

SP Scientific LyoConstellation S100 Production Lyophilizer



Performance Specifications

Lowest Shelf Temperature	-55°C
Shelf Temperature Control Range	-50°C to +50°C
Shelf Temperature Control Accuracy At shelf inlet	-40°C to +40°C: ± 0.5°C Outside this range: ± 1.0°C
Shelf Pull-Down: +20°C to -40°C	≤ 60 minutes
Shelf Temperature Uniformity*	± 1.0°C
Lowest Condenser Temperature	-65°C
Condenser Capacity (24 Hours)	150L
Condenser Pull-Down: +20°C to -45°C	≤ 60 minutes
Maximum Sublimation Rate [†]	150L/24 Hour
Compressor Horsepower	30 hp (22.4 kW)
System Refrigerant	R507b – GWP 3985
CO ₂ E	117.16 Tonnes
Vacuum Rate of Rise [§]	≤ 30 mTorr/hour
Volume-Based Leak Rate [§]	≤ 0.02 mbar·L/sec (15 mTorr·L/sec)
Lowest System Vacuum [§]	≤ 20 mTorr

Note: Performance specifications are based on SP Scientific test data from clean, dry and empty (CDE) units operating at an ambient room temperature of approximately 20°C. SP Scientific recommends an optimum operating range of 15-25°C (59-77°F) with an RH of ≤80% at sea level.

Utility Requirements

Compressed Air	80 -100 psig (5.52-6.89 barg)
Condensing Cooling Water Supply/Return [¶]	50 gpm max @ max 80°F (189.3 Lpm @ max 26.6°C)
Chamber Cooling Water	25-100 gpm (94.6-378.5 Lpm)
Inert Gas for Backfilling	0.33 scfm @ 5-30 psig (9.3 Lpm @ .344-2.06 barg)
Inert Gas for VLC / Vacuum Release	13 scfm @ 5-30 psig (368 Lpm @ .344-2.06 barg)
Inert Gas Consumption (full vacuum release)	5235 L @ 1 ATM
Inert Gas for ControlLy [®]	35-40 psig (2.41-2.75 barg)
Steam for Sterilization In Place (SIP)	500 lbs/hr (226 kg/h) @ 20-25 psig (1.38-1.72 barg)
Clean in Place (CIP) Water / Media	50 gpm (189 Lpm) @ 40 psig (2.75 barg)

Utility Requirements

Heat Output (Cleanroom), Peak	1,980 BTU/h (0.579 kW)
Heat Output (Mach.room), Peak	2,890 BTU/h (0.846 kW)

ControlLy[®] Requirements (Optional)

Volume to Vent percentage ratio (V_v/V_R) ^{††}	< 6.5%
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Note: Vent Volume (V_v) is the product chamber volume multiplied by 10. The volume of a standard LyoConstellation S100 chamber is 176.5 ft³ (4.99m³). V_R is the volume of the room in which the lyophilizer is located.

Key Features

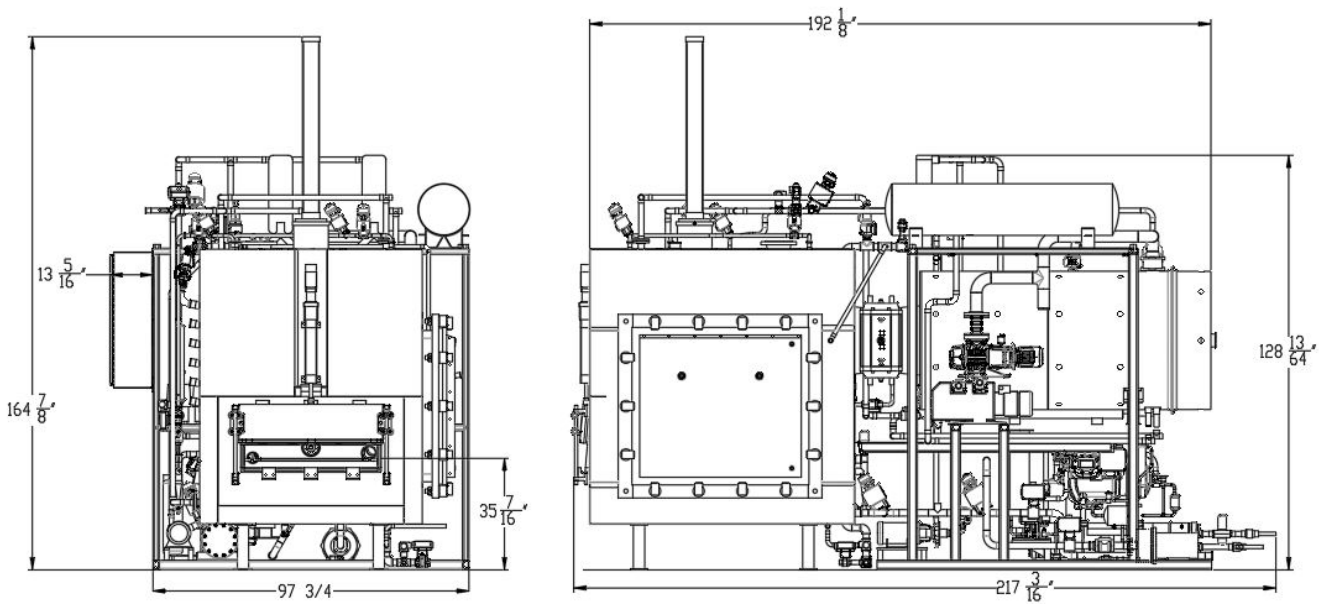
- Powerful, configurable, aseptic production freeze dryer with optional row by row loading system
- Range of telemetry options to fit "line of sight" approach enabling easy transfer of cycles from or to development
 - LyoFlux[®] TDLAS instrument to measure vapor mass flow, determine end points and infer critical process data
 - Optional ControlLy[®] Technology for improved product homogeneity and process efficiency
 - Tempris[®] vial system for wireless temperature sensing

Electrical Requirements (Lyophilizer)

Voltage	208 VAC	400 VAC	480 VAC
Hertz	60 Hz	50 Hz	60 Hz
Phase	3 Φ (4 wire)	3 Φ (5 wire)	3 Φ (4 wire)
Breaker Amperage	275 A	150 A	125 A

SP Scientific LyoConstellation S100

Production Lyophilizer



Dimensional Data

Width	111.1" (2.82m)
Length	217.1875" (5.51m)
Height	128.2" (3.25m)
Height, inc. stoppering ram	164.875" (4.19m)
Max. Weight	22,550 lb (10,228 kg)
Min. Clearance on All Sides	36 in (91.5 cm)

Note(s): TDLAS installation increases overall length by 36" (915mm). SP Scientific recommends a 36" (915mm) clearance around all sides of the unit for serviceability.

Materials of Construction

Product Chamber	AISI 316L Stainless Steel
Shelf	AISI 316L Stainless Steel
Condenser Chamber	AISI 316L Stainless Steel
Isolation Valve Disc	AISI 316L Stainless Steel

Surface Finish

Product Chamber Interior	Ra 25 micro-inches (0.635 micrometers)
Shelves	Ra 25 micro-inches (0.635 micrometers)
Condenser Chamber Interior	Ra 32 micro-inches (0.813 micrometers)

Other Considerations

Protection Rating: IP20

Shelf Configuration

Number of Shelves	Shelf Area	Shelf Clearance
10 Shelves, 9 Usable	108 ft ² (10.03m ²)	4.75" (121mm)
Usable Shelf Dimensions (W x L):	36" x 48" (914.4mm x 1219.2mm)	
Overall Shelf Dimension (W x L):	38.5" x 48" (977.9mm x 1219.2mm)	

Additional Information

Stoppering	Top-Down Hydraulic, 15 PSIG (1.03 barg)
Condenser 'Defrost Type	Steam
Vapor Port Inner Diameter	20 inches (508mm)
Pusher	Horizontal Hydraulic, Back to Front.
Door Auto Lock	Included

Options

Rotary Hull Isolation Valve	ControlLy ^o ® - Controlled Ice Nucleation
N+1 Redundancy	LyoFlux ^o TDLAS Mass Flow Sensor
Independent CIP Skid	Tempris ^o Wireless Temperature Sensors
Virtual servers & Thin clients	CE Compliant

* Shelf temperature deviations shall not exceed the specification relative to the mean of the highest and lowest temperature readings.

§ Vacuum specifications are based on SP Scientific test data from similar units equipped with a two-stage rotary vane vacuum pump. Units equipped with other vacuum pumps may yield different results (e.g., a dry pump shall yield a Lowest System Vacuum of ≤ 50 mTorr).

¶ Cooling water temperatures should not exceed 26.6°C. (80°F) supply, 32.2°C (90°F) return

‡ Noise from the equipment under normal operating conditions shall not exceed 85 dBA when measured at any point 36 inches (91.5 cm) away from the equipment. Lyophilizers equipped with ControlLy^o® shall exceed the specified noise level rating for approximately 3 to 5 seconds during depressurization. SP Scientific recommends the use of both hearing and eye protection during the ControlLy^o® process.