



Laboratory Freeze Dryers
Routine Processes

CHRIST [®]
Freeze Dryers
Vacuum Concentrators



The Optimal Product for Your Freeze-Drying Needs

Product Spectrum

Our comprehensive product range of freeze dryers and vacuum concentrators for every application. Do not hesitate to contact us for an individual configuration of your system.

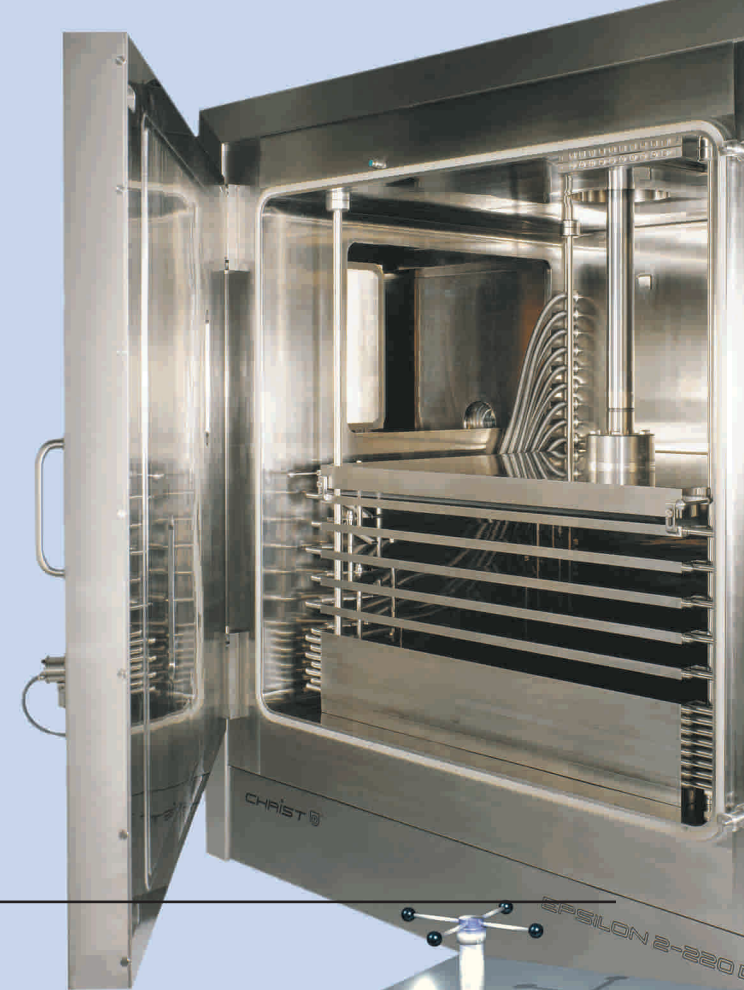
Freeze dryers for industrial production

Pilot systems for process development and optimization

Freeze dryers for research and development

Rotational vacuum concentrators, available in 4 sizes, covering the gamut from solving routine laboratory problems to the evaporation in high-end pharmaceutical research

Freeze dryers for routine laboratory use



CHRIST
Freeze Dryers
Vacuum Concentrators

Technical Data

	Alpha 1-2	Alpha 1-4	Alpha 2-4
Ice condenser capacity	max. 2.5 kg	max. 4 kg	max. 4 kg
Ice condenser performance	max. 2 kg/24 h	max. 4 kg/24 h	max. 4 kg/24 h
Ice condenser temperature	approx. -55°C	approx. -55°C	approx. -85°C
Shelf temperature when pre-freezing inside the ice condenser chamber	approx. -25°C	approx. -25°C	approx. -50°C
Max. shelf surface area when drying outside the ice condenser chamber	3 shelves ø 200 mm △ 920 cm ²	5 shelves ø 360 mm △ 0.5 m ²	5 shelves ø 360 mm △ 0.5 m ²
Max. shelf surface area when drying in injection vials with stoppering under vacuum or nitrogen atmosphere	2 shelves ø 200 mm △ 557 cm ²	4 shelves ø 250 mm △ 0.18 m ²	4 shelves ø 250 mm △ 0.18 m ²
Drying in round bottom flasks	max. 8 pieces	max. 24 pieces	max. 24 pieces
Dimensions of base unit	width: 315 mm height: 345 mm depth: 460 mm	width: 390 mm height: 415 mm depth: 555 mm	width: 390 mm height: 415 mm depth: 555 mm
Weight	approx. 28 kg	approx. 42 kg	approx. 65 kg
Electrical connection (other voltages available)	230 V, 50 – 60 Hz	230 V, 50 – 60 Hz	230 V, 50 – 60 Hz
Max. power consumption	approx. 0.7 kVA	approx. 1.00 kVA	approx. 1.84 kVA
Max. current	approx. 3 A	approx. 4.5 A	approx. 8 A
Max. ambient temperature (unit is air-cooled, higher temperatures upon request)	climate category SN +10°C to +32°C	climate category SN +10°C to +32°C	climate category SN +10°C to +32°C

	Beta 1-8	Beta 2-8
Ice condenser capacity	max. 8 kg	max. 8 kg
Ice condenser performance	max. 6 kg/24 h	max. 6 kg/24 h
Ice condenser temperature	approx. -55°C	approx. -85°C
Shelf temperature when pre-freezing inside the ice condenser chamber	approx. -25°C	approx. -50°C
Max. shelf surface area when drying outside the ice condenser chamber	5 shelves ø 360 mm △ 0.5 m ²	5 shelves ø 360 mm △ 0.5 m ²
Max. shelf surface area when drying in injection vials with stoppering under vacuum or nitrogen atmosphere	4 shelves ø 250 mm △ 0.18 m ²	4 shelves ø 250 mm △ 0.18 m ²
Drying in round bottom flasks	max. 24 pieces	max. 24 pieces
Dimensions of base unit	width: 780 mm height: 415 mm depth: 545 mm	width: 780 mm height: 415 mm depth: 545 mm
Weight	approx. 63 kg	approx. 78 kg
Electrical connection (other voltages available)	230 V, 50 – 60 Hz	230 V, 50 – 60 Hz
Max. power consumption	approx. 1.0 kVA	approx. 1.84 kVA
Max. current	approx. 4.5 A	approx. 8 A
Max. ambient temperature (unit is air-cooled, higher temperatures upon request)	climate category SN +10°C to +32°C	climate category SN +10°C to +32°C

We reserve the right to make technical changes without prior notice.

Experience, expertise, adaptability and flexibility for all freeze-drying procedures

Based on over 55 years experience, Martin Christ offers a comprehensive range of products for both routine and specialized freeze-drying procedures. The diverse and laboratory-tested accessory line allows the basic unit to easily handle a variety of routine and advanced processes.

Guaranteed consistent results for routine freeze drying

Routine processes place continual demands on the operating system. A high degree of consistent, user-friendly, intuitive technical functions and operational flexibility are expected features. The basic equipment of the Alpha and Beta series, combined with their specially developed operator interface "LDplus" (Lyo-Display), live up to the challenges of safe and successful freeze drying day after day.

Innovative technology gives results

- Compact, high-performance laboratory equipment requires little space
- The building-block principle allows procedural and capacity expansion with a far-reaching variety of accessories
- Ice condenser chambers with high-quality stainless steel inner condenser coils
- Easily accessible ice condenser, simple facilities for defrosting, cleaning and decontamination (GMP/GLP requirements), drain valve included
- Visual control of condenser icing during drying
- Low performance losses and no condensation of water due to high-quality thermal insulation of the ice condenser chamber
- Drying chamber located directly above the ice condenser provides high sublimation performance and reduced drying time
- Sample freezing in the ice condenser chamber from -25°C (single-stage compressors) to -50°C (double-stage compressors) and gentle freeze drying
- Digitally displayed ice condenser temperature and indirect determining of the product temperature corresponding to the vapour pressure curve above ice, vacuum control for optimization of process times (option)
- Data interface RS 232 optional, e.g. for process documentation software LyoLog LL-1

Alpha 1-2



Alpha 1-4 / 2-4



Beta 1-8 / 2-8



Configuration

Incremental condensing performance for every application

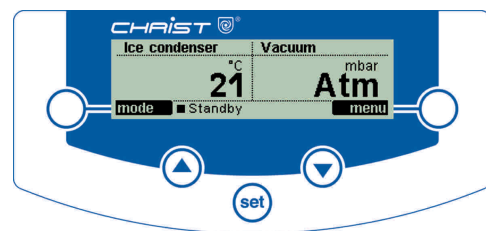
A variety of basic units and accessories are available. Their choice depends on:

- required ice condenser temperature, i.e. -55°C for water-based samples, -85°C for substances with low freezing points or containing organic solvents
- number of shelves, i.e. number of flasks needed for the amount of product per batch
- maximum ice condenser performance required, i.e. total quantity of ice produced until defrosting

Configuration tailored to your procedural needs

The adjacent illustrations show examples of the range of system configurations; you can choose the models and accessories that fit your requirements.

Control System LDplus (Lyo-Display-plus)



LDplus (Lyo Display Plus) stands for a comfortable, easy-to-use and self-explaining user interface for controlling routine freeze drying processes, combining functionality and convenient operation:

- Graphic LC display with a clear layout showing the most important process data (ice condenser temperature, process time, section time and vacuum)
- Comfortable and self-explaining menu guidance in German, English or French language
- Vacuum control for optimization/reduction of process times (electromagnetic pressure control valve available as accessory)
- Conversion of product temperature and vacuum according to the vapour pressure curve above ice
- RS-232 communications interface (PC) available as an option, e.g. for process documentation software LyoLog LL-1

Do not hesitate to contact us regarding your specific requirements; we will gladly provide assistance.

Freeze-drying system Alpha 1-2
Laboratory system with 2 kg capacity
Ice condenser temperature -55°C

- 1 Manifold for 8 flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules
- 2 3 shelves, $\varnothing 200 \text{ mm} \hat{=} 920 \text{ cm}^2$, distance between shelves = 85 mm
- 3 3 shelves, $\varnothing 200 \text{ mm} \hat{=} 920 \text{ cm}^2$, distance between shelves = 85mm, additional ports for 8 flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules
- 4 Stoppering device with 2 shelves, $\varnothing 200 \text{ mm} \hat{=} 557 \text{ cm}^2$

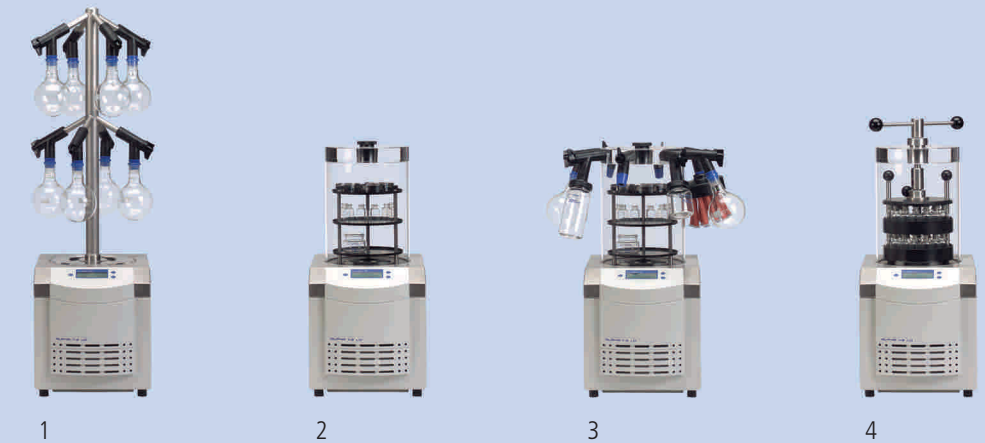
Freeze-drying system Alpha 1-4 / Alpha 2-4
Laboratory system with 4 kg capacity
Ice condenser temperature -55°C , -85°C respectively (version with -105°C available upon request)

- 5 Manifold for 8 flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules
- 6 3 shelves, $\varnothing 250 \text{ mm} \hat{=} 0.15 \text{ m}^2$, distance between shelves = 79 mm, additional ports for 12 flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules
- 7 2 drying chambers with 24 ports for flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules; 3 shelves optional, $\varnothing 250 \text{ mm} \hat{=} 0.15 \text{ m}^2$, distance between shelves = 79 mm
- 8 5 shelves, $\varnothing 360 \text{ mm} \hat{=} 0.5 \text{ m}^2$, distance between shelves = 70mm; (special adapter plate available)
- 9 Stoppering device with 2 shelves, $\varnothing 250 \text{ mm} \hat{=} 900 \text{ cm}^2$; additional ports for 8 flasks, round bottom flasks wide-neck filter bottles or distributors for ampoules

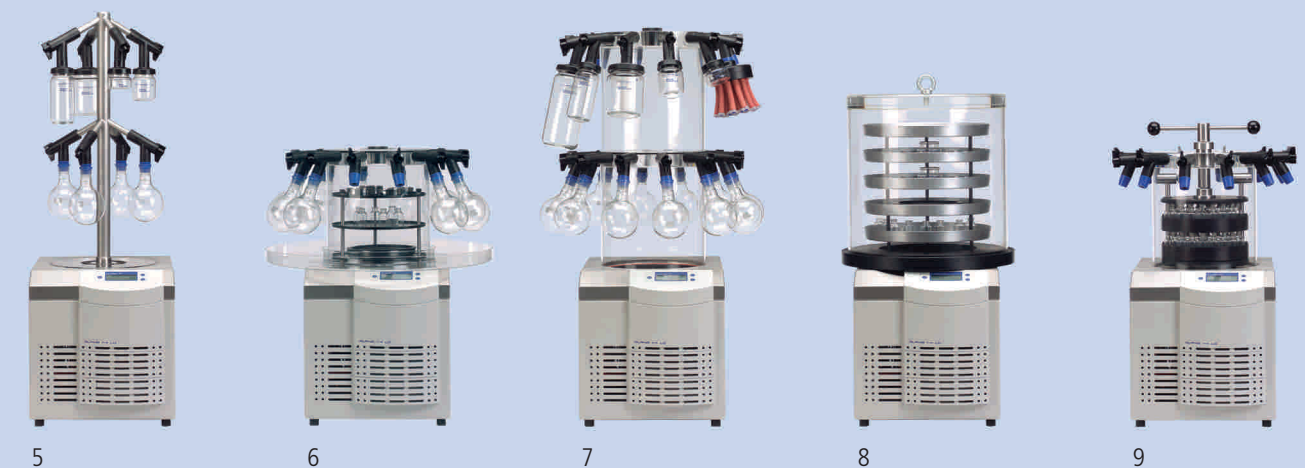
Freeze-drying system Beta 1-8 / Beta 2-8
Laboratory system with 8 kg capacity
Ice condenser temperature -55°C , -85°C respectively

- 10 Manifold for 8 flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules
- 11 5 shelves, $\varnothing 250 \text{ mm} \hat{=} 0.25 \text{ m}^2$, distance between shelves = 79 mm
- 12 drying chambers with 24 ports for flasks, round bottom flasks, wide-neck filter bottles or distributors for ampoules; additional 3 shelves, $\varnothing = 250 \text{ mm} \hat{=} 0.15 \text{ m}^2$, distance between shelves = 79 mm
- 13 5 shelves, $\varnothing = 360 \text{ mm} \hat{=} 0.5 \text{ m}^2$, distance between shelves = 70 mm; (special adapter plate available)
- 14 Stoppering device with 4 shelves, $\varnothing 250 \text{ mm} \hat{=} 0.18 \text{ m}^2$

Alpha 1-2



Alpha 1-4 / 2-4



Beta 1-8 / 2-8

