



SUBMITTAL DATA

Job Name

Augustana Lutheran

For

Scroll Chiller

Prepared By

Bill Roan

Date

12/20/2023

Job Information		Item Summary	
Job Name	Augustana Lutheran Chrurch	Date	12/20/2023
Model	AGZ008F	Software Version	14.70
Unit Tag	Scroll R32 B		

Unit Options		
Code Item	Code Value	Description
1	AGZ	UNIT TYPE; AIR COOLED SCROLL CHILLER
2	008	FAN NUMBER; 8 Fan
3	F	VINTAGE; F Vintage
4	UUNNSUNN	COMPRESSOR SIZE; UUNNSUNN
5	S	UNIT MAKEUP; Standard Efficiency
6	U	BASE; Unpainted Base
7	PK	CONSTRUCTION; Packaged
8	PPA502H190	EVAPORATOR TYPE/SIZE; PPA502H190
9	NS16	TUBE MATERIAL; 316 SS
10	U1GS	HEAD CONFIGURATION; Universal 1 Pass Grooved
11	8	WATERSIDE PRESSURE; 650 PSIG
12	S	EVAPORATOR INSULATION; Single Layer to Suction at each Compressor
13	0440	LEAVING FLUID TEMP; Leaving Fluid Temp
14	P30	PERCENT OF GLYCOL; P30
15	M	CONDENSER COIL FINS; MicroChannel (Standard)
16	095095	AMBIENT TEMP; 095095
17	DV	FAN TYPE; AC Fan Motors & DC (First Fans DC / Circuit)
18	208V60H	VOLTAGE; 208V/60HZ/3Ph
19	AL	STARTER TYPE/FILTER; Across the Line Start
20	0650	INPUT RLA 1; 0650
21	0650	INPUT RLA 2; 0650
22	0430	INPUT RLA 3; 0430
23	0650	INPUT RLA 4; 0650
24	0000	INPUT RLA 5; Nameplate RLA
25	0000	INPUT RLA 6; Nameplate RLA
26	DH	POWER CONNECTION; HSCC w/ Single Pt. Disconnect SW & Circ. Prot.
27	S	SWITCH OPTIONS; Standard
28	N	SITELINE; None
29	CN	COMMUNICATION; Combination of Modbus, BACnet MS/TP, BACnet IP
30	M	DISPLAY OPTION; Door Mounted Display
31	N	GROUND FAULT; None
32	N	OUTLET; None
33	A	WATER FLOW INDICATOR; Water Flow Indication on Evaporator
34	N	RESTORE; Standard
35	N	CONTROL BOX AMBIENT; None
36	N	CONTROL BOX HEATER; None
37	V	PHASE VOLTAGE; Phase & under/over voltage protection
38	S	FAN DESIGN TYPE; Standard
39	C	GUARDS; Cond. Coils Louvers & Base Wire Grilles
40	NN	TANKS; None
41	ST	SOUND; Standard Sound
42	NN	SPECIAL CONSTRUCTION; Standard
43	J	BRAND NAME; Daikin
44	E	AGENCY APPROVAL; With ETL Label
45	A	AHRI APPROVAL; With AHRI Label

Code Item	Code Value	Description
46	A	ASHRAE APPROVAL; With ASHRAE Label
47	N	CRN-EVAPORATOR; No CRN Required
48	B	SHIPPING/PACKAGING; Bagged - Type A or B
49	W	WATER PUMP HP; Without Pumps
50	N	PUMP POWER SUPPLY; None
51	N	PUMP SPEED; None
52	N	PUMP NUMBER; None
53	0321	PUMP FLOW; 0321
54	NNN	PUMP HEAD; None
55	N	PUMP PACKAGE STARTER; No Pump Package
56	N	PUMP GUAGES; No Pressure Guages
57	NNNN	PUMP IMPELLER SIZE; No Pumps
	NNNNNNN	
58	NNNNNNN	PUMP PART NUMBER; No Pumps
	NN	
59	DSU	UNIT START; Domestic Startup
60	DPN	1ST YEAR WARRANTY ; Unit Parts Only Warranty
61	CPE4	EXT. COMPRESSOR WARRANTY; Comp. Only - Ext. 4yr Parts Only (5 Years Total)
62	NNNN	EXT. UNIT WARRANTY; None
63	NNN	REFRIGERANT WARRANTY; None
64	D00	DELAYED WARRANTY START; Additional Months: 0 [12-18] STD
65	S	UNIT MISC; Standard Unit
66	F0	TESTING; Functional Test
67	050	CIRC 1 REFRIGERANT QTY; 050
68	050	CIRC 2 REFRIGERANT QTY; 050
69	NHT	PUMP HEAT TRACE; No Pump Heat Trace
70	ERRS	TUBING OPTIONS; EEXV, Repl FD, Liq/Disch Shutoff, HS Relief
71	WSV	SUCTION VALVE; With Shutoff Valve
72	NHG	HOT GAS BYPASS OPTION; No Hot Gas
73	S	SHIP; Standard Ship
74	00	UNIT REVISION; Major Unit Change Revision
75	4	PUMP CONN AT EVAP; 4.0 inch
76	N	PUMP SUCTION VALVE; No Pump Package Suction Valve Shutoff
77	N	PUMP DISCHARGE VALVE; No Pump Package Discharge Valve Shutoff
78	126	UNIT TONS; 126
79	0968	UNIT EER; 0968
80	1644	UNIT IPLV; 1644
81	2	REFRIGERANT TYPE; R32
82	00389	LRA AMPS 1; 00389
83	00389	LRA AMPS 2; 00389
84	00263	LRA AMPS 3; 00263
85	00389	LRA AMPS 4; 00389
86	00000	LRA AMPS 5; Amps
87	00000	LRA AMPS 6; Amps
88	00000	LRA AMPS 7; Amps
89	00000	LRA AMPS 8; Amps
90	0000	INPUT RLA 7; Nameplate RLA
91	0000	INPUT RLA 8; Nameplate RLA
92	0627	MCA 1; 0627
93	0000	MCA 2; MCA
94	0000	MCA 3; MCA
95	0700	MOCP 1; 0700
96	0000	MOCP 2; MOCP

Code Item	Code Value	Description
97	0000	MOCP 3; MOCP
98	0800	DS SW 1; 0800
99	0000	DS SW 2; DS SW 2
100	0000	DS SW 3; DS SW 3
101	M	MANUFACTURING LOCATION; SLP

Accessories			
Part Number	Description	Qty	Ext Qty
334767527	Spring Isolator Kit AGZ; Gray1	2	2
334767530	Spring Isolator Kit AGZ; Dark Green2	4	4

Job Information		Technical Data Sheet
Job Name	Augustana Lutheran Church	
Date	12/20/2023	
Submitted By	Bill Roan	
Software Version	14.70	
Unit Tag	Scroll R32 B	



Image may not represent ordered unit

Unit Overview					
Model Number	Capacity ton	Voltage	Unit Starter Type	ASHRAE 90.1	LEED Enhanced Refrigerant Management Credit
AGZ008F	126.3	208 V / 60 Hz / 3 Ph	Across the Line	'07, '10, '13, '16 & '19	Pass

Unit								
Unit Type				Platform			Unit Revision	
Air-Cooled Scroll Compressor Chiller				Packaged			00	
Display				Tubing				
Door Mounted Display				High Stage Relief Valve				
Refrigerant Type				Refrigerant Weight				
R32				100 lb (per unit)				
Compressor				Approval				
UUNNSUNN				ETL/cETL, AHRI & ASHRAE 90.1				
Evaporator								
Fluid Volume:		12.8 gal						
Connection Hand:		Universal, 1-Pass, Grooved, Standard Head						
Connection Size:		4.0 in						
Insulation:		Single Layer Insulation to Suction at each Compressor						
Entering Fluid Temperature	Leaving Fluid Temperature	Fluid Type	Glycol Concentration	Fluid Flow	Fluid Flow (with glycol) Min / Max	Pressure Drop	Pressure Drop (with glycol) Min / Max	Fouling Factor
54.00 °F	44.00 °F	Propylene Glycol	30.0 %	321.0 gpm	174.5 / 548.6 gpm	13.1 ft H ₂ O	4.50 / 35.1 ft H ₂ O	0.000100 °F.ft ² .h/Btu

Note: Evaporator Pressure Drop does not include a strainer. Minimum flow is based on a Constant Flow Pumping System Type.

Condenser			
Coil Fins:	MicroChannel		
Guards:	Condenser Coil Louvers & Base Frame Wire Grilles		
Design Ambient Air Temperature	Altitude	Fan Diameter	Minimum Design Ambient Temperature
95.0 °F	5420 ft	31.5 in	20.0 °F

Unit Performance

Design			
Capacity	Input Power	Efficiency (EER)	IPLV.IP (EER)*
126.3 ton	156.6 kW	9.677 Btu/W.h	16.44 Btu/W.h

Performance Points rated at AHRI Ambient Relief - with Glycol										
Unit					Evaporator				Condenser	
Point #	% Load	Capacity ton	Input Power kW	Efficiency (EER) Btu/W.h	Fluid Flow gpm	Pressure Drop ft H ₂ O	Entering Fluid °F	Leaving Fluid °F	Ambient Air °F	Altitude ft
1	100.0	126.3	156.6	9.677	321.0	13.1	54.00	44.00	95.0	5420
2	75.0	94.70	88.60	12.83	321.0	13.1	51.50	44.00	80.0	5420
3	50.0	63.13	45.20	16.76	321.0	13.1	49.00	44.00	65.0	5420
4	25.0	31.57	20.99	18.05	321.0	13.1	46.50	44.00	55.0	5420

Performance Points rated at AHRI Standard Conditions - with Water					
Point #	% Load	Capacity ton	Input Power kW	Efficiency (EER) Btu/W.h	
1	100	132.9	152.3	10.47	
2	75	99.69	86.20	13.88	
3	50	66.46	43.98	18.13	
4	25	33.23	20.42	19.53	

* IPLV reflects AHRI standard rating conditions with water and does not change with user defined conditions

Sound (without insulation)

Sound Pressure (at 30 feet)								
63 Hz dB	125 Hz dB	250 Hz dB	500 Hz dB	1 kHz dB	2 kHz dB	4 kHz dB	8 kHz dB	Overall dBA
47	54	57	64	62	68	57	53	71

Sound Power								
63 Hz dB	125 Hz dB	250 Hz dB	500 Hz dB	1 kHz dB	2 kHz dB	4 kHz dB	8 kHz dB	Overall dBA
74	81	84	91	89	95	84	80	98

Octave band is non 'A' weighted and overall readings are 'A' weighted. Sound data rated in accordance with AHRI Standard-370.

Physical

Unit				
Length*	Height	Width*	Shipping Weight*	Operating Weight*
170 in	99 in	88 in	7012 lb	7126 lb

* Shipping and operating weights are based on 'worst case' unit configuration variations but do not include the weights of any Options or Accessories. Contact Chiller Applications for additional information.

Electrical

Unit Electrical Data				
Voltage		Starter Type	Fan Motor Quantity	FLA Fan Motors (each)
208 V / 60 Hz / 3 Ph		Across the Line	8	3.3 A
Power Connection Type:	65 KAIC SCCR with Single Point Disconnect Switch			
Short Circuit Current Rating:	65KA kA			
Phase Voltage:	Phase & Under/Over Voltage Protection with LED			
Single Point Power Connection				
Minimum Circuit Ampacity (MCA):	627 A			
Recommended Overcurrent Protection Size:	700 A			
Maximum Overcurrent Protection Size(MOCP):	700 A			
Lug Connection Size:	(3) 3/0-400MCM			
Compressor Electrical Data				
Compressor Type		Compressor Quantity		Starter Type
Scroll		4		Across the Line
Circuit #:	1		2	
Compressor #:	1	3	2	4
Rated Load Amps (RLA):	65 A	43 A	65 A	65 A
Inrush Current:	389 A	263 A	389 A	389 A

Options

Basic Unit	
Suction Shut-off Valve:	Included
Control	
Communication:	Combination of Modbus, BACnet MS/TP, BACnet IP
Electrical	
Water Flow Indicator:	Included

Warranty

Unit Startup	Domestic
Standard Warranty:	1st Year Entire Unit Parts only
Extended Compressor Warranty:	Compressor Only; extended 4 years parts only (5 Years Total)

AHRI Certification



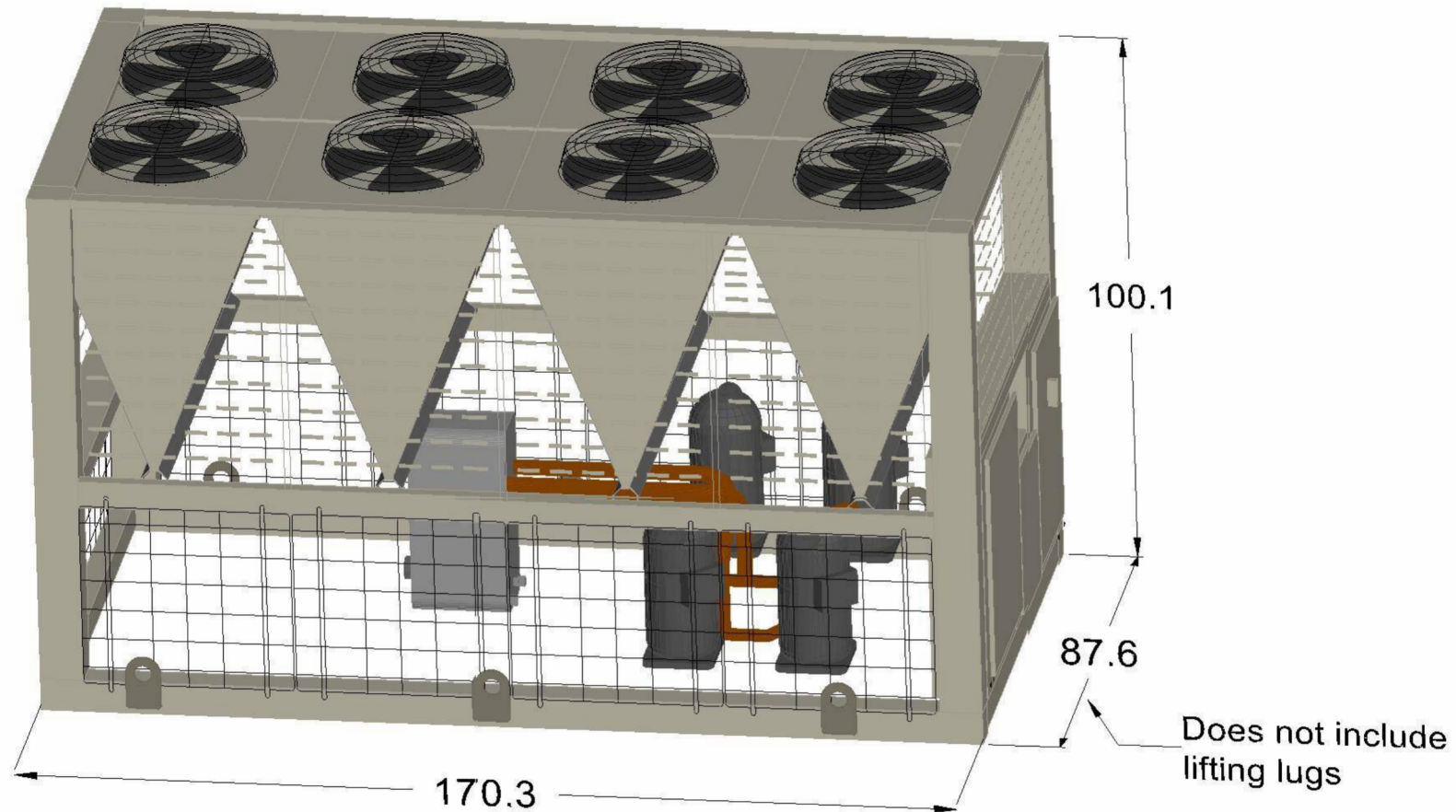
Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found In the AHRI Directory at www.ahridirectory.org. Unit contains freeze protection liquids in the evaporator and is certified when rated per the Standard with water.

Performance at AHRI Standard Condition – with Water										
Unit					Evaporator				Condenser	
% Load	Capacity ton	Input Power kW	Efficiency (EER) Btu/W.h	IPLV,IP* (EER) Btu/W.h	Fluid Flow gpm	Pressure Drop ft H ₂ O	Entering Fluid °F	Leaving Fluid °F	Ambient Air °F	Altitude ft
100	132.9	152.3	10.47	16.44	318.1	10.0	54.00	44.00	95.0	0.000

Note: Performance with water given as reference only to show compliance with AHRI Standard 550/590. Unit will be configured from the factory to support glycol performance as rated. The unit must not operate with water only without consulting the factory.

Accessories

Mandatory	
Part Number	Description
334767527	Spring Isolator Kit AGZ; Gray1
334767530	Spring Isolator Kit AGZ; Dark Green2




NOTE: A water strainer must be installed at the inlet of the evaporator to protect it from damage. Please refer to the IOM for additional details.

Trailblazer® Air-Cooled Scroll	Unit Tag: Scroll R32 B			Sales Office: Long Building Technologies			<div></div> <div>13600 Industrial Park Blvd. Minneapolis, MN 55441</div> <div>www.DaikinApplied.com Software Version: 14.70</div>
Product: Trailblazer® Air-Cooled Scroll	Project Name: Augustana Lutheran			Sales Engineer: Bill Roan			
Model: AGZ008F	Dec. 20, 2023	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	

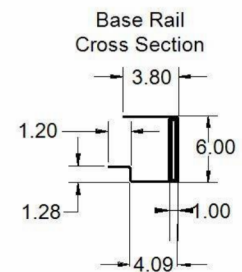
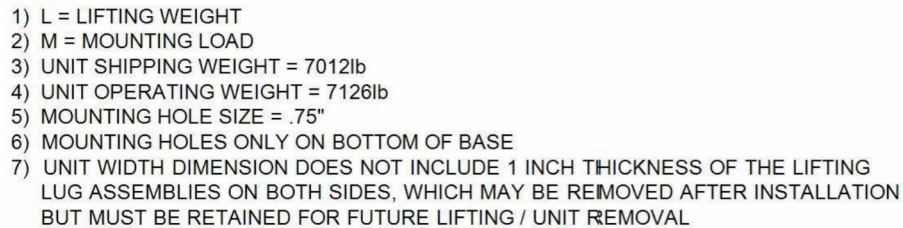
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Top view diagram of the C-Box showing dimensions and power entry location. The diagram indicates a 2x4 grid of fans. Dimensions are provided for the overall width (64.8), height (44.4), and spacing between fans (12.7 and 11.6). A callout points to the bottom right corner, indicating the location of the power entry: POWER ENTRY IN BOTTOM OF C-BOX REMOVABLE COVER 9 X 12.5 OPENING.

Trailblazer® Air-Cooled Scroll		Unit Tag: Scroll R32 B		Sales Office: Long Building Technologies			 13600 Industrial Park Blvd. Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 14.70
Product: Trailblazer® Air-Cooled Scroll		Project Name: Augustana Lutheran		Sales Engineer: Bill Roan			
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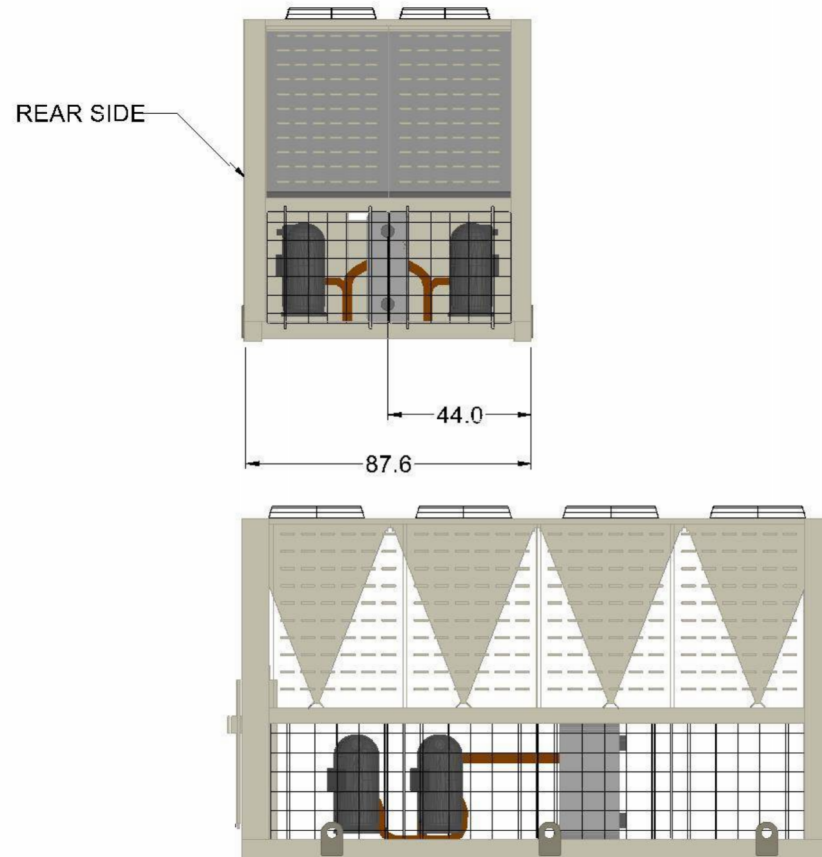
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BASE FRAME TOP VIEW




Trailblazer® Air-Cooled Scroll		Unit Tag: Scroll R32 B		 13600 Industrial Park Blvd. Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 14.70	
Product: Trailblazer® Air-Cooled		Project Name: Augustana Lutheran			
Model: AGZ008F		Sales Office: Long Building			
Sales Engineer: Bill Roan		Dec. 20, 2023	Ver/Rev:	Sheet 1 of 1	Scale: NTS Tolerance: +/-0.25" Dwg Units: (in)
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LEFT VIEW

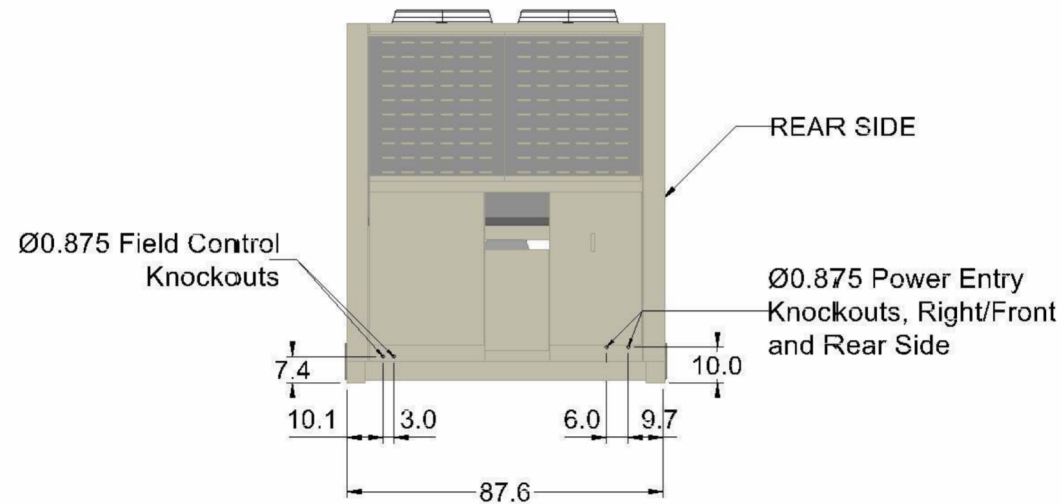


REAR VIEW

Trailblazer® Air-Cooled Scroll	Unit Tag: Scroll R32 B			Sales Office: Long Building Technologies			 13600 Industrial Park Blvd. Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 14.70
Product: Trailblazer® Air-Cooled Scroll	Project Name: Augustana Lutheran			Sales Engineer: Bill Roan			
Model: AGZ008F	Dec. 20, 2023	Ver/Rev:	Sheet: 1 of 1	Scale: NTS	Tolerance: +/- 0.25"	Dwg Units: (in)	

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Right VIEW



Trailblazer® Air-Cooled Scroll

Product: Trailblazer® Air-Cooled Scroll

Model: AGZ008F

Unit Tag: Scroll R32 B

Project Name: Augustana Lutheran

Dec. 20, 2023

Ver/Rev:

Sheet: 1 of 1

Sales Office: Long Building Technologies

Sales Engineer: Bill Roan

Scale: NTS

Tolerance: +/- 0.25"

Dwg Units: (in)



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AGZ-F Close Spacing Performance

Case 1 - Wall on One Side

For 4-6 fans: Use 4 ft minimum clearance from any solid height wall taller than unit.

For 8 fans: Use 6 ft minimum clearance from any solid height wall taller than unit. Refer to Case 4 for partial open wall.

For 10-14: Use 8 ft minimum clearance from any solid height wall taller than unit. Refer to Case 4 for partial open wall.

Case 2 - Two Units Side by Side - % Capacity Reduction & Power Increase for Different Spacing between Units.

Distance Between 2 Units # of Fans	4 Feet		5 Feet		6 Feet		8 Feet	
	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit
4	0	0	0	0	0	0	0	0
6	1.0%	1.5%	0.5%	0.7%	0	0	0	0
8	2.0%	3.0%	1.2%	1.7%	0.5%	0.7%	0	0
10	2.5%	3.6%	2.0%	3.0%	1.4%	2.0%	0.7%	1.0%
12	NR	NR	NR	NR	2.5%	3.5%	2.0%	3.0%
14	NR	NR	NR	NR	3.0%	4.0%	2.5%	3.5%

Note (1): Distance between can only be reduced if the 8Ft (2.4) clearance is on the outside of the two units for Coil removal.

Note (2): NR=Not recommended due to air recirculation and elevated condenser pressure and elevated power input.

Case 3 - Three Units Side by Side - For Outside Units on each side of the middle Unit - See Case 2 above.

% Capacity Reduction & Power Increase for Different Spacing for the middle Unit with a unit on each side.

Distance Between 2 Units # of Fans	4 Feet		5 Feet		6 Feet		8 Feet	
	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit	% -Cap. Reduct. Unit	% Power Increase Unit
4	1.0%	2.0%	0	0	0	0	0	0
6	NR	NR	1.0%	2.0%	0	0	0	0
8	NR	NR	NR	NR	2.0%	3.0%	1.4%	2.1%
10	NR	NR	NR	NR	3.0%	4.5%	2.0%	3.0%
12	NR	NR	NR	NR	4.0%	6.0%	3.0%	4.5%
14	NR	NR	NR	NR	5.0%	7.5%	4.0%	6.0%

Note (3): One Side of the middle Unit must have 8ft (2.4) clearance for Coil Removal.

Note (4): The center unit of 3 units located side by side is affected by the hot discharge from units on each side. Cool ambient air must come from the air space at unit ends.

Product Drawing

Product: Trailblazer® Air-Cooled

Model: AGZ008F

Sales Engineer: Bill Roan

Unit Tag: Scroll R32 B

Project Name: Augustana Lutheran Church

Sales Office: Long Building Technologies

Dec. 20, 2023

Ver/Rev:

Sheet 1 of 3

Scale: NTS

Tolerance: +/-1.0"

Dwg Units: in [mm]



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AGZ-F Close Spacing Performance

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Case 4 Open Screening Walls - % open Wall area vs. Distance in Ft. from Unit

% Open Wall Area		0%	10%	20%	30%	40%	50%
# of Fans	Distance from Wall						
4	Ft	5.0	4.4	4.0	4.0	4.0	4.0
6	Ft	6.0	5.4	4.8	4.0	4.0	4.0
8	Ft	6.5	5.9	5.4	4.5	4.0	4.0
10	Ft	7.0	6.4	5.8	5.2	4.6	4.0
12	Ft	8.0	7.4	6.8	6.2	5.6	5.0
14	Ft	8.0	7.4	6.8	6.2	5.6	5.0

Note (1): One Side of the Unit must have 8ft (2.4) clearance for Coil Removal

Case 5 Pit/Solid Wall Installation - % Full Load Capacity Reduction

Height of Wall (ft)		Up to 8	10	12	13	14
# of Fans	Distance from Wall					
4	4 Ft	0.0%	1.4%	6.0%	Not Allowed	
	5 Ft	0.0%	0.8%	3.2%		
	6 Ft	0.0%	0.0%	0.8%	1.6%	3.0%
6-8	< 5 Ft	Not Allowed				
	5 Ft	0.5%	1.5%	6.0%	Not Allowed	
	6 Ft	0.0%	0.8%	3.2%		
	8 Ft	0.0%	0.0%	0.9%	1.6%	3.0%
10	< 6 Ft	Not Allowed				
	6 Ft	0.5%	1.5%	6.0%	Not Allowed	
	8 Ft	0.0%	0.8%	3.3%		
	10 Ft	0.0%	0.0%	0.8%	1.6%	3.0%
12-14	< 6 Ft	Not Allowed				
	6 Ft	0.8%	1.8%	7.2%	Not Allowed	
	8 Ft	0.0%	1.0%	4.0%		
	10 Ft	0.0%	0.0%	1.0%	1.9%	3.6%

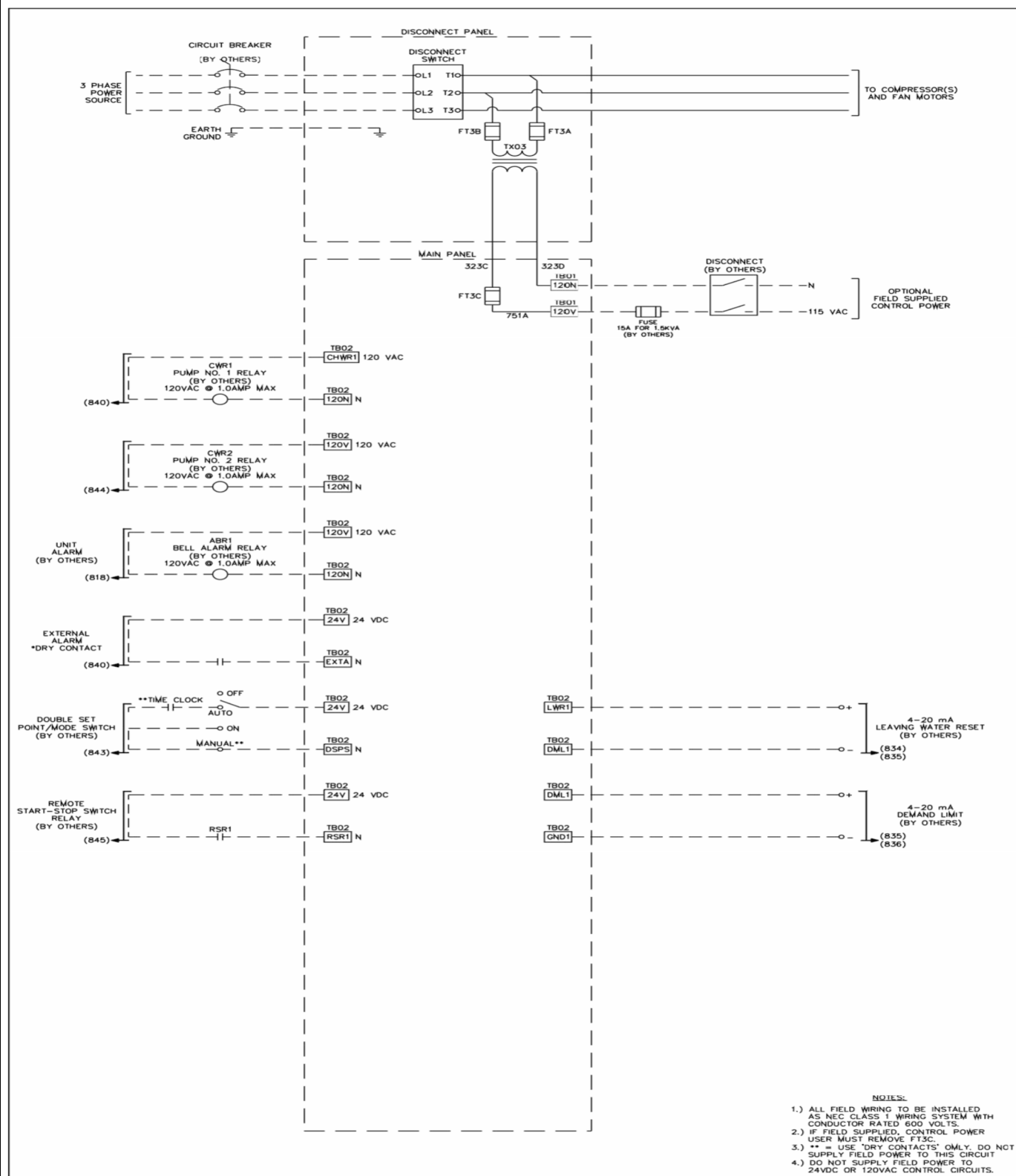
AGZ-F Close Spacing Performance

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Case 5 Pit/Solid Wall Installation - % Full Load Power Increase

Height of Wall (ft)		Up to 8	10	12	13	14
# of Fans	Distance from Wall					
4	4 Ft	0.6%	2.0%	9.0%	Not Allowed	
	5 Ft	0.3%	1.2%	4.8%	9.0%	
	6 Ft	0.0%	0.0%	1.2%	2.5%	4.5%
6-8	< 5 Ft	Not Allowed				
	5 Ft	0.7%	2.1%	9.0%		
	6 Ft	0.4%	1.2%	4.8%	9.0%	
	8 Ft	0.0%	0.0%	1.2%	2.4%	4.5%
10	< 6 Ft	Not Allowed				
	6 Ft	0.6%	2.1%	9.0%		
	8 Ft	0.4%	1.2%	4.7%	9.0%	
	10 Ft	0.0%	0.0%	1.2%	2.4%	4.6%
12-14	< 6 Ft	Not Allowed				
	6 Ft	0.7%	2.5%	10.8%		
	8 Ft	0.5%	1.4%	5.6%	10.8%	
	10 Ft	0.0%	0.0%	1.4%	2.9%	5.5%

AGZ-F Single-Point Connection Field Wiring Diagram



Field Wiring Diagram

Unit Tag: Scroll R32 B

Product: Trailblazer® Air-Cooled

Project Name: Augustana Lutheran

Model :AGZ008F Single-Point Connection

Sales Office: Long Building

Sales Engineer: Bill Roan

Dec. 20, 2023

Ver/Rev:

Sheet 1 of 1



13600 Industrial Park Blvd. Minneapolis, MN 55441

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Software Version: 14.70

Scale: N/A


Tolerance: N/A

Dwg Units: N/A

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Note (1): One Side for Compressor removal and the other side for Compressor/Coil removal

Opposite End	Service access is required to both ends of the unit. Safety codes require a minimum of 4 ft clearance at the control box end End opposite the control box requires clearance for access to unit components
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Product Drawing		Unit Tag: Scroll R32 B		 13600 Industrial Park Blvd. Minneapolis, MN 55441 www.DaikinApplied.com Software Version: 14.70
Product: Trailblazer® Air-Cooled		Project Name: Augsburg Lutheran		
Model: AGZ008F		Sales Office: Long Building		
Sales Engineer: Bill Roan		Dec. 20, 2023	Ver/Rev: Sheet 1 of 1	
		Scale: NTS	Tolerance: +/-1.0"	Dwg Units: in [mm]
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PART 1: GENERAL

1.01 SUMMARY

A. Section includes design, performance criteria, refrigerants, controls, and installation requirements for air-cooled scroll compressor chillers.

1.02 REFERENCES

A. Comply with applicable Standards/Codes of AHRI 550/590, ANSI/ASHRAE 15, ETL, cETL, NEC, and OSHA as adopted by the State.

B. Units shall meet the efficiency standards of the current version of ASHRAE Standard 90.1, and FEMP standard 2012.

1.03 SUBMITTALS

A. Submit shop drawings and product data in accordance with the specifications.

B. Submittals shall include the following:

1. Dimensioned plan and elevation view drawings, required clearances, and location of all field connections
2. Summary of all auxiliary utility requirements such as electricity, water, etc. Summary shall indicate quality and quantity of each required utility.
3. Single line schematic drawing of the field power hookup requirements, indicating all items that are furnished.
4. Schematic diagram of control system indicating points for field interface/connection.
5. Diagram shall fully delineate field and factory wiring.
6. Installation and operating manuals.

1.04 QUALITY ASSURANCE

A. Qualifications: Equipment manufacturer must specialize in the manufacture of the products specified and have five years experience with the type of equipment and refrigerant offered.

B. Regulatory Requirements: Comply with the codes and standards specified.

C. Chiller manufacturer plant must be ISO Registered.

1.05 DELIVERY AND HANDLING

A. Chiller shall be delivered to the job site completely assembled and charged with refrigerant and oil by the manufacturer.

B. Comply with the manufacturer's instructions for rigging and handling equipment.

1.06 WARRANTY

A. Standard Warranty (Domestic): The refrigeration equipment manufacturer's guarantee shall be for a period of one year from date of equipment start-up but not more than 18 months from shipment. The guarantee shall provide for repair or replacement due to failure by material and workmanship that prove defective within the above period, excluding refrigerant.

B. 1st Year Labor Warranty: None included

C. Extended Compressor Warranty: Four (4) years extended compressor warranty, parts only.

D. Extended Unit Warranty: None.

E. Refrigerant Warranty: None.

F. Delay Warranty Start: None.

1.07 MAINTENANCE

A. Maintenance of the chillers shall be the responsibility of the owner and performed in accordance with the manufacturer's instructions.

PART 2: PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Daikin Applied
- B. (Approved Equal)

2.02 UNIT DESCRIPTION

- A. Provide and install as shown on the plans factory-assembled, factory-charged air-cooled scroll compressor packaged chillers in the quantity specified. Each chiller shall consist of hermetic tandem scroll compressor sets, brazed plate evaporator, air-cooled condenser section, microprocessor-based control system and all components necessary for controlled unit operation.
- B. Chiller shall be functionally tested at the factory to ensure trouble free field operation

2.03 DESIGN REQUIREMENTS

- A. Flow Range: The chiller shall have the ability to support variable flow range down to 40% of nominal design (based on AHRI conditions).
- B. Operating Range: The chiller shall have the ability to control leaving chilled fluid temperature from 15F to 65F.
- C. General: Provide a complete scroll compressor packaged chiller as specified herein and as shown on the drawings. The unit shall be in accordance with the standards referenced in section 1.02 and any local codes in effect.
- D. Refer to the schedule of performance on the drawings. The chiller shall be capable of stable operation to a minimum percentage of full load (without hot gas bypass) of 25%. Performance shall be in accordance with AHRI Standard 550/590.
- E. Acoustics: Sound pressure levels for the unit shall not exceed the following specified levels. All manufacturers shall provide the necessary sound treatment (parts and labor) to meet these levels if required. Sound data shall be provided with the quotation. Test shall be in accordance with AHRI Standard 370.

Sound Pressure (at 30 feet)											
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall dBA	75% Load dBA	50% Load dBA	25% Load dBA
Sound Power											
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	Overall dBA	75% Load dBA	50% Load dBA	25% Load dBA

2.04 CHILLER COMPONENTS

- A. Compressor
 - 1. The compressors shall be sealed hermetic, scroll type with crankcase oil heater and suction strainer. The compressor motor shall be refrigerant gas cooled, high torque, hermetic induction type, two-pole, with inherent thermal protection on all three phases and shall be mounted on RIS vibration isolator pads. The compressors shall be equipped with an internal module providing compressor protection and communication capability.
 - 2. Provide power factor correction capacitors for each compressor in order to raise compressor power factor to 0.95 at standard rating conditions. Capacitors shall be housed in a separate NEMA 3R rated enclosure and shall having fusing to protect the capacitors from over current. Fuse indicator lights shall be provided to provide visual indication that a fuse has blown.
- B. Evaporator

1. The evaporator shall be a compact, high efficiency, dual circuit, brazed plate-to-plate type heat exchanger consisting of parallel stainless steel plates. Vent and drain connections shall be provided in the inlet and outlet chilled water piping by the installing contractor.
2. The evaporator shall be protected with an external, electric resistance heater plate. The evaporator and suction piping to the compressors shall be insulated with 3/4" (19 mm) thick CFC and HCFC-free closed-cell flexible elastomeric foam insulation material with 100% adhesive coverage. The insulation shall have an additional outer protective layer of 3mm thick PE embossed film to provide superior damage resistance. Insulation without the protective outer film shall not be acceptable. UV resistance level shall meet or exceed a rating of 'Good' in accordance with the UNI ISO 4892 - 2/94 testing method. This combination of a heater plate and insulation shall provide freeze protection down to -20°F (-29°C) ambient air temperature.
3. The water-side maximum design pressure shall be rated at a minimum of 469 psig (3235 kPa).
Evaporators shall be designed and constructed according to, and listed by, Underwriters Laboratories (UL).

C. Condenser

1. Condenser fans shall be propeller type arranged for vertical air discharge and individually driven by direct-drive fan motors. The fans shall be equipped with a heavy-gauge vinyl-coated fan guard. Fan motors shall be TEAO type with permanently lubricated ball bearings, inherent overload protection, three-phase, direct-drive, 1140 rpm. Each fan section shall be partitioned to avoid cross circulation.
2. Coil shall be microchannel design and shall have a series of flat tubes containing multiple, parallel flow microchannels layered between the refrigerant manifolds. Tubes shall be 9153 aluminum alloy. Tubes made of 3102 alloy or other alloys of lower corrosion resistance shall not be accepted. Coils shall consist of a two-pass arrangement. Each condenser coil shall be factory leak tested with high-pressure air under water. Coils shall withstand 1000+ hour acidified synthetic sea water fog (SWAAT) test (ASTM G85-02) at 120°F (49°C) with 0% fin loss and develop no leaks.

D. Refrigerant Circuit

1. Each of the two refrigerant circuits shall include a replaceable-core refrigerant filter-drier, sight glass with moisture indicator, liquid line solenoid valve (no exceptions), expansion valve, and insulated suction line.

E. Construction

1. Unit formed sheet metal components shall be painted using a corrosion resistant paint system, for aesthetics and long-term durability. Paint system will include a base primer with a high-quality polyester resin topcoat. Painted galvanized parts shall be G60 or greater and finished, unabraded panel surfaces shall be capable to be exposed to an ASTM B117 salt spray environment and exhibit no visible red rust at a minimum of 3,000 hours exposure. Finished, abraded surfaces shall be tested per ASTM D1654, having a mean scribe creepage not exceeding 1/16" at 1,000 hours minimum exposure to an ASTM B117 salt spray environment.
2. Upper section of unit shall have protective and decorative louvers covering the coils and unit end; base section of unit shall have protective, 12 GA, PVC-coated, wire grille guards and have painted steel wraps enclosing the coil end sections and piping.

F. Control System

1. A centrally located weatherproof control panel shall contain the field power connection points, control interlock terminals, and control system. Box shall be designed in accordance with NEMA 3R rating. Power and starting components shall include factory circuit breaker for fan motors and control circuit, individual contactors for each fan motor, solid-state compressor three-phase motor overload protection, inherent fan motor overload protection and two power blocks (one per circuit) for connection to remote, contractor supplied disconnect switches. Hinged access doors shall be lockable. Barrier panels or separate enclosures are required to protect against accidental contact with line voltage when accessing the control system.
2. Shall include high short circuit current rating of 65,000 amps with single-point disconnect switch

G. Unit Controller

1. An advanced DDC microprocessor unit controller with a 5-line by 22-character liquid crystal display provides the operating and protection functions. The controller shall take preemptive limiting action in case of high discharge pressure or low evaporator pressure. The controller shall contain the following features as a minimum:
2. The unit shall be protected in two ways: (1) by alarms that shut the unit down and require manual reset to restore unit operation and (2) by limit alarms that reduce unit operation in response to some out-of-limit condition. Shut down alarms shall activate an alarm signal.
3. Shutdown Alarms
 - a. No evaporator water flow (auto-restart)
 - b. Sensor failures
 - c. Low evaporator pressure
 - d. Evaporator freeze protection
 - e. High condenser pressure
 - f. Outside ambient temperature (auto-restart)
 - g. Motor protection system
 - h. Phase voltage protection (Optional)
4. Limit Alarms
 - a. Condenser pressure stage down, unloads unit at high discharge pressures.
 - b. Low ambient lockout, shuts off unit at low ambient temperatures.
 - c. Low evaporator pressure hold, holds stage #1 until pressure rises.
 - d. Low evaporator pressure unload, shuts off one compressor.
5. Unit Enable Section
 - a. Enables unit operation from either local keypad, digital input, or BAS
6. Unit Mode Selection
 - a. Selects standard cooling, ice, glycol, or test operation mode
7. Analog Inputs:
 - a. Reset of leaving water temperature, 4-20 mA\
 - b. Current Limit
8. Digital Inputs
 - a. Unit off switch
 - b. Remote start/stop
 - c. Flow switch
 - d. Ice mode switch, converts operation and setpoints for ice production
 - e. Motor protection
9. Digital Outputs
 - a. Shutdown alarm; field wired, activates on an alarm condition, off when alarm is cleared
 - b. Evaporator pump; field wired, starts pump when unit is set to start
10. Condenser fan control - The unit controller shall provide control of condenser fans based on compressor discharge pressure.
11. Building Automation System (BAS) Interface
 - a. Factory mounted DDC controller(s) shall support operation on a BACnet®, Modbus® or LONMARK® network via one of the data link / physical layers listed below as specified by the successful Building Automation System (BAS) supplier.
 - b. BACnet MS/TP master (Clause 9)
 - c. BACnet IP, (Annex J)
 - d. BACnet ISO 8802-3, (Ethernet)
 - e. LONMARK FTT-10A. The unit controller shall be LONMARK® certified.

- f. The information communicated between the BAS and the factory mounted unit controllers shall include the reading and writing of data to allow unit monitoring, control and alarm notification as specified in the unit sequence of operation and the unit points list.
- g. For chillers communicating over a LONMARK network, the corresponding LONMARK eXternal Interface File (XIF) shall be provided with the chiller submittal data.
- h. All communication from the chiller unit controller as specified in the points list shall be via standard BACnet objects. Proprietary BACnet objects shall not be allowed. BACnet communications shall conform to the BACnet protocol (ANSI/ASHRAE135-2001). A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided along with the unit submittal.

2.05 OPTIONS AND ACCESSORIES

A. The following options are to be included:

1. Low Ambient Control: Fan VFD allows unit operation from 32°F down to -4°F (-23.3 C).
2. Phase loss with under/over voltage protection and with LED indication of the fault type to guard against compressor motor burnout.
3. BAS interface module to provide interface with a combination of BACnet IP, BACnet MSTP, and Modbus protocols.
4. The following accessories, if selected, are to be included:
 - a. Spring vibration isolators for field installation
 - b. Rubber-in-shear vibration isolators for field installation
 - c. Factory-mounted thermal dispersion type flow switch
 - d. Field-mounted, paddle type, chilled water flow switch field wired to the control panel
 - e. Wye strainer, to be installed at the evaporator inlet and sized for the design flow rate , with perforation diameter of 0.063" with blowdown valve and Victaulic couplings (factory mounted or field installed)
 - f. 115V GFI convenience outlet

B. ----NO TEXT----

PART 3: EXECUTION

3.01 INSTALLATION

- A. Install in strict accordance with manufacturer's requirements, shop drawings, and contract documents.
- B. Adjust and level chiller in alignment on supports.
- C. Coordinate electrical installation with electrical contractor.
- D. Coordinate controls with control contractor.
- E. Install a field-supplied or optional manufacturer-supplied strainer in the chilled water return line at the evaporator inlet that meets manufacturer perforation size specifications.

3.02 START-UP

- A. Provide testing and starting of machine, and instruct the Owner in its proper operation and maintenance.