AVTECH

High Performance

FREEZE DRYING SYSTEMS

Quick Selection Guide

Driven by innovative design and outstanding performance, ANTECH delivers specialized lyophilization solutions for laboratory research, pharmaceutical pilot-scale studies and pharmaceutical production.

Lab

Series	Vacuum control	Shelf cooling/heating	In-situ processing
LyoCubic	●	●	●
LyoPro	●	-	-
LyOrganic	●	-	-

Pilot

Series	1-chamber	2-chamber	Freezing point determination (LyoTR sensor)	Pressure rise test	Capacity vacuum gauge	Comparative pressure measurement
LyoPilot D	-	●	●	●	○	○
LyoPilot S	●	-	●	-	○	○

Production scale : LyoPharma series

TABLE OF CONTENTS

LAB

- LyoCubic series, in-situ 1-3
- LyoPro series 4-8
- LyOrganic series, for organic solvent 9-12

PILOT

- LyoPilot D series, 2-chamber 13-19
- LyoPilot S series, 1-chamber 20-23

PRODUCTION

- LyoPharma series 24

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LyoCubic Series

In-situ Laboratory Freeze Dryer

With an all-in-one workflow from pre-freezing to secondary drying, LyoCubic delivers unmatched convenience to routine tasks.

The cooling shelf realizes pre-freezing and in-situ process. Simply load your liquid samples into chamber from the front, no need to put samples into a freezer firstly, nor lift the tall & heavy cylindrical freezing chamber of a traditional lab freezer dryer.

The combination of heated shelf and controlled vacuum levels accelerates desorption drying, significantly shortening cycle times and lowering residual moisture.

In-Situ freeze-drying: simplified processing

- **All-in-one integration:** The temperature-controlled shelves handle both pre-freezing and drying. Simply load your liquid samples into chamber, let LyoCubic do the rest - no external deep freezer or manual sample transfer required.
- **Front-loading convenience:** The ergonomic front-door design replaces traditional lift-off cylindrical freezing chamber. Loading and unloading samples are as easy as using a standard laboratory refrigerator.

Optimized efficiency & shortened cycle time

- **Accurate vacuum control:** controlled vacuum lowers resistance, allowing water vapor to escape much faster.
- **Shelf heating:** shelf heating delivers the energy needed for vaporization, accelerating desorption drying & significantly shortening cycle time.

Advanced cooling system

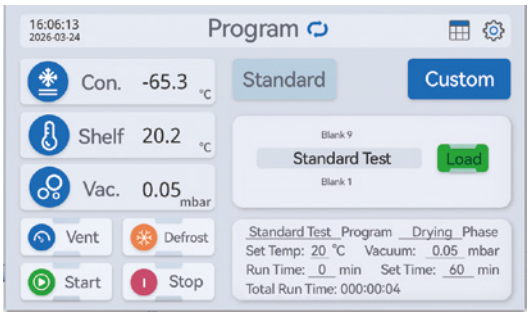
- Single chamber system with a 4kg capacity built-in ice condenser
- 60°C: single compressor system
- 90°C: 2-compressor cascade system
- SECOP brand compressor for durable use

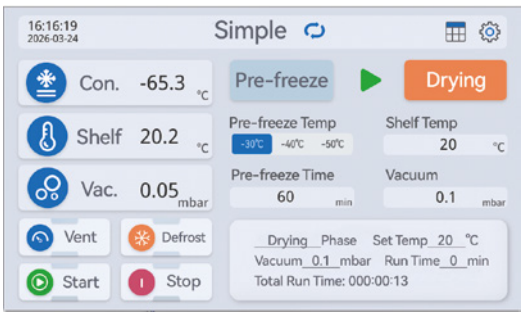
Simplified User Interface

"One button drying": Powered by LyoSmart C system, LyoCubic series allows users to run an entire cycle with a single touch for routine tasks, eliminating complex programming.

"One button operation":

- One-button start: in auto mode, press to start process according to preset program
- One-button stop: vacuum valve shut off, preventing product polluted due to vacuum back suction of pump oil
- One-button vent: aeration valve controls vacuum vent gradually, preventing product polluted due to vacuum back suction of pump oil
- One-button defrost: hot air defrosting of condenser, to enter a new process faster





The LyoCubic series UNIVERSAL package contains:

- LyoCubic freeze dryer main machine
- Pirani vacuum gauge
- Pressure control valve
- Product tray
- High performance vacuum pump(with oil)
- Vacuum hose

Optional Manifold:

For applications working with flasks, please select the 12-port manifold as additional accessory.

Choose the system fits your application best!

Product designation format:

LyoCubic **4** **S/M**

Product series | Ice capacity (kg) | Temperature level

Temperature level	Temperature	Cooling system	Typical application area
S	-60°C	1 compressor	Aqueous products
M	-90°C	2 compressors cascade	Products with low freezing points

Specification

	Model	LyoCubic 4S	LyoCubic 4M
Basic	Type	Desktop, in-situ	Desktop, in-situ
Ice condenser	Temperature	-60°C	-90°C
	Max. ice capacity	4 kg	4 kg
	Performance	4 kg/24h	4 kg/24h
Shelf	Temperature range	-50°C~+50°C	-50°C~+50°C
	Area	0.1 m^2	0.1 m^2
	Dimensions(W*D)	280*372 mm,1	280*372 mm,1
	Product tray(W*D*H)	280*372*30 mm	280*372*30 mm
Control	Controller	7" touch screen	7" touch screen
	Operating system	LyoSmart C	LyoSmart C
	Ice condenser temperature display	●	●
	Shelf temperature display	●	●
	Vacuum degree display	●	●
	Pirani vacuum gauge	●	●
	Ultimate vacuum*	0.01mbar	0.01mbar
	Vacuum venting	Automatic	Automatic
	Hot gas defrosting	●	●
Data	Data record	●	●
	USB port	●	●
Cooling	Compressor	SECOP compressor x 1	SECOP compressor x 2
Power	Voltage & frequency	220V 50Hz	220V 50Hz
	Rated power	900 W	1500 W
Noise level	Freeze dryer	55 dB(A)	60 dB(A)
Dimensions	Main unit (W*D*H)	710*600*510 mm	710*600*510 mm
Weight	Main unit	105 kg	125 kg
Manifold	12-port T-type manifold for flasks	○	○
Vacuum pump	Vacuum pump, with oil	●	●
	Vacuum pump, oil-free	○	○
	Vacuum pump hose	●	●

*: The ultimate vacuum 0.01 mbar is achieved when working with vacuum pump NDD12 (NAVAC brand).

● Basic equipment ○ Optional - Not available

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

LyoPro series

Laboratory freeze dryer

Optimize and simplify your freeze-drying process

Antech Scientific offers advanced LyoPro series freeze-drying system with unique LyoSmart operation system, realizing full control of vacuum degree, making the freeze-drying process simpler, faster and better.

LyoPro series freeze dryers are compact in design, high-efficiency in performance, smart in operation, and in daily use.

Innovative features

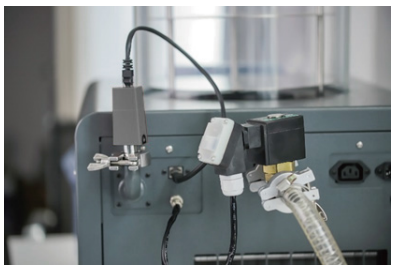
- Compact, high-performance laboratory systems with a small footprint
- 7" touch screen installed with LyoSmart operating system
- Programmable freeze-drying steps
- Controlled vacuum degree for optimized process times
- Built-in ice condenser coils for higher efficiency
- Fast defrost via integrated hot gas
- Automatic non-return venting valve, prevents "vacuum pump" oil mist from entering cold trap
- Pirani vacuum sensor with accuracy 0.001 mbar
- Low noise level: 48~52dB(A)
- High quality vacuum pump
- PTFE coated stainless steel ice condenser

LyoSmart operating system

7" touch screen controller, installed with advanced LyoSmart operating system, assisting users to optimize the freeze-drying process.

- Display of ice condenser temperature and vacuum degree
- Product temperature display according to sublimation pressure curve
- Manual or automatic mode process optional
- Programmable freeze-drying steps with high flexibility
- Vacuum degree of each step can be set and controlled independently
- Historical data recorder for convenient analysis of processing
- USB port to download data
- Password access protection

Full vacuum degree control



- The vacuum degree and duration of each step can be set and controlled at auto mode
- Vacuum control to reduce drying times by up to 40%
- Real-time vacuum degree is displayed on the screen
- Pirani vacuum gauge with accuracy 0.001 mbar

Various “one button” mode

- One-button start: in auto mode, press "START" to start process according to preset program
- One-button stop: vacuum valve shut off, preventing product polluted due to vacuum back suction of pump oil
- One-button vent: aeration valve controls vacuum vent gradually, preventing product polluted due to vacuum back suction of pump oil
- One-button defrosting: hot air defrosting of cold trap, to enter a new process faster

Advanced cooling system

- Built-in ice condenser coils for higher efficiency
- -60°C: single compressor system, high efficiency
- -90°C: 2-compressor cascade system, cold trap temperature reaches -90°C within 15 minutes
- SECOP brand compressor for durable use

Optimized flange seal

- Flat surface & L-shaped sealing ring design, no need for extra manual pressure
- Vacuum grease not required, easier to use and clean
- Proven excellent sealing performance for long-term use

Choose the system fits your application best!

Product designation format:

LyoPro	4/8/12	S/M
Product series	Ice capacity (in kg)	Temperature level

Ice capacity

Max. ice capacity	Performance	Models
4 kg	4 kg/24h	LyoPro 4S, LyoPro 4M
8 kg	6 kg/24h	LyoPro 8S, LyoPro 8M
12 kg	8 kg/24h	LyoPro 12S, LyoPro 12M

Temperature level

Temperature level	Temperature	Cooling system	Typical application area
S	-60°C	1 compressor	Aqueous products
M	-90°C	2 compressors cascade	Products with low freezing points

*For organic solvent application, please choose LyOrganic series freeze dryers.

The UNIVERSAL package with special price

Start your lyophilization with our universal package, which offers both manifolds and shelves, fulfilling most applications for successful processes every day.

The LyoPro series UNIVERSAL package contains

- LyoPro freeze dryer main machine
- Pirani vacuum gauge
- Pressure control valve
- Acrylic chamber with 8 rubber connection valves
- Rack supporting board
- 250ml & 500ml flask (qty refer to specification sheet)
- 4-layer shelves with unique ShelFlex™ design
- Vacuum pump
- Vacuum hose

ShelFlex™ design

Unique ShelFlex™ design, various configurations with different number of shelves and spacing are available.

Shelves				
Configuration	Number	Φ	Area	Spacing
1	2	260 mm	0.11 m²	120 mm
2	3	260 mm	0.16 m²	90 mm
3	4	260 mm	0.22 m²	70 mm
4*	8	260 mm	0.44 m²	45 mm

*For configuration 4, another 4 pcs of shelves shall be ordered as optional accessories, along with an extended-height drying chamber.

Advantages

- All-inclusive package, avoid confusion in accessory selection
- ShelFlex™ design, adjustable shelf number and spacing with flexibility
- Cost-effective, fulfill more applications with lower cost
- Fast delivery, UNIVERSAL package always in stock for urgent demand

Various freeze-drying packages for different applications

Manifold		Shelves				
No.	Number of connection valves	Number	Φ	Area	Spacing	Stopper
1	8	4	260 mm	0.22 m²	70 mm	-
2	8	2	250 mm	0.10 m²	120 mm	●
3	-	4	260 mm	0.22 m²	70 mm	-
4	-	2	250 mm	0.10 m²	120 mm	●
5	8	-	-	-	-	-
6	12	-	-	-	-	-
7	24	-	-	-	-	-

*Package 1, also named as "universal package", is recommended and supplied as standard configuration.

● Basic equipment - Not available

Specification (-60°C)

Model		LyoPro 4S	LyoPro 8S	LyoPro 12S
Basic	Type	Desktop	Desktop	Floor-standing
Ice condenser	Temperature	-60°C	-60°C	-60°C
	Max. ice capacity	4 kg	8 kg	12 kg
	Chamber volume	6.5 L	15 L	21 L
	Performance	4 kg/24h	6 kg/24h	8 kg/24h
Control	Display	7" touch screen	7" touch screen	7" touch screen
	Operating system	LyoSmart	LyoSmart	LyoSmart
	Ice condenser temperature display	●	●	●
	Product temperature sublimation	●	●	●
	Vacuum degree display	●	●	●
	Vacuum gauge type	Pirani	Pirani	Pirani
	Ultimate vacuum (mbar)	0.020	0.020	0.020
	Vacuum venting	Automatic	Automatic	Automatic
	Controlled gas (N2, clean air, etc) backfill	●	●	●
	Hot gas defrosting	●	●	●
Data	Data record	●	●	●
	USB port	●	●	●
Cooling	Compressor	SECOP compressor x 1	SECOP compressor x 1	SECOP compressor x 1
Power	Voltage (V/Hz)	220/50	220/50;220/60;120/60	220/50;220/60;120/60
	Rated power	800 W	900 W	1300 W
Noise level	Freeze dryer	48 (dB)	52 (dB)	52 (dB)
Dimensions	Main unit (W x D x H)	455*550*430 mm	800*533*400 mm	700*650*1015 mm
Weight	Main unit	53 kg	69 kg	125 kg
Universal drying package	Drying chamber	Acrylic	Acrylic	Acrylic
	Rack	4-shelf	4-shelf	4-shelf
	Rack supporting board	●	●	●
	Number of rubber connection valves	8	8	8
	Round bottom flask*	250ml*6 & 500ml*6	250ml*6 & 500ml*6	250ml * 6 & 500ml * 6
Vacuum pump	Vacuum pump	●	●	●
	Oil mist filter	●	●	●
	Vacuum pump hose	●	●	●

*: Flasks are supplied free of charge. Compensation is not applicable in case of damage during transportation.

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

Specification (-90°C)

Model		LyoPro 4M	LyoPro 8M	LyoPro 12M
Basic	Type	Desktop	Desktop	Floor-standing
Ice condenser	Temperature	-90°C	-90°C	-90°C
	Max. ice capacity	4 kg	8 kg	12 kg
	Chamber volume	6.5 L	15 L	21 L
	Performance	4 kg/24h	6 kg/24h	8 kg/24h
Control	Display	7" touch screen	7" touch screen	7" touch screen
	Operating system	LyoSmart	LyoSmart	LyoSmart
	Ice condenser temperature display	●	●	●
	Product temperature sublimation	●	●	●
	Vacuum degree display	●	●	●
	Vacuum gauge type	Pirani	Pirani	Pirani
	Ultimate vacuum (mbar)	0.015	0.015	0.015
	Vacuum venting	Automatic	Automatic	Automatic
	Controlled gas (N2, clean air, etc) backfill	●	●	●
	Hot gas defrosting	●	●	●
Data	Data record	●	●	●
	USB port	●	●	●
Cooling	Compressor	SECOP compressor x 2	SECOP compressor x 2	SECOP compressor x 2
Power	Voltage (V/Hz)	220/50	220/50	220/50;220/60;120/60
	Rated power	1300 W	1600 W	1800 W
Noise level	Freeze dryer	48 (dB)	52 (dB)	52 (dB)
Dimensions	Main unit (W x D x H)	455*550*430 mm	800*533*400 mm	700*650*1015 mm
Weight	Main unit	66 kg	82 kg	125 kg
Universal drying package	Drying chamber	Acrylic	Acrylic	Acrylic
	Rack	4-shelf	4-shelf	4-shelf
	Rack supporting board	●	●	●
	Number of rubber connection valves	8	8	8
	Round bottom flask*	250ml*6 & 500ml*6	250ml*6 & 500ml*6	250ml * 6 & 500ml * 6
Vacuum pump	Vacuum pump	●	●	●
	Oil mist filter	●	●	●
	Vacuum pump hose	●	●	●

*: Flasks are supplied free of charge. Compensation is not applicable in case of damage during transportation.

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

LyOrganic series

Freeze dryer for organic solvent

LyOrganic series is designed for applications dealing with both organic solvents and inorganic solvents. Typical applications include organic dyes and pigments, polymers in benzol, organic substances in solvents, preparative HPLC fractions, solvent removal after chromatography, etc.

Condenser chamber temperature reaches –105°C, vacuum degree is controlled during the process, oil-free vacuum pump is supplied as standard, meeting high requirement of organic solvent drying.

LyOrganic series freeze dryers are compact in design, high-efficiency in performance, smart in operation, and dependable in daily use.

Resistant to organic solvents

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.

Special system configurations for safety

LyOrganic series freeze dryers are compact in design, high-efficiency in performance, smart in operation, and dependable in daily use.

- Durable: high-quality materials for excellent chemical resistance, such as PTFE coated stainless steel ice condenser, and solvent-resistant seals
- High performance internal condenser, most solvents are frozen or liquefied in the chamber at –105°C

Innovative features

- Compact, high-performance laboratory systems with a small footprint
- 7" touch screen installed with LyoSmart operating system
- Programmable freeze-drying steps
- Controlled vacuum degree for optimized process times
- Built-in ice condenser coils for higher efficiency
- Fast defrost via integrated hot gas
- Automatic non-return venting valve
- Low noise level: 54 dB(A)

LyoSmart operating system

7" touch screen controller, installed with advanced LyoSmart operating system, assisting users to optimize the freeze-drying process.

- Display of ice condenser temperature and vacuum
- Indirect product temperature determination based on vapor pressure curve
- Manual or automatic drying process optional
- Programmable freeze-drying steps
- Vacuum degree of each step can be set and controlled independently
- Historical data recorder for convenient analysis of processing
- USB port to download data
- Password access protection

Vacuum degree control

- The vacuum degree and duration of each step can be set and controlled at auto mode
- Vacuum control to reduce drying times by up to 40%
- Real-time vacuum degree is displayed on the screen

Various "one button" mode

- One-button start: in auto mode, press "START" to start process according to preset program
- One-button stop: vacuum valve shut off automatically
- One-button vent: aeration valve controls vacuum vent gradually
- One-button defrosting: hot air defrosting of cold trap, to enter a new process faster

Advanced cooling system

- Built-in ice condenser coils for higher efficiency
- -105°C: 2-compressor cascade system, suitable for organic solvents with ultra low freezing points
- SECOP brand compressor for durable use

Ease of use and durability

- Flat surface & L-shaped sealing ring design, no need for extra manual pressure
- Vacuum grease not required, easier to use and clean
- Proven excellent sealing performance for long-term use
- PTFE coated stainless steel ice condenser, resistant to organic solvents

Choose the system fits your application best!

Product designation format

LyOrganic	8/12	L	Drying Package
Product series	Ice capacity (in kg)	Temperature level	T/U

The various models have different maximum ice capacities

Max. ice capacity	Performance	Ice condenser temperature	Models
8 kg	6 kg/24h	-105°C	LyOrganic 8LT, LyOrganic 8LU
12 kg	8 kg/24h	-105°C	LyOrganic 12LT, LyOrganic 12LU

The LyOrganic series are available in two defined packages, fully aligned to the requirements of freeze drying with organic solvents.

Organic solvent package – manifold

- LyOrganic freeze dryer main machine
- Drying manifold with 12 chemical-resistant connection valves for flasks
- 250ml & 500ml flask (qty refer to specification sheet)
- Vacuum sensor
- Vacuum control to reduce drying time by up to 40%
- Drain valve
- Internal condenser, stainless steel with solvent-resistant PTFE material coating
- High performance oil-free vacuum pump, resistant to organic solvents
- Vacuum pump hose

Organic solvent package – manifold and shelves

- LyOrganic freeze dryer main machine
- Drying chamber with 8 rubber connection valves
- Rack supporting board
- 250ml & 500ml flask (qty refer to specification sheet)
- 4-layer shelves with unique ShelFlex™ design
- Vacuum sensor
- Vacuum control to reduce drying time by up to 40%
- Drain valve
- Internal condenser, stainless steel with solvent-resistant PTFE material coating
- Solvent-resistant seals and connectors
- High performance oil-free vacuum pump, resistant to organic solvents
- Vacuum pump hose

ShelFlex™ design

Unique ShelFlex™ design, various configurations with different number of shelves and spacing are available.

Shelves				
Configuration	Number	Φ	Area	Spacing
1	2	260 mm	0.11 m²	120 mm
2	3	260 mm	0.16 m²	90 mm
3	4	260 mm	0.22 m²	70 mm
4*	8	260 mm	0.44 m²	45 mm

*For configuration 4, another 4 pcs of shelves shall be ordered as optional accessories, along with an extended-height drying chamber.

Advantages

- All-inclusive package, avoid confusion in accessory selection
- ShelFlex™ design, adjustable shelf number and spacing with flexibility
- Cost-effective, fulfill more applications with lower cost
- Fast delivery, UNIVERSAL package always in stock for urgent demand

Various freeze-drying packages for different applications

Manifold		Shelves				
No.	Number of connection valves	Number	Φ	Area	Spacing	Stopper
1	8	4	260 mm	0.22 m²	70 mm	-
2	8	2	250 mm	0.10 m²	120 mm	●
3	-	4	260 mm	0.22 m²	70 mm	-
4	-	2	250 mm	0.10 m²	120 mm	●
5	8	-	-	-	-	-
6	12	-	-	-	-	-
7	24	-	-	-	-	-

● Basic equipment - Not available

Specification (-105°C)

	Model	LyOrganic 8LT	LyOrganic 8LU	LyOrganic 12LT	LyOrganic 12LU
Basic	Type	Desktop	Desktop	Floor-standing	Floor-standing
Ice condenser	Temperature	-105°C	-105°C	-105°C	-105°C
	Max. ice capacity	8 kg	8 kg	12 kg	12 kg
	Chamber volume	15 L	15 L	21 L	21 L
	Performance	6 kg/24h	6 kg/24h	8 kg/24h	8 kg/24h
Control	Display	7" touch screen	7" touch screen	7" touch screen	7" touch screen
	Operating system	LyoSmart	LyoSmart	LyoSmart	LyoSmart
	Ice condenser temperature display	●	●	●	●
	Product temperature sublimation	●	●	●	●
	Vacuum degree display	●	●	●	●
	Vacuum gauge	●	●	●	●
	Ultimate vacuum (mbar)*	0.015	0.015	0.015	0.015
	Vacuum venting	Automatic	Automatic	Automatic	Automatic
	Controlled gas (N2, clean air, etc) backfill	●	●	●	●
	Hot gas defrosting	●	●	●	●
Data	Data record	●	●	●	●
	USB port	●	●	●	●
Cooling	Compressor	SECOP compressor x 2	SECOP compressor x 2	SECOP compressor x 2	SECOP compressor x 2
Power	Voltage (V/Hz)	220/50	220/50	220/50;220/60;120/60	220/50;220/60;120/60
	Rated power	1700 W	1700 W	1900 W	1900 W
Noise level	Freeze dryer	52 (dB)	52 (dB)	52 (dB)	52 (dB)
Dimensions	Main unit (W x D x H)	800*533*400 mm	800*533*400 mm	700*650*1015 mm	700*650*1015 mm
Weight	Main unit	83 kg	83 kg	145 kg	145 kg
Manifold package for flasks	Manifold type	T-type	-	T-type	-
	Number of vessel ports	12	-	12	-
	Round bottom flask**	250ml * 6 & 500ml *6	-	250ml * 6 & 500ml *6	-
Universal drying package	Drying chamber	-	Acrylic	-	Acrylic
	Rack	-	4-shelf	-	4-shelf
	Rack supporting board	-	●	-	●
	Number of vessel ports	-	8	-	8
	Round bottom flask*	-	250ml * 6 & 500ml *6	-	250ml * 6 & 500ml * 6
Vacuum pump	Vacuum pump SVF-100DR (oil-free)	●	●	●	●
	Vacuum pump NDD12 (with oil)	○	○	○	○
	Vacuum pump hose	●	●	●	●

*: The ultimate vacuum 0.015 mbar is achieved when working with vacuum pump NDD12 (NAVAC brand).
**: Flasks are supplied free of charge. Compensation is not applicable in case of damage during transportation.
The data provided refers to the base unit with ambient conditions of +10 °C to +25 °C. Subject to change without prior notice.

● Basic equipment ○ Optional - Not available

LyoPilot D Series

Pilot Freeze Dryer, 2-chamber system

Equipped with stainless steel shelf areas with synthetic silicone heat transfer fluid, the larger 8/12kg pilot systems meet the highest standards of the pharma and biotech industries.

The 2-chamber system is integrated with advanced PAT functions for optimized process.

- Freezing point determination
- Resistivity monitoring
- Pressure rise test
- Pressure comparison method (optional)
- Instantaneous nucleation (optional)

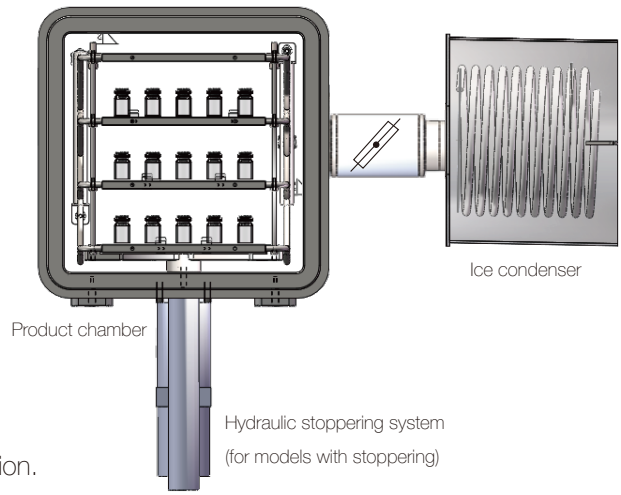
Choose the system fits your application best!

Model	Max.ice capacity	Ice condenser temp	Max. 2ml vials
LyoPilot D8S/D8	8 kg	-90 °C	1263/1611
LyoPilot D12S/D12	12 kg	-90 °C	2380/2952

Advanced system

2-chamber systems

- Optimal vapor transport.
- Side-opening ice condenser for easier observation and cleaning.
- Ultra-low pressure drop between the two chambers.
- Excellent drying rates for sensitive materials and products with low eutectic points or low collapse temperatures.
- Intermediate valve for pressure rise test.
- Compact design with highly efficient and economical operation.



Shelves

- Stainless steel shelf areas with silicone heat transfer fluid, providing excellent thermal conductivity.
- Pulse-type electronic expansion valve, featuring a wide regulation range, quick and precise control on shelf temperature, and low energy consumption.
- The uniformity of different layers and a same layer is within 1°C.
- Hydraulic stopper system, rising from bottom to top and easy for cleaning (available for LyoPilot D8S/D12S)

Refrigeration & ice condenser

- 2-compressor cascade system, ice condenser temperature reaches -90°C.
- Built-in ice condenser coils for higher efficiency.
- Hot gas defrosting, quickly proceed to the next freeze-drying process.
- Mechanism door lock of ice condenser, for convenient cleaning.

Vacuum control

The vacuum degree and duration of each step can be set and controlled at auto mode. Pirani vacuum gauge with accuracy 0.001mbar. Vacuum control reduced drying time by up to 40%.

Advanced Pirani vacuum gauge allows:

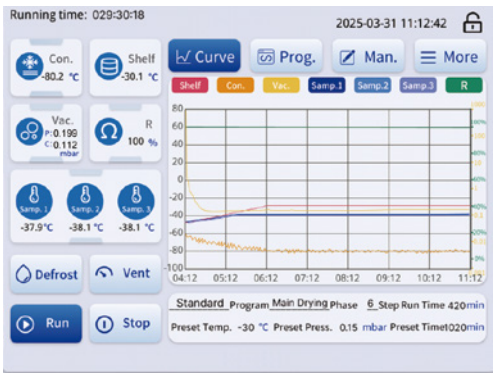
- Airtightness check: before freeze drying process, set a vacuum degree 600~950mbar to check airtightness.
- Gas backfill: after freeze-drying completed, set a vacuum degree 500~800mbar, to backfill inert gas, so that the vial can be plugged under a slightly negative pressure for a longer storage time.

Unique system LyoSMART+ controller

LyoSMART+ controller provides an easy-to-use and intuitive user interface.
All of the extensive accessories are also integrated. Reproducible results are assured by automatic process sequences.

Convenient and intuitive

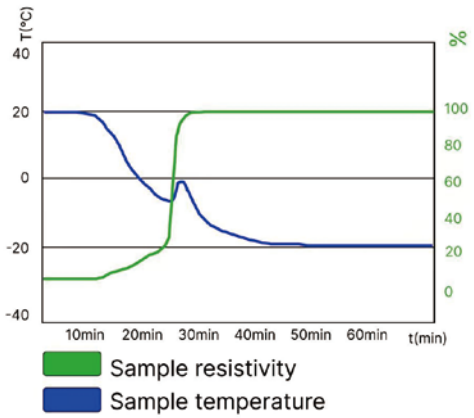
- Color touchscreen with clear display.
- Automatic or manual mode.
- Intuitive program entry, using various freeze-drying sequences and recipes.
- Memory space for 30 user-defined programs with 36 steps.
- Real-time freezing drying diagram display, selective parameter display, data query & export.
- Set safety values such as vacuum level and resistivity for process feedback control.
- Password protection for startup and lock screen protection.
- Equipped with USB port & RS232 port.



PAT (Process Analytical Technology) tools

Freezing point determination

- The LyoTR sensor monitors both electrical resistance and product temperature. From the curves of both of these variables, operator can determine the eutectic point and freezing point of product.
- The LyoTR sensor allows automated control of the energy supply to the shelves during the main drying phase to avoid critical temperatures during the main drying phase, which reduces product defrost risk.



Product temperature measurement

The product temperature influences the form of the ice structure and the speed of the freeze drying process, and it can initiate a thawing process. The product temperature is monitored during the measurement process.

The ultra-fine Pt100 probe with flexible wire harness is compact, highly resistant to interference, corrosion-resistant, and easy to calibrate.

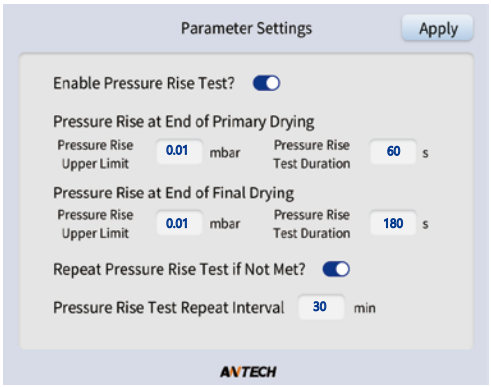
Pt100 LyoTR Pt100

Pressure rise test

The pressure rise test is achieved through the design of the intermediate valve between the drying chamber and the ice condenser. During the drying process, this valve is closed to measure the pressure increase in the drying chamber over a defined time period, which serves as a key indicator for determining the freezing point.

Typically, the pressure rise rate at the end of main drying should within 0.01 mbar/min. The accurate vacuum control is critical for this function.

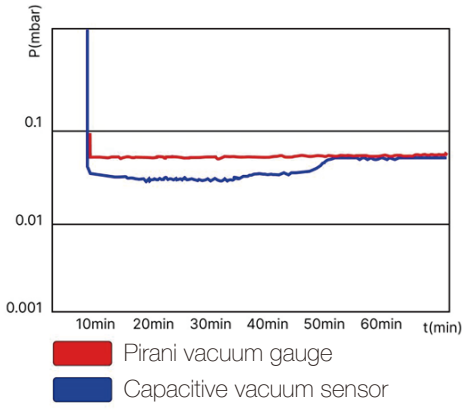
Thanks to ANTECH's ultra-high accurate ASV (Advanced Smart Valve) vacuum control, our pressure rise test delivers superior reliability.



Comparative pressure measurement (optional)

The end of the main drying phase can be detected by using two different vacuum measurement sensors: Pirani vacuum gauge and capacitive vacuum sensor.

When the difference between the pressure measurements falls below a preselected threshold, it indicates that main drying has concluded.



LyoIns-instantaneous nucleation (applicable for LyoPilot D8/D8S)

The LyoIns controlled freezing function ensures the simultaneous freezing of all vials.

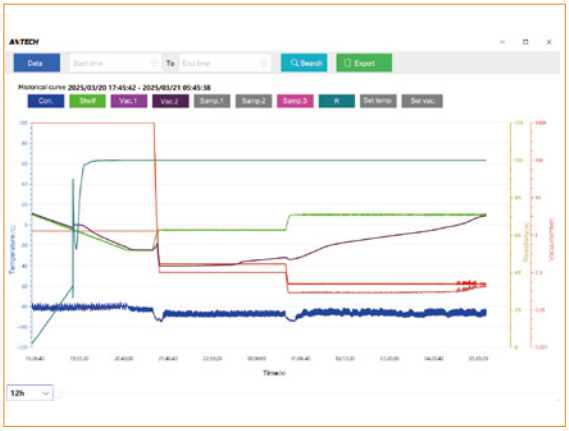
The instantaneous crystallization technology is achieved by controlling the vacuum differential between the product chamber and the ice condenser chamber.

- The ice fog is generated directly by the product, no external substances and additional accessories required.
- No release of gas (with potential product content) from the chamber
- No modification required, available for LyoPilot D8/D8S.

LyoSOFT: operate on PC

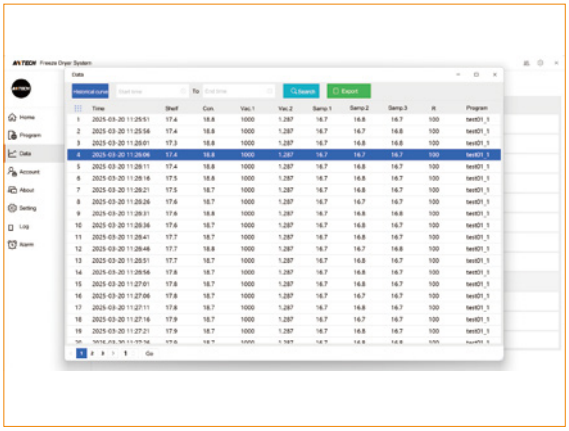
For precise documentation and evaluation

- Our experience shows that freeze-drying processes must be precisely monitored and documented. Regardless of the drying parameters or batch size, this is the only way to ensure accurate analysis.
- The optional LyoSOFT software (PC based) enables comprehensive recording and archiving of all process data. Installed on a separate computer, the software receives data directly from the freeze dryer via an RS232 interface.
- With LyoSOFT, programs for freeze drying can be developed and process data can be viewed in real time in graphical format. Operation is consistent and uniform across all unit sizes, as LyoSOFT is also used with larger production freeze drying systems.



Are you planning to scale up?

- Data recording on USB drive.
- Simple process documentation with LyoSOFT.
- LyoSOFT for process control and documentation.
- Process monitoring with the LyoTR sensor to avoid undesired defrosting effects.
- Automatic determination of the freezing point for reliable process control.
- High-precision temperature and vacuum control ensures the accuracy of the freeze-drying process.
- Scientific structural layout not only meets the convenience of operation, but also ensures the repeatability of the process.
- LyoSOFT software complies with current GAMP standards.



With stoppering

Specification

	Model	LyoPilot D8S	LyoPilot D12S
Type	Chamber	2-chamber	2-chamber
	Stopper	●	●
Ice condenser	Temperature (approx.) *	-90°C	-90°C
	Max. capacity	8 kg	12 kg
	Chamber volume (approx.)	18 L	30 L
	Performance	6 kg/24h	10 kg/24h
	Defrosting	Hot gas	Hot gas
Shelf	Type	Silicone heat transfer fluid	Silicone heat transfer fluid
	Dimensions(W x D)	240 x 410 mm	280 x 500 mm
	Number of shelves	3+1	4+1
	Area	0.3 m^2	0.56 m^2
	Spacing	80 mm	73 mm
	Hydraulic stoppering	Bottom to top	Bottom to top
	Temperature range	-55°C ~ +60°C	-60°C ~ +60°C
	Temperature accuracy	0.1 °C	0.1 °C
	Cooling rate (+20°C to –40°C)	1.3 °C /min	1.3 °C /min
Basic	Dimensions (W x D x H)	960 x 765 x 1320 mm	1065 x 860 x 1380 mm
	Weight	330 Kg	450 Kg
	Noise level (approx.)	56 dB(A)	60 dB(A)
Power	Electrical connection	220V/50Hz;220V/60Hz;120V/60Hz	380V/50Hz, 3-phase
	Rated power	3400 W	4500 W
Controller	Display	8" touch screen	8" touch screen
	Operating system	LyoSmart+	LyoSmart+
	Password protection	●	●
Vacuum	Pirani vacuum gauge	●	●
	Capacitive vacuum sensor	○	○
	Vacuum level	0.008 mbar	0.008 mbar
	Vacuum control accuracy	0.001 mbar	0.001 mbar
	Vacuum leakage rate	<0.005 mbar L / s	<0.005 mbar L / s
	Vacuum pump	●	●
Process control	Safety pressure	●	●
	LyoTR monitoring to prevent defrosting	●	●
	Temperature comparison	●	●
PAT tools	Freezing point determination	●	●
	Product temperature measurement	●	●
	Pressure rise test	●	●
	Comparative pressure measurement	○	○
	LyoIns (instantaneous nucleation)	○	–
Communication	Data record	●	●
	USB port	●	●
	RS 232 port	●	●
	LyoSOFT (software for process control and documentation)	○	○
Vial closure	Hydraulic stoppering	●	●
	Automatic gas backfill	●	●
	Automatic aeration	●	●

*: Tested at ambient temperature 24°C, with good ventilation

● Basic configuration ○ Optional - Not available

Without stoppering

Specification

	Model	LyoPilot D8	LyoPilot D12
Type	Chamber	2-chamber	2-chamber
	Stopper	–	–
Ice condenser	Temperature (approx.) *	-90°C	-90°C
	Max. capacity	8 kg	12 kg
	Chamber volume (approx.)	18 L	30 L
	Performance	6 kg/24h	10 kg/24h
	Defrosting	Hot gas	Hot gas
Shelf	Type	Silicone heat transfer fluid	Silicone heat transfer fluid
	Dimensions(W x D)	315 x 410 mm	350 x 500 mm
	Number of shelves	3+1	4+1
	Area	0.39 m^2	0.7 m^2
	Spacing	80 mm	73 mm
	Temperature range	-55°C ~ +60°C	-60°C ~ +60°C
	Temperature accuracy	0.1°C	0.1°C
	Cooling rate (+20°C to –40°C)	1.3 °C/min	1.3 °C/min
Basic	Dimensions (W x D x H)	960 x 765 x 1320 mm	1065 x 860 x 1380 mm
	Weight	300Kg	420Kg
	Noise level (approx.)	56 dB(A)	60 dB(A)
Power	Electrical connection	220V/50Hz; 220V/60Hz;120V/60Hz	380V/50Hz
	Rated power	3400W	4500W
Controller	Display	8" touch screen	8" touch screen
	Operating system	LyoSmart+	LyoSmart+
	Password protection	●	●
Vacuum	Pirani vacuum gauge	●	●
	Capacitive vacuum sensor	○	○
	Vacuum level	0.008 mbar	0.008 mbar
	Vacuum control accuracy	0.001 mbar	0.001 mbar
	Vacuum leakage rate	<0.005 mbar L / s	<0.005 mbar L / s
	Vacuum pump	●	●
Process control	Safety pressure	●	●
	LyoTR monitoring to prevent defrosting	●	●
	Temperature comparison	●	●
PAT tools	Freezing point determination	●	●
	Product temperature measurement	●	●
	Pressure rise test	●	●
	Comparative pressure measurement	○	○
	LyoIns (instantaneous nucleation)	○	–
Communication	Data record	●	●
	USB port	●	●
	RS 232 port	●	●
	LyoSOFT(software for process control and documentation)	○	○
Vial closure	Hydraulic stoppering	–	–
	Automatic gas backfill	●	●
	Automatic aeration	●	●

*: Tested at ambient temperature 24°C, with good ventilation

● Basic configuration ○ Optional - Not available

Specification

LyoPilot D8S (with stoppering)

Shelf dimensions (W x D): 240 x 410 mm								
Vial volume (total)			2 ml	6 ml	10 ml	20 ml	50 ml	100 ml
Number of shelves	Area (m^2)	Spacing (mm)	Max. number of vials *					
3(Standard)	0.30	80	1263	630	540	360	N/A	N/A
2(Customized)*	0.20	120	842	420	360	240	100	64

LyoPilot D12S (with stoppering)

Shelf dimensions (W x D): 280 x 500 mm								
Vial volume (total)			2 ml	6 ml	10 ml	20 ml	50 ml	100 ml
Number of shelves	Area (m^2)	Spacing (mm)	Max. number of vials *					
4(Standard)	0.56	73	2380	1200	1008	648	N/A	N/A
2(Adjustable)*	0.28	146	1190	600	504	324	160	100

LyoPilot D8 (without stoppering)

Shelf dimensions (W x D): 315 x 410 mm								
Vial volume (total)			2 ml	6 ml	10 ml	20 ml	50 ml	100 ml
Number of shelves	Area (m^2)	Spacing (mm)	Max. number of vials *					
3(Standard)	0.39	80	1611	852	714	429	N/A	N/A
2(Customized)*	0.26	120	1074	568	476	286	144	100

LyoPilot D12 (without stoppering)

Shelf dimensions (W x D): 350 x 500 mm								
Vial volume (total)			2 ml	6 ml	10 ml	20 ml	50 ml	100 ml
Number of shelves	Area (m^2)	Spacing (mm)	Max. number of vials *					
4(Standard)	0.70	73	2952	1508	1296	800	N/A	N/A
2(Adjustable)*	0.35	146	1476	754	648	400	196	122

*Adjustable: equipment is adjustable at user's site based on standard configuration.
*Customized: non-standard configuration to be manufactured at factory.
*Note: data for maximum load, qty will be less when using loading frames.

Vial size overview

Total vial volume	2 ml	6 ml	10 ml	20 ml	50 ml	100 ml
Vial type	2R	6R	10R	20R	50H	100H
↕ mm vial only	35	40	45	55	73	95
↕ mm with Lyo plug	45	50	55	65	83	105
ϕ mm	16	22	24	30	43	52
Net fill volume at 1 cm fill height (ml)	1.2	2.2	4.0	4.6	6.0	7.0

Subject to change without prior notice.

LyoPilot S Series

Pilot Freeze Dryer, Single Chamber

Fitted with stainless steel shelf areas with synthetic silicone heat transfer fluid, the unit comes standard with a stoppering system. Featuring a compact footprint and supporting in-situ freeze-drying, it is equipped with PAT tools to conduct eutectic point testing and freezing point determination.

The Antech Pilot S Series meets industry standards for freeze-drying process development within pharma and biotech industries, and is suitable for research involving pharmaceutical proteins, microorganisms, soil testing and food applications.

Advanced system

Single chamber systems

- Compact design with highly efficient and economical operation.
- Excellent drying rates for sensitive materials and products with low eutectic points or low collapse temperatures.
- Built-in ice condenser shortens drying time and avoids vapor condensation in vacuum pump.
- Optional external 8-port manifold for flasks.

Shelves

- Stainless steel shelf areas with silicone heat transfer fluid, providing excellent thermal conductivity.
- Pulse-type electronic expansion valve, featuring a wide regulation range, quick and precise control on shelf temperature, and low energy consumption.
- The uniformity of different layers and a same layer is within 1°C.
- Hydraulic stopper system as standard.

Refrigeration & ice condenser

- Ice condenser temperature reaches -90°C.
- Built-in ice condenser coils for higher efficiency.
- Hot gas defrosting, quickly proceed to the next freeze-drying process.
- Mechanism door lock for convenient cleaning.

Vacuum control

The vacuum degree and duration of each step can be set and controlled at auto mode. Pirani vacuum gauge with accuracy 0.001mbar. Vacuum control reduced drying time by up to 40%.

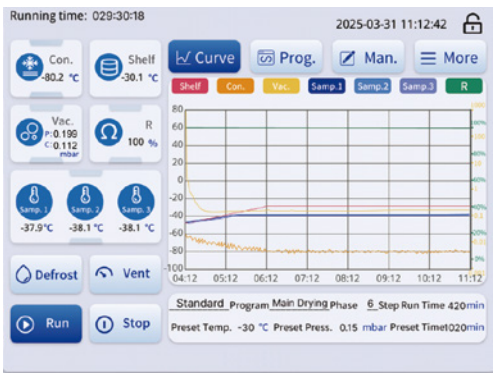
Advanced Pirani vacuum gauge allows:
- Airtightness check: before freeze drying process, set a vacuum degree 600~950mbar to check airtightness.
- Gas backfill: after freeze-drying completed, set a vacuum degree 500~800mbar, to backfill inert gas, so that the vial can be plugged under a slightly negative pressure for a longer storage time.

Unique system LyoSMART+ controller

LyoSMART+ controller provides an easy-to-use and intuitive user interface.
All of the extensive accessories are also integrated. Reproducible results are assured by automatic process sequences.

Convenient and intuitive

- Color touchscreen with clear display.
- Automatic or manual mode.
- Intuitive program entry, using various freeze-drying sequences and recipes.
- Memory space for 30 user-defined programs with 36 steps.
- Real-time freezing drying diagram display, selective parameter display, data query & export.
- Set safety values such as vacuum level and resistivity for process feedback control.
- Password protection for startup and lock screen protection.
- Equipped with USB port & RS232 port.



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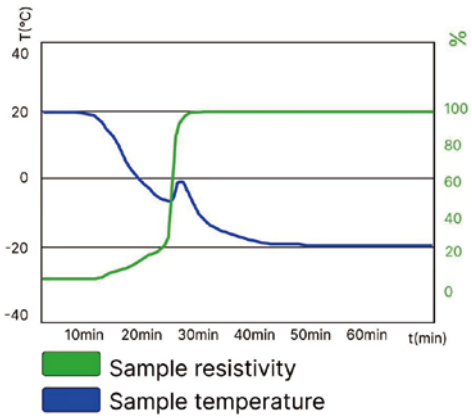

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Pt100 LyoTR Pt100

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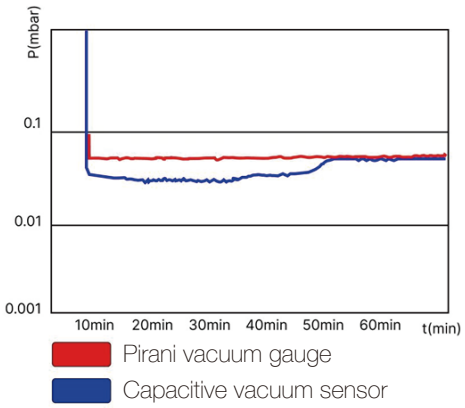

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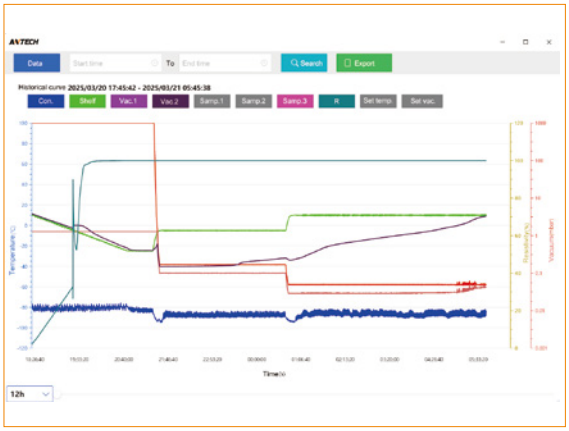

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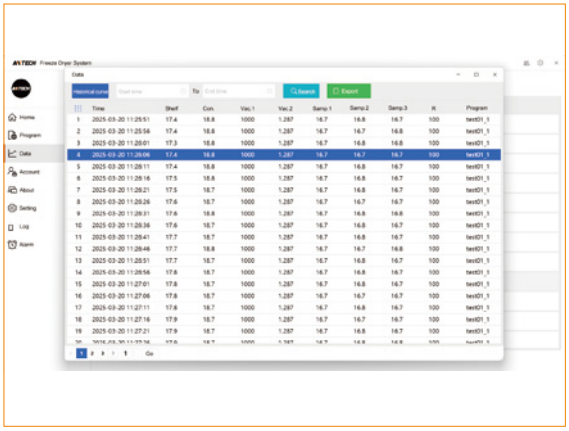


Specification

	Model	LyoPilot S4
Type	Chamber	Single-chamber
	Stopper	●
Ice condenser	Temperature (approx.) *	-90°C
	Max. capacity	4 kg
	Performance	3kg/24h
	Defrosting	Hot gas
Shelf	Type	Silicone heat transfer fluid
	Dimensions(W x D)	240 x 410 mm
	Number of shelves	2+1
	Area	0.2 m^2
	Spacing	60 mm
	Hydraulic stoppering	Top to bottom
	Temperature range	-55°C ~ +60°C
	Temperature accuracy	0.1 °C
Basic	Dimensions (W x D x H)	680x738x1400mm
	Net weight	290 Kg
	Noise level (approx.)	52 dB(A)
Power	Electrical connection	220V/50Hz, 220V/60Hz, 120V/60Hz
	Rated power	1800 W
Controller	Display	8" touch screen
	Operating system	LyoSmart+
	Password protection	●
Vacuum	Pirani vacuum gauge	●
	Capacitive vacuum sensor	○
	Vacuum control accuracy	0.001 mbar
	Vacuum leakage rate	＜0.005 mbar L / s
	Vacuum pump	●
Process control	Safety pressure	●
	LyoTR monitoring to prevent defrosting	●
	Temperature comparison	●
PAT tools	Freezing point determination	●
	Product temperature measurement	●
	Comparative pressure measurement	○
Communication	Data record	●
	USB port	●
	RS232 port	●
	LyoSOFT (software for process control and documentation)	○
Vial closure	Hydraulic stoppering	●
	Automatic gas backfill	●
	Automatic areation	●
Manifold	8-port manifold for flasks	○
Shipping	Packing size (W x D x H)	850x750x1750mm
	Gross weight	360 Kg

*: Tested at ambient temperature 24°C, with good ventilation

● Basic configuration ○ Optional

LyoPharma Series

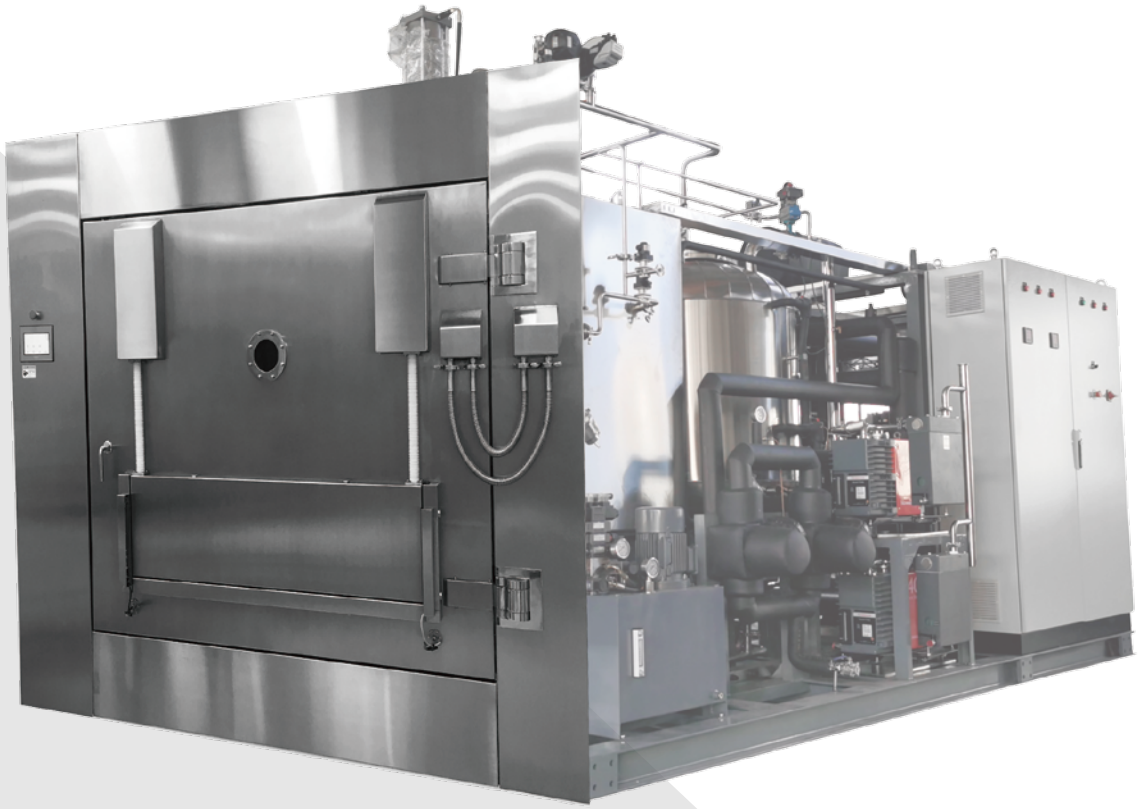
Production Scale Lyophilizer

LyoPharma series integrates the technical essence of both pilot and industrial-scale solutions, providing a complete workflow from process development to large-scale manufacturing.

Designed in full compliance with cGMP, FDA 21 CFR Part 11, and EU Annex 11, the system features automatic CIP/SIP and a 316L stainless steel chamber capable of pure steam sterilization for aseptic production.

It seamlessly integrates with isolators, RABS, and automated loading/unloading systems, enabling hands-free operation from filling to capping. The modular layout supports both split and integrated configurations to flexibly adapt to capacity and facility needs.

We provide full IQ/OQ/PQ validation support and on-site assistance, complemented by a remote HMI for real-time monitoring, diagnostics, and updates—ensuring reliable, continuous production.



ANTECH

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