

Hull Company, Division of SP Industries

Freeze Dryer Utility List

Customer: **Styker Biotech LY-3401**
 Model: **36FXS130-SS30C**

Hull Serial Number: **05V9544**
 Process and Instrumentation Diagram Number: **D892425C**
 Utility Sheet Drawing Number **A892439D**

1. Electrical: Main (Control Voltage(s) Supplied by Step-Down Transformer(s))

Main			
Volts	480	Hertz	60
Phase	3	Full Load Amps	130

2. Chilled Glycol Supply 34 to 65 Deg. F (35% Propylene Glycol) Rev. B

A Condensing

Maximum Supply Pressure	150 PSIG	Maximum Flow Rate	40 GPM	1 Compressor
Minimum Supply Pressure	25 PSIG	Connection	1 1/2 150# Flange	Rev. C

3. Chilled Glycol Return 64 to 95 Deg. F Maximum (35% Propylene Glycol) Rev. B

A Condensing

Maximum Flow Rate	40 GPM	Connection	1 1/2 150 Flg	1 Compressor
Pressure Drop Rev A&B	10 PSI		Rev. C	

4. Clean In Place Water to Freeze Dryer: (End user to supply ambient purified water or 80 deg C WFI as needed) Rev. A

Nominal Flow Rate	30 GPM	Approximate Chamber Usage	300 GAL
Supply Pressure	40 PSIG	Approximate Condenser Usage	200 GAL
Supply Connection	1 1/2 in. San. Clamp	Approximate Total Usage	500 GAL

5. Process Water: 50 to 65 Deg F Nom. Supply Rev A. & B.

G Liquid Ring Vacuum Pump

Flow Rate	3.5 GPM	Supply Connection	3/8 Compr	Rev. A&C
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6. Steam (Supply Pressure Regulated by Customer)

A Saturated Clean Steam (Defrost)

Maximum Supply Pressure	30 PSIG	Defrost Amount	90 Pounds
Minimum Supply Pressure	17 PSIG	Supply Connection	1 1/2 in. San. Clamp

7. Dry, Lubricated Instrument Air (Supply Pressure Regulated by Customer)

Maximum Supply Pressure	120 PSIG	Max SCFM at 110 PSIG	10 SCFM
Minimum Supply Pressure	80 PSIG	Nominal Flow Time	1 Second
		Supply Connection	1/4 in. FPT

8. Nitrogen (Supply Pressure Regulated by Customer) (Rev. B)

A. Vacuum Break/ Gas Bleed

Maximum Supply Pressure	30 PSIG
Minimum Supply Pressure	5 PSIG
Maximum Flow Rate Freeze Dry	0.07 SCFM
Flow Rate 15 min Vac. Release	4 SCFM
Supply Connection	1 in. San. Clp.

I Expansion Tank Blanket (Opt.: Tank OK w/static charge)

Minimum Supply Pressure	5 PSIG
Maximum Supply Pressure	40 PSIG
Nominal Flow Rate	0.1 SCFM
Supply Connection	1 in. FPT Rev C

10. Clean Air (Supply Pressure Regulated by Customer)

Vacuum Break

Maximum Supply Pressure	30 PSIG	Flow Rate 15 min Vac. Release	4 SCFM
Minimum Supply Pressure	5 PSIG	Supply Connection	1 in. Sanitary Clamp

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11. Relief Valves

QTY	LOCATION	SIZE	TYPE	SETTING	QTY	LOCATION	SIZE	TYPE	SETTING
A 1	Chamber	1.5	in. FPT	30 PSIG	I 1	Expansion Tank	3/4	in. FPT	40 PSIG
H 1	Condenser	1.5	in. FPT	30 PSIG	J 4*	Refrig, Condensers	5/8	Compr	350 PSIG

* Refrigeration relief valves will be piped to single manifold **Rev. B&C**

12. Drains

LOCATION	SIZE	TYPE
B Main Rev A&C	1 1/2	Flange
F Vacuum Pump	1/2	in. MPT
G Liquid Ring Pump Rev. C	1	in Flange

13. Vents

LOCATION	SIZE	TYPE
F* Vacuum Pump	1 1/2	Flange Rev D
G Liquid Ring Pump	1	in Flange Rev C

* Vacuum pump vents to be piped to single connection **Rev. B.**

SPECIFICATIONS

Please consult the General Arrangement Drawing for required utilities.

Capacities				
Ice capacity	130 liters			
Pressure rating	30 PSIG			
Usable shelf area	36 square feet			
Heat Transfer System				
Shelf Fluid Circulation pump	Crane 1.5 HP			Qty. 1
Condenser Fluid Circulation pump	Crane 1.5 HP			Qty. 1
Heating element	Heat Inc. 15 kw			Qty. 1
Heat transfer fluid	Silicone Oil – SYL Therm XLT			
Hydraulic System				
Hydraulic pump	Parker Hanninfin 1 HP Power Unit			
Hydraulic fluid	Zurnpreem 30 MV			
Materials Of Construction				
Chamber-wetted surfaces	316 low carbon stainless steel			
External condenser-wetted surfaces	316 low carbon stainless steel			
Shelves-wetted surfaces	316 low carbon stainless steel			
Performance Data				
Condenser blank off temperature	≤ -65°C			
Shelf fluid temperature range	-60°C to +40°C			
System evacuation time to 100 millitorr	≤ 30 minutes			
System vacuum blankoff	≤ 20 millitorr			
Refrigeration				
Compressor	Carlyle	Stage 2	H.P. 20	Qty. 2
Refrigerant	Genetron AZ-50 (R-507)			
Refrigerant compressor oil	Solest 32 POE			
Shelf System				
Double latching included	Yes			
Vacuum System				
Vacuum pump	Leybold		3 HP	Qty. 2
Liquid Ring Pump	Atlantic Fluidics		1.5 HP	Qty: 1