



NSC5000-SLT & NSC2000-ULT BHO EXTRACTION

180 lbs/hr Solvent Condensed and Subcooled to -54°C (-65°F)

CALCULATIONS

From 50°C (122°F) Condensed and Subcooled to -15°C (5°F):

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	50	°C
Desired Outlet Temperature	-15	°C
Ambient	90°F	
Required dT	-10	°C
Flow Rate: (180 lbs/hr)	3.00	lb/min

Condensing Temperature = -13.34C (8.06F)

Absolute minimum capacity	39470	BTU/hr
	11.57	kW

WARNING PHASE CHANGE!!! - Assumes phase change happens at -13.3°C

Chiller Options at -25°C fluid outlet and 90°F Ambient			
Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
NSC5000-SLT	58,500	17,129	48%

NSC5000-SLT has 51,000 BTU/hr (14,933 Watts) at -25C (-13F) Chiller Fluid Temperature at 100F Ambient = 29% oversized.

Calculations		
Inlet Temperature	50.00	°C
Outlet Temperature	-15.00	°C
Flow Rate	0.00000	m³/min
Specific Heat (Liquid)	2.3500	kJ/kg*°K
Specific Heat (Gas)	1.7080	kJ/kg*°K
Density	613.9	kg/m³
Mass flow rate	0.02267962	kg/sec
Volume	0.2	m³
Mass	116.2	kg
Static System Power	0.0	kW
Heat of Vaporization	397.9	kJ/kg
Condensing Temperature	-13.3	°C
Start Phase	Gas	
End Phase	Liquid	
Phase Change Energy	9.0242208	kW
Flowing System Power (Gas)	2.45203887	kW
Flowing System Power (Liquid)	0.09060508	kW
Flowing System Power	11.5668647	kW
Required dT	-10	°C

Ambient	Watts	BTU/hr
100F	0.29	110F
90F	17129	58500
70F	21522	73500
100F	14933	51000
110F	12736	43500

From -15°C (5°F) Subcooled to -54°C (-65°F):

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	-15	°C
Desired Outlet Temperature	-54	°C
Ambient	90°F	
Required dT	-10	°C
Flow Rate: (180 lbs/hr)	3.00	lb/min

Condensing Temperature = -13.34C (8.06F)

Absolute minimum capacity	7100	BTU/hr
	2.08	kW

Chiller Options at -64°C fluid outlet and 90°F Ambient			
Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
NSC2000-ULT	13,600	3,982	92%
NSC3500-ULT	23,900	6,998	237%
NSC5000-ULT	37,400	10,951	427%

NSC2000-ULT has 12,050 BTU/hr (3,528 Watts) at -64C (-83F) Chiller Fluid Temperature at 100F Ambient = 70% oversized.

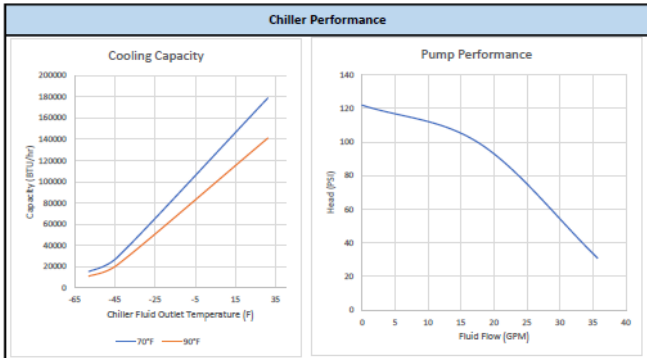
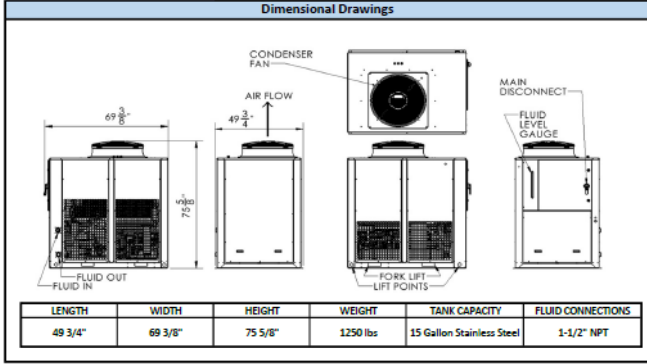
Calculations		
Inlet Temperature	-15.00	°C
Outlet Temperature	-54.00	°C
Flow Rate	0.00000	m³/min
Specific Heat (Liquid)	2.3500	kJ/kg*°K
Specific Heat (Gas)	1.7080	kJ/kg*°K
Density	613.9	kg/m³
Mass flow rate	0.02267962	kg/sec
Volume	0.2	m³
Mass	116.2	kg
Static System Power	0.0	kW
Heat of Vaporization	397.9	kJ/kg
Condensing Temperature	-13.3	°C
Start Phase	Liquid	
End Phase	Liquid	
Phase Change Energy	0	kW
Flowing System Power (Gas)	0	kW
Flowing System Power (Liquid)	2.07858717	kW
Flowing System Power	2.07858717	kW
Required dT	-10	°C

Ambient	Watts	BTU/hr
100F	0.70	110F
90F	3982	13600
70F	4890	16700
100F	45.4	155
110F	3528	12050
	3074	10500



NSC5000-SLT

5 Ton Air Cooled Super Low Temp Chiller



AG-Optimists, LLC
 3130 South 1030 West, Suite 1
 Salt Lake City, UT 84119
 (343) 610-6858
www.ag-chill.com

All Information Is For Reference Only



NSC5000-SLT

Standard Features and Benefits		
Performance	Working Temperature Range	-50°F (-50°C) to 10°F (-12°C)
	Temperature Stability	±2
	Cooling Capacity at 70°F	-58°F (-50°C) - 15,900 BTU/hr (4,540 Watts) -43.6°F (-42°C) - 29,500 BTU/hr (8,650 Watts) 31.1°F (0.5°C) - 179,000 BTU/hr (52,460 Watts)
	Ambient Temperature (Standard)	20°F - 100°F
	Pump Performance	0 GPM @ 122 PSI 17.9 GPM @ 99 PSI 35.7 GPM @ 31 PSI
User Interface	Controls	Electronic Programmed Temperature Controller (PLC) with Constant (Setpoint & Process) Temperature Readout
	Additional Features	Fluid Level Indicator, Touch Screen Controls
Refrigeration Circuit	Compressor	Bitzer 2 Stage Reciprocating
	Heat Exchanger	Brass Plate Heat Exchanger
	Refrigerant	R404a
	Additional Features	Access Ports, Service Valves, Filter Drier, Sight Glass, Liquid Receiver, Suction Accumulator, Thermostatic Expansion Valve (TXV)
Process Fluid Circuit	Max Heat Rejection	165,100 BTU/hr (48.3 kW)
	Pump	Continuous Duty, 3.75kW Vortex Pump
	Inlet/Outlet	1-1/2" NPT
	Reservoir	15 Gallon Stainless Steel
Construction	Additional Features	Inline Strainer, Inlet and Outlet Temperature Sensors, Pump Discharge Pressure Transducer
	Frame	Galvanized Steel
	Enclosure	Powder Coated Steel Enclosure with Easy Access Panels
Quality	Warranty	1 Year Standard Warranty
	UL/CSA Certified (Full Assembly)	Certified for Outdoor Use ETL 3170655, UL STD 61010-2-011, CAN/CSA STD. C22.2 No. 61010-2-011
	Manufacturing	Manufactured in the U.S.A. Certified ISO 9001:2015 Company
	Available Voltages	Max Amps (FLA) 46 Amps (std)

Optional Upgrades		
UPGRADES	Extended Ambient (-15°F) Crating	External Temperature Monitoring Alternate Pumps
		Controller Auto Start Remote Start

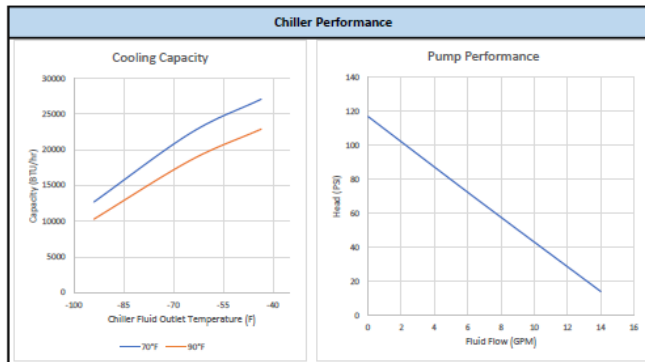
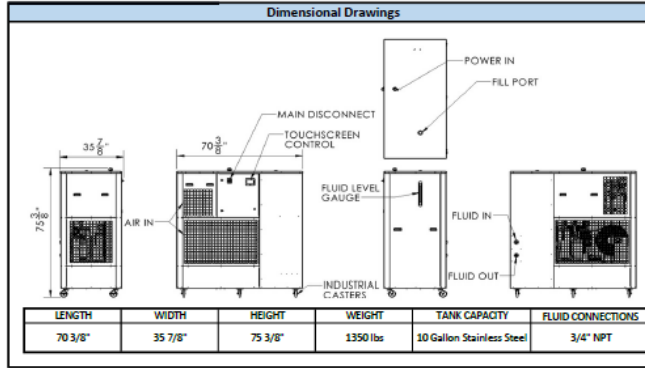
AG-Optimists, LLC
 3130 South 1030 West, Suite 1
 Salt Lake City, UT 84119
 (343) 610-6858
www.ag-chill.com

All Information Is For Reference Only



NSC2000-ULT

2 Ton Air Cooled Ultra Low Temp Chiller



AG-Optimists, LLC
 3130 South 1030 West, Suite 1
 Salt Lake City, UT 84119
 (541) 610-6858
www.ag-chill.com

All information is For Reference Only



NSC2000-ULT

Standard Features and Benefits		
Performance	Working Temperature Range	-112°F (-80°C) to 70°F (21°C)
	Temperature Stability	±2
	Cooling Capacity at 70°F	-84°F (-70°C) - 12,700 BTU/hr (3,720 Watts) 45°F (-13.9°C) - 22,300 BTU/hr (6,540 Watts) -43.6°F (-42°C) - 27,100 BTU/hr (7,940 Watts)
	Ambient Temperature (Standard)	40°F - 100°F
User Interface	Controls	Electronic Programmed Temperature Controller (PLC) with Constant (Setpoint & Process) Temperature Readout
	Additional Features	Fluid Level Indicator, Touch Screen Controls
Refrigeration Circuit	Compressor	Copeland Scroll
	Heat Exchanger	Brazed Plate Heat Exchanger
	Refrigerant	R404a/R508b
	Additional Features	Access Ports, Service Valves, Filter Drier, Sight Glass, Liquid Receiver, Thermostatic Expansion Valve (TXV), Fan Cycling, Oil Separator
Process Fluid Circuit	Max Heat Rejection	38,550 BTU/hr (11.3 kW)
	Pump	Continuous Duty, 2.2kW Vortex Pump
	Inlet/Outlet	3/4" NPT
Construction	Reservoir	10 Gallon Stainless Steel
	Additional Features	Inline Strainer, Inlet and Outlet Temperature Sensors, Pump Discharge Pressure Transducer
	Frame	Galvanized Steel
Quality	Enclosure	Powder Coated Steel Enclosure with Easy Access Panels
	Warranty	1 Year Standard Warranty
Power	UL/CSA Certified (Full Assembly)	ETL 3170655, UL STD 61010-2-011, CAN/CSA STD. C22.2 No. 61010-2-011
	Manufacturing	Manufactured in the U.S.A. Certified ISO 9001:2015 Company
Power	Available Voltages	Max Amps (FLA) Recommended Breaker/Service (MCA)
	480VAC / 3P / 60Hz (STANDARD) 208-240VAC / 3P / 60Hz	20 Amps (std) 55 Amps 30 Amps (std) 65 Amps

Optional Upgrades		
UPGRADES	Process Heating UL/CSA Outdoor Certified Extended Ambient (-15°F)	External Temperature Monitoring Alternate Pumps Controller Auto Start Remote Start Crating

AG-Optimists, LLC
 3130 South 1030 West, Suite 1
 Salt Lake City, UT 84119
 (541) 610-6858
www.ag-chill.com

All information is For Reference Only

