



AG10000-SLT w/AG5000-ULT BHO EXTRACTION

420 lbs/hr (7 lbs/min) 70/30 Solvent Condensed and Subcooled to -54°C (-65°F)

CALCULATIONS

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

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	122	°F
Desired Outlet Temperature	5	°F
Ambient	90°F	
Required dT	-18	°F
Flow Rate:	7.00	lb/min

Condensing Temperature 8.06F (-13.3C)

Absolute minimum capacity	92120	BTU/hr
	27.00	kW

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

Chiller Options at -13°F fluid outlet and 90°F Ambient			
Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
AG10000-SLT	117,000	34,259	27%

Calculations

Inlet Temperature	50.00	°C
Outlet Temperature	-15.00	°C
Flow Rate	0.00000	m ³ /min
Specific Heat (Liquid)	2.3500	kJ/kg °K
Specific Heat (Gas)	1.7150	kJ/kg °K
Density	588.1	kg/m ³
Mass flow rate	0.0529191	kg/sec
Volume	1.1	m ³
Mass	667.9	kg
Static System Power	0.0	kW
Heat of Vaporization	397.6	kJ/kg
Condensing Temperature	-13.3	°C
Start Phase	Gas	
End Phase	Liquid	
Phase Change Energy	21.040639	kW
Flowing System Power (Gas)	5.7448725	kW
Flowing System Power (Liquid)	0.2114119	kW
Flowing System Power	26.996924	kW
Required dT	-9.9	°C

From 5°F (-15°C) Condensed and Chilled to -65°F (-54°C):

Flowing System	Yes	
Material being cooled flowing through chiller?	No	
Fluid	70/30 (Butane/Propane)	
Inlet Temperature	5	°F
Desired Outlet Temperature	-65	°F
Ambient	90°F	
Required dT	-18	°F
Flow Rate:	7.00	lb/min

Condensing Temperature 8.06F (-13.3C)

Absolute minimum capacity	16510	BTU/hr
	4.84	kW

Chiller Options at -83°F fluid outlet and 90°F Ambient			
Chiller Model	Capacity (BTU/hr)	Capacity (Watts)	% Oversized
AG5000-ULT	37,600	11,010	128%

Calculations

Inlet Temperature	-15.00	°C
Outlet Temperature	-53.89	°C
Flow Rate	0.00000	m ³ /min
Specific Heat (Liquid)	2.3500	kJ/kg °K
Specific Heat (Gas)	1.7150	kJ/kg °K
Density	588.1	kg/m ³
Mass flow rate	0.0529191	kg/sec
Volume	1.1	m ³
Mass	667.9	kg
Static System Power	0.0	kW
Heat of Vaporization	397.6	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)	4.836219	kW
Flowing System Power	4.836219	kW
Required dT	-9.9	°C

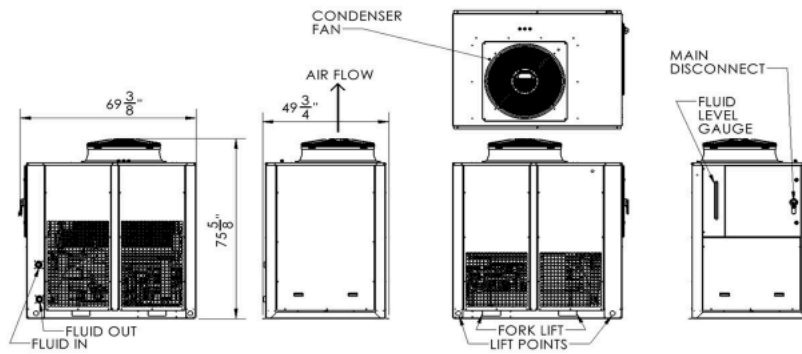
Chiller Technical Data Sheets



AG10000-SLT

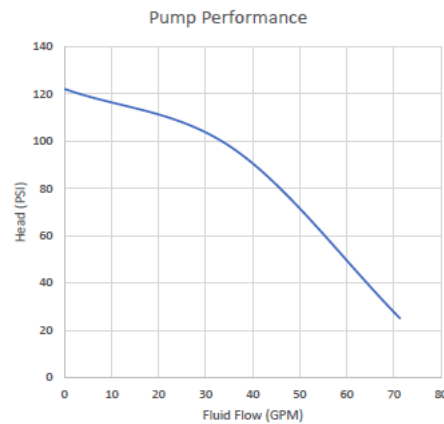
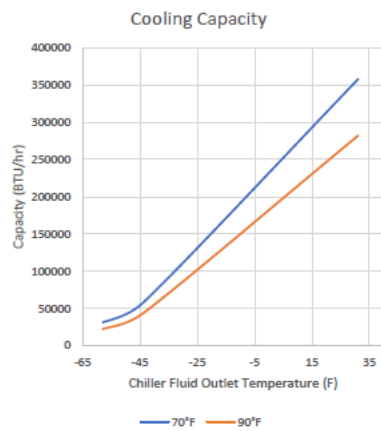
10 Ton Air Cooled Super Low Temp Chiller (Qty 2 AG5000-SLT)

Dimensional Drawings



LENGTH	WIDTH	HEIGHT	WEIGHT	TANK CAPACITY	FLUID CONNECTIONS
60 3/4"	76 3/8"	80 5/8"	1950 lbs	30 Gallon Stainless Steel	1-1/2" NPT

Chiller Performance



AG-Optimists, LLC
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 Salt Lake City, UT 84119
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Chiller Technical Data Sheets



AG10000-SLT

Standard Features and Benefits			
Performance	Working Temperature Range	-58°F(-50°C) to 10°F(-12°C)	
	Temperature Stability	±2	
	Cooling Capacity at 70F	-58°F (-50°C) - 31,100 BTU/hr (9,110 Watts) -43.6°F (-42°C) - 58,900 BTU/hr (17,260 Watts) 31.1°F (-0.5°C) - 358,000 BTU/hr (104,920 Watts)	
	Ambient Temperature (Standard)	20°F - 100°F	
	Pump Performance	0 GPM @ 122 PSI 35.7 GPM @ 97 PSI 71.3 GPM @ 25 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	Brazed Plate Heat Exchanger	
	Refrigerant	R404a	
	Additional Features	Access Ports, Service Valves, Filter Drier, Sight Glass, Liquid Receiver, Suction Accumulator, Thermostatic Expansion Valve (TXV)	
	Max Heat Rejection	165,100 BTU/hr (48.3 kW)	
Process Fluid Circuit	Pump	Continuous Duty, 7.5kW Vortex Pump	
	Inlet/Outlet	1-1/2" NPT	
	Reservoir	30 Gallon Stainless Steel	
	Additional Features	Inline Strainer, Inlet and Outlet Temperature Sensors, Pump Discharge Pressure Transducer	
Construction	Frame	Galvanized Steel	
	Enclosure	Powder Coated Steel Enclosure with Easy Access Panels	
	Warranty	1 Year Standard Warranty	
Quality	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)	92 Amps (std)	106.2 Amps (std)

Optional Upgrades			
UPGRADES	Extended Ambient (-15°F) Crating	External Temperature Monitoring Alternate Pumps	Controller Auto Start Remote Start
	More Options and Customization Available - Contact Factory for More Information		

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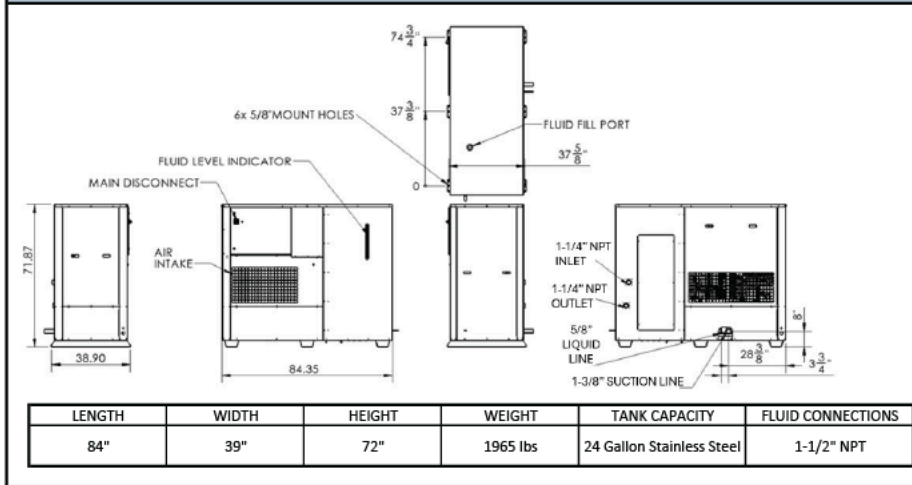
Chiller Technical Data Sheets



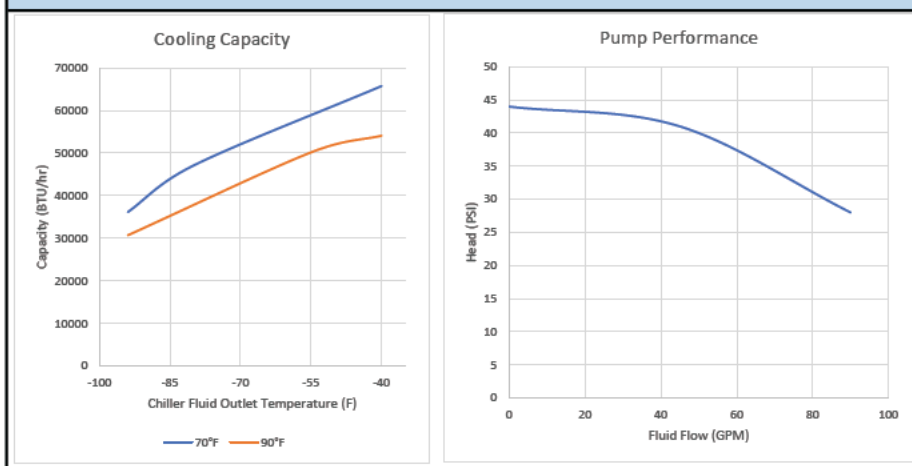
AG5000-ULT

Five Ton Air Cooled Ultra Low Temp Chiller

Dimensional Drawings



Chiller Performance



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Chiller Technical Data Sheets



AG5000-ULT

Standard Features and Benefits		
Performance	Working Temperature Range	-112°F(-80°C) to 70°F(21°C)
	Temperature Stability	±2
	Cooling Capacity at 70F	-94°F (-70°C) - 36,200 BTU/hr (10,610 Watts) -80°F (-62.2°C) - 47,100 BTU/hr (13,800 Watts) -40°F (-40°C) - 65,800 BTU/hr (19,280 Watts)
	Ambient Temperature (Standard)	40°F - 100°F
	Pump Performance	0 GPM @ 44 PSI 45 GPM @ 41 PSI 90 GPM @ 28 PSI
User Interface	Controls	Electronic Programmed Temperature Controller (PLC) with Constant (Setpoint & Process) Temperature Readout
	Additional Features	Fluid Level Indicator, Touch Screen Controls, IO Remote Chiller Control System
Refrigeration Circuit	Compressor	Copeland Discus
	Heat Exchanger	Brazed Plate Heat Exchanger
	Refrigerant	R508B
	Additional Features	Access Ports, Service Valves, Filter Drier, Sight Glass, Liquid Receiver, Thermostatic Expansion Valve (TXV), Oil Separator
	Max Heat Rejection	40,000 BTU/hr (11.7 kW)
Process Fluid Circuit	Pump	Continuous Duty, 5 HP Centrifugal Pump
	Inlet/Outlet	1-1/2" NPT
	Reservoir	24 Gallon Stainless Steel
	Additional Features	Inline Strainer, Inlet and Outlet Temperature Sensors, Pump Discharge Pressure Transducer
Construction	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)	26.7 Amps (std) 31.4 Amps (std)

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

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This Model Utilizes the AG5000-ECU External Condensing Unit

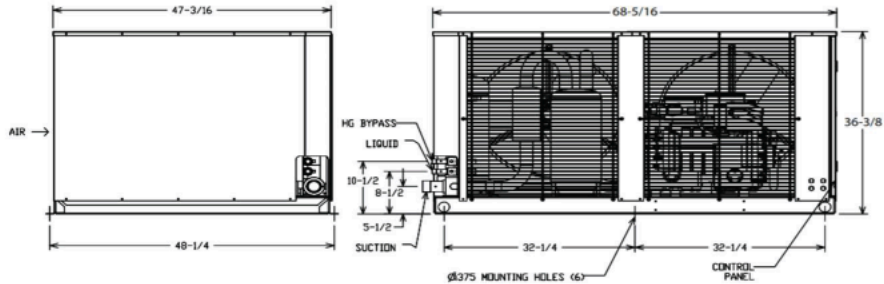
Chiller Technical Data Sheets



AG5000-ECU

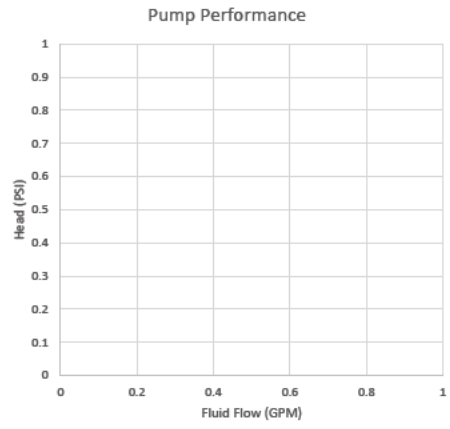
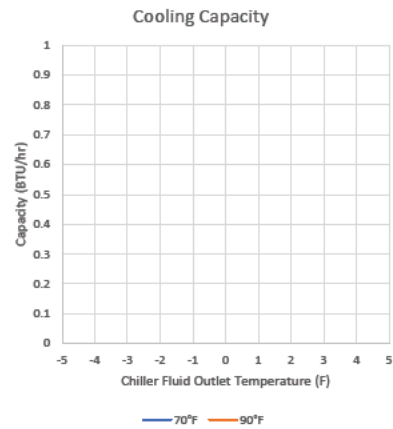
Five Ton External Condensing Unit

Dimensional Drawings



LENGTH	WIDTH	HEIGHT	WEIGHT	TANK CAPACITY	FLUID CONNECTIONS
48 1/4"	68 5/16"	36 3/8"	1080 lbs	N/A	5/8" AND 1-3/8" (OD)

Chiller Performance



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Chiller Technical Data Sheets



AG5000-ECU

Standard Features and Benefits			
Performance	Working Temperature Range	N/A	
	Temperature Stability	N/A	
	Cooling Capacity at 70F		
	Ambient Temperature (Standard)	20°F - 100°F	
	Pump Performance		
User Interface	Controls	High and Low Pressure Switch	
	Additional Features	N/A	
Refrigeration Circuit	Compressor	Copeland Discus	
	Heat Exchanger	N/A	
	Refrigerant	R404A	
	Additional Features	Access Ports, Service Valves, Liquid Receiver, Sight Glass, Oil Separator	
	Max Heat Rejection	195,000 BTU/hr (57.1 kW)	
Process Fluid Circuit	Pump		
	Inlet/Outlet	5/8" AND 1-3/8" (OD)	
	Reservoir	N/A	
	Additional Features	N/A	
Construction	Frame	Galvanized Steel	
	Enclosure	Painted Steel Enclosure with Easy Access Panels	
Quality	Warranty	1 Year Standard Warranty	
	UL/CSA Certified (Full Assembly)	Certified for Outdoor Use cULus	
	Manufacturing	Manufactured in the U.S.A.	
Power	Available Voltages	Max Amps (FLA)	Recommended Breaker/Service (MCA)
	480VAC / 3P / 60Hz (STANDARD)	27.3 Amps (std)	34.2 Amps (std)

Optional Upgrades	
UPGRADES	Extended Ambient (-15°F)
More Options and Customization Available - Contact Factory for More Information	

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