

# LEWA EcoPrime<sup>®</sup> LPLC with enhanced BID option

Streamlining downstream processing while  
improving yield and purity.



# LEWA EcoPrime® LPLC with enhanced buffer in-line dilution (BID) option

Providing analytical performance at pilot and production scale and highly configurable, LEWA EcoPrime systems provide a complete low-pressure liquid chromatography solution with enhanced BID option.

LEWA EcoPrime is an advanced downstream solution designed to optimize biopharmaceutical pilot and production processes. Incorporating state-of-the-art fluid management technology, and proprietary flow path design, this new platform combines innovative hygienic metering pumps with digital LEWA intellidrive® technology to deliver the industries' highest accuracy.

With the enhanced buffer in-line dilution (BID) option integrated on the same skid, the EcoPrime can significantly reduce equipment and tankage footprint and capex.

With more than 10,000 LEWA pumps used on chromatography systems since the 1980s, LEWA is globally respected as a proven supplier of reliable downstream technology.

## Take your chromatography to the next level

- For difficult separations which require precise peak selection, the EcoPrime's best-in-class gradient accuracy enables higher productivity while maintaining required purity.
- The broad flow range of each EcoPrime system allows the use of one system for several processes or multiple projects.
- Enhanced buffer in-line dilution enables use of concentrated buffers and significantly frees up floor space.
- The precision of the LEWA EcoPrime digital control technology results in superior batch-to-batch reproducibility.
- EcoPrime user adaptable software is designed specifically for the GMP manufacturing environment.

## Configure to your needs

With 20 standard options, you can select the features that will address your unique process requirements. The platform design enables LEWA to offer the consistency of a standard system while providing flexibility for your particular needs.

| Options  | Advantage  |
|--|--|
| Third pump to expand BID capability includes 2 inlets  | Third pump is added to perform simultaneous buffer dilution    |
| Additional inlet valves for 3rd pump   | Two additional inlets to the 3rd pump provides flexibility     |
| Pre-column analytics (pH and conductivity)   | Provides pH and conductivity measurements                      |
| Column outlet pressure control   | Prevents out-gassing in column                                 |
| Flow meter(s) for each pump  | Flow meter(s) for controlling and monitoring flow rates        |
| Additional inlet valves for primary pumps  | Adds 2 or 4 additional valves to accommodate more feed streams |
| Bubble trap assembly with level sensors and drain  | Prevents air intrusion on the column                           |
| Static mixer   | Improves mixing of process fluids                              |
| Pre-pump air sensors for all pumps   | Detects absence of flow to pump                                |
| Clean-in-place (CIP) includes inlet and outlet manifolds   | Removable manifolds to facilitate cleaning the system          |
| Blow-down (includes regulator, filter and valves)  | Enables blow down to dry the system                            |
| Additional outlet valves   | Adds 2 or 6 more outlet valves to accommodate more fractions   |
| Pre-column filter assembly   | Removes contaminants from incoming process fluids              |
| Drainability   | Facilitates fully draining the system                          |
| Other options include connection for UPS, additional PLC network card, and options for DeltaV control. |  |

# Why choose LEWA EcoPrime® systems?

## Analytical performance at pilot and production scale

EcoPrime performance attains lab precision at pilot and production scale. EcoPrime performs highly accurate gradients, delivering accuracy and reproducibility well below 1%, with linear gradients from 1 to 99%.

## Increases product yield and purity

Higher product yield, quality, fewer fractions and superior batch-to-batch consistency. These benefits are produced by the exclusive LEWA intellidrive® pump technology with digital fluid control and a highly optimized flow path design.

## Wide flow range provides flexibility

With EcoPrime systems' wide flow range, customers can utilize a variety of column diameters on a single system. The EcoPrime system can perform the role of two conventional skids performing comfortably across process development, pilot or production environments. The advanced design frees up space, reduces cost and footprint.

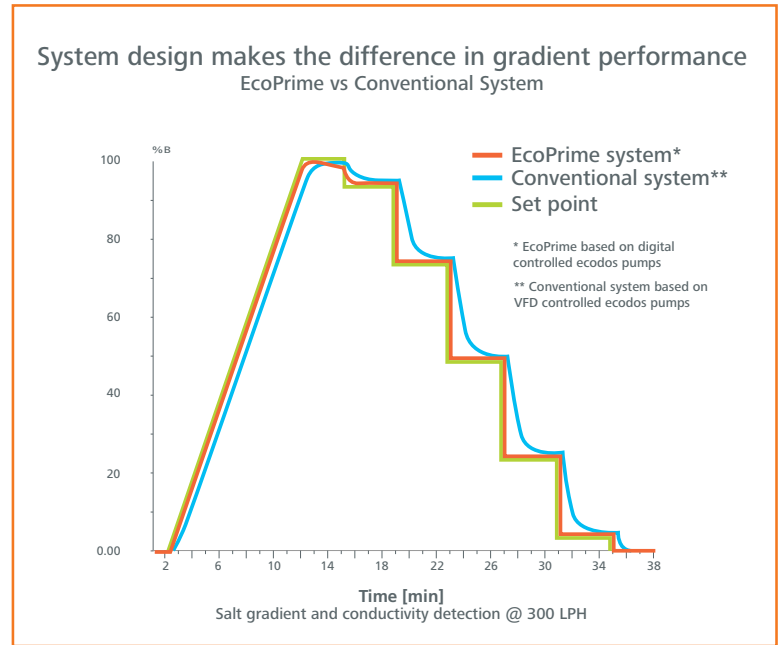
## User adaptable software

The architecture of the EcoPrime software makes it user adaptable. It is recipe driven with configurable sequences. This easy to use software includes an intuitive HMI, standard batch reporting, and a historian for trending data. LEWA can adapt the EcoPrime software to meet your needs.

## Lower capex and opex with integrated in-line buffer dilution

Using concentrated buffers the EcoPrime buffer in-line dilution (BID) option will significantly reduce tank footprint and free up plant space, lowering your operation expenses. Chromatography and buffer in-line dilution are integrated on the same system combining two unit operations into a single platform!

## Increased accuracy and reproducibility leads to improved yield and purity



## EcoPrime LPLC select features

Coriolis flow meter technology

Blow down and full drainability options

Exclusive digital motors

Buffer in-line dilution option

LEWA ecodos hygienic pumps



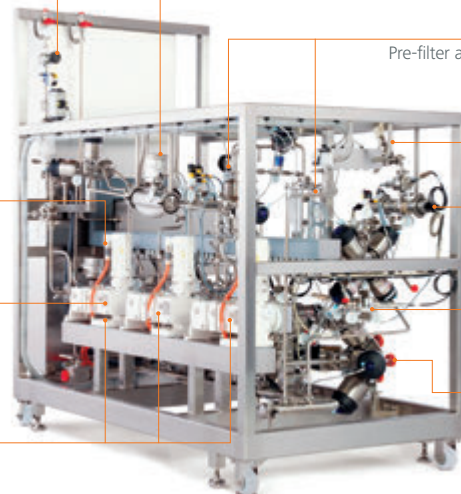
Panel features  
 19" (48cm) HMI  
 in NEMA 4X / IP  
 65 cabinet  
 User adaptable  
 software

Pre-filter and bubble trap options

Up to 10  
 outlet valves

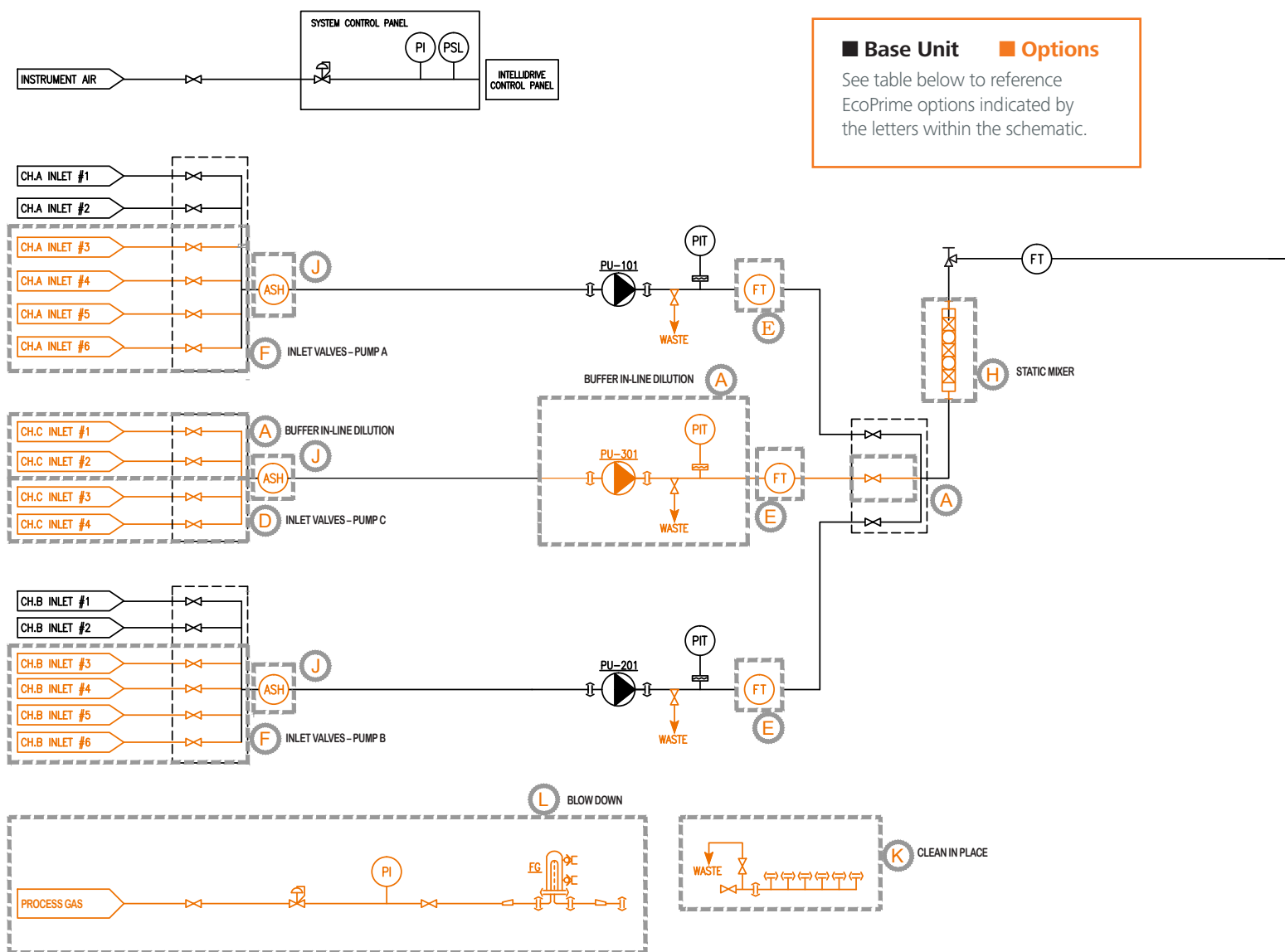
Pre/Post  
 column analytics

Select multiple  
 inlet valves  
 arrangements



Configure to fit your needs — over 20 options to select from

# LEWA EcoPrime LPLC standard platform flow schematic



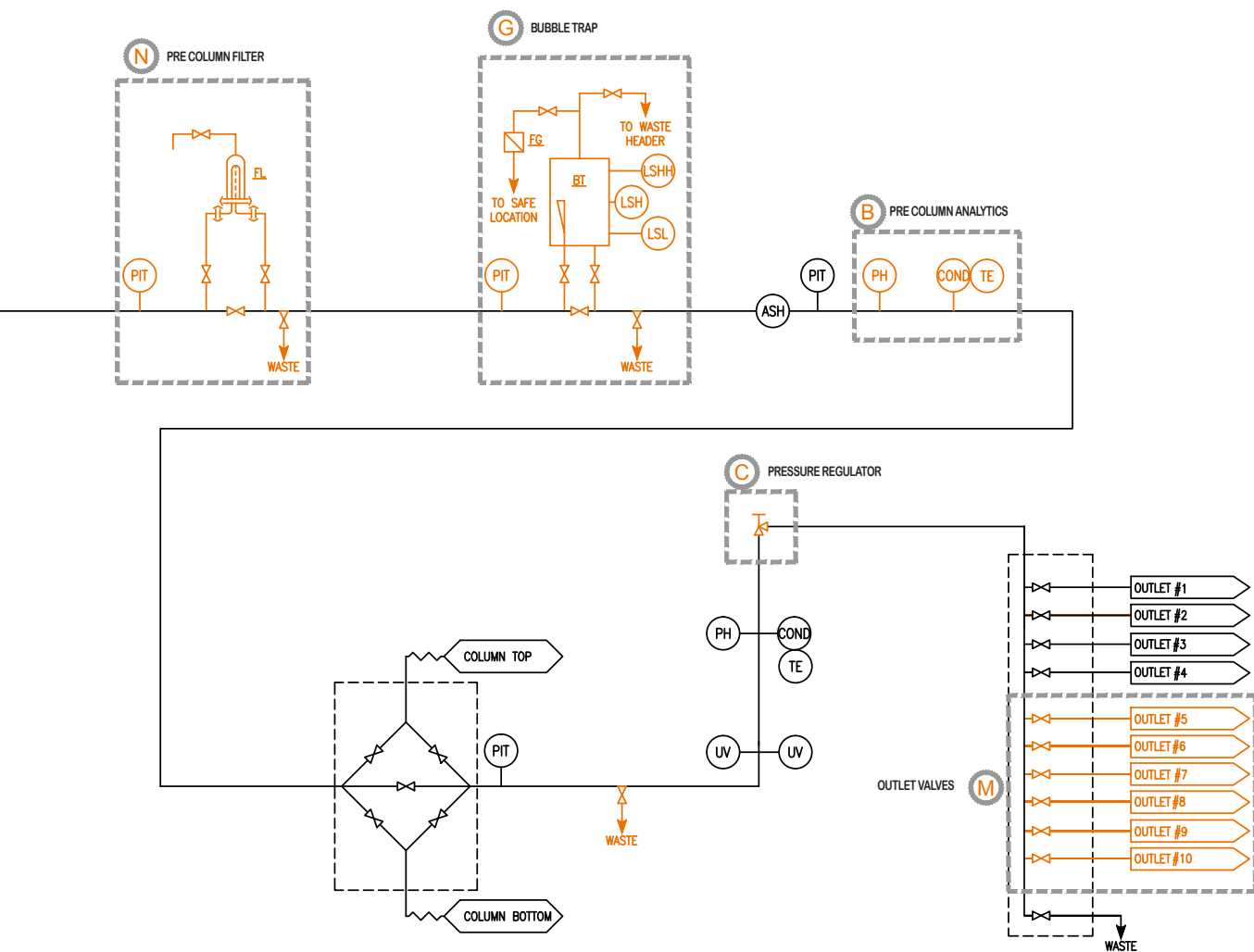
## LEWA EcoPrime LPLC

### Base units

|  | Model            | Model            | Model             | Model                |
|--|------------------|------------------|-------------------|----------------------|
| Pump (LEWA ecosdos® model <sup>1</sup> ) | EP 250           | EP 500           | EP 1000           | EP 2000 <sup>2</sup> |
| Pump flow rate [L/min]                   | 50               | 180              | 350               | 550                  |
| Pump flow rate [L/min]                   | 0.02 to 2.40 LPM | 0.06 to 9.00 LPM | 0.12 to 17.00 LPM | 0.22 to 33.00 LPM    |
| Piping OD (pump suction side)            | 3/4" (19.0 mm)   | 1" (25.4 mm)     | 1 1/2" (38.1 mm)  | 2" (50.8 mm)         |
| Piping OD (pump discharge side)          | 3/8" (9.5 mm)    | 1/2" (12.7 mm)   | 1/2" (12.7 mm)    | 3/4" (19.0 mm)       |

### Standard features – all models

|                      |  |   |                 |
|----------------------|--|---|-----------------|
| Inlets pump A        | 2  | Pre-column air sensor                   | 1               |
| Inlets pump B        | 2  | Post-column UV sensor (dual wavelength) | 1               |
| System outlets       | 5 (4 fractions and 1 waste) <sup>3</sup> | Post-column pH sensor                   | 1               |
| Flow meter           | 1  | Post-column conductivity sensor         | 1               |
| Pressure transmitter | 4  | Pump backpressure regulator             | 1               |
|                      |  | Primary material of construction        | stainless steel |



| EcoPrime LPLC options | EP 250 | EP 500 | EP 1000 | EP 2000 <sup>2</sup> |
|-----------------------|--------|--------|---------|----------------------|
|-----------------------|--------|--------|---------|----------------------|

|  |    |     |     |     |
|--|----|-----|-----|-----|
| <b>A</b> Enhanced buffer in-line dilution (BID) – pump C (LEWA ecodos model <sup>1</sup> ) includes 2 inlets | 50 | 180 | 350 | 550 |
|--|----|-----|-----|-----|

**Options – all models**

|   |                             |  |                                     |
|---|-----------------------------|--|-------------------------------------|
| <b>B</b> Pre-column analytics (pH and conductivity sensors) | 1                           | <b>J</b> Pre-pump air sensors  | choose 1, 2 or 3 additional         |
| <b>C</b> Column outlet pressure control                     | 1                           | <b>K</b> Clean in place (CIP) manifolds  | 1- inlet and 1- outlet <sup>4</sup> |
| <b>D</b> Inlets pump C                                      | 2 additional valves         | <b>L</b> Blow down (includes only regulator, filter and valves) <sup>5</sup>   | 1                                   |
| <b>E</b> Flow meter(s)                                      | choose 1, 2 or 3 additional | <b>M</b> Outlet valves <sup>3</sup>  | choose 2 or 6 additional outlets    |
| <b>F</b> Inlet valves for pump A and B                      | choose 2 or 4 additional    | <b>N</b> Pre-column filter (includes valves, PIT, drain and vent) <sup>5</sup> |                                     |
| <b>G</b> Bubble trap (includes PIT, level sensor and drain) | 1                           | <b>O</b> Drainability (includes blow down option) <sup>5</sup>                 |                                     |
| <b>H</b> Static mixer                                       | 1                           |  |                                     |

|  |   |   |           |
|--|---|---|-----------|
| <b>P</b> UPS ready (for customer supplied UPS) |   | <b>R</b> Second PLC network card          |           |
| <b>Q</b> SCADA UPS                             | 1 | <b>PP</b> Material of construction option | polymeric |

**V1** DeltaV1: LEWA HMI, PLC and software not included; Skid control via customer provided DCS

**V2** DeltaV2: LEWA HMI, PLC and software not included; LEWA provides DeltaV type S controller and I/O

1 Triplex pumps feature exclusive LEWA intellidrive® technology

2 Currently custom only  
3 Outlet valves are polypropylene

4 Includes blow down option; includes block valves at 4 or more drain points  
5 Customer supplies connections if blow down is not ordered with O or K

# Built for the regulated environment

## Software and control

EcoPrime software is designed to be user-friendly and intuitive. The control software helps the user easily navigate and manage process setup, execution and reporting.

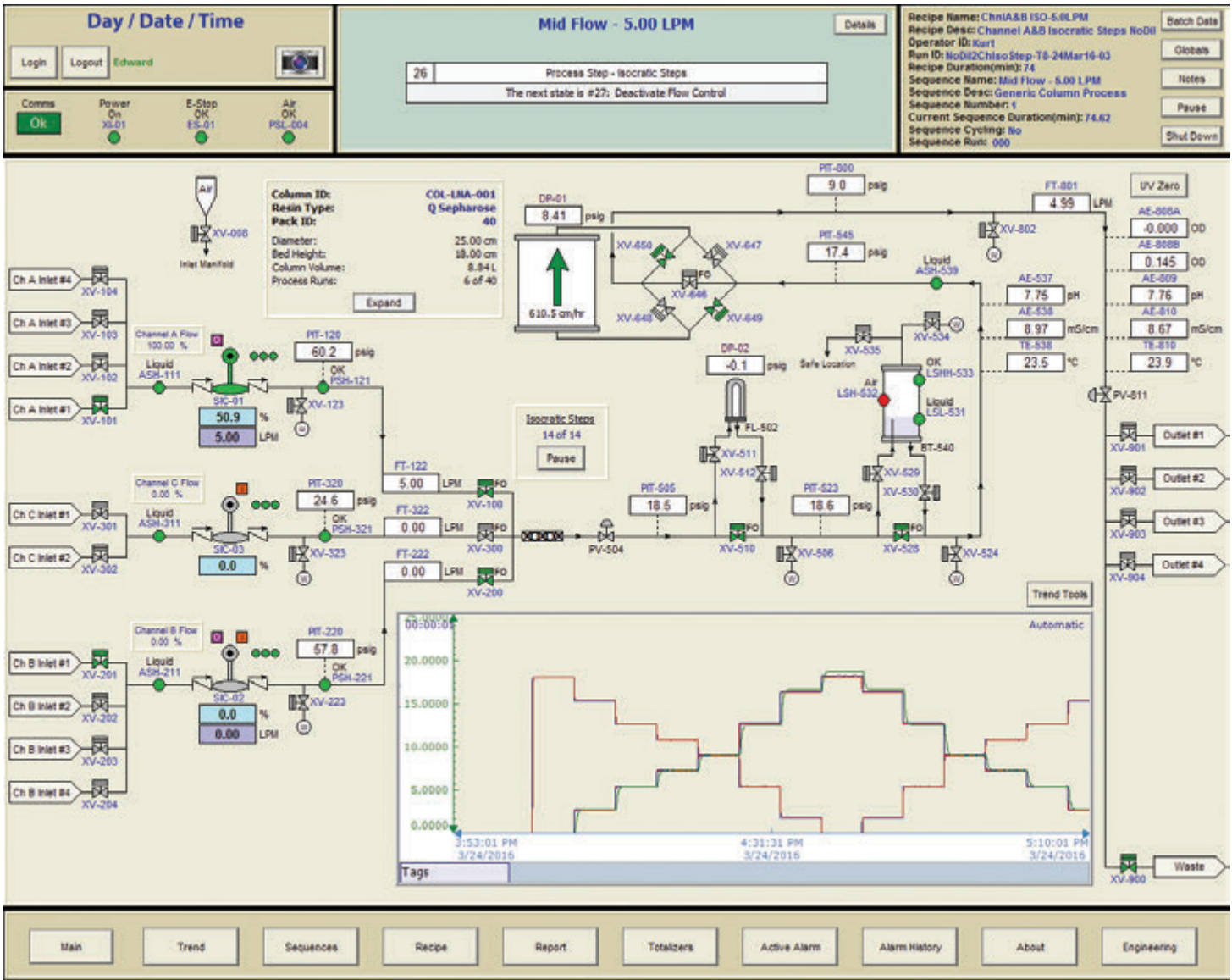
Operation is recipe driven and supported with a library of predefined sequences for all standard functions. The EcoPrime system is controlled using a PLC with a PC-based HMI as the interface and data acquisition device.

EcoPrime software is designed for pilot and process GMP environments, and enables 21 CFR Part 11 compliance.

## Standards and regulatory requirements

The design and construction of the EcoPrime meets the following standards, assuring a safe, ergonomic system capable of producing product within Food and Drug Administration guidelines:

- System designed for GMP operation and validation
- Audit trail to support CFR 21 part 11 compliance and performer/verifier traceability for GMP operations and compliance
- USP Class VI materials and seals
- Compliance to ASME-BPE
- LEWA hygienic metering pumps are European Hygienic Engineering & Design Group (EHEDG) certified
- CE conformity



The user interface on the EcoPrime system is designed for pilot and process GMP environments.

# A bright future built on an innovative history

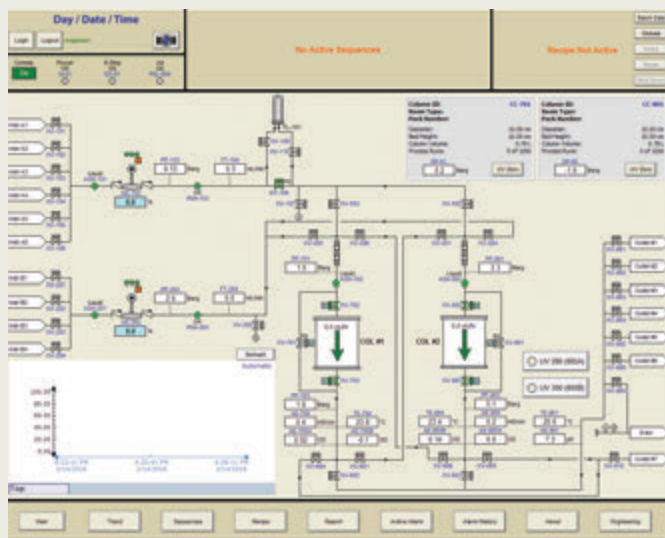


EcoPrime Twin designed for batch or continuous chromatography

## Introducing LEWA EcoPrime Twin

Building on the EcoPrime LPLC platform, LEWA is bringing to market the most advanced yet simple approach to continuous chromatography. The LEWA EcoPrime Twin is a system designed for GMP environments that is based on ChromaCon®'s patented twin column, continuous chromatography technology.\*

LEWA and ChromaCon provide bench to production scale next generation, continuous downstream processes. Ask your Sales Representative for more information.



## What we do

LEWA-Nikkiso develops technologies and engineers solutions for a wide variety of its customers' applications with a focus on critical, demanding industries such as the life sciences. LEWA is shaping a new age in Life Sciences manufacturing.

## Long history, sound financial footing

LEWA GmbH, founded in 1952 headquartered in Leonberg, Germany, has developed over just a few decades into an international group, and its position in the world market was further strengthened by its integration into the NIKKISO Co. Ltd. (listed on First Section of Tokyo Stock Exchange, founded 1953) in 2009. Since its inception, LEWA has provided over 10,000 pumps for use in process chromatography systems. It has also supplied chromatography systems to many leading biopharmaceutical companies since the 1980s.

## Global capabilities

The LEWA division has subsidiaries worldwide as well as representatives and sales offices in more than 80 countries. The LEWA Process Technologies, Inc. division, which is the center of excellence for biopharmaceutical systems, was founded in 2000 and acquired in 2013 by LEWA-Nikkiso. This division is based in Devens, Massachusetts, USA and builds high purity systems conforming to ASME-BPE, UL, CE and many Asian standards for process equipment in regulated product environments.

## Our purpose

To become the world's leading innovator of systems that advances the processing of critical fluids.

## Our value proposition

LEWA is the only company that combines deep expertise in fluid dynamics with proven pump technology to engineer advanced systems that move fluids with unmatched precision, accuracy, flexibility and efficiency.

To find out more about  
LEWA EcoPrime contact the  
LEWA-Nikkiso representative  
in your region.

North America: +1 508 429-7403  
[sales@lewa-inc.com](mailto:sales@lewa-inc.com)  
[www.lewa-inc.com](http://www.lewa-inc.com)

Europe: +49 7152 14-0  
[sales@lewa.de](mailto:sales@lewa.de)  
[www.lewa.de](http://www.lewa.de)

Asia: +81 3 3443-3711  
Nikkiso Co. Ltd.

Your local representative:

