

# VirTis AdVantage Plus

Benchtop Freeze Dryer

Advantage Plus



## Key Features

- Advanced pilot/production scale performance in a compact benchtop unit.
- Available with up to three usable product drying shelves.
- Optional pneumatic stoppering system available for processing in vials.
- Six-liter ice condensing capacity.

## Performance Specifications

Item	ES	XL	EL
Shelf Temperature Control Range (°C) <sup>†</sup>	-40 to 60	-40 to 60	-55 to 60
Lowest Shelf Temperature (50 Hz / 60 Hz, °C)	-42 / -45	-57 / -60	-62 / -65
Lowest Condenser Temperature (50 Hz / 60 Hz, °C)	-50 / -53	-67 / -70	-82 / -85
Maximum Condenser Capacity (L)	6	6	6
Maximum Ice Condensing Capacity in 24 hours (L) <sup>†</sup>	4	4	4
Maximum Deposition Rate (L/hour) <sup>†</sup>	0.17	0.17	0.17
Shelf Pull-Down from 20 °C to -40 °C (minutes) <sup>§</sup>	≤ 45	≤ 40	≤ 30
Number of Compressors	1	1	2
Compressor Horsepower	3/4	3/4	1/3, 3/4
System Refrigerant	MO 89	R245fa / R508B	R508B, R407C
Vacuum Rate of Rise (mT/hour)	≤ 60	≤ 60	≤ 60
Volume-Based Leak Rate (mbar·L/sec)	≤ .0009	≤ .0009	≤ .0009
Temperature Uniformity (°C) <sup>¶</sup>	± 1.0	± 1.0	± 1.0

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

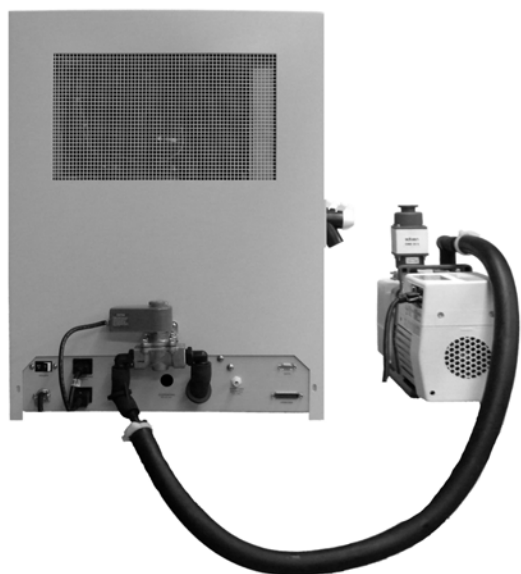
## Electrical Requirements

	ES and XL		EL	
	208/230	200/240	208/230	200/240
Voltage (VAC) <sup>*</sup>	208/230	200/240	208/230	200/240
Hertz <sup>*</sup>	60	50	60	50
Phase <sup>*</sup>	1	1	1	1
Breaker Amperage <sup>*</sup>	10	10	15	15
NEMA Receptacle	6-15R	N/A	6-15R	N/A

## Utility Requirements

Item	ES	XL	EL
Compressed Air (Stoppering only, psig)	60-90	60-90	60-90
<b>With Vacuum Pump</b>			
Approx. Peak Heat Generated (BTU/h)	5,000	5,000	7,000
<b>Without Vacuum Pump</b>			
Approx. Peak Heat Generated (BTU/h)	4,000	4,000	6,000

## Standard Configuration



# Advantage Plus

### Dimensional Data

Width (in / mm)	25.75 / 654
Depth (in / mm)	28 / 711
Height (in / mm)	28.75 / 730
Approximate Weight (lb / kg) <sup>¶¶</sup>	320 / 145

### Shelf Configuration

Number of Shelves	Minimum Shelf Clearance (in / mm)	Shelf Area (in <sup>2</sup> / cm <sup>2</sup> )
1 Shelf	6.25 / 158	143 / 922
2 Shelves	2.87 / 73	286 / 1,844
3 Shelves	1.75 / 44.5	429 / 2,766

### Additional Information

Shelf Construction	316L Stainless Steel
Chamber Construction	304 Stainless Steel
Chamber Door	Full-View Acrylic
Nominal Shelf Size (W x D x TH)	10.25 in X 14 in X 0.375 in (260 mm X 355 mm X 9.5 mm)
Vacuum Pump (Required, not included)	Two-Stage Rotary Vane or Suitable Dry Pump
Stoppering (Optional)	Top-Down Pneumatic
Defrost Type	Hot Gas
Refrigerant Type	CFC Free
Condenser Type	Internal
Inert Gas Port	3/8-inch Hose Barb fitting
Compressed Air Inlet (Stoppering)	1/4-inch FPT fitting

<sup>\*</sup> VirTis units are highly customizable and SP Scientific can configure any unit to conform to the service requirements of a wide range of international voltage and phase configurations. Contact SP Scientific for more information.

<sup>†</sup> The specified Maximum Ice Condensing Capacity in 24 Hours and the 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.

<sup>‡</sup> Shelf temperature controlled to within  $\pm 0.5$  °C of the setpoint within the Shelf Temperature Control Range.

<sup>§</sup> Shelf pull-down times are based on tests performed with no load at "pre-seal" pressure (approximately 400-500 mbar). The increased mass of stainless steel and additional heat transfer fluid for units with more than one shelf will increase the pull-down time. Use the following multipliers when determining the pull-down time specification for the following shelf configurations:

- 2-shelf units, standard pull-down time x 1.5
- 3-shelf units, standard pull-down time x 2.0

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

<sup>¶¶</sup> Weight given is for an Advantage Plus with EL refrigeration package. Units with an ES or XL refrigeration package shall have a lower total weight.