

7 Series

700A11

Geothermal Heat Pump - 50Hz

009 - 015 kW (variable speed)

WaterFurnace
Smarter from the Ground Up™

Submittal Data

English Language/SI Units

SD2705AN 01/15

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

7 Series 700A11
009 - 015 kW 50Hz

WaterFurnace® Smarter from the Ground Up™

Model Nomenclature

1	2-3	4	5-7	8	9	10	11	12	13	14	15	16	17
N	VK	V	012	*	6	1	1	C	T	L	0	J	N

Model Type
N – 7 Series Water-to-Air

Compressor Type
VK – Variable Speed

Cabinet Configuration
V – Vertical
H - Horizontal

Unit Capacity (kW)
009, 012, 015

Vintage
* - Factory Use Only

Voltage
6 – 220-240/50/1

Hot Water Generation
0 – No Hot Water Generation
1 – Hot Water Generation with Factory Installed Pump

Blower Options
1 – Variable Speed ECM
2 – High Static Variable Speed ECM (009 Only)

Future Option
N - None

Control Option
J – Aurora™ Variable Speed Control
K – Aurora Variable Speed Control with Performance Monitoring

Filter Option
0 – 5.08cm MERV11 Filter
1 – AlpinePure 411 (Vertical Only)

Return Air Configuration
L – Left
R – Right

Discharge Air Configuration
T – Top (Vertical)
B – Bottom (Vertical)
R – Rear (Vertical)
S – Side (Horizontal)
E – End (Horizontal)

Water Coil Option
C – Copper
N – CuproNickel

Rev.: 17 July 2013D

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Contractor: _____ P.O.: _____

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Project Name: _____ Unit Tag: _____

EN 14511 Performance Ratings

7 Series - 50 Hz - EN 14511 Data
Variable Speed ECM & X13 ECM Motors

					Cooling Tower		Water-to Brine		Control Cabinet		Close Control		Water		Brine		Water Loop	
Model	Capacity Modulation	Flow Rate			Cooling EWT 30°C		Cooling EWT 10°C		Cooling EWT 15°C		Cooling EWT 30°C		Heating EWT 10°C		Heating EWT 0°C		Heating EWT 20°C	
		Water, l/s	Air, l/s		Capacity Output, kW	EER (W/W)	Capacity Output, kW	EER (W/W)	Capacity Output, kW	EER (W/W)	Capacity Output, kW	EER (W/W)	Capacity Output, kW	COP	Capacity Output, kW	COP	Capacity Output, kW	COP
			clg	htg														
009	**Full**	0.76	614	708	9.34	4.7	11.03	9.1	13.43	10.5	10.03	5.1	12.79	4.2	10.19	3.5	15.53	5.0
	Part	0.44			3.33	5.4	3.86	10.0	4.46	11.9	3.65	6.2	4.26	5.7	3.23	4.2	5.41	7.4
012	**Full**	0.88	708	850	10.74	4.4	14.45	9.5	16.17	9.4	11.32	4.4	16.30	4.0	13.08	3.3	19.98	4.6
	Part	0.47			4.57	6.2	5.49	10.6	5.29	13.5	4.64	5.7	5.63	5.9	4.26	4.2	7.23	7.8
015	**Full**	1.01	850	1038	14.75	4.2	17.81	8.5	20.03	8.4	13.84	4.0	19.49	4.0	15.45	3.3	23.84	4.6
	Part	0.60			5.54	5.2	6.77	9.4	6.52	11.0	5.31	4.5	6.42	4.9	5.03	4.0	8.03	5.9

9/5/2014

Cooling capacities based upon 27°C DB, 19°C WB entering air temperature for cooling tower and water to brine, 35°C DB and 24°C WB for control cabinet, and 24°C DB and 17°C WB for close control.
Heating capacities based upon 20°C DB, 15°C WB entering air temperature

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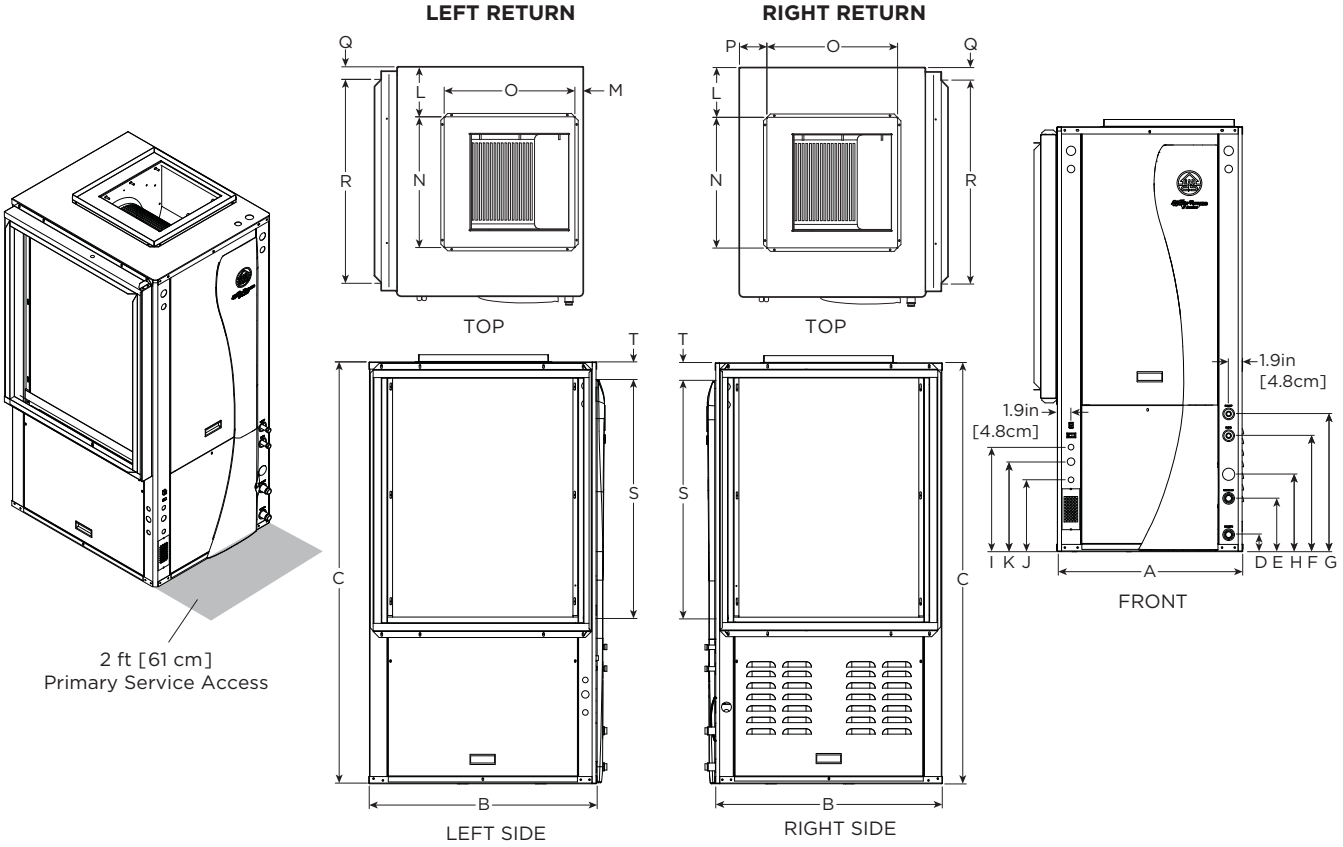
Project Name: _____ Unit Tag: _____

7 Series 700A11
009 - 015 kW 50Hz

WaterFurnace® Smarter from the Ground Up™

Vertical Dimensional Data

Top Air Discharge



Vertical Top Flow Model		Overall Cabinet			Water Connections							Electrical Connections			Discharge Connection duct flange installed (± 2.54mm)					Return Connection using std deluxe filter rack (± 2.54mm)			
		A Width	B Depth	C Height	D Loop In	E Loop Out	F HWG In	G HWG Out	H Cond-ensate	Loop Water FPT	HWG Sweat (I.D.)	I 12.7mm cond Low Voltage	J 12.7mm cond Ext Pump	K 19.05mm cond Power Supply	L	M	N Supply Width	O Supply Depth	P	Q	R Return Depth	S Return Height	T
009	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	25.4mm Swivel	12.7mm Female	36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	76.2	4.3
012	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9			36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	76.2	4.3
015	cm.	65.0	80.3	148.3	5.8	18.5	40.4	48.0	26.9			36.3	24.9	31.2	17.5	2.8	45.7	45.7	9.7	4.3	71.4	86.4	4.3

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/22/13
Unit shipped with deluxe 5.08cm. (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 2.54cm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

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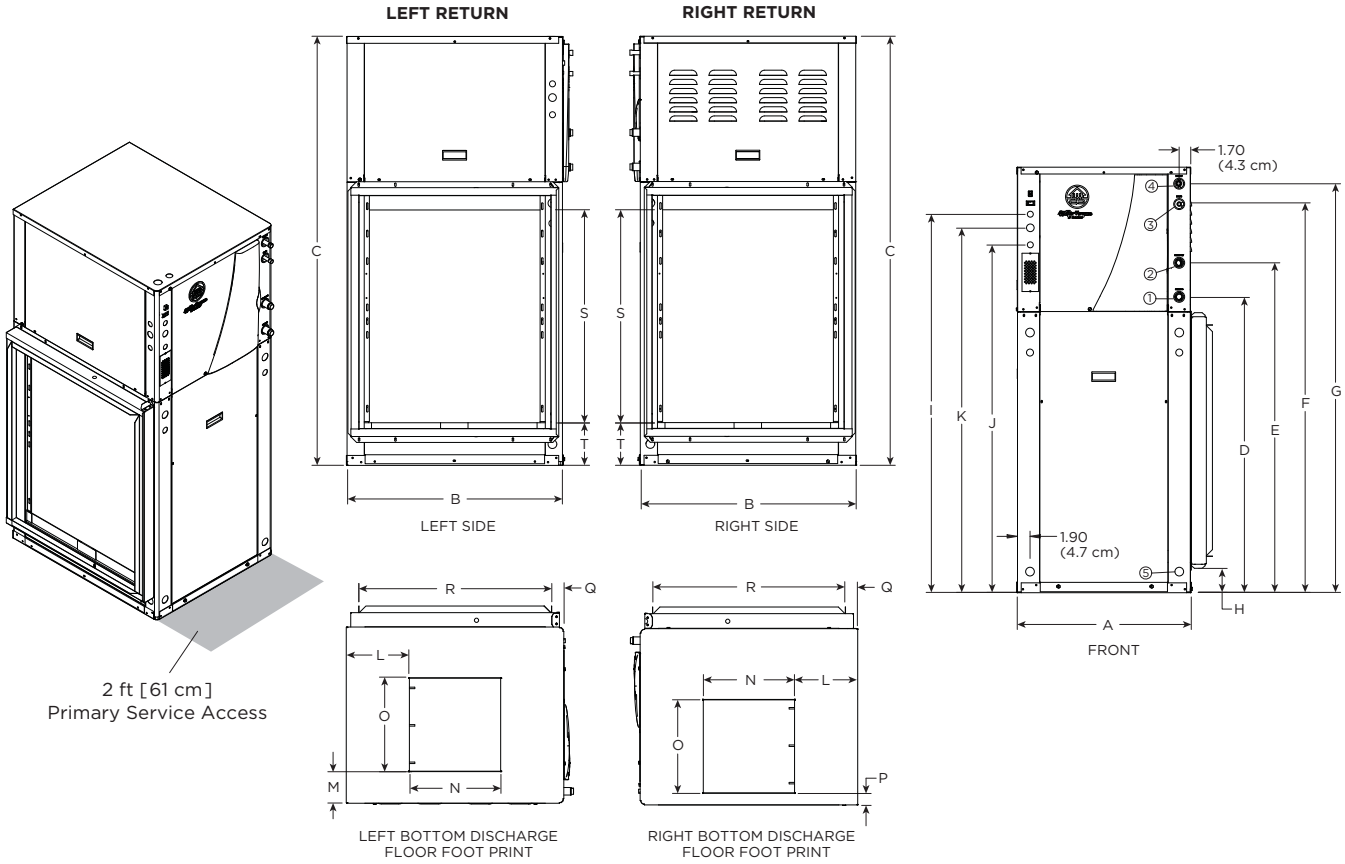
Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Vertical Dimensional Data cont.

Bottom Air Discharge



Bottomflow Models		Overall Cabinet			Water Connections							Electrical Knockouts			Discharge Connection duct flange installed (± 2.54mm)					Return Connection using std deluxe filter rack (± 2.54mm)			
					1	2	3	4	5			I 12.7mm cond	J 12.7mm cond	K 19.05mm cond									
		A Width	B Depth	C Height	D In	E Out	F HWG In	G HWG Out	H Condensate	Loop Water FPT	HWG Sweat (I.D.)	Low Voltage	Ext Pump	Power Supply	L	M	N Supply Width	O Supply Depth	P	Q	R Return Depth	S Return Height	T
009-015	cm.	64.8	80.0	158.8	110.2	122.9	144.8	152.4	7.9	25.4mm Swivel	12.7mm Female	129.8	141.2	136.1	23.1	12.2	34.0	34.5	4.3	4.6	71.4	86.4	14.2

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7mm from side of cabinet. Allow clearance for venting.

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Engineer: _____

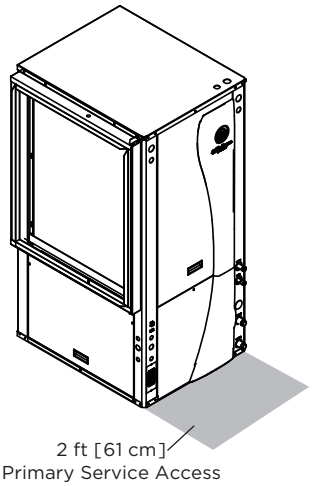
Project Name: _____ Unit Tag: _____

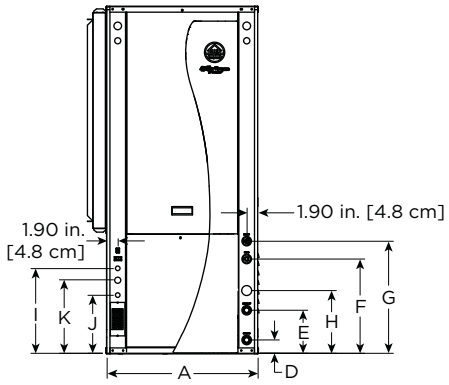
7 Series 700A11
009 - 015 kW 50Hz

WaterFurnace® Smarter from the Ground Up™

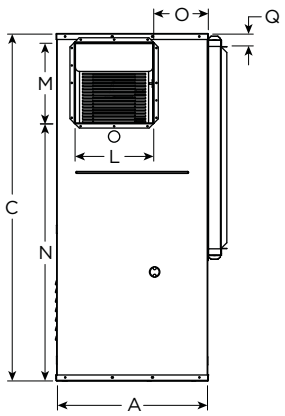
Vertical Dimensional Data cont.

Rear Air Discharge

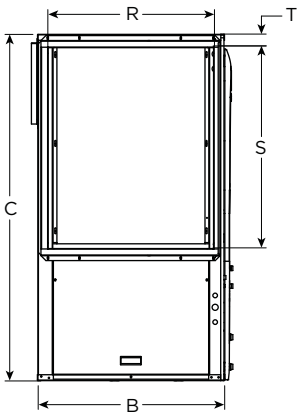




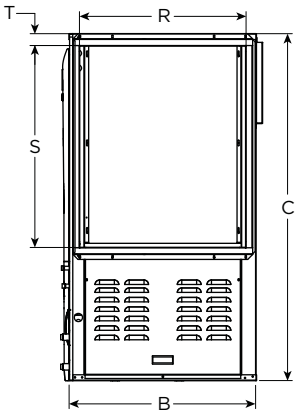
FRONT



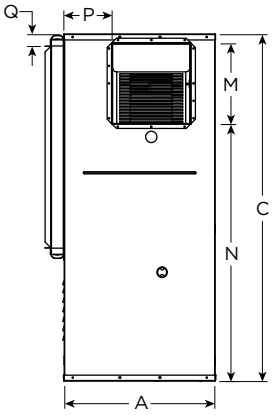
REAR VIEW
LEFT RETURN



SIDE VIEW
LEFT RETURN



SIDE VIEW
RIGHT RETURN



REAR VIEW
RIGHT RETURN

Vertical Rear Discharge Model		Overall Cabinet			Water Connections							Electrical Connections			Discharge Connection duct flange installed (± 2.54mm)					Return Connection using std deluxe filter rack (± 2.54mm)			
		A Width	B Depth	C Height	D Loop In	E Loop Out	F HWG In	G HWG Out	H Cond-ensate	Loop Water FPT	HWG Sweat (I.D.)	I 12.7mm cond Low Voltage	J 12.7mm cond Ext Pump	K 19.05mm cond Power Supply	L Supply Width	M Supply Depth	N	O	P	Q	R Return Depth	S Return Height	T
009	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9	25.4mm Swivel	12.7mm Female	36.3	24.9	31.2	33.8	34.5	100.1	23.1	20.6	4.3	71.4	76.2	4.3
012	cm.	65.0	80.3	138.2	5.8	18.5	40.4	48.0	26.9			36.3	24.9	31.2	33.8	34.5	100.1	23.1	20.6	4.3	71.4	76.2	4.3
015	cm.	65.0	80.3	148.3	5.8	18.5	40.4	48.0	26.9			36.3	24.9	31.2	33.8	34.5	110.2	23.1	20.6	4.3	71.4	86.4	4.3

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 25.4mm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

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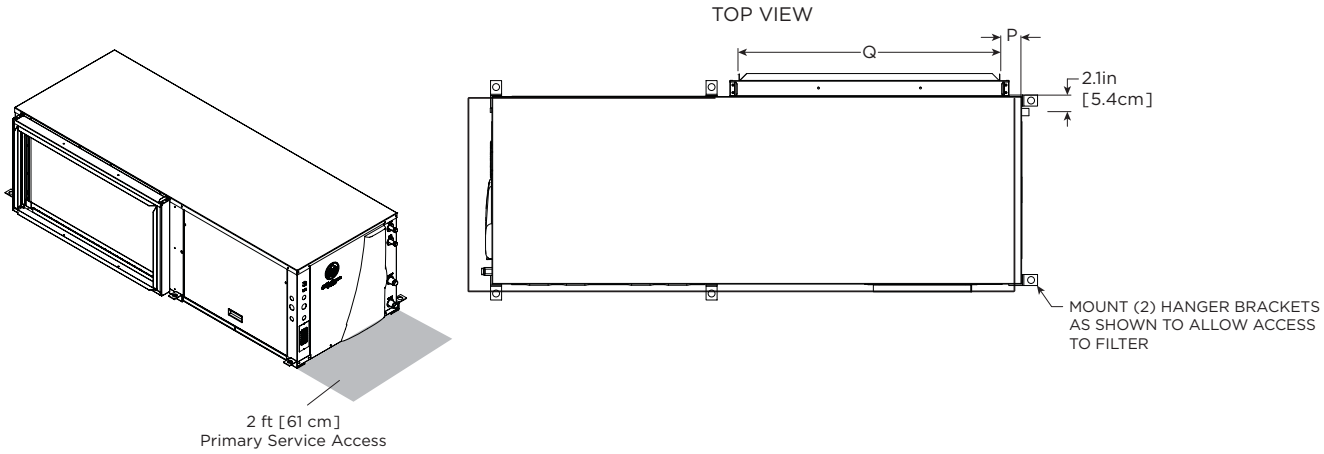
Engineer: _____

Project Name: _____ Unit Tag: _____

7 Series 700A11
009 - 015 kW 50Hz

WaterFurnace® Smarter from the Ground Up™

Horizontal Dimensional Data



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

Horizontal Models		Overall Cabinet			Water Connections							Electrical Connections			Discharge Connection duct flange installed (± 2.54mm)				Return Connection using std deluxe filter rack (± 2.54mm)			
												I 12.7mm cond	J 12.7mm cond	K 19.05mm cond								
		A Width	B Depth	C Height	D In	E Out	F HWG In	G HWG Out	H Cond-ensate	Loop Water FPT	HWG Sweat (I.D.)	Low Voltage	Ext Pump	Power Supply	L	M Supply Height	N Supply Depth	O	P	Q Return Depth	R Return Height	S
009	cm.	65.0	195.6	54.1	5.8	18.5	40.4	48.0	2.0	25.4mm Swivel	12.7mm Female	36.3	24.9	31.2	See Chart	34.5	33.5	See Chart	7.1	102.6	48.0	3.3
012	cm.	65.0	195.6	54.1	5.8	18.5	40.4	48.0	2.0			36.3	24.9	31.2		34.5	33.5		7.1	102.6	48.0	3.3
015	cm.	65.0	208.3	54.1	5.8	18.5	40.4	48.0	2.0			36.3	24.9	31.2		34.5	33.5		7.1	115.3	48.0	3.3

Condensate is 19.05mm PVC female glue socket and is switchable from side to front 5/29/13
Unit shipped with deluxe 5.08cm (field adjustable to 2.54cm) duct collar/filter rack extending from unit 8.255cm and is suitable for duct connection.
Discharge flange is field installed and extends 25.4mm from cabinet
Decorative molding and/or water connections extend 30.5mm beyond front of cabinet.
Louvered vents in the compressor section right side access panel extend 12.7 mm from side of cabinet. Allow clearance for venting.

Units Not Shown Above		L	O
Right Return End Discharge	cm	7.1	11.8
Right Return Side Discharge	cm	12.4	17.5
Left Return End Discharge	cm	12.4	19.4
Left Return Side Discharge	cm	7.1	17.5

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Physical Data

Model		Variable Speed		
		009	**012**	**015**
Compressor (1 each)		Variable Speed Scroll		
Factory Charge R-410A, kg Vertical		2.69	3.40	3.96
Factory Charge R-410A, kg Horizontal		2.69	3.85	4.19
ECM Blower Motor & Blower				
Blower Motor Type/Speeds	ECM	Variable Speed		
Blower Motor - W	ECM	373	746	746
High Static Blower Motor - W	ECM	746	N/A	N/A
Blower Wheel Size (Dia x W), mm	ECM	279 x 254	279 x 254	279 x 254
High Static Blower Wheel Size - [Dia. x W], mm	ECM	279 x 254	N/A	N/A
Coax and Water Piping				
Water Connections Size - Swivel - in [mm]		1 [25.4]	1 [25.4]	1 [25.4]
HWG Connection Size - Female Sweat I.D. - in [mm]		1/2 [12.7]	1/2 [12.7]	1/2 [12.7]
Coax & Piping Water Volume - l		6.1	6.1	8.7
Vertical				
Air Coil Dimensions (H x W), mm		813 x 635	813 x 635	914 x 635
Air Coil Total Face Area, m^2		0.570	0.570	0.641
Air Coil Tube Size, mm		9.5	9.5	9.5
Air Coil Number of rows		3	3	4
Filter Standard - 51 mm Pleated MERV 11 Throwaway, mm		813 x 762	813 x 762	914 x 762
Weight - Operating, kg		160	164	175
Weight - Packaged, kg		169	173	184
Horizontal				
Air Coil Dimensions (H x W), mm		508 x 1016	508 x 1016	508 x 1143
Air Coil Total Face Area, m^2		0.570	0.570	0.641
Air Coil Tube Size, mm		9.5	9.5	9.5
Air Coil Number of rows		3	3	4
Filter Standard - 51 mm Pleated MERV 11 Throwaway, mm		1 - 508 x 508 1 - 508 x 559	1 - 508 x 508 1 - 508 x 559	1 - 508 x 635 1 - 508 x 559
Weight - Operating, kg		176	180	188
Weight - Packaged, kg		189	193	202

5/13/13

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Engineer: _____

Project Name: _____ Unit Tag: _____

Auxiliary Heat Ratings

Model	kW		Stages	Min L/s	Model Compatibility		
	208V	230V			009	012	015
EAL(H)10	7.2	9.6	2	519	•	•	•
EAL(H)15	10.8	14.4	3	590	•	•	•
EAL(H)20	14.4	19.2	4	708		•	•

Air flow level for auxiliary heat (Aux) must be above the minimum air flow in this table 7/17/13
Order the "H" part number when installed on horizontal and vertical rear discharge units

Auxiliary Heat Electrical Data

Model	Supply Circuit	Heater Amps		Min Circuit Amp		Max Fuse (USA)		Max Fuse (CAN)		Max 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	53.3	60	60	60	60	60	60	60
EAL(H)15	Single	52.0	60	75	85	80	90	80	90	70	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	17.3	20	21.7	25	25	25	25	25	20	30
EAL(H)20	Single	69.3	80	96.7	110	100	110	100	110	100	100
	L1/L2	34.7	40	53.3	60	60	60	60	60	60	60
	L3/L4	34.7	40	43.3	50	45	50	45	50	40	50

All heaters rated single phase 60 cycle and include unit fan load 6/1/12
All fuses type "D" time delay (or HACR circuit breaker in USA)

Electrical Data

Model	Rated Voltage	Voltage Min/Max	Compressor		Drive		HWG Pump FLA	Ext Loop FLA	Blower Motor FLA	Total Unit FLA	Minimum Circuit Amp	Max Fuse HACR Breaker
			LRA	CMCC	LRA	Internal Breaker						
009	220-240/50/1	198/264	10.2	18.0	22.0	30.0	0.4	5.4	4.0	31.8	37.3	40
***009**	220-240/50/1	198/264	10.2	18.0	22.0	30.0	0.4	5.4	7.0	34.8	40.3	45
012	220-240/50/1	198/264	12.0	23.5	28.0	35.0	0.4	5.4	7.0	40.8	47.8	50
015	220-240/50/1	198/264	12.0	30.0	33.0	40.0	0.4	5.4	7.0	45.8	54.1	60

*With optional 1 hp Variable Speed ECM Motor 5/08/13
Rated Voltage of 220-240/50/1
HACR circuit breaker in USA only
All fuses Class RK-5

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Blower Performance Data

Variable Speed ECM Blower Motor

Model	Air Flow												
	Max ESP (Pa)	Speed 1	Speed 2	Speed 3	Speed 4	Speed 5	Speed 6	Speed 7	Speed 8	Speed 9	Speed 10	Speed 11	Speed 12
009	124.50	**135**	**179** G	**248** **L**	**319**	**385**	**463**	519	576	628	680 H	727 Aux	743
009 w/746W*	186.75	**227**	**267** G	**314** **L**	**359**	**411**	**472**	519	566	614	665 H	717 Aux	769
012	186.75	**224**	**293** G	**345** **L**	**401**	**481**	**538**	599	661	717	779 H	845 Aux	908
015	186.75	**189**	**283** G	**392** **L**	**496**	**580**	**661**	736	802	883	949 H	1010 Aux	1069
****VS Compressor Speed**				1-2	3-4		5-6	7-8		9-10	11-12		

** VS Compressor speed is given for the factory default L/s settings. When the L/s default settings are changed it will change the relationship to the compressor speed that is shown in the table. In cooling mode compressor speeds 10-12 are only available when SuperBoost mode is selected at the thermostat. 5/13/13

* Optional 746W Variable Speed ECM

Factory settings are at recommended L , H and Aux positions

“G” may be located anywhere within the airflow table

“L” setting should be located within the boldface L/s range

“H” setting MUST be located within the shaded L/s range

“Aux” setting MUST be equal to or greater than “H” setting

“Aux” setting MUST be equal to or greater than the minimum allowable L/s for the auxiliary heater kit (see auxiliary heat ratings table)

Cfm is controlled within 5% up to the maximum ESP

Max ESP includes allowance for wet coil and standard filter

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Operating Limits

Operating Limits	Cooling (°C)	Heating (°C)
Air Limits		
Min. Ambient Air	7.2	7.2
Rated Ambient Air	26.7	21.1
Max. Ambient Air	37.8	29.4
Min. Entering Air	10.0	4.4
Rated Entering Air db/wb	27/19	20.0
Max. Entering Air db/wb	43/28.3	26.7
Water Limits		
Min. Entering Water	-1.1	-6.7
Normal Entering Water	10-43.3	-1.1
Max. Entering Water	48.9	32.2

NOTE: Minimum/maximum limits are only for startup 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.

Legend

ABBREVIATIONS AND DEFINITIONS:

COP = coefficient of performance
EER = cooling energy efficiency (TC/kW)
ELT = entering load fluid temperature
EST = entering source fluid temperature to heat pump
FLA = full load amps
FtHd = pressure drop in feet of head
gpm = US gallon per minute
HC = heating capacity in kW
HE = heat of extraction in kW
HR = heat rejected in kW
kPa = kilopascal
kW = kilowatt
L/s = liters per second
LLT = leaving load fluid temperature from heat pump
LRA = locked rotor amps (starting current)
LST = leaving source fluid temperature from heat pump
LWPD = load heat exchanger water pressure drop
MCC = maximum continuous current
PD = pressure drop
psi = pressure drop in pounds per square inch
P/T = Pressure/Temperature
RLA = run load amps
TC = total cooling capacity in kW
W = Watt

CONVERSIONS:

x°F = (*x* - 32)/1.8°C
1 bar = 100 kPa
1 gpm = 0.0631 L/s
1 US Gallon = 3.785412 L
1 Btu/h = 0.29037 W

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Pressure Drop

Model	L/s	Pressure Drop (kPa)				
		-1.1°C	10.0°C	21.1°C	32.2°C	43.3°C
009	0.7	23.44	22.06	20.68	19.31	17.93
	0.6	18.62	17.93	16.55	15.17	14.48
	0.4	11.38	10.69	10.00	9.31	8.62
	0.3	7.58	6.89	6.21	5.86	5.17
	0.3	4.69	4.41	4.14	3.79	3.52
012	0.9	31.72	30.34	28.27	26.20	24.13
	0.7	19.99	18.62	17.24	15.86	15.17
	0.5	11.72	11.03	10.34	9.65	8.96
	0.4	8.27	7.58	6.89	6.62	6.27
	0.3	4.27	4.21	4.14	4.00	3.86
015	1.1	44.13	41.37	38.61	35.85	33.09
	0.9	28.27	26.20	24.82	22.75	21.37
	0.6	15.17	14.48	13.79	12.41	11.72
	0.5	11.72	11.03	10.34	9.65	8.96
	0.3	4.69	4.27	4.00	3.79	3.65

5/22/13

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Correction Factor Tables

Air Flow Corrections (Compressor Speeds 1-3)

Airflow		Cooling				Heating		
L/s Per kW of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
32	60	0.940	0.740	0.967	0.951	0.943	1.106	0.902
37	69	0.950	0.783	0.973	0.959	0.953	1.088	0.918
40	75	0.960	0.827	0.978	0.967	0.962	1.070	0.935
44	81	0.970	0.870	0.984	0.975	0.972	1.053	0.951
47	88	0.980	0.913	0.989	0.984	0.981	1.035	0.967
50	94	0.990	0.957	0.995	0.992	0.991	1.018	0.984
54	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
57	106	1.030	1.022	1.024	1.026	1.009	0.982	1.016
61	113	1.060	1.045	1.048	1.051	1.019	0.965	1.033
64	119	1.091	1.067	1.071	1.077	1.028	0.947	1.049
67	125	1.121	1.089	1.095	1.103	1.038	0.930	1.065
70	130	1.151	1.111	1.110	1.129	1.047	0.912	1.082

5/29/13

Air Flow Corrections (Compressor Speeds 4-12)

Airflow		Cooling				Heating		
L/s Per kW of Clg	% of Nominal	Total Cap	Sens Cap	Power	Heat of Rej	Htg Cap	Power	Heat of Ext
32	60	0.928	0.747	0.936	0.929	0.961	1.097	0.938
37	69	0.940	0.789	0.946	0.941	0.967	1.081	0.948
40	75	0.952	0.831	0.957	0.953	0.974	1.064	0.959
44	81	0.964	0.873	0.968	0.965	0.980	1.048	0.969
47	88	0.976	0.916	0.979	0.976	0.987	1.032	0.979
50	94	0.988	0.958	0.989	0.988	0.993	1.016	0.990
54	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
57	106	1.020	1.023	1.004	1.018	1.010	0.966	1.018
61	113	1.056	1.042	1.008	1.035	1.020	0.932	1.036
64	119	1.072	1.079	1.011	1.053	1.029	0.898	1.054
67	125	1.087	1.095	1.015	1.070	1.039	0.865	1.071
70	130	1.099	1.113	1.019	1.088	1.049	0.831	1.089

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Cooling Capacity Corrections

Entering Air WB °C	Total Clg Cap	Sensible Cooling Capacity Multipliers - Entering DB °C										Power Input	Heat of Rejection
		15.6	18.3	21.1	23.9	26.7	27.0	29.4	32.2	35.0	37.8		
12.8	0.898	0.723	0.866	1.048	1.185	*	*	*	*	*	*	0.985	0.913
15.6	0.912		0.632	0.880	1.078	1.244	1.260	*	*	*	*	0.994	0.927
17.2	0.945			0.768	0.960	1.150	1.175	*	*	*	*	0.996	0.954
18.3	0.976			0.694	0.881	1.079	1.085	1.270	*	*	*	0.997	0.972
19.0	0.983			0.655	0.842	1.040	1.060	1.232	*	*	*	0.999	0.986
19.4	**1.000**			0.616	0.806	**1.000**	1.023	1.193	1.330	1.480	*	**1.000**	**1.000**
21.1	1.053				0.693	0.879	0.900	1.075	1.205	1.404	*	1.003	1.044
23.9	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.

5/13/13

Heating Capacity Corrections

Ent Air DB °C	Heating Corrections		
	Htg Cap	Power	Heat of Ext
7.2	1.062	0.739	1.158
10.0	1.050	0.790	1.130
12.8	1.037	0.842	1.096
15.6	1.025	0.893	1.064
18.3	1.012	0.945	1.030
20.0	1.005	0.976	1.012
21.1	**1.000**	**1.000**	**1.000**
23.9	0.987	1.048	0.970
26.7	0.975	1.099	0.930

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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
		Load	Source	Load	Source	
EWT - °C		**26.7**	**-1.1**	**10.0**	**32.2**	**-1.1**
Water	0	1.000	1.000	1.000	1.000	1.000
Ethylene Glycol	10	0.990	0.973	0.976	0.991	1.075
	20	0.978	0.943	0.947	0.979	1.163
	30	0.964	0.917	0.921	0.965	1.225
	40	0.953	0.890	0.897	0.955	1.324
	50	0.942	0.865	0.872	0.943	1.419
Propylene Glycol	10	0.981	0.958	0.959	0.981	1.130
	20	0.967	0.913	0.921	0.969	1.270
	30	0.946	0.854	0.869	0.950	1.433
	40	0.932	0.813	0.834	0.937	1.614
	50	0.915	0.770	0.796	0.922	1.816
Ethanol	10	0.986	0.927	0.945	0.991	1.242
	20	0.967	0.887	0.906	0.972	1.343
	30	0.944	0.856	0.869	0.947	1.383
	40	0.926	0.815	0.830	0.930	1.523
	50	0.907	0.779	0.795	0.911	1.639
Methanol	10	0.985	0.957	0.962	0.986	1.127
	20	0.969	0.924	0.929	0.970	1.197
	30	0.950	0.895	0.897	0.951	1.235
	40	0.935	0.863	0.866	0.936	1.323
	50	0.919	0.833	0.836	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 -1.1°C and 32.2°C respectively as well as pressure drop at -1.1°C for a NVK036 operating at 100% capacity.

The corrected cooling capacity at 32.2°C would be: 10.3 kW x 0.969 = 10.0 kW

The corrected heating capacity at -1.1°C would be: 11.0 kW x 0.913 = 10.0 kW

The corrected pressure drop at -1.1°C and 0.7 L/s would be: 23.50 kPa x 1.270 = 29.85 kPa

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Performance Data

NVK009 - 50% Part Load

EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW
-6.7	0.2	2.10	Operation not recommended						
	0.3	4.80							
	0.3	7.50	259.6	4.2	1.24	3.0	34.6	3.41	0.6
			354	4.3	1.25	3.0	31.1	3.43	0.5
-1.1	0.2	2.04	259.6	4.8	1.30	3.5	36.5	3.71	0.7
			354	4.9	1.32	3.6	32.6	3.69	0.6
	0.3	4.66	259.6	5.1	1.34	3.7	37.3	3.79	0.8
			354	5.2	1.35	3.8	33.2	3.84	0.6
	0.3	7.28	259.6	5.2	1.35	3.8	37.6	3.84	0.8
			354	5.2	1.36	3.9	33.4	3.86	0.7
4.4	0.2	1.98	259.6	5.4	1.35	4.1	38.4	4.03	0.7
			354	5.5	1.36	4.2	34.0	4.06	0.6
	0.3	4.52	259.6	5.7	1.38	4.3	39.3	4.13	0.8
			354	5.8	1.38	4.4	34.7	4.20	0.7
	0.3	7.07	259.6	5.8	1.39	4.4	39.6	4.15	0.8
			354	5.9	1.39	4.5	34.9	4.23	0.7
10.0	0.2	1.91	259.6	6.0	1.45	4.6	40.3	4.16	0.8
			354	6.1	1.45	4.7	35.5	4.24	0.7
	0.3	4.38	259.6	6.3	1.48	4.8	41.3	4.27	0.9
			354	6.4	1.48	5.0	36.2	4.36	0.7
	0.3	6.85	259.6	6.4	1.50	4.9	41.6	4.27	0.9
			354	6.6	1.49	5.1	36.5	4.41	0.8
15.6	0.2	1.85	259.6	6.8	1.42	5.3	42.7	4.75	0.9
			354	6.9	1.41	5.5	37.3	4.91	0.7
	0.3	4.24	259.6	7.1	1.45	5.6	43.7	4.88	0.9
			354	7.2	1.44	5.8	38.1	5.03	0.8
	0.3	6.63	259.6	7.2	1.47	5.7	44.0	4.89	1.0
			354	7.4	1.45	5.9	38.3	5.08	0.8
21.1	0.2	1.79	259.6	7.4	1.35	6.1	44.8	5.48	0.9
			354	7.6	1.37	6.2	38.9	5.54	0.8
	0.3	4.10	259.6	7.7	1.38	6.4	45.8	5.61	1.0
			354	8.0	1.36	6.6	39.8	5.86	0.8
	0.3	6.41	259.6	7.8	1.55	6.2	45.9	5.01	1.0
			354	8.1	1.37	6.7	40.0	5.91	0.9
26.7	0.2	1.73	259.6	8.0	1.43	6.5	46.5	5.57	1.0
			354	8.2	1.39	6.8	40.3	5.88	0.8
	0.3	3.96	259.6	8.3	1.46	6.9	47.6	5.69	1.1
			354	8.6	1.43	7.2	41.2	6.03	0.9
	0.3	6.19	259.6	8.5	1.48	7.0	48.1	5.72	1.1
			354	8.7	1.44	7.3	41.5	6.07	0.9
32.2	0.2	1.67	259.6	8.5	1.44	7.1	48.3	5.92	1.1
			354	8.8	1.40	7.4	41.7	6.31	0.9
	0.3	3.82	259.6	8.9	1.47	7.4	49.5	6.03	1.1
			354	9.2	1.42	7.8	42.7	6.47	0.9
	0.3	5.97	259.6	9.0	1.49	7.5	50.0	6.06	1.2
			354	9.4	1.44	7.9	43.1	6.51	1.0
37.8	0.2	1.61	Operation not recommended						
	0.3	3.68							
	0.3	5.76							
43.3	0.2	1.55							
	0.3	3.54							
	0.3	5.54							
48.9	0.2	1.49							
	0.3	3.40							
	0.3	5.32							

EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.2	1.05	Operation not recommended							
	0.2	3.19								
	0.3	5.32								
-1.1	0.2	1.02	236	6.8	4.46	0.65	0.49	7.32	13.8	–
			306.8	6.7	4.42	0.66	0.55	7.23	12.3	–
	0.2	3.09	236	6.8	4.46	0.65	0.48	7.30	14.3	–
			306.8	6.6	4.59	0.69	0.58	7.18	11.4	–
	0.3	5.17	236	6.9	4.59	0.66	0.47	7.41	14.7	–
			306.8	6.7	4.54	0.68	0.54	7.25	12.4	–
4.4	0.2	0.99	236	7.0	4.60	0.65	0.57	7.59	12.4	–
			306.8	7.0	4.69	0.67	0.63	7.64	11.1	–
	0.2	3.00	236	7.0	4.60	0.65	0.55	7.58	12.9	–
			306.8	7.0	4.79	0.69	0.64	7.61	10.9	–
	0.3	5.02	236	7.1	4.65	0.65	0.54	7.66	13.1	–
			306.8	7.1	4.77	0.68	0.61	7.66	11.7	–
10.0	0.2	0.96	236	7.1	4.75	0.67	0.59	7.68	11.9	–
			306.8	7.1	4.93	0.69	0.66	7.77	10.7	–
	0.2	2.91	236	7.1	4.76	0.67	0.57	7.67	12.4	–
			306.8	7.1	4.98	0.70	0.65	7.76	10.9	–
	0.3	4.86	236	7.2	4.79	0.67	0.57	7.74	12.6	–
			306.8	7.2	4.98	0.69	0.62	7.80	11.6	–
15.6	0.2	0.93	236	6.6	4.53	0.69	0.70	7.28	9.4	0.3
			306.8	6.7	4.81	0.71	0.77	7.50	8.8	0.3
	0.2	2.82	236	6.6	4.55	0.69	0.67	7.28	9.8	0.3
			306.8	6.8	4.83	0.71	0.75	7.51	9.1	0.3
	0.3	4.71	236	6.7	4.58	0.69	0.67	7.34	10.0	0.3
			306.8	6.8	4.86	0.71	0.72	7.52	9.5	0.3
21.1	0.2	0.90	236	6.2	4.59	0.74	0.84	7.07	7.4	0.4
			306.8	5.5	4.31	0.78	0.91	6.45	6.1	0.4
	0.2	2.72	236	6.3	4.62	0.74	0.81	7.07	7.7	0.4
			306.8	6.6	4.99	0.76	0.88	7.44	7.5	0.4
	0.3	4.55	236	5.4	3.75	0.69	0.79	6.21	6.9	0.4
			306.8	6.6	5.04	0.77	0.85	7.41	7.7	0.4
26.7	0.2	0.87	236	5.9	4.40	0.75	0.97	6.82	6.0	0.6
			306.8	6.0	4.70	0.78	1.04	7.04	5.8	0.6
	0.2	2.63	236	5.9	4.43	0.75	0.94	6.82	6.3	0.6
			306.8	6.1	4.70	0.77	0.99	7.06	6.1	0.6
	0.3	4.40	236	5.9	4.47	0.75	0.92	6.87	6.5	0.6
			306.8	6.1	4.75	0.78	0.96	7.06	6.3	0.7
32.2	0.2	0.83	236	5.4	4.19	0.77	1.11	6.53	4.9	0.8
			306.8	5.5	4.41	0.81	1.18	6.63	4.6	0.8
	0.2	2.54	236	5.5	4.23	0.78	1.07	6.53	5.1	0.8
			306.8	5.5	4.41	0.80	1.11	6.63	5.0	0.8
	0.3	4.24	236	5.5	4.28	0.78	1.05	6.56	5.3	0.8
			306.8	5.6	4.45	0.80	1.08	6.65	5.2	0.8
37.8	0.2	0.80	236	5.2	4.04	0.78	1.39	6.55	3.7	0.9
			306.8	5.2	4.23	0.81	1.43	6.64	3.6	0.9
	0.2	2.45	236	5.2	4.08	0.78	1.33	6.54	3.9	0.9
			306.8	5.3	4.26	0.81	1.36	6.62	3.9	0.9
	0.3	4.09	236	5.3	4.13	0.79	1.30	6.56	4.0	1.0
			306.8	5.3	4.30	0.81	1.33	6.64	4.0	1.0
43.3	0.2	0.77	236	4.3	3.70	0.86	1.56	5.88	2.8	0.9
			306.8	4.4	3.85	0.88	1.57	5.94	2.8	0.9
	0.2	2.35	236	4.4	3.75	0.86	1.49	5.86	2.9	1.0
			306.8	4.4	3.91	0.89	1.51	5.92	2.9	1.0
	0.3	3.93	236	4.4	3.80	0.86	1.46	5.87	3.0	1.0
			306.8	4.5	3.96	0.89	1.47	5.92	3.0	1.0
48.9	0.2	0.74	236	3.9	3.31	0.86	1.81	5.68	2.1	1.3
			306.8	3.8	3.32	0.87	1.75	5.55	2.2	1.3
	0.2	2.26	236	3.9	3.36	0.86	1.74	5.65	2.3	1.3
			306.8	3.8	3.42	0.89	1.74	5.57	2.2	1.3
	0.3	3.78	236	4.0	3.50	0.88	1.67	5.65	2.4	1.3
			306.8	3.9	3.46	0.89	1.69	5.59	2.3	1.3

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Performance Data cont.

NVK009 - 100% Full Load

EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C							EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C							
			Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW				Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.3	7.52	Operation not recommended							-6.7	0.3	4.83	Operation not recommended							
	0.5	18.56									0.4	11.70								
	0.7	24.20	542.8	9.3	2.84	6.4	35.2	3.26	1.4		0.6	19.36								
			708	9.5	2.87	6.7	32.3	3.32	1.3											
-1.1	0.3	7.31	542.8	10.3	2.74	7.6	36.9	3.77	1.5	-1.1	0.3	4.69	472	11.5	8.01	0.70	0.98	12.48	11.8	–
			708	10.5	2.79	7.7	33.4	3.78	1.4				613.6	11.3	8.02	0.71	1.09	12.36	10.3	–
	0.5	18.02	542.8	10.4	2.77	7.7	37.0	3.77	1.6		0.4	11.36	472	11.5	7.99	0.70	0.95	12.44	12.2	–
			708	10.6	2.82	7.8	33.6	3.77	1.4				613.6	11.1	8.23	0.74	1.14	12.27	9.7	–
	0.7	23.50	542.8	10.6	2.92	7.7	37.3	3.62	1.6		0.6	18.80	472	11.5	8.06	0.70	0.95	12.48	12.2	–
			708	11.0	2.89	8.1	33.9	3.79	1.5				613.6	11.3	8.15	0.72	1.07	12.38	10.6	–
4.4	0.3	7.03	542.8	12.0	2.73	9.3	39.4	4.40	1.6	4.4	0.3	4.55	472	12.1	8.67	0.72	1.10	13.16	11.0	–
			708	12.2	2.77	9.4	35.4	4.39	1.5				613.6	12.0	8.88	0.74	1.23	13.25	9.8	–
	0.5	17.48	542.8	12.1	2.74	9.4	39.6	4.42	1.7		0.4	11.02	472	12.1	8.67	0.72	1.06	13.13	11.4	–
			708	12.4	2.80	9.6	35.6	4.43	1.5				613.6	12.0	9.04	0.76	1.24	13.20	9.6	–
	0.7	22.80	542.8	12.5	2.80	9.6	40.1	4.44	1.7		0.6	18.24	472	12.2	8.72	0.72	1.06	13.22	11.5	–
			708	12.7	2.85	9.8	36.0	4.46	1.5				613.6	12.1	9.01	0.74	1.18	13.27	10.3	–
10.0	0.3	6.83	542.8	13.5	2.85	10.6	41.7	4.73	1.7	10.0	0.3	4.41	472	12.9	9.48	0.73	1.25	14.15	10.3	–
			708	13.6	2.88	10.7	37.0	4.72	1.6				613.6	12.9	9.84	0.76	1.40	14.34	9.2	–
	0.5	16.94	542.8	13.6	2.84	10.8	41.9	4.79	1.9		0.4	10.68	472	12.9	9.50	0.73	1.21	14.13	10.7	–
			708	14.0	2.91	11.1	37.5	4.80	1.7				613.6	12.9	9.94	0.77	1.38	14.32	9.4	–
	0.7	22.09	542.8	13.9	2.93	11.0	42.3	4.74	1.9		0.6	17.67	472	13.1	9.54	0.73	1.20	14.26	10.9	–
			708	14.2	2.94	11.3	37.7	4.83	2.0				613.6	13.1	9.94	0.76	1.31	14.38	10.0	–
15.6	0.3	6.41	542.8	14.9	2.87	12.0	43.8	5.18	1.8	15.6	0.3	4.27	472	11.8	9.05	0.77	1.45	13.27	8.1	0.5
			708	15.1	2.89	12.2	38.8	5.23	1.7				613.6	12.1	9.61	0.79	1.59	13.68	7.6	0.6
	0.5	16.40	542.8	15.2	2.88	12.4	44.4	5.29	2.0		0.4	10.34	472	11.9	9.09	0.77	1.40	13.26	8.5	0.6
			708	15.5	2.92	12.5	39.2	5.29	1.7				613.6	12.2	9.66	0.79	1.55	13.70	7.9	0.6
	0.7	21.39	542.8	15.6	2.93	12.6	44.9	5.31	2.0		0.6	17.11	472	12.0	9.15	0.76	1.39	13.37	8.6	0.6
			708	15.9	2.97	12.9	39.7	5.36	1.7				613.6	12.2	9.71	0.79	1.49	13.70	8.2	0.6
21.1	0.3	6.21	542.8	16.1	2.95	13.1	45.7	5.45	1.9	21.1	0.3	4.14	472	11.4	8.89	0.78	1.68	13.08	6.8	0.8
			708	16.5	3.00	13.5	40.5	5.51	1.8				613.6	10.8	8.70	0.81	1.84	12.63	5.9	0.8
	0.5	15.86	542.8	16.7	3.02	13.6	46.5	5.52	2.0		0.4	10.00	472	11.5	8.95	0.78	1.62	13.07	7.1	0.9
			708	17.0	2.95	14.0	41.0	5.75	1.9				613.6	12.0	9.66	0.80	1.74	13.77	6.9	0.9
	0.7	20.68	542.8	17.2	3.08	14.1	47.4	5.58	2.2		0.6	16.55	472	10.6	7.62	0.72	1.62	12.23	6.5	0.9
			708	17.6	3.01	14.6	41.7	5.84	1.9				613.6	12.0	9.76	0.81	1.69	13.72	7.1	1.0
26.7	0.3	6.00	542.8	17.6	3.15	14.5	48.0	5.59	2.1	26.7	0.3	3.93	472	11.1	9.00	0.81	1.95	13.04	5.7	1.2
			708	18.0	3.16	14.8	42.1	5.68	1.8				613.6	11.4	9.62	0.85	2.08	13.47	5.5	1.2
	0.5	15.32	542.8	18.5	3.18	15.3	49.3	5.80	2.2		0.4	9.66	472	11.2	9.07	0.81	1.88	13.04	5.9	1.2
			708	18.6	3.17	15.4	42.9	5.85	1.9				613.6	11.5	9.62	0.84	1.98	13.48	5.8	1.2
	0.7	19.98	542.8	18.7	3.23	15.5	49.7	5.79	2.2		0.6	15.98	472	11.3	9.15	0.81	1.85	13.12	6.1	1.3
			708	19.1	3.25	15.8	43.4	5.87	2.1				613.6	11.6	9.72	0.84	1.93	13.48	6.0	1.3
32.2	0.3	5.79	542.8	19.0	3.35	15.6	50.1	5.66	2.2	32.2	0.3	3.79	472	10.0	8.61	0.86	2.25	12.29	4.5	1.6
			708	19.3	3.29	16.0	43.7	5.86	2.0				613.6	10.1	9.06	0.90	2.39	12.50	4.2	1.6
	0.5	14.77	542.8	20.0	3.41	16.6	51.6	5.86	2.3		0.4	9.31	472	10.1	8.70	0.86	2.16	12.28	4.7	1.6
			708	20.2	3.33	16.9	44.8	6.07	2.1				613.6	10.2	9.06	0.89	2.26	12.47	4.5	1.6
	0.7	19.27	542.8	20.1	3.48	16.6	51.7	5.76	2.5		0.6	15.41	472	10.2	8.79	0.86	2.12	12.34	4.8	1.7
			708	20.6	3.42	17.2	45.2	6.01	2.3				613.6	10.3	9.16	0.89	2.19	12.51	4.7	1.7
37.8	0.3	5.52	Operation not recommended							37.8	0.3	3.65	472	9.8	8.48	0.86	2.61	12.44	3.8	2.0
													613.6	9.9	8.88	0.90	2.69	12.61	3.7	2.0
	0.5	14.24									0.4	8.98	472	9.9	8.58	0.87	2.50	12.42	4.0	2.1
													613.6	10.0	8.94	0.89	2.56	12.58	3.9	2.1
	0.7	18.57									0.6	14.86	472	10.0	8.68	0.87	2.44	12.47	4.1	2.2
													613.6	10.1	9.04	0.89	2.49	12.62	4.1	1.8
43.3	0.3	5.31								43.3	0.3	3.52	472	8.7	7.83	0.90	3.01	11.71	2.9	2.4
													613.6	8.8	8.16	0.93	3.04	11.83	2.9	2.3
	0.5	13.70									0.4	8.64	472	8.8	7.95	0.90	2.88	11.67	3.0	2.5
													613.6	8.9	8.28	0.93	2.91	11.79	3.0	2.5
	0.7	17.87									0.6	14.30	472	8.1	8.05	0.99	2.81	10.96	2.9	2.6
													613.6	9.0	8.38	0.93	2.84	11.81	3.2	2.4
48.9	0.3	5.03								48.9	0.3	3.38	472	8.2	7.52	0.92	3.40	11.60	2.4	2.9
													613.6	8.1	7.63	0.95	3.31	11.39	2.4	3.0
	0.5	13.16									0.4	8.30	472	8.3	7.64	0.92	3.26	11.55	2.5	3.0
													613.6	8.1	7.77	0.96	3.27	11.39	2.5	3.1
	0.7	17.17									0.6	13.73	472	8.3	7.79	0.94	3.17	11.49	2.6	3.1
													613.6	8.3	7.85	0.95	3.17	11.44	2.6	3.1

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Performance Data cont.

NVK012 - 50% Part Load

EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW	EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.2	3.87	Operation not recommended							**-6.7**	0.2	3.23	Operation not recommended							
	0.3	6.66									0.3	5.61								
	0.4	9.44	306.8	5.2	1.55	3.6	35.0	3.33	0.7		0.4	7.99								
			424.8	5.2	1.56	3.7	31.3	3.35	0.9											
-1.1	0.2	3.76	306.8	5.9	1.54	4.3	37.0	3.81	0.8	**-1.1**	0.2	3.13	236	8.2	4.49	0.55	0.53	8.69	15.5	–
			424.8	6.0	1.57	4.4	32.7	3.80	0.7				354	8.0	4.45	0.56	0.58	8.57	13.7	–
	0.3	6.46	306.8	6.2	1.58	4.6	37.8	3.90	0.9		0.3	5.44	236	8.2	4.48	0.55	0.51	8.67	16.0	–
			424.8	6.3	1.60	4.7	33.4	3.94	0.8				354	7.9	4.62	0.58	0.62	8.51	12.8	–
	0.4	9.16	306.8	6.3	1.60	4.7	38.1	3.94	0.9		0.4	7.75	236	8.3	5.04	0.61	0.51	8.81	16.4	–
			424.8	6.4	1.61	4.8	33.6	3.96	0.8				354	8.0	4.57	0.57	0.58	8.60	13.9	–
4.4	0.2	3.65	306.8	7.0	1.58	5.5	40.1	4.45	0.9	**4.4**	0.2	3.04	236	8.5	5.11	0.60	0.61	9.12	14.0	–
			424.8	7.2	1.59	5.6	35.1	4.49	0.8				354	8.5	5.22	0.62	0.68	9.16	12.5	–
	0.3	6.27	306.8	7.4	1.62	5.8	41.1	4.57	1.0		0.3	5.28	236	8.5	5.11	0.60	0.59	9.10	14.5	–
			424.8	7.5	1.63	5.9	35.8	4.64	0.8				354	8.4	5.33	0.63	0.69	9.13	12.3	–
	0.4	8.89	306.8	7.5	1.64	5.9	41.4	4.59	1.0		0.4	7.52	236	8.6	5.18	0.60	0.58	9.21	14.8	–
			424.8	7.7	1.64	6.0	36.1	4.68	0.8				354	8.5	5.31	0.62	0.65	9.19	13.1	–
10.0	0.2	3.53	306.8	7.8	1.66	6.2	42.3	4.71	1.0	**10.0**	0.2	2.95	236	9.1	5.84	0.64	0.71	9.81	12.8	–
			424.8	8.0	1.66	6.3	36.7	4.81	0.8				354	9.1	6.06	0.66	0.80	9.93	11.4	–
	0.3	6.08	306.8	8.2	1.70	6.5	43.3	4.84	1.0		0.3	5.12	236	9.1	5.85	0.64	0.69	9.80	13.3	–
			424.8	8.4	1.70	6.7	37.5	4.94	0.9				354	9.1	6.13	0.67	0.78	9.91	11.7	–
	0.4	8.62	306.8	8.3	1.72	6.6	43.6	4.85	1.1		0.4	7.29	236	9.2	5.88	0.64	0.68	9.89	13.5	–
			424.8	8.5	1.71	6.8	37.8	4.99	1.0				354	9.2	6.13	0.66	0.75	9.97	12.4	–
15.6	0.2	3.42	306.8	8.9	1.72	7.2	45.2	5.19	1.1	**15.6**	0.2	2.85	236	8.3	5.57	0.67	0.82	9.12	10.2	0.3
			424.8	9.1	1.70	7.4	38.9	5.36	0.9				354	8.5	5.91	0.70	0.90	9.39	9.5	0.4
	0.3	5.88	306.8	9.3	1.75	7.6	46.3	5.32	1.1		0.3	4.95	236	8.3	5.59	0.67	0.79	9.12	10.6	0.4
			424.8	9.6	1.74	7.8	39.8	5.50	1.0				354	8.5	5.94	0.70	0.87	9.41	9.8	0.4
	0.4	8.34	306.8	9.5	1.78	7.7	46.8	5.34	1.2		0.4	7.06	236	8.4	5.63	0.67	0.78	9.20	10.8	0.4
			424.8	9.7	1.75	8.0	40.1	5.55	1.0				354	8.6	5.97	0.70	0.84	9.42	10.3	0.4
21.1	0.2	3.31	306.8	10.0	1.80	8.2	48.1	5.56	1.2	**21.1**	0.2	2.76	236	7.9	5.56	0.70	1.01	8.93	7.8	0.5
			424.8	9.9	1.79	8.1	40.5	5.55	1.0				354	8.1	5.93	0.74	1.18	9.24	6.8	0.5
	0.3	5.69	306.8	10.4	1.83	8.6	49.2	5.69	1.3		0.3	4.79	236	8.0	5.59	0.70	0.98	8.93	8.2	0.6
			424.8	10.7	1.81	8.9	42.1	5.94	1.1				354	8.4	6.03	0.72	1.05	9.40	8.0	0.6
	0.4	8.07	306.8	10.4	1.84	8.6	49.3	5.67	1.3		0.4	6.83	236	6.9	4.07	0.62	1.01	7.93	6.8	0.5
			424.8	10.9	1.82	9.1	42.4	5.99	1.1				354	8.4	6.10	0.73	1.02	9.37	8.2	0.6
26.7	0.2	3.20	306.8	10.7	1.83	8.8	49.9	5.83	1.2	**26.7**	0.2	2.66	236	7.8	5.66	0.73	1.19	8.98	6.6	0.7
			424.8	11.0	1.84	9.1	42.5	5.96	1.0				354	8.0	6.05	0.76	1.27	9.27	6.3	0.7
	0.3	5.49	306.8	11.1	1.87	9.3	51.2	5.95	1.3		0.3	4.63	236	7.8	5.70	0.73	1.14	8.98	6.9	0.8
			424.8	11.5	1.88	9.6	43.5	6.11	1.1				354	8.1	6.05	0.75	1.21	9.29	6.7	0.8
	0.4	7.79	306.8	11.3	1.91	9.4	51.7	5.93	1.4		0.4	6.59	236	7.9	5.75	0.73	1.12	9.04	7.0	0.8
			424.8	11.7	1.90	9.8	43.9	6.15	1.2				354	8.1	6.11	0.75	1.17	9.29	6.9	0.9
32.2	0.2	3.08	306.8	11.3	1.88	9.5	51.8	6.04	1.3	**32.2**	0.2	2.57	236	7.1	5.31	0.75	1.41	8.51	5.0	1.0
			424.8	11.7	1.89	9.8	44.0	6.20	1.1				354	7.2	5.59	0.78	1.49	8.65	4.8	1.0
	0.3	5.30	306.8	11.8	1.92	9.9	53.1	6.17	1.4		0.3	4.46	236	7.2	5.36	0.75	1.35	8.51	5.3	1.0
			424.8	12.3	1.93	10.3	45.0	6.36	1.2				354	7.2	5.59	0.77	1.41	8.64	5.1	1.0
	0.4	7.51	306.8	12.0	1.97	10.1	53.6	6.11	1.5		0.4	6.36	236	7.2	5.42	0.75	1.33	8.55	5.4	1.1
			424.8	12.5	1.95	10.5	45.5	6.40	1.3				354	7.3	5.64	0.77	1.37	8.67	5.3	1.1
37.8	0.2	2.97	Operation not recommended							**37.8**	0.2	2.48	236	6.9	5.37	0.77	1.70	8.65	4.1	1.3
													354	7.0	5.62	0.80	1.75	8.76	4.0	1.3
	0.3	5.11									0.3	4.30	236	7.0	5.43	0.78	1.63	8.64	4.3	1.3
													354	7.1	5.66	0.80	1.67	8.75	4.2	1.3
	0.4	7.24									0.4	6.13	236	7.1	5.49	0.78	1.60	8.67	4.4	1.4
													354	7.1	5.72	0.80	1.63	8.78	4.4	1.4
43.3	0.2	2.86								**43.3**	0.2	2.38	236	6.3	5.04	0.80	1.97	8.25	3.2	1.5
													354	6.3	5.25	0.83	1.99	8.34	3.2	1.5
	0.3	4.91									0.3	4.14	236	6.3	5.11	0.81	1.89	8.24	3.4	1.6
													354	6.4	5.33	0.83	1.91	8.32	3.4	1.6
	0.4	6.97									0.4	5.90	236	6.4	5.18	0.81	1.84	8.25	3.5	1.7
													354	6.5	5.39	0.83	1.86	8.34	3.5	1.7
48.9	0.2	2.75								**48.9**	0.2	2.29	236	5.8	4.69	0.81	2.39	8.18	2.4	1.9
													354	5.7	4.70	0.83	2.30	8.00	2.5	1.9
	0.3	4.72									0.3	3.98	236	5.8	4.76	0.81	2.29	8.14	2.6	1.9
													354	5.7	4.84	0.85	2.30	8.03	2.5	1.9
	0.4	6.70									0.4	5.67	236	6.0	4.95	0.83	2.21	8.16	2.7	2.0
													354	5.8	4.89	0.84	2.23	8.06	2.6	2.0

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Performance Data cont.

NVK012 - 100% Full Load

EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW	EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.4	9.68	Operation not recommended							**-6.7**	0.3	7.26	Operation not recommended							
	0.6	19.67									0.5	13.76								
	0.9	33.00	708	11.9	3.67	8.2	35.0	3.24	1.8		0.7	20.25								
			849.6	12.2	3.72	8.5	33.0	3.28	1.6											
-1.1	0.4	9.40	708	13.2	3.86	9.3	36.5	3.41	1.9	**-1.1**	0.3	7.05	472	15.4	10.63	0.69	1.21	16.62	12.7	–
			849.6	13.4	3.93	9.5	34.2	3.41	1.8				660.8	15.1	10.64	0.70	1.35	16.45	11.2	–
	0.6	19.10	708	13.3	3.90	9.4	36.6	3.40	2.0		0.5	13.36	472	15.4	10.61	0.69	1.17	16.57	13.2	–
			849.6	13.5	3.97	9.6	34.3	3.41	1.8				660.8	14.9	10.92	0.73	1.41	16.32	10.6	–
	0.9	32.04	708	13.5	4.11	9.4	36.9	3.27	2.0		0.7	19.66	472	15.4	10.70	0.69	1.17	16.62	13.2	–
			849.6	14.0	4.07	9.9	34.7	3.43	1.9				660.8	15.2	10.81	0.71	1.32	16.47	11.5	–
4.4	0.4	9.12	708	14.6	3.94	10.6	38.2	3.70	2.1	**4.4**	0.3	6.84	472	15.8	10.89	0.69	1.40	17.17	11.3	–
			849.6	14.8	4.00	10.8	35.5	3.70	1.8				660.8	15.7	11.16	0.71	1.56	17.29	10.1	–
	0.6	18.53	708	14.7	3.95	10.8	38.3	3.72	2.1		0.5	12.96	472	15.8	10.89	0.69	1.35	17.13	11.7	–
			849.6	15.1	4.04	11.0	35.8	3.73	1.9				660.8	15.6	11.36	0.73	1.58	17.22	9.9	–
	0.9	31.08	708	15.1	4.04	11.1	38.8	3.74	2.2		0.7	19.07	472	15.9	10.95	0.69	1.35	17.25	11.8	–
			849.6	15.4	4.11	11.3	36.1	3.75	1.9				660.8	15.8	11.31	0.71	1.49	17.32	10.6	–
10.0	0.4	8.84	708	17.0	4.04	13.0	41.0	4.20	2.2	**10.0**	0.3	6.63	472	16.6	11.40	0.69	1.64	18.26	10.2	–
			849.6	17.2	4.09	13.1	37.9	4.20	2.1				660.8	16.7	11.84	0.71	1.83	18.51	9.1	–
	0.6	17.95	708	17.2	4.03	13.1	41.2	4.26	2.4		0.5	12.56	472	16.7	11.43	0.69	1.58	18.24	10.6	–
			849.6	17.6	4.13	13.5	38.3	4.27	2.1				660.8	16.7	11.96	0.72	1.80	18.48	9.3	–
	0.9	30.12	708	17.6	4.16	13.4	41.7	4.22	2.5		0.7	18.48	472	16.8	11.49	0.68	1.57	18.40	10.7	–
			849.6	17.9	4.17	13.8	38.6	4.30	2.5				660.8	16.9	11.96	0.71	1.71	18.56	9.9	–
15.6	0.4	8.56	708	18.5	3.99	14.5	42.8	4.64	2.2	**15.6**	0.3	6.42	472	15.0	10.71	0.71	1.88	16.90	8.0	0.8
			849.6	18.8	4.03	14.8	39.5	4.67	2.1				660.8	15.4	11.36	0.74	2.06	17.42	7.5	0.8
	0.6	17.38	708	19.0	4.01	15.0	43.3	4.73	2.5		0.5	12.16	472	15.1	10.75	0.71	1.81	16.88	8.3	0.8
			849.6	19.2	4.07	15.2	39.9	4.73	2.1				660.8	15.4	11.42	0.74	2.00	17.44	7.7	0.8
	0.9	29.16	708	19.4	4.08	15.3	43.8	4.75	2.5		0.7	17.89	472	15.2	10.82	0.71	1.80	17.01	8.5	0.8
			849.6	19.8	4.13	15.7	40.4	4.79	2.2				660.8	15.5	11.48	0.74	1.93	17.44	8.1	0.9
21.1	0.4	8.27	708	19.8	4.02	15.8	44.3	4.93	2.4	**21.1**	0.3	6.21	472	14.3	10.26	0.72	2.22	16.52	6.5	1.0
			849.6	20.0	3.94	16.1	40.6	5.08	2.2				660.8	14.0	10.08	0.72	2.52	16.47	5.5	1.1
	0.6	16.81	708	20.9	4.00	16.9	45.6	5.23	2.5		0.5	11.76	472	14.4	10.32	0.72	2.13	16.51	6.7	1.1
			849.6	21.0	4.02	17.0	41.6	5.23	2.3				660.8	15.1	11.14	0.74	2.30	17.38	6.6	1.1
	0.9	28.20	708	21.3	4.61	16.7	46.0	4.62	2.8		0.7	17.31	472	12.9	8.76	0.68	2.17	15.07	5.9	1.1
			849.6	21.8	4.10	17.7	42.3	5.31	2.4				660.8	15.1	11.25	0.75	2.23	17.32	6.8	1.2
26.7	0.4	7.99	708	22.0	4.01	18.0	46.8	5.48	2.6	**26.7**	0.3	5.99	472	13.9	10.31	0.74	2.56	16.48	5.4	1.6
			849.6	22.4	4.01	18.4	42.9	5.57	2.3				660.8	14.3	11.03	0.77	2.73	17.02	5.2	1.6
	0.6	16.24	708	23.0	4.08	18.9	48.0	5.63	2.8		0.5	11.36	472	14.0	10.39	0.74	2.46	16.47	5.7	1.7
			849.6	23.1	4.03	19.1	43.7	5.74	2.3				660.8	14.4	11.03	0.76	2.60	17.04	5.5	1.7
	0.9	27.24	708	23.3	4.13	19.2	48.4	5.65	2.8		0.7	16.72	472	14.1	10.49	0.74	2.42	16.57	5.8	1.7
			849.6	23.8	4.16	19.6	44.3	5.72	2.6				660.8	14.5	11.14	0.77	2.53	17.03	5.7	1.7
32.2	0.4	7.71	708	23.7	4.04	19.7	48.9	5.88	2.8	**32.2**	0.3	5.78	472	12.5	9.79	0.78	2.94	15.46	4.3	2.0
			849.6	24.1	4.03	20.1	44.6	5.99	2.5				660.8	12.6	10.30	0.82	3.12	15.73	4.0	1.9
	0.6	15.66	708	25.0	4.13	20.9	50.4	6.05	2.8		0.5	10.95	472	12.6	9.89	0.78	2.83	15.44	4.5	2.1
			849.6	25.3	4.03	21.3	45.8	6.28	2.6				660.8	12.7	10.30	0.81	2.95	15.68	4.3	2.1
	0.9	26.27	708	25.1	4.35	20.8	50.5	5.77	3.0		0.7	16.12	472	12.7	9.99	0.78	2.77	15.51	4.6	2.1
			849.6	25.8	4.20	21.6	46.3	6.14	2.8				660.8	12.9	10.40	0.81	2.86	15.73	4.5	2.2
37.8	0.4	7.43	Operation not recommended							**37.8**	0.3	5.57	472	12.4	9.65	0.78	3.45	15.87	3.6	2.6
													660.8	12.5	10.10	0.81	3.55	16.09	3.5	2.6
	0.6	15.09									0.5	10.56	472	12.5	9.77	0.78	3.30	15.84	3.8	2.7
													660.8	12.7	10.17	0.80	3.39	16.05	3.7	2.7
	0.9	25.32									0.7	15.54	472	12.7	9.88	0.78	3.23	15.89	3.9	2.9
													660.8	12.8	10.29	0.80	3.29	16.09	3.9	2.4
43.3	0.4	7.15								**43.3**	0.3	5.36	472	11.4	9.28	0.82	3.93	15.30	2.9	3.1
													660.8	11.5	9.67	0.84	3.97	15.46	2.9	3.1
	0.6	14.52									0.5	10.16	472	11.5	9.42	0.82	3.77	15.26	3.1	3.2
													660.8	11.6	9.81	0.85	3.80	15.41	3.1	3.2
	0.9	24.36									0.7	14.95	472	11.6	9.54	0.82	3.67	15.28	3.2	3.4
													660.8	11.7	9.94	0.85	3.71	15.43	3.2	3.1
48.9	0.4	6.87								**48.9**	0.3	5.15	472	10.6	8.52	0.80	4.57	15.15	2.3	3.7
													660.8	10.4	8.65	0.83	4.45	14.88	2.3	3.9
	0.6	13.95									0.5	9.76	472	10.7	8.66	0.81	4.38	15.08	2.4	3.9
													660.8	10.5	8.81	0.84	4.39	14.88	2.4	4.0
	0.9	23.41									0.7	14.36	472	10.7	8.83	0.82	4.26	15.00	2.5	4.1
													660.8	10.7	8.90	0.83	4.26	14.93	2.5	4.1

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Performance Data cont.

NVK015 - 50% Part Load

EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW	EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.3	4.36	Operation not recommended							**-6.7**	0.3	2.99	Operation not recommended							
	0.4	8.07									0.4	8.39								
	0.5	13.39	401.2	6.6	2.18	4.4	34.7	3.02	1.0		0.5	12.42								
			519.2	6.8	2.16	4.7	32.0	3.16	0.9											
-1.1	0.3	4.23	401.2	7.6	2.15	5.5	36.9	3.55	1.1	**-1.1**	0.3	2.90	330.4	10.8	6.28	0.58	0.74	11.53	14.5	–
			519.2	7.8	2.18	5.6	33.5	3.56	1.0				448.4	10.4	6.27	0.60	0.84	11.28	12.5	–
	0.4	7.83	401.2	7.7	2.17	5.5	37.0	3.55	1.2		0.4	8.15	330.4	10.8	6.27	0.58	0.72	11.50	15.0	–
			519.2	7.8	2.21	5.6	33.6	3.56	1.0				448.4	10.4	6.45	0.62	0.87	11.31	12.0	–
	0.5	13.00	401.2	7.8	2.29	5.5	37.2	3.41	1.2		0.5	12.06	330.4	11.0	6.63	0.60	0.71	11.70	15.5	–
			519.2	8.1	2.26	5.8	34.0	3.57	1.1				448.4	10.6	6.39	0.60	0.81	11.42	13.0	–
4.4	0.3	4.10	401.2	9.1	2.22	6.8	39.8	4.08	1.3	**4.4**	0.3	2.81	330.4	11.0	6.91	0.63	0.86	11.91	12.8	–
			519.2	9.2	2.25	6.9	35.8	4.08	1.1				448.4	11.0	7.08	0.65	0.97	11.94	11.3	–
	0.4	7.60	401.2	9.2	2.23	6.9	40.0	4.10	1.3		0.4	7.90	330.4	11.1	6.91	0.63	0.83	11.89	13.2	–
			519.2	9.4	2.28	7.1	36.1	4.11	1.1				448.4	11.0	7.21	0.66	0.98	11.93	11.2	–
	0.5	12.61	401.2	9.4	2.28	7.1	40.5	4.12	1.4		0.5	11.70	330.4	11.2	7.07	0.63	0.83	12.02	13.5	–
			519.2	9.6	2.32	7.3	36.4	4.14	1.1				448.4	11.1	7.18	0.65	0.92	12.00	12.0	–
10.0	0.3	3.98	401.2	10.3	2.34	8.0	42.4	4.41	1.4	**10.0**	0.3	2.72	330.4	11.2	7.34	0.66	1.02	12.18	11.0	–
			519.2	10.4	2.36	8.0	37.7	4.40	1.2				448.4	11.2	7.62	0.68	1.14	12.34	9.8	–
	0.4	7.36	401.2	10.4	2.33	8.1	42.6	4.46	1.4		0.4	7.66	330.4	11.2	7.36	0.66	0.98	12.17	11.4	–
			519.2	10.7	2.39	8.3	38.2	4.47	1.2				448.4	11.2	7.70	0.69	1.12	12.32	10.0	–
	0.5	12.22	401.2	10.6	2.41	8.2	43.1	4.42	1.5		0.5	11.34	330.4	11.3	7.39	0.65	0.98	12.27	11.6	–
			519.2	10.9	2.41	8.5	38.5	4.51	1.4				448.4	11.3	7.70	0.68	1.06	12.38	10.6	–
15.6	0.3	3.85	401.2	11.5	2.33	9.2	44.9	4.94	1.5	**15.6**	0.3	2.64	330.4	11.0	7.71	0.70	1.22	12.24	9.1	0.4
			519.2	11.7	2.35	9.3	39.8	4.98	1.2				448.4	11.3	8.18	0.73	1.33	12.61	8.5	0.5
	0.4	7.13	401.2	11.8	2.34	9.4	45.4	5.03	1.6		0.4	7.41	330.4	11.1	7.74	0.70	1.17	12.23	9.4	0.5
			519.2	11.9	2.37	9.6	40.2	5.04	1.3				448.4	11.3	8.22	0.73	1.29	12.63	8.7	0.5
	0.5	11.83	401.2	12.0	2.38	9.7	46.0	5.06	1.6		0.5	10.98	330.4	11.2	7.79	0.70	1.16	12.33	9.6	0.5
			519.2	12.3	2.41	9.9	40.7	5.10	1.4				448.4	11.4	8.26	0.73	1.25	12.63	9.1	0.5
21.1	0.3	3.72	401.2	12.5	2.33	10.2	46.9	5.36	1.6	**21.1**	0.3	2.55	330.4	10.6	7.72	0.73	1.39	12.03	7.7	0.6
			519.2	13.1	2.40	10.7	42.1	5.47	1.3				448.4	11.4	8.31	0.73	1.53	12.94	7.4	0.7
	0.4	6.89	401.2	12.7	2.39	10.3	47.3	5.31	1.7		0.4	7.17	330.4	10.7	7.77	0.73	1.33	12.03	8.0	0.7
			519.2	13.3	2.33	10.9	42.3	5.68	1.4				448.4	11.2	8.39	0.75	1.44	12.66	7.8	0.7
	0.5	11.45	401.2	13.1	2.44	10.7	48.2	5.38	1.8		0.5	10.62	330.4	10.6	6.76	0.64	1.37	11.93	7.7	0.7
			519.2	13.7	2.38	11.4	43.0	5.78	1.5				448.4	11.2	8.47	0.75	1.40	12.62	8.0	0.7
26.7	0.3	3.60	401.2	13.7	2.36	11.4	49.4	5.81	1.7	**26.7**	0.3	2.46	330.4	10.4	7.89	0.76	1.65	12.06	6.3	0.9
			519.2	14.0	2.36	11.6	43.4	5.91	1.4				448.4	10.7	8.43	0.79	1.76	12.45	6.1	0.9
	0.4	6.66	401.2	14.3	2.40	11.9	50.7	5.97	1.8		0.4	6.93	330.4	10.5	7.95	0.76	1.59	12.06	6.6	1.0
			519.2	14.4	2.39	12.0	44.1	6.03	1.5				448.4	10.8	8.43	0.78	1.68	12.47	6.4	1.0
	0.5	11.06	401.2	14.6	2.43	12.1	51.2	5.99	1.9		0.5	10.26	330.4	10.6	8.02	0.76	1.56	12.14	6.8	1.0
			519.2	14.9	2.45	12.4	44.8	6.06	1.6				448.4	10.8	8.52	0.79	1.63	12.47	6.7	1.2
32.2	0.3	3.47	401.2	14.8	2.41	12.4	51.6	6.12	1.8	**32.2**	0.3	2.38	330.4	10.1	8.11	0.80	1.97	12.12	5.1	1.3
			519.2	15.0	2.38	12.6	45.0	6.31	1.5				448.4	10.2	8.53	0.83	2.09	12.31	4.9	1.3
	0.4	6.42	401.2	15.4	2.48	12.9	52.9	6.20	1.9		0.4	6.68	330.4	10.2	8.19	0.80	1.89	12.12	5.4	1.3
			519.2	15.6	2.42	13.1	45.9	6.43	1.6				448.4	10.3	8.53	0.83	1.97	12.30	5.2	1.3
	0.5	10.66	401.2	15.6	2.51	13.1	53.4	6.22	2.1		0.5	9.89	330.4	10.3	8.27	0.80	1.86	12.19	5.6	1.4
			519.2	16.0	2.47	13.6	46.7	6.48	1.7				448.4	10.4	8.62	0.83	1.92	12.35	5.4	1.4
37.8	0.3	3.34	Operation not recommended							**37.8**	0.3	2.29	330.4	9.2	7.45	0.81	2.30	11.49	4.0	1.6
													448.4	9.3	7.80	0.84	2.37	11.64	3.9	1.6
	0.4	6.19									0.4	6.44	330.4	9.3	7.54	0.81	2.21	11.47	4.2	1.6
													448.4	9.4	7.86	0.84	2.26	11.62	4.1	1.6
	0.5	10.28									0.5	9.53	330.4	9.4	7.63	0.82	2.16	11.52	4.3	1.7
													448.4	9.5	7.95	0.84	2.20	11.66	4.3	1.7
43.3	0.3	3.22								**43.3**	0.3	2.20	330.4	7.8	6.55	0.83	2.50	10.35	3.1	1.8
													448.4	7.9	6.82	0.86	2.53	10.45	3.1	1.8
	0.4	5.96									0.4	6.19	330.4	7.9	6.64	0.84	2.40	10.33	3.3	2.0
													448.4	8.0	6.92	0.86	2.42	10.43	3.3	2.0
	0.5	9.89									0.5	9.17	330.4	8.0	6.72	0.84	2.34	10.35	3.4	2.1
													448.4	8.1	7.00	0.87	2.36	10.45	3.4	2.1
48.9	0.3	3.09								**48.9**	0.3	2.12	330.4	7.4	6.42	0.87	2.99	10.35	2.5	2.4
													448.4	7.2	6.50	0.91	2.94	10.10	2.4	2.4
	0.4	5.72									0.4	5.95	330.4	7.4	6.53	0.88	2.87	10.30	2.6	2.5
													448.4	7.3	6.64	0.91	2.87	10.16	2.5	2.5
	0.5	9.50									0.5	8.81	330.4	7.6	6.98	0.92	2.74	10.32	2.8	2.5
													448.4	7.4	6.71	0.91	2.79	10.21	2.7	2.5

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Performance Data cont.

NVK015 - 100% Full Load

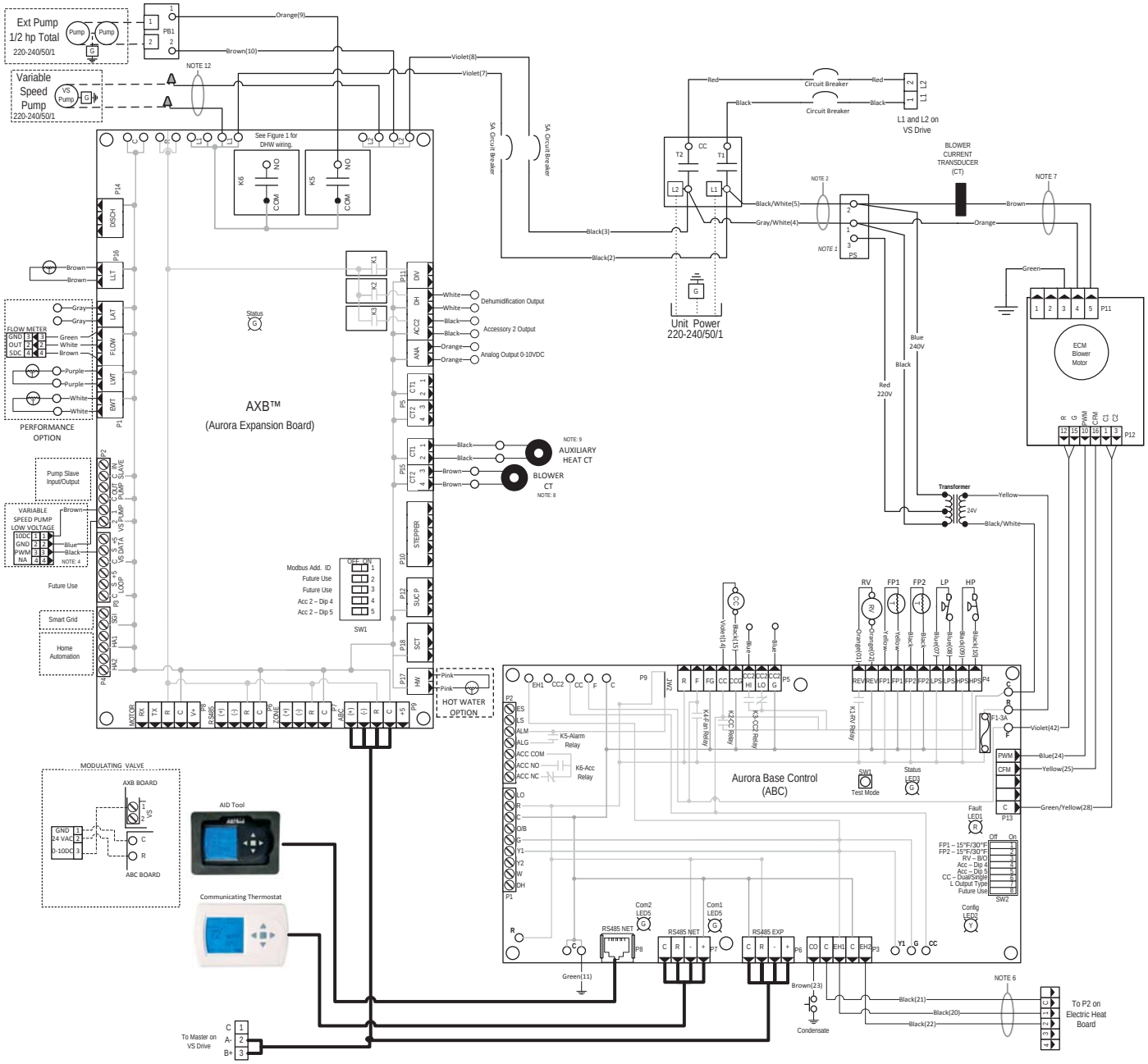
EWT °C	Flow L/s	WPD kPa	HEATING - EAT 21.1°C							EWT °C	Flow L/s	WPD kPa	COOLING - EAT 26.7/19.4°C							
			Airflow L/s	HC kW	Power kW	HE kW	LAT °C	COP	HWC kW				Airflow L/s	TC kW	SC kW	S/T Ratio	Power kW	HR kW	EER	HWC kW
-6.7	0.5	13.79	Operation not recommended							-6.7	0.4	8.31	Operation not recommended							
	0.8	24.27									0.6	18.64								
	1.1	45.18	849.6	15.1	5.23	9.8	35.8	2.88	2.4		0.9	28.96								
			1038.4	15.4	5.27	10.1	33.4	2.91	2.2											
-1.1	0.5	13.44	849.6	16.6	5.07	11.6	37.3	3.28	2.5	-1.1	0.4	8.07	708	20.4	13.59	0.67	1.86	22.24	11.0	–
			1038.4	17.0	5.16	11.8	34.6	3.29	2.3				849.6	20.0	13.61	0.68	2.08	22.05	9.6	–
	0.8	23.57	849.6	16.8	5.12	11.7	37.5	3.28	2.5		0.6	18.09	708	20.4	13.57	0.67	1.80	22.17	11.3	–
			1038.4	17.1	5.21	11.9	34.8	3.28	2.3				849.6	19.7	13.97	0.71	2.18	21.90	9.1	–
	1.1	43.87	849.6	17.0	5.40	11.6	37.7	3.15	2.6		0.9	28.12	708	20.4	13.69	0.67	1.81	22.24	11.3	–
			1038.4	17.6	5.35	12.3	35.2	3.30	2.3				849.6	20.0	13.83	0.69	2.04	22.08	9.8	–
4.4	0.5	13.10	849.6	19.0	5.16	13.8	39.6	3.68	2.6	4.4	0.4	7.83	708	20.1	13.63	0.68	2.08	22.18	9.6	–
			1038.4	19.3	5.24	14.0	36.5	3.68	2.4				849.6	20.0	13.96	0.70	2.33	22.37	8.6	–
	0.8	22.86	849.6	19.2	5.18	14.0	39.8	3.70	2.7		0.6	17.55	708	20.1	13.63	0.68	2.01	22.13	10.0	–
			1038.4	19.6	5.29	14.3	36.8	3.71	2.5				849.6	19.9	14.22	0.71	2.35	22.29	8.5	–
	1.1	42.55	849.6	19.7	5.30	14.4	40.3	3.72	2.8		0.9	27.28	708	20.3	13.71	0.68	2.01	22.28	10.1	–
			1038.4	20.1	5.38	14.7	37.1	3.73	2.5				849.6	20.2	14.16	0.70	2.23	22.39	9.1	–
10.0	0.5	12.76	849.6	21.2	5.28	15.9	41.7	4.01	2.8	10.0	0.4	7.59	708	20.1	13.78	0.69	2.36	22.46	8.5	–
			1038.4	21.4	5.34	16.0	38.2	4.00	2.5				849.6	20.2	14.30	0.71	2.64	22.80	7.6	–
	0.8	22.16	849.6	21.4	5.27	16.1	42.0	4.06	2.9		0.6	17.01	708	20.1	13.81	0.69	2.27	22.41	8.9	–
			1038.4	21.9	5.39	16.5	38.6	4.07	2.6				849.6	20.2	14.45	0.72	2.59	22.75	7.8	–
	1.1	41.24	849.6	21.9	5.44	16.4	42.4	4.02	3.0		0.9	26.44	708	20.3	13.88	0.68	2.26	22.60	9.0	–
			1038.4	22.3	5.45	16.9	38.9	4.10	2.7				849.6	20.4	14.45	0.71	2.46	22.83	8.3	–
15.6	0.5	12.41	849.6	23.7	5.43	18.3	44.2	4.37	2.9	15.6	0.4	7.34	708	18.7	13.24	0.71	2.68	21.36	7.0	0.9
			1038.4	24.1	5.47	18.6	40.3	4.40	2.6				849.6	19.1	14.06	0.74	2.93	22.05	6.5	0.9
	0.8	21.45	849.6	24.3	5.45	18.8	44.8	4.45	3.1		0.6	16.47	708	18.8	13.30	0.71	2.58	21.33	7.3	0.8
			1038.4	24.6	5.53	19.1	40.7	4.45	2.8				849.6	19.2	14.13	0.74	2.85	22.06	6.7	0.9
	1.1	39.92	849.6	24.8	5.55	19.2	45.3	4.47	3.2		0.9	25.59	708	18.9	13.38	0.71	2.55	21.49	7.4	0.8
			1038.4	25.3	5.61	19.7	41.3	4.51	2.9				849.6	19.3	14.20	0.74	2.74	22.05	7.1	0.8
21.1	0.5	12.07	849.6	25.9	5.68	20.2	46.4	4.56	3.1	21.1	0.4	7.10	708	17.6	12.93	0.73	3.03	20.67	5.8	1.4
			1038.4	26.4	5.63	20.7	42.1	4.68	2.8				849.6	18.4	13.83	0.75	3.41	21.80	5.4	1.4
	0.8	20.74	849.6	27.3	5.65	21.7	47.7	4.83	3.3		0.6	15.93	708	17.7	13.01	0.73	2.91	20.64	6.1	1.3
			1038.4	27.4	5.68	21.8	43.0	4.83	2.9				849.6	18.6	14.04	0.75	3.14	21.75	5.9	1.3
	1.1	38.61	849.6	27.8	5.91	21.9	48.2	4.71	3.5		0.9	24.75	708	18.2	12.91	0.71	2.86	21.08	6.4	1.2
			1038.4	28.5	5.80	22.7	43.8	4.91	3.1				849.6	18.6	14.18	0.76	3.04	21.65	6.1	1.2
26.7	0.5	11.55	849.6	28.6	5.74	22.9	49.0	4.98	3.4	26.7	0.4	6.86	708	17.0	12.77	0.75	3.48	20.51	4.9	1.8
			1038.4	29.1	5.75	23.4	44.4	5.06	2.9				849.6	17.5	13.65	0.78	3.71	21.19	4.7	1.8
	0.8	20.04	849.6	29.9	5.84	24.1	50.3	5.12	3.6		0.6	15.39	708	17.1	12.87	0.75	3.34	20.48	5.1	1.7
			1038.4	30.2	5.78	24.4	45.2	5.21	3.1				849.6	17.7	13.65	0.77	3.53	21.19	5.0	1.7
	1.1	37.30	849.6	30.4	6.02	24.4	50.7	5.04	3.7		0.9	23.91	708	17.3	12.98	0.75	3.29	20.60	5.3	1.6
			1038.4	31.0	5.96	25.0	45.8	5.19	3.3				849.6	17.7	13.79	0.78	3.43	21.17	5.2	1.6
32.2	0.5	11.03	849.6	31.2	5.99	25.2	51.5	5.20	3.4	32.2	0.4	6.62	708	15.9	12.38	0.78	3.98	19.84	4.0	2.4
			1038.4	31.7	5.93	25.7	46.4	5.34	3.0				849.6	16.0	13.03	0.82	4.22	20.19	3.8	2.4
	0.8	19.32	849.6	32.8	6.08	26.7	53.1	5.40	3.7		0.6	14.84	708	16.0	12.51	0.78	3.83	19.80	4.2	2.3
			1038.4	33.2	5.93	27.3	47.6	5.60	3.3				849.6	16.1	13.03	0.81	3.99	20.12	4.0	2.3
	1.1	35.97	849.6	33.0	6.40	26.6	53.3	5.15	3.9		0.9	23.06	708	16.1	12.63	0.78	3.75	19.89	4.3	2.1
			1038.4	33.8	6.18	27.7	48.1	5.48	3.5				849.6	16.3	13.16	0.81	3.87	20.17	4.2	2.2
37.8	0.5	10.69	Operation not recommended							37.8	0.4	6.38	708	15.0	12.13	0.81	4.50	19.52	3.3	3.0
													849.6	15.2	12.70	0.84	4.64	19.79	3.3	3.0
	0.8	18.63									0.6	14.30	708	15.2	12.28	0.81	4.31	19.47	3.5	2.8
													849.6	15.3	12.79	0.84	4.42	19.73	3.5	2.9
	1.1	34.67									0.9	22.23	708	15.3	12.42	0.81	4.22	19.53	3.6	2.7
													849.6	15.5	12.94	0.84	4.30	19.76	3.6	2.7
43.3	0.5	10.34								43.3	0.4	6.14	708	13.6	11.42	0.84	5.06	18.65	2.7	3.8
													849.6	13.7	11.90	0.87	5.11	18.84	2.7	3.8
	0.8	17.92									0.6	13.76	708	13.7	11.59	0.84	4.85	18.58	2.8	3.6
													849.6	13.9	12.07	0.87	4.89	18.76	2.8	3.6
	1.1	33.36									0.9	21.38	708	13.9	11.73	0.85	4.73	18.60	2.9	3.4
													849.6	14.0	12.22	0.87	4.77	18.78	2.9	3.4
48.9	0.5	9.65								48.9	0.4	5.89	708	12.6	11.31	0.90	5.75	18.31	2.2	4.7
													849.6	12.4	11.48	0.93	5.60	17.97	2.2	4.7
	0.8	17.22									0.6	13.22	708	12.7	11.49	0.90	5.51	18.21	2.3	4.5
													849.6	12.4	11.69	0.94	5.52	17.97	2.3	4.5
	1.1	32.05									0.9	20.54	708	12.7	11.72	0.92	5.36	18.10	2.4	4.2
													849.6	12.7	11.81	0.93	5.36	18.02	2.4	4.2

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Wiring Schematics

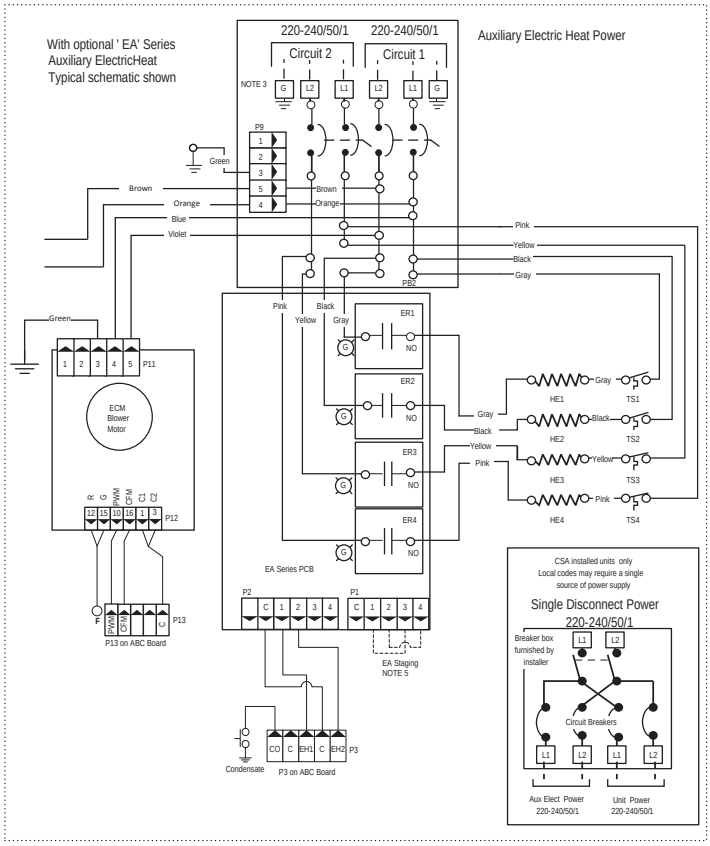
Aurora Variable Speed



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Wiring Schematics cont.

Aurora Variable Speed cont.



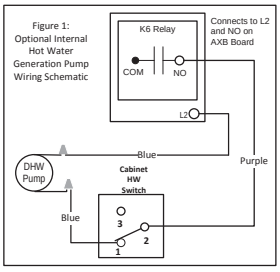


Figure 1:
Optional Internal
Hot Water
Generation Pump
Wiring Schematic

Notes

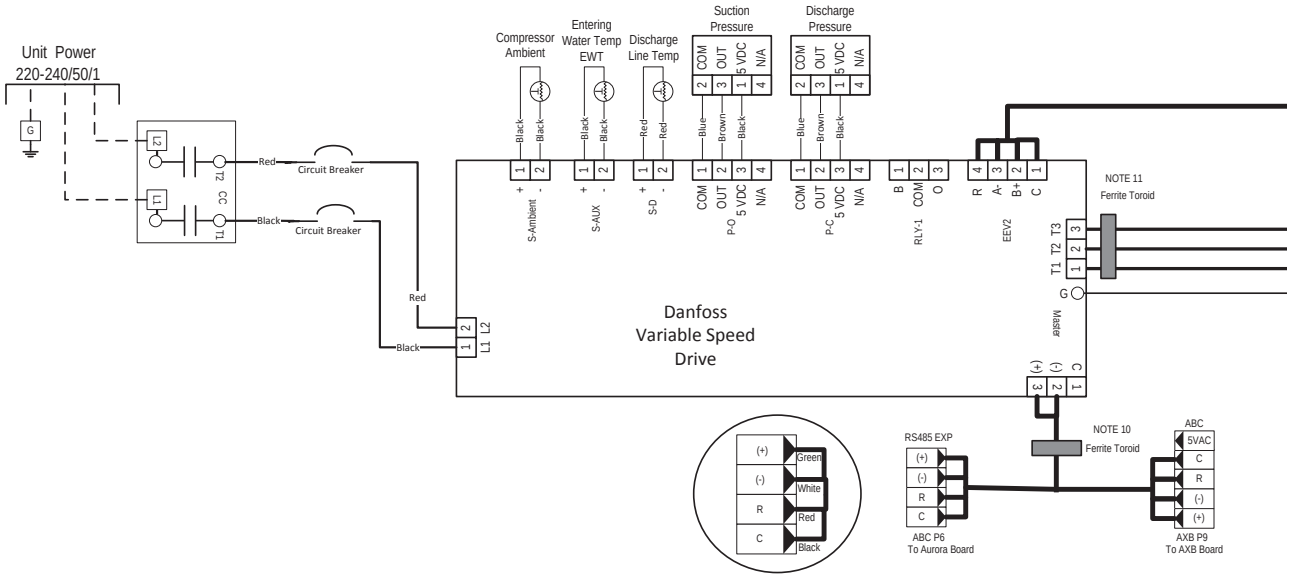
1 - Switch blue and red wires for 220V operation.
2 - The blk/wh and gray/wh wires are removed when Aux Heat is installed
3 - Use manufacturer's part number 19P592-01 (jumper bar assembly) when single source power is required.
4 – Variable speed pump low voltage harness provided with Variable Speed Flow Center.
5 - For additional Auxiliary Heat staging place jumpers as shown.
6 - Wires provided for Auxiliary Heat low voltage control. Wires are secured at blower.
7 – 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.
8 – Brown blower power wire routed through Current Transducer two times.
9 – Field Connected: Refer to Installation Manual and Auxiliary Heat Instructions for Current Transducer installation.
10 – Communication cable routed through Ferrite Toroid four times.
11 – Compressor power cable routed through Ferrite Toroid three times.
12 – Variable speed pump power wires to connect the pump to L1 and L2 on the AXB board are provided with Variable Speed Flow Center.

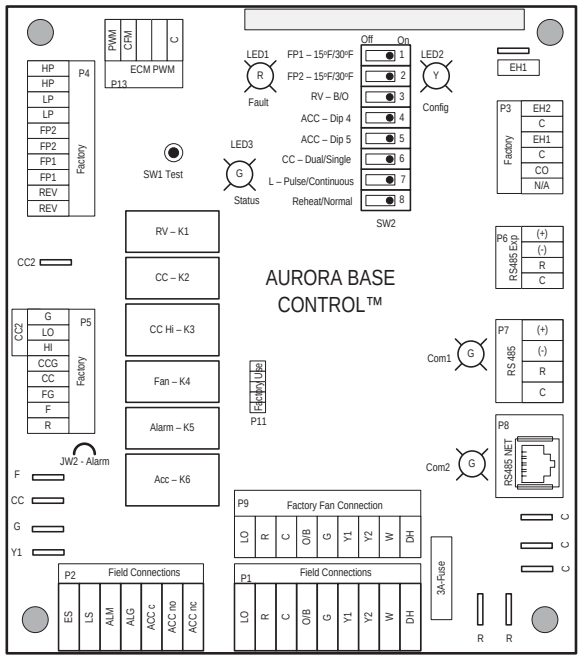
97P842-11A 02/15/13

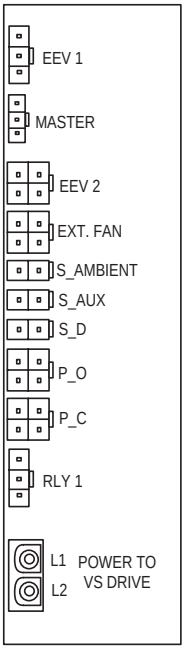
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Wiring Schematics cont.

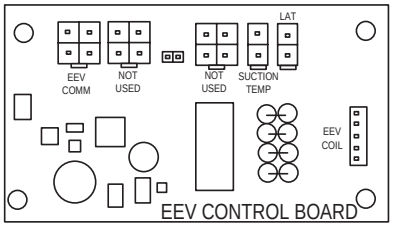
Aurora Variable Speed Drive/EEV Wiring

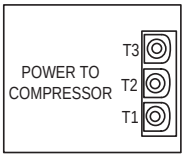






VARIABLE SPEED
DRIVE END VIEWS

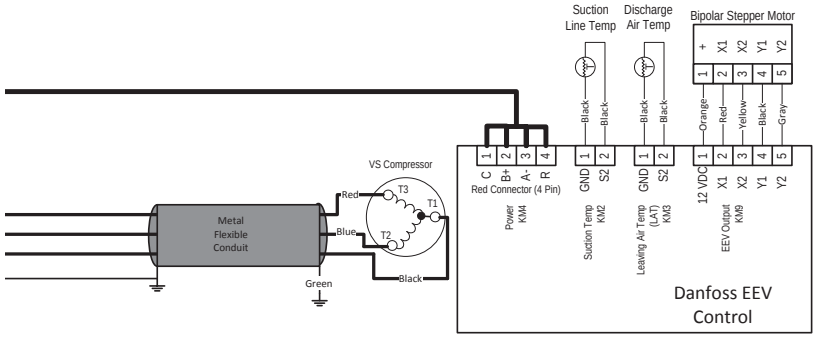


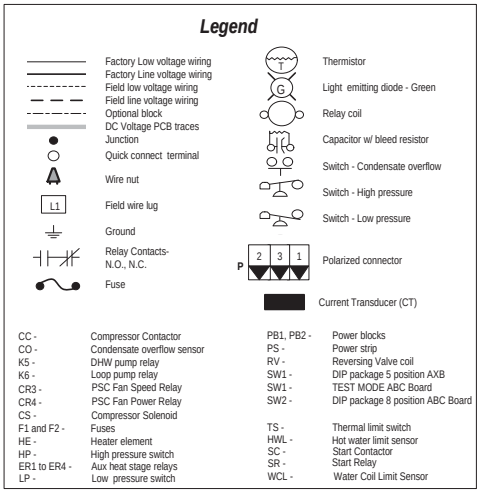


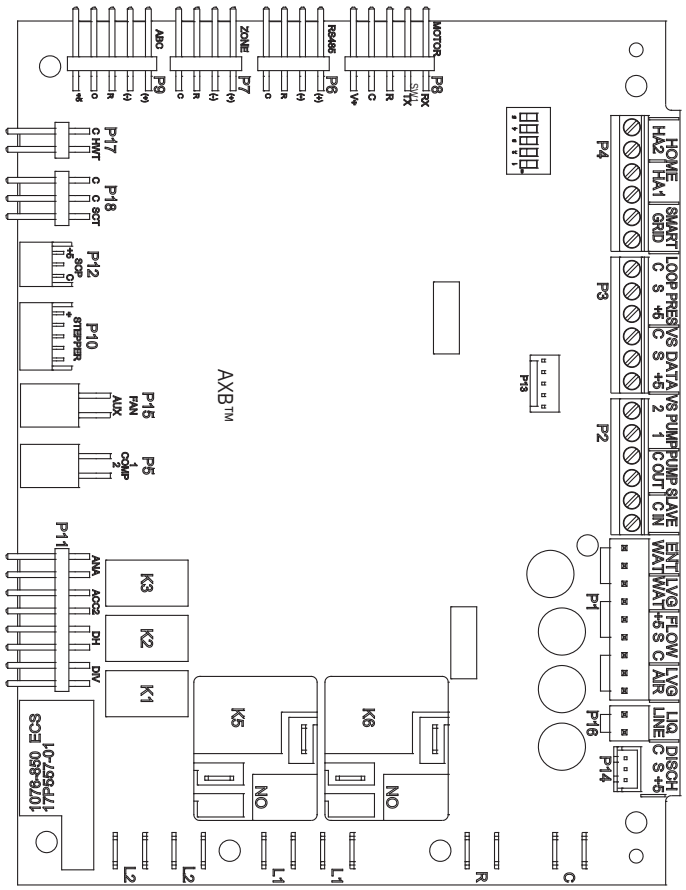
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Wiring Schematics cont.

Aurora Variable Speed Drive/EEV Wiring 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
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 and FP2 Sensor Error	Flash Code 11	Dehumidification Mode	Flash Code 2
Future Use	Flash Code 12	Future Use	Flash Code 3
Non-Critical AXB Sensor Error	Flash Code 13	Future Use	Flash Code 4
Critical AXB Sensor Error	Flash Code 14	Load Shed	Flash Code 5
Alarm - Hot 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	Safe Mode - Ambient Temperature Sensor	Flash Code 49
Fault - Critical Communication Error	Flash Code 19	Fault - Discharge Temperature Sensor	Flash Code 51
Alarm - Low Loop Pressure	Flash Code 21	Fault - Suction Pressure Sensor	Flash Code 52
Fault - Communication ECM Fan Motor Error	Flash Code 22	Fault - Condensing Pressure Sensor	Flash Code 53
Alarm - Home Automation 1	Flash Code 23	Fault - Low Supply Voltage	Flash Code 54
Alarm - Home Automation 2	Flash Code 24	Fault - Compressor Out of Envelope	Flash Code 55
Fault - EEV Error	Flash Code 25	Fault - Over Current	Flash Code 56
Derate - Drive Temperature	Flash Code 41	Fault - Over/Under Voltage	Flash Code 57
Derate - High Discharge Temperature	Flash Code 42	Fault - High Drive Temperature	Flash Code 58
Derate - Low Suction Temperature	Flash Code 43	Fault - Drive Internal Error MOC/AOC	Flash Code 59
Derate - Low Condensing Pressure	Flash Code 44	Fault - Multiple Safe Modes	Flash Code 61
Derate - High Condensing Pressure	Flash Code 45	Fault - Loss of Charge	Flash Code 71
Derate - Outer Power Limit	Flash Code 46	Safe Mode - Suction Temperature Sensor	Flash Code 72
Safe Mode - EEV (Indoor) Communication	Flash Code 47	Safe Mode - LAT Temperature Sensor	Flash Code 73
Safe Mode - EEV (Outdoor) Communication	Flash Code 48	Safe Mode - Max Operating Pressure	Flash Code 74

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

97P842-11B 2/15/13

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Engineering Guide Specifications

General

Furnish and install WaterFurnace Water Source Heat Pumps as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow. The reverse cycle heating/cooling units shall be either suspended type with horizontal air inlet and discharge or floor mounted type with horizontal air inlet and vertical upflow air discharge. 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 -6.7°C and 48.9°C.

Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with optional corrosion-resistant powder coating. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117. The interior shall be insulated with 12.7 mm 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 two compressor compartment access panels shall be 'lift-out' removable with supply and return ductwork in place.

A duct collar shall be provided on the supply air opening. Standard size 25.4mm MERV 4 filters shall be provided with each unit. Units shall have a return air filter rack that is field convertible from 25.4mm to 50.8mm. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise. Vertical units shall be supplied with left or right horizontal air inlet and top vertical air discharge. Horizontal units shall be supplied with left or right air inlet and side or end air discharge.

The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting. The compressor mounting bracket shall be acoustically deadened galvanized steel to prevent vibration transmission to the cabinet.

Option: AlpinePure MERV 13 filter - A 50.8mm thick MERV 13 filter can help fulfill a credit under the LEED Rating System. Its low initial resistance promotes low energy consumption (52.3 Pa @ 1.5 m/s) and provides nearly twice the life of a standard filter (1.5 m/s vs. standard 2.54 m/s application).

Refrigerant Circuit

All units shall utilize the non-ozone depleting and low global warming potential refrigerant R-410A. All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bidirectional thermostatic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, optional hot water generator coil, and service ports.

Compressors shall be high-efficiency single speed rotary or scroll type designed for heat pump duty and mounted on vibration isolators. The compressor shall be double isolation mounted using selected durometer grommets to provide vibration free compressor mounting.

Option: FormiShield electro-coated air coil for maximum protection against formicary corrosion.

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 air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 4135 kPa refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure.

The thermostatic 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.

Option: Cupronickel refrigerant to water heat exchanger shall be of copper-nickel inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure. Water lines shall also be of cupronickel construction.

Option: Hot water generator - Internal double wall vented hot water generator coil refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 4135 kPa working refrigerant pressure and 3101 kPa working water pressure.

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Engineering Guide Specifications cont.

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 isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermostatic overload protection.

Electrical

A control box shall be located within the unit compressor compartment and shall contain a 50VA or 75VA transformer, 24 volt activated, 2 pole compressor contactor, 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 microprocessor-based controller that 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, high and low pressure switch monitoring, freeze detection, condensate overflow sensing, lockout mode control, LED status and fault indicators, fault memory, field selectable options and accessory output. The control shall provide fault retry three times before locking out to limit nuisance trips.

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.

Piping

Supply and return water connections shall be FPT copper fittings fixed to the corner post, which eliminate the need for backup pipe wrenches.

With vertical units, the condensate connection shall be a 19.1 mm PVC socket with internally-trapped hose that can be routed to front or side corner post locations.

Hanger Kit

(included with horizontal units only - field installed)
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 in. threaded rods. Unit sizes 005-015 shall require four brackets and unit size 017 shall require five brackets. Brackets shall not inhibit filter removal in any way.

Options and Accessories

Cupronickel Heat Exchanger

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

Hot Water Generator

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

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.

Thermostat (field-installed)

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

Color Touchscreen Thermostat (field-installed)

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

Electronic Air Cleaner (field-installed)

A 25mm 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 0.05 kPa at 1.5 m/s force velocity.

Electrostatic Air Cleaner (field-installed)

A 25mm 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 0.04 kPa at 1.5 m/s force velocity.

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Engineering Guide Specifications cont.

AlpinePure 411–Rack 102mm Pleated Filter Accessory
A 102mm thick MERV 11 filter and filter rack shall be provided in lieu of the standard filter and rack.

AlpinePure MERV 13 Filter (field-installed)

A 50mm 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 HRV/ERV (field installed)

A self-contained unit shall provide removal of stale air while replenishing the structure with an equal amount of fresh, clean air. The incoming and exhaust air streams shall be completely separate through the exchanger. The Heat Recovery Ventilator (HRV) shall transfer sensible heat from the stale exhaust air to the fresh incoming air with a Sensible Efficiency up to 79%. The HRV shall be equipped with a Defrost Mode. The Energy Recovery Ventilator (ERV) shall transfer sensible heat as well as latent heat with a Total Efficiency of 50%. The ERV shall be designed for use in warm humid areas with heavy air conditioning use. The ERV shall not be recommended for use in areas where the temperature drops below -4°C for more than five days. The ERV shall not be equipped with a Defrost Mode.

AlpinePure HEPA Filter (field-installed)

For the ultimate in air filtration, the AlpinePure Series HEPA filter captures 99.97% of all particles down to 0.30 microns in size.

AlpinePure Drain Pan Treatment (field-installed)

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 76 L/s. The pumps shall be wired to a power block located in the nearest unit. The heat pump units shall contain low voltage pump slaving control so that two units may share one flow center.

Auxiliary Heater (field-installed)

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

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Revision Guide

Pages:	Description:	Date:	By:
All	First Published	05 Sept 2013	DS
3, 15-20	Updated data tables EER values to be in W/W units	18 Nov 2014	MA

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