5 Series

Geo-Ready® Split

Geothermal heat pump

3-5 ton (dual capacity)

WaterFurnace
Smarter from the Ground Up™

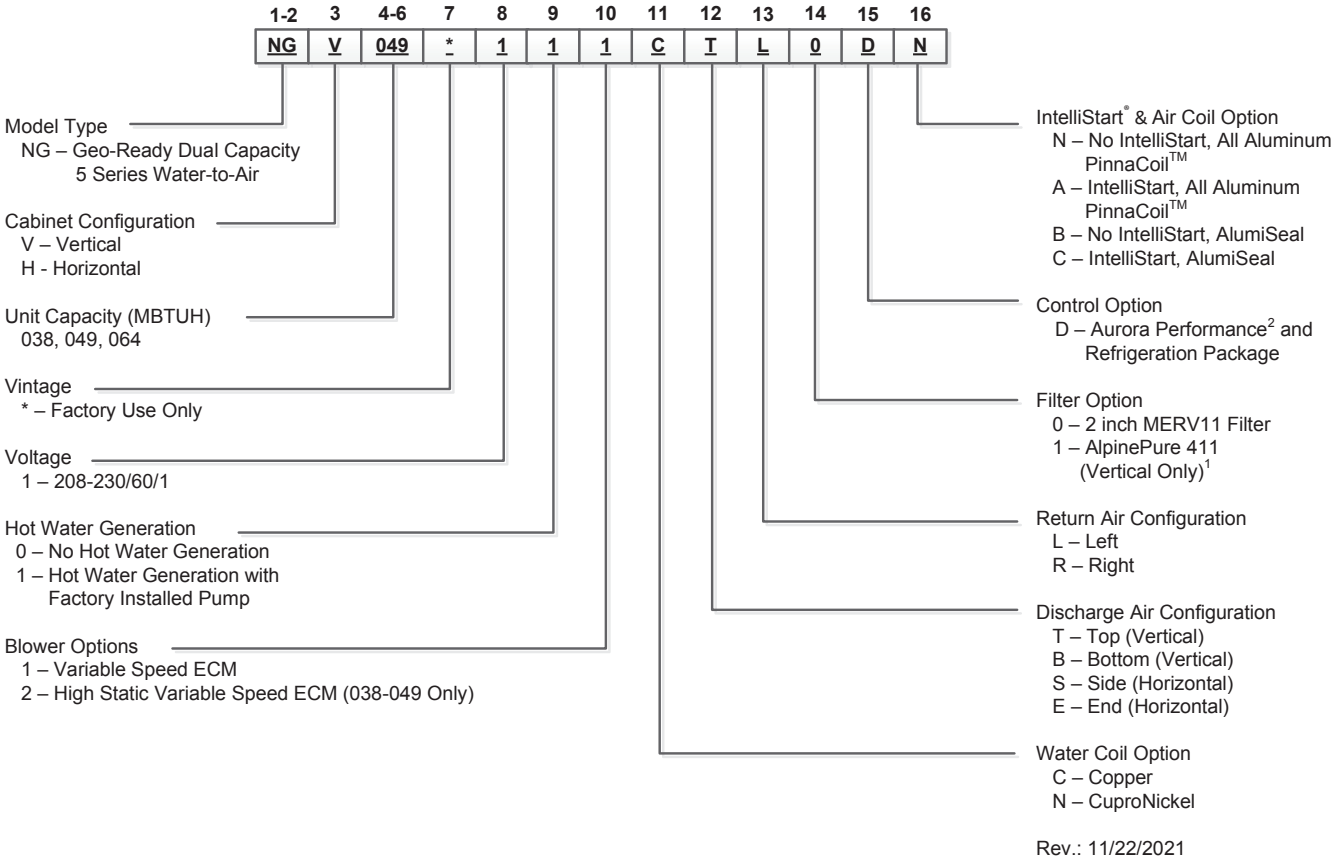
Submittal Data

English Language/IP Units

SD2510EW 07/24

Model Nomenclature

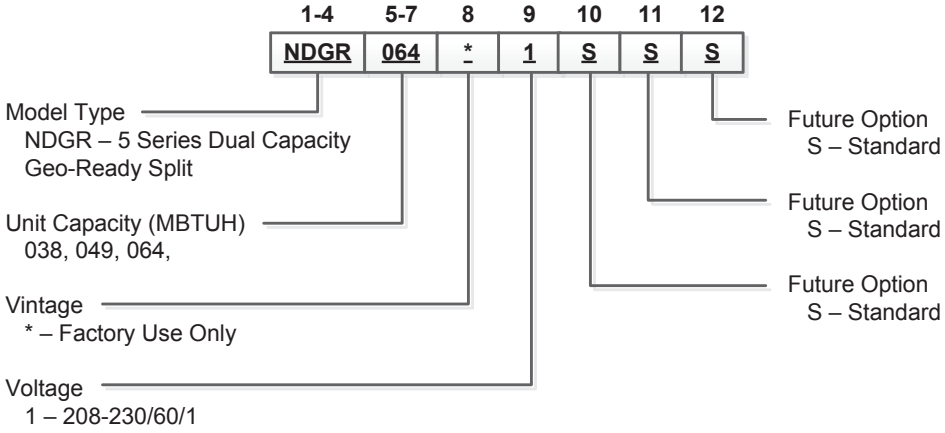
Indoor



Notes:
All Models include sound kits as std. equipment
[1] Available on vertical configurations only
[2] Performance demonstrated only when connected to ground source

Model Nomenclature cont.

Outdoor



Rev.: 3/28/22

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

AHRI/ISO 13256-1 Performance Ratings

ECM motor

AHRI/ASHRAE/ISO 13256-1

English (IP) Units

Model	Capacity Modulation	Flow Rate		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
				Cooling EWT 86°F		Heating EWT 68°F		Cooling EWT 59°F		Heating EWT 50°F		Cooling Brine Full Load 77°F Part Load 68°F		Heating Brine Full Load 32°F Part Load 41°F	
		gpm	cfm	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
038	Full	9	1300	36,500	17.0	43,300	5.5	40,000	24.4	35,000	4.9	38,200	19.7	28,500	4.2
	Part	8	1150	26,500	19.0	31,300	6.4	29,900	32.1	24,900	5.1	29,500	28.0	22,900	4.8
049	Full	12	1600	49,100	17.2	59,000	5.5	54,100	24.5	47,200	4.6	50,800	19.3	38,200	4.0
	Part	11	1400	36,300	19.1	41,700	6.1	41,600	33.0	33,600	4.7	39,800	27.4	31,000	4.4
064	Full	16	1800	62,300	16.4	73,900	5.2	69,000	23.9	60,400	4.6	65,500	19.3	47,300	3.8
	Part	14	1500	45,800	18.1	53,200	5.9	53,000	30.7	43,500	4.8	50,500	26.5	35.700	4.3

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

11/22/22

AHRI 210/240 Performance Ratings (Air Source Mode)

AHRI 210/240

English (IP) Units

Indoor	Outdoor	Rated SCFM	*2023 Standard						2017 Standard					
			Cooling			Heating			Cooling			Heating		
			Capacity (95°F) Btuh	EER-2 (95°F)	SEER-2	Capacity (47°F) Btuh	Capacity (17°F) Btuh	HSPF-2 (Region IV)	Capacity (95°F) Btuh	EER (95°F)	SEER	Capacity (47°F) Btuh	Capacity (17°F) Btuh	HSPF (Region IV)
NGV/NGH038*1*(1,2)	NDGR038*1	1300	36,800	12.60	16.00	35,000	21,800	8.90	36,800	13.50	17.30	35,000	21,800	10.50
NGV/NGH049*1*(1,2)	NDGR049*1	1600	47,000	12.30	15.50	48,000	31,000	8.60	47,000	12.65	16.00	48,000	31,000	10.00
NGV/NGH064*1*1	NDGR064*1	1800	60,000	12.10	15.00	55,500	35,600	8.60	60,000	12.45	15.50	55,500	35,600	10.00

Cooling capacities based upon 80°F DB, 67°F WB entering air temperature
Heating capacities based upon 70°F DB, 60°F WB entering air temperature
All ratings based upon 230V operation
*New SEER-2, EER-2, HSPF-2 ratings (based on new 2023 M1 standard) equivalent to previous SEER, EER and HSPF ratings (based on 2017 M standard)

11/16/22

The new SEER-2, EER-2 and HSPF-2 ratings are based on the Appendix-M1 update to the 10CFR Subpart B of Part 430 of the Federal Code. M1 Ratings are effective January 1, 2023. All Heat Pumps manufactured on or after January 1, 2023 must comply to the new M1 standard. The degradation in efficiency numbers is a reflection of more stringent testing requirements meant to be more representative of real world application in terms of higher external static pressures experienced by Indoor Units. The minimum static pressure requirements for Indoor Airflow increased to 0.5 from 0.2 for units with Air Filters. And for units without Air Filters, the minimum requirement increased to 0.58 from 0.28. Bin hour distributions for HSPF calculations have changed to allow for more stringent testing conditions at lower temperatures. This is reflected in the significant efficiency degradation in Heating more so than Cooling. In addition, the minimum energy efficiency requirements have also increased by 7% compared to 2017. All Geo-Ready products comply with the 2023 standards based on AHRI Certification Test Results.

Minimum Efficiency Requirements for Air Source Heat Pumps

2017		2023			
SEER	HSPF	SEER	HSPF	SEER-2	HSPF-2
14	8.2	15	8.8	14.3	7.5

11/16/22

AHRI/ISO 13256-1 Performance Ratings cont.

Energy Star Compliance Table AHRI ISO 13256-1 (Geo Mode)

Model	Tier 3	
	Ground Water	Ground Loop
038	E	E
049	E	E
064	E	E

Notes for Blower Option 5/16/22

E - ECM

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

GSHP Energy Star Rated Tier 3 Minimum Requirements

GWHP	21.1
GLHP	17.1
GWHP	4.1
GLHP	3.6

Energy Star Compliance Table AHRI 210/240 (Air Source Mode)

Indoor	Outdoor	Energy Star Compliant
NGV/NGH038*1*(1,2)	NDGR038*1	Yes
NGV/NGH049*1*(1,2)	NDGR049*1	Yes
NGV/NGH064*1*1	NDGR064*1	No

6/27/22

ASHP Energy Star Criteria for Certified Residential Heat Pumps

Product Type	**SEER**	**EER**	**HSPF**
HP Split Systems	≥ 16.0	≥ 12.5	≥ 9.2

6/1/22

Sound Performance Ratings (Air Source)

Model	Stage	Sound Rating (dBa)
038	Part Load	55
	Full Load	60
049	Part Load	55
	Full Load	63
064	Part Load	60
	Full Load	72

8/18/22

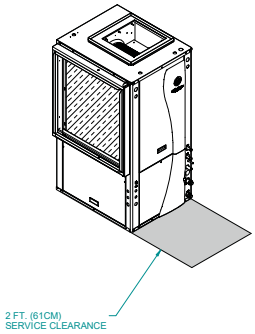
Contractor: _____ P.O.: _____

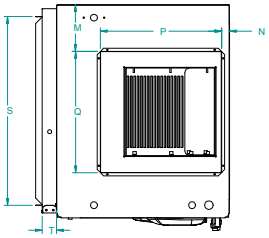
Engineer: _____

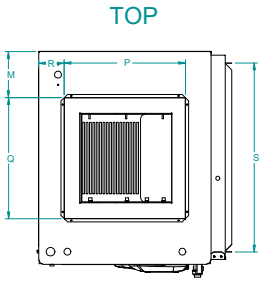
Project Name: _____ Unit Tag: _____

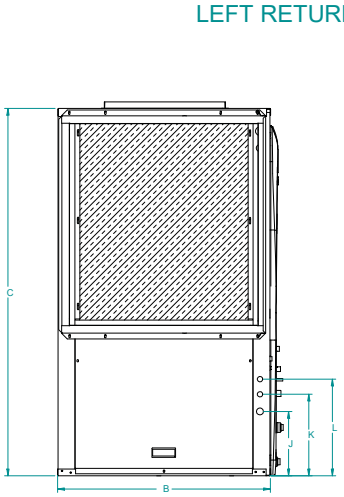
Vertical Dimensional Data

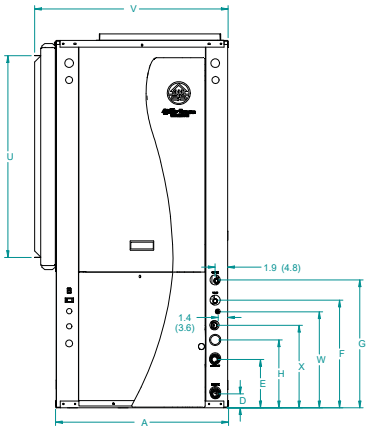
Top Air Discharge

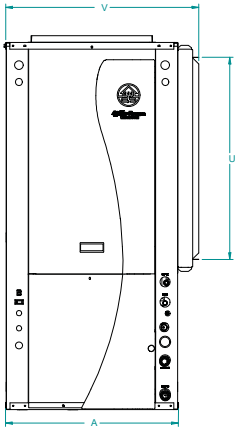


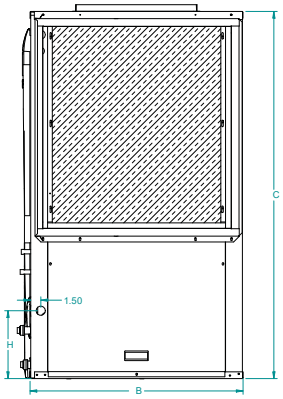












Vertical Top Flow		Overal Cabinet			Water Connections							Electrical Connections			Discharge Connection					Return Connection				Refrigerant Connections (O.d.)		
												J	K	L	duct flanges installed ± .01"					using std deluxe filter rack (± 0.10 IN)						
		A	B	C	D	E	F	G	H	LOOP WATER FPT	HWG SWEAT (I.D.)	3/4" K.O.	1/2" K.O.	1/2" K.O.	M	N	P	Q	R	S	T	U	V	W	X	
		Width	Depth	Height	Loop In	Loop Out	HWG In	HWG Out	Conden-sate			Power Supply	Ext. Pump	Low Voltage			Supply Width	Supply Depth		Return Width	Return Depth	Return Height		3/8"	3/4"	7/8"
038	in.	25.7	31.6	50.4	2.3	7.2	16.0	19.0	9.8	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	1.1	18.0	18.0	3.8	28.0	2.2	30.0	28.6	14.2	12.2	N/A
	cm.	65.3	80.3	128.0	5.8	18.3	40.6	48.3	24.9			24.1	30.7	36.3	17.5	2.8	45.7	45.7	9.7	71.1	5.6	76.2	72.6	36.1	31.0	N/A
049	in.	25.7	31.6	54.5	2.3	7.2	16.0	19.0	10.6	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	1.1	18.0	18.0	3.8	28.0	2.2	30.0	28.6	14.2	N/A	12.2
	cm.	65.3	80.3	138.4	5.8	18.3	40.6	48.3	26.9			24.1	30.7	36.3	17.5	2.8	45.7	45.7	9.7	71.1	5.6	76.2	72.6	36.1	N/A	31.0
064	in.	25.7	31.6	58.4	2.3	7.2	16.0	19.0	10.6	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	1.1	18.0	18.0	3.8	28.0	2.2	34.0	28.6	14.2	N/A	12.2
	cm.	65.3	80.3	148.3	5.8	18.3	40.6	48.3	26.9			24.1	30.7	36.3	17.5	2.8	45.7	45.7	9.7	71.1	5.6	86.4	72.6	36.1	N/A	31.0

Condensate is 3/4" PVC female glue socket and is switchable from side to front
Unit shipped with deluxe 2" (field adjustable to 1") duct collar/filter rack extending from unit 3.25" and is suitable for duct connection.
Discharge flange is field installed and extends 1" [25.4mm] from cabinet
Decorative molding and/or water connections extend 1.2" [30.5mm] beyond front of cabinet.
Top panel has 1.375 and 1.125 knockouts for electrical connections

10/24/22

Contractor: _____ P.O.: _____

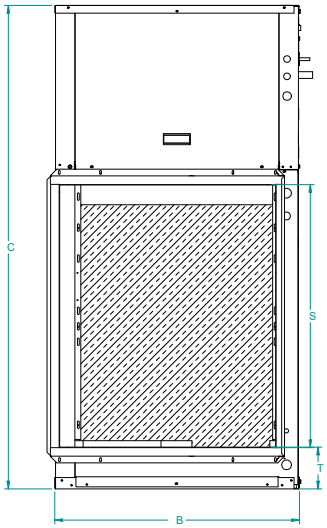
Engineer: _____

Project Name: _____ Unit Tag: _____

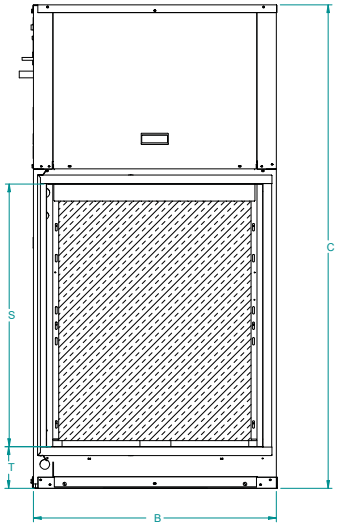
Vertical Dimensional Data cont.

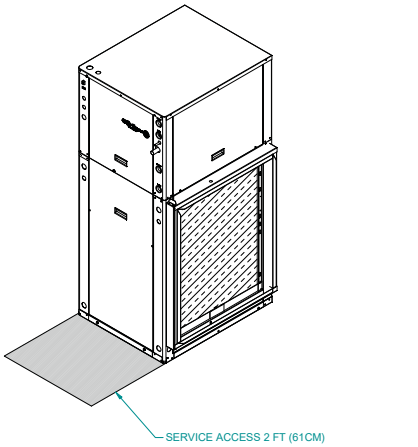
Bottom Air Discharge

LEFT RETURN

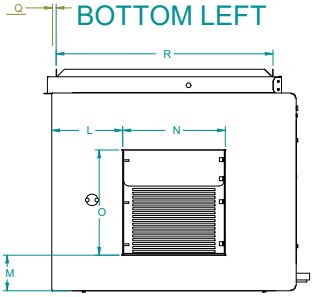


RIGHT RETURN



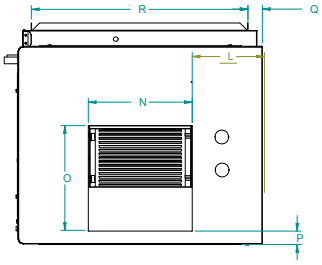


BOTTOM LEFT

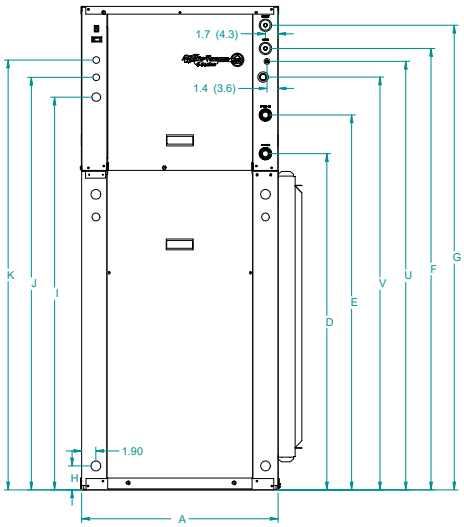


LEFT BOTTOM DISCHARGE
FLOOR FOOT PRINT

BOTTOM RIGHT



RIGHT BOTTOM DISCHARGE
FLOOR FOOT PRINT



FRONT

Bottomflow Models		Overall Cabinet			Water Connections							Electrical Knockouts			Discharge Connection					Return Connection				REFRIGERANT CONNECTIONS (O.D.)		
					1	2	3	4	5			I 3/4" cond	J 1/2" cond	K 1/2" cond	duct flange installed (±0.10 in)					using std deluxe filter rack (±0.10 in)						
		A	B	C	D	E	F	G	H						L	M	N	O	P	Q	R	S	T	U	V	W
		Width	Depth	Height	In	Out	HWG In	HWG Out	Conden-sate	Loop Water FPT	HWG Sweat (I.D.)	Power Supply	Ext Pump	Low Votage			Supply Width	Supply Depth			Return Depth	Return Height		3/8"	3/4"	7/8"
038	in.	25.5	31.5	62.5	43.4	48.4	57.0	60.0	3.1	1"	1/2"	50.8	53.3	55.6	9.1	4.8	13.4	13.6	1.5	1.9	28.1	34.0	5.6	55.4	53.4	N/A
	cm.	64.8	80.0	158.8	110.2	122.9	144.8	152.4	7.9	Swivel	female	129.0	135.4	141.2	23.1	12.2	34.0	34.5	3.8	4.8	71.4	86.4	14.2	140.7	135.6	N/A
049-064	in.	25.5	31.5	62.5	43.4	48.4	57.0	60.0	3.1	1"	1/2"	50.8	53.3	55.6	9.1	4.8	13.4	13.6	1.5	1.9	28.1	34.0	5.6	55.4	N/A	53.4
	cm.	64.8	80.0	158.8	110.2	122.9	144.8	152.4	7.9	Swivel	female	129.0	135.4	141.2	23.1	12.2	34.0	34.5	3.8	4.8	71.4	86.4	14.2	140.7	N/A	135.6

Condensate is 3/4" PVC female glue socket and is switchable from side to front
Vertical bottomflow unit shipped with deluxe 2" (field adjustable to 1") duct collar/filter rack extending from unit 3.25" and is suitable for duct connection.
Decorative molding and water connections extend 1.2" (30.5mm) beyond front of cabinet.

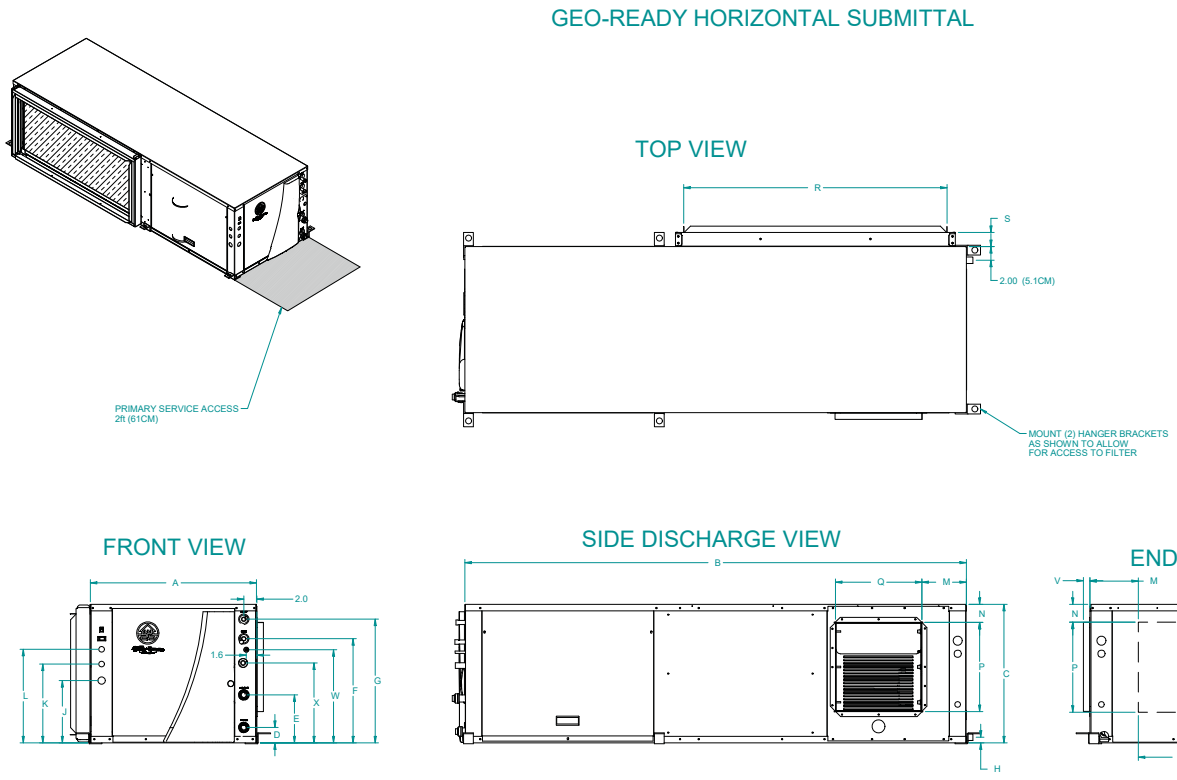
10/24/2022

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Horizontal Dimensional Data

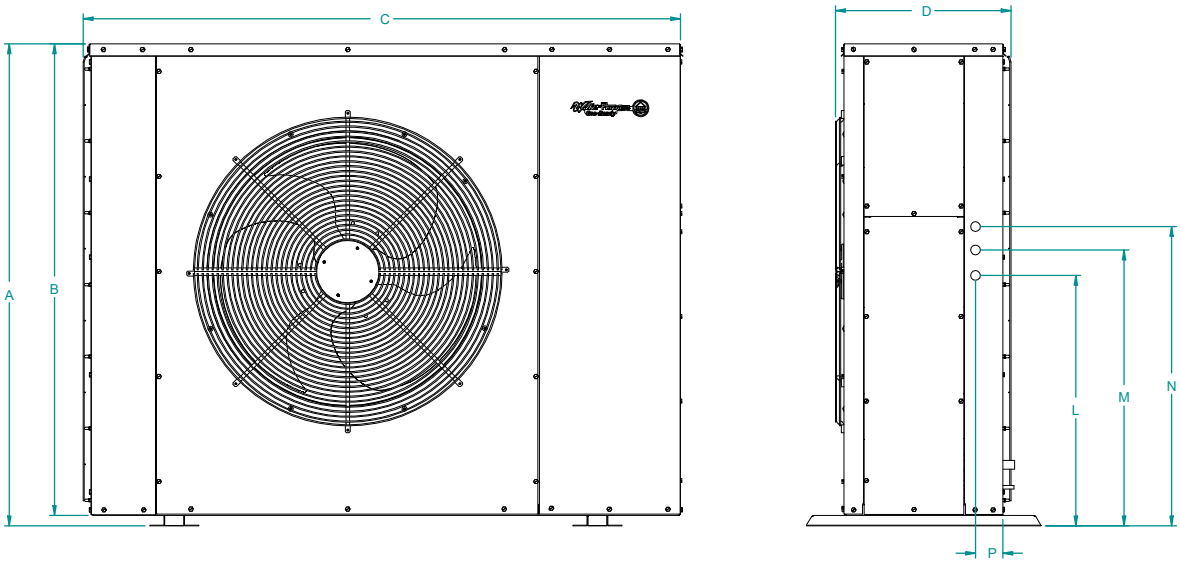


Horizontal Models		Overall Cabinet			Water Connections							Electrical Connections			Discharge Connection					Return Connection				Refrigerant Connections (O.d.)		
												J	K	L	duct flanges installed ± .01"					using std deluxe filter rack ± .01"						
		A	B	C	D	E	F	G	H	LOOP WATER FPT	HWG SWEAT (I.D.)	3/4" K.O.	1/2" K.O.	1/2" K.O.	M	N	P	Q	R	S	T	U	V	W	X	Y
		Width	Depth	Height	Loop In	Loop Out	HWG In	HWG Out	Conden-sate			Power Sup-ply	Ext. Pump	Low Voltage			Supply Width	Supply Depth		Return Width	Return Depth	Return Height		3/8"	3/4"	7/8"
038	in.	25.6	72.0	21.3	2.3	7.2	16.0	19.0	0.1	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	2.8	13.7	13.2	1.0	35.4	2.2	18.7	1.4	14.2	12.2	N/A
	cm.	65.0	182.9	54.1	5.8	18.3	40.6	48.3	0.2			24.1	30.7	36.3	17.5	7.1	34.8	33.5	2.5	89.9	5.6	47.5	3.6	36.1	31.0	N/A
049	in.	25.6	77.0	21.3	2.3	7.2	16.0	19.0	0.9	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	2.8	13.7	13.2	1.0	40.4	2.2	18.7	1.4	14.2	N/A	12.2
	cm.	65.0	195.6	54.1	5.8	18.3	40.6	48.3	2.3			24.1	30.7	36.3	17.5	7.1	34.8	33.5	2.5	102.6	5.6	47.5	3.6	36.1	N/A	31.0
064	in.	25.6	82.0	21.3	2.3	7.2	16.0	19.0	0.9	1" Swivel	1/2" Female	9.5	12.1	14.3	6.9	2.8	13.7	13.2	1.0	45.4	2.2	18.7	1.4	14.2	N/A	12.2
	cm.	65.0	208.3	54.1	5.8	18.3	40.6	48.3	2.3			24.1	30.7	36.3	17.5	7.1	34.8	33.5	2.5	115.3	5.6	47.5	3.6	36.1	N/A	31.0

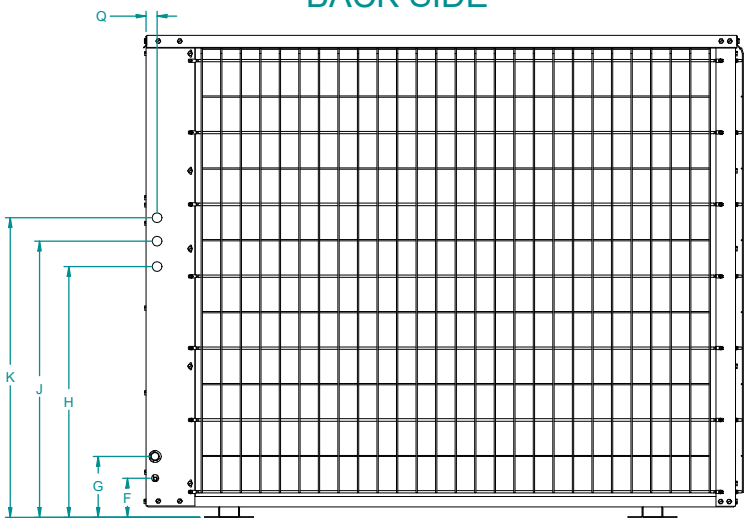
Condensate is 3/4" PVC tube. 10/24/22
Unit shipped with deluxe 2" (field adjustable to 1") duct collar/filter rack extending from unit 3.25" and is suitable for duct connection.
Discharge flange is field installed and extends 1" [25.4mm] from cabinet
Decorative molding and/or water connections extend 1.2" [30.5mm] beyond front of cabinet.

038-064 MODEL		Q	P
Right Return End Discharge	in	2.8	4.6
	cm	7.1	11.8
Right Return Side Discharge	in	4.9	6.9
	cm	12.4	17.5
Left Return End Discharge	in	4.9	7.6
	cm	12.4	19.4
Left Return Side Discharge	in	2.8	6.9
	cm	7.1	17.5

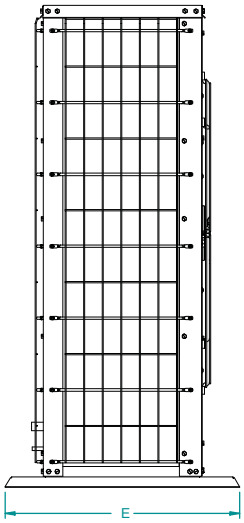
Geo-Ready Dimensional Data



BACK SIDE



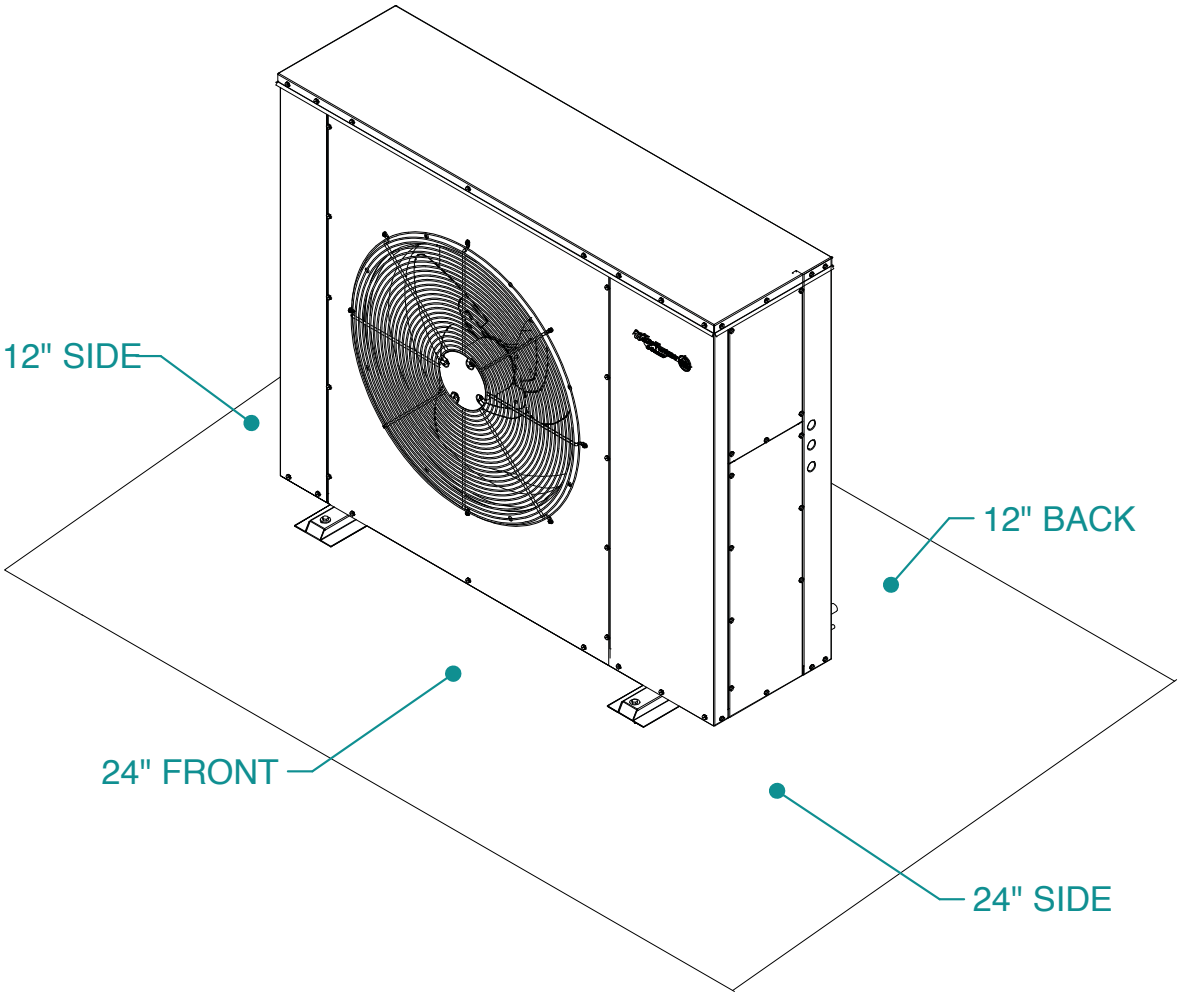
LEFT SIDE



GEO-READY OUTDOOR UNIT

Models		Height	Height w/ Bracket	Width	Depth	Depth w/ Bracket	Service Valve Connections		KNOCK OUT	KNOCK OUT	KNOCK OUT	KNOCK OUT	KNOCK OUT	KNOCK OUT	KNOCK OUT	KNOCK OUT
							Liquid	Gas	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"	1 1/8"
		A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
038-064	in.	48.25	49.30	61.10	18.00	24.00	4.00	6.20	25.70	28.30	30.70	25.70	28.30	30.70	2.80	1.10
	cm.	122.50	125.20	155.50	45.70	61.00	10.20	15.75	65.30	71.90	78.00	65.30	71.90	78.00	7.10	2.80
049-064	in.	48.25	49.30	61.10	18.00	24.00	4.00	6.20	25.70	28.30	30.70	25.70	28.30	30.70	2.80	1.10
	cm.	122.50	125.20	155.50	45.70	61.00	10.20	15.75	65.30	71.90	78.00	65.30	71.90	78.00	7.10	2.80

10.24.2022



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Physical Data

Model		038	049	064
Compressor (1 each)				
Indoor Factory Charge R410a, oz [kg] (Aluminum tube and fin air coil)	Vertical	76 [2.15]	93 [2.64]	86 [2.44]
Indoor Factory Charge R410a, oz [kg] (Aluminum tube and fin air coil)	Horizontal	70 [1.98]	91 [2.58]	100 [2.83]
ECM Blower Motor & Blower				
Blower Motor Type/Speeds	VS ECM			
Blower Motor- hp [W]	VS ECM	1/2 [373]	1/2 [373]	1 [746]
High Static Blower Motor - hp [W]	VS ECM	1 [746]	1 [746]	n/a
Blower Wheel Size (Dia x W), in. [mm]	VS 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]	VS ECM	11 x 10 [279 x 254]	11 x 10 [279 x 254]	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 [l]		1.3 [4.9]	1.6 [6.1]	1.6 [6.1]
Indoor Vertical				
Air Coil Dimensions (H x W), in. [mm]		28 x 25 [711 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]
Air Coil Total Face Area, ft2 [m2]		4.9 [0.451]	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]		28 x 30 [712 x 762]	32 x 30 [813 x 762]	36 x 30 [914 x 762]
Weight - Operating, lb [kg]		358 [162]	408 [185]	453 [205]
Weight - Packaged, lb [kg]		378 [172]	428 [194]	473 [215]
Indoor Horizontal				
Air Coil Dimensions (H x W), in. [mm]		20 x 35 [508 x 889]	20 x 40 [508 x 1016]	20 x 45 [508 x 1143]
Air Coil Total Face Area, ft2 [m2]		4.9 [0.451]	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 37 [686 x 940]	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]		368 [167]	418 [190]	463 [210]
Weight - Packaged, lb [kg]		388 [176]	438 [199]	483 [219]
Outdoor				
Air Coil Dimensions (H x W), in. [mm]		48 x 64 [1219 x 1626]	48 x 64 [1219 x 1626]	48 x 64 [1219 x 1626]
Air Coil Total Face Area, ft2 [m2]		21 [1.951]	21 [1.951]	21 [1.951]
Air Coil Tube Size, in [mm]		5/16 [7.9]	5/16 [7.9]	5/16 [7.9]
Air Coil Number of rows		2	2	2
Weight - Operating, lb [kg]		215 [98]	215 [98]	215 [98]
Weight - Packaged, lb [kg]		235 [107]	235 [107]	235 [107]

11/17/2022

Auxiliary Heat Ratings

Model	KW		Stages	BTU/HR		Min CFM	5 Series Compatibility		Minimum Unit Size
	208V	230V		208V	230V		038	049 - 064	
EAL(H)10	7.2	9.6	2	24,600	32,700	1100	•	•	038
EAL(H)15	10.8	14.4	2	36,900	49,100	1250	•	•	049
EAL(H)20	14.4	19.2	2	49,200	65,500	1500		•	064

Order the "H" part number when installed on horizontal and vertical rear discharge units 5/16/2022

Air flow level for auxiliary heat (Aux) must be equal to or above the minimum CFM in this table

NOTE: Compressor is disabled below -5F to conserve compressor health as temperatures below -5F are beyond the compressor's operating envelope. The system shall run on Emergency Heat below -5F if demand for heating exists.

Auxiliary Heat Electrical Data

Model	Supply Circuit	Heater Amps		Min Circuit Amp		Fuse (USA)		Fuse (CAN)		CKT BRK	
		208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V	208 V	240 V
EAL(H)10	Single	34.7	40.0	53.3	60.0	60	60	60	60	60	60
EAL(H)15	Single	52.0	60.0	75.0	85.0	80	90	80	90	70	100
	L1/L2	34.7	40.0	53.3	60.0	60	60	60	60	60	60
	L3/L4	17.3	20.0	21.7	25.0	25	25	25	25	20	30
EAL(H)20	Single	69.3	80.0	96.7	110.0	100	110	100	110	100	100
	L1/L2	34.7	40.0	53.3	60.0	60	60	60	60	60	60
	L3/L4	34.7	40.0	43.3	50.0	45	50	45	50	40	50

All heaters rated single phase 60 cycle and include unit fan load 3/9/22
All fuses type "D" time delay (or HACR circuit breaker in USA)
Supply wire size to be determined by local codes

Electrical Data

Dual Capacity with ECM2.3 motor

Rated		Voltage Min/Max	Compressor				HWG Pump FLA	Ext Loop FLA	Blower Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
Model	Voltage		MCC	RLA	LRA	LRA**						
038	208-230/60/1	187/253	24.1	15.4	92.0	33.0	0.4	5.4	4.0	25.2	29.1	50
049	208-230/60/1	187/253	31.1	19.9	126.5	45.0	0.4	5.4	4.0	29.7	34.7	60
064	208-230/60/1	187/253	37.0	23.7	151.0	54.0	0.4	5.4	7.0	36.5	42.4	70

Rated Voltage of 208/230/60/1 11/17/2022
HACR circuit breaker in USA only
All fuses Class RK-5

Geo-Ready Split Outdoor Unit Electrical Table

Rated		Voltage Min/Max	Outdoor Motor FLA	Max Fuse/ HACR
Model	Voltage			
038	208-230	187/253	2.8	10
049	208-230	187/253	2.8	10
064	208-230	187/253	2.8	10

Rated Voltage of 208/230/60/1 5/16/2022
HACR circuit breaker in USA only
All fuses Class RK-5

Blower Performance Data

5 Series Dual Capacity ECM Blower Table

MODEL	MAX ESP	INDOOR AIR FLOW SPEED SETTINGS											
		1	2	3	4	5	6	7	8	9	10	11	12
038	0.50	650	750 G	850	1000	**1100 L**	**1200**	**1300 H**	**1400**	**1500**	1550 Aux		
049	0.50	650	800 G	900	1050	1150	**1250**	**1350 L**	**1450**	**1550 H**	1575 Aux		
064	0.75	800	950 G	1100	1300	**1500 L**	**1750**	**1950 H**	**2100**	**2300**	2325 Aux		

Factory settings are at recommended G-L-H-Aux speed settings 3/9/22
L-H settings MUST be located within boldface CFM range
"Aux" is factory setting for auxiliary heat and must be equal to or above the "H" setting as well as at least the minimum required for the auxiliary heat package
"G" may be located anywhere within the airflow table
CFM is controlled within ±5% up to the maximum ESP
Max ESP includes allowance for wet coil and standard filter

Operating Limits

Operating Limits	Cooling		Heating	
	(°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.

Outdoor Ambient Temperature Limits

Cooling Operation	Max DB	125°F
	Min DB	55°F
Heating Operation	Max DB	75°F
	Min DB	-5°F

10/25/22

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

Reference Calculations

Heating Calculations:	Cooling Calculations:
$LWT = EWT - \frac{HE}{gpm \times 500}$	$LWT = EWT + \frac{HR}{gpm \times 500}$
$LAT = EAT + \frac{HC}{cfm \times 1.08}$	$LAT\ (DB) = EAT\ (DB) - \frac{SC}{cfm \times 1.08}$
$TH = HC + HW$	$LC = TC - SC$
	$S/T = \frac{SC}{TC}$

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.

Correction Factor Tables

Air Flow Corrections (Dual Capacity Part Load)

Airflow		Cooling				Heating		
cfm Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.778	0.956	0.924	0.943	1.239	0.879
275	69	0.944	0.830	0.962	0.944	0.958	1.161	0.914
300	75	0.957	0.866	0.968	0.958	0.968	1.115	0.937
325	81	0.970	0.900	0.974	0.970	0.977	1.075	0.956
350	88	0.982	0.933	0.981	0.980	0.985	1.042	0.972
375	94	0.991	0.968	0.991	0.991	0.993	1.018	0.988
400	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
425	106	1.007	1.033	1.011	1.008	1.007	0.990	1.010
450	113	1.013	1.065	1.023	1.015	1.012	0.987	1.018
475	119	1.017	1.099	1.037	1.022	1.018	0.984	1.025
500	125	1.020	1.132	1.052	1.027	1.022	0.982	1.031
520	130	1.022	1.159	1.064	1.030	1.025	0.979	1.034

5/30/06

Air Flow Corrections (Dual Capacity Full Load and Single Speed)

Airflow		Cooling				Heating		
cfm Per Ton of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
240	60	0.922	0.786	0.910	0.920	0.943	1.150	0.893
275	69	0.944	0.827	0.924	0.940	0.958	1.105	0.922
300	75	0.959	0.860	0.937	0.955	0.968	1.078	0.942
325	81	0.971	0.894	0.950	0.967	0.977	1.053	0.959
350	88	0.982	0.929	0.964	0.978	0.985	1.031	0.973
375	94	0.992	0.965	0.982	0.990	0.993	1.014	0.988
400	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
425	106	1.007	1.034	1.020	1.010	1.007	0.990	1.011
450	113	1.012	1.065	1.042	1.018	1.013	0.983	1.020
475	119	1.017	1.093	1.066	1.026	1.018	0.980	1.028
500	125	1.019	1.117	1.092	1.033	1.023	0.978	1.034
520	130	1.020	1.132	1.113	1.038	1.026	0.975	1.038

5/30/06

Cooling Capacity Corrections

Entering Air WB °F	Total Clg Cap	Sensible Cooling Capacity Multipliers - Entering DB °F										Power Input	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95	100		
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.

3/28/12

Heating Capacity Corrections

Ent Air DB °F	Heating Corrections		
	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

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
Ethylene Glycol	10	0.973	0.991	1.075
	20	0.943	0.979	1.163
	30	0.917	0.965	1.225
	40	0.890	0.955	1.324
	50	0.865	0.943	1.419
Propylene Glycol	10	0.958	0.981	1.130
	20	0.913	0.969	1.270
	30	0.854	0.950	1.433
	40	0.813	0.937	1.614
	50	0.770	0.922	1.816
Ethanol	10	0.927	0.991	1.242
	20	0.887	0.972	1.343
	30	0.856	0.947	1.383
	40	0.815	0.930	1.523
	50	0.779	0.911	1.639
Methanol	10	0.957	0.986	1.127
	20	0.924	0.970	1.197
	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 a 5 Series NS*022-ECM.

The corrected cooling capacity at 90°F would be: 22,400 MBtu/h x 0.969 = 21,706 MBtu/h

The corrected heating capacity at 30°F would be: 14,500 MBtu/h x 0.913 = 13,239 MBtu/h

The corrected pressure drop at 30°F and 6 gpm would be: 6.6 feet of head x 1.270 = 8.38 feet of head

Pressure Drop

Model	GPM	Pressure Drop (psi)				
		30°F	50°F	70°F	90°F	110°F
038 full load	5	1.3	1.2	1.1	0.8	0.7
	7	2.8	2.3	2.0	1.8	1.6
	9	4.6	3.7	3.3	3.0	2.6
	11	6.3	5.4	4.7	4.3	3.9
038 part load	4	0.9	0.8	0.6	0.5	0.4
	6	2.1	1.7	1.4	1.3	1.2
	8	3.6	3.1	2.5	2.3	1.8
	10	5.5	4.5	4.0	3.6	3.2
049 full load	6	1.5	1.4	1.2	1.1	1.0
	9	3.0	2.7	2.5	2.2	2.0
	12	4.9	4.3	3.9	3.7	3.6
	15	7.2	6.2	5.9	5.5	5.6
049 part load	5	1.1	1.1	1.0	0.9	0.7
	8	2.5	2.2	2.0	1.8	1.6
	11	4.2	3.7	3.4	3.1	3.0
	14	6.3	5.5	5.3	4.9	5.0
064 full load	8	2.5	2.2	2.0	1.8	1.6
	12	4.9	4.3	3.9	3.7	3.6
	16	7.9	7.0	6.7	6.3	6.5
	20	11.7	10.5	10.5	9.6	10.2
064 part load	6	1.5	1.4	1.2	1.1	1.0
	10	3.5	3.2	2.9	2.6	2.5
	14	6.3	5.5	5.3	4.9	5.0
	18	9.5	8.7	8.3	7.9	8.2

6/3/22

Geo Mode Performance Data

NG*026 - High Speed (900 cfm)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	4.0	1.4	3.2	Operation not recommended							Operation not recommended							
	6.0	2.9	6.6															
	8.0	4.8	11.1	700	16.5	1.42	11.6	91.8	3.40	2.1								
				900	17.0	1.46	12.0	87.5	3.41	2.0								
30	4.0	1.4	3.2	Operation not recommended							Operation not recommended							
	6.0	2.8	6.4	700	18.9	1.45	13.9	95.0	3.82	2.3	700	29.8	18.6	0.62	0.93	33.0	32.0	---
				900	19.4	1.50	14.3	90.0	3.81	2.1	900	30.3	20.3	0.67	0.98	33.6	30.8	---
	8.0	4.7	10.8	700	19.2	1.47	14.2	95.4	3.84	2.3	700	30.0	18.6	0.62	0.90	33.1	33.1	---
				900	19.8	1.51	14.7	90.4	3.85	2.2	900	30.7	20.3	0.66	0.95	33.9	32.3	---
40	4.0	1.3	3.1	Operation not recommended							Operation not recommended							
	6.0	2.7	6.2	700	21.5	1.50	16.4	98.5	4.21	2.5	700	30.1	19.1	0.63	1.02	33.6	29.4	-
				900	22.2	1.53	17.0	92.8	4.25	2.3	900	30.7	20.8	0.68	1.07	34.3	28.5	-
	8.0	4.5	10.4	700	22.0	1.51	16.8	99.1	4.25	2.6	700	30.3	19.1	0.63	0.99	33.7	30.5	-
				900	22.7	1.55	17.4	93.3	4.30	2.4	900	31.0	20.8	0.67	1.04	34.5	29.8	-
50	4.0	1.3	3.0	700	23.3	1.51	18.2	100.9	4.53	2.7	700	28.8	17.8	0.62	1.17	32.8	24.6	1.3
				900	24.0	1.53	18.8	94.7	4.60	2.5	900	30.3	19.7	0.65	1.23	34.5	24.6	1.4
	6.0	2.6	6.0	700	24.2	1.55	18.9	102.0	4.59	2.8	700	29.4	18.0	0.61	1.10	33.2	26.7	1.3
				900	25.0	1.57	19.6	95.7	4.67	2.6	900	31.0	20.0	0.64	1.16	34.9	26.8	1.4
	8.0	4.4	10.1	700	24.7	1.56	19.4	102.7	4.65	2.9	700	29.7	19.2	0.65	1.08	33.4	27.6	1.2
				900	25.5	1.58	20.1	96.2	4.73	2.7	900	31.3	21.3	0.68	1.13	35.2	27.7	1.3
60	4.0	1.2	2.9	700	26.0	1.58	20.6	104.4	4.82	3.1	700	28.5	17.9	0.63	1.28	32.9	22.3	1.6
				900	26.8	1.59	21.4	97.6	4.94	2.9	900	29.9	19.9	0.67	1.34	34.4	22.3	1.7
	6.0	2.5	5.8	700	27.2	1.63	21.6	105.9	4.90	3.2	700	29.2	18.1	0.62	1.22	33.3	24.0	1.5
				900	28.1	1.64	22.5	98.9	5.02	2.9	900	30.5	20.1	0.66	1.27	34.9	24.1	1.6
	8.0	4.2	9.8	700	27.8	1.64	22.2	106.8	4.96	3.3	700	29.4	19.1	0.65	1.19	33.5	24.8	1.4
				900	28.8	1.65	23.1	99.6	5.11	3.0	900	30.9	21.2	0.68	1.24	35.1	24.9	1.6
70	4.0	1.2	2.8	700	28.7	1.65	23.1	108.0	5.09	3.5	700	28.2	18.0	0.64	1.39	32.9	20.3	2.0
				900	29.7	1.65	24.0	100.5	5.27	3.2	900	29.4	20.1	0.68	1.44	34.3	20.4	2.1
	6.0	2.4	5.6	700	30.2	1.71	24.3	109.9	5.18	3.6	700	28.9	18.2	0.63	1.33	33.4	21.7	1.9
				900	31.2	1.71	25.3	102.1	5.35	3.3	900	30.1	20.2	0.67	1.38	34.8	21.9	2.0
	8.0	4.1	9.5	700	30.9	1.73	25.1	110.9	5.25	3.7	700	29.2	19.0	0.65	1.30	33.6	22.5	1.7
				900	32.0	1.72	26.1	102.9	5.45	3.4	900	30.5	21.0	0.69	1.35	35.1	22.6	1.9
80	4.0	1.2	2.7	700	31.2	1.75	25.3	111.3	5.23	3.9	700	27.0	17.8	0.66	1.54	32.2	17.5	2.5
				900	32.3	1.74	26.4	103.3	5.46	3.6	900	28.0	19.8	0.71	1.59	33.5	17.7	2.7
	6.0	2.4	5.4	700	33.0	1.82	26.8	113.7	5.32	4.0	700	27.7	18.0	0.65	1.49	32.8	18.6	2.3
				900	34.2	1.80	28.0	105.1	5.56	3.7	900	28.8	20.0	0.69	1.53	34.0	18.8	2.5
	8.0	4.0	9.2	700	34.0	1.84	27.7	115.0	5.41	4.1	700	28.0	18.5	0.66	1.46	33.0	19.2	2.2
				900	35.2	1.82	29.0	106.2	5.68	3.8	900	29.2	20.5	0.70	1.50	34.3	19.4	2.4
90	4.0	1.1	2.6	700	33.8	1.85	27.5	114.7	5.36	4.3	700	25.7	17.6	0.68	1.69	31.5	15.2	3.1
				900	35.0	1.82	28.8	106.0	5.63	4.0	900	26.7	19.5	0.73	1.73	32.6	15.4	3.3
	6.0	2.3	5.2	700	35.9	1.93	29.3	117.5	5.45	4.5	700	26.5	17.8	0.67	1.64	32.1	16.1	2.9
				900	37.2	1.90	30.7	108.2	5.74	4.1	900	27.5	19.8	0.72	1.68	33.2	16.3	3.2
	8.0	3.8	8.8	700	37.0	1.96	30.3	119.0	5.54	4.6	700	26.8	18.0	0.67	1.62	32.3	16.6	2.7
				900	38.3	1.91	31.8	109.4	5.88	4.3	900	27.8	19.9	0.72	1.65	33.4	16.8	3.0
100	4.0	1.1	2.5	Operation not recommended							Operation not recommended							
	6.0	2.2	5.1								700	24.9	17.3	0.69	1.85	31.2	13.5	3.6
											900	25.7	19.2	0.74	1.88	32.1	13.7	3.9
	8.0	3.7	8.5								700	25.2	17.2	0.68	1.82	31.4	13.9	3.3
											900	26.0	19.1	0.73	1.85	32.3	14.1	3.7
110	4.0	1.0	2.4								Operation not recommended							
	6.0	2.1	4.9								700	23.3	16.7	0.72	2.05	30.3	11.4	4.4
											900	24.0	18.6	0.78	2.07	31.0	11.6	4.7
	8.0	3.5	8.2								700	23.6	16.5	0.70	2.02	30.4	11.7	4.1
											900	24.2	18.2	0.75	2.04	31.2	11.9	4.5
120	4.0	1.0	2.3								Operation not recommended							
	6.0	2.0	4.7								700	21.6	16.1	0.74	2.28	29.4	9.5	5.3
											900	22.0	17.5	0.79	2.34	30.0	9.4	5.7
	8.0	3.4	7.9								700	21.8	16.1	0.74	2.21	29.4	9.9	4.9
											900	22.3	17.5	0.78	2.28	30.1	9.8	5.4

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Geo Mode Performance Data cont.

NG*026 - Low Speed (700 cfm).

EWT °F	Flow Rate GPM	WPD PSI	WPD FT/HD	HEATING - EAT 70°F Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	COOLING - EAT 80/67 °F Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	3.0	0.8	1.9	Operation not recommended							Operation not recommended							
	5.0	2.0	4.7															
	7.0	3.7	8.7	500	11.9	1.06	8.3	92.0	3.28	1.8								
				700	12.4	1.09	8.7	86.4	3.33	1.6								
30	3.0	0.8	1.8	Operation not recommended							Operation not recommended							
	5.0	2.0	4.5	500	13.1	1.06	9.5	94.3	3.61	1.8	500	22.5	14.1	0.63	0.52	24.3	43.3	-
				700	13.7	1.09	9.9	88.1	3.66	1.6	700	22.9	15.4	0.67	0.55	24.8	41.8	-
	7.0	3.6	8.4	500	13.9	1.09	10.2	95.8	3.75	1.8	500	22.6	14.1	0.62	0.50	24.4	44.9	-
				700	14.5	1.12	10.7	89.2	3.80	1.6	700	23.2	15.4	0.66	0.53	25.0	43.8	-
40	3.0	0.8	1.8	Operation not recommended							Operation not recommended							
	5.0	1.9	4.4	500	15.3	1.06	11.7	98.3	4.21	1.8	500	23.3	14.7	0.63	0.58	25.3	40.1	-
				700	15.8	1.08	12.1	90.9	4.28	1.7	700	23.7	16.0	0.67	0.61	25.8	38.9	-
	7.0	3.5	8.2	500	16.1	1.09	12.4	99.8	4.33	1.9	500	23.5	14.7	0.62	0.56	25.4	41.6	-
				700	16.7	1.11	12.9	92.0	4.40	1.7	700	24.0	16.0	0.67	0.59	26.0	40.7	-
50	3.0	0.7	1.7	500	16.8	1.06	13.2	101.2	4.65	1.9	500	23.5	14.5	0.62	0.66	25.8	35.6	0.7
				700	17.4	1.08	13.7	93.0	4.73	1.7	700	24.2	16.1	0.67	0.67	26.5	35.9	0.8
	5.0	1.8	4.3	500	17.4	1.06	13.8	102.3	4.81	1.9	500	23.7	14.6	0.62	0.64	25.9	36.9	0.7
				700	18.0	1.08	14.3	93.8	4.90	1.8	700	24.4	16.2	0.66	0.66	26.6	37.2	0.7
	7.0	3.4	7.9	500	18.3	1.09	14.6	103.8	4.92	2.0	500	24.1	15.0	0.62	0.64	26.3	37.8	0.6
				700	18.8	1.10	15.0	94.9	5.01	1.8	700	24.8	16.6	0.67	0.65	27.0	38.2	0.7
60	3.0	0.7	1.7	500	19.4	1.08	15.7	105.9	5.28	2.1	500	23.1	14.5	0.63	0.75	25.7	30.7	1.0
				700	19.9	1.09	16.2	96.3	5.37	1.9	700	23.7	16.0	0.68	0.77	26.4	31.0	1.0
	5.0	1.8	4.1	500	20.2	1.08	16.5	107.4	5.50	2.1	500	23.3	14.6	0.63	0.73	25.8	31.8	0.9
				700	20.7	1.08	17.0	97.3	5.60	2.0	700	24.0	16.1	0.67	0.75	26.5	32.1	1.0
	7.0	3.3	7.6	500	20.9	1.10	17.1	108.7	5.56	2.2	500	23.7	15.0	0.63	0.73	26.2	32.6	0.8
				700	21.4	1.11	17.6	98.2	5.66	2.0	700	24.4	16.6	0.68	0.74	26.9	32.9	0.9
70	3.0	0.7	1.6	500	21.9	1.09	18.2	110.6	5.88	2.3	500	22.7	14.5	0.64	0.84	25.6	26.9	1.3
				700	22.4	1.09	18.6	99.6	5.99	2.1	700	23.3	16.0	0.69	0.86	26.2	27.1	1.4
	5.0	1.7	4.0	500	22.9	1.09	19.2	112.4	6.16	2.4	500	22.9	14.5	0.64	0.82	25.7	27.8	1.3
				700	23.3	1.09	19.6	100.8	6.28	2.2	700	23.5	16.1	0.68	0.84	26.4	28.1	1.4
	7.0	3.2	7.4	500	23.5	1.11	19.7	113.5	6.19	2.4	500	23.3	14.9	0.64	0.81	26.0	28.6	1.2
				700	23.9	1.11	20.1	101.6	6.31	2.2	700	23.9	16.5	0.69	0.83	26.7	28.8	1.3
80	3.0	0.7	1.6	500	24.4	1.12	20.5	115.1	6.35	2.6	500	21.1	13.8	0.65	0.97	24.4	21.8	1.8
				700	24.7	1.12	20.9	102.7	6.47	2.4	700	21.7	15.3	0.70	0.99	25.1	21.9	1.9
	5.0	1.7	3.9	500	25.5	1.12	21.7	117.3	6.70	2.6	500	21.3	13.9	0.65	0.95	24.5	22.5	1.7
				700	25.8	1.11	22.0	104.2	6.83	2.4	700	21.9	15.4	0.70	0.96	25.2	22.7	1.9
	7.0	3.1	7.1	500	25.9	1.14	22.0	117.9	6.65	2.7	500	21.6	14.2	0.66	0.94	24.8	23.1	1.6
				700	26.2	1.13	22.3	104.6	6.78	2.5	700	22.3	15.8	0.71	0.96	25.5	23.3	1.8
90	3.0	0.7	1.5	500	26.8	1.16	22.8	119.6	6.79	2.9	500	19.5	13.1	0.67	1.10	23.3	17.8	2.4
				700	27.0	1.14	23.1	105.7	6.93	2.7	700	20.1	14.5	0.72	1.12	23.9	18.0	2.6
	5.0	1.6	3.7	500	28.1	1.15	24.2	122.1	7.20	3.0	500	19.7	13.2	0.67	1.07	23.4	18.4	2.3
				700	28.3	1.13	24.5	107.5	7.35	2.8	700	20.3	14.6	0.72	1.09	24.0	18.6	2.5
	7.0	3.0	6.9	500	28.3	1.17	24.3	122.4	7.09	3.1	500	20.0	13.6	0.68	1.06	23.7	18.9	2.1
				700	28.4	1.15	24.5	107.6	7.24	2.8	700	20.6	15.0	0.73	1.08	24.3	19.1	2.4
100	3.0	0.6	1.5	Operation not recommended							Operation not recommended							
	5.0	1.6	3.6								500	18.2	12.6	0.69	1.23	22.4	14.9	3.0
											700	18.7	14.0	0.75	1.25	23.0	15.0	3.2
	7.0	2.9	6.6								500	18.5	13.0	0.70	1.22	22.7	15.2	2.8
											700	19.1	14.4	0.75	1.24	23.3	15.4	3.1
110	3.0	0.6	1.4								Operation not recommended							
	5.0	1.5	3.4								500	16.8	12.1	0.72	1.39	21.5	12.1	3.8
				Operation not recommended							700	17.2	13.4	0.78	1.41	22.0	12.2	4.1
	7.0	2.8	6.4								500	17.0	12.4	0.73	1.37	21.7	12.4	3.5
											700	17.5	13.7	0.78	1.40	22.3	12.5	3.9
120	3.0	0.6	1.3								Operation not recommended							
	5.0	1.4	3.3								500	16.2	12.4	0.77	1.59	21.6	10.2	4.7
											700	16.5	13.5	0.82	1.63	22.1	10.1	5.1
	7.0	2.7	6.1								500	16.4	12.4	0.76	1.54	21.6	10.6	4.3
											700	16.7	13.5	0.81	1.59	22.1	10.5	4.8

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Geo Mode Performance Data cont.

NG*038 - High Speed (1250 CFM Heatling)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MB-tu/h	Power kW	HE MB-tu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mb-tu/h	SC Mb-tu/h	S/T Ratio	Power kW	HR Mb-tu/h	EER	HWC Mbtu/h
20	5.0	1.3	3.0	Operation not recommended							Operation not recommended							
	7.0	2.3	5.2															
	9.0	3.5	8.1	1050	25.2	2.21	17.7	92.2	3.34	2.9								
				1250	26.0	2.28	18.2	89.3	3.34	2.6								
30	5.0	1.2	2.9	Operation not recommended							Operation not recommended							
	7.0	2.2	5.1	1050	28.8	2.24	21.1	95.4	3.77	3.1	1050	39.3	25.2	0.64	1.43	44.2	27.4	-
				1250	29.6	2.31	21.7	91.9	3.76	2.8	1250	40.0	27.5	0.69	1.51	45.1	26.5	-
	9.0	3.4	7.9	1050	29.2	2.26	21.5	95.8	3.79	3.2	1050	39.5	25.2	0.64	1.39	44.3	28.4	-
				1250	30.2	2.33	22.3	92.4	3.80	2.9	1250	40.5	27.5	0.68	1.46	45.5	27.7	-
40	5.0	1.2	2.8	Operation not recommended							Operation not recommended							
	7.0	2.1	4.9	1050	32.7	2.32	24.8	98.8	4.12	3.4	1050	40.6	26.4	0.65	1.60	46.0	25.4	-
				1250	33.7	2.37	25.6	95.0	4.16	3.1	1250	41.3	28.8	0.70	1.67	47.0	24.7	-
	9.0	3.3	7.6	1050	33.3	2.35	25.3	99.4	4.16	3.5	1050	40.9	26.4	0.65	1.55	46.2	26.4	-
				1250	34.4	2.40	26.2	95.5	4.21	3.2	1250	41.8	28.8	0.69	1.62	47.3	25.8	-
50	5.0	1.2	2.7	1050	35.3	2.36	27.3	101.1	4.39	3.7	1050	39.7	25.1	0.63	1.84	46.0	21.5	1.9
				1250	36.4	2.39	28.2	96.9	4.46	3.4	1250	41.8	27.9	0.67	1.94	48.4	21.5	2.0
	7.0	2.1	4.8	1050	36.6	2.41	28.4	102.3	4.45	3.8	1050	40.5	25.4	0.63	1.74	46.5	23.3	1.8
				1250	37.8	2.44	29.4	98.0	4.53	3.5	1250	42.6	28.2	0.66	1.82	48.8	23.4	1.9
	9.0	3.2	7.4	1050	37.4	2.43	29.1	103.0	4.51	3.9	1050	40.9	27.1	0.66	1.69	46.7	24.1	1.7
				1250	38.6	2.47	30.2	98.6	4.59	3.6	1250	43.1	30.1	0.70	1.78	49.2	24.2	1.8
60	5.0	1.1	2.6	1050	38.7	2.47	30.3	104.1	4.60	4.2	1050	39.4	25.8	0.66	2.00	46.2	19.7	2.3
				1250	40.0	2.48	31.5	99.6	4.72	3.8	1250	41.3	28.7	0.70	2.09	48.4	19.8	2.4
	7.0	2.0	4.6	1050	40.5	2.54	31.8	105.7	4.68	4.3	1050	40.4	26.1	0.65	1.90	46.8	21.3	2.2
				1250	41.8	2.55	33.1	100.9	4.80	4.0	1250	42.3	29.0	0.69	1.98	49.0	21.4	2.3
	9.0	3.1	7.2	1050	41.4	2.56	32.7	106.5	4.74	4.4	1050	40.7	27.5	0.68	1.85	47.1	22.0	2.0
				1250	42.8	2.57	34.0	101.7	4.88	4.1	1250	42.8	30.6	0.71	1.94	49.4	22.1	2.2
70	5.0	1.1	2.5	1050	42.1	2.57	33.4	107.2	4.80	4.7	1050	39.2	26.6	0.68	2.15	46.5	18.2	2.9
				1250	43.6	2.57	34.8	102.3	4.96	4.3	1250	40.9	29.6	0.72	2.23	48.5	18.3	3.0
	7.0	1.9	4.5	1050	44.3	2.66	35.2	109.1	4.88	4.8	1050	40.2	26.9	0.67	2.06	47.2	19.5	2.7
				1250	45.8	2.66	36.7	103.9	5.04	4.4	1250	41.9	29.8	0.71	2.13	49.2	19.7	2.9
	9.0	3.0	6.9	1050	45.5	2.69	36.3	110.1	4.95	5.0	1050	40.6	28.0	0.69	2.01	47.4	20.2	2.5
				1250	47.0	2.68	37.9	104.8	5.14	4.6	1250	42.4	31.0	0.73	2.09	49.5	20.3	2.8
80	5.0	1.1	2.5	1050	45.4	2.72	36.2	110.1	4.89	5.2	1050	37.5	26.1	0.70	2.34	45.4	16.0	3.6
				1250	47.0	2.70	37.8	104.8	5.10	4.8	1250	39.0	29.0	0.74	2.41	47.2	16.1	3.8
	7.0	1.9	4.3	1050	48.1	2.83	38.4	112.4	4.98	5.4	1050	38.5	26.4	0.69	2.26	46.2	17.0	3.3
				1250	49.7	2.80	40.1	106.8	5.20	5.0	1250	40.0	29.2	0.73	2.33	48.0	17.2	3.6
	9.0	2.9	6.7	1050	49.5	2.87	39.7	113.6	5.05	5.6	1050	38.9	27.0	0.69	2.21	46.4	17.6	3.1
				1250	51.2	2.83	41.5	107.9	5.31	5.1	1250	40.5	30.0	0.74	2.28	48.3	17.8	3.4
90	5.0	1.0	2.4	1050	48.8	2.87	39.0	113.0	4.97	5.9	1050	35.8	25.5	0.71	2.53	44.4	14.1	4.4
				1250	50.5	2.83	40.8	107.4	5.23	5.4	1250	37.0	28.4	0.77	2.59	45.9	14.3	4.7
	7.0	1.8	4.2	1050	51.8	3.00	41.6	115.7	5.06	6.0	1050	36.8	25.9	0.70	2.46	45.2	15.0	4.1
				1250	53.7	2.95	43.6	109.8	5.33	5.6	1250	38.2	28.7	0.75	2.52	46.8	15.1	4.5
	9.0	2.8	6.5	1050	53.5	3.05	43.1	117.1	5.14	6.2	1050	37.2	26.1	0.70	2.42	45.5	15.4	3.9
				1250	55.3	2.97	45.2	111.0	5.46	5.8	1250	38.6	28.9	0.75	2.47	47.0	15.6	4.3
100	5.0	1.0	2.3	Operation not recommended							Operation not recommended							
	7.0	1.7	4.0								1050	34.6	25.0	0.72	2.73	43.9	12.7	5.1
											1250	35.7	27.7	0.78	2.77	45.2	12.9	5.5
	9.0	2.7	6.2								1050	35.0	24.9	0.71	2.68	44.1	13.1	4.8
											1250	36.1	27.6	0.76	2.72	45.4	13.3	5.3
110	5.0	1.0	2.2								Operation not recommended							
	7.0	1.7	3.9								1050	32.4	24.1	0.74	2.99	42.6	10.8	6.2
											1250	33.3	26.7	0.80	3.01	43.5	11.0	6.8
	9.0	2.6	6.0								1050	32.7	23.7	0.73	2.94	42.7	11.1	5.8
											1250	33.6	26.2	0.78	2.97	43.7	11.3	6.4
120	5.0	0.9	2.1								Operation not recommended							
	7.0	1.6	3.7								1050	30.6	23.3	0.76	3.31	41.9	9.2	7.5
											1250	31.1	25.3	0.81	3.39	42.7	9.2	8.1
	9.0	2.5	5.8								1050	30.8	23.3	0.76	3.20	41.8	9.6	7.0
											1250	31.5	25.3	0.80	3.30	42.8	9.5	7.7

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Geo Mode Performance Data cont.

NG*038 - Low Speed (1050 CFM Heating)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	4.0	0.9	2.1	Operation not recommended							Operation not recommended							
	6.0	1.7	4.0															
	8.0	2.9	6.7	900	17.6	1.63	12.1	88.1	3.17	2.5								
				1050	18.4	1.67	12.7	86.2	3.22	2.3								
30	4.0	0.9	2.0	Operation not recommended							Operation not recommended							
	6.0	1.7	3.9	900	19.2	1.58	13.8	89.8	3.57	2.4	900	29.5	19.1	0.65	0.74	32.0	40.1	---
				1050	20.0	1.62	14.5	87.7	3.62	2.2	1050	30.0	20.9	0.70	0.78	32.6	38.7	---
	8.0	2.8	6.5	900	20.5	1.62	14.9	91.0	3.71	2.5	900	29.7	19.1	0.64	0.71	32.1	41.5	---
				1050	21.3	1.66	15.6	88.8	3.76	2.3	1050	30.4	20.9	0.69	0.75	33.0	40.5	---
40	4.0	0.8	1.9	Operation not recommended							Operation not recommended							
	6.0	1.6	3.8	900	22.5	1.60	17.0	93.1	4.11	2.5	900	30.8	20.6	0.67	0.81	33.5	37.8	-
				1050	23.3	1.63	17.7	90.5	4.17	2.3	1050	31.3	22.5	0.72	0.85	34.3	36.8	-
	8.0	2.7	6.3	900	23.7	1.64	18.1	94.4	4.23	2.6	900	31.0	20.6	0.66	0.79	33.7	39.3	-
				1050	24.5	1.67	18.8	91.6	4.29	2.4	1050	31.7	22.5	0.71	0.83	34.5	38.4	-
50	4.0	0.8	1.9	900	24.8	1.63	19.3	95.5	4.47	2.6	900	31.3	21.1	0.67	0.91	34.4	34.2	1.0
				1050	25.6	1.65	20.0	92.6	4.55	2.4	1050	32.2	23.4	0.73	0.93	35.4	34.5	1.1
	6.0	1.6	3.7	900	25.7	1.63	20.1	96.4	4.62	2.7	900	31.6	21.2	0.67	0.89	34.6	35.5	0.9
				1050	26.5	1.65	20.8	93.3	4.70	2.5	1050	32.5	23.5	0.72	0.91	35.6	35.8	1.0
	8.0	2.6	6.1	900	26.9	1.67	21.2	97.7	4.73	2.8	900	32.1	21.8	0.68	0.88	35.1	36.4	0.9
				1050	27.7	1.69	21.9	94.4	4.81	2.5	1050	33.0	24.1	0.73	0.90	36.1	36.7	1.0
60	4.0	0.8	1.8	900	28.1	1.67	22.4	98.9	4.94	2.9	900	30.5	20.8	0.68	1.04	34.0	29.4	1.3
				1050	28.8	1.68	23.1	95.4	5.03	2.6	1050	31.3	23.1	0.74	1.06	35.0	29.7	1.4
	6.0	1.5	3.6	900	29.3	1.67	23.6	100.1	5.15	3.0	900	30.8	21.0	0.68	1.01	34.2	30.5	1.3
				1050	29.9	1.68	24.2	96.4	5.24	2.7	1050	31.6	23.2	0.73	1.03	35.1	30.7	1.4
	8.0	2.5	5.9	900	30.3	1.70	24.5	101.2	5.21	3.0	900	31.3	21.5	0.69	1.00	34.7	31.3	1.2
				1050	31.0	1.71	25.1	97.3	5.30	2.8	1050	32.2	23.8	0.74	1.02	35.6	31.5	1.3
70	4.0	0.8	1.8	900	31.4	1.71	25.6	102.3	5.39	3.2	900	29.7	20.6	0.69	1.16	33.6	25.6	1.9
				1050	32.0	1.71	26.2	98.3	5.49	2.9	1050	30.5	22.8	0.75	1.18	34.5	25.8	2.0
	6.0	1.5	3.5	900	32.8	1.70	27.0	103.7	5.64	3.3	900	30.0	20.7	0.69	1.13	33.8	26.6	1.7
				1050	33.4	1.70	27.6	99.4	5.75	3.0	1050	30.8	22.9	0.74	1.15	34.7	26.8	1.9
	8.0	2.5	5.7	900	33.6	1.74	27.7	104.6	5.67	3.4	900	30.5	21.2	0.70	1.12	34.3	27.2	1.6
				1050	34.2	1.74	28.3	100.2	5.78	3.1	1050	31.3	23.5	0.75	1.14	35.2	27.5	1.8
80	4.0	0.7	1.7	900	35.0	1.77	29.0	106.0	5.80	3.6	900	28.1	19.8	0.70	1.33	32.6	21.1	2.5
				1050	35.5	1.76	29.5	101.3	5.91	3.3	1050	28.9	21.9	0.76	1.36	33.5	21.3	2.7
	6.0	1.4	3.3	900	36.7	1.76	30.7	107.7	6.12	3.7	900	28.3	19.9	0.70	1.30	32.8	21.9	2.4
				1050	37.1	1.74	31.1	102.7	6.24	3.4	1050	29.1	22.0	0.76	1.32	33.6	22.0	2.6
	8.0	2.4	5.5	900	37.2	1.79	31.1	108.3	6.08	3.8	900	28.8	20.4	0.71	1.29	33.2	22.4	2.2
				1050	37.6	1.78	31.5	103.1	6.20	3.5	1050	29.6	22.6	0.76	1.31	34.1	22.6	2.5
90	4.0	0.7	1.6	900	38.6	1.83	32.3	109.7	6.19	4.0	900	26.5	18.9	0.71	1.50	31.6	17.6	3.4
				1050	38.9	1.81	32.7	104.3	6.31	3.7	1050	27.2	20.9	0.77	1.53	32.4	17.7	3.6
	6.0	1.4	3.2	900	40.5	1.81	34.4	111.7	6.56	4.2	900	26.7	19.0	0.71	1.46	31.7	18.2	3.2
				1050	40.8	1.79	34.7	106.0	6.70	3.8	1050	27.4	21.1	0.77	1.49	32.5	18.4	3.4
	8.0	2.3	5.3	900	40.7	1.85	34.4	111.9	6.46	4.3	900	27.1	19.5	0.72	1.45	32.1	18.7	2.9
				1050	40.9	1.82	34.7	106.1	6.59	4.0	1050	27.9	21.6	0.77	1.48	32.9	18.9	3.3
100	4.0	0.7	1.6	Operation not recommended							Operation not recommended							
	6.0	1.3	3.1								900	24.9	18.6	0.75	1.68	30.6	14.8	4.1
											1050	25.6	20.6	0.80	1.72	31.4	14.9	4.5
	8.0	2.2	5.1								900	25.3	19.1	0.75	1.67	31.0	15.2	3.8
											1050	26.0	21.1	0.81	1.70	31.8	15.3	4.2
110	4.0	0.7	1.5								Operation not recommended							
	6.0	1.3	3.0								900	23.1	18.1	0.79	1.90	29.6	12.1	5.2
											1050	23.7	20.1	0.85	1.94	30.3	12.2	5.7
	8.0	2.1	4.9								900	23.4	18.6	0.79	1.88	29.9	12.4	4.8
											1050	24.1	20.6	0.85	1.92	30.7	12.6	5.4
120	4.0	0.6	1.5								Operation not recommended							
	6.0	1.2	2.9								900	22.2	18.8	0.85	2.18	29.7	10.2	6.5
											1050	22.6	20.4	0.90	2.24	30.3	10.1	7.0
	8.0	2.0	4.7								900	22.4	18.8	0.84	2.11	29.6	10.6	6.0
											1050	22.9	20.4	0.89	2.18	30.3	10.5	6.7

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Geo Mode Performance Data cont.

NG*049 - High Speed (1550 CFM Heating)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	6.0	1.3	3.0	Operation not recommended							Operation not recommended							
	9.0	2.5	5.7															
	12.0	4.0	9.2	1350	32.6	2.94	22.6	92.4	3.25	5.3								
				1550	33.8	2.98	23.6	90.2	3.32	4.8								
30	6.0	1.2	2.9	Operation not recommended							Operation not recommended							
	9.0	2.4	5.5	1350	36.2	2.99	26.0	94.8	3.55	5.6	1350	51.5	28.2	0.55	1.80	57.6	28.6	---
				1550	37.3	3.01	27.0	92.3	3.63	5.2	1550	52.3	30.8	0.59	1.89	58.8	27.6	---
	12.0	3.9	8.9	1350	37.1	3.01	26.8	95.4	3.61	5.6	1350	51.7	28.2	0.54	1.74	57.7	29.7	---
				1550	38.4	3.05	28.0	92.9	3.69	5.3	1550	53.0	30.8	0.58	1.83	59.2	29.0	---
40	6.0	1.2	2.8	Operation not recommended							Operation not recommended							
	9.0	2.3	5.3	1350	40.9	3.11	30.3	98.0	3.86	6.2	1350	52.9	29.7	0.56	2.01	59.8	26.3	-
				1550	42.3	3.11	31.7	95.3	3.99	5.7	1550	53.9	32.5	0.60	2.11	61.1	25.6	-
	12.0	3.7	8.7	1350	42.2	3.13	31.5	98.9	3.96	6.4	1350	53.3	29.7	0.56	1.95	60.0	27.3	-
				1550	43.7	3.15	32.9	96.1	4.07	5.8	1550	54.5	32.5	0.60	2.04	61.5	26.7	-
50	6.0	1.2	2.7	1350	42.3	3.12	31.7	99.0	3.98	6.7	1350	52.9	28.8	0.54	2.63	61.8	20.1	3.0
				1550	43.7	3.12	33.0	96.1	4.10	6.2	1550	54.5	34.0	0.62	2.74	63.9	19.9	3.2
	9.0	2.2	5.2	1350	45.6	3.22	34.6	101.3	4.15	6.9	1350	54.0	28.9	0.54	2.27	61.8	23.8	2.8
				1550	47.3	3.20	36.4	98.3	4.34	6.4	1550	55.7	34.1	0.61	2.38	63.8	23.4	3.0
	12.0	3.6	8.4	1350	47.3	3.24	36.3	102.5	4.28	7.2	1350	54.4	28.9	0.53	2.14	61.7	25.4	2.6
				1550	48.9	3.24	37.8	99.2	4.42	6.5	1550	56.0	34.1	0.61	2.25	63.7	24.9	2.9
60	6.0	1.1	2.6	1350	46.3	3.26	35.2	101.8	4.16	7.6	1350	52.5	29.1	0.55	2.78	62.0	18.9	3.7
				1550	48.0	3.24	36.9	98.7	4.34	7.0	1550	54.1	34.3	0.63	2.90	64.0	18.7	3.9
	9.0	2.2	5.0	1350	50.1	3.34	38.7	104.4	4.40	7.8	1350	53.4	29.3	0.55	2.47	61.8	21.6	3.4
				1550	52.1	3.30	40.8	101.1	4.62	7.2	1550	55.0	34.5	0.63	2.58	63.8	21.3	3.7
	12.0	3.5	8.1	1350	52.2	3.37	40.7	105.8	4.54	8.0	1350	54.0	29.4	0.55	2.34	61.9	23.0	3.2
				1550	54.1	3.33	42.7	102.3	4.76	7.4	1550	55.6	34.6	0.62	2.45	63.9	22.7	3.5
70	6.0	1.1	2.5	1350	50.4	3.40	38.8	104.5	4.34	8.5	1350	52.1	29.4	0.56	2.94	62.1	17.7	4.6
				1550	52.3	3.36	40.9	101.3	4.56	7.9	1550	53.7	34.6	0.64	3.07	64.2	17.5	4.9
	9.0	2.1	4.9	1350	54.7	3.46	42.9	107.5	4.63	8.8	1350	52.6	29.7	0.56	2.66	61.7	19.8	4.3
				1550	56.8	3.40	45.2	103.9	4.90	8.1	1550	54.3	34.9	0.64	2.78	63.8	19.5	4.6
	12.0	3.4	7.9	1350	57.2	3.50	45.2	109.2	4.79	9.0	1350	53.6	29.9	0.56	2.54	62.2	21.1	4.0
				1550	59.3	3.42	47.6	105.4	5.08	8.3	1550	55.2	35.1	0.64	2.64	64.2	20.9	4.4
80	6.0	1.1	2.5	1350	54.3	3.56	42.2	107.2	4.47	9.6	1350	49.7	28.5	0.57	3.11	60.3	16.0	5.8
				1550	56.4	3.50	44.5	103.7	4.73	8.8	1550	51.3	33.5	0.65	3.25	62.3	15.8	6.2
	9.0	2.0	4.7	1350	59.0	3.60	46.7	110.5	4.80	9.8	1350	50.0	28.8	0.58	2.89	59.8	17.3	5.4
				1550	61.4	3.51	49.4	106.7	5.13	9.1	1550	51.4	33.9	0.66	3.01	61.7	17.1	5.9
	12.0	3.3	7.6	1350	62.0	3.64	49.6	112.5	4.99	10.1	1350	51.1	29.1	0.57	2.77	60.5	18.5	5.0
				1550	64.5	3.54	52.4	108.5	5.34	9.4	1550	52.7	34.2	0.65	2.88	62.5	18.3	5.6
90	6.0	1.0	2.4	1350	58.2	3.72	45.6	109.9	4.59	10.7	1350	47.3	27.6	0.58	3.30	58.5	14.3	7.3
				1550	60.5	3.63	48.1	106.1	4.88	9.9	1550	48.8	32.4	0.66	3.43	60.5	14.2	7.7
	9.0	2.0	4.5	1350	63.3	3.74	50.6	113.4	4.97	11.1	1350	47.3	27.9	0.59	3.13	57.9	15.1	6.8
				1550	65.9	3.61	53.6	109.4	5.35	10.2	1550	48.6	32.9	0.68	3.24	59.6	15.0	7.4
	12.0	3.2	7.3	1350	66.8	3.78	53.9	115.8	5.18	11.4	1350	48.6	28.2	0.58	2.99	58.8	16.2	6.3
				1550	69.6	3.66	57.1	111.6	5.58	10.6	1550	50.1	33.2	0.66	3.13	60.8	16.0	7.0
100	6.0	1.0	2.3	Operation not recommended							Operation not recommended							
	9.0	1.9	4.4								1350	44.3	27.1	0.61	3.49	56.2	12.7	8.4
											1550	45.6	31.9	0.70	3.62	58.0	12.6	9.2
	12.0	3.1	7.1								1350	45.9	27.5	0.60	3.36	57.4	13.7	7.8
											1550	47.3	32.3	0.68	3.51	59.2	13.5	8.7
110	6.0	1.0	2.2								Operation not recommended							
	9.0	1.8	4.2								1350	41.2	26.3	0.64	3.85	54.4	10.7	10.3
											1550	42.6	30.9	0.73	4.01	56.3	10.6	11.2
	12.0	2.9	6.8								1350	43.2	26.8	0.62	3.73	55.9	11.6	9.6
											1550	44.4	31.4	0.71	3.89	57.7	11.4	10.7
120	6.0	0.9	2.1								Operation not recommended							
	9.0	1.7	4.0								1350	40.1	27.7	0.69	4.35	54.9	9.2	12.5
											1550	40.8	30.1	0.74	4.46	56.0	9.1	13.5
	12.0	2.8	6.5								1350	40.4	27.7	0.69	4.21	54.8	9.6	11.6
											1550	41.3	30.1	0.73	4.34	56.1	9.5	12.9

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Geo Mode Performance Data cont.

NG*049 - low speed (1350 CFM Heating)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	5.0	0.9	2.2	Operation not recommended							Operation not recommended							
	8.0	2.0	4.6															
	11.0	3.4	7.8	1150	23.5	2.20	15.9	88.9	3.12	4.2								
				1350	24.3	2.24	16.7	86.7	3.19	3.8								
30	5.0	0.9	2.1	Operation not recommended							Operation not recommended							
	8.0	1.9	4.4	1150	26.5	2.20	19.0	91.3	3.52	4.3	1150	37.5	21.5	0.57	1.10	41.2	34.1	---
				1350	27.3	2.22	19.7	88.7	3.61	3.9	1350	38.1	23.5	0.62	1.16	42.0	32.9	---
	11.0	3.3	7.6	1150	27.1	2.22	19.6	91.8	3.59	4.4	1150	37.7	21.5	0.57	1.07	41.3	35.3	---
				1350	28.1	2.25	20.4	89.3	3.66	4.0	1350	38.6	23.5	0.61	1.12	42.4	34.5	---
40	5.0	0.9	2.0	Operation not recommended							Operation not recommended							
	8.0	1.9	4.3	1150	29.9	2.23	22.3	94.1	3.93	4.5	1150	39.5	23.4	0.59	1.21	43.6	32.6	-
				1350	31.0	2.23	23.3	91.2	4.06	4.2	1350	40.2	25.6	0.64	1.27	44.6	31.7	-
	11.0	3.2	7.4	1150	30.9	2.25	23.2	94.9	4.03	4.7	1150	39.8	23.4	0.59	1.18	43.8	33.8	-
				1350	32.0	2.26	24.2	91.9	4.14	4.2	1350	40.7	25.6	0.63	1.23	44.9	33.1	-
50	5.0	0.9	2.0	1150	31.0	2.19	23.5	94.9	4.14	4.8	1150	40.4	23.3	0.58	1.56	45.7	25.9	1.6
				1350	32.0	2.19	24.5	91.9	4.27	4.4	1350	41.7	27.5	0.66	1.63	47.2	25.6	1.7
	8.0	1.8	4.2	1150	33.4	2.26	25.7	96.9	4.32	4.9	1150	41.3	23.5	0.57	1.35	45.9	30.5	1.5
				1350	34.7	2.25	27.0	93.8	4.51	4.5	1350	42.5	27.6	0.65	1.42	47.4	30.0	1.6
	11.0	3.1	7.2	1150	34.7	2.28	26.9	97.9	4.46	5.1	1150	41.5	23.5	0.56	1.27	45.9	32.6	1.4
				1350	35.8	2.28	28.0	94.6	4.60	4.6	1350	42.8	27.6	0.65	1.34	47.4	31.9	1.5
60	5.0	0.8	1.9	1150	33.7	2.23	26.1	97.1	4.42	5.2	1150	39.5	23.3	0.59	1.69	45.3	23.4	2.3
				1350	34.9	2.22	27.3	93.9	4.61	4.8	1350	40.7	27.5	0.67	1.76	46.8	23.1	2.4
	8.0	1.8	4.0	1150	36.5	2.29	28.6	99.3	4.67	5.4	1150	40.2	23.5	0.59	1.50	45.3	26.8	2.1
				1350	37.9	2.26	30.2	96.0	4.91	5.0	1350	41.4	27.7	0.67	1.57	46.7	26.4	2.3
	11.0	3.0	6.9	1150	38.0	2.31	30.1	100.6	4.83	5.5	1150	40.6	23.6	0.58	1.42	45.5	28.6	1.9
				1350	39.4	2.28	31.6	97.0	5.06	5.1	1350	41.9	27.7	0.66	1.49	46.9	28.2	2.2
70	5.0	0.8	1.8	1150	36.4	2.27	28.7	99.3	4.71	5.8	1150	38.6	23.3	0.60	1.81	44.8	21.3	3.2
				1350	37.9	2.24	30.2	96.0	4.95	5.4	1350	39.8	27.4	0.69	1.90	46.3	21.0	3.4
	8.0	1.7	3.9	1150	39.5	2.31	31.7	101.8	5.02	6.0	1150	39.0	23.6	0.60	1.64	44.6	23.8	3.0
				1350	41.1	2.27	33.4	98.2	5.31	5.5	1350	40.2	27.7	0.69	1.72	46.1	23.5	3.2
	11.0	2.9	6.7	1150	41.3	2.33	33.4	103.3	5.19	6.1	1150	39.7	23.7	0.60	1.57	45.0	25.3	2.8
				1350	42.9	2.28	35.1	99.4	5.51	5.7	1350	40.9	27.8	0.68	1.63	46.5	25.1	3.1
80	5.0	0.8	1.8	1150	39.3	2.31	31.4	101.6	4.99	6.5	1150	37.5	22.3	0.60	2.01	44.3	18.6	4.4
				1350	40.8	2.27	33.1	98.0	5.27	6.0	1350	38.7	26.2	0.68	2.10	45.8	18.4	4.6
	8.0	1.6	3.8	1150	42.6	2.33	34.7	104.3	5.36	6.7	1150	37.7	22.5	0.60	1.87	44.1	20.1	4.1
				1350	44.4	2.27	36.6	100.4	5.72	6.1	1350	38.8	26.5	0.68	1.95	45.4	19.9	4.4
	11.0	2.8	6.5	1150	44.8	2.36	36.8	106.1	5.57	6.9	1150	38.5	22.7	0.59	1.79	44.6	21.5	3.8
				1350	46.6	2.29	38.8	102.0	5.95	6.3	1350	39.7	26.7	0.67	1.87	46.1	21.3	4.2
90	5.0	0.7	1.7	1150	42.1	2.35	34.1	103.9	5.26	7.2	1150	36.3	21.3	0.59	2.21	43.9	16.4	5.9
				1350	43.7	2.30	35.9	100.0	5.58	6.7	1350	37.5	25.0	0.67	2.30	45.3	16.3	6.2
	8.0	1.6	3.6	1150	45.8	2.36	37.7	106.8	5.68	7.4	1150	36.3	21.5	0.59	2.10	43.5	17.3	5.5
				1350	47.6	2.28	39.9	102.7	6.12	6.9	1350	37.3	25.4	0.68	2.18	44.8	17.2	5.9
	11.0	2.7	6.2	1150	48.3	2.38	40.1	108.9	5.93	7.7	1150	37.3	21.8	0.58	2.01	44.2	18.6	5.1
				1350	50.3	2.31	42.4	104.5	6.39	7.1	1350	38.5	25.6	0.66	2.10	45.7	18.3	5.6
100	5.0	0.7	1.7	Operation not recommended							Operation not recommended							
	8.0	1.5	3.5								1150	35.2	22.5	0.64	2.42	43.5	14.6	7.1
											1350	36.3	26.5	0.73	2.51	44.9	14.4	7.7
	11.0	2.6	6.0								1150	36.5	22.8	0.63	2.33	44.5	15.7	6.6
											1350	37.6	26.8	0.71	2.43	45.9	15.5	7.3
110	5.0	0.7	1.6								Operation not recommended							
	8.0	1.5	3.4								1150	31.6	21.2	0.67	2.69	40.8	11.7	9.0
											1350	32.6	24.9	0.76	2.80	42.2	11.6	9.8
	11.0	2.5	5.8								1150	33.1	21.6	0.65	2.61	42.0	12.7	8.4
											1350	34.0	25.3	0.74	2.72	43.3	12.5	9.3
120	5.0	0.7	1.5								Operation not recommended							
	8.0	1.4	3.3								1150	29.1	20.6	0.71	3.01	39.4	9.7	11.2
											1350	30.1	24.2	0.80	3.14	40.8	9.6	12.1
	11.0	2.4	5.6								1150	30.8	21.0	0.68	2.92	40.8	10.6	10.4
											1350	31.6	24.7	0.78	3.06	42.0	10.3	11.5

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Geo Mode Performance Data cont.

NG*064 - High Speed (1800 CFM Heating)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	8.0	1.8	4.2	Operation not recommended							Operation not recommended							
	12.0	3.8	8.8															
	16.0	6.5	15.1	1500	39.7	3.44	28.0	94.5	3.39	6.2								
				1800	40.7	3.60	28.4	90.9	3.31	5.6								
30	8.0	1.8	4.1	Operation not recommended							Operation not recommended							
	12.0	3.7	8.6	1500	45.8	3.46	34.1	98.3	3.89	6.5	1500	64.3	41.0	0.64	2.29	72.1	28.1	---
				1800	47.1	3.68	34.6	94.2	3.75	6.0	1800	65.3	44.8	0.69	2.41	73.5	27.1	---
	16.0	6.4	14.7	1500	46.5	3.54	34.4	98.7	3.84	6.7	1500	64.6	41.0	0.63	2.22	72.2	29.1	---
				1800	47.6	3.71	34.9	94.5	3.76	6.1	1800	66.2	44.8	0.68	2.33	74.1	28.4	---
40	8.0	1.7	4.0	Operation not recommended							Operation not recommended							
	12.0	3.6	8.3	1500	52.7	3.68	40.1	102.5	4.19	7.2	1500	66.8	41.9	0.63	2.66	75.9	25.1	---
				1800	53.9	3.84	40.8	97.7	4.11	6.6	1800	68.1	45.8	0.67	2.79	77.6	24.4	---
	16.0	6.2	14.2	1500	53.5	3.75	40.7	103.0	4.18	7.4	1500	67.4	41.9	0.62	2.58	76.2	26.1	---
				1800	54.7	3.88	41.5	98.1	4.13	6.7	1800	68.9	45.8	0.66	2.70	78.1	25.5	---
50	8.0	1.7	3.8	1500	56.3	3.84	43.2	104.7	4.30	7.8	1500	68.7	42.2	0.61	3.00	78.9	22.9	4.0
				1800	57.4	3.95	44.0	99.6	4.26	7.2	1800	70.1	45.9	0.65	3.19	81.0	22.0	4.2
	12.0	3.5	8.1	1500	59.5	3.91	46.2	106.7	4.46	8.0	1500	69.4	42.6	0.61	2.94	79.4	23.6	3.7
				1800	60.7	4.01	47.0	101.2	4.44	7.4	1800	70.8	46.4	0.65	3.12	81.5	22.7	4.0
	16.0	6.0	13.8	1500	60.5	3.95	47.0	107.3	4.48	8.2	1500	70.1	43.1	0.61	2.89	80.0	24.3	3.4
				1800	61.8	4.05	48.0	101.8	4.47	7.5	1800	71.5	46.8	0.65	3.07	82.0	23.3	3.8
60	8.0	1.6	3.7	1500	63.1	4.12	49.1	109.0	4.49	8.7	1500	68.2	42.2	0.62	3.30	79.5	20.7	4.8
				1800	64.5	4.18	50.2	103.2	4.52	8.0	1800	70.0	45.9	0.66	3.51	81.9	19.9	5.1
	12.0	3.4	7.8	1500	66.0	4.18	51.7	110.7	4.62	9.0	1500	68.9	42.6	0.62	3.23	79.9	21.3	4.5
				1800	67.4	4.24	53.0	104.7	4.66	8.3	1800	70.7	46.3	0.66	3.43	82.4	20.6	4.9
	16.0	5.8	13.4	1500	67.4	4.23	53.0	111.6	4.67	9.2	1500	69.6	43.1	0.62	3.18	80.4	21.9	4.2
				1800	69.0	4.28	54.3	105.5	4.72	8.5	1800	71.4	46.8	0.66	3.38	82.9	21.1	4.6
70	8.0	1.6	3.6	1500	69.9	4.39	55.0	113.2	4.66	9.8	1500	67.7	42.2	0.62	3.60	80.0	18.8	6.1
				1800	71.5	4.42	56.4	106.8	4.74	9.0	1800	69.8	45.9	0.66	3.83	82.9	18.2	6.4
	12.0	3.3	7.5	1500	72.5	4.46	57.3	114.8	4.77	10.1	1500	68.4	42.6	0.62	3.53	80.4	19.4	5.7
				1800	74.2	4.47	58.9	108.1	4.86	9.3	1800	70.6	46.3	0.66	3.75	83.4	18.8	6.1
	16.0	5.6	12.9	1500	74.4	4.51	59.0	115.9	4.83	10.4	1500	69.0	43.0	0.62	3.46	80.9	19.9	5.3
				1800	76.1	4.51	60.7	109.1	4.95	9.6	1800	71.2	46.8	0.66	3.69	83.8	19.3	5.8
80	8.0	1.5	3.5	1500	76.9	4.70	60.9	117.5	4.80	11.0	1500	63.2	40.8	0.65	3.89	76.5	16.3	7.7
				1800	78.7	4.67	62.7	110.5	4.94	10.2	1800	65.5	44.3	0.68	4.14	79.7	15.8	8.1
	12.0	3.2	7.3	1500	78.7	4.76	62.5	118.6	4.85	11.3	1500	63.9	41.1	0.64	3.81	76.9	16.8	7.1
				1800	80.6	4.71	64.6	111.5	5.02	10.5	1800	66.2	44.7	0.68	4.06	80.0	16.3	7.7
	16.0	5.4	12.5	1500	81.1	4.81	64.7	120.1	4.94	11.7	1500	64.5	41.6	0.65	3.75	77.3	17.2	6.6
				1800	83.2	4.76	66.9	112.8	5.13	10.8	1800	66.9	45.2	0.68	3.99	80.5	16.8	7.4
90	8.0	1.4	3.3	1500	83.9	5.00	66.8	121.8	4.92	12.4	1500	58.7	39.3	0.67	4.18	72.9	14.0	9.6
				1800	85.9	4.93	69.1	114.2	5.11	11.4	1800	61.3	42.7	0.70	4.45	76.5	13.8	10.2
	12.0	3.0	7.0	1500	85.0	5.05	67.7	122.5	4.93	12.7	1500	59.3	39.6	0.67	4.10	73.3	14.5	9.0
				1800	87.1	4.95	70.2	114.8	5.16	11.8	1800	61.8	43.1	0.70	4.36	76.7	14.2	9.7
	16.0	5.2	12.0	1500	87.9	5.12	70.4	124.3	5.03	13.1	1500	59.9	40.1	0.67	4.03	73.7	14.9	8.3
				1800	90.2	5.00	73.1	116.4	5.29	12.2	1800	62.5	43.5	0.70	4.29	77.2	14.6	9.2
100	8.0	1.4	3.2	Operation not recommended							Operation not recommended							
	12.0	2.9	6.8								1500	55.2	37.5	0.68	4.47	70.4	12.3	11.1
											1800	57.8	40.7	0.70	4.77	74.0	12.1	12.1
	16.0	5.0	11.6								1500	55.7	37.9	0.68	4.39	70.7	12.7	10.3
											1800	58.4	41.2	0.71	4.69	74.3	12.5	11.5
110	8.0	1.3	3.1								Operation not recommended							
	12.0	2.8	6.5								1500	51.0	35.3	0.69	4.84	67.5	10.5	13.6
											1800	53.7	38.3	0.71	5.17	71.4	10.4	14.8
	16.0	4.8	11.2								1500	51.5	35.7	0.69	4.76	67.7	10.8	12.7
											1800	54.2	38.8	0.72	5.08	71.5	10.7	14.1
120	8.0	1.3	3.0								Operation not recommended							
	12.0	2.7	6.3								1500	51.4	36.4	0.71	5.62	70.6	9.2	16.5
											1800	52.4	39.5	0.75	5.76	72.0	9.1	17.9
	16.0	4.6	10.7								1500	51.9	36.4	0.70	5.44	70.4	9.5	15.3
											1800	53.0	39.5	0.75	5.61	72.1	9.4	17.0

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Geo Mode Performance Data cont.

NG*064 - Low Speed (1500 CFM Heating)

EWT °F	Flow Rate GPM	WPD		HEATING - EAT 70°F							COOLING - EAT 80/67 °F							
		PSI	FT/HD	Airflow CFM	HC MBtu/h	Power kW	HE MBtu/h	LAT °F	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	HR Mbtu/h	EER	HWC Mbtu/h
20	6.0	1.0	2.4	Operation not recommended							Operation not recommended							
	10.0	2.7	6.2															
	14.0	5.1	11.8	1250	28.6	2.73	19.3	91.2	3.07	4.9								
				1500	29.6	2.77	20.1	88.3	3.13	4.5								
30	6.0	1.0	2.3	Operation not recommended							Operation not recommended							
	10.0	2.6	6.0	1250	31.9	2.70	22.7	93.6	3.46	5.0	1250	50.0	30.0	0.60	1.38	54.7	36.3	-
				1500	33.1	2.74	23.7	90.4	3.54	4.6	1500	50.8	32.8	0.65	1.45	55.8	35.0	-
	14.0	5.0	11.5	1250	33.1	2.70	23.8	94.5	3.58	5.1	1250	50.3	30.0	0.60	1.34	54.8	37.6	-
				1500	34.2	2.74	24.9	91.1	3.66	4.7	1500	51.5	32.8	0.64	1.40	56.3	36.7	-
40	6.0	1.0	2.3	Operation not recommended							Operation not recommended							
	10.0	2.5	5.9	1250	37.4	2.79	27.9	97.7	3.92	5.3	1250	51.5	30.7	0.60	1.54	56.8	33.5	-
				1500	38.4	2.80	28.9	93.7	4.02	4.9	1500	52.5	33.6	0.64	1.61	58.0	32.5	-
	14.0	4.8	11.1	1250	38.6	2.80	29.1	98.6	4.04	5.5	1250	51.9	30.7	0.59	1.49	57.0	34.8	-
				1500	39.7	2.81	30.1	94.5	4.14	5.0	1500	53.1	33.6	0.63	1.56	58.4	34.0	-
50	6.0	0.9	2.2	1250	42.2	2.83	32.5	101.2	4.37	5.6	1250	52.8	30.0	0.57	1.74	58.7	30.4	2.0
				1500	43.3	2.83	33.7	96.7	4.49	5.2	1500	54.3	34.0	0.63	1.83	60.6	29.7	2.1
	10.0	2.5	5.7	1250	42.8	2.88	33.0	101.7	4.36	5.7	1250	52.9	30.2	0.57	1.67	58.7	31.7	1.9
				1500	43.8	2.86	34.0	97.0	4.48	5.3	1500	54.5	34.3	0.63	1.75	60.5	31.1	2.0
	14.0	4.7	10.8	1250	44.1	2.90	34.2	102.7	4.46	5.9	1250	53.1	30.2	0.57	1.64	58.7	32.3	1.7
				1500	45.1	2.88	35.3	97.8	4.59	5.4	1500	54.6	34.3	0.63	1.72	60.5	31.8	1.9
60	6.0	0.9	2.1	1250	46.6	2.91	36.7	104.5	4.70	6.1	1250	51.4	29.8	0.58	1.96	58.1	26.2	2.8
				1500	47.6	2.89	37.8	99.4	4.84	5.7	1500	53.0	33.7	0.64	2.06	60.0	25.8	3.0
	10.0	2.4	5.5	1250	48.1	2.96	38.0	105.6	4.76	6.3	1250	51.6	30.1	0.58	1.90	58.1	27.2	2.6
				1500	48.9	2.92	38.9	100.2	4.90	5.8	1500	53.2	34.0	0.64	1.99	60.0	26.8	2.9
	14.0	4.5	10.4	1250	49.2	2.99	39.0	106.5	4.83	6.5	1250	51.9	30.2	0.58	1.86	58.2	27.9	2.5
				1500	50.0	2.95	40.0	100.9	4.98	6.0	1500	53.4	34.1	0.64	1.95	60.1	27.4	2.7
70	6.0	0.9	2.0	1250	51.1	2.99	40.9	107.9	5.01	6.8	1250	50.0	29.7	0.59	2.19	57.5	22.9	4.0
				1500	52.0	2.94	42.0	102.1	5.18	6.3	1500	51.6	33.3	0.64	2.28	59.4	22.6	4.2
	10.0	2.3	5.3	1250	53.3	3.04	42.9	109.5	5.13	7.0	1250	50.3	29.9	0.59	2.13	57.6	23.7	3.7
				1500	53.9	2.98	43.7	103.3	5.31	6.5	1500	51.9	33.7	0.65	2.22	59.5	23.4	4.0
	14.0	4.4	10.1	1250	54.3	3.08	43.8	110.2	5.17	7.2	1250	50.7	30.1	0.59	2.08	57.8	24.3	3.5
				1500	54.9	3.01	44.6	103.9	5.35	6.6	1500	52.2	33.8	0.65	2.17	59.6	24.0	3.9
80	6.0	0.9	2.0	1250	55.4	3.09	44.9	111.0	5.26	7.6	1250	47.2	28.5	0.60	2.49	55.7	18.9	5.5
				1500	55.9	3.02	45.6	104.5	5.43	7.0	1500	48.6	31.8	0.65	2.58	57.4	18.9	5.9
	10.0	2.2	5.1	1250	58.5	3.14	47.8	113.4	5.47	7.8	1250	47.6	28.7	0.60	2.43	55.9	19.6	5.2
				1500	58.8	3.04	48.4	106.3	5.66	7.2	1500	49.0	32.2	0.66	2.52	57.6	19.4	5.6
	14.0	4.2	9.8	1250	59.2	3.18	48.4	113.9	5.46	8.0	1250	47.9	28.9	0.60	2.39	56.0	20.0	4.8
				1500	59.5	3.09	48.9	106.7	5.65	7.4	1500	49.4	32.4	0.65	2.48	57.8	19.9	5.3
90	6.0	0.8	1.9	1250	59.7	3.18	48.9	114.2	5.51	8.5	1250	44.3	27.2	0.61	2.80	53.8	15.8	7.4
				1500	59.8	3.09	49.3	106.9	5.67	7.8	1500	45.6	30.2	0.66	2.88	55.4	15.9	7.8
	10.0	2.1	5.0	1250	63.7	3.23	52.7	117.2	5.79	8.7	1250	44.8	27.5	0.61	2.73	54.1	16.4	6.9
				1500	63.7	3.11	53.1	109.3	6.01	8.1	1500	46.1	30.6	0.66	2.83	55.8	16.3	7.5
	14.0	4.1	9.4	1250	64.1	3.28	53.0	117.5	5.74	9.0	1250	45.1	27.8	0.62	2.70	54.3	16.7	6.4
				1500	64.0	3.16	53.2	109.5	5.94	8.3	1500	46.6	30.9	0.66	2.78	56.1	16.8	7.1
100	6.0	0.8	1.8	Operation not recommended							Operation not recommended							
	10.0	2.1	4.8								1250	41.7	26.8	0.64	3.13	52.4	13.3	9.0
											1500	43.0	29.6	0.69	3.22	54.0	13.4	9.7
	14.0	3.9	9.1								1250	42.2	27.1	0.64	3.09	52.7	13.6	8.3
											1500	43.5	30.0	0.69	3.17	54.3	13.7	9.2
110	6.0	0.8	1.8								Operation not recommended							
	10.0	2.0	4.6								1250	38.7	26.0	0.67	3.53	50.7	10.9	11.3
											1500	39.9	28.6	0.72	3.60	52.2	11.1	12.3
	14.0	3.8	8.7								1250	39.2	26.4	0.67	3.48	51.1	11.3	10.5
											1500	40.4	29.0	0.72	3.55	52.5	11.4	11.7
120	6.0	0.7	1.7								Operation not recommended							
	10.0	1.9	4.4								1250	36.7	26.7	0.73	4.01	50.4	9.2	14.0
											1500	37.4	29.0	0.78	4.11	51.4	9.1	15.2
	14.0	3.6	8.4								1250	37.0	26.7	0.72	3.88	50.2	9.5	13.0
											1500	37.8	29.0	0.77	4.00	51.4	9.5	14.5

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Air Source Mode Performance Data

NG*038 - High Speed (1250 CFM Heating and Cooling) - 1 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
5	60	55	1050	16.20	1.83	2.62	2.92	Operation not recommended						
			1250	15.61	1.89	2.45	2.79							
	70	60	1050	16.56	2.03	2.43	3.83							
			1250	16.36	2.07	2.34	3.76							
	75	62	1050	16.74	2.14	2.33	4.29							
			1250	16.74	2.17	2.29	4.24							
	80	57	1050	18.79	2.32	2.74	4.40							
			1250	18.60	2.36	2.65	4.32							
	80	62	1050	17.86	2.28	2.49	4.57							
			1250	17.86	2.31	2.45	4.52							
	80	67	1050	16.92	2.24	2.24	4.74							
			1250	17.12	2.26	2.24	4.73							
	80	72	1050	15.98	2.20	1.99	4.91							
			1250	16.38	2.21	2.03	4.93							
15	60	55	1050	19.51	1.93	2.96	2.93	Operation not recommended						
			1250	20.13	1.95	3.01	2.79							
	70	60	1050	20.20	2.15	2.77	3.81							
			1250	20.37	2.17	2.76	3.80							
	75	62	1050	20.55	2.26	2.67	4.25							
			1250	20.49	2.28	2.64	4.30							
	80	57	1050	22.94	2.45	3.12	4.38							
			1250	23.10	2.47	3.12	4.37							
	80	62	1050	21.92	2.41	2.85	4.54							
			1250	21.86	2.43	2.82	4.58							
	80	67	1050	20.89	2.37	2.57	4.70							
			1250	20.62	2.39	2.52	4.80							
	80	72	1050	19.87	2.32	2.30	4.86							
			1250	19.37	2.34	2.22	5.01							
25	60	55	1050	22.82	2.02	3.30	2.93	Operation not recommended						
			1250	24.65	2.02	3.57	2.80							
	70	60	1050	23.84	2.26	3.10	3.79							
			1250	24.38	2.27	3.18	3.83							
	75	62	1050	24.35	2.37	3.01	4.22							
			1250	24.25	2.39	2.99	4.35							
	80	57	1050	27.09	2.57	3.50	4.35							
			1250	27.61	2.58	3.58	4.41							
	80	62	1050	25.98	2.53	3.21	4.50							
			1250	25.86	2.55	3.19	4.64							
	80	67	1050	24.86	2.49	2.91	4.65							
			1250	24.11	2.51	2.80	4.87							
	80	72	1050	23.75	2.45	2.61	4.80							
			1250	22.37	2.48	2.41	5.10							
35	60	55	1050	27.33	2.10	3.80	3.06	Operation not recommended						
			1250	29.37	2.07	4.16	2.81							
	70	60	1050	28.01	2.36	3.50	4.01							
			1250	28.84	2.34	3.66	3.92							
	75	62	1050	28.35	2.49	3.34	4.49							
			1250	28.57	2.48	3.40	4.47							
	80	57	1050	31.79	2.70	3.94	4.61							
			1250	32.65	2.68	4.11	4.52							
	80	62	1050	30.24	2.66	3.57	4.79							
			1250	30.47	2.65	3.63	4.77							
	80	67	1050	28.68	2.63	3.19	4.97							
			1250	28.30	2.62	3.15	5.03							
	80	72	1050	27.13	2.59	2.82	5.15							
			1250	26.13	2.60	2.67	5.29							
45	60	55	1050	33.04	2.16	4.48	3.30	Operation not recommended						
			1250	34.31	2.10	4.79	2.82							
	70	60	1050	33.27	2.47	4.01	4.38							
			1250	33.74	2.41	4.18	4.05							
	75	62	1050	33.39	2.62	3.77	4.92							
			1250	33.46	2.56	3.88	4.67							
	80	57	1050	37.73	2.82	4.51	5.04							
			1250	38.20	2.75	4.70	4.67							
	80	62	1050	35.62	2.79	4.02	5.25							
			1250	35.69	2.73	4.14	4.98							
	80	67	1050	33.51	2.77	3.53	5.46							
			1250	33.17	2.71	3.58	5.28							
	80	72	1050	31.40	2.75	3.05	5.67							
			1250	30.66	2.70	3.02	5.59							
55	60	55	1050	37.88	2.20	5.04	3.50							
			1250	38.84	2.15	5.30	3.03							
	70	60	1050	37.63	2.50	4.47	4.74	1050	43.14	18.34	0.67	1.68	25.65	1.45
			1250	38.34	2.44	4.67	4.33	1250	44.02	19.67	0.71	1.78	24.77	1.52
	75	62	1050	37.51	2.65	4.19	5.36	1050	38.68	28.63	0.74	1.66	23.24	1.40
			1250	38.09	2.59	4.36	4.98	1250	39.95	31.14	0.78	1.74	22.98	1.41
	80	57	1050	42.63	2.86	5.03	5.45	1050	34.22	38.93	0.81	1.65	20.84	1.36
			1250	43.42	2.79	5.25	4.99	1250	35.87	42.61	0.85	1.70	21.19	1.30
	80	62	1050	40.01	2.83	4.47	5.72	1050	38.11	33.76	0.89	1.66	22.91	1.47
			1250	40.63	2.76	4.65	5.31	1250	39.61	36.63	0.92	1.73	22.94	1.49
	80	67	1050	37.38	2.81	3.90	5.98	1050	42.00	28.59	0.70	1.68	24.97	1.57
			1250	37.84	2.74	4.05	5.62	1250	43.36	30.65	0.72	1.75	24.68	1.67
	80	72	1050	34.76	2.78	3.34	6.24	1050	45.89	23.43	0.51	1.70	27.04	1.68
			1250	35.06	2.71	3.44	5.94	1250	47.11	24.67	0.52	1.78	26.42	1.86

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Air Source Mode Performance Data cont.

NG*038 - High Speed (1250 CFM Heating and Cooling) - 2 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
65	60	55	1050	42.71	2.24	5.61	3.69							
			1250	43.36	2.19	5.81	3.23							
	70	60	1050	41.98	2.54	4.94	5.09	1050	41.33	17.64	0.68	1.89	22.77	2.52
			1250	42.94	2.48	5.16	4.60	1250	42.24	18.97	0.72	1.98	22.12	2.55
	75	62	1050	41.62	2.69	4.60	5.80	1050	37.15	27.92	0.75	1.87	20.69	2.45
			1250	42.73	2.62	4.84	5.28	1250	38.36	30.39	0.79	1.95	20.50	2.46
	80	57	1050	47.53	2.90	5.55	5.87	1050	32.98	38.21	0.83	1.85	18.60	2.37
			1250	48.64	2.83	5.81	5.30	1250	34.49	41.80	0.87	1.91	18.88	2.37
	80	62	1050	44.40	2.87	4.91	6.18	1050	36.74	33.05	0.90	1.87	20.45	2.50
			1250	45.58	2.80	5.16	5.64	1250	38.14	35.87	0.94	1.94	20.48	2.55
	80	67	1050	41.26	2.84	4.27	6.50	1050	40.50	27.88	0.71	1.89	22.30	2.63
			1250	42.51	2.77	4.52	5.97	1250	41.80	29.95	0.74	1.96	22.09	2.73
	80	72	1050	38.12	2.81	3.63	6.81	1050	44.26	22.72	0.51	1.91	24.16	2.76
			1250	39.45	2.73	3.87	6.30	1250	45.46	24.02	0.53	1.99	23.69	2.90
75	60	55	Operation not recommended											
	70	60						1050	39.53	16.94	0.69	2.11	19.90	3.60
								1250	40.45	18.27	0.73	2.19	19.46	3.58
	75	62						1050	35.63	27.21	0.77	2.08	18.13	3.49
								1250	36.78	29.63	0.81	2.16	18.02	3.51
	80	57						1050	31.73	37.49	0.84	2.06	16.35	3.39
								1250	33.11	41.00	0.88	2.12	16.57	3.43
	80	62						1050	35.37	32.33	0.92	2.08	17.99	3.54
								1250	36.68	35.12	0.96	2.15	18.03	3.60
	80	67						1050	39.00	27.17	0.72	2.10	19.63	3.70
								1250	40.25	29.24	0.75	2.17	19.49	3.78
	80	72						1050	42.64	22.01	0.52	2.12	21.28	3.85
								1250	43.82	23.37	0.53	2.20	20.95	3.95
85	60	55	Operation not recommended											
	70	60						1050	37.73	16.24	0.70	2.32	17.03	4.67
								1250	38.67	17.57	0.74	2.40	16.81	4.61
	75	62						1050	34.10	26.50	0.78	2.29	15.57	4.54
								1250	35.20	28.88	0.82	2.37	15.54	4.55
	80	57						1050	30.48	36.77	0.86	2.27	14.10	4.40
								1250	31.73	40.19	0.90	2.33	14.26	4.50
	80	62						1050	33.99	31.62	0.93	2.29	15.53	4.58
								1250	35.21	34.37	0.98	2.36	15.58	4.66
	80	67						1050	37.51	26.46	0.73	2.31	16.96	4.76
								1250	38.69	28.54	0.76	2.38	16.90	4.83
	80	72						1050	41.02	21.31	0.52	2.33	18.40	4.93
								1250	42.18	22.72	0.54	2.41	18.22	4.99
95	60	55	Operation not recommended											
	70	60						1050	35.92	15.54	0.71	2.54	14.16	5.75
								1250	36.88	16.87	0.76	2.60	14.15	5.64
	75	62						1050	32.58	25.79	0.79	2.50	13.01	5.58
								1250	33.61	28.13	0.84	2.58	13.05	5.60
	80	57						1050	29.23	36.05	0.87	2.47	11.86	5.42
								1250	30.35	39.39	0.92	2.55	11.96	5.56
	80	62						1050	32.62	30.90	0.95	2.49	13.08	5.62
								1250	33.74	33.61	0.99	2.57	13.13	5.72
	80	67						1050	36.01	25.75	0.74	2.52	14.30	5.82
								1250	37.14	27.84	0.77	2.59	14.31	5.88
	80	72						1050	39.40	20.60	0.52	2.54	15.51	6.01
								1250	40.54	22.06	0.54	2.62	15.49	6.03
105	60	55	Operation not recommended											
	70	60						1050	33.15	15.40	0.76	2.83	12.14	7.26
								1250	33.56	16.93	0.83	2.86	12.00	7.08
	75	62						1050	30.43	25.15	0.83	2.82	11.20	7.18
								1250	31.35	27.46	0.88	2.89	11.25	7.22
	80	57						1050	27.71	34.91	0.90	2.81	10.26	7.11
								1250	29.14	37.99	0.94	2.92	10.49	7.35
	80	62						1050	30.57	29.75	0.98	2.81	11.27	7.24
								1250	31.81	31.70	0.99	2.89	11.40	7.38
	80	67						1050	33.43	24.60	0.76	2.82	12.29	7.38
								1250	34.48	25.42	0.77	2.86	12.30	7.42
	80	72						1050	36.30	26.25	0.78	2.90	12.31	7.46
								1250	37.14	20.11	0.55	2.87	13.26	7.52
115	60	55	Operation not recommended											
	70	60						1050	30.38	15.26	0.81	3.12	10.11	8.78
								1250	30.23	18.62	0.89	3.19	9.87	8.61
	75	62						1050	28.28	24.51	0.87	3.13	9.39	8.79
								1250	29.08	26.78	0.93	3.20	9.44	8.83
	80	57						1050	26.18	33.77	0.94	3.14	8.67	8.79
								1250	27.93	34.94	0.96	3.21	9.01	9.05
	80	62						1050	28.52	28.61	0.94	3.13	9.47	8.86
								1250	29.87	29.80	0.96	3.21	9.66	9.05
	80	67						1050	30.86	23.45	0.78	3.12	10.28	8.93
								1250	31.81	24.65	0.79	3.20	10.31	9.05
	80	72						1050	33.20	18.29	0.55	3.11	11.08	9.01
								1250	33.75	19.51	0.58	3.20	10.96	9.04
125	60	55	Operation not recommended											
	70	60						1050	27.61	15.12	0.85	3.42	8.09	10.30
								1250	26.91	19.50	0.96	3.48	7.73	10.09
	75	62						1050	26.13	23.87	0.91	3.45	7.58	10.39
								1250	26.82	26.11	0.97	3.51	7.63	10.44
	80	57						1050	24.66	32.63	0.98	3.48	7.07	10.48
								1250	26.72	32.72	0.99	3.54	7.53	10.80
	80	62						1050	26.47	27.46	0.98	3.45	7.67	10.49
								1250	27.94	27.89	0.99	3.53	7.92	10.71
	80	67						1050	28.29	22.29	0.80	3.42	8.27	10.49
								1250	29.15	23.06	0.80	3.51	8.31	10.63
	80	72						1050	30.11	17.13	0.57	3.40	8.86	10.50
								1250	30.36	18.23	0.60	3.49	8.70	10.55

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Air Source Mode Performance Data cont.

NG*049 - High Speed (1550 CFM Heating and Cooling) - 1 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
5	60	55	1350	24.51	2.64	2.74	1.40	Operation not recommended						
			1550	24.23	2.65	2.70	3.85							
	70	60	1350	24.81	2.85	2.58	4.10							
			1550	23.38	2.99	2.35	5.40							
	75	62	1350	24.97	2.95	2.50	5.45							
			1550	22.96	3.16	2.17	6.17							
	80	57	1350	28.14	3.24	2.91	4.83							
			1550	26.44	3.41	2.64	6.22							
	80	62	1350	26.63	3.15	2.67	5.81							
			1550	24.49	3.37	2.32	6.58							
	80	67	1350	25.12	3.05	2.42	6.80							
			1550	22.54	3.33	2.00	6.94							
	80	72	1350	23.61	2.96	2.18	7.79							
			1550	20.58	3.29	1.68	7.31							
15	60	55	1350	28.62	2.79	2.99	2.84	Operation not recommended						
			1550	28.29	2.80	2.95	4.23							
	70	60	1350	28.69	3.06	2.76	4.73							
			1550	27.58	3.14	2.60	5.43							
	75	62	1350	28.73	3.20	2.64	5.67							
			1550	27.22	3.31	2.43	6.04							
	80	57	1350	32.52	3.49	3.11	5.49							
			1550	31.20	3.58	2.93	6.24							
	80	62	1350	30.64	3.41	2.81	6.05							
			1550	29.03	3.53	2.59	6.44							
	80	67	1350	28.76	3.34	2.52	6.62							
			1550	26.86	3.48	2.26	6.64							
	80	72	1350	26.88	3.26	2.22	7.19							
			1550	24.69	3.43	1.92	6.84							
25	60	55	1350	32.74	2.94	3.25	4.27	Operation not recommended						
			1550	32.35	2.95	3.20	4.61							
	70	60	1350	32.57	3.28	2.93	5.36							
			1550	31.77	3.29	2.86	5.47							
	75	62	1350	32.49	3.45	2.77	5.90							
			1550	31.48	3.45	2.69	5.90							
	80	57	1350	36.90	3.74	3.30	6.14							
			1550	35.97	3.75	3.22	6.26							
	80	62	1350	34.65	3.68	2.96	6.29							
			1550	33.58	3.69	2.87	6.29							
	80	67	1350	32.40	3.62	2.61	6.44							
			1550	31.19	3.62	2.51	6.33							
	80	72	1350	30.16	3.57	2.27	6.59							
			1550	28.80	3.56	2.16	6.37							
35	60	55	1350	38.13	3.02	3.70	4.93	Operation not recommended						
			1550	37.92	2.97	3.76	4.66							
	70	60	1350	37.79	3.38	3.32	5.88							
			1550	37.55	3.34	3.35	5.68							
	75	62	1350	37.63	3.56	3.13	6.36							
			1550	37.37	3.52	3.15	6.19							
	80	57	1350	42.81	3.85	3.73	6.73							
			1550	42.53	3.80	3.77	6.50							
	80	62	1350	40.13	3.80	3.33	6.78							
			1550	39.86	3.75	3.36	6.60							
	80	67	1350	37.46	3.74	2.94	6.84							
			1550	37.18	3.70	2.94	6.70							
	80	72	1350	34.78	3.68	2.54	6.89							
			1550	34.51	3.65	2.52	6.79							
45	60	55	1350	44.81	3.03	4.34	4.79	Operation not recommended						
			1550	44.99	2.85	4.64	4.39							
	70	60	1350	44.77	3.40	3.90	6.51							
			1550	44.91	3.28	4.08	6.06							
	75	62	1350	44.75	3.59	3.69	7.37							
			1550	44.87	3.50	3.81	6.89							
	80	57	1350	50.74	3.88	4.40	7.50							
			1550	50.90	3.75	4.59	6.98							
	80	62	1350	47.74	3.83	3.93	7.87							
			1550	47.87	3.74	4.06	7.35							
	80	67	1350	44.73	3.78	3.47	8.23							
			1550	44.83	3.72	3.53	7.73							
	80	72	1350	41.73	3.73	3.01	8.60							
			1550	41.80	3.70	3.00	8.10							
55	60	55	1350	52.16	3.10	4.92	5.04							
			1550	53.05	3.02	5.14	4.48							
	70	60	1350	51.63	3.52	4.36	6.93	1350	56.13	23.36	0.65	2.39	23.49	2.83
			1550	51.73	3.35	4.57	6.38	1550	56.85	24.52	0.67	2.49	22.86	3.21
	75	62	1350	51.37	3.73	4.08	7.88	1350	51.41	36.79	0.72	2.35	21.92	2.37
			1550	51.06	3.52	4.29	7.32	1550	53.20	39.28	0.74	2.45	21.75	2.47
	80	57	1350	58.48	4.02	4.90	7.99	1350	46.69	50.21	0.79	2.30	20.35	1.90
			1550	58.53	3.82	5.15	7.35	1550	49.55	54.05	0.81	2.40	20.64	1.73
	80	62	1350	54.79	3.98	4.35	8.41	1350	50.29	42.99	0.85	2.35	21.42	2.45
			1550	54.47	3.75	4.58	7.81	1550	52.11	45.93	0.88	2.44	21.35	2.46
	80	67	1350	51.11	3.94	3.80	8.83	1350	53.89	35.77	0.68	2.39	22.49	3.00
			1550	50.40	3.68	4.01	8.27	1550	54.67	37.80	0.70	2.48	22.06	3.19
	80	72	1350	47.42	3.90	3.25	9.25	1350	57.50	28.55	0.50	2.44	23.56	3.55
			1550	46.33	3.62	3.44	8.73	1550	57.22	29.68	0.52	2.51	22.77	3.93

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Air Source Mode Performance Data cont.

NG*049 - High Speed (1550 CFM Heating and Cooling) - 2 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
65	60	55	1350	59.51	3.18	5.50	5.29							
			1550	61.11	3.19	5.64	4.57							
	70	60	1350	58.49	3.64	4.81	7.36	1350	53.56	23.03	0.66	2.65	20.96	4.02
			1550	58.54	3.42	5.06	6.69	1550	54.49	23.95	0.68	2.75	20.48	4.31
	75	62	1350	57.98	3.87	4.47	8.39	1350	49.26	35.78	0.73	2.61	19.58	3.66
			1550	57.25	3.53	4.78	7.75	1550	50.92	38.05	0.75	2.71	19.46	3.76
	80	57	1350	66.22	4.15	5.41	8.47	1350	44.96	48.53	0.80	2.57	18.21	3.30
			1550	66.17	3.89	5.70	7.73	1550	47.35	52.14	0.82	2.67	18.43	3.20
	80	62	1350	61.85	4.12	4.77	8.95	1350	48.41	41.77	0.86	2.61	19.19	3.74
			1550	61.07	3.77	5.10	8.27	1550	49.98	44.56	0.89	2.71	19.12	3.78
	80	67	1350	57.48	4.10	4.13	9.42	1350	51.85	35.01	0.69	2.66	20.18	4.19
			1550	55.97	3.65	4.49	8.81	1550	52.61	36.98	0.71	2.75	19.81	4.37
	80	72	1350	53.10	4.07	3.49	9.90	1350	55.29	28.24	0.51	2.70	21.16	4.64
			1550	50.86	3.53	3.89	9.36	1550	55.24	29.40	0.53	2.78	20.50	4.95
75	60	55	Operation not recommended											
	70	60						1350	50.99	22.70	0.67	2.91	18.42	5.21
								1550	52.13	23.37	0.69	3.02	18.11	5.41
	75	62						1350	47.11	34.78	0.74	2.88	17.24	4.95
								1550	48.64	36.81	0.76	2.97	17.17	5.04
	80	57						1350	43.24	46.86	0.81	2.84	16.07	4.69
								1550	45.15	50.24	0.83	2.93	16.23	4.68
	80	62						1350	46.52	40.55	0.87	2.88	16.97	5.04
								1550	47.85	43.20	0.90	2.97	16.90	5.11
	80	67						1350	49.80	34.25	0.70	2.92	17.87	5.38
								1550	50.55	36.16	0.73	3.01	17.57	5.54
	80	72						1350	53.09	27.94	0.53	2.96	18.76	5.72
								1550	53.25	29.13	0.55	3.05	18.23	5.97
85	60	55	Operation not recommended											
	70	60						1350	48.41	22.37	0.69	3.17	15.88	6.40
								1550	49.77	22.80	0.69	3.28	15.73	6.51
	75	62						1350	44.96	33.78	0.75	3.14	14.91	6.24
								1550	46.36	35.57	0.77	3.24	14.88	6.33
	80	57						1350	41.51	45.18	0.82	3.11	13.93	6.09
								1550	42.96	48.33	0.84	3.19	14.02	6.15
	80	62						1350	44.64	39.33	0.88	3.15	14.74	6.33
								1550	45.72	41.84	0.92	3.24	14.67	6.43
	80	67						1350	47.76	33.48	0.71	3.19	15.55	6.57
								1550	48.49	35.34	0.74	3.28	15.32	6.71
	80	72						1350	50.88	27.64	0.55	3.22	16.36	6.81
								1550	51.26	28.85	0.56	3.32	15.97	6.99
95	60	55	Operation not recommended											
	70	60						1350	45.84	22.04	0.70	3.43	13.34	7.58
								1550	47.41	22.23	0.70	3.55	13.35	7.61
	75	62						1350	42.81	32.77	0.77	3.41	12.57	7.53
								1550	44.09	34.33	0.78	3.50	12.58	7.62
	80	57						1350	39.79	43.50	0.83	3.38	11.79	7.48
								1550	40.76	46.43	0.85	3.46	11.82	7.63
	80	62						1350	42.75	38.11	0.89	3.42	12.52	7.62
								1550	43.59	40.48	0.93	3.50	12.45	7.76
	80	67						1350	45.71	32.72	0.73	3.45	13.24	7.76
								1550	46.43	34.52	0.75	3.55	13.07	7.89
	80	72						1350	48.67	27.34	0.56	3.49	13.96	7.89
								1550	49.27	28.57	0.58	3.60	13.70	8.01
105	60	55	Operation not recommended											
	70	60						1350	43.52	21.06	0.72	3.85	11.65	9.05
								1550	44.42	20.64	0.73	3.91	11.66	9.47
	75	62						1350	40.28	31.42	0.78	3.82	10.91	9.40
								1550	41.30	33.04	0.80	3.91	10.91	9.48
	80	57						1350	37.04	41.78	0.85	3.78	10.16	9.75
								1550	38.18	45.44	0.88	3.92	10.16	9.50
	80	62						1350	40.02	36.46	0.91	3.82	10.83	9.78
								1550	40.89	38.72	0.95	3.92	10.79	9.66
	80	67						1350	43.00	31.14	0.74	3.87	11.49	9.81
								1550	43.61	32.01	0.75	3.92	11.42	9.81
	80	72						1350	45.98	32.88	0.77	3.97	11.35	9.80
								1550	46.33	26.43	0.57	3.97	12.03	9.90
115	60	55	Operation not recommended											
	70	60						1350	41.20	20.08	0.73	4.28	9.96	10.52
								1550	41.42	20.79	0.76	4.36	9.82	11.31
	75	62						1350	37.75	30.07	0.80	4.23	9.25	11.27
								1550	38.51	31.74	0.83	4.32	9.23	11.35
	80	57						1350	34.30	40.06	0.87	4.18	8.53	12.02
								1550	35.59	42.70	0.90	4.28	8.65	11.39
	80	62						1350	37.30	34.81	0.94	4.23	9.14	11.94
								1550	38.19	36.97	0.97	4.33	9.13	11.55
	80	67						1350	40.30	29.55	0.75	4.29	9.74	11.86
								1550	40.79	31.24	0.78	4.39	9.62	11.72
	80	72						1350	43.29	24.30	0.56	4.34	10.34	11.79
								1550	43.39	25.51	0.59	4.44	10.11	11.89
125	60	55	Operation not recommended											
	70	60						1350	38.87	19.09	0.74	4.70	8.27	11.98
								1550	38.42	20.07	0.78	4.77	8.05	13.16
	75	62						1350	35.22	28.72	0.82	4.64	7.59	13.13
								1550	35.72	30.45	0.85	4.73	7.56	13.21
	80	57						1350	31.56	38.35	0.89	4.58	6.91	14.29
								1550	33.01	40.83	0.92	4.68	7.06	13.26
	80	62						1350	34.57	33.16	0.96	4.64	7.45	14.10
								1550	35.49	35.22	0.99	4.75	7.48	13.45
	80	67						1350	37.59	27.97	0.76	4.70	7.98	13.92
								1550	37.97	29.60	0.79	4.81	7.89	13.64
	80	72						1350	40.60	22.78	0.56	4.76	8.52	13.74
								1550	40.44	23.99	0.59	4.87	8.31	13.83

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Air Source Mode Performance Data cont.

NG*064 - High Speed (1800 CFM Heating and Cooling) - 1 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
5	60	55	1500	24.37	2.98	2.43	4.74	Operation not recommended						
			1800	25.17	3.09	2.42	4.19							
	70	60	1500	25.31	3.38	2.24	5.60							
			1800	25.07	3.24	2.29	5.60							
	75	62	1500	25.78	3.57	2.15	6.03							
			1800	25.03	3.32	2.23	6.31							
	80	57	1500	28.74	3.85	2.53	6.40							
			1800	28.41	3.69	2.59	6.44							
	80	62	1500	27.49	3.81	2.29	6.43							
			1800	26.70	3.54	2.38	6.73							
	80	67	1500	26.24	3.77	2.05	6.46							
			1800	24.98	3.40	2.17	7.01							
	80	72	1500	25.00	3.73	1.81	6.49							
			1800	23.27	3.26	1.95	7.29							
15	60	55	1500	31.42	3.26	2.80	4.96	Operation not recommended						
			1800	31.51	3.31	2.77	4.50							
	70	60	1500	30.98	3.56	2.56	6.05							
			1800	30.45	3.54	2.52	5.90							
	75	62	1500	30.76	3.71	2.43	6.60							
			1800	29.93	3.66	2.40	6.60							
	80	57	1500	35.08	4.06	2.88	6.93							
			1800	34.44	4.03	2.84	6.78							
	80	62	1500	32.81	3.96	2.59	7.04							
			1800	31.92	3.90	2.56	7.04							
	80	67	1500	30.53	3.87	2.31	7.15							
			1800	29.40	3.77	2.28	7.31							
	80	72	1500	28.26	3.77	2.02	7.25							
			1800	26.88	3.64	1.99	7.57							
25	60	55	1500	38.47	3.53	3.17	5.19	Operation not recommended						
			1800	37.85	3.54	3.11	4.81							
	70	60	1500	36.65	3.75	2.87	6.51							
			1800	35.84	3.84	2.75	6.20							
	75	62	1500	35.74	3.85	2.72	7.17							
			1800	34.83	3.99	2.57	6.90							
	80	57	1500	41.41	4.26	3.23	7.47							
			1800	40.48	4.37	3.09	7.13							
	80	62	1500	38.12	4.11	2.90	7.65							
			1800	37.15	4.26	2.74	7.36							
	80	67	1500	34.82	3.96	2.57	7.83							
			1800	33.82	4.14	2.39	7.60							
	80	72	1500	31.53	3.81	2.24	8.01							
			1800	30.49	4.02	2.03	7.84							
35	60	55	1500	45.92	3.69	3.65	5.41	Operation not recommended						
			1800	45.79	3.67	3.65	4.96							
	70	60	1500	43.97	4.02	3.23	6.77							
			1800	43.62	4.05	3.19	6.42							
	75	62	1500	42.99	4.18	3.02	7.46							
			1800	42.54	4.24	2.95	7.15							
	80	57	1500	49.70	4.57	3.63	7.77							
			1800	49.29	4.62	3.58	7.37							
	80	62	1500	45.86	4.46	3.22	7.96							
			1800	45.38	4.53	3.15	7.63							
	80	67	1500	42.02	4.34	2.81	8.14							
			1800	41.46	4.43	2.72	7.88							
	80	72	1500	38.18	4.23	2.40	8.33							
			1800	37.54	4.34	2.30	8.13							
45	60	55	1500	53.77	3.72	4.23	5.62	Operation not recommended						
			1800	55.32	3.71	4.37	4.96							
	70	60	1500	53.79	4.23	3.77	7.24							
			1800	53.82	4.18	3.83	6.55							
	75	62	1500	53.80	4.49	3.54	8.05							
			1800	53.07	4.41	3.56	7.35							
	80	57	1500	60.96	4.83	4.24	8.31							
			1800	60.89	4.77	4.30	7.53							
	80	62	1500	57.38	4.79	3.78	8.59							
			1800	56.60	4.71	3.80	7.83							
	80	67	1500	53.81	4.75	3.31	8.86							
			1800	52.31	4.65	3.29	8.14							
	80	72	1500	50.23	4.70	2.84	9.13							
			1800	48.03	4.59	2.78	8.45							
55	60	55	1500	62.74	3.99	4.60	5.95							
			1800	63.49	3.89	4.78	5.17							
	70	60	1500	62.35	4.54	4.08	7.63	1500	64.83	28.40	0.66	3.32	19.53	4.58
			1800	62.63	4.38	4.25	6.81	1800	64.50	27.59	0.69	3.58	17.96	4.92
	75	62	1500	62.15	4.81	3.82	8.47	1500	64.65	46.12	0.71	3.25	19.90	3.59
			1800	62.20	4.62	3.98	7.63	1800	65.28	49.26	0.75	3.45	18.91	4.43
	80	57	1500	70.64	5.18	4.59	8.76	1500	64.47	63.84	0.77	3.18	20.27	2.61
			1800	70.93	4.99	4.78	7.83	1800	66.05	70.94	0.82	3.32	19.87	3.95
	80	62	1500	66.30	5.13	4.08	9.03	1500	65.56	54.37	0.83	3.20	20.47	3.43
			1800	66.35	4.93	4.25	8.14	1800	66.35	59.23	0.89	3.35	19.81	4.37
	80	67	1500	61.96	5.09	3.56	9.31	1500	66.65	44.91	0.68	3.22	20.68	4.26
			1800	61.77	4.86	3.72	8.46	1800	66.66	47.52	0.71	3.37	19.76	4.79
	80	72	1500	57.62	5.04	3.05	9.58	1500	67.74	35.45	0.52	3.24	20.88	5.09
			1800	57.20	4.80	3.18	8.77	1800	66.96	35.81	0.53	3.40	19.70	5.21

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Air Source Mode Performance Data cont.

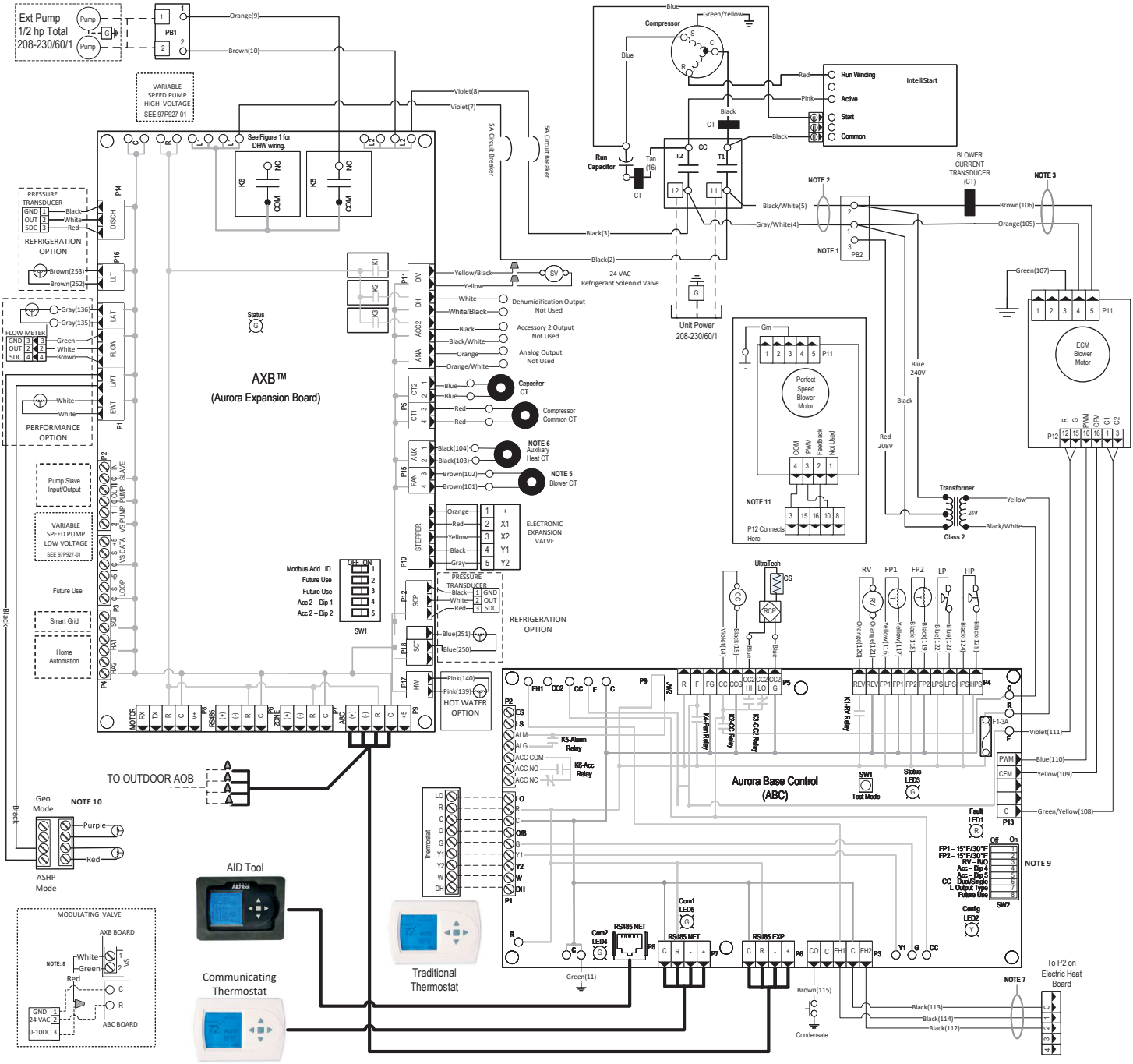
NG*064 - High Speed (1800 CFM Heating and Cooling) - 2 of 2

OD DB Temp °F	ID Temp °F		HEATING					COOLING						
	DB	WB	Airflow CFM	HC MBtu/h	Power kW	COP	HWC Mbtu/h	Airflow CFM	TC Mbtu/h	SC Mbtu/h	S/T Ratio	Power kW	EER	HWC Mbtu/h
65	60	55	1500	71.70	4.26	4.96	6.28							
			1800	71.67	4.07	5.19	5.38							
	70	60	1500	70.91	4.84	4.39	8.02	1500	63.22	27.72	0.66	3.66	17.75	5.82
			1800	71.45	4.57	4.66	7.07	1800	64.24	26.99	0.69	3.89	16.74	6.11
	75	62	1500	70.51	5.13	4.11	8.89	1500	62.20	45.01	0.72	3.59	17.90	4.99
			1800	71.34	4.83	4.40	7.92	1800	63.04	48.23	0.77	3.78	17.13	5.64
	80	57	1500	80.31	5.53	4.94	9.20	1500	61.18	62.30	0.79	3.52	18.05	4.17
			1800	80.96	5.22	5.25	8.13	1800	61.83	69.48	0.84	3.67	17.52	5.18
	80	62	1500	75.21	5.48	4.38	9.48	1500	62.98	53.35	0.85	3.55	18.36	4.85
			1800	76.10	5.15	4.69	8.45	1800	63.55	58.17	0.92	3.71	17.74	5.58
	80	67	1500	70.11	5.43	3.82	9.76	1500	64.77	44.40	0.69	3.58	18.67	5.53
			1800	71.23	5.08	4.14	8.77	1800	65.28	46.86	0.72	3.75	17.95	5.97
	80	72	1500	65.02	5.38	3.26	10.03	1500	66.56	35.45	0.53	3.62	18.99	6.21
			1800	66.37	5.01	3.58	9.09	1800	67.00	35.55	0.53	3.79	18.17	6.37
75	60	55	Operation not recommended											
	70	60						1500	61.61	27.03	0.67	4.01	15.96	7.07
								1800	63.97	26.38	0.69	4.21	15.52	7.30
	75	62						1500	59.76	43.89	0.74	3.93	15.89	6.40
								1800	60.79	47.20	0.78	4.11	15.35	6.86
	80	57						1500	57.90	60.76	0.80	3.85	15.83	5.73
								1800	57.61	68.01	0.86	4.02	15.18	6.41
	80	62						1500	60.39	52.33	0.87	3.90	16.25	6.26
								1800	60.76	57.11	0.94	4.07	15.67	6.78
	80	67						1500	62.88	43.89	0.71	3.94	16.67	6.80
								1800	63.90	46.20	0.74	4.12	16.15	7.15
	80	72						1500	65.37	35.46	0.54	3.99	17.10	7.33
								1800	67.04	35.30	0.53	4.17	16.63	7.52
85	60	55	Operation not recommended											
	70	60						1500	60.00	26.34	0.68	4.36	14.18	8.32
								1800	63.70	25.78	0.70	4.53	14.30	8.49
	75	62						1500	57.31	42.78	0.75	4.27	13.89	7.80
								1800	58.55	46.17	0.79	4.45	13.57	8.07
	80	57						1500	54.61	59.22	0.82	4.18	13.61	7.29
								1800	53.40	66.55	0.88	4.36	12.84	7.65
	80	62						1500	57.80	51.30	0.89	4.24	14.14	7.67
								1800	57.96	56.04	0.97	4.43	13.59	7.99
	80	67						1500	60.99	43.38	0.72	4.30	14.67	8.06
								1800	62.52	45.54	0.75	4.49	14.35	8.33
	80	72						1500	64.18	35.46	0.55	4.36	15.20	8.45
								1800	67.08	35.04	0.52	4.56	15.10	8.67
95	60	55	Operation not recommended											
	70	60						1500	58.39	25.65	0.68	4.71	12.39	9.57
								1800	63.44	25.18	0.70	4.84	13.08	9.68
	75	62						1500	54.86	41.67	0.76	4.61	11.89	9.21
								1800	56.31	45.13	0.80	4.78	11.79	9.28
	80	57						1500	51.32	57.69	0.84	4.52	11.39	8.85
								1800	49.18	65.08	0.90	4.71	10.50	8.88
	80	62						1500	55.21	50.28	0.91	4.59	12.03	9.09
								1800	55.16	54.98	0.97	4.79	11.52	9.19
	80	67						1500	59.10	42.87	0.74	4.66	12.67	9.33
								1800	61.14	44.88	0.76	4.87	12.54	9.50
	80	72						1500	62.99	35.46	0.56	4.73	13.31	9.57
								1800	67.12	34.79	0.52	4.95	13.56	9.82
105	60	55	Operation not recommended											
	70	60						1500	54.80	25.95	0.72	5.24	10.78	11.27
								1800	58.64	23.83	0.74	5.33	11.27	11.33
	75	62						1500	51.76	40.18	0.78	5.18	10.34	11.03
								1800	53.13	43.75	0.83	5.35	10.26	11.10
	80	57						1500	48.73	54.41	0.84	5.11	9.90	10.78
								1800	47.61	63.67	0.91	5.36	9.26	10.88
	80	62						1500	52.47	47.33	0.90	5.18	10.48	11.00
								1800	52.62	52.68	0.98	5.35	10.12	11.09
	80	67						1500	56.21	40.24	0.73	5.25	11.07	11.22
								1800	57.63	41.69	0.75	5.34	10.99	11.30
	80	72						1500	59.96	43.15	0.77	5.44	10.92	11.38
								1800	62.64	33.38	0.55	5.42	11.68	11.56
115	60	55	Operation not recommended											
	70	60						1500	51.21	26.25	0.75	5.77	9.16	12.98
								1800	53.85	25.39	0.77	6.01	9.31	13.13
	75	62						1500	48.67	38.70	0.80	5.74	8.79	12.84
								1800	49.95	42.37	0.85	5.92	8.73	12.92
	80	57						1500	46.13	51.14	0.84	5.71	8.41	12.71
								1800	46.05	59.35	0.93	5.82	8.16	12.71
	80	62						1500	49.73	44.38	0.89	5.77	8.93	12.91
								1800	50.08	50.38	0.99	5.92	8.73	12.99
	80	67						1500	53.33	37.61	0.72	5.83	9.46	13.12
								1800	54.12	41.41	0.78	6.01	9.30	13.26
	80	72						1500	56.92	30.85	0.54	5.89	9.99	13.32
								1800	58.16	32.44	0.56	6.11	9.87	13.54
125	60	55	Operation not recommended											
	70	60						1500	47.62	26.55	0.78	6.30	7.55	14.68
								1800	49.06	25.49	0.81	6.60	7.43	14.86
	75	62						1500	45.58	37.21	0.82	6.30	7.23	14.66
								1800	46.77	40.99	0.88	6.49	7.21	14.74
	80	57						1500	43.53	47.87	0.85	6.31	6.92	14.64
								1800	44.48	56.49	0.94	6.38	6.99	14.63
	80	62						1500	46.98	41.43	0.88	6.36	7.39	14.83
								1800	47.55	48.09	0.99	6.48	7.34	14.89
	80	67						1500	50.44	34.98	0.71	6.41	7.86	15.01
								1800	50.61	39.68	0.80	6.58	7.68	15.14
	80	72						1500	53.89	28.54	0.53	6.47	8.33	15.20
								1800	53.68	31.27	0.58	6.69	8.03	15.40

7/13/2022

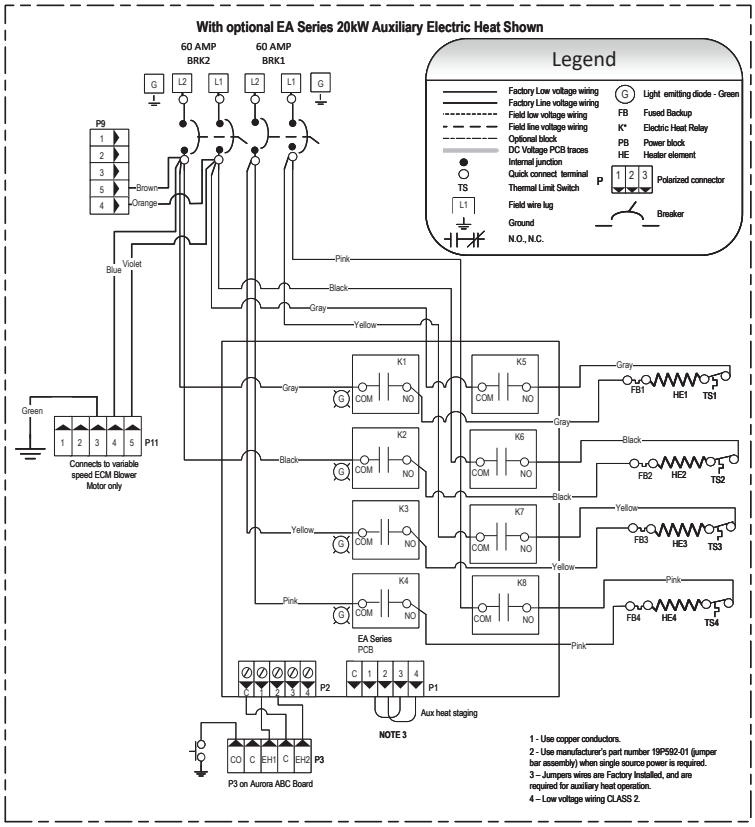
Wiring Schematics

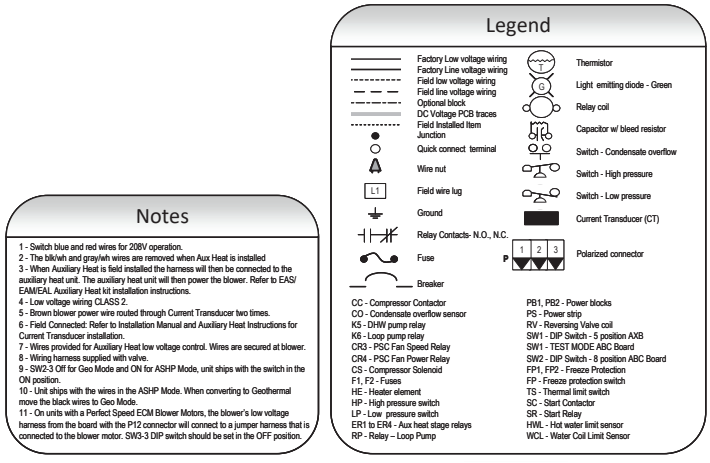
Aurora Advanced with ECM and IntelliStart



Wiring Schematics cont.

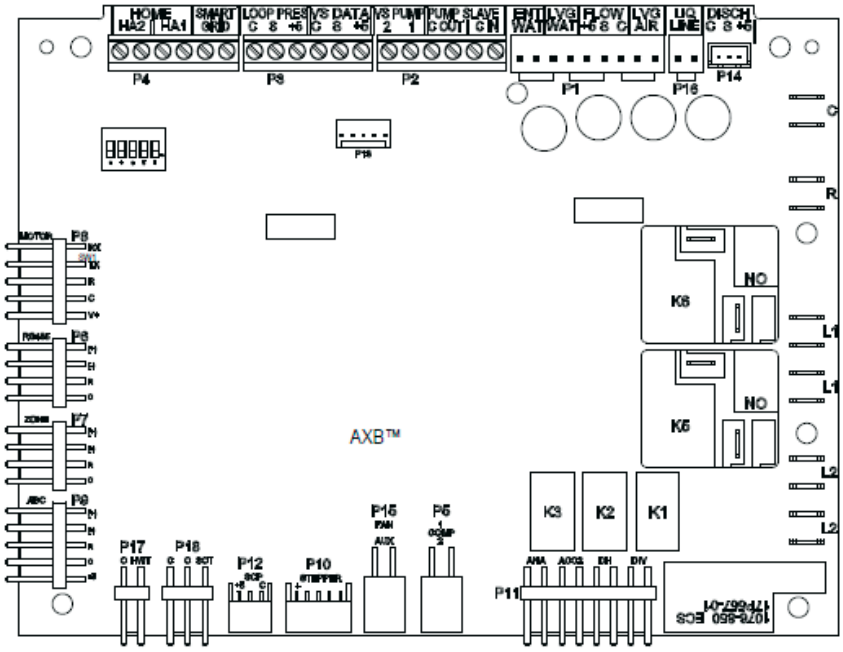
Aurora Advanced with ECM and IntelliStart cont.





Wiring Schematics cont.

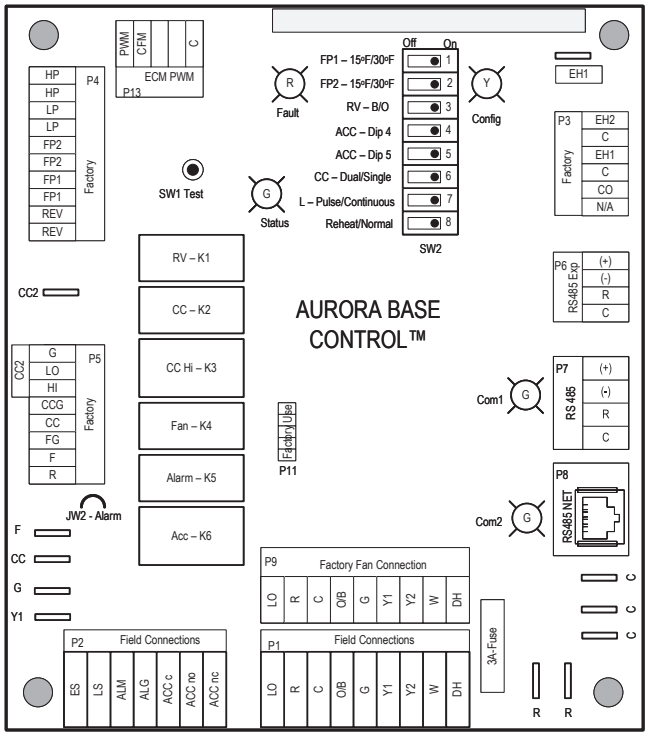
Aurora Advanced with ECM and IntelliStart cont.

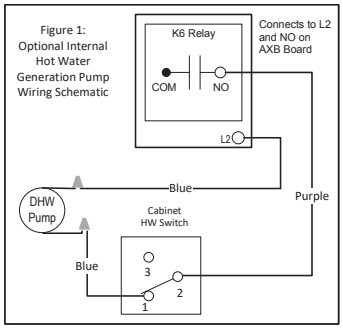


Aurora LED Flash Codes			
Slow Flash	1 second on and 1 second off		
Fast Flash	100 milliseconds on and 100 milliseconds off		
Flash Code	100 milliseconds on and 400 milliseconds off with a 2 second pause before repeating		
Fault LED (LED 1, Red)		**Random Start Delay (Alternating Colors)**	
Normal Mode	OFF	Status LED (LED1, Green)	Fast Flash
Input Fault Lockout	Flash Code 1	Configuration LED (LED 2, Yellow)	Fast Flash
High Pressure Lockout	Flash Code 2	Fault LED (LED 3, Red)	Fast Flash
Low Pressure Lockout	Flash Code 3	**Configuration LED (LED 2, Yellow)**	
Freeze Detection - FP2	Flash Code 4	No Software Overide	OFF
Freeze Detection - FP1	Flash Code 5	DIP Switch Overide	Slow Flash
Loss of Charge	Flash Code 6	**Status LED (LED 3, Green)**	
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
Compressor Monitoring	Flash Code 10	Lockout Active	Fast Flash
Fault- FP1 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 Water	Flash Code 15	ESD	Flash Code 6
Fault Variable Speed Pump	Flash Code 16	Future Use	Flash Code 7
Future Use	Flash Code 17	**Fault LED (LED 1, Red) Cont.**	
Non-Critical Communication Error	Flash Code 18	Alarm - Home Automation 1	Flash Code 23
Fault - Critical Communication Error	Flash Code 19	Alarm - Home Automation 2	Flash Code 24
Alarm - Low Loop Pressure	Flash Code 21	Fault - EEV Error	Flash Code 25
Fault - Communication ECM Fan Motor Error	Flash Code 22	Outdoor Coil Temperature Sensor Failure	Flash Code 35
		Low Discharge Line Temperature	Flash Code 36
		High Discharge Line Temperature	Flash Code 42
		Outdoor Ambient Temperature Sensor Failure	Flash Code 49
		Discharge Temperature Sensor Failure	Flash Code 51
		Suction Pressure (EEV-1/EEV-2)	Flash Code 52
		Suction Temperature Sensor Failure (EEV-1/EEV-2)	Flash Code 72

Wiring Schematics cont.

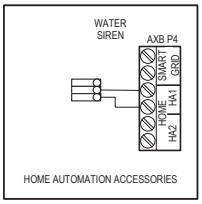
Aurora Advanced with ECM and IntelliStart cont.

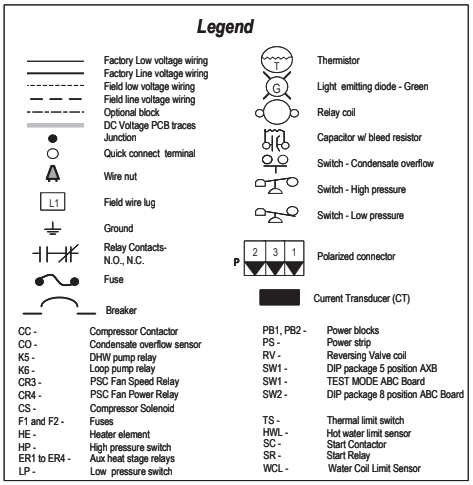




AXB Accessory 2 DIP Settings		
SW1-4	**SW1-5**	**DESCRIPTION**
ON	ON	Cycles with Blower
OFF	ON	Cycles with CC first stage compressor or compressor spd 1-12
ON	OFF	Cycles with CC2 second stage of compressor or comp spd 7-12
OFF	OFF	Cycles with DH from ABC board

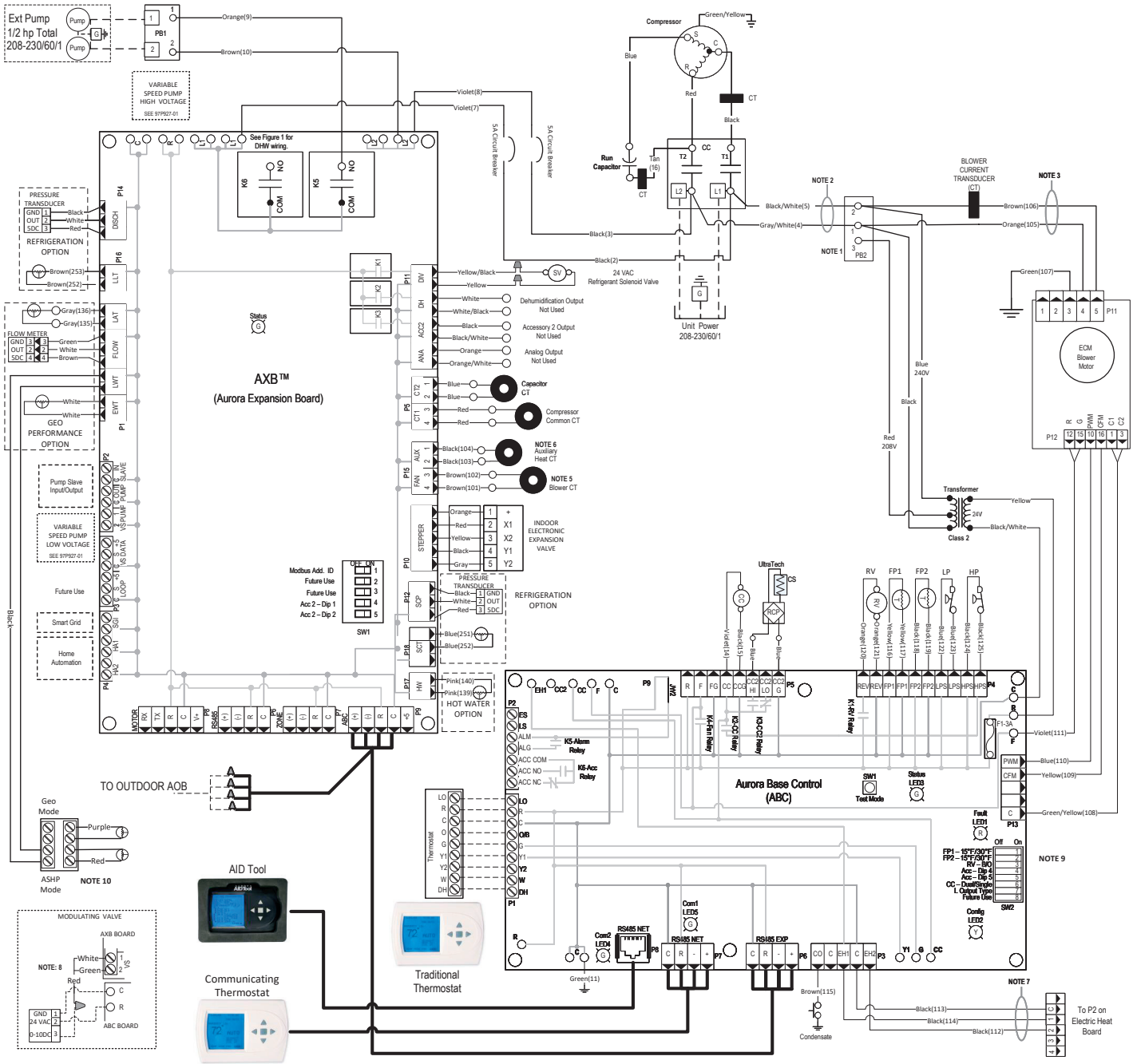
ABC SW2 Accessory Relay		
DESCRIPTION	**SW2-4**	**SW2-5**
Cycle with Blower	ON	ON
Cycle with Compressor	OFF	OFF
Water Valve Slow Opening	ON	OFF
Cycle with Comm. T-stat Hum Cmd	OFF	ON





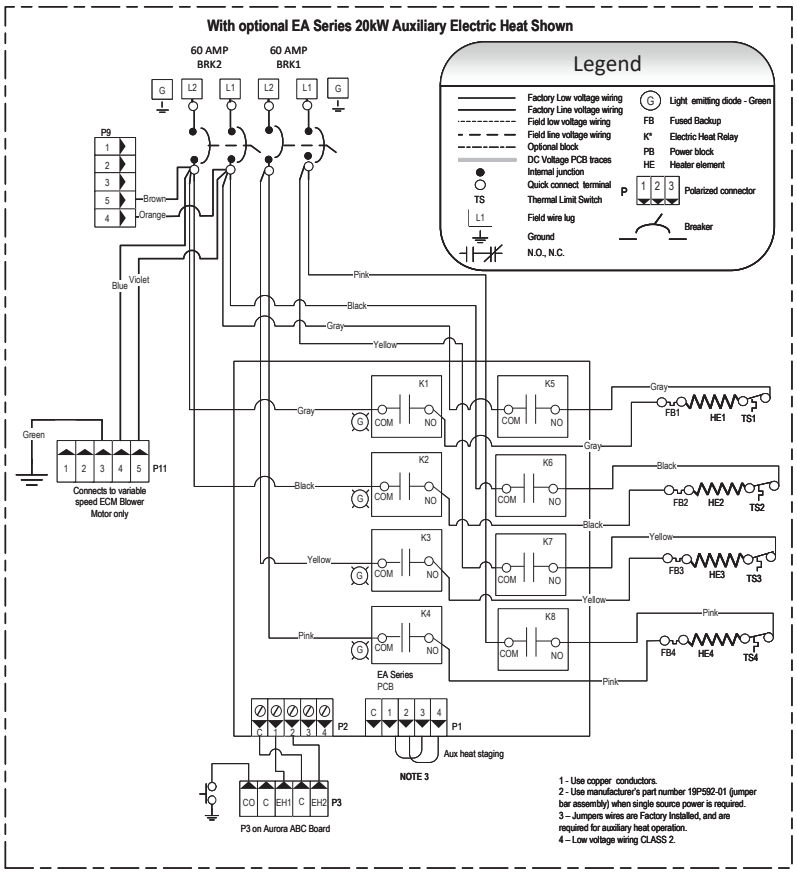
Wiring Schematics cont.

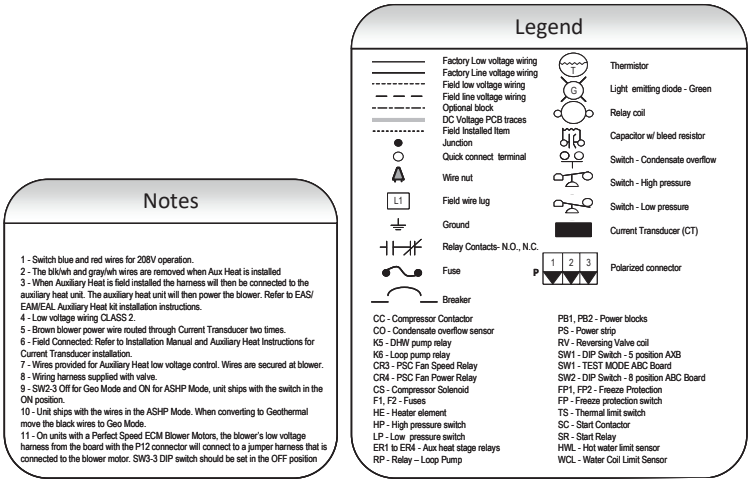
Aurora Advanced with ECM



Wiring Schematics cont.

Aurora Advanced with ECM cont.



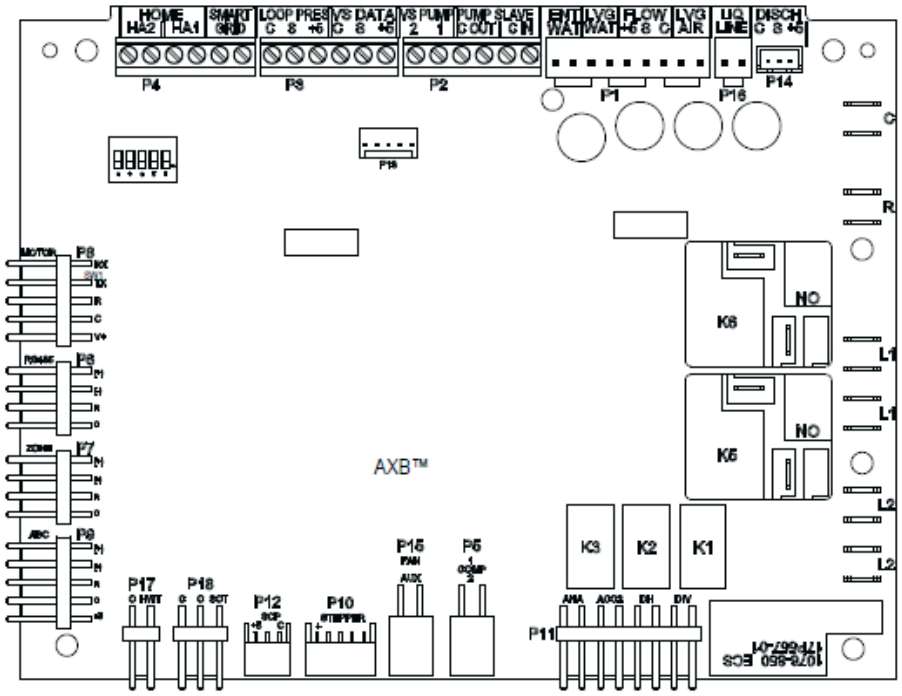


Notes

1 - Switch blue and red wires for 208V operation.
2 - The blk/wh and gray/wh wires are removed when Aux Heat is installed
3 - When Auxiliary Heat is field installed the harness will then be connected to the auxiliary heat unit. The auxiliary heat unit will then power the blower. Refer to EAS/EAM/EAL Auxiliary Heat kit installation instructions.
4 - Low voltage wiring CLASS 2.
5 - Brown blower power wire routed through Current Transducer two times.
6 - Field Connected: Refer to Installation Manual and Auxiliary Heat Instructions for Current Transducer installation.
7 - Wires provided for Auxiliary Heat low voltage control. Wires are secured at blower.
8 - Wiring harness supplied with valve.
9 - SW2-3 Off for Geo Mode and ON for ASHP Mode, unit ships with the switch in the ON position.
10 - Unit ships with the wires in the ASHP Mode. When converting to Geothermal move the black wires to Geo Mode.
11 - On units with a Perfect Speed ECM Blower Motors, the blower's low voltage harness from the board with the P12 connector will connect to a jumper harness that is connected to the blower motor. SW3-3 DIP switch should be set in the OFF position

Wiring Schematics cont.

Aurora Advanced with ECM cont.



Aurora LED Flash Codes			
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Flash Code	100 milliseconds on and 400 milliseconds off with a 2 second pause before repeating		
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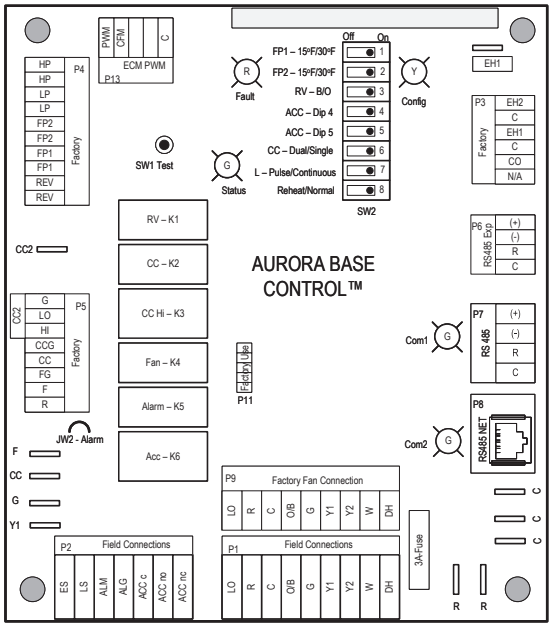
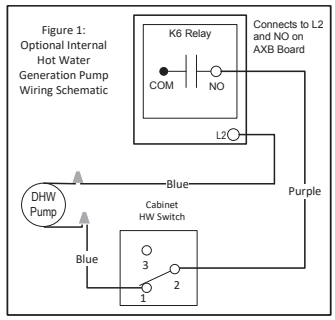
High Pressure Lockout	Flash Code 2	Fault LED (LED 3, Red)	Fast Flash
Low Pressure Lockout	Flash Code 3	**Configuration LED (LED 2, Yellow)**	
Freeze Detection - FP2	Flash Code 4	No Software Overide	OFF
Freeze Detection - FP1	Flash Code 5	DIP Switch Overide	Slow Flash
Reserved	Flash Code 6	**Status LED (LED 3, Green)**	
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
Compressor Monitoring	Flash Code 10	Lockout Active	Fast Flash
Fault- FP1 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 Water	Flash Code 15	ESD	Flash Code 6
Fault Variable Speed Pump	Flash Code 16	Future Use	Flash Code 7
Future Use	Flash Code 17	**Fault LED (LED 1, Red) Cont.**	
Non-Critical Communication Error	Flash Code 18	Alarm - Home Automation 1	Flash Code 23
Fault - Critical Communication Error	Flash Code 19	Alarm - Home Automation 2	Flash Code 24
Alarm - Low Loop Pressure	Flash Code 21	Fault - EEV Error	Flash Code 25
Fault - Communication ECM Fan Motor Error	Flash Code 22		

Wiring Schematics cont.

Aurora Advanced with ECM cont.





AXB Accessory 2 DIP Settings		
SW1-4	**SW1-5**	**DESCRIPTION**
ON	ON	Cycles with Blower
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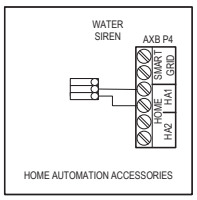
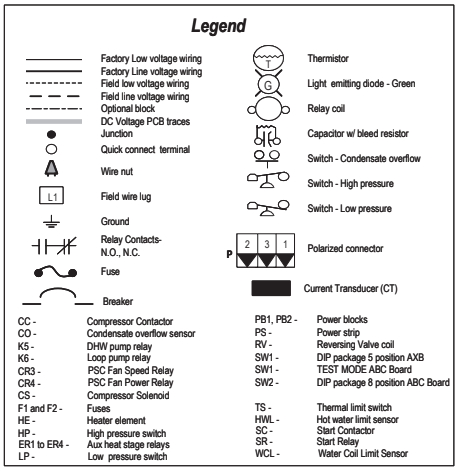
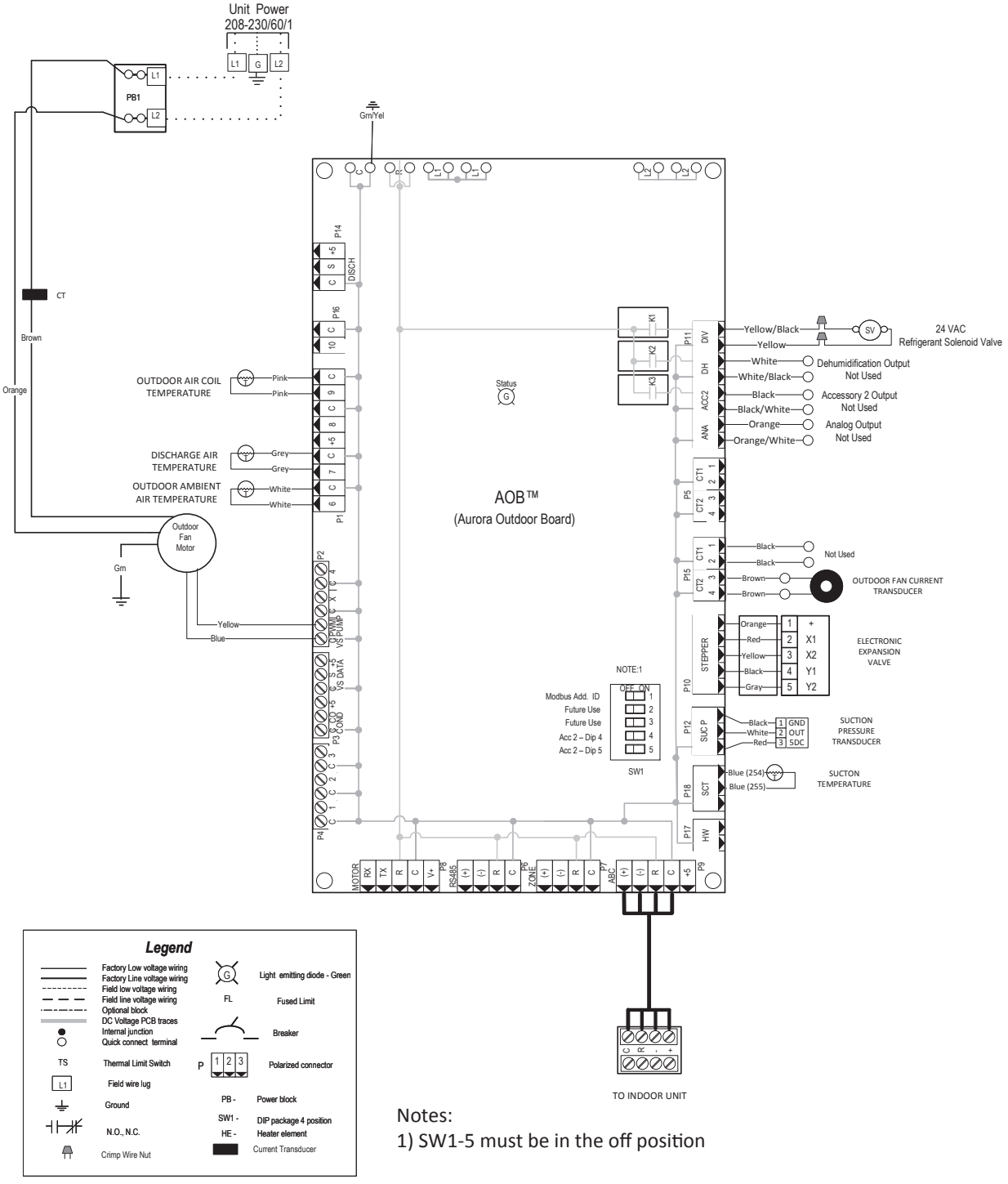
OFF	OFF	Cycles with DH from ABC board

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





Wiring Schematics



Notes:
1) SW1-5 must be in the off position

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Engineering Guide Specifications

General

Furnish and install WaterFurnace Water/Air 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 (for GLHP/WSHP) and AHRI 210/240 (for ASHP) 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] for Geo Mode, and with entering air temperature between -6°F and 125°F [-21°C and 51.7°C] for Air Source Mode..

Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with corrosion-resistant powder coating. 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 units shall have a return air filter rack/duct collar; the horizontal units shall have a filter bracket each field convertible from 2 in. [5.1 cm] to 1 in. [2.5 cm]. The upflow vertical (038-064) 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 or bottom (038-064), 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 indoor 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 (038-064), electronic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, optional hot water generator coil (038-064) solenoid valves, and service ports.

Compressors shall be high-efficiency dual capacity scroll type designed for heat pump duty and mounted on vibration isolators. Compressor motors shall be single-phase PSC with overload protection. The indoor finned tube air-to-refrigerant heat exchanger will be aluminum tube/fin or copper tube/aluminum fin and shall be sized for low-face velocity and constructed of lanced aluminum fins bonded to performance enhanced tubes in a staggered pattern not less than three rows deep for superior performance. The aluminum tube and fin air-to-refrigerant heat exchanger has as optional to be double electro-coated with AlumiSeal. Models 038-064 shall include discharge mufflers to help quiet compressor discharge gas pulsations. Refrigerant to air heat exchangers shall utilize enhanced tube construction rated to withstand 650psig (4482 kPa) refrigerant working pressure.

Engineering Guide Specifications cont.

The coaxial water-to-refrigerant heat exchanger shall be designed for low water pressure drop and constructed of a convoluted copper (cupronickel option) inner tube and a steel outer tube. Refrigerant to water heat exchangers shall be of copper 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. The 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 shall be coated with ThermaShield. Refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures.

Outdoor Unit (Air Source Only)

The Outdoor Unit shall consist of a Copper Tube and Aluminum Fin Air Coil, a variable speed ECM Outdoor Fan Motor Assembly, an AOB (Aurora Outdoor Board), EEV, Solenoid Valve, Suction Pressure Transducer, Suction Temperature, Outdoor Coil Temperature, Outdoor Ambient Temperature, Discharge Air Temperature Sensors. The cabinet and corner posts shall be fabricated from heavy-gauge galvanized steel and finished with corrosion-resistant powder coating. Coil guards shall be installed to protect the Outdoor Air Coil from damage. The Outdoor Fan Motor Assembly shall consist of a Fan Guard for mounting the motor and Venturi Ring for proper airflow distribution across the coil. All components shall meet the UL-1995 Safety Standard.

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 Variable Speed 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 and have thermostatic overload protection. Variable Speed ECM motors shall be long-life ball bearing type.

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, terminal block for thermostat wiring, 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 24 volt and provide heating or cooling as required by the remote thermostat/sensor. An Aurora, a microprocessor-based controller, interfaces with a multi-stage electronic 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, and accessory output. The Lockout signal output shall have a pulsed option so that DDC systems can read specific lockout conditions from the control.

The Aurora Advanced Control shall also feature an Energy Monitoring Package that will provide real time total power consumption, compressor monitoring, 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/CO_2 or dirty air filter sensors. Optional Refrigerant and Performance Monitoring (N/A air source mode) kits to provide real time data including refrigerant superheat and subcooling, as well as heat of extraction/rejection capacity data. The capability for communicating to advanced IntelliZone2 zoning packages with up to 6 zones (Variable Speed), 4 zones (Dual Capacity), or 2 zones (Single Speed) 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, fault description and history, manual operation capability, sensor readings, timings, and other diagnostic tools.

Engineering Guide Specifications cont.

Optional IntelliStart® (compressor Soft Starter) shall be factory installed for use in applications that require low starting amps, reduced compressor start-up noise, off-grid, and improved start-up behavior. IntelliStart shall reduce normal starting current by up to 60%.

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 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. Unit sizes 038-064 shall include six 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.

Thermostat (field-installed)

A multi-stage auto-changeover electronic digital thermostat shall be provided. The thermostat shall offer three heating and two cooling stages with precise temperature control. An OFF-HEAT-AUTO-COOL-EMERG system switch, OFF-AUTO blower switch, and indicating LEDs shall be provided. The thermostat shall display in °F or °C. The thermostat shall be either a communicating type or a traditional 24 VAC type.

Communicating 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 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.

Communicating 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 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.

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 411–Rack 4 in. Pleated Filter Accessory

A 4 in. [102 mm] thick MERV 11 filter and filter rack shall be provided in lieu of the standard filter and rack.

Engineering Guide Specifications cont.

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.

Symphony/Aurora Weblink

Symphony is a Wi-Fi enabled smart comfort system for your geothermal heat pump that is unsurpassed in its ease of use, feature set and capability. Symphony marries the sophisticated Aurora controls of your WaterFurnace Geo-Ready System with a web enabled Aurora Weblink Router giving you access to your comfort heat pump from practically anywhere. Symphony is cloud-based and includes your whole system and isn't limited to just the thermostat as in other 'smart thermostat' systems. Symphony web-portal provides control over every aspect of your geothermal heat pump including:

- View your system's operation from anywhere. Great for vacation or second homes.
- Dashboard for quick review of operation, alerts and energy use (if installed).
- Smart Device capability
- Modify your zone temperature setpoints and programs remotely
- IntelliZone2 zoning system compatible to access up to 6 zone thermostats with variable speed, 4 zones with dual capacity, and 2 zones with single speed geothermal heat pumps.
- Observe and track WaterFurnace energy use for the last 13 months (if installed).
- Receive equipment alerts and service reminders (as well as your dealer) via email and texts
- Monitor earth loop and air temperature of your geothermal heat pump directly (if installed).
- Utilize a 'wireless' thermostat system with no visible thermostats using a smart device. By mounting a communicating thermostat in a closet with external mud-in sensor located in the living space, a smart device can be used as a wireless thermostat for the ultimate in flexibility (TPCC32U01, TPCM32U03A, TPCM32U04A, or MasterStat only)

External Sump Alarm Sensors for Aurora Controls

The sensor (field supplied) can be added to any Aurora Advanced Control System (including both ABC and AXB) to monitor a sump pump. The sensor can be connected to the Aurora Home Automation inputs (HA-1 or HA-2) of the AXB board. These will each display an E23 and E24 code respectively when the alarm is active and when Symphony/AWL is installed will also produce text/e-mail notifications.

- This sensor provides a relay closure that can be used to trip a fault when moisture is present. This can be used as a primary sump alarm or simply a wet basement or signal a blown washing machine hose.

Revision Guide

Pages:	Description:	Date:	By:
All	Document Creation	24 Feb 2023	JM
All	Geo-Ready™ updated to Geo-Ready®	18 July 2024	SW