

# 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.

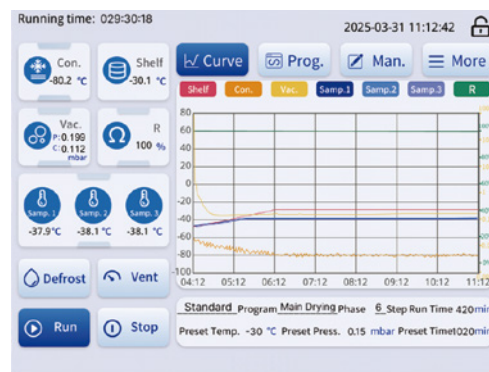
## Unique system LyoSMART+ controller

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

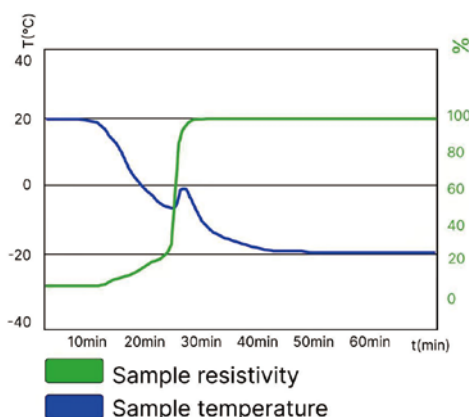
- Color touchscreen with clear display.
- Automatic or manual mode.
- Intuitive program entry, using various freeze-drying sequences and recipes.
- Memory space for 30 user-defined programs with 36 steps.
- Real-time freezing drying diagram display, selective parameter display, data query & export.
- 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.



## PAT(Process Analytical Technology) Tools

### ► Freezing point determination

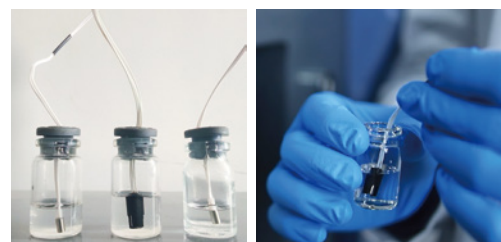
- The LyoTR sensor monitors both electrical resistance and product temperature. From the curves of both of these variables, operator can determine the eutectic point and freezing point of product.
- The LyoTR sensor allows automated control of the energy supply to the shelves during the main drying phase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

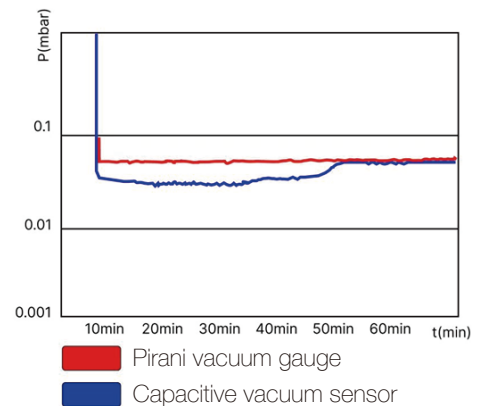


Pt100 LyoTR Pt100

### ► 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.

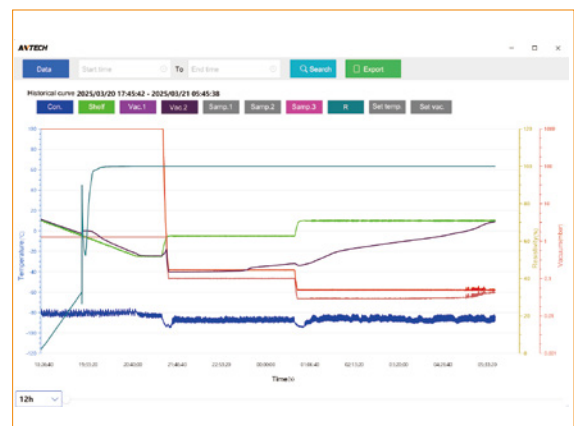
When the difference between the pressure measurements falls below a preselected threshold, it indicates that main drying has concluded.



## LyoSOFT: operate on PC

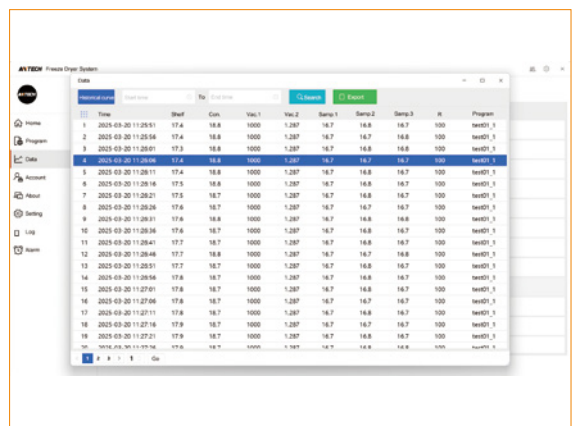
### ► For precise documentation and evaluation

- 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.



## ► 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 <sup>2</sup>
	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
	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