit (up to 99 °C)
- The thermostat has a long column space that can fit up to 3 columns of up to 30 cm
- Precise temperature control enhances separation
- and reproducibility and improves the quality of analysis.
 Thanks to the built-in leak alarm, the column ovens
- are a safe, accurate, and flexible choice

Sample Injection Valve



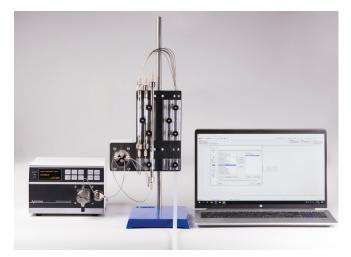
- Analytical/semipreparative stainless steel
- 2-position injection valve
- Needle injection port on the front side

• No-flow interruption technology reduces pressure spikes during position switching to a minimum. It has a built-in position sensor for starting data acquisition precisely at the point of injection.

Autosampler AS96



HPLC Column Washing System ECW 2006



- Features versions with or without sample heating and cooling module
- Backpressure versions: 60 MPa (8702 PSI) and 40 MPa (5801 PSI)
- Capacity: 96 vials
- Fast injection and wash cycles
- Quick-fit injection valve for fast service
- Multi-solvent needle wash

- Consists of an ECP2011P single-piston pump, an automated 6+1 ports valve, a column holder and SW
- Capacity: Up to 6 columns
- Using the ECOMAC control software, it is possible to set the number of columns to be washed, required flow rate, rinsing time, and maximum pressure limit
- This enables a fully automatic process which will be stopped after all columns have been washed

VALVE ACTUATORS AND LABORATORY FREEZE DRYERS

Valve Actuator

ECVA 2000

The ECOM ECVA 2000 Valve Actuator is an advanced valve actuator designed to control injection, switching and selector valves in liquid and gas chromatography (LC and GC) applications.

- The actuator is used for all Vici and Knauer valves
- It supports 2-position and multi-position valves
- High- and low-pressure options
- Switching, selecting, and injecting functions
- External or embedded versions Either with a cover for external use or without a cover for embedded use
- Motor stall detection
- Safe shutdown in case of power failure
- Switching speed optimization Switching time from as little as 95 ms

• Smart control and diagnostics – An advanced communication protocol, fast response time, calibration with a single command, and the possibility to read event and error logs for quick problem diagnostics.

• FDA approved materials available

External (standalone) version



Embedded (OEM) version



Laboratory Freeze Dryers (Lyophilizers)



The advanced PRO versions: The units in the PRO version are equipped with the LyoControl control system with a touch screen, which allows intuitive control and perfect overview of the entire drying process. The system also allows automatic vacuum control, recording of the drying process on USB memory, process control with 25 drying programs, and communication via RS232 or Ethernet. In addition, the PRO version can be equipped with a heating shelf control system to increase drying efficiency.

L Series Laboratory Freeze Dryers (lyophilizers) are designed for both routine applications and advanced drying with programmable semi-automatic control.

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Freezing capacity and condenser temperatures:

The instruments offer a freezing capacity from 2 to 4 kg / 24 h with condenser temperatures of -55 $^\circ\text{C}$ and -110 $^\circ\text{C}.$

Materials and construction: The condenser and top plate are made of chemically resistant stainless steel (AISI316L) and welded in a single piece with the cooling circuit located in the condenser wall. This solution offers a large condensing area and, thanks to its smooth construction, without seals and trims, guarantees a long service life and easy cleaning.



Laboratory Freeze Dryer with Accessories

HPLC ANALYTICAL SYSTEMS AND UNITS Amino Acid Analysis System • Columns

Amino Acid Analysis System

ECA AMINO 500

A complete solution for automated amino acid analysis.

Applications: Specifically used for the identification and quantification of amino acids in protein hydrolysates and peptides, of free amino acids in physiological liquids and extracts, as well as for biogenic amines detection. Suitable for a wide range of uses in biochemical research, in the research of human and animal nutrition, in medicinal diagnostics and in control of pharmaceuticals, food and feed – as well as in standardized processes. The unit ensures the highest accuracy and reproducibility.

Special methods and an analysis program, using robust and accurate chromatographic methods, provide maximum accuracy and reproducibility of the analysis. In this case, the low- pressure ion- exchange chromatography with post-column derivatization with ninhydrin and photometric detection is used. **Configurations:** The analyzer uses a 2-channel spectrophotometer detector, a 6-fold gradient, and an 8-channel degasser, optionally equipped with a chilled sample rack, with

a heated column thermostat. Possible customization of the system aids its use for assessing a wide range of amino acids.

Columns

A wide range of high-quality, but also price affordable, analytical columns, designed and developed in the Czech Republic. Suitable for use with HPLC and UHPLC systems.

Our columns have perfect end-capping, no broken particles, stability over wide pH ranges, and resistance to high pressures (up to 1300 bar). They come in **4 stationary-phase variants** and a wide range of column dimensions and various particle sizes. The assortments are available with various physical parameters, enabling a diverse selection from the viewpoint of applications. This lets the user raise resolution and effectiveness or lower mobile phase consumption. Used for the analysis of medium hydrophobic, aromatic, and amine substances.

Columns C18-HE: Highly-used stationary phase with chemical ligand C18. The free silanol groups are efficiently endcapped by an alkyl substituent. This column is one of the most widely used stationary phases for reversed-phase separations. Suitable for the analysis of peptides, as well as ionized and non-ionized moderately hydrophobic substances.

Columns Diol: The chemically bonded ligand

1,2-dihydroxypropyl is in the stationary phase of this column. The stationary phase exhibits a moderate degree of polarity. This column is suitable for normal and reversed-phase separations, as well for HILIC chromatography. The column is stable in the purely aqueous mobile phase. This property allows an easy transition between the normal and reversed-phase separations on the same instrument.



Effectivity: The ECA AMINO 500 offers a very good priceperformance ratio, and it is also very cost-effective regarding operation and maintenance costs – for example thanks to its use of own chemicals with no need to purchase ready-made buffers.

Chromatography Software: Supported by Clarity SW.



Columns Specifications	
Column lengths	50–250 mm
Inner diameters	4.6 mm; 3 mm; 2.1 mm
Stationary-phase particle sizes	5 µm; 3 µm; 2 µm
Pressure limits	Up to 1300 bar (130 MPa; 19000 Psi)

Columns DM: A specially developed stationary phase DM (Dual Modification). The first polar functional group is inserted into the non-polar alkyl chain, which is embedded in the stationary phase. The entire chain is terminated with a second polar group. This dual-modified polar alkyl chain excels in weak non-bonding interactions with analytes steric, dipole-dipole, π - π , hydrogen bonds. The stationary phase shows a high rate of end-capping (>99 %). Suitable for the measurement of polar, aromatic or amine substances.

Columns C18-AQ: This specially modified stationary-phase column comes with a chemically bound C18 ligand. Free silanol groups are effectively endcapped by a polar substituent, which ensures stability in a purely aqueous mobile phase.

HPLC FLOW CELLS

Standard cells: We manufacture a wide range of external and internal **standard flow cells**.

Custom cells: We are constantly expanding our technological production equipment. Thus, we offer an ever wider assortment for the **development and production of custom flow cells**, including OEM versions. Do not hesitate to contact us for a request for customized cells.

Materials: Stainless steel, PEEK, Hastelloy, sapphire glass, quartz glass, FEP, titanium, and various bioinert materials including FDA-compatible materials, etc.

Preparative Flow Cells

PFC Series

- PFC- A new series of ECOM stainless-steel flow cells and also now extended to PEEK flow cells
- Variants: PFC Basic (without a holder), PFC L (with a holder), PFC EX (external)
- Intended for ECOM HPLC and flash UV-VIS detectors and systems
- Optical path lengths: 0.05; 0.1; 0.3; 0.5; 1; 2; 3; 4 and 5 mm
- Maximum pressure: 6 MPa (870 psi, 60 bar)
- Maximum flow rate: 200 ml/min (tubing 1/16"), 500 ml/min (tubing 1/8"); 3000 ml/min (tubing 3/16")
- By default, detectors supplied with a PFC010 cell, others available on request
- Custom cell parameters available

PLCC Series and UHPLC Flow Cells

- Maximum pressures: 30, 100, and 200 MPa (4351; 14504; 29007 psi)
- Cell connection: 1/4"-28 for 1/8" tubing, UNF10-32 for 1/16" capillaries or 5/16" for 3/16" tubing
- Materials: PEEK, stainless steel
- Custom cell parameters available

Tri-clamp EX Flow Cells

- A series of flow cells with a tri-clamp or hose pipeline connection, used in HPLC
- Various materials: Stainless steel, Hastelloy, and PEEK
- Optional optical path length ranges: 0.1–10 mm
- Maximum operating pressure: 30 MPa (4351 psi)
- Elimination of dead volume inside the cell
- Custom cell parameters available

Single-Use Flow Cells

• A new cost-effective solution - single-use cells exchangeable in the

stainless steel holder – cells can be easily replaced in the holder by the customer after each use, or after a few uses

- Connection to piping systems: Tri-clamp or hose (others available on request)
- Materials: PEEK body and a sapphire window
- Optional optical path length ranges: 0.1-10 mm
- Resistant to: high pressures (30 MPa, 4351 psi) and high temperatures (up to +260 °C, 500 °F)

Analytical Flow Cells

- 3 versions of optical path lengths: 2, 5 and 10 mm
- These cells included by default in detectors/systems, with a 5 mm optical path length, other path lengths available on request
- Designed with a temperature exchanger which suppresses temperature changes
- Custom cell parameters available

Cell Design Examples















SOFTWARE AND SERVICES

Consultations • Rental Service • Software

Consultations and Contract Research

Our partner specialists provide services in custom synthesis, scaleup, and contract research across organic, bioorganic, and medicinal chemistry, with a focus on nucleotide and nucleoside chemistry, ADC linkers, and advanced applications. We can offer developing novel synthetic routes for undescribed compounds and custom synthesis of known molecules, also offering dedicated FTE chemists.

Rental of Chromatographic Instruments–DaaS

ECOM recently added to its services portfolio a rental service for chromatographic instruments (DaaS-Device as a Service) with the option of later purchase.

ECOMAC Software

ECOMAC is software produced by ECOM used for chromatography device control and data acquisition. The software is designed to maximize the ease of operation of ECOM chromatographic systems. All ECOM devices are supported by ECOMAC software.

ECOMAC features and benefits

- ECOMAC is a useful tool for the convenient management of work with devices, servicing activity purposes and easy diagnostics · Easy installation
- Connection by USB, LAN or RS232
- No need for an A/D converter (an added PC card)

Clarity Chromatography Software

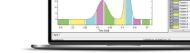
Clarity software is a globally used advanced chromatography data software for data acquisition, processing, and instrument control, which enables controlling all ECOM devices from one environment. Clarity is useful for both analytical and preparative purposes.

Integration of ECOM devices: The benefit of ECOM for the customers is that we constantly prepare for our clients the integration of all our devices into the Clarity system. Thus, all ECOM device drivers are included within the software. There is no need for an A/D converter (an added PC card). Drivers contain full control of instruments as well as diagnostic tools which are made by ECOM in cooperation with the producer. This guarantees the highest quality and full integration into the Clarity station.

Data acquisition: Simultaneous data acquisition from up to four independent chromatographs. Each chromatograph can acquire data from up to 32 detectors.

Language support: Clarity is multilingual; users can switch between 6 languages - English, Chinese, Russian, Spanish, French, and German.

GLP (Good Laboratory Praxis) and regulated environment compliance: Clarity contains tools to meet FDA 21 CFR Part 11 requirements, ensuring its suitability for use in regulated environments. Also, Clarity cooperates with LIMS systems.



· Data export in various formats

- Secure access
- · Unit control and data collection from one place
- · Language support: English, Chinese and Czech







Find out more about ECOM products and services

www.ecomsro.com



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