

## Technická specifikace

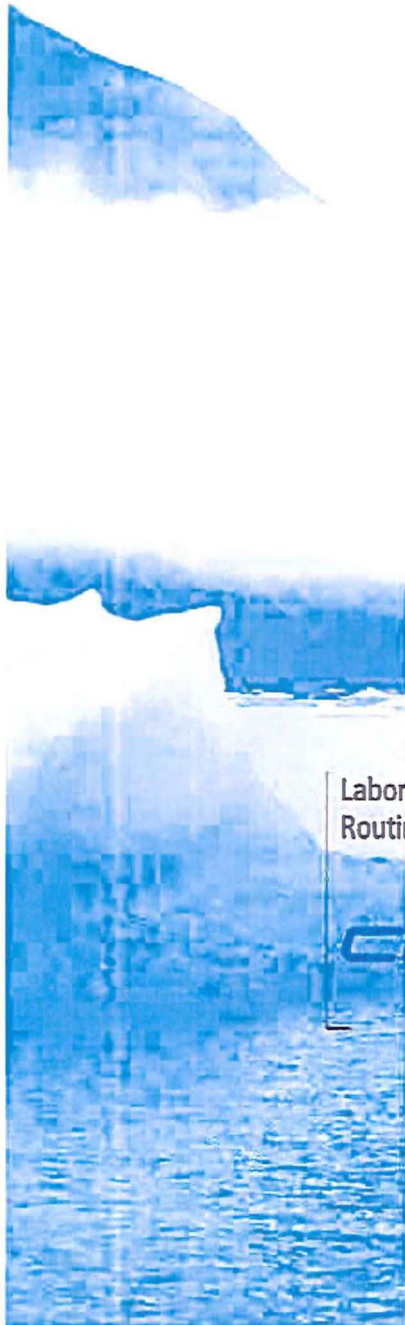
požadováno	Martin Christ ALPHA 2-4 LDplus
olejová dvoustupňová vývěva	ano
minimální dosažitelný tlak : 0,002 mbar	ano
čerpací rychlost:5,7 m3/h	5,9 m3/h
měření vakua v rozsahu: 1000-0,001 mbar	ano
olejový filtr na výstupní straně vývěvy	ano
olejová náplň vývěvy	ano
kompletní propojení vývěvy a lyofilizátoru	ano
zavzdušňovací ventil	ano
operace s volně loženými vzorky ( poličky na Petriho misky , vialky...)	ano
vnitřní prostor pro vzorky dělený poličkami o Ø 250 mm	ano
minimální počet poliček s roztečí min. 70 mm: 3	ano
možnost napojit baňky, min. počet připojení : 4	12
všechna připojení baňek vybavena ventilem a NZ 29	ano
adapter umožňující připojení baňek NZ 14 v min.počtu 5 ks	ano
baňky s kulatým dnem 100-150 ml: min. 10 ks	ano
baňky s kulatým dnem 250 - 300 ml: min. 10 ks	ano
teplota kondenzoru : - 85 ° C nebo nižší	
kapacita kondenzoru ( led ) : alespoň 2,5 kg / 24 h	4 kg/ 24 h
objem kondenzoru : min 4 L	ano
v provedení pro kontakt s agresivními látkami ( DMF, DMSO, MeCN, Me/EtOH)	ano
součástí dodávky je pojízdný stolek umožňující transport kompletní sestavy	ano

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Laboratory Freeze Dryers  
Routine Processes

**CHRIST**   
Freeze Dryers  
Vacuum Concentrators

57  
**CHRIST**   
Freeze Dryers  
Vacuum Concentrators

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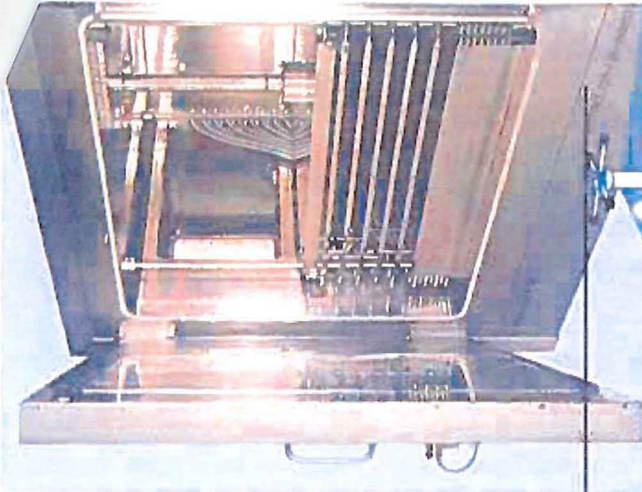
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## The Optimal Product for Your Freeze-Drying Needs

### 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



#### PIB systems for process development and optimization



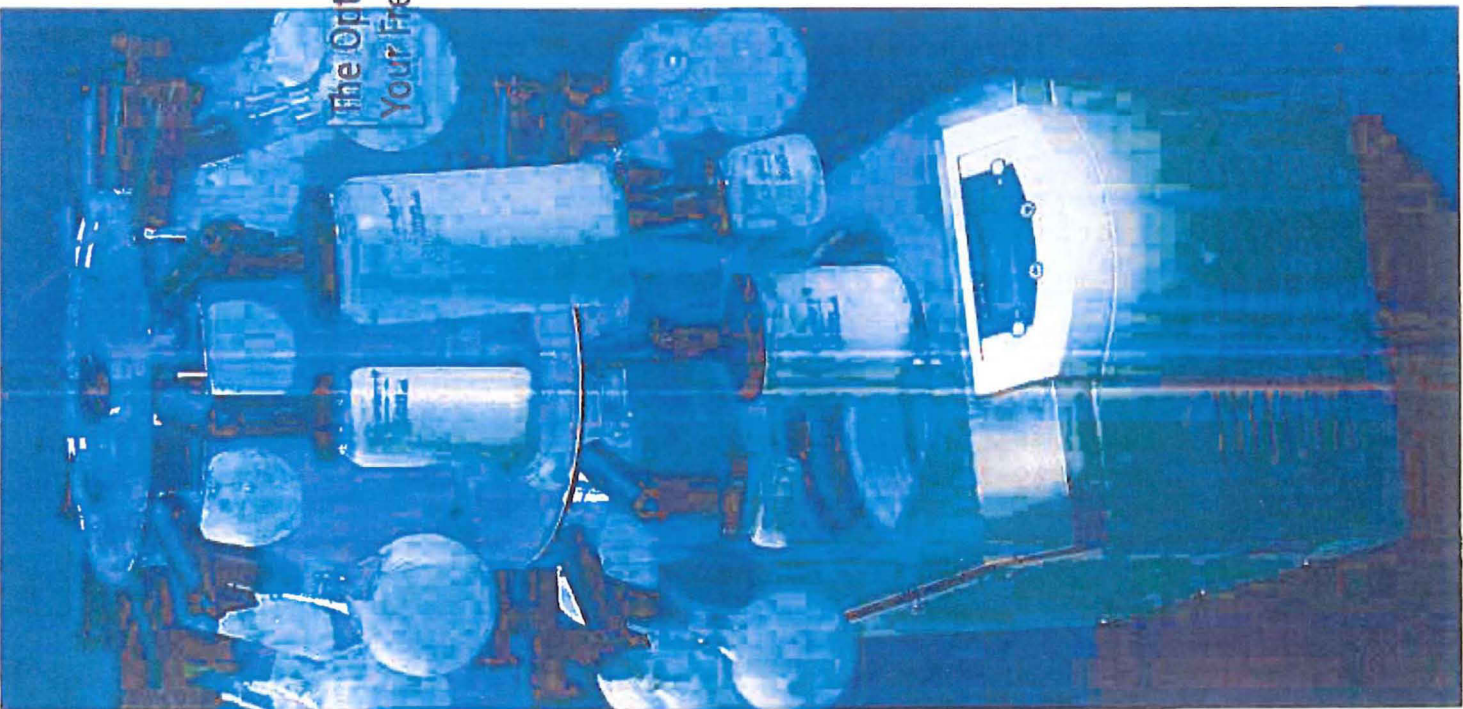
#### Freeze dryers for research and development



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

**CHAIST**  
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 ± 0.20 m <sup>2</sup>	5 shelves ø 360 mm ± 0.5 m <sup>2</sup>	5 shelves ø 360 mm ± 0.5 m <sup>2</sup>
Max. shelf surface area when drying in injection vials with stoppering under vacuum or nitrogen atmosphere	2 shelves ø 200 mm ± 0.57 m <sup>2</sup>	4 shelves ø 250 mm ± 0.18 m <sup>2</sup>	4 shelves ø 250 mm ± 0.18 m <sup>2</sup>
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 <sup>2</sup>	5 shelves ø 360 mm ± 0.5 m <sup>2</sup>
Max. shelf surface area when drying in injection vials with stoppering under vacuum or nitrogen atmosphere	4 shelves ø 250 mm ± 0.18 m <sup>2</sup>	4 shelves ø 250 mm ± 0.18 m <sup>2</sup>
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

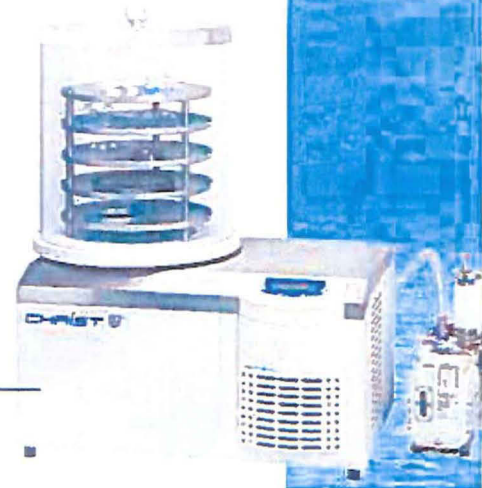
- Compact, high-performance laboratory equipment requires little space
- The building-block principle allows procedural and capacity expansion with a far-reaching variety of accessories
- Ice condenser chambers with high-quality stainless steel inner condenser coils
- Easily accessible ice condenser 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.  $-55^{\circ}\text{C}$  for water-based samples,  $-85^{\circ}\text{C}$  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  $-55^{\circ}\text{C}$

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

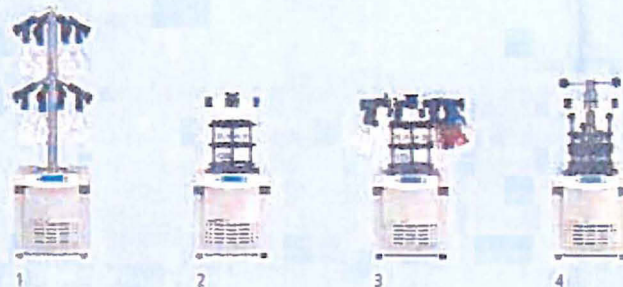
Freeze-drying system Alpha 1-4 / Alpha 1-4  
Laboratory system with 4 kg capacity  
Ice condenser temperature  $-55^{\circ}\text{C}$ ,  $-85^{\circ}\text{C}$  respectively  
(version with  $-105^{\circ}\text{C}$  available upon request)

- 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 = 70 mm; (special adapter plate available)
- 9 Stopping 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

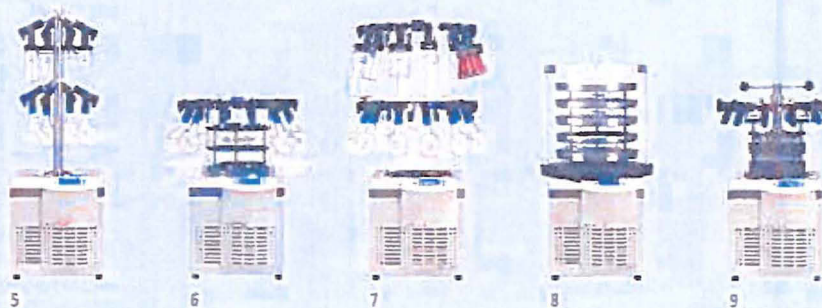
Freeze-drying system Beta 1-8 / Beta 2-8  
Laboratory system with 8 kg capacity  
Ice condenser temperature  $-55^{\circ}\text{C}$ ,  $-85^{\circ}\text{C}$  respectively

- 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 Stopping 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

