

# Laboratory freeze drying systems

## Routine applications



Reliable and  
versatile – LSCbasic



# Process reliability and versatility

## For your application

### Experience, expertise and versatility for your freeze drying

Benefit from our experience as a leading manufacturer of freeze drying systems for more than 70 years. We offer you a closely graduated series of systems for product-specific freeze drying with a wide range of optimization options.

The highly diverse, modularly structured range of accessories allows the laboratory freeze drying systems to be used for a wide variety of tasks.

### Assured results in daily routine use

Routine operations in particular make high demands on system technology. Along with suitable application versatility, a high level of process reliability and intuitive functionality are expected. The various base units of the Alpha and Beta series, combined with the specially developed LSCbasic and LDplus (Alpha 1-2 only) system controllers, ensure compliance with the requirements for successful and reliable freeze drying day after day.

### Innovative technology for outstanding results

- Compact, high-performance laboratory systems with a small footprint
- Low noise level: 54 dB(A) according to DIN 45635
- Drying chamber above the ice condenser chamber for high sublimation performance and short process times
- Ice condenser chamber with internal condenser coils, entirely made of high-grade stainless steel (type 316L)
- Modular structure for an extremely wide range of applications
- Extensible with a large range of accessories to suit your task
- Integrated hot gas function for quick defrosting
- Automatic venting valve
- LSCbasic controller with color touchscreen, intuitive operation, and presentation of relevant process parameters
- LDplus controller (Alpha 1-2 only) with digital display of ice condenser temperature and vacuum
- Vacuum control for optimized process times
- Product temperature display according to vapor pressure curve
- Data interface (LAN), e.g. for LyoLogplus documentation software

## Typical applications

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

- Preserving the product characteristics of the original substances
- Preserving the original form (e.g. animal preparations, archaeological objects or flowers)
- Conditioning the material (e.g. freeze-dried fruit)
- Chemical analyses (e.g. trace element analyses of foods, sludge or soil)

### Detailed application examples:

[martinchrist.de/application-database](http://martinchrist.de/application-database)

# Make the right choice

## Graduated condenser temperatures and drying capacities

Laboratory freeze drying systems are available in various sizes with a wide range of accessories.

### Product designation format



Different ice condenser temperatures are available for each base model, depending on the solvents used:

Temperature level	Temperature	Typical application area
1	-55 °C	Aqueous products
2	-85 °C	Products with low freezing points
3	-105 °C	Products containing solvents

The various models have different maximum ice capacities:

Maximum ice capacity	System type
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 your  
task requirements  
– we will be pleased to  
advise you.

## Our product line

for daily routine applications



Alpha 1-2 LDplus



Alpha 1-4 LSCbasic  
Alpha 2-4 LSCbasic



Alpha 3-4 LSCbasic



Beta 1-8 LSCbasic  
Beta 2-8 LSCbasic

# Versatile for small product amounts

## Alpha 1-2 LDplus

The Alpha 1-2 LDplus with high quality equipment is a universal tool for your successful processes, day after day.

### Innovative technology for outstanding results

- Small, high-performance benchtop unit
- Drying chamber above the ice condenser chamber for high sublimation performance and short process times
- Ice condenser chamber with internal condenser coils, entirely made of high-grade stainless steel
- Digital display of ice condenser temperature and vacuum, indirect product temperature determination based on vapor pressure curve
- Extensive range of accessories, including shelves, drying manifolds, and sealing devices for vials
- Integrated hot gas function for quick defrosting

### Alpha 1-2 LDplus

2.5 kg ❄️ -55 °C

No.	Manifold <sup>1)</sup>	Shelves			
	Number of vessels	Number	Ø	A <sub>tot</sub>	Spacing
1	8	-	-	-	-
2	-	3	200 mm	0.09 m <sup>2</sup>	85 mm
3	8	3	200 mm	0.09 m <sup>2</sup>	85 mm
4	-	2	200 mm	0.06 m <sup>2</sup>	70 mm <sup>2)</sup>

<sup>1)</sup> For round-bottom flasks, wide-mouth filter bottles or ampoule distributors

<sup>2)</sup> Sealing device



1



2



3



4

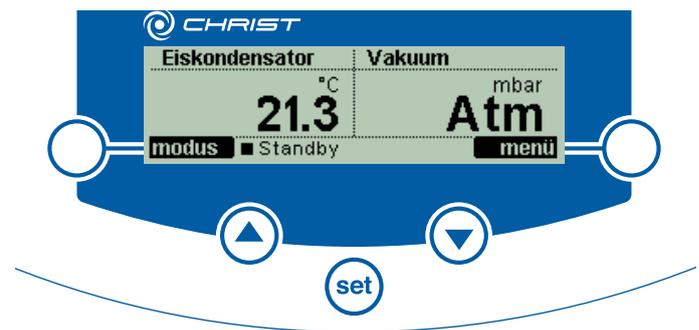
# Easy, fast and effective operation

## LDplus system controller

The LDplus system controller is a simple, intuitive user interface for controlling free drying processes. It combines functionality with practicality:

- Well-organised graphical display
- Presentation of important process parameters
- Multiple language options
- Vacuum control
- Detailed messages
- Option: LyoLogplus process documentation software

LDplus system controller



### Entry-package

Universal system package for successful processes every day. The complete, ready-to-use package consists of the Alpha 1-2 LDplus base system with 2.5 kg ice condenser capacity, a vacuum pump, and accessories for drying in flasks.



Additional information  
on the entry-package:  
[martinchrist.de/EntryPackage](http://martinchrist.de/EntryPackage)



## Example configurations

### Alpha 1-4 LSCbasic Alpha 2-4 LSCbasic



No.	Manifold <sup>1)</sup>	Shelves			
	Number of vessels	Number	Ø	A <sub>tot</sub>	Spacing
1	8	-	-	-	-
2	12	3	265 mm	0.15 m <sup>2</sup>	79 mm
3	2 x 12	3	265 mm	0.15 m <sup>2</sup>	79 mm
4	-	5	360 mm	0.5 m <sup>2</sup>	70 mm
5	-	2	250 mm	0.1 m <sup>2</sup>	45 mm <sup>2)</sup>

<sup>1)</sup> For round-bottom flasks, wide-mouth filter bottles or ampoule distributors

<sup>2)</sup> Sealing device

#### Typical applications

- Soil samples
- Plant material
- Food for harmful substance analysis
- Natural substances

### Beta 1-8 LSCbasic Beta 2-8 LSCbasic



No.	Manifold <sup>1)</sup>	Shelves			
	Number of vessels	Number	Ø	A <sub>tot</sub>	Spacing
6	8	-	-	-	-
7	-	5	265 mm	0.25 m <sup>2</sup>	79 mm
8	2 x 12	3	265 mm	0.15 m <sup>2</sup>	79 mm
9	-	5	360 mm	0.5 m <sup>2</sup>	70 mm
10	-	4	250 mm	0.2 m <sup>2</sup>	50 mm <sup>2)</sup>

<sup>1)</sup> For round-bottom flasks, wide-mouth filter bottles or ampoule distributors

<sup>2)</sup> Sealing device

#### Typical applications

- Excrement
- Plant material for DNA analysis
- Colloids from cider or wine
- Content analytics



# Intuitive touchscreen user interface

## LSCbasic system controller



Cutting-edge technologies are brought together in the LSCbasic system controller to make an easy-to-use, intuitive user interface. Automatic process sequences ensure reproducible results.

- 5.7" color touchscreen with clear layout
- Automatic or manual sequencing of freeze drying processes
- Interactive graphical display of the system schematic
- Extensive messages (cause, action, effect)
- Maintenance intervals for vacuum pump and system
- System test
- Multiple language options
- Selectable units for temperature (°C, °F) and pressure (mbar, hPa, Torr)
- Password protection available
- Process data acquisition and optional data exchange over USB or LAN

**LSCbasic  
system controller:**  
convenient and intuitive

# Quick and easy front loading

## LyoCube acrylic glass

### Front loader for extremely simple operation with large capacity

LyoCube is the ideal solution when fast and convenient loading is a primary consideration or bulky products have to be freeze dried.

- It is compatible with every Martin Christ laboratory freeze drying system
- Rectangular shelves with a hinged door for convenient operation
- Standard configuration with five shelves (0.38 m<sup>2</sup>)
- Optimal solutions when using MTP or deep well plates
- Extensive accessories including thermoblocks, product trays and product screens



View the LyoCube  
acrylic glass  
product video



# 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 or inorganic solvents, such as acetonitrile, TFA and other alcohols, or other products with t-butanol, DMSO, etc. The Alpha 3-4 LSCbasic is available in two defined packages, fully aligned to the requirements of freeze drying with solvents.

### 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  $-105\text{ }^{\circ}\text{C}$
- Solvent-resistant hybrid vacuum pump (chemical-resistant diaphragm pump plus rotary vane pump)
- Connector for inerting during loading and defrosting

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

### Typical applications

- Preparative HPLC fractions
- Solvent removal after chromatography
- Organic dyes and pigments
- Polymers in benzol
- Organic substances in solvents

# Complete and ready to use

## Two system configurations

For more information about Alpha 3-4 LSCbasic, see the webpage:

[martinchrist.de/alpha-3-4](http://martinchrist.de/alpha-3-4)



### Solvent package for flasks:

- Alpha 3-4 LSCbasic freeze dryer with internal condenser, made entirely of stainless steel (316L)
- All materials solvent-resistant
- Vacuum chemistry hybrid pump with filter
- Stainless steel vacuum hose
- Capacitive vacuum sensor
- Vacuum control to reduce drying times by up to 40%
- Connector for inerting (e.g. for nitrogen)
- Drain valve
- Drying manifold with 12 chemical-resistant valves for flasks



### Universal solvent package – flasks and shelf:

- Alpha 3-4 LSCbasic freeze dryer with internal condenser, made entirely of stainless steel (316L)
- Solvent-resistant seals and connectors
- Vacuum chemistry hybrid pump with filter
- Stainless steel vacuum hose
- Capacitive vacuum sensor
- Vacuum control to reduce drying times by up to 40%
- Connector for inerting (e.g. for nitrogen)
- Drain valve
- Base plate for shelf
- Three shelves 265 mm diameter, unheated
- Mineral glass drying chamber
- 12 chemical-resistant valves for flasks



## 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
<b>Ice condenser</b>						
<ul style="list-style-type: none"> <li>Max. capacity</li> <li>Max. throughput</li> <li>Temperature</li> <li>Chamber volume</li> </ul>	2.5 kg 2 kg/24 h approx. -55 °C approx. 3.5 l	4 kg 3 kg/24 h approx. -55 °C approx. 6.5 l	4 kg 3 kg/24 h approx. -85 °C approx. 6.5 l	8 kg 6 kg/24 h approx. -55 °C approx. 11 l	8 kg 6 kg/24 h approx. -85 °C approx. 11 l	4 kg 3 kg/24 h approx. -105 °C approx. 11 l
<b>Dimensions</b> of base unit (W x H x D), 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
<b>Weight</b>	approx. 28 kg	approx. 42 kg	approx. 55 kg	approx. 63 kg	approx. 78 kg	approx. 80 kg
<b>Electrical connection</b> (other variants available upon request)	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
<b>Noise level</b> as per DIN 45635	49	54	54	54	54	54
<b>Defrosting</b>	●	●	●	●	●	●
<b>Venting valve</b>		●	●	●	●	●
<b>Vacuum indication</b>	●	●	●	●	●	●
<b>Vacuum control</b>	●	●	●	●	●	●
<b>Temperature</b>						
<ul style="list-style-type: none"> <li>Ice condenser (display)</li> <li>Product based on H<sub>2</sub>O sublimation curve</li> </ul>	● ●	● ●	● ●	● ●	● ●	● ●
<b>Communication</b>						
<ul style="list-style-type: none"> <li>Serial interface</li> <li>LAN</li> <li>USB</li> <li>LyoLogplus</li> <li>LPCplus</li> </ul>	○ - - ○ ○	- ○ ○ ○ ○	- ○ ○ ○ ○	- ○ ○ ○ ○	- ○ ○ ○ ○	- ○ ○ ○ ○

The data provided refers to the base unit with ambient conditions of +10 °C to +25 °C.  
Subject to change without prior notice.

● Standard ○ Optional - Not available

## Our product range

With a unique and broad graduated range of devices and accessories, we can supply freeze drying systems and vacuum concentrators for every application. Let us show what we can do!



- 1 Freeze drying systems for industrial production with ice condenser capacity from 20 to 500 kg; custom system design including LyoShuttle loading and unloading system.
- 2 Pilot freeze drying systems for process development and/or optimization with ice condenser capacity from 4 to 16 kg.
- 3 Freeze drying systems for routine applications or research and development with ice condenser capacity from 2 to 24 kg.
- 4 Rotational vacuum concentrators for applications ranging from routine to evaporation concentration in the high-end range of pharmaceutical research.



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