



Pharma & Chemistry
BUCHI R&D Solutions

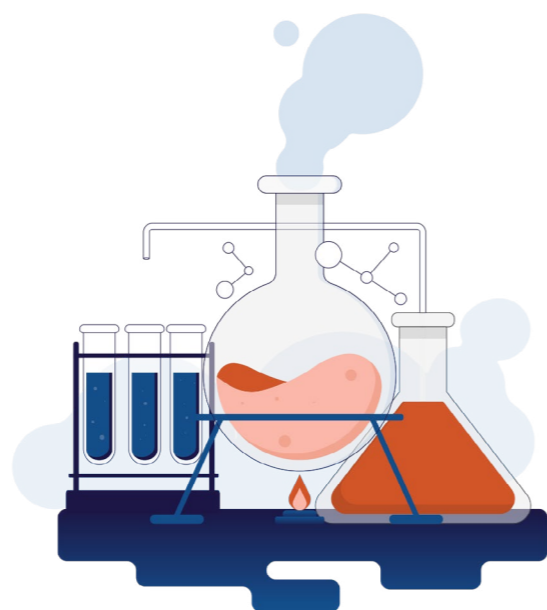
Workflow Pharma & Chemistry

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



Pharma & Chemistry

R&D Development





Laboratory Evaporation

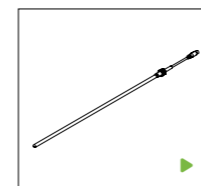
Product Details [↗](#)



System Portfolio & Technical Features

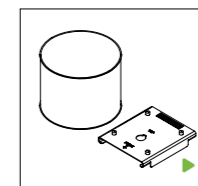
Rotavapor® Model	Max. Flask Size	Lift System	Vacuum Pump	Chiller
R-300 ↗	1 or 5 L	electric or manual	no	no
Rotavapor® system RS-300	1 or 5 L	electric or manual	yes (final vacuum: 5 mbar)	yes (optional)
R-100 ↗	4 L	manual	no	no
Rotavapor® system RS-100	4 L	manual	yes (final vacuum: 10 mbar)	yes (optional)

Accessories



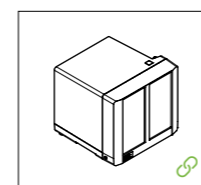
Foam Sensor

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



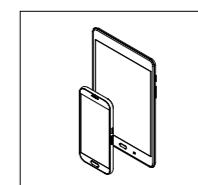
Dewar Accessory

For sample preparation in freeze drying.



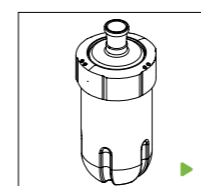
Vacuum Pump V-600

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



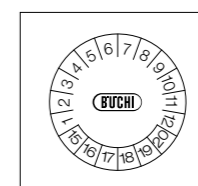
Monitor App

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



A	C	V	S	CR	E	BY	HP
Diagonal	Cold trap	Vertical	Reflux	Cold trap reflux	Expansion	Double jacket	High performance
•	••	••	•	••	•	•	••

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

Parallel Evaporation

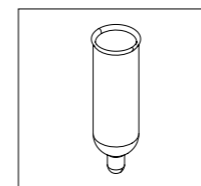
Product Details



System Portfolio & Technical Features

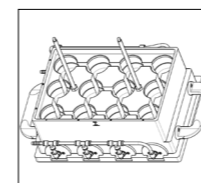
SyncorePlus Model	Method	Number of Samples	Max Temperature	Rotation
Analyst ↗	concentration to final volume	4, 6, 12	100 °C	60 - 400 rpm
Polyvap ↗	evaporation to dryness	4, 6, 12, 24, 48, 96	100 °C	60 - 400 rpm

Accessories



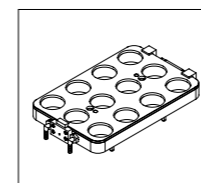
Graduated Vessels

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.



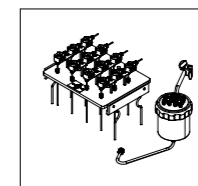
Interchangeable Racks

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



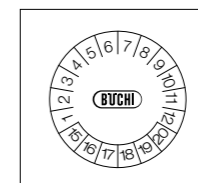
Flushback Module for R-6, R-12

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.



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

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



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.



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.

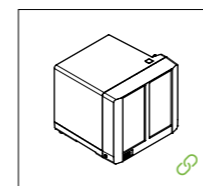


Industrial Evaporation

Product Details [↗](#)

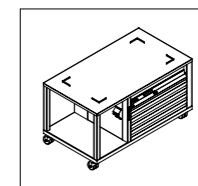


Accessories



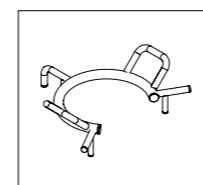
Vacuum Pump

Chemically resistant 3-stage diaphragm pump.
Final vacuum: 1.5 mbar



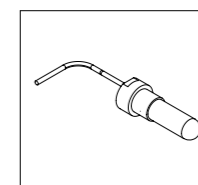
Recirculating Chiller

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



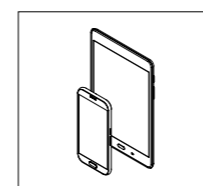
Manual Flask Handler

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



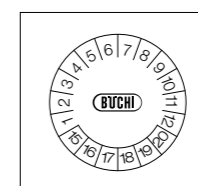
Foam Sensor

Detects rising foam and triggers a short aeration pulse, eliminating foam.



Monitor App

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



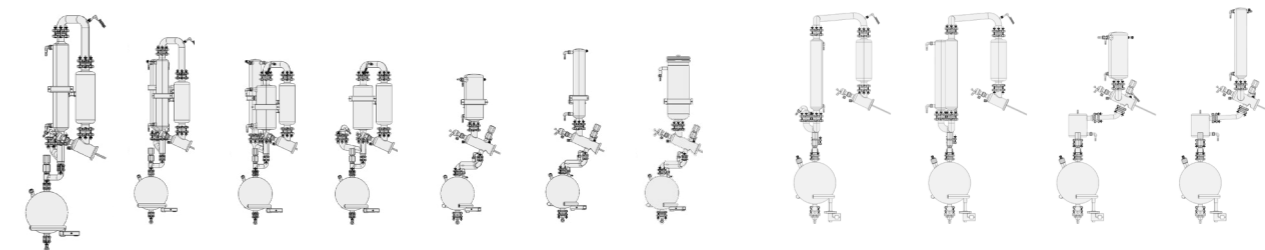
IQOQ Documentation

Installation / Operational Qualifications documentation.

Condensers

R-220 Pro

R-250 Pro



D D2 DB2 DB RB R C D2 D3 RB2 R2



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
- Minimum emissions
- High boiling points
- Reflex reactions
- Very low boiling point
- Reduced height

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



Flash / prep HPLC Chromatography

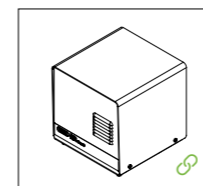
Product Details [↗](#)



System Portfolio & Technical Features

	Pure C-805 Flash ↗	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 ↗	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



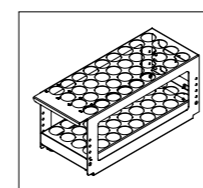
Dry Air Supply

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.



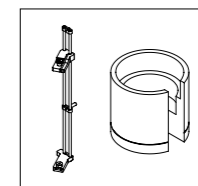
Solid Loader

Easy and flexible filling of the sample (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.



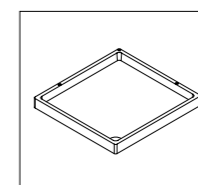
Racks

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.



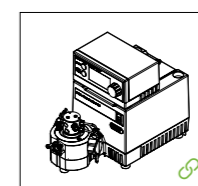
XL Consumable Holders

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



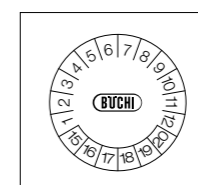
Solvent Platform

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

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

Lengths 100 - 900 mm

IDs 15 - 100 mm

Silica capacities 9 - 3400 g

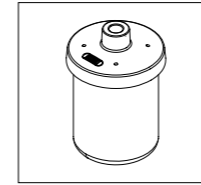


Freeze Drying

Product Details [↗](#)

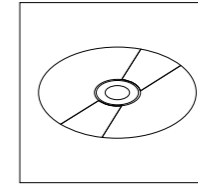


Accessories [↗](#)



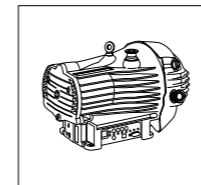
Glassware

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



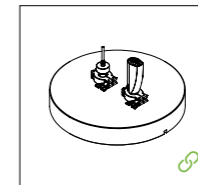
Lyovapor Software

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.



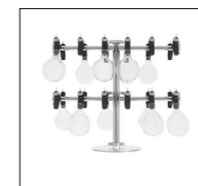
Acrylic chamber with heated shelves and stoppering for vial drying.



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.

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



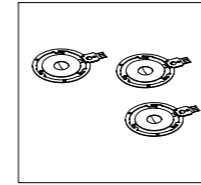
Spray Drying Product Details



System Portfolio & Technical Features

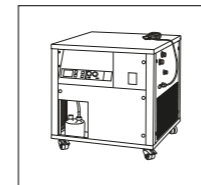
	Nano Spray Dryer B-90 HP ↗	Mini Spray Dryer B-290 ↗
Particle Size	200 nm - 5 µm	2 - 25 µm (60 µm with ultrasonic package)
Particle Nature	dry	dry
Particle Size Sistribution	narrow	broad
Max. Sample Throughput	200 mL / h	1 L / h
Min. Sample Amount	200 mg / 2 mL	5 g / 10 mL
Yield	up to 90 %	up to 70 %
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	drying micronisation, agglomeration matrix encapsulation amorphous solid dispersion	

Accessories Nano Spray Dryer B-90 HP [↗](#)



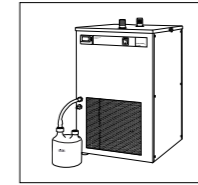
Nebulizers Set

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).



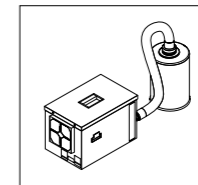
Inert Loop B-295 SE

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



Dehumidifier B-296 Nano

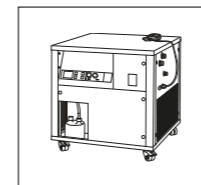
An efficient way to obtain constant parameters by conditioning the inlet air allowing to work with organic solvents and water mixtures in combination with the Inert Loop B-295.



Aspirator

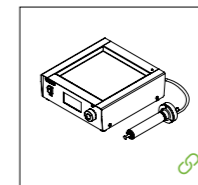
If no compressed air is available, the BUCHI Aspirator unit with inlet filter can be used to establish the required drying air flow rate. In "closed loop" mode, with the Nano Spray Dryer advanced, the Aspirator is required to build up the gas stream.

Accessories Mini Spray Dryer B-290 [↗](#)



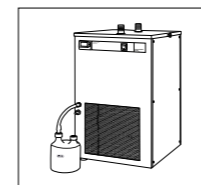
Inert Loop B-295 SE

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



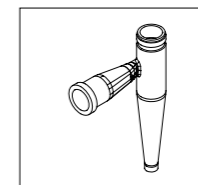
Ultrasonic Package

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



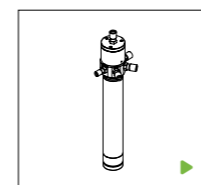
Dehumidifier B-296

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.



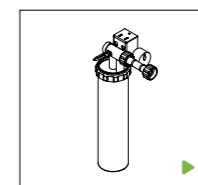
High Performance Cyclone

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



Two-fluid nozzle

The two fluid nozzle equipped 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 [↗](#)

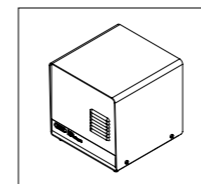


System Portfolio & Technical Features

Encapsulator B-390 / 395 Pro [↗](#)

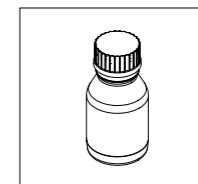
Particle Size	150 - 2000 μm
Particle Nature	wet (hydrogel beads / capsules)
Particle Size Distribution	uniform
Max. Sample Throughput	600 mL / h
Min. Sample Amount	5 mL
Yield	up to 100 %
Sample Viscosity	up to 300 cps
Sample Composition	aqueous
	organic solutions, suspensions or emulsions
	wax / melt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

Accessories



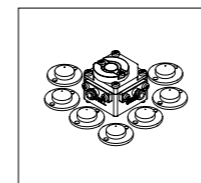
Dry Air Supply Cpl.

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 reproducible.



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

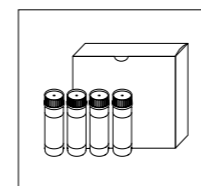
Product Details [↗](#)



System Portfolio & Technical Features

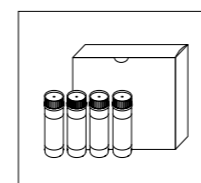
Melting Point Model	Compliant with Pharmacopeia Methods	Automatic Detection	Sample Loader
M-560 ↗	yes	no	no
M-565 ↗	yes	yes	no
M-565 + Sample Loader M-569 ↗	yes	yes	yes

Accessories



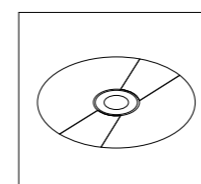
Verification Kit

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



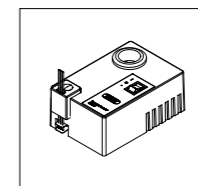
Calibration Kit

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



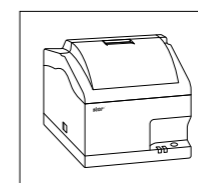
MeltingPoint Monitor Software with License

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).



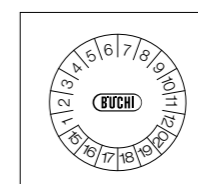
Sample Loader

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



Printer and Keyboard

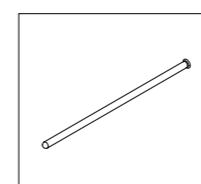
For documenting calibration results and melting and boiling point determinations and convenient straightforward input of parameters.



IQOQ Documentation

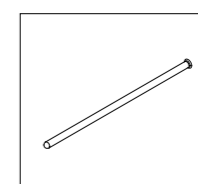
Installation / Operational Qualifications documentation.

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



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



Vacuum Pump V-300 / V-600
The powerful and silent vacuum source



Recirculating Chiller F-3xx
The efficient way of cooling, optimally suited in combination with Rotavapor® R-300



Glass Oven B-585 Kugelrohr
For distillation, sublimation, freeze-drying or drying of small samples



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 volume



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.

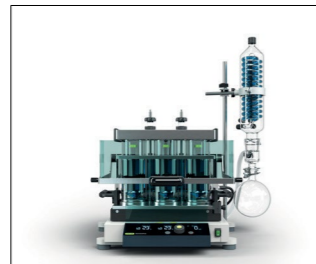


Rotavapor® R-220 EX / 250 EX
Both, R-220 EX and R-250 EX, meet the newest EX regulations and fulfil the highest safety levels

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 lab-scale 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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