



NSC5000-SLT & NSC1000-ULT BHO EXTRACTION

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

CALCULATIONS

From 50°C (122°F) Condensed and Subcooled to -30°C (-22°F):

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	50	°C
Desired Outlet Temperature	-30	°C
Ambient	90°F	
Required dT	-10	°C
Flow Rate: (90 lbs/hr)	1.50	lb/min

Condensing Temperature = -13.34C (8.06F)

Absolute minimum capacity	21100	BTU/hr
	6.18	kW

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

Chiller Options at -40°C fluid outlet and 90°F Ambient

Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
NSC2000-ULT	23,500	6,881	11%
NSC3500-ULT	41,200	12,064	95%
NSC5000-ULT	54,100	15,841	156%
NSC5000-SLT	25,600	7,496	21%

NSC5000-SLT has 22,350 BTU/hr (6,544.5 Watts) at -40C (-40F) Chiller Fluid Temperature at 100F Ambient = 6% oversized.

Calculations		
Inlet Temperature	50.00	°C
Outlet Temperature	-30.00	°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	0.0113398	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	4.5121104	kW
Flowing System Power (Gas)	1.2260194	kW
Flowing System Power (Liquid)	0.4450308	kW
Flowing System Power	6.1831607	kW
Required dT	-10	°C

	Ambient	Watts	BTU/hr
NSC5000-SLT	100F	0.06	110F
90F	7496	25600	
70F	9399	32100	
	95.15	325	
100F	6544.5	22350	
110F	5593	19100	

From -30°C (-22°F) Subcooled to -54°C (-65°F):

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	-30	°C
Desired Outlet Temperature	-54	°C
Ambient	90°F	
Required dT	-10	°C
Flow Rate: (90 lbs/hr)	1.50	lb/min

Condensing Temperature = -13.34C (8.06F)

Absolute minimum capacity	2190	BTU/hr
	0.64	kW

Chiller Options at -64°C fluid outlet and 90°F Ambient

Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
NSC1000-ULT	3,800	1,113	74%
NSC2000-ULT	13,600	3,982	521%

NSC1000-ULT has 2,650 BTU/hr (776.5 Watts) at -64C (-83F) Chiller Fluid Temperature at 100F Ambient = 21% oversized.

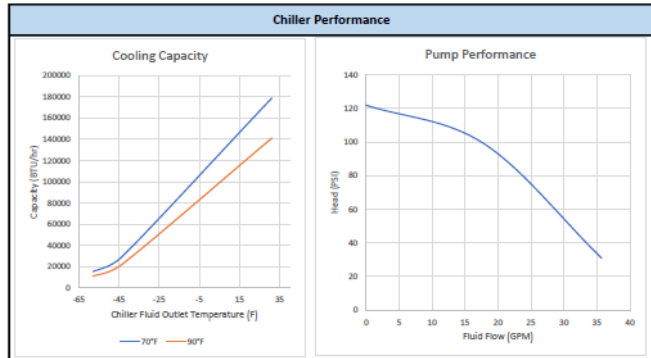
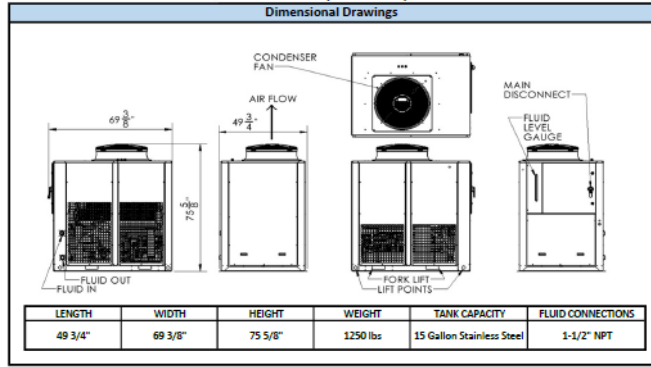
Calculations		
Inlet Temperature	-30.00	°C
Outlet Temperature	-54.00	°C
Flow Rate	0.00000	m³/min
Specific Heat (Liquid)	2.3500	kJ/kg *K
Specific Heat (Gas)	1.7080	kJ/kg *K
Density	613.9	kg/m³
Mass flow rate	0.01133981	kg/sec
Volume	0.2	m³
Mass	116.2	kg
Static System Power	0.0	kW
Heat of Vaporization	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)	0.63956528	kW
Flowing System Power	0.63956528	kW
Required dT	-10	°C

	Ambient	Watts	BTU/hr
NSC1000-ULT	100F	0.21	110F
90F	1113	3800	
70F	1786	6100	
	33.65	115	
100F	776.5	2650	
110F	440	1500	



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
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
Power	Available Voltages	Max Amps (FLA) Recommended Breaker/Service (MCA)
	480VAC / 3P / 60Hz (STANDARD)	46 Amps (std) 53.1 Amps (std)

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

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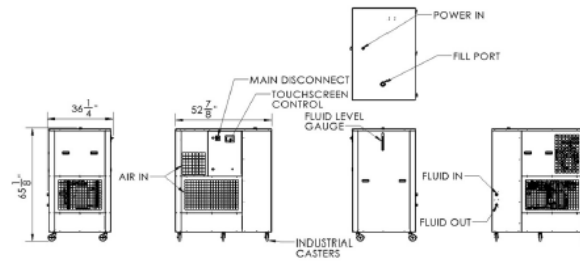




NSC1000-ULT

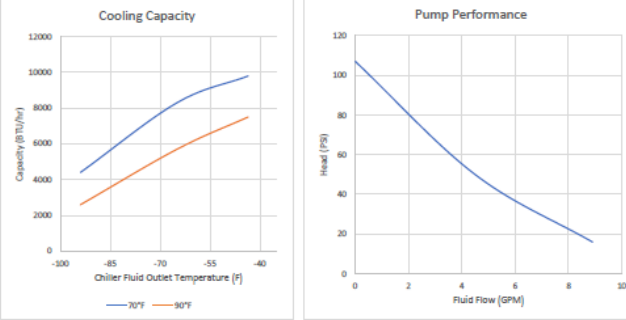
1 Ton Air Cooled Ultra Low Temp Chiller

Dimensional Drawings



LENGTH	WIDTH	HEIGHT	WEIGHT	TANK CAPACITY	FLUID CONNECTIONS
36 1/4"	52 7/8"	65 1/8"	1150 lbs	5 Gallon Stainless Steel	1/2" NPT

Chiller Performance



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NSC1000-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	-94°F (-70°C) - 4,400 BTU/hr (1,290 Watts) -65°F (-53.9°C) - 8,300 BTU/hr (2,430 Watts) -43.6°F (-42°C) - 9,800 BTU/hr (2,870 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	
	Compressor	Copeland Scroll	
Refrigeration Circuit	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	
	Max Heat Rejection	31,450 BTU/hr (9.2 kW)	
Process Fluid Circuit	Pump	Continuous Duty, 0.75kW Vortex Pump	
	Inlet/Outlet	1/2" NPT	
	Reservoir	5 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)	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)
	200-240VAC / 3P / 60Hz (STANDARD) 480VAC / 3P / 60Hz	25 Amps (std)	30 Amps (std)

Optional Upgrades

UPGRADES	Process Heating UL/CSA Outdoor Certified Extended Ambient (-15°F)	External Temperature Monitoring Alternate Pumps	Controller Crating
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More Options and Customization Available - Contact Factory for More Information

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