



Pharma & Chemistry BUCHI R&D Solutions

Workflow

Pharma & Chemistry

Any chemical compounds or pharmaceutical ingredients, such as standard drugs, fine & specialty chemicals, or cosmetics & fragrances, undergo complex and time-consuming R&D processes and strict application testing before being produced at large scale and released to the market.



Discovery

There are several common steps during the discovery of novel therapeutics or chemical compounds. Ingredients or chemicals of interest are either extracted from natural sources or synthesized in the laboratory. Any targets of interest are processed further to achieve a single compound of high purity, which is thoroughly tested for desirable characteristics and functions.



Development

Once an active pharmaceutical ingredient (API) or chemical of interest has been identified, the development of the production process can begin. Here, the process is optimized on a larger scale to ensure a trouble-free production process. Drug formulation is the process of designing and producing drugs to be given to patients. Before being incorporated into a final formulation, ingredients need to be preformulated in either a liquid or solid form to facilitate storage.



Testing

Chemical or pharmaceutical products must undergo strict application testing before they enter the production process. The final product is typically tested for chemical stability and physical integrity under specific storage, transport, and use conditions. Clinical trials can take several years to complete and involve the evaluation of the drug mixture with animal, in vitro, and in vivo studies. If the drug is proven safe and efficient, the therapeutic can move on to the clinical research phase.



Production

Inspection of incoming goods and final quality control ensures the desired quality of any chemical or pharmaceutical products. Additionally, quality control during the production of chemicals and drugs helps to analyze the identity, purity, and content of bulk material, intermediates, impurities, and degradation products. Close monitoring of the process enables safe operation and ensures the product meets the required specifications.

Pharma & Chemistry

R&D Discovery

Synthesis, Extraction

Concentration

Cold Extraction / Soxhlet

Evaporation

Since both synthesis and extraction require large amounts of solvent, a

concentration step is required prior to downstream processing. Here, rotary

evaporation is used to remove the solvent and concentrate the compound

The use of parallel evaporation can speed up the concentration of multiple

samples. Many samples are evaporated simultaneously, which increases







Rotavapor®



SyncorePlus

The search for active pharmaceutical ingredients (APIs) and chemical compounds typically begins with a synthesis or an extraction step. Reflux synthesis and Soxhlet extraction can be performed via a rotary evaporator.

 Reflux condenser for reflux synthesis

- · Soxhlet accessory for Soxhlet extraction
- One instrument fits several application
- Evaporation of a single sample with evaporating flask size of 50 to 5000 mL

of interest.

sample throughput.

- Fully communicating system to avoid downtime: solvent library, dynamic distillation, drying mode, leak test, foam sensor
- Dewar accessory for freeze drying sample preparation
- Multiple samples in the range of 0.5 - 500 mL can be concentrated or dried simultaneously
- Flushback module to achieve highest analyte recovery and most reliable results
- Interchangeable racks and volume versatility

Separation

Flash Chromatography
Prep HPLC

Freeze Drying

Drying

Melting Point

Analysis



Pure Instruments & Consumables



Lyovapor™



Melting Point

Flash and preparative highpressure liquid chromatography (prep HPLC) are commonly used to purify target compounds: flash is used as a pre-purification step, whereas prep HPLC increases the purity of the target compound to the maximum.

Following the separation process, molecules of interest are highly diluted and must be concentrated before proceeding with the next steps. Freeze drying can be used to remove solvent from heatsensitive products with minimal damage.

Melting point analysis can be used to perform quality control on the compound of interest. Determination of the novel compound's melting point serves as a useful indicator of the material's purity.

- Flash and prep HPLC in one system (optionally)
- Integrated UV and ELS detection (optionally)
- Compatible with a wide range of flash cartridges, prep HPLC columns and glass columns
- Leak, pressure, solvent level sensors and RFID technology on cartridges and racks for superior sample safety
- · Two BUCHI platforms available:
- L-200: high-quality traditional freeze drying of samples (-55 °C, 6 kg)
- L-300: continuous sublimation with two alternately working and automatically cleansed condensers at -105 °C (Infinite-Technology™)
- Easy way of controlling and monitoring of the freeze drying process

- Automatic determination of melting and boiling points
- Compliant with Pharmacopeia methods (European, USP, Japanese)
- Observation and replay of the phase transition using color display and video recording
- Parallel measurement of up to 3 samples

Application

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Pharma & Chemistry

R&D Development

Process

Synthesis, Extraction

Concentration

Separation

Formulation

Cold Extraction / Soxhlet

Evaporation

Flash Chromatography **Prep HPLC**















Scaling up

Rotavapor®

Scaling up

Pure Systems & Consumables

Rotavapor®

Scaling up

The process of synthesizing or exple sizes.

tracting target compounds is scaled up using industrial rotary evaporation. Here, large scale evaporating flasks and Soxhlet extraction chambers are used to handle large sam-

- · Scale-up your process while keeping the same parameters
- · Evaporating flask size: from 50 mL to 50 L
- · Size of the cold extraction chamber: 200 mL and 500 mL (R-300) to 4 L (R-220 Pro)

drying is scaled up using industrial rotary evaporation. High heating capacities and fast distillation rates can rapidly concentrate large volumes.

- · The Rotavapor® system is fully provided by BUCHI: Rotavapor®, pump, interface and chiller
- · Evaporating flask size: from 50 mL to 50 L
- · Heating capacity: from 1,5 kW up to 6kW
- · The interface and parameters stay the same
- Distillation rates:
- Acetone: from up to 7 L / h (R-300) to up to 27 L/h(R-220 Pro HP)
- Ethanol: from up to 3 L / h (R-300) to up to 17 L/h (R-220 Pro HP)

The process of concentration or

As the separation process is optimized and upscaled, the sample amounts increase. With this, loading & collection equipment as well as consumables for flash chromatography and prep HPLC need to be adapted accordingly.

- · Wide size range of consumables:
- Flash cartridges 4 to 5000 g
- Prep HPLC columns 4.6 to 70 mm ID
- Glass columns 9 to 3700 g
- · Several options for sample injections: solid and liquid (syringe, loop or external pump)
- · Collection vessel sizes range from a few to hundreds of mL or I (funnel racks)

Freeze Drying

Drying





After separation, the molecule of interest may require concentration prior to formulation. Freeze drying is commonly used to remove the solvent without damaging the product.

- · Reproducible process due to stable parameters (temperature and vacuum pressure)
- · Large choice of drying chambers: as well as manifold cover, stoppering cover or manifold tree
- L-200 ≤ 6 kg; L-300 unlimited (Infinite-Technology™)

Spray Drying

Drying



Functional molecules are pre-for-

- heatable and unheatable shelves
- · Flexible condenser capacities:



Mini Spray Dryer & Nano Spray Dryer

mulated by spray drying to facilitate their storage or their incorporation into a formulation. Spray drying is one of the most common technologies used to obtain granulated substances.

- · Generation of dry homogenous or matrix particles
- · Continuous process and short process time
- · Mild drying conditions
- · Broad particle size distribution: 0.2 - 60 µm
- · Three BUCHI solutions available: Spray Drying small, medium and large particles

Encapsulation

Prilling by Vibration



Encapsulator

Prilling by vibration (dripping) is a technique for generating small amounts of liquidcarrying polymer particles in the laboratory. This process results in coreshell particles or matrix particles.

- · Generation of liquid core beads or capsules (wet) (possible to dry afterwards)
- · Particle hardening in cooling or polymerization bath
- · Extremely gentle conditions
- · Narrow particle size distribution: 100 - 2000 μm
- · Two BUCHI solutions available: Prilling by Vibration Dry and Wet



Laboratory EvaporationProduct Details §



System Portfolio & Technical Features

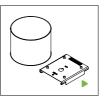
Rotavapor® Model	Max. Flask Size	Lift System	Vacuum Pump	Chiller
R-300 &	1 or 5 L	electric or manual	no	no
Rotavapor® system RS-300	1 or 5 L	electric or manual	yes (final vacuum: 5 mbar)	yes (optional)
R-100 &	4 L	manual	no	no
Rotavapor® system RS-100	4 L	manual	yes (final vacuum: 10 mbar)	yes (optional)

Accessories



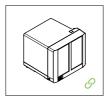
Foam Sensor

Prevents sample from foaming into the condenser by automatic short aeration of the system.



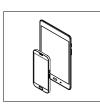
Dewar Accessory

For sample preparation in freeze drying.



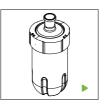
Vacuum Pump V-600

To achieve distillation of high boiling point solvent. Final vacuum: 1.5 mbar



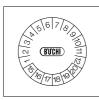
Monitor App

Allows to monitor all BUCHI instruments on a mobile device thanks to the BUCHI Bluetooth Dongle.



Beaker Flasks

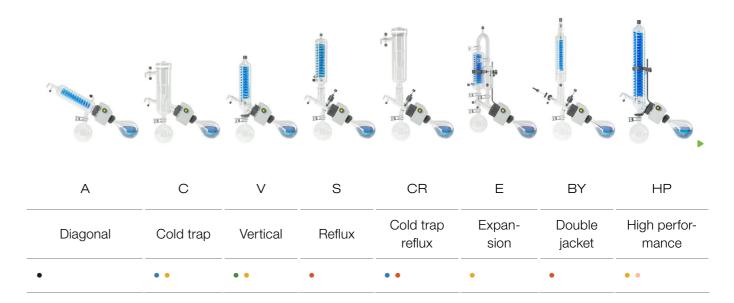
Beaker flasks with large screw-cap opening for easy retrieval of substances.



IQOQ Documentation

Installation / Operational Qualifications documentation.

Condensers



- Reduced height
- Low boiling point •
- Standard
- Foaming products
- Reflux reactions
- Increased distillation rate





Parallel Evaporation

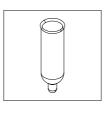
Product Details



System Portfolio & Technical Features

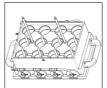
SyncorePlus Model	Method	Number of Samples	Max Temperature	Rotation
Analyst &	concentration to final volume	4, 6, 12	100 °C	60 - 400 rpm
Polyvap 🔗	evaporation to dryness	4, 6, 12, 24, 48, 96	100 °C	60 - 400 rpm

Accessories



Graduated Vessels

Concentrates of up to 12 samples to a predefined residual volume using SyncorePlus Analyst, ranging from 0.3 mL, 1 mL, to 3 mL per sample.



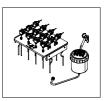
Interchangeable Racks

Broad selection of racks for SyncorePlus Polyvap to accommodate any workflow or throughput; that come in 4, 6, 12, 24, 48 and 96 positions.



Flushback Module for R-6, R-12

Improves recovery rates by flushing back analyte that adheres to the glass walls with condensed vapor during the evaporation process.



Solid Phase Extraction Cover

All essential work-up steps including evaporation of the eluates are achieved without any sample handling between the individual steps.



IQOQ Documentation

Installation / Operational Qualifications documentation.

Automation & Workflow



Interface I-300 Pro

Full automation with the Interface I-300 Pro. Start the process and walk away. Specified evaporation methods and predefined specific solvents.



Vacuum Pump V-300

Essential system component for quiet, eco-friendly operations and the ability to distill solvents of any volume and with any boiling point.



Recirculating Chiller F-305, F-308, F-314

Convenient central temperature setting, energy-saving ECOmode, and automatic start / stop.



SpeedExtractor E-914 / E-916

Pressurized Solvent Extraction (PSE) for increased productivity by processing up to 6 samples in parallel. Streamlined workflow of the sample preparation thanks to ease of sample loading and ready to use extract collection.

Industrial Evaporation Product Details *◊*



System Portfolio & Technical Features

Rotavapor® Model	Sample Size (per batch)	Heating Bath Temperature	Distillation Rate of Ethanol	EX Protection
R-220 Pro &	max 12 L	up to 180 °C	up to 18 L / h	no
R-250 Pro &	max 30 L	up to 180 °C	up to 19 L / h	no
R-220 EX 🔗	max 12 L	up to 150 °C (T3)	up to 12 L / h	yes
R-250 EX 🔗	max 30 L	up to 150 °C (T3)	up to 19 L / h	yes

Accessories



Vacuum Pump

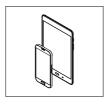
Chemically resistant 3-stage diaphragm pump.

Final vacuum: 1.5 mbar



Manual Flask Handler

For easy mounting and removal of the 20 L and 50 L flasks along with safe transport.



Monitor App

Allows to monitor all BUCHI instruments on a mobile device thanks to the BUCHI Bluetooth Dongle.



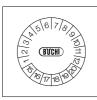
Recirculating Chiller

Chiller that also operates as a trolley and host of the Vacuum Pump V-600 for the R-220 Pro.



Foam Sensor

Detects rising foam and triggers a short aeration pulse, eliminating



IQOQ Documentation

Installation / Operational Qualifications documentation.

Condensers

R-220 Pro R-250 Pro D2 D3 RB2 R2 DB2 Height 175 cm 175 cm 150 cm 150 cm 143 cm 163 cm 158 cm 230 cm 230 cm 210 cm 226 cm

- Low boiling points and / or foaming products
- High boiling points
- Very low boiling point
- Minimum emissions
- Reflux reactions
- Reduced height



Flash / prep HPLC Chromatography

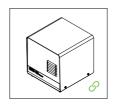
Product Details &



System Portfolio & Technical Features

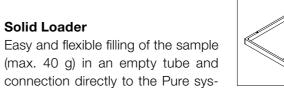
	Pure C-805 Flash <i>&</i>	Pure C-810 Flash &	Pure C-815 Flash &	Pure C-830 Prep &	Pure C-835 Prep &	Pure C-850 FlashPrep &
Mode	Flash	Flash	Flash	prep HPLC	prep HPLC	Flash & prep HPLC
Flow Rate (flash mode)	250 mL / min	250 mL / min	250 mL / min			250 mL / min
Flow Rate (prep HPLC mode)				100 mL / min	100 mL / min	100 mL / min
Max Pressure (flash mode)	50 bar	50 bar	50 bar			50 bar
Max Pressure (prep HPLC mode)				300 bar	300 bar	300 bar
UV Scan Function 6	no	yes	yes	yes	yes	yes
UV-Vis Wavelengths Range	200 - 400 nm	200 - 800 nm	200 - 800 nm	200 - 800 nm	200 - 800 nm	200 - 800 nm
ELSD &	no	no	yes	no	yes	yes

Accessories



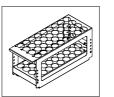
Dry Air Supply

Production of particle-free dry air on demand without the need for operator attention. Air is used in the Pure system to carry sample to the ELSD and to purge cartridges and sample loaders.



Solid Loader

(max. 40 g) in an empty tube and connection directly to the Pure system. This equipment can handle up to 50 bar (725 psi) and therefore provides maximum flexibility.



Racks

Several different sizes of racks and glass tubes, which enable an optimal collection depending on the fractions sizes. All racks get automatically identified by the Pure system via an RFID tag.



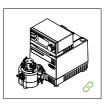
XL Consumable Holders

Allows the connection of big size cartridges (750 - 5000 g) and prep HPLC columns (50 – 70 mm ID) with Pure.



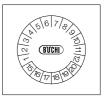
Solvent Platform

Extra solvent platform on top of the Pure system which provides space for four bottles. This allows for better use of available space and reduces risk of spills.



Sampling Pump

For large sample volumes injected manually on a large flash cartridge. Flow rates up to 250 mL / min and 50 bar.



IQOQ Documentation

Installation / Operational Qualifications documentation.

Consumables



FlashPure

A wide range of flash cartridges

Phases	Silica, C18, Amino, Diol, C18 WP, Alumina
Particle sizes	15 - 50 μm
Particle shapes	Irregular, spherical
Cartridge sizes	4 - 5000 g



PrepPure

Highest performance for prep HPLC applications

Cartridge sizes	4 - 5000 g
Phases	Silica, C18, C4, C18 AQ
Particle sizes	5 - 15 μm
Particle shapes	Spherical
Column sizes	4.6 - 70 mm ID, 150 & 250 mm Lengths



GlasPure

Scale-up purification

Column sizes	4.6 - 70 mm ID, 150 & 250 mm Lengths
Lengths	100 - 900 mm
IDs	15 - 100 mm
Silica capacities	9 - 3400 g



Freeze Drying Product Details







System Portfolio & Technical Features

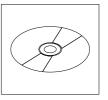
Lyovapor Model	Condenser Capacity	Lowest Condenser Temperature	Condensing Capacity	Min. System Vacuum	Drying Shelf Temperature
L-200 &	6 L	-55 °C + / - 3 °C	6 kg / 24 h	30 mTorr / 0.04 mbar	Up to 60 °C+ / -1 °C
L-300 🔗	Infinite	-105 °C + / - 3 °C	12 kg / 24 h	30 mTorr / 0.04 mbar	Up to 60 °C + / -1 °C

Accessories &



Glassware

Large variety of glassware such as beaker flasks to meet laboratory needs.



Lyovapor Software

Easy way of controlling and monitoring the Freeze Drying process and generating reports.



Edwards Scroll Pump

Stable and high-quality vacuum pump for freeze drying of organic solvents.



Sensors

Choice of product temperature and vacuum sensors for end point determination.

Drying Chambers

The Lyovapor[™] has a large choice of drying chambers that can be used in any combination.



Acrylic chamber with heated shelves and stoppering for vial drying.



Acrylic chamber with 12 manifold top and shelves for bulk, vial and flask drying.



Acrylic chamber with heated shelves for bulk and vial drying.



Manifold with 12, 24 or 36 valves for flask or beaker drying.

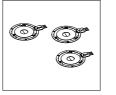
Spray DryingProduct Details



System Portfolio & Technical Features

	Nano Spray Dryer B-90 HP ${\cal O}$	Mini Spray Dryer B-290 ♂
Particle Size	200 nm - 5 um	2 - 25 um (60 um with ultrasonic package)
Particle Nature	dry	dry
Particle Size Sistribution	narrow	broad
Max. Sample Throughput	200 mL / h	1 L/h
Min. Sample Amount	200 mg / 2 mL	5 g / 10 mL
Yield	up to 90 %	up to 70 %
Sample Viscosity	up to 5 cps	up to 300 cps
Sample Composition	aqueous and organic solutions, suspensions or emulsions NO acidic or alkaline	aqueous, organic, acidic and alkaline solutions, suspensions or emulsions NO acidic or alkaline organic mixture
Application	micronisation matrix en	ying , agglomeration capsulation solid dispersion

Accessories Nano Spray Dryer B-90 HP *𝑉*



Nebulizers Set

Nebulizers in the sizes small, medium and large allow the finding of the perfect balance between small particles and high throughput (up to 200 mL/h).



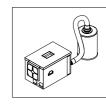
Dehumidifier B-296 Nano

An efficient way to obtain constant parameters by conditioning the inlet air allowing to work with organic solvents and water mixtures in combination with the Inert Loop B-295.



Inert Loop B-295 SE

Used to work in closed mode, under nitrogen atmosphere with the BUCHI Spray Dryers. Furthermore it condenses the organic solvents and recirculates the nitrogen.



Aspirator

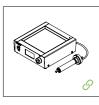
If no compressed air is available, the BUCHI Aspirator unit with inlet filter can be used to establish the required drying air flow rate. In "closed loop" mode, with the Nano Spray Dryer advanced, the Aspirator is required to build up the gas stream.

Accessories Mini Spray Dryer B-290 €



Inert Loop B-295 SE

Used to work in closed mode, under nitrogen atmosphere with the BUCHI Spray Dryers. Furthermore it condenses the organic solvents and recirculates the nitrogen.



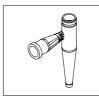
Ultrasonic Package

Allows the Mini Spray Dryer B-290 to produce particles in the size range from 10 – 60 μ m.



Dehumidifier B-296

An efficient way to obtain constant parameters by conditioning the inlet air allowing you to work with organic solvents and water mixtures in combination with the Inert Loop B-295.



High Performance Cyclone

Specially optimized to collect small particles in high yields from the Mini Spray Dryer B-290.



Two-fluid nozzle

The two fluid nozzle equiped with an effective nozzle cleaning mechanism and a ruby stone to guarantee reproducibility offers a high degree of flexibility.



Outlet filter

Collects the residual particles from the cyclone and protects the user, the environment and the instrument. Available with a polyester deep filter and a PTFE filter membrane. Recommended for all Mini Spray Dryers B-290.



Prilling by Vibration Product Details &



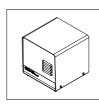


System Portfolio & Technical Features

Encapsulator B-390 / 395 Pro &

Particle Size	150 - 2000 um
Particle Nature	wet (hydrogel beads / capsules)
Particle Size Distribution	uniform
Max. Sample Throughput	600 mL / h
Min. Sample Amount	5 mL
Yield	up to 100 %
Sample Viscosity	up to 300 cps
Sample Composition	aqueous organic solutions, suspensions or emulsions wax / melt
Application	agglomeration matrix encapsulation liquid core encapsulation

Accessories



Dry Air Supply Cpl.

Brings dry and clean air to work with pressure bottle on the Encapsulator.



Alginate Powder

The alginate is tested for microencapsulation procedures and will make your lab work more reproduc-



Concentric Nozzle

Used for the core-shell capsule production. Includes a pulsation chamber plus a set of 7 external nozzles with high precision opening of 0.2, 0.3, 0.4, 0.5, 0.6, 0.7 and 0.9 mm.



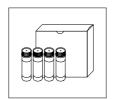
Melting Point Product Details 6



System Portfolio & Technical Features

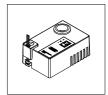
Melting Point Model	Compliant with Pharmacopeia Methods	Automatic Detection	Sample Loader
M-560 <i>⊗</i>	yes	no	no
M-565 <i>&</i>	yes	yes	no
M-565 + Sample Loader M-569 6	yes	yes	yes

Accessories



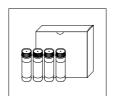
Verification Kit

Kit of three BUCHI certified standards for verification of the Melting Point M-560 and M-565.



Sample Loader

Instrument for fast and efficient loading of samples into melting point capillaries.



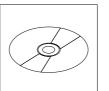
Calibration Kit

Kit of four BUCHI certified standards for calibration of the Melting Point M-560 and M-565.



Printer and Keyboard

For documenting calibration results and melting and boiling point determinations and convenient straightforward input of parameters.



MeltingPoint Monitor Software with License

Software CD, Tutorial and single PC license. For installation under Windows 7 Professional / Enterprise / Ultimate (32-bit or 64-bit, SP1), Windows 8.1 Professional / Enterprise (64-bit), Windows 10 Professional / Enterprise (64-bit).



IQOQ Documentation

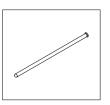
Installation / Operational Qualifications documentation.

Consumables



Melting Point Capillaries

The precision glass capillaries ensure highly reproducible melting point determinations.



Boiling Point Tube A Boiling Point Capillary B

The precision capillaries B generate perfect gas bubbles within tube A for reproducible boiling point determinations.

Laboratory Evaporation



Rotavapor® R-300

The R-300 meets the highest expectations in convenience and versatility. Modular design allows the extension to a fully integrated system



VacuumPump V-300 / V-600

The powerful and silent vacuum source



Rotavapor® R-100

The entry level Rotavapor® to meet the essential needs in evaporation



Interface I-300 Pro

The convenient interface with central touch screen control, recording and charting



Interface I-300

The controlling unit for all process parameters



Glass Oven B-585 Kugelrohr

amples

For distillation, sublimation,

freeze-drying or drying of small

The efficient way of cooling, optimally suited in combination with Rotavapor® R-300

Recirculating Chiller F-3xx



Glass Oven B-585 Drying

The cost efficient way to dry small and medium samples gently under vacuum

Industrial Evaporation



Rotavapor® R-220 Pro

Perform large distillation processes the most economical way with up to 20 liter flask



Rotavapor® R-250 Pro

Benefit from optimized distillation rate, intuitive operation, exceptional product durability, and highest user safety with up to 50 liter flask volume.



Rotavapor® R-220 EX / 250 EX

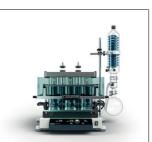
Both, R-220 EX and R-250 EX, meet the newest EX regulations and fulfil the highest safety levels

Parallel Evaporation



Multivapor P-6 / P-12 stand-alone

The Multivapor enables neatless integration of your custom sample tubes and allows parallel evaporation of up to 12 samples



SyncorePlus

Our SyncorePlus parallel evaporation instrument comes in two configurations; the SyncorePlus Analyst "Pre-Analytical" and the SyncorePlus Polyvap "Throughput"

Spray Drying & Encapsulation



Mini Spray Dryer B-290

The world leading R&D solution for Spray Drying. Reproducible powder production at lab scale



Nano Spray Dryer B-90 HP

Three patented technologies enable the production of small particles and reduce R&D cost due to small sample volumes and higher yields



Encapsulator B-395 Pro

Controlled encapsulation of cells, biological and active materials for labscale R&D work requiring sterile conditions



Encapsulator B-390

Facile and flexible operation of the B-390 to produce beads and capsules for numerous actives and materials

Freeze Drying



Lyovapor™ L-200

Efficient Freeze Drying (-55 °C, 6 kg) with Infinite-Control™ including easy method creation, data logging, chart recording in real time and required interruption at anytime and anywhere.



Lyovapor™ L-300

Infinite-Technology™ offers continuous sublimation with two alternate working and automatically cleaned condensers at -105°C including the Infinite-Control™ for entire process control



Melting Point

Melting Point M-565

Automated and reliable determination of melting and boiling points with video camera and replay function



Melting Point M-560

Manual determination of melting and boiling points with intuitive calibration and verification procedures for highly accurate measurements

Purification



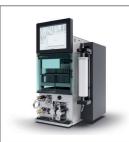
Pure C-810/C-815 Flash

Powerful Flash purification systems, with and without ELS Detection, for maximal flexibility, purity and recovery. With standard remote control.



Pure C-830/C-835 Prep

High performance preparative HPLC systems, with and without ELS Detection. One screen programming and auto-recognition of collection racks.



Pure C-850 FlashPrep

Powerful system combining flash and preparative HPLC capabilities. Offers all the benefits of flash and prep systems in one unit.



FlashPure cartridges

A complete range of flash cartridges for optimum performance and loadability

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