

# Ultra 50L Pilot Lyophilizer



## Specifications

	EL
Lowest shelf temperature (50 Hz / 60 Hz)	≤ -67°C / -70°C
Shelf temperature control range*	-55 to 65°C
Shelf pull-down from 20°C to -40°C†	≤ 40 minutes
Lowest condenser temperature (50 Hz / 60 Hz)	≤ -82°C / -85°C
Maximum condenser capacity	≥ 50 L
Condenser surface area	10 ft² (.93 m²)
Condenser pull-down from 20°C to -45°C	≤ 35 minutes
Maximum ice condensing capacity in 24 hours‡	≥ 20 L
Maximum deposition rate‡	≥ 0.83 L/hour
Number of compressors	2
Compressor horsepower	3.5 hp, 1.5 hp
Vacuum time to 100 mTorr§	≤ 45 minutes
Vacuum rate of rise§	≤ 30 mT/hour
Vacuum Control +/- 5mTorr	50mTorr to 500mTorr
Volume-based leak rate§	≤ .0042 mbar•L/sec
Lowest system vacuum§	≤ 15 mT
Temperature uniformity¶	± 1.0°C

*Note: Performance specifications are based on SP test data from units operating at an ambient room temperature of approximately 20°C. SP recommends an optimum operating range of 15-25°C (59-77°F).*

## Utility Requirements

	Air-Cooled	Water-Cooled
Compressed air (for units with isolation valve)	80 psig (5.5 bar)	80 psig (5.5 bar)
Ambient room temperature	15-25°C (59-77°F)	15-25°C (59-77°F)
Approx. peak room heat generated	22,900 BTU/h (6.7 kW)	5,400 BTU/h (1.6 kW)
Cooling water usage**	N/A	2-5 gpm (8-19 Lpm)
Cooling water load	N/A	17,500 BTU/h (5.1 kW)

## Electrical Requirements

Voltage	Phase	Hertz	Breaker Amperage	Recommended Outlet
208/230 VAC <sup>1</sup> 220 VAC <sup>1</sup>	1 Φ	60 Hz 50 Hz	50 A	NEMA 6-50R
208/230 VAC <sup>1</sup>	3 Φ	60 Hz	40 A	N/A
400 VAC <sup>1</sup>	3 Φ	50 Hz	30 A	N/A

*Note: Other electrical configurations available.*



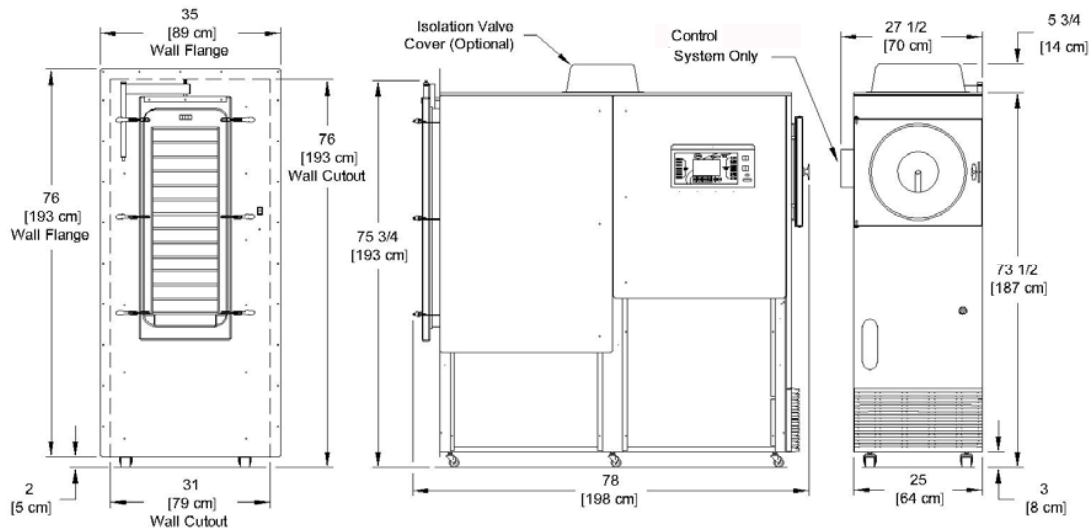
Cleanroom configuration shown.

## Key Features

- Compact design for easy installation
- Single product chamber design allows for larger batches and product uniformity
- Available with a Merlin or LyoS 2.0™ control system
- Optional hydraulic stoppering system available
- Narrow footprint (cleanroom configuration available)

## Refrigerant Information

	Gas 1	Gas 2
F gas	R407C	R508B
Charge (Kg)	1.245	0.970 (AC); 0.452 (WC)
GWP	1774	13396
EPA SNAP	IPR/VLTR	IPR/VLTR
Safety Class	A1	A1
Total CO2e (t)	15.198 (AC); 8.264 (WC)	



## Dimensional Data

	Standard Configuration	Cleanroom Configuration
Width	25 in (64 cm)	25 in (64 cm)
Depth	78 in (198 cm)	78 in (198 cm)
Height	75.75 in (192 cm)	75.75 in (192 cm)
Max. weight	2,000 lb (909 kg)	2,000 lb (909 kg)
Min. clearance	10 in (25.4 cm)	10 in (25.4 cm)

Note: SP recommends a 24-inch (61 cm) clearance around all sides of the unit for serviceability. If machines are placed side by side, increase the minimum clearance to 48 inches (121.9 cm)

## Additional Information

Construction	316L stainless steel shelves, product chamber and condenser chamber
Stoppering	Bottom-up hydraulic
Defrost type	Hot gas
Refrigerant type	CFC-free
Vapor port <sup>§§</sup>	8 in (20.3 cm)

## Shelf Configuration

	Shelf Area		Shelf Clearance (Approximate)	
	Bulk Drying and Stoppering		Moveable Bulk / Stoppering	Fixed Bulk (Legacy)
4 Shelves	6.12 ft <sup>2</sup> (5,686 cm <sup>2</sup> )		8.44 in (214 mm)	8.88 in (225 mm)
5 Shelves	7.65 ft <sup>2</sup> (7,107 cm <sup>2</sup> )		6.68 in (169 mm)	7.03 in (178 mm)
6 Shelves	9.18 ft <sup>2</sup> (8,528 cm <sup>2</sup> )		5.51 in (139 mm)	5.79 in (146 mm)
7 Shelves	10.71 ft <sup>2</sup> (9,950 cm <sup>2</sup> )		4.67 in (118 mm)	4.91 in (124 mm)
8 Shelves	12.24 ft <sup>2</sup> (11,371 cm <sup>2</sup> )		4.04 in (102 mm)	4.25 in (108 mm)
9 Shelves	13.77 ft <sup>2</sup> (12,793 cm <sup>2</sup> )		3.55 in (89 mm)	3.74 in (94 mm)
10 Shelves	15.3 ft <sup>2</sup> (14,214 cm <sup>2</sup> )		3.15 in (79 mm)	3.33 in (84 mm)
11 Shelves	16.83 ft <sup>2</sup> (15,636 cm <sup>2</sup> )		2.83 in (71 mm)	2.99 in (75 mm)
12 Shelves	18.36 ft <sup>2</sup> (17,057 cm <sup>2</sup> )		2.56 in (65 mm)	2.71 in (68 mm)
13 Shelves	19.89 ft <sup>2</sup> (18,478 cm <sup>2</sup> )		2.34 in (59 mm)	2.47 in (62 mm)
14 Shelves	21.43 ft <sup>2</sup> (19,909 cm <sup>2</sup> )		2.14 in (54 mm)	2.27 in (57 mm)
15 Shelves	22.96 ft <sup>2</sup> (21,331 cm <sup>2</sup> )		1.97 in (50 mm)	2.09 in (53 mm)

Shelf size (W × D): 10.8 in × 20.5 in (274.3 mm × 520.7 mm)

\\ Voltage supply should be ±5% of the specified nominal Voltage. SP VirTis units are highly customizable and SP can configure any unit to conform to the service requirements of a wide range of international voltage and phase configurations. Contact SP for more information.

\* Shelf fluid temperature controlled to within ± 0.5°C of the setpoint within the Shelf Temperature Control Range when at 100 mTorr.

† Shelf Pull-Down times are based on units with one (1) to eight (8) shelves. The increased mass of stainless steel and additional heat transfer fluid required for nine (9) or more shelves increases pull-down time. Use the following multipliers when determining the pull-down time specification for the following shelf configurations:

9-shelf units, standard pull-down time × 1.13      12-shelf units, standard pull-down time × 1.5      15-shelf units, standard pull-down time × 1.88

10-shelf units, standard pull-down time × 1.25      13-shelf units, standard pull-down time × 1.63

11-shelf units, standard pull-down time × 1.38      14-shelf units, standard pull-down time × 1.75

‡ The specified Maximum Ice Condensing Capacity in 24 Hours and Maximum Deposition Rate are based on the process of freeze-drying water as aggressively as possible. The freeze dryer's ability to collect ice at an hourly rate or over a specified period will always be application dependent.

§ Vacuum specifications are based on SP test data from similar units equipped with a Leybold D16B two-stage rotary vane vacuum pump. Units equipped with other vacuum pumps may yield different results.

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

\*\* Cooling water temperatures should not exceed 24°C.