

Sycamore Series VARIABLE SPEED GEOTHERMAL HEAT PUMPS

3 TO 5 TONS

Submittal Data English Language IP/Metric Units SD2700AGA 02/21

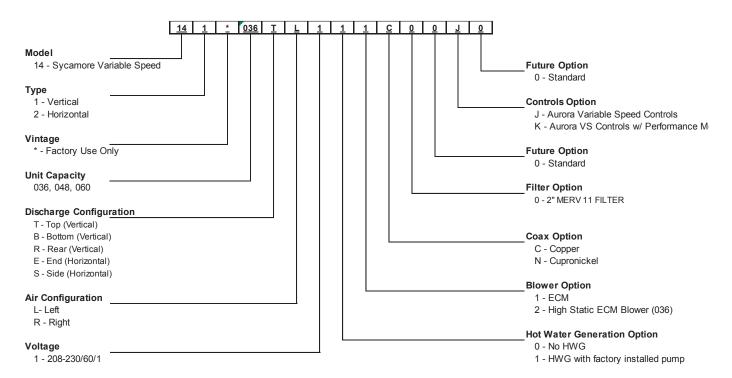


Sycam	ore	Se	ries
3 - 5	Ton	s 6	OH:

Contractor:	P.O.:	
Engineer:		
Proiect Name:	Unit Tag:	



Model Nomenclature



Rev. 8/1/2019

Contractor:	PO:	Sycamore Series
Contractor.	F.U	3 - 5 Tons 60Hz
Engineer:		



AHRI/ISO 13256-1 Performance Ratings

Variable Speed ECM Motor

Project Name: _____ Unit Tag: _

AHRI/ASHRAE/ISO 13256-1 English (IP) Units

			Wa	ter Loop I	leat Pump	Gro	und Water	Heat Pump)	Ground Loop Heat Pump					
Model	Model Capacity Modulation	Flow Rate Clg/Htg	Cooling EWT 86°F		Heating EWT 68°F		Cooling EWT 59°F		Heatii EWT 5		Cool Full Loa Part Loa	ıd 77°F	Heating Full Load 32°F Part Load 41°F		
	Wodulation	cfm	Capacity Btuh	EER Btuh/W	Capacity Btuh	СОР	Capacity Btuh	EER Btuh/W	Capacity Btuh	СОР	Capacity Btuh	EER Btuh/W	Capacity Btuh	СОР	
036	Full	1300/1500	32,300	17.7	51,000	5.3	38,000	31.2	41,700	4.5	35,800	21.6	32,900	3.5	
030	Part	1300/1300	11,000	21.1	17,000	7.6	12,500	50.0	14,000	5.9	13,400	39.0	12,000	5.1	
048	Full	1500/1800	40,700	16.9	67,000	4.9	49,000	30.0	55,200	4.0	45,000	20.0	43,500	3.4	
046	Part	1500/1600	16,000	24.0	24,000	7.8	19,000	56.0	19,000	6.0	18,000	43.5	16,300	5.1	
060	Full	1800/2200	50,000	15.9	79,000	4.9	60,000	27.1	66,000 4.3		56,000 19.1		51,700	3.4	
000	Part	1000/2200	20,100	22.3	29,100	7.6	22,500	55.0	23,000	5.8	22,800	40.0	20,000	5.1	

Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature Heating capacities based upon 68°F DB, 59°F WB entering air temperature All ratings based upon 208V operation

1/15/21

Series

Energy Star Compliance Table

Model	Tie	r 3
Wodei	Ground Water	Ground Loop
036	Yes	Yes
048	Yes	Yes
060	Yes	Yes

6/1/12

Energy Star Rating Criteria

In order for water-source heat pumps to be Energy Star rated they must meet or exceed the minimum efficiency requirements listed below. Tier 3 represents the current minimum efficiency water source heat pumps must have in order to be Energy Start rated.

Tier 3: 1/1/2012 - No Effective End Date Published

Water-to-Air	EER	COP
Ground Loop	17.1	3.6
Ground Water	21.1	4.1
Water-to-Water		
Ground Loop	16.1	3.1
Ground Water	20.1	3.5





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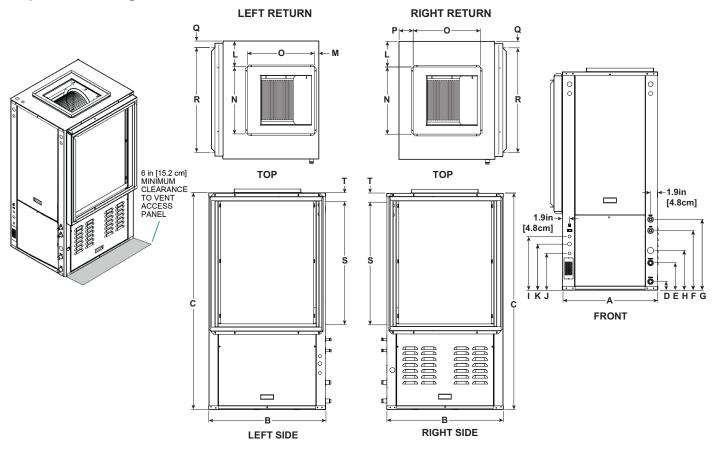
Sy	can	nore	Se	ries
3	- 5	Ton	s 6	0Hz

Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



Vertical Dimensional Data

Top Air Discharge



		Ove	rall Cab	inet			Water	Conne	ctions			Electrical Connections		Discharge Connection duct flange installed (±0.10 in)					Return Connection using std deluxe filter rack (±0.10 in)				
Vertical Top Flow Model		A Width	B Depth	C Height	D Loop	E Loop	F HWG	G HWG	H Cond-	Loop Water	HWG Sweat	I 1/2 in. cond	J 1/2 in. cond	K 3/4 in. cond	L	М		O Supply	Р	Q	R Return	S Return	т
		Widei	Бериі	rieigiit	In	Out	In	Out	ensate	FPT	FPT (I.D.)		Ext Pump	Power Supply			Width	Depth			Depth	Height	
036	in.	25.6	31.6	54.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	6.9	1.1	18.0	18.0	3.8	1.7	28.1	30.0	1.7
036	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	Swivel	Female	36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	76.2	4.3
048	in.	25.6	31.6	54.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	6.9	1.1	18.0	18.0	3.8	1.7	28.1	30.0	1.7
046	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	Swivel	Female	36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	76.2	4.3
060	in.	25.6	31.6	58.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	6.9	1.1	18.0	18.0	3.8	1.7	28.1	34.0	1.7
060	cm.	65.0	80.3	148.3	5.8	18.5	40.4	48.0	26.9	Swivel	Female	36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	86.4	4.3

Condensate is 3/4 in. PVC female glue socket and is switchable from side to front
Unit shipped with deluxe 2 in. (field adjustable to 1 in.) duct collar/filter rack extending from unit 3.25 in. and is suitable for duct connection.

Discharge flange is field installed and extends 1 in. [25.4mm] from cabinet

Decorative molding and/or water connections extend 1.2 in. [30.5mm] beyond front of cabinet.

Louvered vents in the compressor section right side access panel extend 1/2 in. [12.7 mm] from side of cabinet. Allow 6" clearance for venting. Top auxiliary electric heat power knockouts are 1.125", 1.375", and 2".

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6/29/12

Sy	can	nore	Se	ries
3	- 5	Ton	s 6	0H2

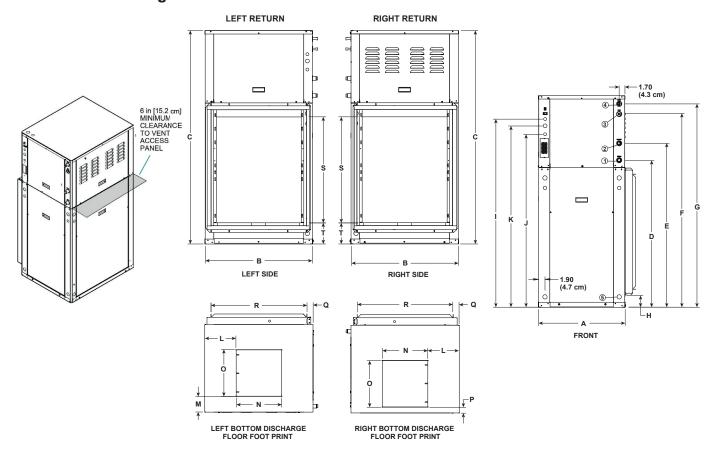
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Contractor:	P.O.:	_
Engineer:		_
Project Name:	Unit Tag:	



Vertical Dimensional Data cont.

Bottom Air Discharge



							Water	Conne	ctions			Electri	cal Kno	ckouts						Return Connection				
Bottom Mode		Ove	rall Cab	inet	1	2	3	4	5	Loop	HWG	I 1/2 in. cond	J 1/2 in. cond	K 3/4 in. cond		Discharge Connection duct flange installed (±0.10 in				using etd deluve filter				
Would	713	A Width	B Depth	C Height	D In	E Out	F HWG In	G HWG Out	H Cond- ensate	Water FPT	Sweat (I.D.)	Low Voltage	Ext Pump	Power Supply	L	М	N Supply Width	O Supply Depth	Р	Q		S Return Height		
036-	in.	25.5	31.5	62.5	43.4	48.4	57.0	60.0	3.1	1 in.	1/2 in.	51.1	55.6	53.6	9.1	4.8	13.4	13.6	1.7	1.8	28.1	34.0	5.6	
060	cm.	64.8	80.0	158.8	110.2	122.9	144.8	152.4	7.9	Swivel	Female	129.8	141.2	136.1	23.1	12.2	34.0	34.5	4.3	4.6	71.4	86.4	14.2	

Condensate is 3/4 in. PVC female glue socket and is switchable from side to front

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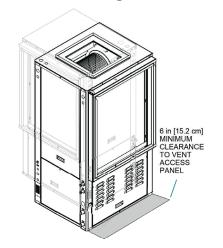
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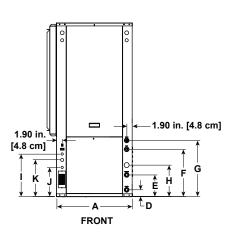
Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	

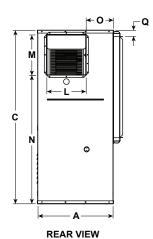


Vertical Dimensional Data cont.

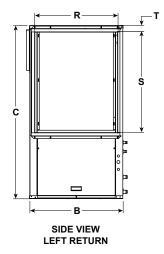
Rear Air Discharge

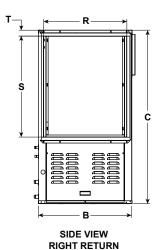


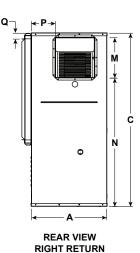




LEFT RETURN







Vert	ical	Ove	Overall Cabinet Water Connections										lectrica nnectio		Discharge Connection duct flange installed (±0.10 in)					Return Connection using std deluxe filter rack (±0.10 in)			
Re Disch Mo	arge	Α	A B C Loop Loop HWG HWG Cond- Water Sweat		HWG Sweat	I 1/2 in. cond	J 1/2 in. cond	K 3/4 in. cond	L Supply	M Supply	N	0	P	Q	R Return		Т						
		width	Бериі	rieigiit	In	Out	In	Out	ensate	FPT (I.D.)		Low Voltage	Ext Pump	Power Supply	Width	Depth					Depth	Height	
036	in.	25.6	31.6	54.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	13.3	13.6	39.4	9.1	8.1	1.7	28.1	30.0	1.7
036	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	Swivel	vivel Female	36.3	24.9	31.2	33.8	34.5	100.1	23.1	20.6	4.3	71.4	76.2	4.3
048	in.	25.6	31.6	54.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	13.3	13.6	39.4	9.1	8.1	1.7	28.1	30.0	1.7
046	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	Swivel	Female	36.3	24.9	31.2	33.8	34.5	100.1	23.1	20.6	4.3	71.4	76.2	4.3
060	in.	25.6	31.6	58.4	2.3	7.3	15.9	18.9	10.6	1 in.	1/2 in.	14.3	9.8	12.3	13.3	13.6	43.4	9.1	8.1	1.7	28.1	34.0	1.7
000	cm.	65.0	80.3	148.3	5.8	18.5	40.4	48.0	26.9	Swivel	Female	36.3	24.9	31.2	33.8	34.5	110.2	23.1	20.6	4.3	71.4	86.4	4.3
Conde	Condensate is 3/4 in. PVC female glue socket and is switchable from side to front 6/29/12																						

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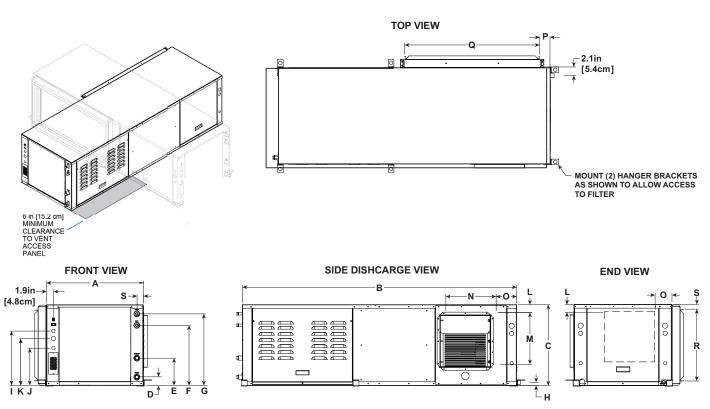
Louvered vents in the compressor section right side access panel extend 1/2 in. [12.7 mm] from side of cabinet. Allow 6" clearance for venting.

Top auxiliary electric heat power knockouts are 1.125", 1.375", and 2".

Contractor:	P.O.:	_
Engineer:		_
Project Name:	Unit Tag:	



Horizontal Dimensional Data



AS SHOWN LR UNIT (RR UNIT ON OPPOSITE SIDE—SAME DIMENSIONS)

												Electric	al Conn	ections					Return Connection			
		Ove	rall Cab	inet			Water	Connec	ctions			ı	J	K		charge (uxe filter	
Horiz	ontal											1/2 in.	1/2 in.	3/4 in.	duct flange installed (±0.10 in)				(±0.10 in)			
Mod	dels				<u> </u>							cond	cond	cond								
		A Width	B Depth	C Height	D In	HWG Cond- Water Sweat I		Low Voltage	Ext Pump	Power Supply	L	M Supply Height	N Supply Depth	0	Р	Q Return Depth	R Return Height	s				
036	in.	25.6	77.0	21.3	2.3	7.3	15.9	18.9	0.8	1 in.	1/2 in.	14.3	9.8	12.3	SEE	13.6	13.2	SEE	2.8	40.4	18.9	1.3
036	cm.	65.0	195.6	54.1	5.8	18.5	40.4	48.0	2.0	Swivel	Swivel Female	36.3	24.9	31.2	CHART	34.5	33.5	CHART	7.1	102.6	48.0	3.3
048	in.	25.6	77.0	21.3	2.3	7.3	15.9	18.9	0.8	1 in.	1/2 in.	14.3	9.8	12.3	SEE	13.6	13.2	SEE	2.8	40.4	18.9	1.3
U40	cm.	65.0	195.6	54.1	5.8	18.5	40.4	48.0	2.0	Swivel	Female	36.3	24.9	31.2	CHART	34.5	33.5	CHART	7.1	102.6	48.0	3.3
060	in.	25.6	82.0	21.3	2.3	7.3	15.9	18.9	0.8	1 in.	1/2 in.	14.3	9.8	12.3	SEE	13.6	13.2	SEE	2.8	45.4	18.9	1.3
000	cm.	65.0	208.3	54.1	5.8	18.5	40.4	48.0	2.0	Swivel	Female	36.3	24.9	31.2	CHART	34.5	33.5	CHART	7.1	115.3	48.0	3.3
Condensate is 3/4 in. PVC female glue socket and is switchable from side to front 6/29/12																						6/29/12

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Units Not Shown Above		L	0
Bight Beturn End Discharge	in	2.8	4.6
Right Return End Discharge	cm	7.1	11.8
Right Return Side Discharge	in	4.9	6.9
Right Return Side Discharge	cm	12.4	17.5
Left Deturn End Discharge	in	4.9	7.6
Left Return End Discharge	cm	12.4	19.4
Loft Deturn Side Discharge	in	2.8	6.9
Left Return Side Discharge	cm	7.1	17.5

Sycan	ore	Se	ries
3 - 5	Ton	c 6	UH.

Contractor:	P.O.:	
Engineer:		
Project Name	Unit Tag	

Physical Data

Model				
Model		036	048	060
Compressor (1 each)			Variable Speed Scroll	
Factory Charge R410a, oz [kg] Vertical (Aluminum tube and fin air coil)		90 [2.55]	120 [3.40]	140 [3.96]
Factory Charge R410a, oz [kg] Horizontal (Aluminum tube and fin air coil)		86 [2.44]	108 [3.06]	148 [4.19]
ECM Blower Motor & Blower				
Blower Motor Type/Speeds	ECM		Variable Speed	
Blower Motor- hp [W]	ECM	1/2 [373]	1 [746]	1 [746]
High Static Blower Motor - hp [W]	ECM	1 [746]	n/a	n/a
Blower Wheel Size (Dia x W), in. [mm]	ECM	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]
High Static Blower Wheel Size - [Dia. x W], in. [mm]	ECM	11 x 10 [279 x 254]	n/a	n/a
Coax and Water Piping				
Water Connections Size - Swivel - in [mm]		1" [25.4]	1" [25.4]	1" [25.4]
HWG Connection Size - Female Sweat I.D in [mm]		1/2" [12.7]	1/2" [12.7]	1/2" [12.7]
Coax & Piping Water Volume - gal [I]		1.3 [4.9]	2.3 [8.7]	2.3 [8.7]
Vertical				
Air Coil Dimensions (H x W), in. [mm]		32 x 25 [813 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]
Air Coil Total Face Area, ft2 [m2]		5.6 [0.570]	5.6 [0.570]	6.3 [0.641]
Air Coil Tube Size, in [mm]		3/8 [9.5]	3/8 [9.5]	3/8 [9.5]
Air Coil Number of rows		3	3	4
Filter Standard - 2" [51mm] Pleated MERV11 Throwaway, in [mi	m]	32 x 30 [813 x 762]	32 x 30 [813 x 762]	36 x 30 [914 x 762]
Weight - Operating, lb [kg]		331 [150]	354 [161]	372 [169]
Weight - Packaged, lb [kg]		351 [159]	374 [170]	392 [178]
Horizontal				
Air Coil Dimensions (H x W), in. [mm]		20 x 40 [508 x 1016]	20 x 40 [508 x 1016]	20 x 4 [508 x 1143]
Air Coil Total Face Area, ft2 [m2]		5.6 [0.570]	5.6 [0.570]	6.3 [0.641]
Air Coil Tube Size, in [mm]		3/8 [9.5]	3/8 [9.5]	3/8 [9.5]
Air Coil Number of rows		3	3	4
Filter Standard - 2" [51mm] Pleated MERV11 Throwaway, in [mm]]	1 - 20 x 20 [508 x 508] 1 - 20 x 22 [508 x 559]	1 - 20 x 20 [508 x 508] 1 - 20 x 22 [508 x 559]	1 - 20 x 25 [508 x 635] 1 - 20 x 22 [508 x 559]
Weight - Operating, lb [kg]		365 [166]	388 [176]	402 [182]
Weight - Packaged, lb [kg]		395 [179]	418 [190]	432 [196]

*Bottom flow 036-060 models use the 2in. [51mm] MERV 11 throwaway in. [mm] 36×30 [914 x 762] filter.

12/3/2020

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Contractor:	P.O.:
Engineer:	
Project Name:	Unit Tag:

Sycamore Series 3 - 5 Tons 60Hz

GEOSTAR

Auxiliary Heat Ratings

Model	k¹	W	Stamon	Bt	u/h	Min CFM	Model Compatibility				
Iwiodei	208V	230V	Stages	208V	230V	WIIII CFIVI	036	048	060		
EAL(H)10A	7.2	9.6	2	24,600	32,700	1100	•	•	•		
EAL(H)15A	10.8	14.4	3	36,900	49,100	1250	•	•	•		
EAL(H)20A	14.4	19.2	4	49,200	65,500	1500		•	•		

Air flow level for auxiliary heat (Aux) must be above the minimum cfm in this table Order the "H" part number when installed on horizontal and vertical rear discharge units 6/1/12

Auxiliary Heat Electrical Data

Model	Supply	Heater	Amps	Min Circuit Amp		Max Fus	se (USA)	Max Fus	se (CAN)	Max CKT BRK	
Wodei	Circuit	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
EAL(H)10A	Single	34.7	40	53.3	60	60	60	60	60	60	60
	Single	52.0	60	75	85	80	90	80	90	70	100
EAL(H)15A	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	17.3	20	21.7	25	25	25	25	25	20	30
	Single	69.3	80	96.7	110	100	110	100	110	100	100
EAL(H)20A	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	34.7	40	43.3	50	45	50	45	50	40	50

All heaters rated single phase 60 cycle and include unit fan load All fuses type "D" time delay (or HACR circuit breaker in USA)

6/1/12

Electrical Data

	Rated	Voltage	Compress		ressor Drive		HWG	Ext Loop	Blower	Total Unit	Minimum	Max Fuse	
Model	Voltage	Min/Max	LRA	СМСС	LRA	Internal Breaker	Pump FLA	FLA	Motor FLA	FLA	Circuit Amp	HACR Breaker	
036	208-230/60/1	187/253	10.2	18.0	22.0	30.0	0.4	5.4	4.0	31.8	37.3	40	
*036	208-230/60/1	187/253	10.2	18.0	22.0	30.0	0.4	5.4	7.0	34.8	40.3	45	
048	208-230/60/1	187/253	12.0	23.5	28.0	35.0	0.4	5.4	7.0	40.8	47.8	50	
060	208-230/60/1	187/253	12.0	30.0	33.0	40.0	0.4	5.4	7.0	45.8	54.1	60	

*With optional 1 hp Variable Speed ECM Motor Rated Voltage of 208/230/60/1 HACR circuit breaker in USA only All fuses Class RK-5 3/26/12

Contractor:	P.O.:	
Engineer:		
Project Name	Unit Tag	



Blower Performance Data

Variable Speed ECM Blower Motor

							Air Flow						
Model	Max	Speed	Speed	Speed	Speed	Speed	Speed	Speed	Speed	Speed	Speed	Speed	Speed
	ESP	1	2	3	4	5	6	7	8	9	10	11	12
	0.50	285	380	525	675	815	980	1100	1220	1330	1440	1540	1575
036	0.50		G	L							Н	Aux	
		480	565	665	761	870	1000	1100	1200	1300	1410	1520	1630
036 w/1hp*	0.75		G	L							Н	Aux	
242		475	620	730	850	1020	1140	1270	1400	1520	1650	1790	1925
048	0.75		G	L							Н	Aux	
		400	600	830	1050	1230	1400	1560	1700	1870	2010	2140	2265
060	0.75		G	L							Н	Aux	
**VS Compresso	r Speed	Speed 1-2 3-4 5-6 7-8 9-10 11-12											
** VS Compressor spe	ed is given t	for the factor	y default cf	m settings.	When the c	fm default s	ettings are	changed it	will change	the relation	ship to the		6/7/12

^{**} VS Compressor speed is given for the factory default cfm settings. When the cfm default settings are changed it will change the relationship to the compressor speed that is shown in the table. In cooling mode compressor speeds 10-12 are only available when SuperBoost mode is selected at the thermostat.

Cfm is controlled within 5% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

Setting Blower Speed - Variable Speed ECM

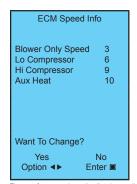
The ABC board's Yellow Config LED will flash the current ECM blower speed selections for G, low, and high continuously with a short pause in between. The speeds can also be confirmed with the AID Tool under the Setup/ECM Setup screen. The Aux will not be flashed but can be viewed in the AID Tool. The ECM blower motor speeds can be field adjusted with or without using an AID Tool.

Variable Speed ECM Setup without an AID Tool

The blower speeds for G only, Low (Y1), and High (Y2/Aux) can be adjusted directly at the Aurora ABC board which utilizes the push button (SW1) on the ABC board. This procedure is outlined in the ECM Configuration Mode portion of the Aurora 'Base' Control System section. The Aux cannot be set manually without an AID Tool.

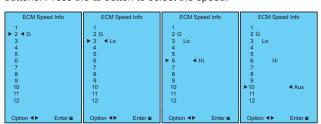
Variable Speed ECM Setup with an AID Tool

A much easier method utilizes the AID Tool to change the airflow using the procedure below. First navigate to the Setup screen and then select ECM Setup. This screen displays the current ECM settings. It allows the technician to enter the setup screens to change the ECM settings. Change the highlighted item using the ◀ and ▶ buttons and then press the ■ button to select the item.



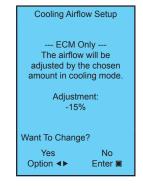
Selecting YES will enter ECM speed setup, while selecting NO will return to the previous screen.

ECM Speed Setup - These screens allow the technician to select the G, low, high, and auxiliary heat blower speed for the ECM blower motor. Change the highlighted item using the ▲ and ▼ buttons. Press the ■ button to select the speed.



After the auxiliary heat speed setting is selected the AID Tool will automatically transfer back to the ECM Setup screen.

Cooling Airflow Setup - These screens allow the technician to select -15%, -10%, -5%, None or +5% change from the heating airflow. Change the adjustment percentage using the ▲ and ▼ buttons. Press the ■ button to save the change.





The manufacturer works continually to improve is products. As a result, the design and special control of the job special continual to improve is products. As a result, the design and special control of the job special control of the job

Optional 1 hp Variable Speed ECM

Factory settings are at recommended L , H and Aux positions

[&]quot;G" may be located anywhere within the airflow table

[&]quot;L" setting should be located within the boldface cfm range

[&]quot;H" setting MUST be located within the shaded cfm range

[&]quot;Aux" setting MUST be equal to or greater than "H" setting

[&]quot;Aux" setting MUST be equal to or greater than the minimum allowable cfm for the auxiliary heater kit (see auxiliary heat ratings table)

Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	

Sycamore Series 3 - 5 Tons 60Hz



Operating Limits

Oneveting Limite	Coo	ling	Heating		
Operating Limits	(°F)	(°C)	(°F)	(°C)	
Air Limits					
Min. Ambient Air	45	7.2	45	7.2	
Rated Ambient Air	80	26.7	70	21.1	
Max. Ambient Air	100	37.8	85	29.4	
Min. Entering Air	50	10.0	40	4.4	
Rated Entering Air db/wb	80.6/66.2	27/19	68	20.0	
Max. Entering Air db/wb	110/83	43/28.3	80	26.7	
Water Limits					
Min. Entering Water	30	-1.1	20	-6.7	
Normal Entering Water	50-110	10-43.3	30-70	-1.1	
Max. Entering Water	120	48.9	90	32.2	

NOTE: Minimum/maximum limits are only for start-up conditions, and are meant for bringing the space up to occupancy temperature. Units are not designed to operate at the minimum/maximum conditions on a regular basis. The operating limits are dependent upon three primary factors: 1) water temperature, 2) return air temperature, and 3) ambient temperature. When any of the factors are at the minimum or maximum levels, the other two factors must be at the normal level for proper and reliable unit operation.

Definitions

Abbreviations and Definitions

cfm = airflow, cubic feet/minute

EWT = entering water temperature, Fahrenheit

gpm = water flow in gallons/minute

WPD = water pressure drop, psi and feet of water

EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)

HC = air heating capacity, MBtu/h
TC = total cooling capacity, MBtu/h
SC = sensible cooling capacity, MBtu/h
kW = total power unit input, kilowatts
HR = total heat of rejection, MBtu/h
HE = total heat of extraction, MBtu/h

HWC = hot water generator capacity, MBtu/h

EER = Energy Efficient Ratio = Btu output/Watt input

COP = Coefficient of Performance

= Btu output/Btu input

LWT = leaving water temperature, °F
LAT = leaving air temperature, °F
TH = total heating capacity, MBtu/h
LC = latent cooling capacity, MBtu/h
S/T = sensible to total cooling ratio

Pressure Drop

	0014		Press	sure Drop	(psi)	
Model	GPM	30°F	50°F	70°F	90°F	110°F
	11.5	3.60	3.30	3.10	2.90	2.70
	9.0	2.30	2.10	2.00	1.90	1.70
36	7.0	1.50	1.40	1.30	1.20	1.10
	6.0	1.20	1.15	1.10	1.05	1.00
	4.5	0.70	0.66	0.64	0.60	0.55
	13.5	4.60	4.40	4.10	3.80	3.50
	10.5	2.90	2.70	2.50	2.30	2.20
48	7.5	1.70	1.60	1.50	1.40	1.30
	6.0	1.20	1.10	1.00	0.96	0.91
	4.0	0.62	0.61	0.60	0.58	0.56
	17.0	6.40	6.00	5.60	5.20	4.80
	13.5	4.60	4.40	4.10	3.80	3.50
60	9.5	2.20	2.10	2.00	1.80	1.70
	7.5	1.70	1.60	1.50	1.40	1.30
	5.0	0.68	0.62	0.58	0.55	0.53

Notes to Performance Data Tables

The following notes apply to all performance data tables: Performance ratings are based on 80°F DB/67°F WB EAT for cooling and 70°F DB EAT for heating. Three flow rates are shown for each unit. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum of 50°F EWT. The middle flow rate shown is the minimum geothermal closed loop flow rate. The highest flow rate shown is optimum for geothermal closed loop systems and the suggested flow rate for boiler/tower applications. The hot water generator numbers are based on a flow rate of 0.4 gpm/ton of rated capacity with an EWT of 90°F. Entering water temperatures below 40°F assumes 15% antifreeze solution. For non-standard EAT conditions, apply the appropriate Correction Factor tables. Interpolation between EWT, gpm, and cfm data is permissible, extrapolation is not.

The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely the manufacturer's opinion or commendation of its products.

12/02/20

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Contractor:	P.O.:	
Engineer:		
Proiect Name:	Unit Tag:	



Correction Factor Tables

Air Flow Corrections (Compressor Speeds 1-3)

Air	low		Cod	oling		Heating		
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.940	0.740	0.967	0.951	0.943	1.106	0.902
275	69	0.950	0.783	0.973	0.959	0.953	1.088	0.918
300	75	0.960	0.827	0.978	0.967	0.962	1.070	0.935
325	81	0.970	0.870	0.984	0.975	0.972	1.053	0.951
350	88	0.980	0.913	0.989	0.984	0.981	1.035	0.967
375	94	0.990	0.957	0.995	0.992	0.991	1.018	0.984
400	100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
425	106	1.030	1.022	1.024	1.026	1.009	0.982	1.016
450	113	1.060	1.045	1.048	1.051	1.019	0.965	1.033
475	119	1.091	1.067	1.071	1.077	1.028	0.947	1.049
500	125	1.121	1.089	1.095	1.103	1.038	0.930	1.065
520	130	1.151	1.111	1.110	1.129	1.047	0.912	1.082

6/29/12

Air Flow Corrections (Compressor Speeds 4-12)

Air	flow		Cod	oling			Heating	
CFM Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.928	0.747	0.936	0.929	0.961	1.097	0.938
275	69	0.940	0.789	0.946	0.941	0.967	1.081	0.948
300	75	0.952	0.831	0.957	0.953	0.974	1.064	0.959
325	81	0.964	0.873	0.968	0.965	0.980	1.048	0.969
350	88	0.976	0.916	0.979	0.976	0.987	1.032	0.979
375	94	0.988	0.958	0.989	0.988	0.993	1.016	0.990
400	100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
425	106	1.020	1.023	1.004	1.018	1.010	0.966	1.018
450	113	1.056	1.042	1.008	1.035	1.020	0.932	1.036
475	119	1.072	1.079	1.011	1.053	1.029	0.898	1.054
500	125	1.087	1.095	1.015	1.070	1.039	0.865	1.071
520	130	1.099	1.113	1.019	1.088	1.049	0.831	1.089

6/14/12

Cooling Capacity Corrections

Entering	Total Clg		Sensible Cooling Capacity Multipliers - Entering DB °F								Power	Heat of	
Air WB °F	Сар	60	65	70	75	80	80.6	85	90	95	100	Input	Rejection
55	0.898	0.723	0.866	1.048	1.185	*	*	*	*	*	*	0.985	0.913
60	0.912		0.632	0.880	1.078	1.244	1.260	*	*	*	*	0.994	0.927
63	0.945			0.768	0.960	1.150	1.175	*	*	*	*	0.996	0.954
65	0.976			0.694	0.881	1.079	1.085	1.270	*	*	*	0.997	0.972
66.2	0.983			0.655	0.842	1.040	1.060	1.232	*	*	*	0.999	0.986
67	1.000			0.616	0.806	1.000	1.023	1.193	1.330	1.480	*	1.000	1.000
70	1.053				0.693	0.879	0.900	1.075	1.205	1.404	*	1.003	1.044
75	1.168					0.687	0.715	0.875	1.040	1.261	1.476	1.007	1.141

NOTE: *Sensible capacity equals total capacity at conditions shown.

4/22/12

Heating Capacity Corrections

Ent Air DB °F		Heating Corrections						
EIIL AII DB F	Htg Cap	Power	Heat of Ext					
45	1.062	0.739	1.158					
50	1.050	0.790	1.130					
55	1.037	0.842	1.096					
60	1.025	0.893	1.064					
65	1.012	0.945	1.030					
68	1.005	0.976	1.012					
70	1.000	1.000	1.000					
75	0.987	1.048	0.970					
80	0.975	1.099	0.930					

11/10/09

Sycamore S	eries
3 - 5 Tons	60Hz

Contractor:	P.O.:	
Engineer:		
Project Name	Unit Tag	



Antifreeze Corrections

Catalog performance can be corrected for antifreeze use. Please use the following table and note the example given.

Antifreeze Type	Antifreeze % by wt	Heating	Cooling	Pressure Drop
EWT - °F [°C]		30 [-1.1]	90 [32.2]	30 [-1.1]
Water	0	1.000	1.000	1.000
	10	0.973	0.991	1.075
	20	0.943	0.979	1.163
Ethylene Glycol	30	0.917	0.965	1.225
	40	0.890	0.955	1.324
	50	0.865	0.943	1.419
	10	0.958	0.981	1.130
	20	0.913	0.969	1.270
Propylene Glycol	30	0.854	0.950	1.433
	40	0.813	0.937	1.614
	50	0.770	0.922	1.816
	10	0.927	0.991	1.242
	20	0.887	0.972	1.343
Ethanol	30	0.856	0.947	1.383
	40	0.815	0.930	1.523
	50	0.779	0.911	1.639
	10	0.957	0.986	1.127
	20	0.924	0.970	1.197
Methanol	30	0.895	0.951	1.235
	40	0.863	0.936	1.323
	50	0.833	0.920	1.399



WARNING: Gray area represents antifreeze concentrations greater than 35% by weight and should be avoided due to the extreme performance penalty they represent.

Antifreeze Correction Example

Antifreeze solution is Propylene Glycol 20% by weight. Determine the corrected heating and cooling performance at 30°F and 90°F respectively as well as pressure drop at 30°F for Model 036 operating at 100% capacity.

The corrected cooling capacity at 90°F would be: 35,200 MBtu/h x 0.969 = 34,109 MBtu/h

The corrected heating capacity at 30°F would be: 37,400 MBtu/h x 0.913 = 34,146 MBtu/h

The corrected pressure drop at 30°F and 11.5 gpm would be: 7.9 feet of head x 1.270 = 10.03 feet of head

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Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



Performance Data

036 - 50% Part Load

		WP	/PD HEATING - EAT 70°F EWT Flow WPD									COO	LING - E	EAT 80/6	57 °F							
°F	Flow	DOL		Airflow	нс	Power	HE	LAT	000	HWC	°F	ı	- C		Airflow	TC	sc	S/T	Power	HR		HWC
Г	gpm	PSI	FT	cfm	MBtuh	kW	MBtuh	°F	СОР	MBtuh	_	gpm	PSI	FT	cfm	MBtuh	MBtuh	Ratio	kW	MBtuh	EER	MBtuh
	3.0		0.7		0	peration	not reco	mmende	ed			2.5	0.15	0.4								
20	4.5	0.70	1.6	550	12.7	1.43	7.8	91.4	2.61	2.2	20	3.5	0.46	1.1			Operat	ion not i	recomme	ended		
	5.5	1.09	2.5	750	12.8	1.26	8.5	85.8	2.98	1.8		5.0	0.77	1.8					,			
	3.0	0.30	0.7	550 750	13.3 13.8	1.19	9.2 9.7	92.3 87.1	3.26	2.3		2.5	0.15	0.3	500 650	18.3 18.6	12.5 13.7	0.68	0.57	20.2	32.2	-
30	4.5	0.60	1.6	550	13.6	1.20	9.5	92.9	3.33	2.6	30	2.5	0.45	1.0	500	18.5	12.6	0.74	0.54	20.4	34.3	-
30	4.5	0.68	1.6	750	14.2	1.23	10.0	87.5	3.38	2.2	30	3.5	0.45	1.0	650	18.8	13.8	0.73	0.57	20.8	33.1	-
	5.5	1.06	2.4	550 750	15.0 15.1	1.43	10.1 10.8	95.3 88.6	3.07	2.7		5.0	0.75	1.7	500 650	18.6 19.1	12.6 13.8	0.68	0.52	20.4	35.6 34.7	-
	3.0	0.29	0.7	550	15.6	1.21	11.4	96.2	3.77	2.5		2.5	0.14	0.3	500	20.4	13.3	0.65	0.51	22.1	39.7	-
	0.0	0.20	0.7	750 550	16.1 16.1	1.23	11.9 11.9	89.9 97.0	3.83	2.2			0.11	0.0	650 500	20.8	14.5 13.4	0.70	0.53	22.6 22.3	38.9 42.3	-
40	4.5	0.66	1.5	750	16.6	1.24	12.4	90.5	3.94	2.3	40	3.5	0.44	1.0	650	21.0	14.7	0.70	0.43	22.8	41.1	-
	5.5	1.02	2.4	550	16.9	1.24	12.7	98.5	3.99	2.8		5.0	0.73	1.7	500	20.8	13.4	0.65	0.47	22.4	43.9	-
	\vdash			750 550	17.5 17.8	1.27	13.2 13.7	91.6	4.05	2.4					650 500	21.3	14.7 13.6	0.69	0.50	22.9	42.9 49.7	-
	3.0	0.28	0.6	750	18.4	1.24	14.2	92.7	4.34	2.3		2.5	0.14	0.3	650	22.8	15.0	0.66	0.46	24.4	50.1	-
50	4.5	0.64	1.5	550 750	18.5 19.0	1.23	14.3 14.8	101.1 93.5	4.41 4.49	3.0 2.5	50	3.5	0.42	1.0	500 650	22.4	13.7 15.1	0.61	0.44	23.9 24.5	51.4 51.9	-
		0.00	0.0	550	19.0	1.24	15.0	102.5	4.49	3.1		-	0.70	4.0	500	22.8	14.0	0.62	0.44	24.5	52.7	-
	5.5	0.99	2.3	750	19.9	1.27	15.6	94.6	4.59	2.8		5.0	0.70	1.6	650	23.4	15.5	0.66	0.44	24.9	53.2	-
	3.0	0.27	0.6	550 750	20.2	1.24	16.0 16.4	104.0 95.6	4.77	3.0 2.5		2.5	0.13	0.3	500 650	20.0	13.4 14.8	0.67	0.59	22.0 22.6	34.0	1.0
60	4.5	0.62	1.4	550	21.0	1.24	16.8	105.4	4.97	3.2	60	3.5	0.41	0.9	500	20.2	13.5	0.67	0.57	22.2	35.2	1.1
	1.0	0.02		750 550	21.5	1.25 1.27	17.3 17.4	96.6 106.6	5.05	2.7 3.3		0.0	0.11	0.0	650 500	20.8	14.9 13.8	0.72	0.59	22.8 22.5	35.5 36.1	1.1
	5.5	0.96	2.2	750	22.3	1.28	17.4	97.5	5.11	2.8		5.0	0.68	1.6	650	21.1	15.3	0.07	0.57	23.1	36.4	1.2
	3.0	0.26	0.6	550	22.6	1.26	18.3	108.0	5.25	3.2		2.5	0.13	0.3	500	17.8	13.2	0.74	0.73	20.3	24.4	1.3
	\vdash			750 550	22.9	1.27	18.6 19.3	98.3 109.7	5.28 5.50	2.6 3.4		<u> </u>			650 500	18.6 18.0	14.9	0.80	0.86	21.5	21.6 25.3	1.3
70	4.5	0.60	1.4	750	24.0	1.25	19.7	99.6	5.61	2.9	70	3.5	0.40	0.9	650	18.5	14.7	0.80	0.73	21.0	25.5	1.4
	5.5	0.93	2.1	550 750	24.2	1.28 1.28	19.8 20.2	110.7 100.4	5.53 5.63	3.5 2.9		5.0	0.66	1.5	500 650	18.3 18.8	13.6 15.1	0.75	0.71	20.7	25.9 26.1	1.5 1.5
	20	0.05	0.0	550	24.8	1.28	20.2	111.8	5.67	3.4		2.5	0.40	0.0	500	16.7	12.3	0.80	0.72	19.8	18.6	1.9
	3.0	0.25	0.0	750	25.2	1.28	20.8	101.1	5.78	2.8		2.5	0.13	0.3	650	17.2	13.6	0.79	0.92	20.3	18.7	2.0
80	4.5	0.57	1.3	550 750	26.0 26.3	1.28	21.7 22.0	113.8 102.5	5.98 6.09	3.6	80	3.5	0.38	0.9	500 650	16.8 17.3	12.3 13.7	0.73	0.88	19.8 20.4	19.2 19.4	2.1
	5.5	0.90	2.1	550	26.4	1.30	21.9	114.4	5.94	3.8		5.0	0.64	1.5	500	17.1	12.6	0.74	0.87	20.1	19.7	2.2
	0.0	0.00		750 550	26.7 27.1	1.29	22.2 22.6	102.9 115.5	6.05	3.2		0.0	0.01	1.0	650 500	17.6 15.6	14.0	0.80	0.89 1.07	20.6 19.2	19.9 14.6	2.5
	3.0	0.24	0.6	750	27.1	1.29	22.9	103.7	6.19	2.9		2.5	0.12	0.3	650	16.0	12.5	0.78	1.07	19.7	14.7	2.6
90	4.5	0.55	1.3	550	28.4	1.30	24.0	117.9	6.44	3.8	90	3.5	0.37	0.9	500	15.7	11.4	0.72	1.04	19.2	15.1	2.7
			_	750 550	28.6 28.6	1.28	24.3 24.1	105.3 118.1	6.57	3.2 4.1		<u> </u>			650 500	16.1 16.7	12.6 12.0	0.78	1.06	19.7 20.3	15.2 15.8	2.7
	5.5	0.87	2.0	750	28.7	1.30	24.3	105.4	6.47	3.4		5.0	0.61	1.4	650	16.4	12.9	0.79	1.05	20.0	15.6	2.8
	3.0	0.23	0.5									2.5	0.12	0.3	500 650	14.5 14.9	10.9 12.0	0.75 0.81	1.29	18.9 19.4	11.2	3.1
100	4.5	0.53	1.2								100	3.5	0.35	0.8	500	14.6	10.9	0.75	1.26	18.9	11.7	3.2
100	4.5	0.53	1.2								100	3.5	0.35	0.0	650	15.1	12.1	0.80	1.28	19.4	11.7	3.2
	5.5	0.84	1.9	9								5.0	0.59	1.4	500 650	14.9 15.3	11.2 12.4	0.75	1.25 1.27	19.1 19.6	11.9 12.0	3.3
	3.0	0.22	0.5									2.5	0.11	0.3	500	13.5	10.4	0.77	1.51	18.6	8.9	3.0
	\vdash			_								<u> </u>	\vdash		650 500	13.8 13.6	11.5 10.5	0.83	1.54 1.47	19.1 18.6	9.0	3.0
110	4.5	0.51	1.2	Operation not recommended							110	3.5	0.34	0.8	650	14.0	11.6	0.83	1.50	19.1	9.3	3.2
	5.5	0.80	1.9									5.0	0.57	1.3	500	13.8	10.8	0.78	1.46	18.8	9.5	3.4
				5									Н		650 500	14.2 12.6	11.9 10.6	0.84	1.49	19.3 19.1	9.5	3.4 4.3
	3.0	0.22	0.5	-								2.5	0.11	0.2	650	12.8	11.6	0.90	1.97	19.6	6.5	4.4
120	4.5	0.49	1.1	.1							120	3.5	0.33	0.8	500 650	12.7 12.9	10.7 11.6	0.84	1.82	18.9 19.3	7.0 6.9	4.4 4.4
	5.5	0.77	1 0									5.0	0.55	1 2	500	12.8	10.7	0.83	1.76	18.8	7.3	4.6
	5.5	0.77	1.δ									5.0	0.55	1.3	650	13.1	11.6	0.89	1.82	19.3	7.2	4.6

Performance capacities shown in thousands of Btuh.

11/2/20

The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely the manufacturer's opinion or commendation of its products.

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Contractor:	P.O.:	
Engineer:		
Proiect Name:	Unit Tag:	



036 - 100% Full Load

		WP	D D			HEATI	NG - EA	Г 70°F			<u> </u>	I	W	PD			COOLI	NG - E	AT 80/6	7 °F		
EWT °F	Flow			Airflow	нс	Power	HE	LAT		HWC	EWT °F	Flow			Airflow	тс	sc	S/T	Power	HR		нмс
F	gpm	PSI	FT	cfm	MBtuh	kW	MBtuh	°F	COP	MBtuh	F	gpm	PSI	FT	cfm	MBtuh	MBtuh	Ratio	kW	MBtuh	EER	MBtuh
	5.5	1.09	2.5		Oı	peration	not recoi	nmende	d			4.5	0.70	_								
20	8.0	2.69	6.2	1150	28.0	3.01	17.8	92.6	2.73	4.7	20	7.0	1.70				Operatio	n not re	ecomme	ended		
	11.5	3.51	8.1	1500	28.9	2.91	19.0	87.8	2.91	4.3	<u> </u>	9.0	2.81	6.5								
	5.5	1.06	2.5	1150	31.4	2.77	21.9	95.3	3.32	5.2		4.5	0.68	1.6	1000	35.0	23.9	0.68	0.96	38.2	36.4	-
				1500 1150	32.3 32.2	2.87	22.5 22.6	90.0 95.9	3.30	4.8 5.3					1300 1000	35.6 35.4	26.2 24.1	0.73	1.00 0.91	39.0 38.6	35.6 38.8	-
30	8.0	2.61	6.0	1500	33.1	2.90	23.2	90.5	3.35	4.8	30	7.0	1.65	3.8	1300	36.0	26.3	0.73	0.96	39.3	37.4	-
	11.5	3.41	7.9	1150	32.8	3.03	22.5	96.4	3.17	5.4	ļ	9.0	2.73	6.3	1000	35.6	24.1	0.68	0.89	38.7	40.2	-
	\vdash			1500 1150	33.8 36.3	2.93	23.8	90.9	3.38	5.0 5.6	_		╁		1300 1000	36.5	26.3 25.7	0.72	0.93	39.7 40.9	39.2	-
	5.5	1.02	2.4	1500	37.4	2.89	27.5	93.1	3.79	5.0	İ	4.5	0.66	1.5	1300	37.7	28.1	0.75	1.20	41.8	31.4	-
40	8.0	2.53	5.9	1150	37.4	2.88	27.6	100.1	3.82	5.8	40	7.0	1.60	3.7	1000	37.4	26.0	0.69	1.09	41.1	34.2	-
	\vdash			1500 1150	38.6 38.2	2.94	28.6	93.8	3.85	5.1 5.9		<u> </u>			1300 1000	38.1	28.4	0.74	1.15	42.0 41.3	33.2 35.5	-
	11.5	3.31	7.6	1500	39.4	2.97	29.3	94.3	3.89	5.2		9.0	2.65	6.1	1300	38.6	28.4	0.74	1.11	42.3	34.7	-
	5.5	0.99	2.3	1150	41.2	2.87	31.4	103.1	4.21	6.0		4.5	0.64	1.5	1000	37.4	25.3	0.68	1.34	41.9	28.0	-
	-			1500 1150	42.4 42.7	2.91	32.5 32.7	96.2 104.4	4.27	5.6 6.5					1300 1000	39.4	28.2 25.6	0.72	1.41	44.1 42.5	28.0	-
50	8.0	2.46	5.7	1500	44.0	2.97	33.9	97.2	4.34	5.7	50	7.0	1.55	3.6	1300	40.2	28.5	0.07	1.32	44.7	30.4	-
	11.5	3.20	7.4	1150	43.6	2.96	33.5	105.1	4.32	6.6		9.0	2.56	5.9	1000	38.5	27.4	0.71	1.23	42.7	31.4	-
				1500 1150	45.0 45.2	3.00 2.89	34.8 35.4	97.8 106.4	4.40	6.8					1300 1000	40.6 35.9	30.4 25.4	0.75	1.29	45.0 41.1	31.5 23.4	1.9
	5.5	0.93	2.2	1500	46.7	2.09	36.8	98.8	4.70	5.7	l	4.5	0.62	1.4	1300	37.7	28.3	0.71	1.60	43.1	23.5	2.0
60	8.0	2.38	5.5	1150	47.3	2.97	37.1	108.0	4.66	6.7	60	7.0	1.50	3.5	1000	36.8	25.7	0.70	1.46	41.7	25.2	2.1
**			0.0	1500	48.8	2.99	38.6	100.1	4.78	5.8 6.9	"		1	0.0	1300 1000	38.5 37.1	28.6 27.1	0.74	1.52	43.7 42.0	25.4 26.1	2.1
	11.5	3.10	7.2	1500	1150 48.4 3.00 38.2 109.0 4.73 1500 50.0 3.02 39.7 100.9 4.86							9.0	2.48	5.7	1300	39.0	30.1	0.73	1.42	44.0	26.2	2.2
	5.5	0.90	2.1	1150	49.3	2.91	39.4	109.7	4.97	6.6		4.5	0.60	1.4	1000	34.4	25.6	0.74	1.92	41.0	17.9	2.7
	0.5	0.50	2.1	1500	51.0	3.02	40.7	101.5	4.95	6.2		ļ	0.00	1.7	1300 1000	36.5	29.5	0.81	1.91	43.0	19.1	2.9
70	8.0	2.30	5.3	1150 1500	51.9 53.5	3.01	41.6 43.3	111.8	5.06	6.9 6.4	70	7.0	1.45	3.4	1300	35.3 36.9	25.9 28.7	0.73	1.66	41.0 42.7	21.3	3.1
	11.5	3.00	6.9	1150	53.2	3.04	42.8	112.8	5.12	7.6	}	9.0	2.40	5.5	1000	35.7	26.9	0.75	1.61	41.2	22.1	3.2
	11.0	0.00	0.0	1500	55.0	3.03 2.96	44.7 42.6	104.0 112.5	5.32	6.6	<u> </u>	0.0	12.10	0.0	1300	37.3 32.9	29.8 25.3	0.80	1.68	43.0 39.7	22.2	3.3 4.0
	5.5	0.87	0.1	1150 1500	52.7 54.6	2.90	44.5	103.7	5.21	7.2 6.1	ł	4.5	0.57	1.3	1000	34.2	28.2	0.77	2.00	41.2	16.5 16.6	4.0
80	8.0	2.22	5.1	1150	55.8	3.08	45.3	114.9	5.31	7.5	80	7.0	1.40	3.2	1000	33.8	25.6	0.76	1.93	40.4	17.5	4.2
"	0.0	2.22	0.1	1500	57.7	3.05	47.3	105.6	5.54	6.3	**	7.0	10	0.2	1300	35.1	28.4	0.81	1.98	41.9	17.7	4.2
	11.5	2.90	6.7	1150 1500	57.4 59.4	3.12	46.7 48.9	116.2 106.6	5.39	7.7		9.0	2.32	5.4	1000	34.1 35.6	26.3 29.1	0.77	1.89	40.6 42.2	18.1	4.4 4.4
	5.5	0.84	1.9	1150	56.2	3.02	45.9	115.2	5.45	7.4		4.5	0.55	1.3	1000	31.3	25.1	0.80	2.27	39.0	13.8	5.3
	5.5	0.04	1.5	1500	58.2	2.97	48.0	105.9	5.74	6.7		4.5	0.55	1.5	1300	32.4	27.9	0.86	2.32	40.3	14.0	5.3
90	8.0	2.14	5.0	1150 1500	59.7 61.8	3.15	48.9 51.2	118.1 108.2	5.55	7.8 7.2	90	7.0	1.35	3.1	1000 1300	32.2 33.4	25.4 28.2	0.79	2.20	39.7 41.1	14.6	5.6 5.6
	11.5	2.79	6.5	1150	61.6	3.20	50.7	119.6	5.64	8.6]	9.0	2.24	5.2	1000	32.8	24.9	0.76	2.17	40.2	15.1	5.9
	11.5	2.73	0.0	1500	63.7	3.12	53.1	109.3	5.98	7.9	<u> </u>	0.0	2.27	0.2	1300	33.8	28.4	0.84	2.21	41.3	15.3	5.6
	5.5	0.80	1.8									4.5	0.53	1.2	1000	29.1 30.0	24.2 26.8	0.83	2.62	38.1 39.1	11.1	6.8
100	8.0	2.07	4.8								100	7.0	1.30	3.0	1000	30.1	24.5	0.81	2.57	38.9	11.7	7.1
'**		2.07	4.0								'**	/.0	1.00	0.0	1300	31.1	27.2	0.87	2.61	40.0	11.9	7.0
	11.5	2.69	6.2									9.0	2.16	5.0	1000 1300	30.4	24.4 27.0	0.80	2.53	39.0 40.2	12.0 12.2	7.5 6.2
	5.5	0.77	1.8									4.5	0.51	12	1000	26.9	23.3	0.87	2.98	37.1	9.0	8.1
	5.5	0.77	1.0									4.5	0.51	1.2	1300	27.7	25.8	0.93	3.01	37.9	9.2	8.0
110	8.0	1.99	4.6		Operation not recommended							7.0	1.25	2.9	1000 1300	27.9	23.5 26.1	0.84	2.95	38.0 38.9	9.5	8.5 8.5
	11.5	2.59	6.0									9.0	2.07	ΔΩ	1000	28.2	23.2	0.82	2.90	38.1	9.7	8.9
	11.5	2.08	0.0								<u> </u>	9.0	2.07	7.0	1300	29.0	25.6	0.88	2.93	39.0	9.9	8.1
	5.5	0.73	1.7									4.5	0.49	0.8	1000 1300	23.9	22.7 24.8	0.95 1.02	3.54	36.0 36.7	6.7	9.9
120	8.0	1.91	4.4								120	7.0	1.20	2 0	1000	24.2	22.9	0.95	3.35	35.6	7.2	10.2
'20	0.0	1.81	7.4									1.0	1.20	2.0	1300	24.6	24.9	1.01	3.43	36.3	7.2	10.5
	11.5	2.49	5.8									9.0	1.99	4.6	1000 1300	24.4	22.9 24.9	1.00	3.24	35.4 36.3	7.5	10.7
				<u> </u>	n thousa								_		1000	_ F.U	2 7.0	1.00	0.04	1 00.0	7.0	11/2/20

Performance capacities shown in thousands of Btuh.

11/2/20

Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



048 - 50% Part Load

U48				_oad			0 547	- 00F					1 14/5				2001	1110 5	- A T 00/			
EWT	Flow	WP	טי			HEATIN	ı				EWT	Flow	WF	טי		ı	1		AT 80/6		ı	
°F	gpm	PSI	FT	Airflow	HC	Power	HE	LAT °F	СОР	HWC	°F	gpm	PSI	FT	Airflow	TC	SC	S/T	Power	HR	EER	HWC
	2.5	0 E6	1 2	cfm	mBtuh	kW	MBtuh	1		MBtuh		2.0	0.47	1 1	cfm	MBtuh	MBtuh	Ratio	kW	MBtuh		MBtuh
	3.5 5.0				Оре	eration n	ot recor	nmende	ed			3.0 4.5	0.47	1.1								
20	6.5		3.2	650	16.5	1.83	10.3	93.6	2.65	2.4	20	6.0	1.16				Operati	on not r	ecomm	ended		
	0.0		0.2	900 650	16.9 16.7	1.65	11.3 11.4	87.4	3.00	3.1 2.7		1 0.0			500	23.9	14.1	0.50	0.57	25.0	42.0	l -
	3.5	0.55	1.3	900	17.3	1.60	11.4	93.9 87.8	3.12	2.7		3.0	0.45	1.1	750	24.3	15.5	0.59	0.57	25.8 26.3	41.1	-
30	5.0	0.94	22	650	18.1	1.64	12.5	95.8	3.22	3.0	30	4.5	0.79	1.8	500	24.2	14.3	0.59	0.54	26.0	44.8	-
"	0.0	0.54	2.2	900 650	18.6 18.8	1.66	13.0 12.5	89.2 96.8	3.30 2.96	2.6 3.1	"	7.5	0.73	1.0	750 500	24.6	15.6 14.3	0.63	0.57	26.5 26.1	43.2 46.4	-
	6.5	1.33	3.1	900	19.2	1.68	13.5	89.8	3.35	2.6		6.0	1.12	2.6	750	24.3	15.6	0.59	0.52	26.8	45.3	-
	3.5	0.53	1.2	650	19.8	1.61	14.3	98.3	3.61	3.0		3.0	0.44	1.0	500	27.0	18.1	0.67	0.49	28.6	55.3	-
		0.00		900 650	20.5	1.62	14.9 15.7	91.1	3.70	2.6 3.3		0.0	0.11	1.0	750 500	27.5 27.3	19.7	0.72	0.51	29.2	54.1 58.9	-
40	5.0	0.91	2.1	900	22.1	1.67	16.4	92.8	3.88	2.8	40	4.5	0.77	1.8	750	27.8	19.9	0.07	0.40	29.4	57.2	-
	6.5	1.29	3.0	650	22.1	1.68	16.4	101.5	3.85	3.4		6.0	1.09	2.5	500	27.5	18.2	0.66	0.45	29.0	61.2	-
	0.5	1.23	3.0	900	22.9	1.70	17.1	93.5	3.95	2.8		0.0	1.03	2.0	750	28.1	19.9	0.71	0.47	29.7	59.8	-
	3.5	0.51	1.2	650 900	22.9	1.65 1.65	17.3 18.0	102.7 94.3	4.08	3.3 2.8		3.0	0.43	1.0	500 750	25.8 26.6	16.3 19.2	0.63	0.68	28.1 29.0	38.1 37.7	-
50	5.0	0.88	2.0	650	24.7	1.70	18.9	105.2	4.26	3.6	50	4.5	0.74	1.7	500	26.3	16.4	0.62	0.59	28.3	45.0	-
30	3.0	0.00	2.0	900	25.7	1.69	19.9	96.4	4.45	3.0	"	4.5	0.74	1.7	750	27.1	19.3	0.71	0.61	29.2	44.2	-
	6.5	1.25	2.9	650 900	25.7 26.5	1.71	19.8 20.7	106.6 97.3	4.40	3.8		6.0	1.06	2.4	500 750	26.5 27.3	16.4 19.3	0.62	0.55	28.4 29.3	48.0 47.1	-
	3.5	0.50	1.1	650	25.7	1.71	19.9	106.6	4.41	3.7		3.0	0.41	1.0	500	24.7	15.9	0.64	0.83	27.6	29.8	1.2
	3.5	0.50	1.1	900	26.7	1.70	20.9	97.4	4.60	3.0		3.0	0.41	1.0	750	25.5	18.7	0.73	0.87	28.5	29.5	1.2
60	5.0	0.85	2.0	650 900								4.5	0.72	1.7	500 750	25.1 25.9	16.0 18.9	0.64	0.74	27.7 28.5	34.2 33.6	1.3
	6.5	1.21	2.8	650	650 29.0 1.77 23.0 111.3 4.82							6.0	1.02	2.4	500	25.4	16.1	0.63	0.70	27.8	36.4	1.4
	0.5	1.21	2.0	900	900 30.1 1.75 24.1 100.9 5.05							0.0	1.02	2.4	750	26.2	18.9	0.72	0.73	28.7	35.9	1.4
	3.5	0.48	1.1	650 900	28.5 31.1	1.77	22.5 25.1	110.7 102.0	4.73 5.15	4.0 3.3		3.0	0.40	0.9	500 750	23.7 24.6	15.5 18.3	0.65	0.98 1.03	27.0 28.1	24.2	1.7 1.8
70	5.0	0.83	1 0	650	31.0	1.80	24.8	114.1	5.04	4.3	70	4.5 0.70	1.6	500	23.9	15.7	0.65	0.89	27.0	27.0	1.9	
10	5.0	0.03	1.9	900	32.2	1.77	26.1	103.1	5.33	3.6	١,٠		0.70	1.0	750	24.7	18.4	0.75	0.93	27.8	26.7	1.9
	6.5	1.17	2.7	650 900	32.4 33.6	1.82	26.2 27.5	116.1 104.6	5.21	4.5 3.7		6.0	0.99	2.3	500 750	24.4 25.1	15.8 18.5	0.65	0.85	27.2 28.1	28.7	1.9 2.0
	3.5	0.46	1.1	650	30.5	1.87	24.1	113.4	4.78	4.2		3.0	0.39	0.9	500	22.6	15.0	0.66	1.16	26.5	19.5	2.5
	3.5	0.40	1.1	900	31.6	1.83	25.4	102.6	5.06	3.5		3.0	0.59	0.9	750	23.3	17.6	0.76	1.21	27.4	19.3	2.5
80	5.0	0.80	1.8	650 900	33.1 34.4	1.89	26.6 28.1	117.1 105.4	5.14 5.48	4.5 3.8	80	4.5	0.67	1.6	500 750	22.7	15.2 17.8	0.67	1.07	26.3 27.2	21.1	2.6
	6.5	1.13	26	650	34.8	1.91	28.3	119.5	5.34	4.8		6.0	0.96	2.2	500	23.2	15.3	0.66	1.03	26.7	22.6	2.8
	0.5	1.15	2.0	900	36.2	1.86	29.8	107.2	5.71	4.0		0.0	0.30	2.2	750	23.9	18.0	0.75	1.07	27.6	22.3	3.2
	3.5	0.45	1.0	650 900	32.4 33.6	1.96	25.7 27.1	116.1 104.6	4.84 5.14	4.5 3.7		3.0	0.37	0.9	500 750	21.4 22.1	14.5 17.0	0.68	1.33	26.0 26.8	16.1 16.0	3.4
90	5.0	0.77	1.8	650	35.2	1.97	28.5	120.1	5.23	4.8	90	4.5	0.65	1.5	500	21.4	14.6	0.68	1.26	25.7	17.0	3.5
30	5.0	0.77	1.0	900	36.7	1.91	30.1	107.7	5.63	4.0	90	4.5	0.03	1.5	750	22.0	17.2	0.78	1.31	26.5	16.9	3.6
	6.5	1.09	2.5	650 900	37.1 38.7	1.99	30.3	122.9 109.8	5.46	5.2 4.3		6.0	0.92	2.1	500 750	20.5	13.8	0.67	1.27	24.8	16.1 18.0	3.7
	3.5	0.43	1 0									3.0	0.36	0.8	500	19.3	13.3	0.69	1.56	24.6	12.4	4.3
	0.0	0.40	1.0									0.0	0.00	0.0	750	19.9	15.6	0.78	1.62	25.5	12.3	4.3
100	5.0	0.74	1.7								100	4.5	0.62	1.4	500 750	19.2 19.8	13.4 15.8	0.70	1.52 1.58	24.4 25.2	12.7 12.6	4.4 4.4
	6.5	1.05	2 1									6.0	0.89	2 1	500	19.9	13.6	0.68	1.46	24.9	13.6	4.6
	0.5	1.00	2.4									0.0	0.03	2.1	750	20.5	16.0	0.78	1.53	25.7	13.4	4.6
	3.5	0.41	1.0									3.0	0.35	0.8	500 750	17.2 17.7	12.1 14.2	0.70	1.78 1.85	23.3	9.7 9.6	5.0 5.0
110	5.0	0.71	16		Operation not recommended							4.5	0.60	1 1	500	17.0	12.2	0.72	1.77	23.0	9.6	5.4
'''	5.0	0.71	1.0		Ороганот постесопиненией							4.5	0.00	1.4	750	17.6	14.4	0.82	1.85	23.9	9.5	5.4
	6.5	1.01	2.3									6.0	0.86	2.0	500 750	17.8 18.3	12.4 14.6	0.70	1.72	23.7 24.4	10.4	5.8 5.8
	3.5	0.40	0.0									2.0	0 22	0.0	500	16.0	12.8	0.80	2.22	23.6	7.2	6.4
	3.5	0.40	0.9	-								3.0	0.33	0.0	750	16.4	13.9	0.85	2.27	24.1	7.2	6.5
120	5.0	0.68	1.6								120	4.5	0.58	1.3	500 750	16.2 16.5	12.9 14.0	0.80	2.09	23.4	7.7	6.6 6.6
	6.5	0.97	2.2						6.0	0.82	1 0	500	16.4	12.9	0.79	2.03	23.3	8.1	6.8			
ب	oxdot						D. 1					0.0	0.02	1.9	750	16.7	14.0	0.84	2.09	23.8	8.0	6.8
Perfor	mance	capa	citie	s shown	in thousa	ands of I	Btuh.															11/2/2

Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



048 - 100% Full Load

		WF	D		-	HEATIN	G - EAT	70°F			=\c-											
°F	Flow gpm	PSI	FT	Airflow cfm	HC mBtuh	Power	HE MBtuh	LAT °F	СОР	HWC MBtuh	°F	Flow gpm	PSI	FT	Airflow cfm	TC MBtuh	SC MB-	S/T Ratio	Power	HR MBtuh	EER	HWC MBtuh
	6.5	1.40	3.2	Cilli						WIDtull		5.5	1.05	2.4	Cilli	WIDtull	tun	Italio	N.V.	Wibtuii		Wibtuii
20	10.0	2.85	6.6				ot recom				20	8.0	2.00	4.6			Operation	on not re	ecomm	ended		
	13.5	4.79	11.1	1500 1800	39.4 39.7	4.05 3.97	25.6 26.2	94.3	2.86	6.05 5.6		10.5	2.94	6.8								
	6.5	1.36	3.2	1500	39.9	3.84	26.7	94.6	3.04	6.6		5.5	1.02	2.4	1000	42.8	28.0	0.65	1.20	46.9	35.7	-
	0.0	1.00	0.2	1800 1500	41.2 43.0	3.90 4.01	27.9 29.3	91.2 96.6	3.10	6.1 6.8		0.0	1.02		1400 1000	43.6 43.4	30.8	0.70	1.25	47.9 47.3	35.0 38.1	-
30	10.0	2.77	6.4	1800	44.4	4.04	30.6	92.8	3.22	6.1	30	8.0	1.94	4.5	1400	44.1	30.9	0.70	1.20	48.2	36.8	-
	13.5	4.65	10.7	1500	45.4	4.18	31.1	98.0	3.18	6.9		10.5	2.85	6.6	1000	43.6	28.3	0.65	1.10	47.4	39.5	-
	0.5	4.00	0.4	1800 1500	45.7 45.4	4.10	31.7 31.8	93.5 98.0	3.27	6.3 7.0			0.00		1400 1000	44.7	30.9 29.0	0.69	1.16	48.7 49.5	38.5	-
	6.5	1.32	3.1	1800	46.9	4.02	33.2	94.1	3.42	6.2		5.5	0.99	2.3	1400	45.5	31.7	0.70	1.48	50.6	30.8	-
40	10.0	2.69	6.2	1500 1800	49.0 50.7	4.15 4.15	34.9 36.6	100.3 96.1	3.46	7.3 6.4	40	8.0	1.88	4.3	1000 1400	45.2 46.0	29.2 31.9	0.65	1.35	49.8 50.9	33.5	-
	13.5	4.51	10.4	1500	50.6	4.18	36.4	101.2	3.55	7.5		10.5	2.77	6.4	1000	45.5	29.2	0.64	1.31	50.0	34.8	-
	13.5	4.51	10.4	1800	52.4	4.21	38.0	96.9	3.65	6.5		10.5	2.11	0.4	1400	46.6	31.9	0.69	1.37	51.2	34.0	-
	6.5	1.28	3.0	1500 1800	51.0 52.7	4.15 4.15	36.9 38.5	101.5 97.1	3.61	7.5 7.0		5.5	0.96	2.2	1000 1400	45.7 47.1	27.8 32.8	0.61	1.84	52.0 53.7	24.8	-
50	10.0	2.60	6.0	1500	55.0	4.28	40.4	104.0	3.77	8.2	50	8.0	1.82	4.2	1000	46.7	27.9	0.60	1.60	52.1	29.3	-
				1800 1500	57.1 57.1	4.26 4.31	42.6 42.4	99.4 105.3	3.93	7.2 8.4					1400 1000	48.1 47.0	32.9 27.9	0.68	1.67	53.8 52.1	28.8	-
	13.5	4.37	10.1	1800	59.0	4.31	44.3	100.3	4.01	8.6		10.5	2.68	6.2	1400	48.4	32.9	0.68	1.58	53.8	30.6	-
	6.5	1.24	2.9	1500 1800	57.1 59.1	4.32	42.3 44.5	105.2 100.4	3.87 4.04	7.6 7.1		5.5	0.93	2.2	1000 1400	43.9 45.2	27.2 32.1	0.62	2.06	50.9 52.6	21.3	2.6
60	40.0	2.52		1500	61.7	4.42	46.7	108.1	4.09	8.4	60	0.0	4.70	4.4	1000	44.6	27.4	0.62	1.83	50.8	24.4	2.9
80	10.0	2.52	5.8	1800	64.1	4.37	49.2	103.0	4.30	7.2	60	8.0	1.76	4.1	1400	45.9	32.3	0.70	1.91	52.5	24.1	2.9
	13.5	4.23	9.8	.8 1500 64.4 4.46 49.1 109.7 4.23 8.6 1800 66.7 4.41 51.6 104.3 4.43 7.4 10.5 2.60							6.0	1000 1400	45.1 46.5	27.5 32.4	0.61	1.73	51.0 52.6	26.0	2.8 3.0			
	6.5	1.20	2.8	1500	63.1	4.48	47.8	109.0	4.13	8.1		5.5	0.90	2.1	1000	42.0	26.7	0.63	2.27	49.7	18.5	3.4
	0.0	0		1800 1500	67.8 68.5	4.49 4.56	52.5 52.9	104.9	4.43	7.5 8.6		0.0	0.00		1400 1000	43.7 42.4	31.7 26.9	0.73	2.27	51.4 49.5	19.3	3.7
70	10.0	2.44	5.6	1800	71.2	4.48	55.9	106.6	4.65	7.9	70	8.0	1.71	3.9	1400	43.8	31.7	0.72	2.15	51.1	20.4	3.9
	13.5	4.09	9.5	1500 1800	63.7 74.3	4.28 4.51	49.1 58.9	109.3	4.36	9.4 8.2		10.5	2.51	5.8	1000 1400	43.2 44.5	27.1 31.8	0.63	1.96 2.04	49.9 51.5	22.0	3.9 4.1
	0.5	1.10	0.7	1500	68.3	4.71	52.3	112.2	4.25	9.0			0.07	2.0	1000	39.8	25.7	0.65	2.54	48.5	15.6	5.4
	6.5	1.16	2.7	1800	71.0	4.63	55.2	106.5	4.50	7.7		5.5	0.87	2.0	1400	41.0	30.2	0.74	2.65	50.1	15.5	5.4
80	10.0	2.35	5.4	1500 1800	74.2 77.2	4.76 4.64	58.0 61.4	115.8 109.7	4.57	9.5 7.9	80	8.0	1.65	3.8	1000 1400	40.0 41.2	26.0 30.6	0.65	2.36	48.1 49.6	16.9 16.8	5.7 5.7
	13.5	3.95	9.1	1500	78.0	4.81	61.6	118.1	4.75	9.6		10.5	2.42	5.6	1000	40.9	26.2	0.64	2.26	48.6	18.1	5.9
-				1800 1500	81.1 73.5	4.68	65.1 56.7	111.7 115.4	5.08 4.37	9.0 9.7					1400 1000	42.2 37.6	30.8 24.8	0.73	2.36	50.2 47.2	17.9 13.3	5.9 6.7
	6.5	1.12	2.6	1800	76.4	4.82	60.0	109.3	4.64	8.6		5.5	0.84	1.9	1400	38.8	29.1	0.75	2.93	48.7	13.2	6.6
90	10.0	2.27	5.2	1500 1800	79.9 83.3	4.96 4.80	63.0 66.9	119.4 112.8	4.73 5.09	9.5 8.9	90	8.0	1.59	3.7	1000 1400	37.6 38.6	25.1 29.5	0.67	2.67	46.7 48.0	14.1	7.0
	13.5	3.81	8.8	1500	84.4	5.01	67.3	122.1	4.93	10.4		10.5	2.34	5.4	1000	37.3	24.9	0.67	2.59	46.1	14.4	7.3
	13.5	3.01	0.0	1800	87.9	4.85	71.4	115.2	5.31	9.7		10.5	2.34	5.4	1400	39.8	29.8	0.75	2.67	48.9	14.9	7.4
	6.5	1.08	2.5									5.5	0.81	1.9	1000 1400	35.1 36.2	23.9 28.1	0.68	3.14	45.8 47.3	11.2 11.1	8.9 8.8
100	10.0	2.19	5.1								100	8.0	1.53	3.5	1000	34.9	24.2	0.69	3.05	45.3	11.4	9.3
	\vdash														1400 1000	36.0 36.2	28.5 24.6	0.79	3.17 2.94	46.8 46.2	11.3	9.2
	13.5	3.67	8.5	5								10.5	2.25	5.2	1400	37.3	28.9	0.77	3.07	47.7	12.1	8.2
	6.5	1.04	2.4									5.5	0.78	1.8	1000 1400	32.7 33.6	23.1 27.0	0.71	3.45 3.59	44.5 45.9	9.5 9.4	10.6 10.5
140	10.0	2 11	4.0	Operation not recommended							140	0.0	1 47	2 4	1000	32.2	23.3	0.80	3.43	43.9	9.4	11.1
110	10.0	2.11	4.9		Оре	auon n	ot recom	menae	u		110	8.0	1.47	3.4	1400	33.3	27.5	0.82	3.58	45.5	9.3	11.1
	13.5	3.53	8.2									10.5	2.17	5.0	1000 1400	33.8	23.8 27.9	0.70	3.33	45.1 46.5	10.1	11.6 10.5
	6.5	1.00	2.3									5.5	0.75	17	1000	30.9	24.4	0.79	4.15	45.0	7.4	12.8
												0.0			1400 1000	31.5 31.3	26.6 24.6	0.84	4.25 3.93	46.0 44.7	7.4 8.0	13.1 13.2
120	10.0	2.02	4.7	7							120	8.0	1.42	3.3	1400	31.8	26.7	0.79	4.03	45.6	7.9	13.6
	13.5	3.39	7.8									10.5	2.08	4.8	1000	31.5	24.6	0.78	3.80	44.5	8.3	13.8
<u></u>				shown in											1400	32.2	26.7	0.83	3.92	45.6	8.2	14.0

Performance capacities shown in thousands of Btuh.

11/2/20

The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely the manufacturer's opinion or commendation of its products.

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Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



060 - 50% Part Load

000	- 50%	o Pai	ιL	oau																		
		WP	D						WP	D			COOL	ING - E	AT 80/6	7°F						
EWT	Flow gpm	PSI	FT	Airflow	нс	Power	HE	LAT	СОР	HWC	°F	Flow gpm	PSI	FT	Airflow	TC	sc	S/T	Power	HR	EER	HWC
<u> </u>	gpiii	POI	гі	cfm	mBtuh	kW	MBtuh	°F	COP	MBtuh	·	gpiii	PSI	гі	cfm	MBtuh	MBtuh	Ratio	kW	MBtuh	EER	MBtuh
	4.5	0.63	1.5		Оре	eration r	ot recom	mende	ed			4.0	0.43	1.0								
20	6.3	1.17	2.7	850	21.0	2.18	13.5	92.9	2.82	3.4	20	6.0	1.22	2.8			Operation	on not r	ecomm	ended		
	8.5	1.94	4.5	1100	21.4	2.02	14.5	88.0	3.10	3.1		7.5	1.80	4.2								
	4.5	0.61	1.4	850	23.8	2.01	16.9	95.9	3.47	3.9		4.0	0.42	1.0	700	31.5	18.0	0.57	0.76	34.1	41.2	-
	7.5	0.01	1.7	1100	24.6	2.03	17.7	90.7	3.54	3.4		4.0	0.42	1.0	950	32.1	19.7	0.61	0.80	34.8	40.3	-
30	6.3	1.14	2.6	850 1100	23.6	2.03	16.7 17.4	95.7 90.6	3.40	4.1 3.5	30	6.0	1.18	2.7	700 950	32.0 32.5	18.1 19.8	0.57	0.73	34.4 35.1	44.0 42.4	-
				850	24.8	2.22	17.4	97.0	3.27	4.2					700	32.1	18.1	0.56	0.70	34.5	45.6	-
	8.5	1.89	4.4	1100	25.3	2.06	18.3	91.3	3.60	3.6		7.5	1.75	4.0	950	32.9	19.8	0.60	0.74	35.4	44.5	-
	4.5	0.60	1.4	850	27.5	2.05	20.5	100.0	3.94	4.3		4.0	0.41	0.9	700	32.5	20.5	0.63	0.81	35.3	39.9	-
				1100 850	28.4	2.06	21.3	93.9	4.03 3.90	3.7 4.5			-		950 700	33.2 32.9	22.4	0.68	0.85	36.1 35.5	39.1 42.5	-
40	6.3	1.10	2.5	1100	28.5	2.00	21.4	94.0	4.00	3.8	40	6.0	1.15	2.6	950	33.5	22.6	0.67	0.77	36.3	41.3	-
İ	8.5	1 02	4.0	850	28.6	2.09	21.5	101.2	4.02	4.7		7.5	1.70	3.9	700	33.2	20.7	0.62	0.75	35.7	44.2	-
	0.5	1.83	4.2	1100	29.4	2.10	22.3	94.7	4.11	3.9		7.5	1.70	3.9	950	33.9	22.6	0.67	0.79	36.6	43.2	-
	4.5	0.58	1.3	850 1100	31.3	2.09	24.2 25.0	104.1	4.39	4.7 3.9		4.0	0.40	0.9	700 950	33.7 34.7	22.2	0.66	0.84	36.6	40.3 39.3	-
l				850	31.8	2.09	24.5	97.1 104.6	4.51	4.9					700	33.8	25.2 22.4	0.73	0.88	37.7 36.6	41.9	-
50	6.3	1.07	2.5	1100	32.5	2.12	25.3	97.4	4.50	4.1	50	6.0	1.11	2.6	950	34.8	25.4	0.73	0.85	37.7	41.2	-
	8.5	1.77	4.1	850	32.8	2.14	25.5	105.7	4.48	5.2		7.5	1.64	3.8	700	33.9	22.4	0.66	0.79	36.6	42.8	-
	0.0			1100	33.5	2.13	26.2	98.2	4.61	4.6		1.0		0.0	950	34.9	25.4	0.73	0.83	37.7	42.0	- 4.5
	4.5	0.56	1.3	850 1100	35.3 36.1	2.13	28.0 28.9	108.5 100.4	4.86 5.01	5.1 4.2		4.0	0.38	0.9	700 950	32.7 33.7	21.9	0.67	1.03	36.2 37.4	31.8	1.5 1.6
		4.00	2.4	850	36.4	2.17	29.0	109.7	4.92	5.3	-		4.00	2.5	700	32.9	22.1	0.67	1.00	36.3	33.0	1.7
60	6.3	1.03	2.4	1100	37.0	2.14	29.7	101.1	5.07	4.5	60	6.0	1.08	2.5	950	33.9	25.0	0.74	1.04	37.4	32.5	1.7
	8.5	1.72	4.0	850	37.3	2.19	29.8	110.6	5.00	5.6		7.5	1.59	3.7	700	33.0	22.1	0.67	0.98	36.3	33.9	1.8
-	Н			1100 850	37.9 39.3	2.16	30.5 31.9	101.9 112.8	5.15	4.7 5.4		_			950 700	34.0	25.0 21.6	0.74	1.02	37.5 35.9	33.3 26.0	1.8 2.1
İ	4.5	0.54	1.2	1100	38.6	2.15	31.3	102.5	5.26	4.5		4.0	0.37	0.9	950	33.0	24.7	0.75	1.39	37.7	23.7	2.3
70	6.3	1.00	2.3	850	41.0	2.20	33.5	114.6	5.45	5.8	70	6.0	1.04	2.4	700	31.9	21.8	0.68	1.18	36.0	27.0	2.4
'*	0.0	1.00		1100	41.4	2.16	34.1	104.9	5.63	4.8	70		1.01		950	32.9	24.5	0.74	1.24	37.1	26.6	2.4
	8.5	1.66	3.8	850 1100	41.8	2.23	34.1 34.8	115.5 105.5	5.49	6.0 5.0		7.5	1.54	3.6	700 950	32.1 33.1	21.9 24.6	0.68	1.16 1.21	36.1 37.2	27.7 27.4	2.5
				850	42.9	2.23	35.3	116.7	5.64	5.8					700	29.9	21.2	0.71	1.45	34.8	20.6	3.1
	4.5	0.52	1.2	1100	43.3	2.18	35.8	106.4	5.81	4.8		4.0	0.36	0.8	950	30.8	23.6	0.77	1.50	35.9	20.5	3.2
80	6.3	0.97	2.2	850	45.3	2.27	37.6	119.3	5.86	6.2	80	6.0	1.00	2.3	700	30.1	21.4	0.71	1.41	35.0	21.3	3.3
	\vdash			1100 850	45.5 45.8	2.20	38.0 38.0	108.3 119.9	6.06 5.85	5.1 6.6					950 700	31.0	23.9	0.77	1.47	36.1 35.1	21.2	3.4
İ	8.5	1.60	3.7	1100	46.0	2.23	38.4	108.7	6.05	5.4		7.5	1.49	3.4	950	31.3	24.1	0.77	1.44	36.2	21.7	4.0
	4.5	0.50	1.2	850	46.5	2.29	38.6	120.6	5.94	6.2		4.0	0.34	0.8	700	28.0	20.7	0.74	1.68	33.8	16.7	4.4
	4.5	0.50	1.2	1100	46.6	2.23	39.0	109.2	6.12	5.0		4.0	0.34	0.0	950	28.9	23.0	0.80	1.73	34.8	16.7	4.4
90	6.3	0.93	2.2	850 1100	49.6 49.6	2.33	41.6 41.9	124.0 111.7	6.24	6.6 5.4	90	6.0	0.97	2.2	700 950	28.4	20.9	0.74	1.64 1.70	34.0 35.0	17.3 17.2	4.6 4.6
	0.5	4.55	0.0	850	49.9	2.36	41.8	124.4	6.19	7.1		7.5	4 40		700	28.2	19.4	0.69	1.67	33.9	16.9	4.8
	8.5	1.55	3.6	1100	49.8	2.28	42.0	111.9	6.40	5.8		7.5	1.43	3.3	950	29.5	23.5	0.80	1.67	35.2	17.7	4.8
	4.5	0.48	1.1									4.0	0.33	0.8	700	26.1	20.1	0.77	2.02	33.0	12.9	5.4
	\vdash														950 700	26.9 26.4	22.2	0.83	2.07 1.99	34.0 33.2	13.0	5.4 5.5
100	6.3	0.90	2.1								100	6.0	0.93	2.2	950	27.2	22.5	0.83	2.04	34.2	13.3	5.5
	8.5	1.49	3.4									7.5	1.38	3 2	700	26.7	20.6	0.77	1.96	33.4	13.6	5.8
	J.5	1. 70	U.T									۲.۰	1.50	0.2	950	27.6	22.8	0.83	2.01	34.4	13.7	5.8
	4.5	0.47	1.1	Operation not recommended								4.0	0.32	0.7	700 950	24.2	19.6 21.5	0.81	2.36	32.2 33.2	10.2 10.4	6.3
440		0.00	2.2								110		0.00	2.1	700	24.5	19.8	0.81	2.34	32.5	10.4	6.8
110	6.3	0.86	2.0		Operation not reconfinenced							6.0	0.90	2.1	950	25.3	21.7	0.86	2.38	33.4	10.6	6.8
	8.5	1.43	3.3									7.5	1.33	3.1	700	24.8	20.1	0.81	2.30	32.7	10.8	7.2
<u> </u>		-	-									<u> </u>			950 700	25.6 23.6	22.0 19.3	0.86	2.35	33.6 33.4	10.9 8.2	7.2 8.2
	4.5	0.45	1.0									4.0	0.31	0.7	950	24.1	21.0	0.87	2.00	34.2	8.2	8.2
120	6.3	0.83	1.9								120	6.0	0.86	2 0	700	23.9	19.4	0.81	2.73	33.2	8.8	8.4
'2"	0.3	0.00	1.5									0.0	0.00	2.0	950	24.3	21.1	0.87	2.80	33.8	8.7	8.4
	8.5	1.38	3.2									7.5	1.28	3.0	700 950	24.1	19.4 21.1	0.81	2.64	33.1 33.9	9.1	8.7 8.7
$\overline{}$	-														900	24.0	∠ I. I	U.00	2.12	JJ.8	J.U	0.7

Performance capacities shown in thousands of Btuh.

11/2/20

Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



060 - 100% Full Load

060	- 100	70 F	uli L	.oau																											
EWT	Flow	WF	PD	D HEATING - EAT 70°F							EWT	Flow	WF	D			COOL	ING - E	AT 80/6	7 °F											
°F	gpm	PSI	FT	Airflow	нс	Power	HE	LAT	СОР	HWC	°F	gpm	PSI	FT	Airflow	TC	sc	S/T	Power	HR	EER	HWC									
	31			cfm	mBtuh	kW	MBtuh	°F	001	MBtuh		31			cfm	MBtuh	MBtuh	Ratio	kW	MBtuh	LLIX	MBtuh									
	8.5	2.00 3.52	4.6 8.1		Operation not recommended							6.5	_	2.8 6.2																	
20	13.0			1800	47.9	5.26	29.9	94.6	2.67	8.1	20	10.0	2.70		Operation not recommended																
	17.0	6.55	15.1	2200	48.9	5.23	31.1	90.6	2.74	7.5		13.5	4.20	9.7																	
	8.5	1.95	4.5	1800	48.2	4.41	33.2	94.8	3.21	8.4		6.5	1.17	2.7	1500	59.6	37.0	0.62	1.75	65.5	34.1										
				2200 1800	49.4 51.6	4.64 4.45	33.5 36.4	90.8	3.12	7.8 8.6		_	Н		1800 1500	60.7 60.4	40.6 37.3	0.67	1.82	66.9	33.4 36.4	-									
30	13.0 3	3.42 7.9	7.9	2200	53.0	4.74	36.9	92.3	3.28	7.9	30	10.0	2.62	6.1	1800	61.4	40.8	0.66	1.75	67.3	35.1	-									
	17.0	17.0 6.36	6.36 14.7	14.7	1800	52.5	4.81	36.1	97.0	3.20	8.8		13.5	4.08	9.4	1500	60.7	37.3	0.61	1.61	66.2	37.7	-								
				2200 1800	53.6 56.0	4.78 4.58	37.3 40.4	92.6 98.8	3.29	8.0 8.9		10.0			1800 1500	62.2	40.8 39.5	0.66	1.69 2.04	68.0 67.5	36.8	-									
	8.5	1.90	4.4	2200	57.3	4.77	41.0	94.1	3.52	8.2		6.5	1.14	2.6	1800	61.8	43.2	0.70	2.12	69.0	29.1	-									
40	13.0	3.32	7.7	1800	59.6	4.65	43.7	100.6	3.75	9.2	40	10.0	2.55	5.9	1500	61.3	39.9	0.65	1.94	67.9	31.7	-									
"	10.0	0.02	1	2200	60.9	4.85	44.4	95.6	3.68	8.4	"	10.0	2.00	0.0	1800	62.4	43.5	0.70	2.03	69.4	30.7	-									
	17.0	6.17	14.3	1800 2200	60.5 61.9	4.74 4.90	44.3 45.1	101.1 96.0	3.74	9.5 8.6		13.5	3.96	9.1	1500 1800	61.8 63.2	39.9 43.5	0.65	1.88	68.2 69.9	32.9	-									
	0.5	4.05	4.2	1800	63.8	4.75	47.6	102.8	3.93	9.5		0.5	4.40	2.5	1500	61.6	41.7	0.68	2.19	69.1	28.1	-									
	8.5	1.85	4.3	2200	65.2	4.90	48.4	97.4	3.90	8.6		6.5	1.10	2.5	1800	62.8	45.3	0.72	2.33	70.8	27.0	-									
50	13.0	3.21	7.4	1800 2200	67.5 68.9	4.85 4.97	51.0 51.9	104.7 99.0	4.08	9.9 8.9	50	10.0	.0 2.47	5.7	1500 1800	62.2 63.5	42.1 45.8	0.68	2.14	69.5 71.2	29.0	-									
	47.0	F ^^	10.0	1800	68.6	4.90	51.9	105.3	4.10	10.3	10 -	2.00	0.0	1500	62.8	42.6	0.72	2.20	70.0	29.8	-										
	17.0	5.98	13.8	2200	70.1	5.02	53.0	99.5	4.09	9.3		13.5	3.83	8.9	1800	64.1	46.2	0.72	2.24	71.7	28.6	-									
	8.5	1.80	4.2	1800	72.5	4.94	55.7	107.3	4.30	10.1		6.5	1.07	2.5	1500	59.2	40.9	0.69	2.46	67.6	24.0	3.1									
	\vdash												2200 1800	74.1 75.9	5.02	57.0 58.7	101.2 109.0	4.33	9.0			Н		1800 1500	60.7 59.8	44.4	0.73	2.62	69.6 68.0	23.1	3.1 2.9
60	13.0	3.11	7.2	2200	77.5	5.08	60.1	102.6	4.47	9.5	60	60 10.0	2.39 5	5.5	1800	61.3	44.9	0.73	2.57	70.1	23.9	2.9									
	17.0	5.79	13.4	1800	77.5	5.08	60.2	109.9	4.47	11.1]	13.5	3.71	8.6	1500	60.4	41.7	0.69	2.37	68.5	25.4	2.7									
				2200 1800	79.3 81.3	5.14 5.12	61.7	103.4 111.8	4.52	9.9	<u> </u>	-			1800 1500	61.9 56.7	45.3 40.1	0.73	2.53	70.5 66.1	24.5	2.7 4.6									
	8.5		4.0	2200	81.5	5.15	63.9	104.3	4.64	9.5	70 10.0	6.5	1.03	2.4	1800	58.1	44.0	0.76	3.20	69.0	18.2	4.6									
70	13.0		7.0	1800	84.2	5.19	66.5	113.3	4.76	11.2		10.0	0 2.31	5.3	1500	57.3	40.5	0.71	2.69	66.5	21.3	4.3									
'	10.0		7.0	2200 1800	86.1 86.4	5.20 5.25	68.4 68.5	106.3 114.4	4.85	10.0 11.9		10.0		0.0	1800 1500	59.1 57.8	43.9 40.8	0.74	2.86	68.9	20.7	4.3									
	17.0	5.60	12.9	2200	88.4	5.25	70.5	107.2	4.82	10.6		13.5	3.59	8.3	1800	59.7	44.4	0.71	2.81	66.9	21.9	4.2									
	8.5	1.68 3.9	3.9	1800	90.5	5.41	72.1	116.6	4.90	11.8	6.5	6.5	5 0.99	2 2	1500	52.9	38.8	0.73	3.13	63.6	16.9	6.1									
	0.5	1.00	3.3	2200	92.6	5.38	74.2	109.0	5.05	9.9		0.5	0.55	2.0	1800	54.9	42.2	0.77	3.34	66.3	16.4	6.1									
80	13.0	2.91	6.7	1800 2200	92.7 94.9	5.48 5.42	74.0 76.4	117.7 109.9	4.96 5.13	12.2 10.6	80	10.0	2.23	5.2	1500 1800	53.5 55.4	39.2 42.6	0.73	3.07	64.0	17.4 17.0	5.8 5.8									
	17.0	0 5 44 40	12.5	1800	95.5	5.54	76.6	119.1	5.05	12.6		13.5	2 5 2 47	8.0	1500	54.0	39.6	0.73	3.02	64.3	17.9	5.5									
	17.0	5.41	12.5	2200	97.9	5.48	79.2	111.2	5.24	11.2	Ш	13.5	3.5 3.47	0.0	1800	56.0	43.0	0.77	3.22	67.0	17.4	5.5									
	8.5	1.60	3.7	1800 2200	99.8 102.2	5.70 5.62	80.3	121.3 113.0	5.13	11.7 10.3	1	6.5	0.96	2.2	1500 1800	49.1 51.3	37.6 40.8	0.77	3.53	61.1 64.1	13.9 13.6	8.2 8.2									
	40.0	0.00	0.5	1800	101.1	5.76	81.4	122.0	5.14	12.6	1	10.0	0.45		1500	49.7	37.9	0.76	3.46	61.4	14.4	7.8									
90	13.0	2.80	6.5	2200	103.6	5.64	84.3	113.6	5.38	11.1	90	10.0	2.15	5.0	1800	51.7	41.2	0.80	3.68	64.3	14.1	7.8									
	17.0	5.22	12.1	1800 2200	104.5	5.83	84.6 87.9	123.8 115.2	5.25	13.4 11.9		13.5	3.34	7.7	1500 1800	50.7 52.3	38.2 41.6	0.75	3.50	62.6	14.5	7.3 7.4									
				2200	107.3	3.70	07.9	110.2	0.02	11.9					1500	44.7	36.4	0.81	4.02	58.4	11.1	10.3									
	8.5	1.55	3.6									6.5	0.92	2.1	1800	46.9	39.5	0.84	4.29	61.5	10.9	10.3									
100	13.0	2.70	6.2								100	10.0	2.07	4.8	1500	45.2	36.7	0.81	3.94	58.6	11.5	9.7									
															1800 1500	47.3 45.6	39.9 37.1	0.84	4.20 3.87	61.7 58.8	11.3	9.8									
	17.0	5.03	11.6									13.5	3.22	7.5	1800	47.8	40.3	0.84	4.13	61.9	11.6	9.2									
	8.5	1.50	3.5									6.5	0.89	2.1	1500	40.3	35.2	0.87	4.52	55.7	8.9	13.0									
		-										-	\vdash		1800 1500	42.4 40.7	38.2 35.5	0.90	4.82 4.42	58.9 55.8	9.2	13.1 12.3									
110	13.0	2.60	6.0		Ор	eration n	ot recom	mende	d		110	10.0	2.00	4.6	1800	42.9	38.6	0.90	4.72	59.0	9.1	12.4									
	17.0	4.84	11.2									13.5	3.10	7.2	1500	41.1	35.9	0.87	4.35	55.9	9.5	11.6									
-												1.5.5	155		1800	43.3	39.0	0.90	4.64	59.1	9.3	11.7									
	8.5	1.40	3.2									6.5	0.85	2.0	1500 1800	38.7 39.6	34.1 37.1	0.88	5.54 5.67	57.6 58.9	7.0	16.1 16.2									
120	13.0	2.50	5.8								120	10.0	1 02	4 1	1500	39.2	34.4	0.88	5.24	57.1	7.5	15.2									
120	13.0	2.50	0.0								'20	10.0	1.92	4.4	1800	39.9	37.3	0.93	5.38	58.3	7.4	15.3									
	17.0	4.65	10.7									13.5	2.98	6.9	1500 1800	39.6 40.4	34.4 37.3	0.87	5.07 5.23	56.9 58.2	7.8	14.3 14.5									
Dorfo	ш	as capacities shown in thousands of Dtub						ш				1000	+∪.4	57.5	0.52	5.25	JU.Z	1.1	11/2/20												

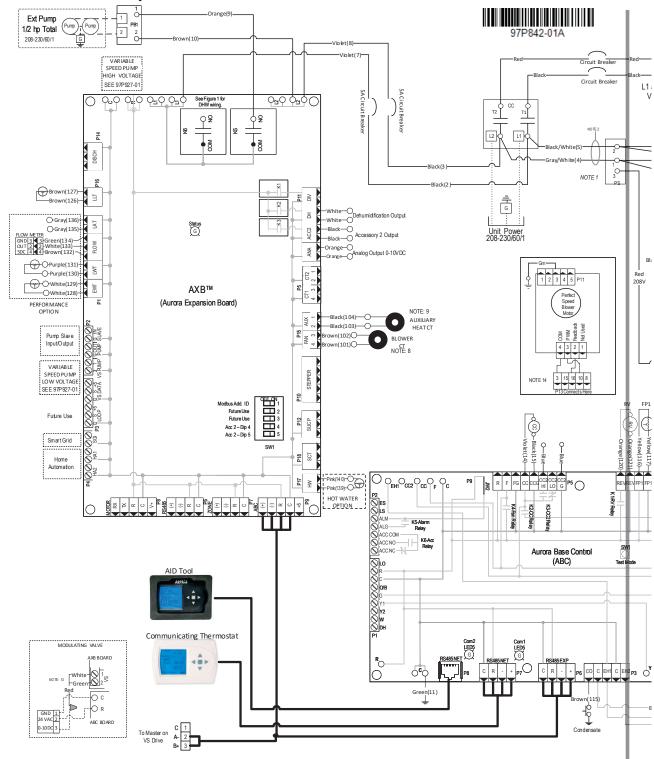
Performance capacities shown in thousands of Btuh.

11/2/20

Contractor:	P.O.:
Engineer:	
Project Name:	Unit Tag:

Wiring Schematics

Aurora Variable Speed



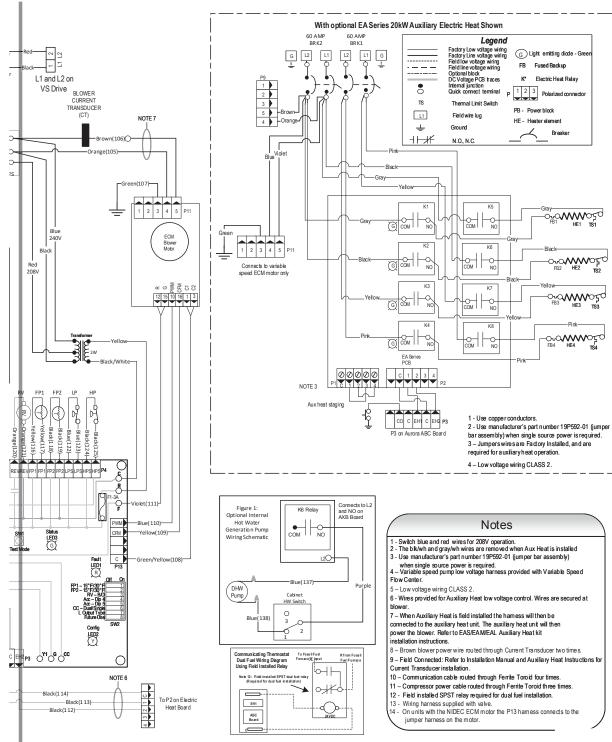
97P842-01A

The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set a find manufacturer works continually to improve its products. As a result, the design and specifications of send not have been approximately and their information contained berinnia to any of works were an every several results.

Contractor:	P.O.:	
Engineer:		
Proiect Name:	Unit Tag:	

Wiring Schematics cont.

Aurora Variable Speed cont.

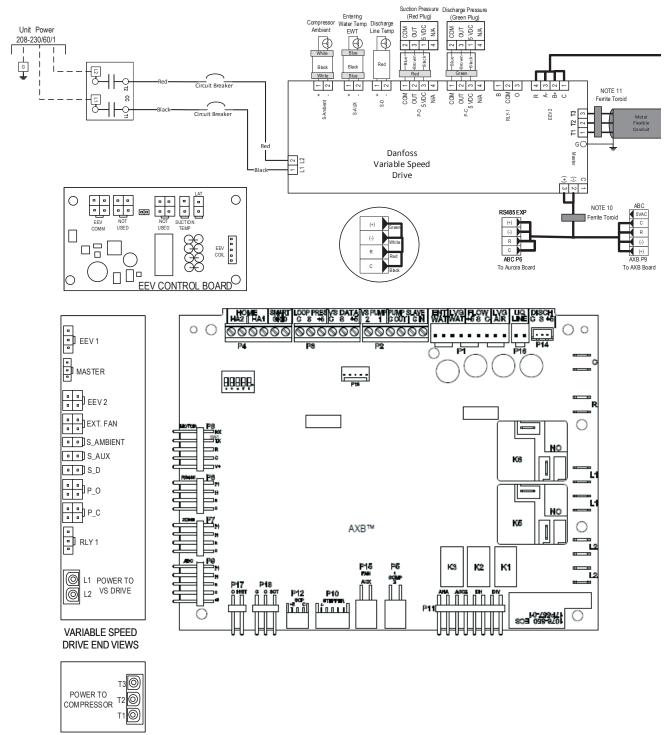


97P842-01A

Contractor:	P.O.:	_
Engineer:		_
Project Name:	Unit Tag:	

Wiring Schematics cont.

Aurora Variable Speed Drive/EEV Wiring



97P842-01B

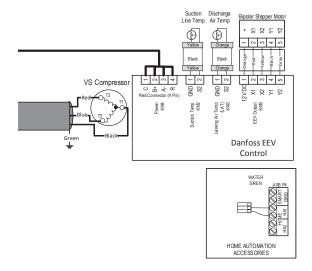
The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of this industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of t

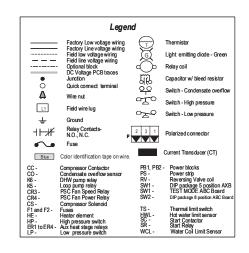
Contractor:	P.O.:	
Engineer:		
Project Name:	Unit Tag:	



Wiring Schematics cont.

Aurora Variable Speed Drive/EEV Wiring cont.





HP P4 HP LP P5 FP2 FP1 REV REV	ECM PWM SWI Test	LED1 FP1-19F730F	EH2 C EH1 C CO N/A
CC2 G P5	CC - K2	AURORA BASE CONTROL™	(-) R C
E F F F F F F F F F F F F F F F F F F F	CC Hi – K3 Fan – K4	Com1 C P S8 88	(+) (-) R C
R JW2 - Alarm	Alarm – K5 Acc – K6	P11 Com2 Com2 Sel	}
		P9 Factory Fan Connection	
\frac{1}{1} \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \bigcup \b		S	— 。
P2 Field	Connections	P1 Field Connections	— °
ES ES	AUS AOC c AOC no AOC nc	9 a ∪ 0 0 5 5 2 8 H H R R	

ABC SW2 Accessory Relay						
DESCRIPTION	SW2-4	SW2-5				
Cycle with Blower	ON	ON				
Cycle with Compressor	OFF	OFF				
Water Valve Slow Opening	ON	OFF				
Cycle with Comm. T-stat Hum Cmd	OFF	ON				

	AXB Accessory 2 DIP Settings							
SW1-4	SW1-5	DESCRIPTION						
ON	ON	Cycles with Blower						
OFF	ON	Cycles with CC first stage compressor or compressor spd 1-12						
ON	OFF	Cycles with CC2 second stage of compressor or comp spd 7-12						
OFF	OFF	Cycles with DH from ABC board						

		Aurora LED	Flash Codes	
Slow Flash	1 second on and 1 second off			
Fast Flash	100 milliseconds on and 100 mil	liseconds off		
Flash Code	100 milliseconds on and 400 mil	liseconds off with a	2 second pause before repeating	
	Fault LED (LED 1, Red)		Random Start Delay (Alternatin	g Colors)
Normal Mode	е	OFF	Status LED (LED1, Green)	Fast Flash
Input Fault Lo	ockout	Flash Code 1	Configuration LED (LED 2, Yellow)	Fast Flash
High Pressur	re Lockout	Flash Code 2	Fault LED (LED 3, Red)	Fast Flash
Low Pressur	e Lockout	Flash Code 3	Configuration LED (LED 2,)	'ellow)
Freeze Dete	ction- FP2	Flash Code 4	No Software Overide	OFF
Freeze Dete	ction - FP1	Flash Code 5	DIP Switch Overide	Slow Flash
Reserved		Flash Code 6	Status LED (LED 3, Gree	n)
Condensate	Overflow Lockout	Flash Code 7	Normal Mode	ON
Over/Under	Voltage Shutdown	Flash Code 8	Control is Non - Functional	OFF
Future Use		Flash Code 9	Test Mode	Slow Flash
Fault- FP1 a	nd FP2 Sensor Error	Flash Code 11	Dehumidification Mode	Flash Code 2
Future Use		Flash Code 12	Future Use	Flash Code 3
Non-Critical AXB Sensor Error		Flash Code 13	Future Use	Flash Code 4
Critical AXB \$	Sensor Error	Flash Code 14	Load Shed	Flash Code 5
Alarm - Hot V	Nater	Flash Code 15	ESD	Flash Code 6
Fault Variabl	e Speed Pump	Flash Code 16	Future Use	Flash Code 7
Future Use		Flash Code 17	Fault LED (LED 1, Red) C	ont.
Non-Crifical (Communication Error	Flash Code 18	Safe Mode - Ambient Temperature Sensor	Flash Code 49
Fault - Critica	al Communication Error	Flash Code 19	Fault - Discharge Temperature Sensor	Flash Code 51
Alarm - Low	Loop Pressure	Flash Code 21	Fault - Suction Pressure Sensor	Flash Code 52
Fault - Comn	nunication ECM Fan Motor Error	Flash Code 22	Fault - Condensing Pressure Sensor	Flash Code 53
Alarm - Hom	e Automation 1	Flash Code 23	Fault - Low Supply Voltage	Flash Code 54
Alarm - Hom	e Automation 2	Flash Code 24	Fault - Compressor Out of Envelope	Flash Code 55
Fault - EEV E	Error	Flash Code 25	Fault - Over Current	Flash Code 56
Derate - Driv	ve Temperature	Flash Code 41	Fault - Over/Under Voltage	Flash Code 57
Derate - High	h Discharge Temperature	Flash Code 42	Fault - High Drive Temperature	Flash Code 58
Derate - Low	Suction Temperature	Flash Code 43	Fault - Drive Internal Error MOC/AOC	Flash Code 59
Derate - Low	Condensing Pressure	Flash Code 44	Fault - Multiple Safe Modes	Flash Code 61
Derate - High	h Condensing Pressure	Flash Code 45	Fault - Loss of Charge	Flash Code 71
Derate - Out	er Power Limit	Flash Code 46	Safe Mode - Suction Temperature Sensor	Flash Code 72

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Engineering Guide Specifications

General

Furnish and install GeoStar Water Source Heat Pumps, as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow. The reverse cycle heating/ cooling units shall be either suspended type with horizontal air inlet and discharge or floor mounted type with horizontal air inlet and vertical upflow, downflow, or rear air discharge. Units shall be AHRI/ISO 13256-1 certified and listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory. Each unit shall be computer run-tested at the factory with conditioned water and operation verified to catalog data. Each unit shall be mounted on a pallet and shipped in a corrugated box or stretch-wrapped. The units shall be designed to operate with entering liquid temperature between 20°F and 120°F [-6.7°C and 48.9°C].

Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with corrosion-resistant powder coating. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. The interior shall be insulated with 1/2-inch thick, multi-density, cleanable aluminum foil coated glass fiber with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL- 181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. Unit insulation must meet these stringent requirements or unit(s) will not be accepted.

One (horizontal) to two (vertical) blower and three compressor compartment access panels shall be 'lift-out' removable with supply and return ductwork in place. The front access panel shall be lift-out to provide easy access to the electrical/compressor section. The control box shall be hinged and removable to allow easy access to the compressor. The internal component layout shall provide for service access from the front side for restricted installations.

A duct collar shall be provided on the supply air opening. Standard size 2 in. [5.1 cm] MERV 11 pleated filters shall be provided with each unit. Vertical and horizontal units shall have a return air filter rack/duct collar which is field convertible from 2 in. [5.1 cm] to 1 in. [2.5 cm]. The upflow vertical units shall have a removable insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise and to permit operational service testing without air bypass. Vertical units shall be supplied with left or right horizontal air inlet and top, bottom, or rear vertical air discharge. Horizontal units shall be supplied with left or right air inlet and side or end air discharge.

The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting.

The drain pan shall be of plastic construction to inhibit corrosion and bacterial growth. Drain outlet shall be located on pan as to allow complete and unobstructed drainage of condensate. The unit as standard will be supplied with solid-state electronic condensate overflow protection. Mechanical float switches WILL NOT be accepted. Vertical units shall be furnished with a PVC slip condensate drain connection and an internal factory installed condensate trap.

Refrigerant Circuit

All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, discharge line muffler, bidirectional electronic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, optional hot water generator coil, and service ports. Compressors shall be high-efficiency variable speed scroll type designed for heat pump duty and mounted on double vibration isolators.

Compressor motors shall be permanent magnet type. The all-aluminum air coil shall be sized for low-face velocity and constructed of aluminum fins bonded to aluminum tubes in a staggered pattern not less than three rows deep for enhanced performance. All models shall include discharge mufflers to help quiet compressor discharge gas pulsations.

Refrigerant to air heat exchangers shall utilize tube construction rated to withstand 600 psig (4135 kPa) refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper (cupronickel optional) inner water tube and steel refrigerant outer tube design, rated to withstand 600 psig (4135 kPa) working refrigerant pressure and 450 psig (3101 kPa) working water pressure. An electronic expansion valve shall provide proper superheat over the entire liquid temperature range with minimal "hunting." The valve shall operate bidirectionally without the use of check valves.

All units shall have the source coaxial tube refrigerant-to water heat exchanger and the optional hot water generator coil coated with ThermaShield insulation. Refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures.

Blower Motor and Assembly

The blower shall be a direct drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low outlet velocity operation. The blower housing shall be removable from the unit without disconnecting the supply air ductwork for servicing of the blower motor. The blower motor shall be a variable-speed ECM type. The ECM blower motor shall be soft starting, shall maintain constant cfm over its operating static range, and shall provide 12 cfm settings. The blower motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated, have thermostatic overload protection and be long-life ball bearing type.

The manufacturer works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of this industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of the industrial control of t

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Electrical

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24 Volt activated, 2 pole compressor contactor, circuit breakers for protecting loop pumps and compressor drive, removable terminal block for thermostat wiring, variable speed compressor drive and solid-state controller for complete unit operation. Electromechanical operation WILL NOT be accepted. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be communicating type and provide heating or cooling as required by the remote thermostat/sensor. An Aurora Advanced VS Control, a microprocessor based controller, interfaces with a digital communicating thermostat to monitor and control unit operation shall be provided. The control shall provide operational sequencing, blower speed control, blower failure, high and low pressure switch monitoring, freeze detection, hot water limit thermistor sensing, condensate overflow sensing, auxiliary heat staging, lockout mode control, hot water and loop pump control, LED status and fault indicators, fault memory, field selectable options, compressor envelope management, energy consumption measurement, and accessory output. The fault signals shall be plain English text and displayed on the thermostat.

The Aurora Advanced VS Control shall also feature an On Peak input signal for utility controlled demand programs, intelligent hot water generation with user adjustable temperature limit, loop pump linking for multiple units driving a common flow center and up to two optional home automation inputs to drive dedicated alarms for sump pump, security system, and smoke/CO2 or dirty air filter sensors. As standard, the energy and refrigerant monitoring kits will provide real time data including total power consumption, refrigerant superheat and subcooling. Optional performance monitoring kit to provide real time data including, entering and leaving water temperature, flow rate and heat of extraction/rejection capacity data. The capability for communicating to advanced zoning packages with up to six zones shall also be provided with complete fault and information display on the zoning MasterStat.

A detachable terminal block with screw terminals will be provided for field control wiring. All units shall have knockouts for entrance of low and line voltage wiring. The blower motor and control box shall be harness plug wired for easy removal.

An optional Aurora Interface Diagnostic (AID) Tool shall communicate with the Aurora control allowing quick and easy access to setup, monitoring, and troubleshooting of any Aurora control. The device shall include the features of ECM airflow setup, VS pump and modulating water valve setup, fault description and history, manual operation capability, sensor readings, timings, and other diagnostic tools.

Piping

Supply and return water connections shall be 1 in. [25.4 mm] FPT brass swivel fittings, which provide a union and eliminate the need for pipe wrenches and sealants when making field connections. The optional hot water generator shall have sweat type connections. All source water piping shall be insulated to prevent condensation at low liquid temperatures. On the vertical units, the condensate connection shall be a 3/4 in. [19.1 mm] PVC socket with internally-trapped hose that can be routed to front or side locations.

Hanger Kit

(field-installed horizontal units only)

The hanger kit shall consist of galvanized steel brackets, bolts, lock washers, and isolators and shall be designed to fasten to the unit bottom panel for suspension from 3/8- inch threaded rods. All unit size shall include six brackets hanging brackets.

Options and Accessories

Cupronickel Heat Exchanger

An optional cupronickel water-to-refrigerant heat exchanger shall be provided.

Hot Water Generator

An optional ThermaShield coated heat reclaiming hot water generator coil of vented double-wall copper construction suitable for potable water shall be provided. The coil and hot water circulating pump shall be factory mounted inside the unit with integral electronic high limit temperature monitoring and external on/off switch. Hot water set point is selectable through the AID Tool.

Thermostat (field-installed)

A communicating auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer variable speed heating and cooling staging with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO-INTERMITTENT blower switch, and indicating display shall be provided. The thermostat shall display in °F or °C. The thermostat shall provide real time energy consumption data of the unit.

Color Touchscreen Thermostat (field-installed)

A color touchscreen communicating auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer variable speed heating and cooling staging with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO-INTERMITTENT blower switch, and indicating display shall be provided. The thermostat shall display in °F or °C. The thermostat shall provide real time and historical energy consumption data of the unit.

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Electronic Air Cleaner (field-installed)

A 1 in. [25 mm] electronic air cleaner, cleanable 97% efficiency at 0.3 microns and larger, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.2 in. w.g. at 300 fpm force velocity.

Electrostatic Air Cleaner (field-installed)

A 1 in. [25 mm] electrostatic air cleaner, cleanable 90% efficiency, shall be provided in lieu of the standard throwaway filter. The initial pressure drop across the filter shall not exceed 0.15 in. w.g. at 300 fpm force velocity.

AlpinePure MERV 13 Filter

A 2 in. [50 mm] thick MERV 13 filter shall be provided in lieu of the standard filter and fits the factory filter rack. The filter maintains MERV 13 rating in full ASHRAE 52.2 independent testing as required for LEED® certification. Helps fulfill a full credit under the LEED rating system.

AlpinePure Drain Pan Treatment

Provides dependable, sustained time-release protection from slime build-up and foul smelling odors in the drain pan. Also adds a light, pleasant scent to the air.

Earth Loop Flow Center (field-installed)

A self-contained module shall provide all liquid flow, fill and connection requirements for ground source closed loop systems up to 20 gpm. The pumps shall be wired to a power block located in the nearest unit. The heat pump units shall contain low voltage pump linking control so that two units may share one flow center.

Auxiliary Heater (field-installed)

An electric resistance heater shall provide supplemental and/or emergency heating capability. Vertical units shall have the control panel and resistance heater coil assembly mounted internally. For horizontal units, the control panel shall be mounted internally while the resistance heater coil assembly shall be mounted externally. A low voltage plug shall be provided in each unit for quick auxiliary heat connection. The heater shall operate in sequenced stages as controlled by the unit's microprocessor. The heater shall feed line voltage power to the unit blower and transformer to provide emergency heat capability in the event of an open compressor circuit breaker.

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Revision Guide

Pages:	Description:		By:
Misc	Updated with Aluminum Air Coils	04 Dec 2020	MA
Misc	Updated Schematics, General Installation Information, Unit Startup (UPMXL)	20 Sept 2020	JM
All	Misc. Updates	04 Jan 2017	MA
Misc.	Misc. Updates, Updated Performance Data	12 Aug 2016	MA
All	Various Updates for Electric Heating Change	22 April 2015	MA