

Ultra Prime Pilot Freeze Dryer

Key Features

- Compact design for easy installation
- Improved refrigeration for faster condenser pull-down and overall performance
- Single product chamber design allows for larger batches and product uniformity
- Available with a Merlin or LyoLogic control system
- Optional hydraulic stoppering system available
- Narrow footprint (cleanroom configuration available)
- Refrigerant with lower GWP

Specifications

Lowest shelf temperature (50 Hz / 60 Hz)	≤ -67°C / -70°C
Shelf temperature control range*	-55 to 65°C
Shelf Temperature Control Range Tolerance	+/- 0.5 °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 ft ² (.93 m ²)
Condenser pull-down from 20°C to -45°C	≤ 20 minutes
Ice condensing capacity in 24 hours‡	≥ 20 L
Number of compressors	2
Compressor Horsepower (high-stage / low-stage)	3.5 hp, 2 hp
Vacuum time to 100 mTorr§	≤ 45 minutes
Vacuum rate of rise§	≤ 30 mT/hour
Vacuum Level Control	+/- 5 mTorr
Vacuum Level Control Range	50 mTorr to 500 mTorr
Volume-based leak rate§	≤ .0042 mbar·L/sec
Lowest system vacuum§	≤ 15 mT
Temperature uniform	± 1.0°C
Noise Level	

Specifications note:

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)
Inert Gas for Backfilling	1 PSIG (70 mbar or 7 kpa)	1 PSIG (70 mbar or 7 kpa)
Ambient room temperature	15 -25°C (59 -77°F)	15 -25°C (59 -77°F)
Cooling water	N/A	15-22 Lpm (4-6 gpm) 5-25°C, 2-4 bar (30-60 psi)

Utility Considerations

	Air-Cooled	Water-Cooled
Heat Output Room, Peak	22,900 BTU/h (6.7 kW)	5,400 BTU/h (1.6 kW)
Max Energy Consumption		

Electrical Requirements

Voltage (-5%/+10%)	Phase	Hertz	Breaker Amperage	Recommended Outlet
208 VAC	1 Φ	60 Hz	50 A	NEMA 6-50R
208 VAC	3 Φ	60 Hz	40 A	N/A
230 VAC	1 Φ	50 Hz	50 A	NEMA 6-50R
400 VAC\	3 Φ	50 Hz	30 A	N/A

Refrigerant Information

	Gas 1	Gas 2
F Gas	R1270	R170
Charge (Kg)	0.450 (WC) 0.380 (AC)	0.3
GWP	2	6
EPA SNAP	IPR	VLTR
Safety Class	A3	A3
Total CO ₂ E	0.00256 (AC); 0.0027 (WC)	

Dimensional Data

	Standard Configuration	Cleanroom Configuration
Width	64cm (25 in)	89cm (35 in)
Depth	198 cm (78 in)	198 cm (78 in)
Height	192 cm (75.75 in)	192 cm (75.75 in)
Max. weight	909 kg (2,000 lb)	909 kg (2,000 lb)
Max. weight crated (est.)	1,089 kg (2,400 lb)	1,089 kg (2,400 lb)
Min. clearance	61 cm (24 in)	61 cm (24 in)

Note: If machines are placed side by side, increase the minimum clearance to 121.9 cm (48 inches).

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	8 in (20.3 cm)

Shelf Configuration

Number of shelves	Shelf Area	Shelf Clearance
	Bulk and Stoppering	Moveable Bulk/ Stoppering
7 Shelves	10.71 ft ² (9,950 cm ²)	4.67 in (118 mm)
8 Shelves	12.24 ft ² (11,371 cm ²)	4.04 in (102 mm)
9 Shelves	13.77 ft ² (12,793 cm ²)	3.55 in (89 mm)
10 Shelves	15.3 ft ² (14,214 cm ²)	3.15 in (79 mm)
11 Shelves	16.83 ft ² (15,636 cm ²)	2.83 in (71 mm)
12 Shelves	18.36 ft ² (17,057 cm ²)	2.56 in (65 mm)
13 Shelves	19.89 ft ² (18,478 cm ²)	2.34 in (59 mm)
14 Shelves	21.43 ft ² (19,909 cm ²)	2.14 in (54 mm)
15 Shelves	22.96 ft ² (21,331 cm ²)	2.14 in (54 mm)

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

* Shelf fluid inlet temperature controlled to within $\pm 0.5^{\circ}\text{C}$ 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 $\times 1.13$ 12-shelf units, standard pull-down time $\times 1.5$
15-shelf units, standard pull-down time $\times 1.88$

10-shelf units, standard pull-down time $\times 1.25$ 13-shelf units, standard pull-down time $\times 1.63$

11-shelf units, standard pull-down time $\times 1.38$ 14-shelf units, standard pull-down time $\times 1.75$

‡ The specified Ice Condensing Capacity in 24 Hours and Maximum Deposition Rate is based on the process of freeze-drying water under controlled conditions. 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 Scientific Products 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. All Scientific Products supplied pumps are tested to meet specifications regardless of brand.