

LyoStar II™ Freeze-Dryer

Overview

- Designed for product development
- Engineered for results
- Intuitive software decreases training time
- Built for performance with the most dependable components
- Optional touch screen computer facilitates data entry and cycle monitoring



Optional touch screen

Introducing Smart Freeze-Dryer™ Technology

LyoStar II is the first commercial system to feature SMART Freeze-Dryer Technology for accelerating cycle development. This optional tool provides instant feedback on important product data - product resistance, heat flow, and product thickness - previously unavailable.



Call 800.251.1531
or visit www.ftssystems.com

Research & Development

Designed with industry experts for formulations work, process development, and scale-up.



Standard LyoStar II™ Features at a Glance

- Powerful reliable Scroll compressors with 5.5 total horsepower for fast cooling rates
- 4" Vapor port between product chamber and condenser ensures no vapor restriction
- Corrosion resistant, 316L chamber construction increases system longevity
- Stainless steel coil condenser design improves lyophilization efficiency
- Additional chamber ports standard for accessories/options, facilitate field retrofits
- Front panel access to vacuum pump and electrical components increases ease of maintenance

LyoStar II Specifications

- ▶ Shelf pull down rate from +25°C to -40°C in less than 25 minutes
- ▶ Temperature resolution in 0.1°C increments
- ▶ System evacuates to less than 100 mT within 15 minutes
- ▶ Vacuum leak rate of less than 30 mT/hour
- ▶ Vacuum level to reach 5-10 mT with dry and empty system
- ▶ Ambient tolerance range +15°C to +30°C
- ▶ Humidity tolerance range 20% to 85%
- ▶ Shelf temperature control within $\pm 0.6^\circ\text{C}$



Condenser

Configuration:	External coil
Material:	Stainless steel
Capacity:	30 liters total 20 liters in 24 hours
Surface area:	5.745 square feet 0.53 square meters
Temperature:	< -85°C
Defrost:	Hot gas
Defrost time:	< -60 minutes

- ▶ *Overload safety and alarm system*
- ▶ *Power outage safety and alarm system*

Tray Chamber

Configuration:	Rectangular
Material:	316L
Shelf:	316L
Door:	Acrylic
Port size to condenser:	-inches 4 -centimeters 10.2
Gas backfill:	Standard
Shelf dimensions:	-inches 11 x 20 -centimeters 30 x 51
Shelf fluid system:	Sealed
Fluid:	HT-20
Isolation valve:	Butterfly type, electrical, or pneumatic

Refrigeration

Shelf temperature:	-70°C to +60°C
Condenser:	-85°C
Compressor:	Scroll 1 @ 3.5 HP 1 @ 2 HP
Refrigerant:	R-404A, R-508B
Cooling:	Air, standard/water-cooled, optional

- ▶ *This system has a high/low pressure safety and is CFC free.*

Instrumentation

Controller:	PLC
Thermocouples:	6 (16 optional)
Condenser thermocouple:	1
Shelf temperature RTD's:	System inlet and outlet
Vacuum sensor:	- Standard Pirani - Option Both Capacitance Manometer and Pirani
Vacuum sensor location:	Product chamber and condenser foreline
Additional sensors:	Moisture sensor
Location:	Chamber

- ▶ *All thermocouples are T type.*

Voltage

Volts/Hz:	240V/60Hz or 220V/50Hz 50 amps/1 phase
-----------	---

- ▶ *Circuit protection and a line voltage reader*
- ▶ *CE compliant*

Bulk System Configurations

Dimensional Specifications

	LYO1B	LYO2B	LYO3B	LYO4B	LYO5B
No. Shelves	1	2	3	4	5
Shelf area (sq. ft./m ²)	1.5/0.14	3.1/0.29	4.6/0.43	6.1/0.57	7.6/0.71
Distance between shelves(in/mm)	9.5/241	4.5/114	2.8/71	2.0/51	1.5/38

Volumetric Specifications (Liters)

Product thickness	LYO1B	LYO2B	LYO3B	LYO4B	LYO5B
0.25 in. (0.6 cm)	0.88	1.77	2.66	3.55	4.43
0.50 in. (1.3 cm)	1.77	3.55	5.32	7.09	8.86
0.75 in. (1.9 cm)	2.66	5.32	7.98	10.64	13.29
1.0 in. (2.54)	3.54	7.09	10.64	14.18	17.73

Stoppering System Configurations

Dimensional Specifications

	LYO1S	LYO2S	LYO3S	LYO4S
No. Shelves	1	2	3	4
Shelf area (sq. ft./m ²)	1.5/0.14	3.1/0.28	4.6/0.43	6.1/0.57
Distance between shelves(in/mm)	9.5/241	4.5/114	2.8/71	2.0/51

Vial Dimensions & Capacity (Number of vials processed)

	2 ml	3-5 ml	5 ml	10 ml	20 ml	30 ml	50 ml	100 ml
Diameter (mm)	17.5	18	23	25	32	37	43	52
Height (mm)**	43	53	56	63	67	72	82	104
LYO1S	468	459	273	228	135	100	66	45
LYO2S	936	918	546	456	270	200	132	90
LYO3S	1404	1377	819	684	405	200*	132*	90*
LYO4S	1872	1377*	819*	684*	405*	200*	132*	90*

* Requires shelf latching plates

**Includes partially inserted stopper

Each Bulk LyoStar comes with one solid bottom tray per shelf

Each Stoppering LyoStar comes with one removable bottom tray per shelf

LyoStar Accessories

Items ordered separately

Vacuum pump and oil mist eliminator

- ▶ VP200: Corrosion-resistant, 2 stage, oil-sealed, direct-drive vacuum pump with gas ballast valve
- ▶ OME-06: Oil mist eliminator for VP200C

Additional trays

- ▶ TS-1120: Solid bottom tray
- ▶ TRB-1120: Removable bottom tray
- ▶ TF-1120: Filter tray

Shelf latching plates

- ▶ LSLP2: Shelf latching kit for 2 shelf-unit
- ▶ LSLP3: Shelf latching kit for 3 shelf-unit
- ▶ LSLP4: Shelf latching kit for 4 shelf-unit

Sample extractor door

- ▶ Allows removal of stoppered vial from lyophilizer at any point in cycle
- ▶ Facilitates changing from standard door to sample thief door

Specifications and prices may change without notification.

Auto-refilling liquid nitrogen trap

- ▶ Additional low temperature trap for use with organic solvents
- ▶ Auto-refilling feature minimizes handling of LN₂

System footprint

- ▶ 33" W x 43" L x 78" H

Control package specifications

OPTO 22 PLC with touchscreen PC and printer.

Software includes:

- ▶ LyoManager II
- ▶ MS Excel
- ▶ PC Anywhere

Other factory installed options

- ▶ Electric or pneumatic isolation valve (activated through PC)
- ▶ Custom IQ/OQ package
- ▶ Moisture analyzer
- ▶ 6 product thermocouples standard, 16 optional
- ▶ 21 CFR Part 11 configurable controls



Committed to Product Excellence...and Continuous Support

SP Industries

PO Box 158 3538 Main Street Stone Ridge, NY 12484 USA
800.251.1531 Phone : 845.687.0071 Fax: 845.687.7481 www.ftssystem.com

SP TechCare

Hull

Wilmad | LabGlass

VirTis

Hotpack

SP Industries Corporate Headquarters:

935 Mearns Road Warminster, PA 18974 USA 800.523.2327 Phone: 215.672.7800 Fax: 215.672.7807 www.SPindustries.com