

Laboratory Freeze Dryers Routine Applications



Reliable and flexible

New controller – LSCbasic



Process reliability & flexibility

For all your applications

Let our experience, skill, and flexibility enhance your freeze drying

Benefit from our over 70 years of experience as the leading manufacturer of freeze drying systems. We have a finely graded series of systems for product-specific freeze drying, with a wide range of potential optimizations.

With our varied modular accessories program, our lab freeze drying systems can be used for a wide range of tasks.

Daily routine applications guaranteed

Routine operations in particular places high demands on machinery. Expectations include flexibility for each application, a high level of process reliability, and self-explanatory technical functionality. The various basic systems in the Alpha and Beta series, combined with the specially developed LDplus (only for Alpha 1-2) and LSCbasic control system, meet the requirements for safe and successful freeze drying, day after day.

Typical application

Our freeze dryers are suitable for a wide range of potential applications:

- Retaining product characteristics of initial substances (e.g., pharmaceutical products, milk)
- Maintaining initial shapes (e.g., taxidermy, archaeological finds, flowers)
- Conditioning the material (e.g., freeze dried fruits in yogurt)
- Chemical analysis (e.g., trace surveys in food products, sludge, soil)

Innovative technology for excellent results

- Compact, high-performance laboratory systems with low space requirements
- Very low noise level (54 dB (A) per DIN 45635)
- Drying chamber above the ice condensation chamber for high sublimation capacity and short process times
- Ice condensation chamber with internal condenser coils, made entirely of high-quality stainless steel (316L), resistant to solvents and acids typically used in freeze drying (except HCl)
- Modular construction for a wide range of applications
- Expandable with accessories for your task
- Integrated hot-gas function for rapid defrosting
- Integrated venting valve
- LDplus controller (only for Alpha 1-2) with digital display of ice condenser temperature and vacuum
- LSCbasic with color touch screen and intuitive operator controls and display of relevant process parameters
- Vacuum controller for optimizing process times
- Product temperature display per vapor pressure curve
- Data interface (LAN), for example for LyoLogplus documentation software

Detailed application examples:
martinchrist.de/application

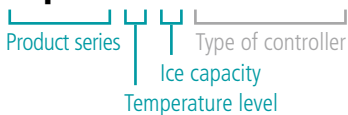
Selection criteria

Graduated condenser temperatures and drying capacities

Depending on the application, our lab freeze drying systems are available in various sizes with a wide range of accessories.

Breakdown of product designations

Alpha 1-4 LSCbasic



Different ice condenser temperatures are available for different basic types, depending on the solvents used:

Temperature level	Temperature	Typical area of application
1	-55 °C	Aqueous products
2	-85 °C	Products containing solvents or with low freezing point
3	-105 °C	Products containing solvents (e.g., ethanol, methanol)

The systems have different maximum ice capacities:

Max. ice capacity	Type of system	Type of controller
2.5 kg	Alpha 1-2	LDplus
4 kg	Alpha 1-4	LSCbasic
	Alpha 2-4	LSCbasic
4 kg	Alpha 3-4	LSCbasic
8 kg	Beta 1-8	LSCbasic
	Beta 2-8	LSCbasic

Tell us about your own application needs. We will be happy to advise you.

Our product series

For daily routine applications



 2.5 kg

 -55 °C

Alpha 1-2 LDplus



 4 kg

 -55 °C
-85 °C

Alpha 1-4 LSCbasic
Alpha 2-4 LSCbasic



 4 kg

 -105 °C

Alpha 3-4 LSCbasic



 8 kg

 -55 °C
-85 °C

Beta 1-8 LSCbasic
Beta 2-8 LSCbasic

Flexible for smaller product quantities

Alpha 1-2 LDplus

The Alpha 1-2 LDplus's high-quality features make it a universal tool for successful processes, every day.

Innovative technology for excellent results

- Small, high-performance tabletop unit
- Drying chamber above the ice condenser for high sublimation capacity and short process times
- Ice condenser chamber with internal condenser coils, made entirely of high-quality stainless steel type 316L
- Digital display of ice condenser temperature and vacuum, indirect product temperature measurement, analogous to vapor pressure curve
- Extensive range of accessories, from unheated shelves to manifolds to closure devices for vials
- Integrated hot-gas function for rapid defrosting



Link to installation
video Alpha 1-2 LDplus:
martinchrist.de/EntryPackage

Alpha 1-2 LDplus

2.5 kg ❄️ -55 °C

No.	Manifold ¹⁾		Shelf area		
	Number of flasks	Number	Ø	A _{ges}	Spacing
1	8	-	-	-	-
2	-	3	200 mm	0.09 m ²	85 mm
3	8	3	200 mm	0.09 m ²	85 mm
4	-	2	200 mm	0.06 m ²	70 mm ²⁾

¹⁾ For round-bottom flasks and wide-neck filter bottles or distributors for ampoules

²⁾ Stoppering device



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3



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Simple, fast, and targeted operation

LDplus system controller

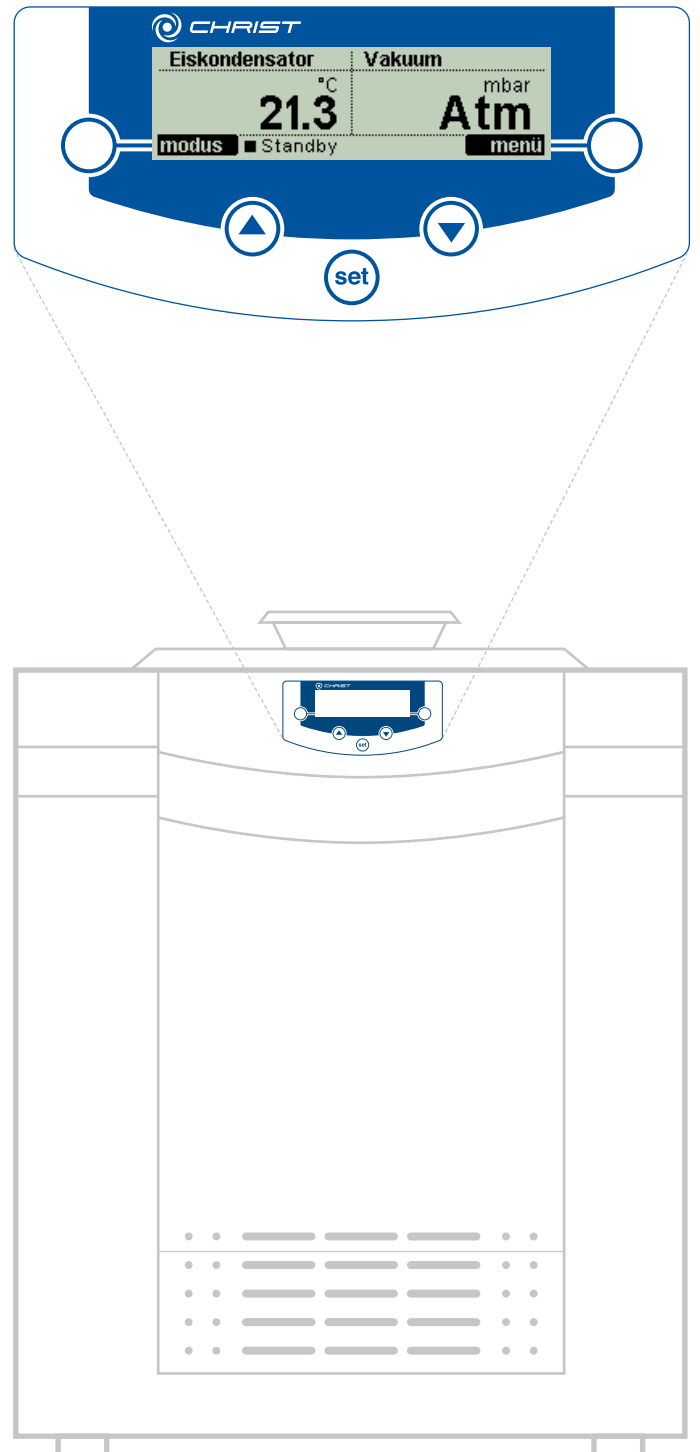
The LDplus system controller is a simple, intuitive user interface for controlling freeze drying processes. It combines functionality and practical utility:

- Clearly arranged graphic display
- Display of important process parameters
- Extensive selection of languages
- Vacuum controller
- Detailed message texts
- Option: LyoLogplus process documentation software

Typical applications

- Bacterial suspensions
- Biomass
- Food products
- Analytics

LDplus system controller



For larger quantities of product and high demands

Efficient product family with new user interface

Alpha 1-4 LSCbasic and Alpha 2-4 LSCbasic

Universal table-top unit with compact form for efficient lyophilization of samples for everyday lab work. The LSCbasic user interface brings clear simplicity to the task.

Condenser temperature:

- Alpha 1-4 LSCbasic: -55°C for typical aqueous solutions
- Alpha 2-4 LSCbasic: -85°C for solutions with low freezing point



4 kg



-55°C

-85°C



Beta 1-8 LSCbasic and Beta 2-8 LSCbasic

Compact table-top unit for efficient drying of larger quantities of samples, with intuitive LSCbasic user interface. A wide range of configurations supports many varied individual solutions.

Condenser temperature:

- Beta 1-8 LSCbasic: -55°C for typical aqueous solutions
- Beta 2-8 LSCbasic: -85°C for solutions with low freezing point



8 kg



-55°C

-85°C



Special system for safe freeze drying of organic samples containing solvents

Alpha 3-4 LSCbasic

The condenser temperature of the Alpha 3-4 LSCbasic is -105°C . The ice capacity is 4 kg. The specialized system is available in two different packet configurations (see page 13). Meets increased safety requirements for commonly flammable solvents.



4 kg



-105°C



Intuitive user interface with touch screen

LSCbasic system controller

Cutting-edge technologies are collated into an easy-to-use, intuitive user interface with the LSCbasic system controller. Automatic process sequences ensure reproducible results.

- 5.7" color touchscreen with clear layout
- Automatic or manual sequencing of freeze drying processes
- Interactive graphic display of the system schematic
- Extensive message texts (cause, countermeasures, effect)
- Maintenance interval for vacuum pump and system
- System test (leakage and performance test)
- Multiple language selection
- Selectable units of measure for temperature °C/°F and pressure mbar/hPa/Torr
- Password protection available
- Process data capture and option for data exchange via USB or Ethernet

LSCbasic
System controller
Convenient and intuitive



Configuration examples

Alpha 1-4 LSCbasic Alpha 2-4 LSCbasic



No.	Manifold ¹⁾	Shelf area			
	Number of containers	Number	Ø	A _{ges}	Spacing
1	8	-	-	-	-
2	12	3	265 mm	0.15 m ²	79 mm
3	2 x 12	3	265 mm	0.15 m ²	79 mm
4	-	5	360 mm	0.5 m ²	70 mm
5	-	2	250 mm	0.1 m ²	45 mm ²⁾

Typical applications

- Soil samples
- Plant material
- Food products for toxin analytics
- Natural materials

¹⁾ For round-bottom flasks and wide-neck filter bottles or distributors for ampoules

²⁾ Stoppering device

Beta 1-8 LSCbasic Beta 2-8 LSCbasic



No.	Manifold ¹⁾	Shelf area			
	Number of containers	Number	Ø	A _{ges}	Spacing
6	8	-	-	-	-
7	-	5	265 mm	0.25 m ²	79 mm
8	2 x 12	3	265 mm	0.15 m ²	79 mm
9	-	5	360 mm	0.5 m ²	70 mm
10	-	4	250 mm	0.2 m ²	50 mm ²⁾

Typical applications

- Excrements
- Plant materials for DNA analysis
- Colloids from must and wine
- Ingredient analytics

¹⁾ For round-bottom flasks and wide-neck filter bottles or distributors for ampoules

²⁾ Stoppering device

Note: If your task has special equipment requirements, our series of devices with the LSCplus system controller has additional features, such as heated storage surfaces, product temperature measurement, and program functions.



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7



8



9



10



www.martinchrist.de/accessories

Specialized system for organic solvents

Alpha 3-4 LSCbasic



Freeze drying is not only used for water-based materials. Typical examples include HPLC fractions with organic and inorganic solvents, such as acetonitrile, TFA and other alcohols, or other products with t-butanol, DMSO, etc.

Increased safety considerations require special system configurations:

- Safe: No sources of ignition, such as commonly used Pirani vacuum sensors
- Durable: High-quality materials for excellent chemical resistance, such as 316L stainless steel for the condenser, manifolds, and drying chamber, and solvent-resistant seals
- High-performance: Internal condenser; most solvents are frozen or liquefied in the chamber at -105 °C
- Solvent-resistant hybrid vacuum pump (chemical-resistant membrane plus rotary vane pump)
- Connection for inertization during loading and defrosting

The Alpha 3-4 solvent packet is equipped with the user-friendly LSCbasic control system, for safe and successful freeze drying, day after day.

Typical applications

- Preparative HPLC fractions
- Removal of solvents after chromatography
- Organic coloring agents
- Polymers in benzol
- Organic substances in solvents

Complete and ready to use

Two system configurations

Solvent packet flask:

- Alpha 3-4 LSCbasic freeze dryer with internal condenser, made entirely of stainless steel (316L)
- Solvent-resistant materials
- Vacuum-chemical hybrid pump with filter
- Stainless steel vacuum hose
- Capacitive vacuum measurement probe
- Vacuum controller for reducing drying times by up to 40%
- Connection for inertization (e.g., for nitrogen)
- Drain valve
- Manifold with 12 chemical-resistant valves for flasks



Universal solvent packet – flasks and storage surface:

- Alpha 3-4 LSCbasic freeze dryer with internal condenser, made entirely of stainless steel (316L)
- Solvent-resistant materials for seals and connectors
- Vacuum-chemical hybrid pump with filter
- Stainless steel vacuum hose
- Capacitive vacuum measurement probe
- Vacuum controller for reducing drying times by up to 40%
- Connection for inertization (e.g., for nitrogen)
- Drain valve
- Base plate for storage surface
- 3 storage spaces, diameter 265 mm, unheated
- Drying chamber made of mineral glass
- 12 chemical-resistant valves for flasks (optional)



Technical data

Technical data	Alpha 1-2 LDplus	Alpha 1-4 LSCbasic	Alpha 2-4 LSCbasic	Beta 1-8 LSCbasic	Beta 2-8 LSCbasic	Alpha 3-4 LSCbasic
Ice condenser						
<ul style="list-style-type: none"> Max. capacity Max. performance Temperature (approx.) Chamber volume (approx.) 	2.5 kg 2 kg/24 h -55 °C 3.5 l	4 kg 4 kg/24 h -55 °C 6.5 l	4 kg 4 kg/24 h -85 °C 6.5 l	8 kg 6 kg/24 h -55 °C 11 l	8 kg 6 kg/24 h -85 °C 11 l	4 kg 2.5 kg/24 h -105 °C 11 l
Chiller unit	0.43 kW	0.51 kW	2 x 0.51 kW	0.51 kW	2 x 0.51 kW	1x 0.52 kW/ 1x 0.75 kW
Refrigerant	CFC-free	CFC-free	CFC-free	CFC-free	CFC-free	CFC-free
Dimensions of the base machine (W x H x D in mm)	315 x 345 x 460	390 x 415 x 540	390 x 415 x 540	780 x 415 x 540	780 x 415 x 540	780 x 415 x 540
Weight (approx.)	28 kg	42 kg	55 kg	63 kg	78 kg	80 kg
Noise level in dB (A)	49	54	54	54	54	54
Electrical connection	230 V/50 Hz 230 V/60 Hz	230 V/50 Hz 220 V/60 Hz 208 V/60 Hz	230 V/50 Hz 220 V/60 Hz 208 V/60 Hz	230 V/50 Hz 220 V/60 Hz 208 V/60 Hz	230 V/50 Hz 220 V/60 Hz 208 V/60 Hz	230 V/50 Hz
Defrost function	●	●	●	●	●	●
Venting valve		●	●	●	●	●
Temperature						
<ul style="list-style-type: none"> Ice condenser (display) Product using the vapor pressure curve 	● ●	● ●	● ●	● ●	● ●	● ●
Vacuum sensor						
<ul style="list-style-type: none"> Pirani Capacitive 	●	● ○	● ○	● ○	● ○	— ●
Vacuum controller	●	●	●	●	●	●
Communication						
<ul style="list-style-type: none"> Serial interface Ethernet USB LyoLogplus LPCplus 	○ — — ○ ○	— ○ ○ ○ ○	— ○ ○ ○ ○	— ○ ○ ○ ○	— ○ ○ ○ ○	— ○ ○ ○ ○

The data provided refer to the base unit for ambient conditions of +10 °C to +25 °C.
Subject to technical changes.

● Standard ○ optional — not available

Our product range

With our unique, broadly graduated range of devices and accessories, we provide freeze drying systems and vacuum concentrators for any application. Challenge us to support your task!



- 1 Freeze drying systems for industrial production, with ice condenser capacities from 20 to 500 kg; individualized project planning including the LyoShuttle loading and unloading system.
- 2 Pilot freeze drying systems for process development and optimization, with ice condenser capacities from 4 to 16 kg.
- 3 Freeze drying systems for routine applications, research, and development, with ice condenser capacities from 2 to 24 kg.
- 4 Rotary-vacuum concentrators for routine applications, up to evaporation in high-end pharmaceutical research.



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