



Innovators in Freeze Drying

LyoDryer

# Freeze Dryer / Lyophilizer

NEW!



LyoDryer combines the latest hardware and software advancements of laboratory research freeze dryer on the market today. Using the best components and design techniques combined with the most advanced PC/PLC control system, the LyoDryer is the perfect solution for both protocol development and small scale production needs. The LyoDryer includes LSI's Opti-Dry PC/PLC freeze drying control system and offers all the necessary options to meet your most demanding needs.

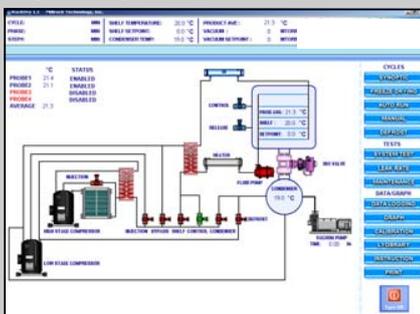
The LyoDryer Series offers largest shelves and best shelf-to-shelf spacing of any system in its class, resulting in more product throughput in the same floor space.

The exposed coil condenser eliminates vapor bypass that is common with 'cold wall' style condensers. During the freeze drying run the condensing surface area increases making vapor trapping more efficient.

## ST5B Standard Features

Control System	PC/PLC with Opti-Dry Software
Shelf Temperature Range	-43C or -70C to +60C
Shelf Heating rate	>1 degree C per min
Shelf Size and Finish	12" x 24", 316L, 220 grit or better
Shelf Area	2 sq ft to 10 sq ft
Shelf Assembly	Bulk or Hydraulic Stopping
Condenser Temperature	-55C or -85C
Condenser Capacity	30L
Condensing Rate	20L in 24 hours
Condenser Style/ Area	Exposed Coil/ 6 sq.ft
Vapor Port	4" Standard, 6" or 8" Option
Compressors	Scroll
Defrost	Hot Gas
Vacuum Pump	260 LPM, Corrosion Resistant
Vacuum Control	Pirani w/Solenoid & Needle Valve
Gas Backfill	Included
Product Sensors	4
Cabinet	35"W x 42"D x 72"H
Electrical	230V/60Hz or 200V/50Hz, 1PH

## Opti-Dry Control Software



- Manual and Automatic Mode
- Graphic and Numeric Data Collection
- Automatic System and Leak Rate Testing
- Ethernet Based with Web Connectivity
- Optional Opti-Dry Pro provides the tools you need for protocol development



## System Performance

- Shelf pull down from +20 to -40C in less than 40 minutes
- Vacuum pull down to 100 mT in less than 20 minutes
- Vacuum leak rate less than 30 mT per hour
- Vacuum pump level 5 mT in clean dry system

## LyoDryer Equipment Design Features

- PC/PLC controls standard—no proprietary microprocessors
- 316L on all wetted parts
- Large shelves for more product capacity—12" x 24" each
- Temperature uniformity: across shelf and same shelf +/- 1 degree C
- Hydraulic stoppering—no bladders or cables (for stoppering only)
- Exposed coil condenser (316L with Electropolish) design to prevent vapor bypass (a common problem on externally wrapped condensers)
- High reliability scroll compressors (3.5 Hp, air cooled)
- CFC-Free, Non-proprietary refrigerants
- High efficient stainless steel heat exchanger for oil heat exchange
- Four product thermocouples with option for more
- Oversized air-cooled condenser to minimize the affect of changing ambient temperatures
- 260 LPM two stage corrosion resistant vacuum pump with easy access from the front of the unit and solenoid valve for prevention of oil back flow
- Built-in validation port (40 mm)
- Vacuum control (10-1000 mtorr) and gas backfill standard
- Magnetic drive fluid pump for circulation of heat exchange oil
- Extensive list of options to meet your every need

**NEW! Ask about hydrogen peroxide (H2O2) sterilization**

## Opti-Dry PC/PLC Control

The LyoDryer comes complete with PLC controls and a PC for programming and data collection. Our easy-to-use software provides automatic freeze-drying, defrost, system and leak rate testing. Data can be printed either numerically or graphically. This same control system can be used on industrial dryers, allowing scaling to production. An interactive maintenance screen simplifies component servicing.

Opti-Dry uses an Ethernet platform for hardware connectivity making data transmission extremely fast. It also provides web connectivity for those who want remote access to their systems.

<b>Freeze Drying</b>	10 Freezing Steps 16 Drying Steps with Pressure Control 1 Step Secondary Drying 1 Step Final Drying Alarms, Recipe Management, Data Logging
<b>Manual</b>	Individual switches for shelf, condenser, vacuum, isolation valve and release. Single set-points for shelf and set-point.
<b>Defrost</b>	Automatic timed hot gas.
<b>System Test</b>	Performance evaluation of shelf, condenser, vacuum, heating, and control.
<b>Leak Rate</b>	Automatic testing of leak rate.
<b>Maintenance</b>	Independent operation of components, with troubleshooting and calibration.

### Available Options

6" and 8" Vapor Ports	H2O2 sterilization
Shelf Latching Plates	Isolation Valve
Advanced Vacuum Control	Additional Product Probes
Moisture Sensor	Capacitance Manometer
Clean Room Configuration	LN2 Trap
Manifold for Flask Drying	Acid Trap
IQ/OQ Documentation	21CFR Part 11 Compliance
FAT and SAT	Extended Warranty
	Water Cooled

Note: Specifications subject to change without notice.  
All specifications based on 20C ambient

Shelves	Spacing (in/mm)	Area (sq ft/sqM)
1	11.5/292	2/.186
2	5.5/139	4/.373
3	3.5/89	6/.559
4	2.5/63	8/.746
5	1.9/48	10/.932

## Vial Capacity

Vial ml	Dia mm	Ht mm	1	2	3	4	5
2	16	41	730	1460	2190	2920	3650
5	22	48	398	796	1194	1592	
10	24	58	336	672	1008	1344	
20	29	71	220	440	660		
50	43	81	91	182			
100	52	92	66	132			

## Bulk Fill (liters)

	1	2	3	4	5
<b>10mm deep</b>	1.8	3.6	5.4	7.2	9.0
<b>15mm deep</b>	2.7	5.4	8.1	10.8	13.5
<b>20mm deep</b>	3.6	7.2	10.8	14.4	18.0

## Opti-Dry Pro Upgrade

For R&D, Protocol Development, Cycle Automation and Optimization, Opti-Dry Pro offers all the tools you need.

Features:

- Eutectic Point Determination
- Product temperature feedback optimizes the recipe, both freezing and primary drying, based on the product temperature average.
- Multiple methods for Primary Drying Endpoint Determination
- Automatic Cycles for Optimum Drying Performance



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