

## Install Requirements

To ensure a successful installation and efficient operation, of your SP Hull® LyoStar® 4.0 lyophilizer, the following utilities and pre-installation requirements must be in place at your facility.

### Placement and Positioning

Position the SP Hull LyoStar 4.0 in an area providing adequate air circulation. 60 cm (24 in) of clearance is recommended on all sides of the unit for serviceability and efficient operation. If multiple machines are being operated in a single area, position them so that the hot exhaust from one does not blow into the intake of another. If machines are placed side-by-side, increase the minimum clearance to 1.2 m (4 ft).

### Electrical Requirements

The SP Hull LyoStar 4.0 is offered with the following standard voltage configurations:

Voltage	Hertz	Phase	Breaker Amperage
208 VAC	60 Hz	1 Phase	40 Amps
230 VAC	50 Hz	1 Phase	40 Amps
400 VAC (5 wire)	50 Hz	3 Phase	30 Amps



**VOLTAGE REQUIREMENTS ARE CRITICAL. A LINE VOLTAGE INDICATOR IS INCLUDED IN THE LYOPHILIZER'S SOFTWARE.**

**REFER TO THIS READING DURING INITIAL POWERING AND OPERATION OF THE LYOPHILIZER.**

### Electrical Plugs

All SP Hull LyoStar 4.0 machines delivered to locations within the United States are shipped with a **NEMA 6-50P** plug on the unit. All units shipped internationally do not include a plug due to the wide variety of plugs that may be used. Units should be directly wired to suitable switch and breaker by a qualified electrician in accordance with site, local, and national regulations.

### Workstation Voltage Configurations

Voltage	Hertz	Phase
115 VAC	60 Hz	1 Phase
230 VAC	50 Hz	1 Phase

### Sample Extractor Assembly Voltage Configurations (Optional Item):

Voltage	Hertz	Phase
115 VAC	60 Hz	1 Phase
230 VAC	50 Hz	1 Phase

**Note:** The Sample Extractor Assembly voltage requirements apply to the vacuum pump used to operate the Sample Extractor Assembly. This vacuum pump is independent of the vacuum pump installed on the lyophilizer.

### Compressed Air

The pneumatic isolation valve, a standard feature of the SP Hull LyoStar 4.0, requires a water-free compressed air source capable of delivering 1 scfm when regulated at a minimum of 6.9 bar (100 psig) for operation of the pneumatic isolation valve.

Utility Connection: ¼ in male quick-connect.

### Ambient Temperature

The SP Hull LyoStar 4.0 is designed for installation and operation in a room with a controlled temperature of between 16 -25°C (60-77°F).



**DO NOT ALLOW THE INTAKE AIR FOR THE SP HULL LYOSTAR 4.0 EXCEED 30 °C.**

**IF THE AMBIENT TEMPERATURE EXCEEDS 30 °C, DO NOT OPERATE THE LYOPHILIZER UNTIL ADEQUATE COOLING AND VENTILATION IS ESTABLISHED.**

### Heat Output

Heat emissions in the room may vary, depending on the product load and the current step of an automatic cycle. Suitable ventilation or conditioning of the room is required to keep unit performance at the specified level.

<b>Air-Cooled</b>	Peak demand could be as high as 21,000 BTU/h.
<b>Water-Cooled</b>	Peak demand could be as high as 4,200 BTU/h.

### Cooling Water

The water-cooled refrigeration system requires a filtered water supply of 5 to 25 °C (41 to 77 °F) capable of providing 15 to 22 lpm (4 to 6 gpm) at 2 to 4 bar (30 to 60 psi). The water supply must be filtered with size 50 mesh or better to prevent heat exchanger fouling.

## Cooling Water cont.

Utility Connection: ½ in female NPT.

**Note:** SP recommends cooling water containing less than 25% Mono-Ethylene Glycol. If more than 25% contact SP service for guidance.

## Inert Gas (Backfilling)

Nitrogen or other inert gas may be used to backfill the product chamber prior to stoppering. If used, the inert gas source should be capable of delivering 2 scfm when regulated between 0.2-0.35 bar (3-5 psig).

Utility Connection: ¼ in Push-to-Connect Fitting.

## ControlLyo® Nucleation Technology

### Inert Gas

SP Hull LyoStar 4.0 lyophilizers equipped with ControlLyo technology shall require an inert gas source for system pressurization. Argon, nitrogen, or other suitable inert gasses should be supplied with the gas pressure capable of delivering 4 scfm when regulated between 3.5-4.1 bar (50-60 psig).

Utility Connection: ¼ in female NPT connection.

### Room Ventilation

Without proper ventilation, operation of ControlLyo technology may cause the oxygen concentration of ambient air to drop below an acceptable level of 19.5%. To ensure that ventilation is adequate for the depressurization process, the volume to vent percentage ratio ( $V_v/V_R$ ) must be less than 6.5%.  $V_v$  equals the product chamber volume

multiplied by 10 and  $V_R$  equals the total volume of the room in which the lyophilizer is located.

In addition, SP Industries recommends the use of an  $O_2$  sensor to monitor oxygen concentration while operating ControlLyo technology.

**Note:** The volume of a standard SP Hull LyoStar 4.0 chamber is  $0.113 m^3$  (3.99  $ft^3$ ).

## Noise Level

Under normal operating conditions, noise from the equipment shall not exceed 70-75 dBA when measured at any point 1 m away from the equipment.

**Note:** Lyophilizers equipped with ControlLyo technology shall exceed the specified noise level rating for approximately 3 to 5 seconds during depressurization. SP Industries recommends the use of both hearing and eye protection during the ControlLyo technology process.

## LyoFlux\* 200 Utility Requirements

LyoFlux 200 is offered with the standard voltage configuration (3 connections required):

Voltage	Hertz	Phase
115 VAC	60 Hz	1 Phase
230 VAC	50 Hz	1 Phase

## Nitrogen Gas

1-2 SLPM, <0.69 bar (10 psig), ¼ in compression fitting inlet (Qty. 2),  $N_2$  purge gas dewpoint <-60°C.

The LyoFlux sensor is a Class 1 laser device.

**Complete the following information and return to SP Industries. A signature indicates that all utilities are in place and installation may be scheduled. If facilities are not in place upon technician's scheduled arrival, additional charges incurred will be billed as a Field Service Visit.**

Name	Title
Signature	Date
Company	Phone
City / State	Email



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