

ENVISION™

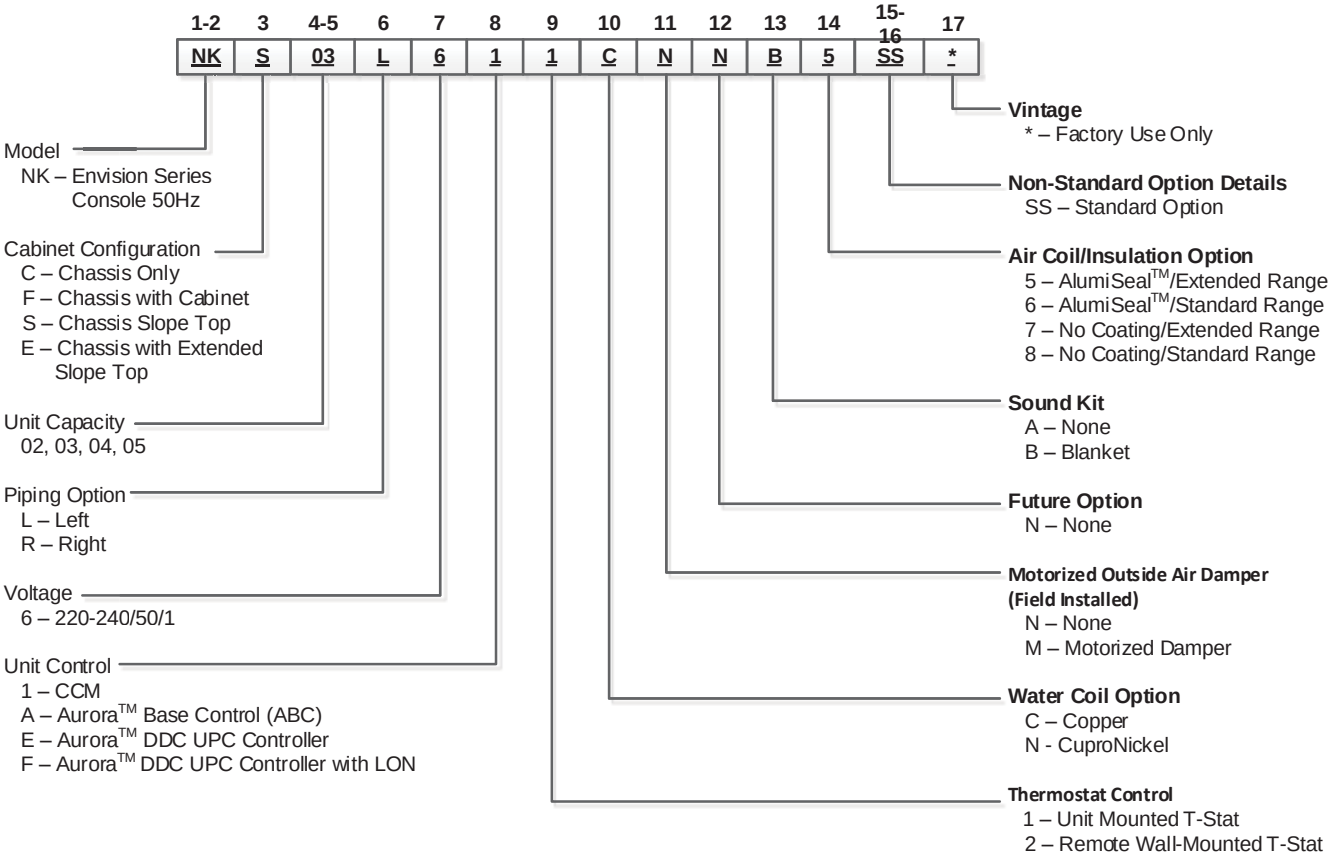
CONSOLE - 50 HZ

Commercial 2 to 5 kW
Geothermal/Water Source Heat Pump

WaterFurnace®
Smarter from the Ground Up™

Submittal Data
English Language/IP Units
SD1015CNB 12/15

Model Nomenclature



NOTES: Chassis only available with left piping option.
UPC option is only available with remote wall-mounted thermostat control.

Intertek

All Envision Series product is Safety listed under UL1995 thru ETL.

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AHRI/ISO 13256-1 Performance Ratings

ECM Motors

AHRI/ASHRAE/ISO 13256-1

Metric (SI) Units

Model	Flow Rate		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
			Cooling EWT 30°C		Heating EWT 20°C		Cooling EWT 15°C		Heating EWT 10°C		Cooling EWT 25°C		Heating EWT 0°C	
	water l/S	air l/S	Capacity Watts	COP (W/W)	Capacity Watts	COP	Capacity Watts	COP (W/W)	Capacity Watts	COP	Capacity Watts	COP (W/W)	Capacity Watts	COP
02	0.2	120.0	2,290	4.3	2,780	5.0	2,750	7.5	2,290	4.2	2,490	5.3	1,760	3.3
03	0.2	140.0	2,780	3.9	3,660	4.9	3,370	6.4	3,020	4.1	2,990	4.7	2,370	3.6
04	0.3	205.0	3,750	4.5	4,690	5.5	4,430	7.3	3,810	4.5	3,990	5.3	2,930	3.6
05	0.3	225.0	4,370	4.1	5,600	5.0	5,160	6.5	4,480	4.1	4,600	5.0	3,490	3.3

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Cooling capacities based upon 27°C DB, 19°C WB entering air temperature
Heating capacities based upon 20°F DB, 15°C WB entering air temperature
All ratings based upon 220V operation

Definitions

ABBREVIATIONS AND DEFINITIONS:

CFM = airflow, cubic feet/minute
EWT = entering water temperature, Fahrenheit
GPM = water flow in gallons/minute
WPD = water pressure drop, PSI and feet of water
EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
HC = air heating capacity, MBTUH
TC = total cooling capacity, MBTUH
SC = sensible cooling capacity, MBTUH
KW = total power unit input, kilowatts
HR = total heat of rejection, MBTUH
HE = total heat of extraction, MBTUH
HW = desuperheater capacity, MBTUH
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, MBTUH
LC = latent cooling capacity, MBTUH
S/T = sensible to total cooling ratio

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Contractor: _____ P.O.: _____

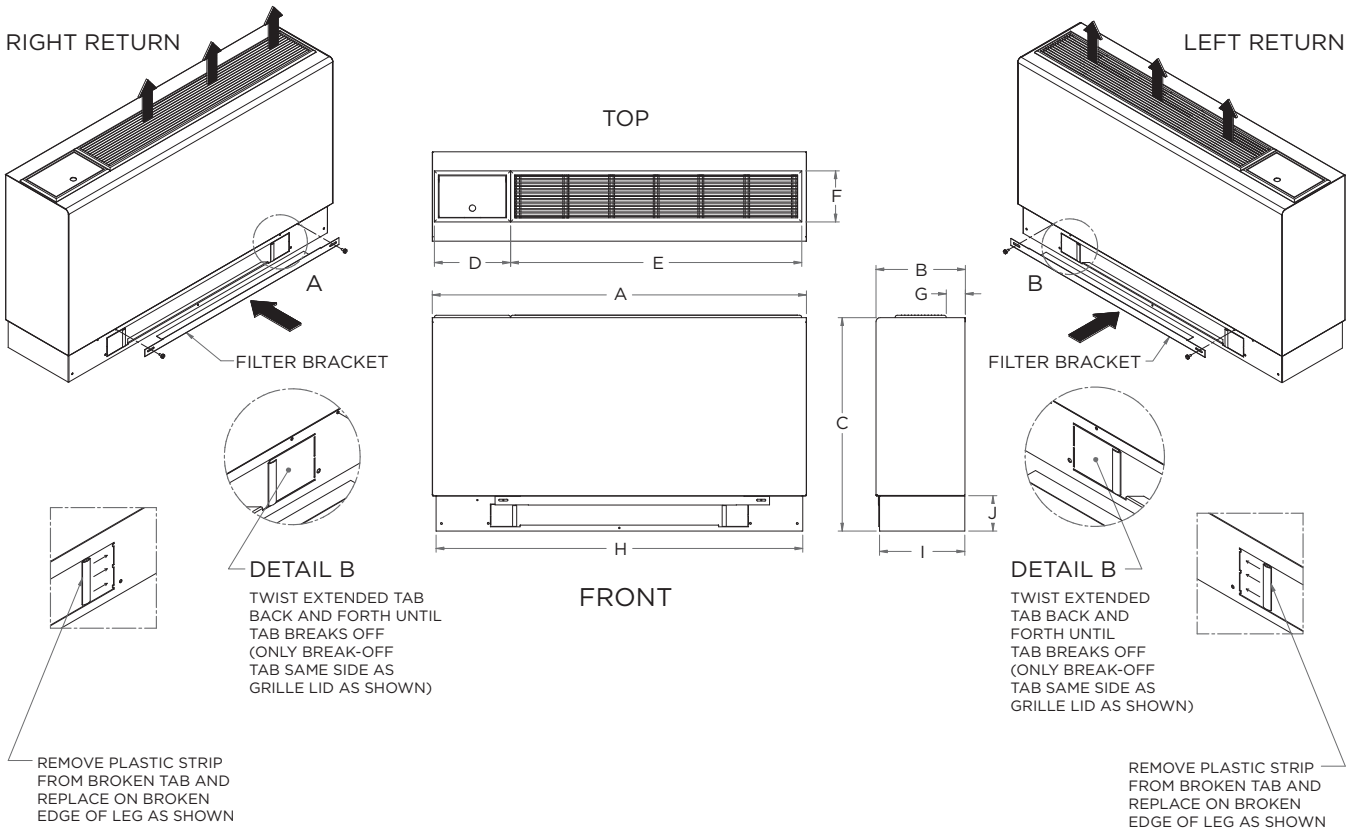
Engineer: _____

Project Name: _____ Unit Tag: _____

ENVISION Console - 50 Hz
Commercial 2 to 5 kW

Dimensional Data - Flat Top Cabinet

NKW02-05

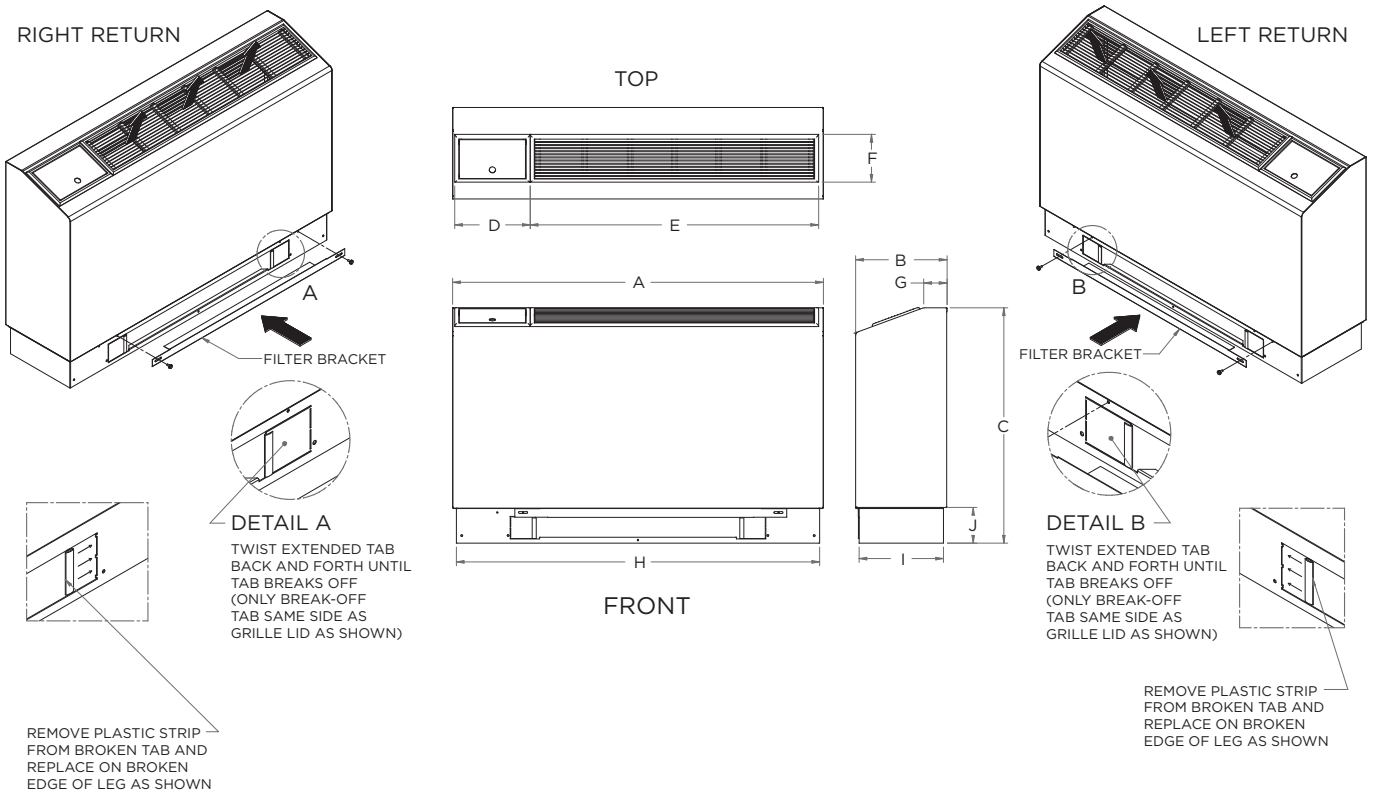


Flat Top Configuration		Overall Cabinet									
		A	B	C	D	E	F	G	H	I	J
		Width	Depth	Height	Grille Lid	Grille Length	Grille Width				
02-03	in.	45.0	10.8	25.7	9.2	35.0	6.1	2.3	44.1	10.3	4.3
	cm.	114.3	27.3	65.2	23.4	88.9	15.6	5.8	112.0	26.0	10.9
04-05	in.	50.0	12.3	25.7	9.2	35.0	6.1	3.3	49.1	11.8	4.3
	cm.	127.0	31.1	65.2	23.4	88.9	15.6	8.3	124.7	29.8	10.9

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Dimensional Data - Slope Top Cabinet

NKS02-05

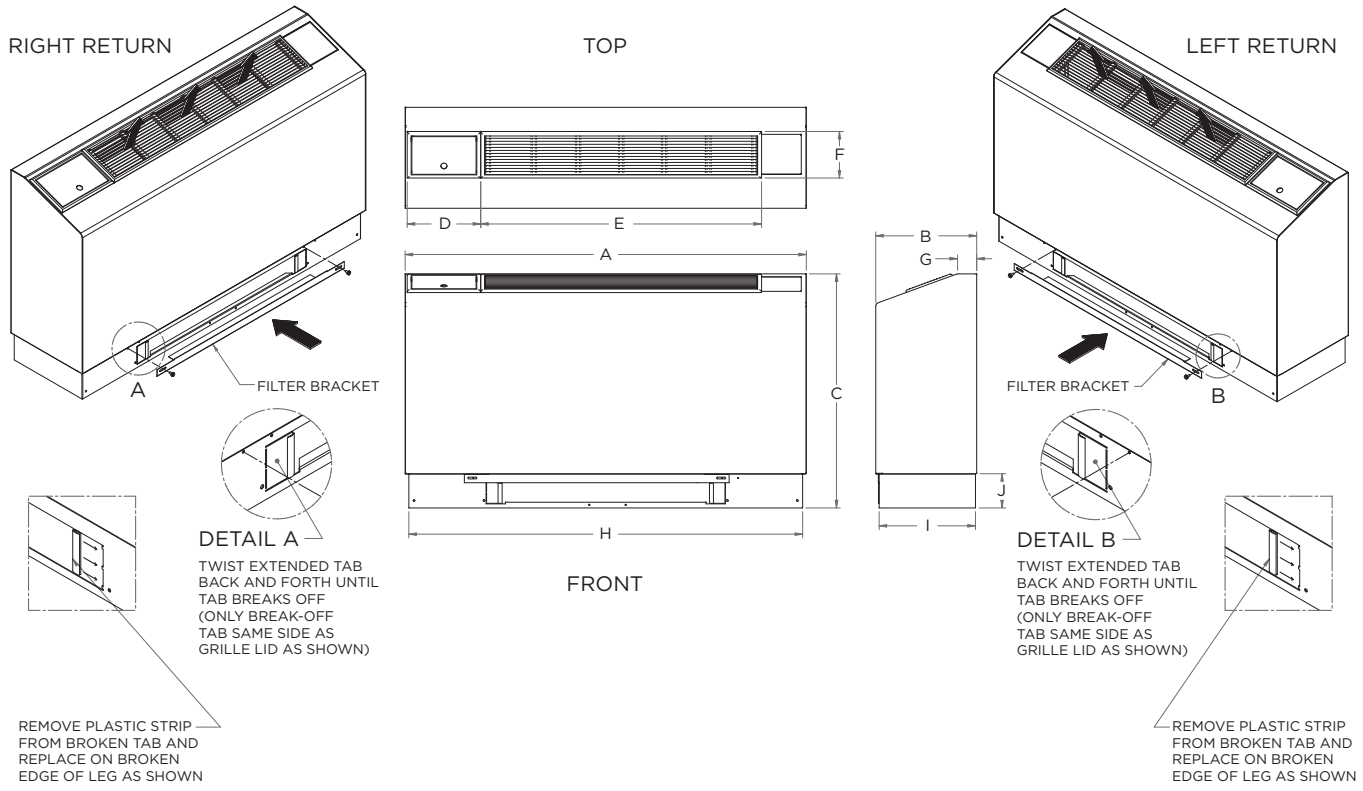


Slope Top Configuration		Overall Cabinet									
		A Width	B Depth	C Height	D Grille Lid	E Grille Length	F Grille Width	G	H	I	J
02-03	in.	45.0	11.1	28.6	9.2	35.0	6.1	2.8	44.1	10.3	4.3
	cm.	114.3	28.2	72.6	23.4	88.9	15.6	7.2	112.0	26.0	10.9
04-05	in.	50.0	12.6	29.1	9.2	35.0	6.1	2.5	49.1	11.8	4.3
	cm.	127.0	32.0	73.9	23.4	88.9	15.6	6.4	124.7	29.8	10.9

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Dimensional Data - Extended Slope Top Cabinet

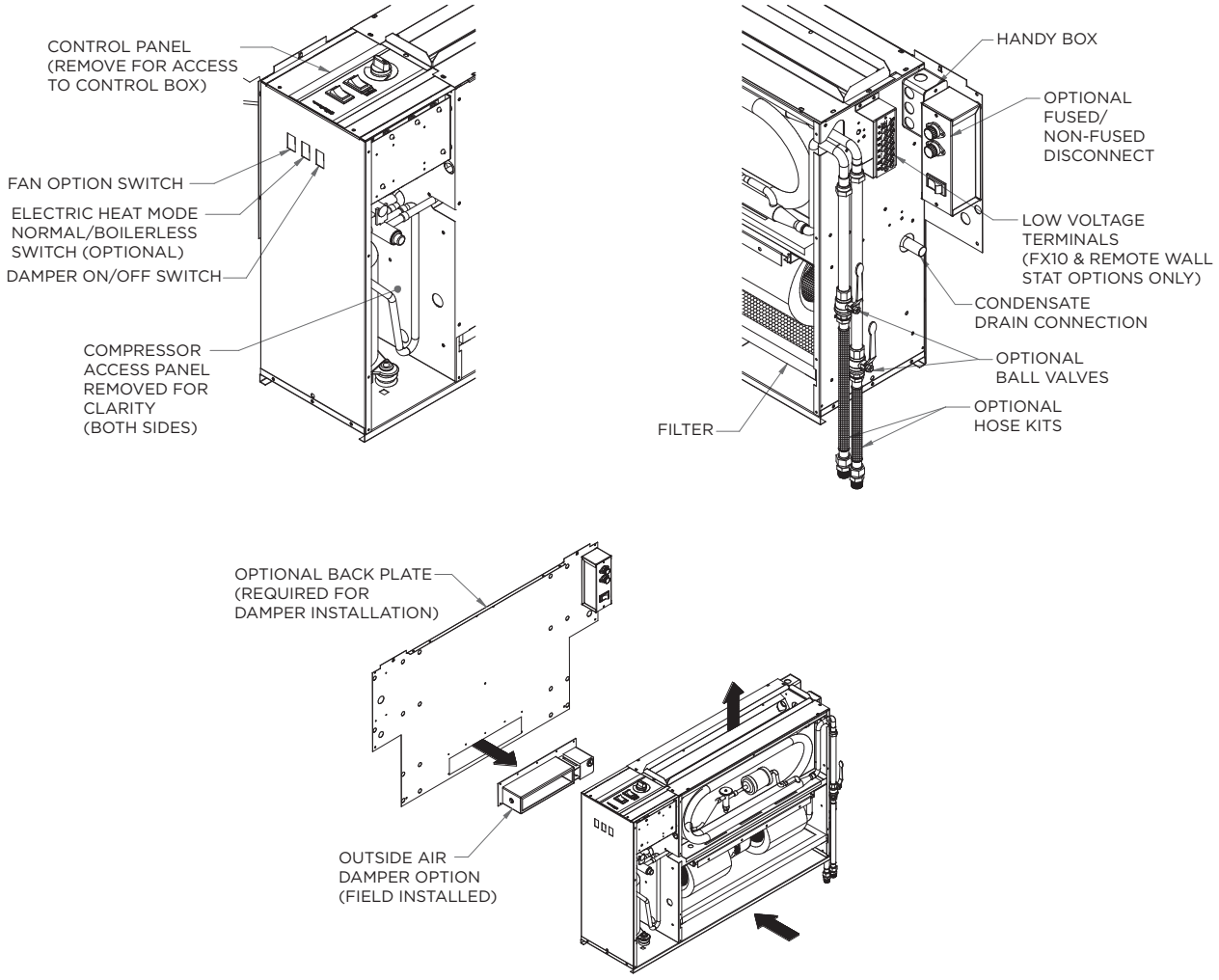
NKE02-05



Ext. Slope Top Configuration		Overall Cabinet									
		A Width	B Depth	C Height	D Grille Lid	E Grille Length	F Grille Width	G	H	I	J
02-03	in.	50.0	12.6	29.1	9.2	35.0	6.1	2.4	49.1	12.0	4.3
	cm.	127.0	32.0	73.9	23.4	88.9	15.6	6.1	124.7	30.5	10.9
04-05	in.	55.0	12.6	29.1	9.2	35.0	6.1	2.5	54.1	11.8	4.3
	cm.	139.7	32.0	73.9	23.4	88.9	15.6	6.4	137.4	29.8	10.9

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Dimensional Data - Right Return Controls Detail

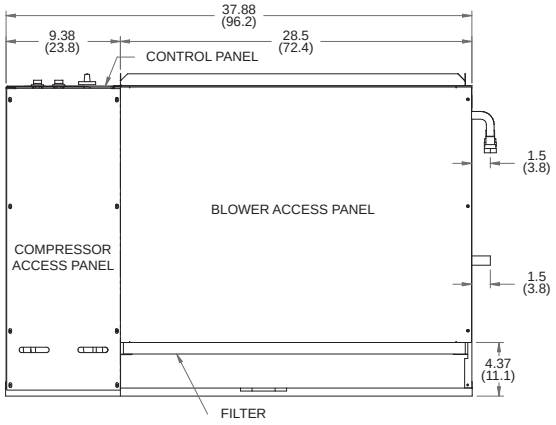


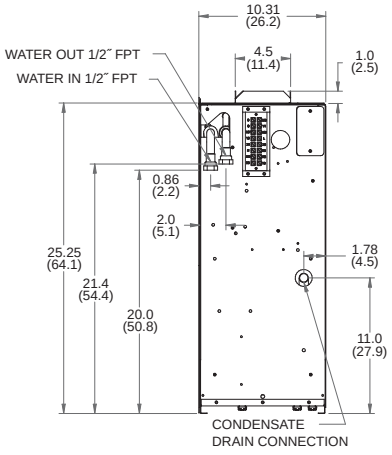
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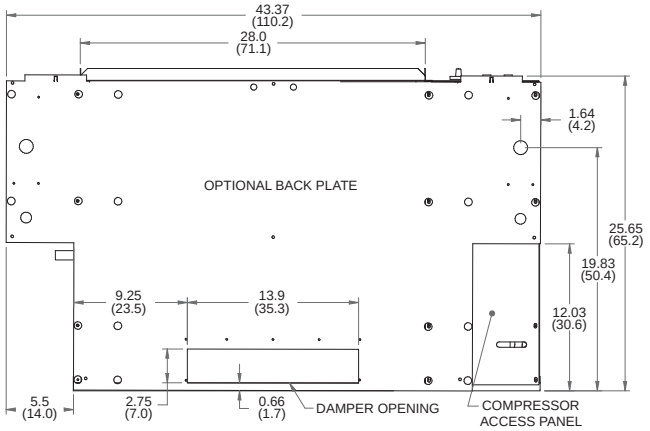
Dimensional Data - Right Return Chassis

Data = inches (cm)

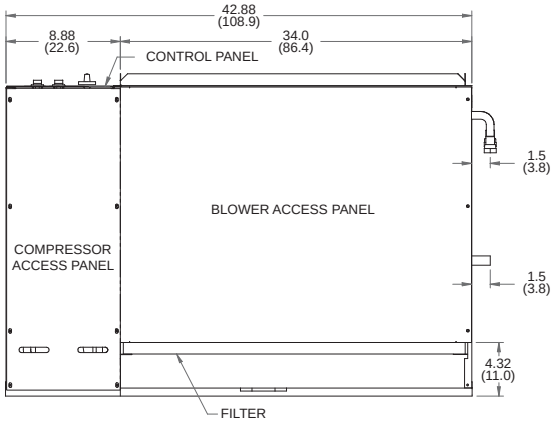
Models 02-03

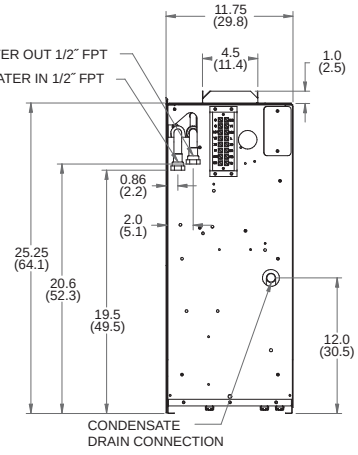


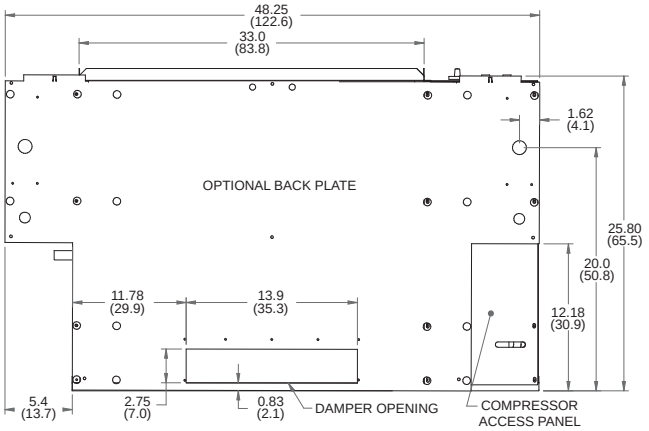




Models 04-05

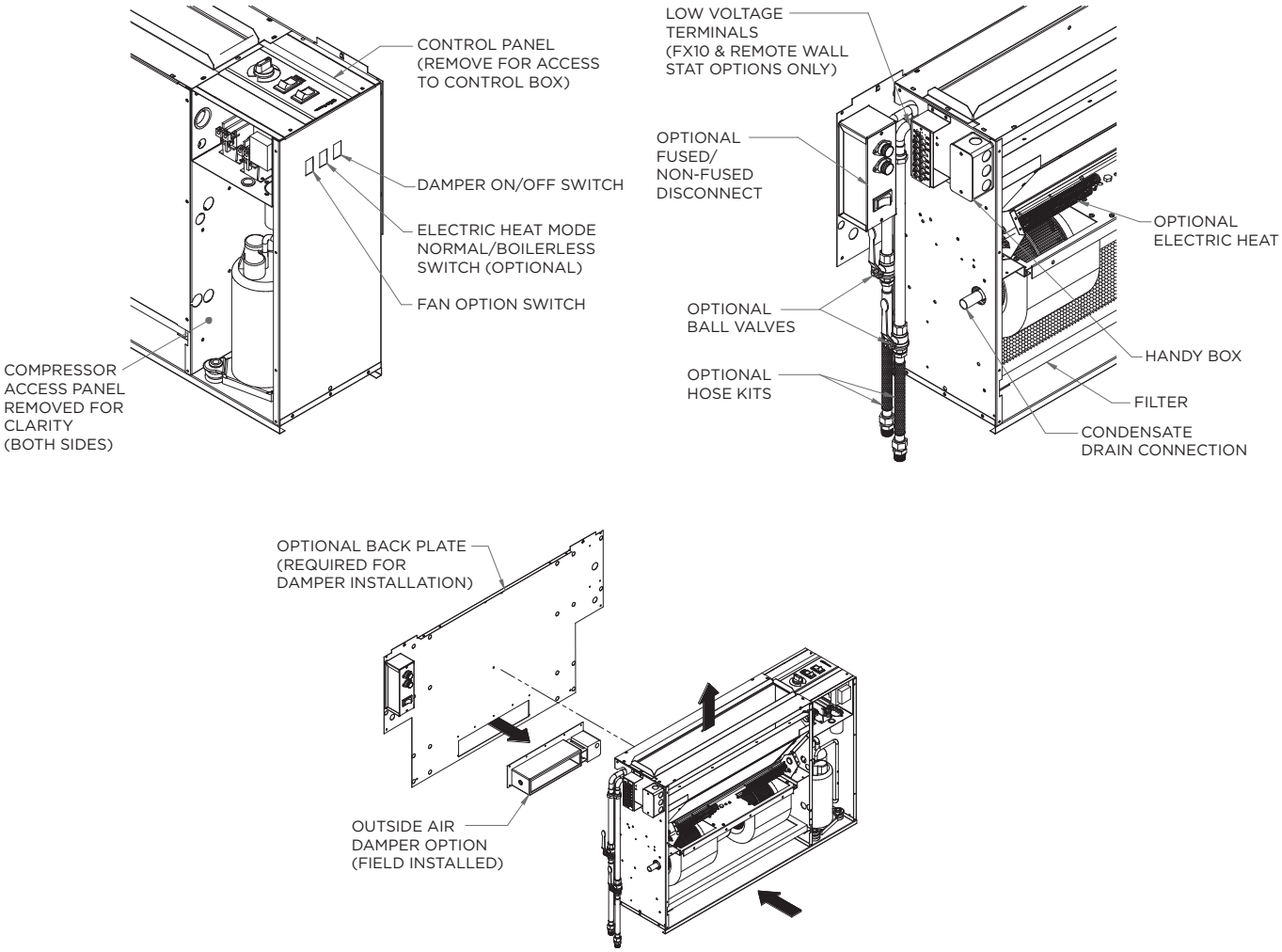






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Dimensional Data - Left Return Controls Detail

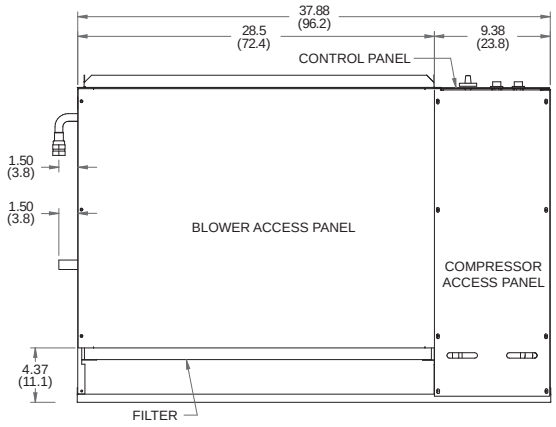


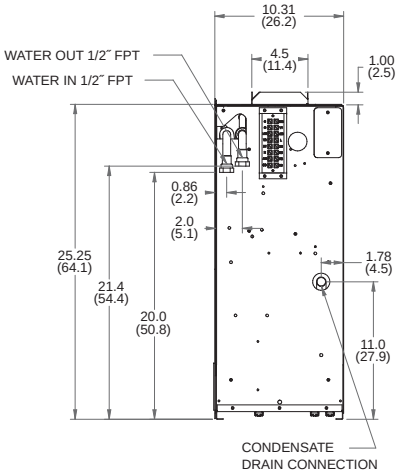
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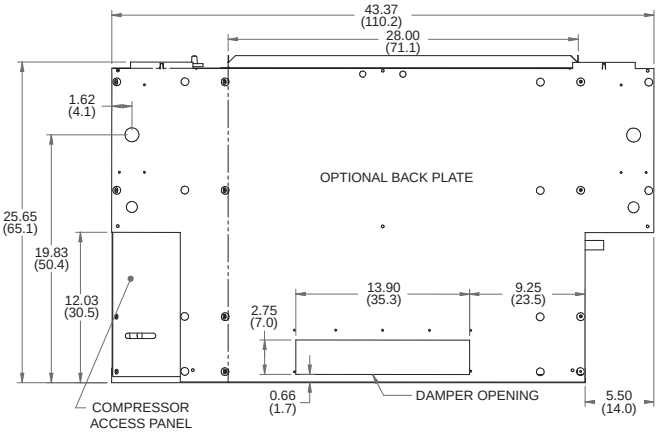
Dimensional Data - Left Return Chassis

Data = inches (cm)

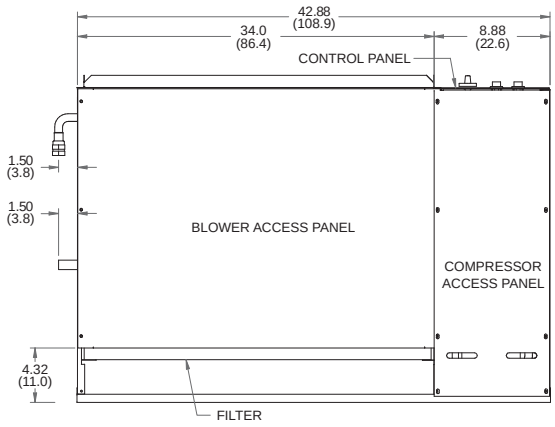
Models 02-03

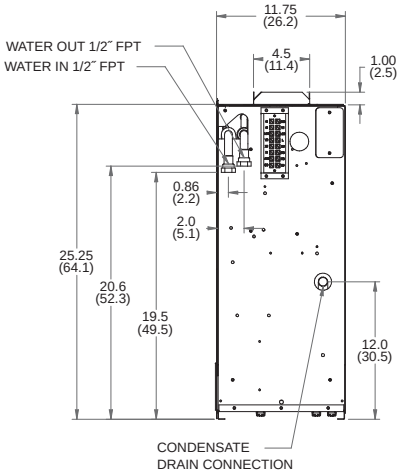


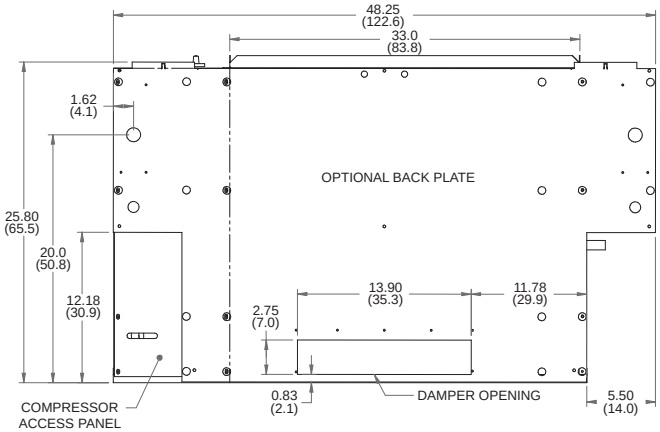




Models 04-05







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Physical Data - Single Speed

Model		Consoles			
		02	**03**	**04**	**05**
Compressor (1 each)		LG Rotary			
Factory Charge R410A, oz [kg]		27 [0.77]	27 [0.77]	36 [1.02]	34 [0.96]
Fan Motor & Blower					
Fan Motor Type/Speeds	ECM	3 Speeds			
Fan Motor- hp [W]	ECM	0.25 [186]	0.25 [186]	0.25 [186]	0.25 [186]
Blower Wheel Size (Dia x W), in. [mm]	ECM	5.75 x 5.5 [146 x 140]	5.75 x 5.5 [146 x 140]	6.0 x 6.5 [152 x 165]	6.0 x 6.5 [152 x 165]
Coax and Water Piping					
Water Connections Size - FPT - in [mm]		1/2" [12.7]	1/2" [12.7]	1/2" [12.7]	1/2" [12.7]
Coax & Piping Water Volume - gal [l]		0.15 [0.6]	0.18 [0.7]	0.35 [1.3]	0.35 [1.3]
Consoles					
Air Coil Dimensions (H x W), in. [mm]		8 x 22 [203 x 559]	8 x 22 [203 x 559]	8 x 30 [203 x 762]	8 x 30 [203 x 762]
Air Coil Total Face Area, ft2 [m2]		1.2 [0.114]	1.2 [0.114]	1.7 [0.155]	1.7 [0.155]
Air Coil Tube Size, in [mm]		3/8 [9.5]	3/8 [9.5]	3/8 [9.5]	3/8 [9.5]
Air Coil Number of rows		3	3	4	4
Filter Standard - 1" [25.44mm]		1 - 10 x 28 [254 x 711]	1 - 10 x 28 [254 x 711]	1 - 12 x 33 [305 x 838]	1 - 12 x 33 [305 x 838]
Weight - Operating, lb [kg]		210 [91]	210 [95]	230 [102]	235 [107]
Weight - Packaged, lb [kg]		220 [100]	220 [100]	240 [109]	245 [111]

1/20/14

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Electrical Data

ECM Blowers

Model	Rated Voltage	Voltage Min/Max	Compressor			Blower Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
			MCC	RLA	LRA				
02	220-240/50/1	198/264	6.4	4.1	17.0	2.6	6.7	7.7	10/15
03	220-240/50/1	198/264	7.6	4.9	18.7	2.6	7.5	8.8	10/15
04	220-240/50/1	198/264	9.2	5.9	23.0	2.6	8.5	10.0	15
05	220-240/50/1	198/264	10.5	6.7	24.0	2.6	9.3	11.0	15

HACR circuit breaker in USA only

3/05/14

Blower Performance Data

ECM Blowers

Model	LPS		
	Low Speed	Medium Speed	High Speed
02	140	150	190
03	140	150	190
04	165	210	280
05	165	210	280

Factory settings are in Bold
Air flow values are with dry coil and standard filter.

For wet coil performance first calculate the face velocity of the air coil (Face Velocity [mps] = Airflow [lps] / Face Area [m^2]). Then for velocities of 1 mps, reduce the static capability by 7.5 pa, 1.5 mps by 19.9 pa, 2 mps by 29.9 pa and 2.5 mps by 39.8 pa.

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Correction Factor Tables

Air Flow Corrections

Airflow		Cooling				Heating		
LPS Per 3kW of Clg	**% of Nominal**	**Total Cap**	**Sens Cap**	**Power**	**Heat of Rej**	**Htg Cap**	**Power**	**Heat of Ext**
115	60	0.922	0.786	0.910	0.920	0.943	1.150	0.893
130	69	0.944	0.827	0.924	0.940	0.958	1.105	0.922
140	75	0.959	0.860	0.937	0.955	0.968	1.078	0.942
155	81	0.971	0.894	0.950	0.967	0.977	1.053	0.959
165	88	0.982	0.929	0.964	0.978	0.985	1.031	0.973
175	94	0.992	0.965	0.982	0.990	0.993	1.014	0.988
190	**100**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**	**1.000**
200	106	1.007	1.034	1.020	1.010	1.007	0.990	1.011
210	113	1.012	1.065	1.042	1.018	1.013	0.983	1.020
225	119	1.017	1.093	1.066	1.026	1.018	0.980	1.028
235	125	1.019	1.117	1.092	1.033	1.023	0.978	1.034
245	130	1.020	1.132	1.113	1.038	1.026	0.975	1.038

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Cooling Capacity Corrections

Entering Air WB ºC	Total Clg Cap	Sensible Cooling Capacity Multipliers - Entering DB ºC									Power Input	Heat of Rejection
		16	**18**	**21**	**24**	**27**	**29**	**32**	**35**	**38**		
13	0.898	0.723	0.866	1.048	1.185	*	*	*	*	*	0.985	0.913
16	0.912		0.632	0.880	1.078	1.244	*	*	*	*	0.994	0.927
18	0.967			0.694	0.881	1.079	1.270	*	*	*	0.997	0.972
19	**1.000**			0.616	0.806	**1.000**	1.193	1.330	*	*	**1.000**	**1.000**
21	1.053				0.693	0.879	1.075	1.250	1.404	*	1.003	1.044
24	1.168					0.687	0.875	1.040	1.261	1.476	1.007	1.141

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

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Heating Capacity Corrections

Ent Air DB °C	Heating Corrections		
	Htg Cap	**Power**	**Heat of Ext**
7	1.062	0.739	1.158
10	1.050	0.790	1.130
13	1.037	0.842	1.096
16	1.025	0.893	1.064
18	1.012	0.945	1.030
20	1.005	0.976	1.012
21	**1.000**	**1.000**	**1.000**
24	0.987	1.048	0.970
27	0.975	1.099	0.930

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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 dependant upon three primary factors: 1) water temperature, 2) return air temperature, and 3) ambient temperature. When any of the factors are at the minimum or maximum levels, the other two factors must be at the normal level for proper and reliable unit operation.

Definitions

ABBREVIATIONS AND DEFINITIONS:

AF = airflow, liters per second
EWT = entering water temperature, °Celsius
WF = water flow in liters/second
WPD = water pressure drop, Pascal
EAT = entering air temperature, °Celsius (dry bulb/wet bulb)
HC = air heating capacity, kilowatts
TC = total cooling capacity, kilowatts
SC = sensible cooling capacity, kilowatts
KW = total power unit input, kilowatts
HR = total heat of rejection, kilowatts
HE = total heat of extraction, kilowatts
HW = hot water generator capacity, kilowatts
EER = Energy Efficient Ratio = Watt output/Watt input
COP = Coefficient of Performance = Watt output/Watt input
LWT = leaving water temperature, °Celsius
LAT = leaving air temperature, °Celsius
TH = total heating capacity, kilowatts
LC = latent cooling capacity, kilowatts
S/T = sensible to total cooling ratio

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Antifreeze Correction

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

Antifreeze Type	Antifreeze % by wt	Cooling Capacity	Heating Capacity	Pressure Drop
EWT - degF [DegC]		**90 [32.2]**	**30 [-1.1]**	**30 [-1.1]**
Water	0	1.000	1.000	1.000
Ethylene Glycol	10	0.991	0.973	1.075
	20	0.979	0.943	1.163
	30	0.965	0.917	1.225
	40	0.955	0.890	1.324
	50	0.943	0.865	1.419
Propylene Glycol	10	0.981	0.958	1.130
	20	0.969	0.913	1.270
	30	0.950	0.854	1.433
	40	0.937	0.813	1.614
	50	0.922	0.770	1.816
Ethanol	10	0.991	0.927	1.242
	20	0.972	0.887	1.343
	30	0.947	0.856	1.383
	40	0.930	0.815	1.523
	50	0.911	0.779	1.639
Methanol	10	0.986	0.957	1.127
	20	0.970	0.924	1.197
	30	0.951	0.895	1.235
	40	0.936	0.863	1.323
	50	0.920	0.833	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 [32°C] respectively as well as pressure drop at 30°F [-1°C] for an Envision Console Series NK05.

The corrected cooling capacity at 32°C would be: 5.0 kW x 0.969 = 4.9 kW

The corrected heating capacity at -1°C would be: 4.2 kW x 0.913 = 3.8 kW

The corrected pressure drop at -1°C and 0.35 l/s would be: 54.4 kPa x 1.270 = 69.1 kPa

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Pressure Drop

Model	l/s	Pressure Drop (kPa)				
		0°C	10°C	20°C	30°C	40°C
02	0.08	6.9	6.2	5.5	4.8	4.1
	0.11	15.9	15.2	13.8	13.1	12.4
	0.16	26.2	25.5	24.1	22.8	21.4
03	0.09	6.2	5.5	4.8	4.1	3.5
	0.15	11.7	10.3	9.7	9.0	7.6
	0.22	20.7	18.6	17.2	16.6	15.2
04	0.13	11.7	11.0	10.3	9.7	9.0
	0.19	22.8	22.1	20.7	20.0	19.3
	0.25	28.3	27.6	26.9	25.5	24.8
05	0.13	11.7	11.0	10.3	9.7	9.0
	0.22	25.5	24.8	24.1	22.8	22.1
	0.28	39.3	37.9	36.5	35.2	33.8

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NK02 - Performance Data

120 lps Rated Airflow

EWT ºC	Flow Rate l/s	Water Pressure Drop kPa	HEATING - EAT 20 °C					COOLING - EAT 27/19 °C					
			HC kW	Power kW	HE kW	LAT ºC	COP	TC kW	SC kW	S/T Ratio	Power kW	HR kW	COP
-5	0.08	7.6	Operation not recommended					Operation not recommended					
	0.11	16.6											
	0.16	26.2	1.31	0.49	0.82	30.1	2.67						
0	0.08	6.9	Operation not recommended					Operation not recommended					
	0.11	15.9	1.47	0.50	0.98	31.4	2.97	2.77	1.61	0.58	0.28	3.05	9.76
	0.16	26.2	1.50	0.50	1.00	31.6	3.00	2.81	1.64	0.58	0.27	3.08	10.37
5	0.08	6.9	1.66	0.50	1.16	32.8	3.30	Operation not recommended					
	0.11	15.9	1.69	0.51	1.18	33.0	3.32	2.61	1.56	0.60	0.31	2.93	8.35
	0.16	26.2	1.72	0.51	1.21	33.3	3.36	2.66	1.59	0.60	0.30	2.96	8.81
10	0.08	6.2	1.87	0.51	1.35	34.4	3.63	2.43	1.50	0.62	0.36	2.79	6.67
	0.11	15.2	1.90	0.52	1.38	34.7	3.65	2.47	1.52	0.61	0.35	2.82	7.05
	0.16	25.5	1.94	0.53	1.41	35.0	3.69	2.51	1.54	0.62	0.33	2.84	7.49
15	0.08	6.2	2.15	0.54	1.61	36.6	3.99	2.29	1.45	0.63	0.40	2.70	5.67
	0.11	14.5	2.18	0.54	1.64	36.8	4.01	2.33	1.47	0.63	0.39	2.72	5.99
	0.16	24.8	2.23	0.55	1.68	37.2	4.05	2.37	1.50	0.63	0.37	2.74	6.36
20	0.08	5.5	2.43	0.56	1.86	38.7	4.32	2.21	1.41	0.64	0.46	2.67	4.80
	0.11	13.8	2.46	0.57	1.90	39.0	4.34	2.24	1.43	0.64	0.44	2.69	5.06
	0.16	24.1	2.51	0.57	1.94	39.4	4.39	2.28	1.45	0.64	0.42	2.70	5.38
25	0.08	5.5	2.64	0.57	2.07	40.4	4.61	2.12	1.37	0.64	0.52	2.64	4.11
	0.11	13.8	2.69	0.58	2.11	40.7	4.64	2.16	1.38	0.64	0.50	2.65	4.34
	0.16	23.4	2.74	0.58	2.16	41.2	4.69	2.19	1.41	0.64	0.48	2.67	4.61
30	0.08	4.8	2.85	0.58	2.27	42.0	4.89	2.01	1.32	0.66	0.58	2.59	3.49
	0.11	13.1	2.90	0.59	2.31	42.4	4.92	2.05	1.34	0.66	0.56	2.60	3.69
	0.16	22.8	2.96	0.60	2.36	42.8	4.97	2.08	1.37	0.66	0.53	2.61	3.92
35	0.08	4.8	Operation not recommended					Operation not recommended					
	0.11	12.4						1.93	1.30	0.67	0.61	2.54	3.16
	0.16	22.1						1.96	1.32	0.67	0.58	2.55	3.36
40	0.08	4.1						Operation not recommended					
	0.11	12.4						1.83	1.26	0.69	0.67	2.50	2.72
	0.16	21.4						1.86	1.28	0.69	0.64	2.50	2.89
45	0.08	4.1						Operation not recommended					
	0.11	11.7						1.72	1.22	0.71	0.74	2.46	2.33
	0.16	20.7						1.75	1.24	0.71	0.71	2.46	2.48

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NK03 - Performance Data

140 lps Rated Airflow

EWT ºC	Flow Rate l/s	Water Pressure Drop kPa	HEATING - EAT 20 °C					COOLING - EAT 27/19 °C					
			HC kW	Power kW	HE kW	LAT ºC	COP	TC kW	SC kW	S/T Ratio	Power kW	HR kW	COP
-5	0.09	6.9	Operation not recommended					Operation not recommended					
	0.15	11.7											
	0.22	22.1	1.73	0.66	1.06	31.4	2.60						
0	0.09	6.2	Operation not recommended					Operation not recommended					
	0.15	11.7	1.95	0.67	1.28	32.9	2.90	3.12	1.65	0.53	0.39	3.51	8.03
	0.22	20.7	1.99	0.68	1.31	33.1	2.93	3.17	1.68	0.53	0.37	3.54	8.53
5	0.09	6.2	2.17	0.68	1.48	34.3	3.18	Operation not recommended					
	0.15	11.0	2.20	0.69	1.51	34.6	3.20	2.95	1.60	0.54	0.43	3.38	6.87
	0.22	20.0	2.25	0.70	1.55	34.9	3.23	3.00	1.63	0.54	0.41	3.41	7.25
10	0.09	5.5	2.42	0.70	1.72	36.0	3.45	2.74	1.53	0.56	0.50	3.24	5.49
	0.15	10.3	2.46	0.71	1.75	36.2	3.48	2.78	1.55	0.56	0.48	3.26	5.80
	0.22	18.6	2.51	0.71	1.79	36.6	3.51	2.83	1.58	0.56	0.46	3.29	6.16
15	0.09	5.5	2.68	0.71	1.97	37.7	3.77	2.59	1.48	0.57	0.55	3.14	4.67
	0.15	9.7	2.73	0.72	2.01	38.0	3.79	2.63	1.50	0.57	0.53	3.16	4.93
	0.22	17.9	2.78	0.73	2.06	38.4	3.83	2.67	1.53	0.57	0.51	3.18	5.24
20	0.09	4.8	2.95	0.72	2.22	39.5	4.07	2.46	1.60	0.65	0.62	3.07	3.98
	0.15	9.7	2.99	0.73	2.26	39.8	4.10	2.50	1.62	0.65	0.59	3.09	4.20
	0.22	17.2	3.06	0.74	2.32	40.2	4.14	2.54	1.65	0.65	0.57	3.11	4.46
25	0.09	4.8	3.21	0.74	2.47	41.2	4.35	2.33	1.72	0.74	0.68	3.01	3.42
	0.15	9.0	3.26	0.75	2.52	41.6	4.38	2.36	1.74	0.74	0.66	3.02	3.61
	0.22	17.2	3.33	0.75	2.58	42.0	4.42	2.40	1.78	0.74	0.63	3.03	3.83
30	0.09	4.1	3.47	0.75	2.72	42.9	4.61	2.18	1.67	0.76	0.75	2.93	2.89
	0.15	9.0	3.53	0.76	2.77	43.3	4.64	2.21	1.69	0.76	0.73	2.94	3.05
	0.22	16.6	3.60	0.77	2.83	43.8	4.69	2.25	1.72	0.76	0.69	2.94	3.24
35	0.09	4.1	Operation not recommended					Operation not recommended					
	0.15	8.3						2.09	1.63	0.78	0.80	2.89	2.62
	0.22	15.9						2.12	1.66	0.78	0.76	2.89	2.78
40	0.09	3.5						Operation not recommended					
	0.15	7.6						1.97	1.58	0.80	0.88	2.85	2.25
	0.22	15.2						2.01	1.61	0.80	0.84	2.85	2.39
45	0.09	3.5						Operation not recommended					
	0.15	7.6						1.86	1.53	0.82	0.97	2.83	1.93
	0.22	14.5						1.90	1.56	0.82	0.92	2.82	2.05

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

NK04 - Performance Data

200 lps Rated Airflow

EWT ºC	Flow Rate l/s	Water Pressure Drop kPa	HEATING - EAT 20 °C					COOLING - EAT 27/19 °C					
			HC kW	Power kW	HE kW	LAT ºC	COP	TC kW	SC kW	S/T Ratio	Power kW	HR kW	COP
-5	0.13	12.4	Operation not recommended					Operation not recommended					
	0.19	23.4											
	0.25	29.0	2.11	0.77	1.35	29.8	2.76						
0	0.13	11.7	Operation not recommended					Operation not recommended					
	0.19	22.8	2.38	0.77	1.61	31.0	3.08	4.32	2.90	0.67	0.44	4.77	9.73
	0.25	28.3	2.43	0.78	1.78	31.3	3.11	4.39	2.96	0.67	0.43	4.82	10.34
5	0.13	11.7	2.70	0.79	1.91	32.5	3.44	Operation not recommended					
	0.19	22.1	2.74	0.79	1.95	32.7	3.46	4.08	2.81	0.69	0.49	4.57	8.32
	0.25	28.3	2.80	0.80	2.00	33.0	3.49	4.15	2.87	0.69	0.47	4.62	8.79
10	0.13	11.0	3.05	0.80	2.25	34.1	3.80	3.79	2.69	0.71	0.57	4.36	6.66
	0.19	22.1	3.10	0.81	2.29	34.4	3.82	3.86	2.73	0.71	0.55	4.40	7.03
	0.25	27.6	3.16	0.82	2.48	34.6	3.86	3.92	2.78	0.71	0.52	4.44	7.47
15	0.13	11.0	3.41	0.81	2.60	35.8	4.20	3.58	2.61	0.73	0.63	4.22	5.66
	0.19	21.4	3.47	0.82	2.65	36.1	4.23	3.64	2.64	0.73	0.61	4.25	5.97
	0.25	26.9	3.54	0.83	2.71	36.4	4.27	3.70	2.69	0.73	0.58	4.28	6.35
20	0.13	10.3	3.77	0.82	2.95	37.5	4.60	3.40	2.55	0.75	0.71	4.12	4.76
	0.19	20.7	3.83	0.83	3.01	37.8	4.63	3.46	2.58	0.75	0.69	4.14	5.02
	0.25	26.9	3.91	0.84	3.22	38.1	4.68	3.51	2.63	0.75	0.66	4.17	5.34
25	0.13	10.3	4.11	0.84	3.28	39.0	4.92	3.22	2.48	0.77	0.80	4.02	4.04
	0.19	20.7	4.18	0.85	3.33	39.4	4.95	3.27	2.51	0.77	0.77	4.04	4.27
	0.25	26.2	4.27	0.85	3.41	39.7	5.00	3.32	2.56	0.77	0.73	4.06	4.54
30	0.13	9.7	4.44	0.85	3.59	40.6	5.20	3.04	2.39	0.79	0.88	3.92	3.44
	0.19	20.0	4.51	0.86	3.65	40.9	5.24	3.09	2.42	0.78	0.85	3.94	3.63
	0.25	25.5	4.61	0.87	3.74	41.3	5.29	3.14	2.47	0.79	0.81	3.95	3.86
35	0.13	9.7	Operation not recommended					Operation not recommended					
	0.19	19.3						2.92	2.34	0.80	0.94	3.85	3.12
	0.25	25.5						2.96	2.39	0.81	0.89	3.86	3.31
40	0.13	9.0						Operation not recommended					
	0.19	19.3						2.75	2.27	0.82	1.03	3.78	2.68
	0.25	24.8						2.80	2.31	0.83	0.98	3.78	2.85
45	0.13	9.0						Operation not recommended					
	0.19	18.6						2.60	2.20	0.85	1.13	3.73	2.30
	0.25	24.1						2.64	2.24	0.85	1.08	3.73	2.44

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NK05 - Performance Data

220 lps Rated Airflow

EWT ºC	Flow Rate l/s	Water Pressure Drop kPa	HEATING - EAT 20 °C					COOLING - EAT 27/19 °C					
			HC kW	Power kW	HE kW	LAT ºC	COP	TC kW	SC kW	S/T Ratio	Power kW	HR kW	COP
-5	0.13	12.4	Operation not recommended					Operation not recommended					
	0.22	26.2											
	0.28	40.7	1.73	0.66	1.06	27.3	2.60						
0	0.13	11.7	Operation not recommended					Operation not recommended					
	0.22	25.5	1.95	0.67	1.28	28.2	2.90	3.12	2.04	0.65	0.39	3.51	8.03
	0.28	39.3	1.99	0.68	1.31	28.4	2.93	3.17	2.08	0.66	0.37	3.54	8.53
5	0.13	11.7	2.17	0.68	1.48	29.1	3.18	Operation not recommended					
	0.22	25.5	2.20	0.69	1.51	29.3	3.20	2.95	1.98	0.67	0.43	3.38	6.87
	0.28	38.6	2.25	0.70	1.55	29.5	3.23	3.00	2.02	0.67	0.41	3.41	7.25
10	0.13	11.0	2.42	0.70	1.72	30.2	3.45	2.74	1.89	0.69	0.50	3.24	5.49
	0.22	24.8	2.46	0.71	1.75	30.3	3.48	2.78	1.92	0.69	0.48	3.26	5.80
	0.28	37.9	2.51	0.71	1.79	30.6	3.51	2.83	1.95	0.69	0.46	3.29	6.16
15	0.13	11.0	2.68	0.71	1.97	31.3	3.77	2.59	1.83	0.71	0.55	3.14	4.67
	0.22	24.1	2.73	0.72	2.01	31.5	3.79	2.63	1.86	0.71	0.53	3.16	4.93
	0.28	37.2	2.78	0.73	2.06	31.7	3.83	2.67	1.89	0.71	0.51	3.18	5.24
20	0.13	10.3	2.95	0.72	2.22	32.4	4.07	2.46	1.78	0.72	0.62	3.07	3.98
	0.22	24.1	2.99	0.73	2.26	32.6	4.10	2.50	1.80	0.72	0.59	3.09	4.20
	0.28	36.5	3.06	0.74	2.32	32.9	4.14	2.54	1.83	0.72	0.57	3.11	4.46
25	0.13	10.3	3.21	0.74	2.47	33.5	4.35	2.33	1.72	0.74	0.68	3.01	3.42
	0.22	23.4	3.26	0.75	2.52	33.7	4.38	2.36	1.74	0.74	0.66	3.02	3.61
	0.28	35.9	3.33	0.75	2.58	34.0	4.42	2.40	1.78	0.74	0.63	3.03	3.83
30	0.13	9.7	3.47	0.75	2.72	34.6	4.61	2.18	1.67	0.76	0.75	2.93	2.89
	0.22	22.8	3.53	0.76	2.77	34.8	4.64	2.21	1.69	0.76	0.73	2.94	3.05
	0.28	35.2	3.60	0.77	2.83	35.1	4.69	2.25	1.72	0.76	0.69	2.94	3.24
35	0.13	9.7	Operation not recommended					Operation not recommended					
	0.22	22.8						2.09	1.63	0.78	0.80	2.89	2.62
	0.28	34.5						2.12	1.66	0.78	0.76	2.89	2.78
40	0.13	9.0						Operation not recommended					
	0.22	22.1						1.97	1.58	0.80	0.88	2.85	2.25
	0.28	33.8						2.01	1.61	0.80	0.84	2.85	2.39
45	0.13	9.0						Operation not recommended					
	0.22	21.4						1.86	1.53	0.82	0.97	2.83	1.93
	0.28	33.1						1.90	1.56	0.82	0.92	2.82	2.05

8/17/10

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

ENVISION Console - 50 Hz
Commercial 2 to 5 kW

WaterFurnace
Smarter from the Ground Up™

Wiring Schematics

CCM - with ECM Motor and Electronic Stat

220-240/50/1

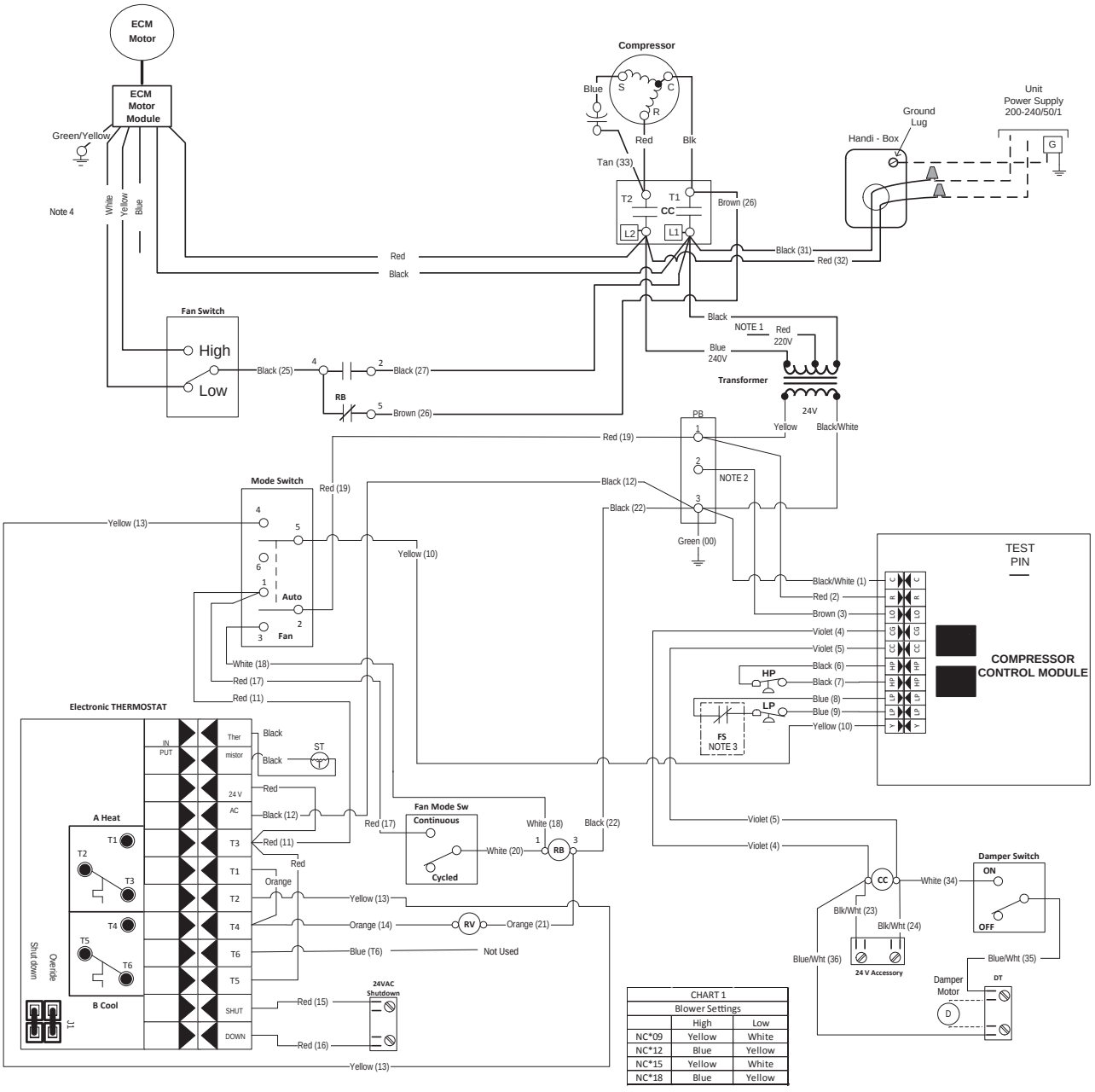


CHART 1		
Blower Settings		
	High	Low
NC*09	Yellow	White
NC*12	Blue	Yellow
NC*15	Yellow	White
NC*18	Blue	Yellow

Legend

- Factory low voltage wiring
- Factory line voltage wiring
- Field low voltage wiring
- Field line voltage wiring
- Quick connect terminal
- Wire nut

CC - Compressor Contactor
DT - Damper Terminal Block
FS - Freeze Sensing Device
HP - High Pressure Switch
LP - Low Pressure Switch
PB - Power Block
RB - Blower Relay
RV - Reversing Valve Coil
ST - Entering Air Temperature Sensor

- L1 — Field wire lug
- Earth Ground
- Relay Contacts - N.O., N.C.
- P — Polarized connector
- HP — Switch - High Pressure
- LP — Switch - Low Pressure
- Relay coil
- Capacitor
- T — Thermistor
- Temperature Switch

Notes:

1. Switch Red and Blue wires for 220 volt operation
2. Terminal C of 24 V PB is used as "L" output for Brown wire 3 for Lockout.
3. Optional field installed freeze sensing device.
4. Factory wired. Refer to blower table settings.

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Wiring Schematics cont.

CCM w/ECM - ELECTRONIC THERMOSTAT

220-240/50/1

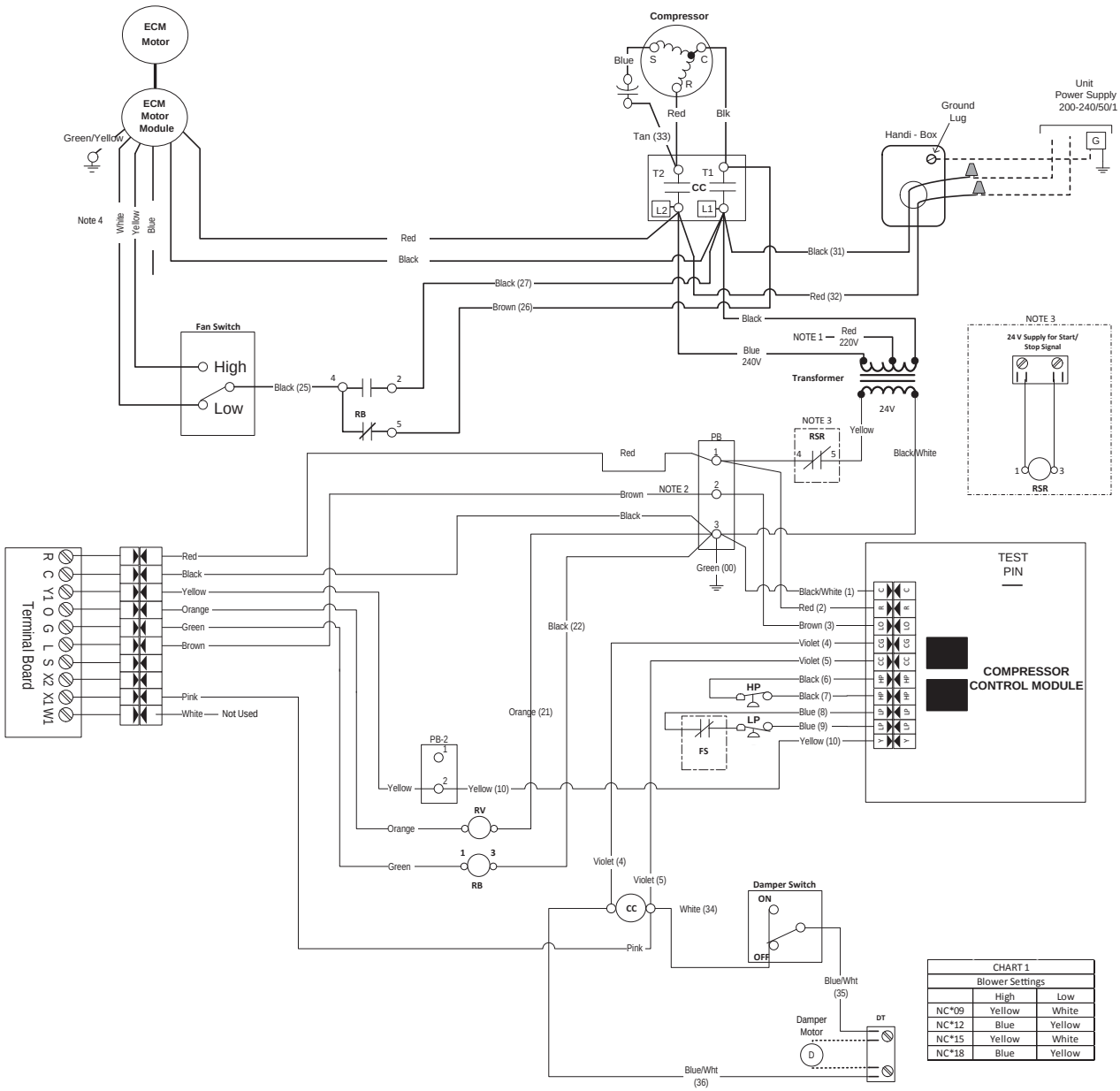


CHART 1		
Blower Settings		
	High	Low
NC*09	Yellow	White
NC*12	Blue	Yellow
NC*15	Yellow	White
NC*18	Blue	Yellow

Legend

- Factory low voltage wiring
- Factory line voltage wiring
- Factory low voltage wiring
- Factory line voltage wiring
- Quick connect terminal
- Wire nut

CC - Compressor Contactor
DT - Damper Terminal Block
FS - Freeze Sensing Device
HP - High Pressure Switch
LP - Low Pressure Switch
PB - Power Block
RB - Blower Relay
RSR – Remote Start/Stop Relay
RV - Reversing Valve Coil
ST - Entering Air Temperature Sensor

- L1 Wiring lug
- Ground
- Relay Contacts - N.O., N.C.

- HP Switch - High Pressure
- LP Switch - Low Pressure
- Relay coil
- Capacitor
- T Thermistor
- Temperature Switch

Notes:

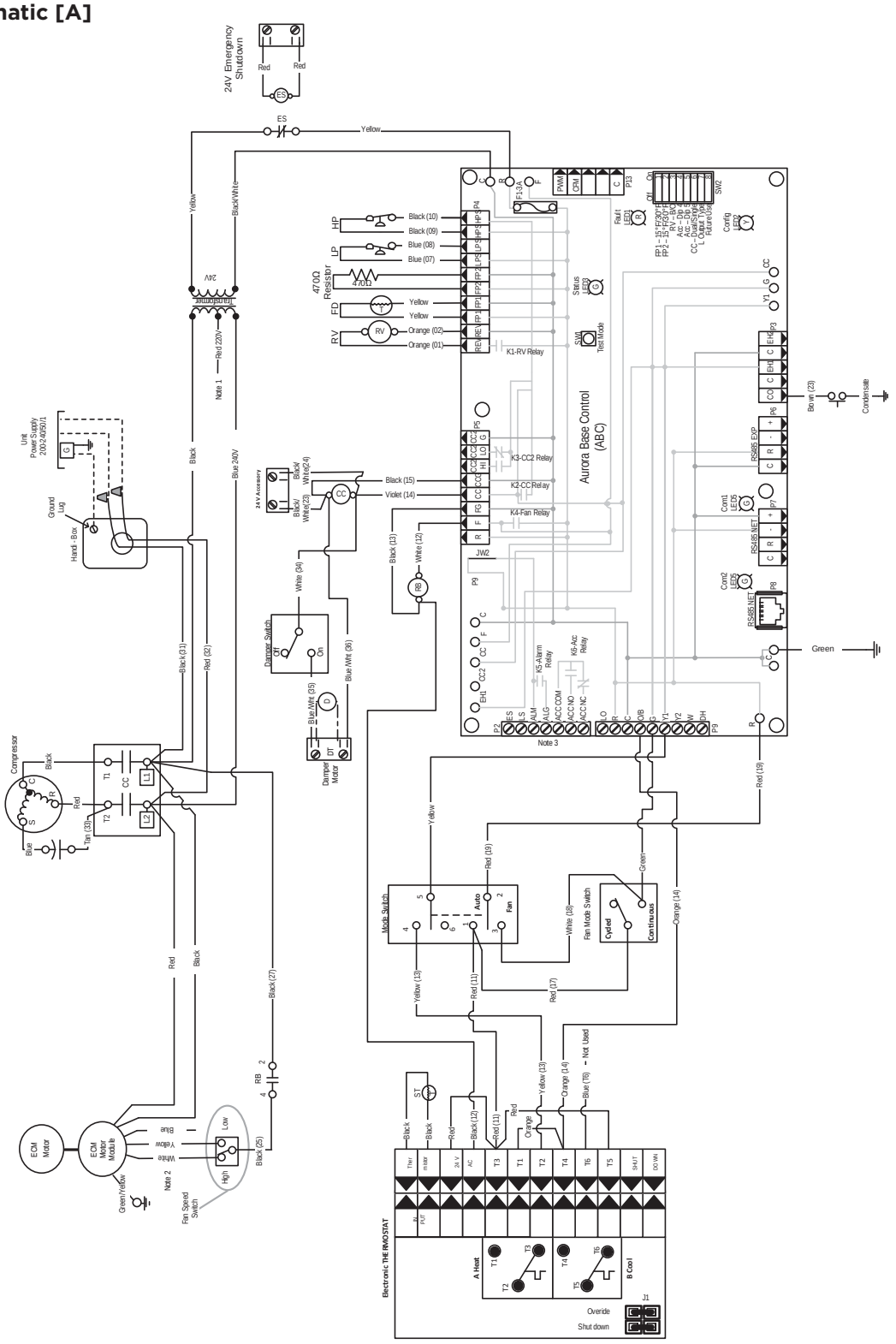
1. Switch Red and Blue wires for 220 volt operation.
2. Terminal C of the 24V PB is used as "L" output for Brown wire 3 for Lockout.
3. When installed, 24VAC connection for remote start/stop controller option.
4. Factory wired. Refer to blower table settings.

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Wiring Schematics cont.

ABC - With ECM Motor and Electronic Stat **220-240/50/1**

Schematic [A]



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Wiring Schematics cont.

ABC - With ECM Motor and Electronic Stat

220-240/50/1

Accessory Relay		
Operation	SW2-4	SW2-5
Cycle with Blower	On	On
Cycle with Compressor	Off	Off
Water Valve Slow Open	On	Off
Outdoor Air Damper	Off	On

Aurora Timing Events		
Event	Normal Mode	Test Mode
Random Start Delay	5 to 80 seconds	1 second
Compressor On Delay	5 seconds	< 1 second
Compressor Minimum On Time	2 minutes	5 seconds
Compressor Short Cycle Delay	4 minutes	15 seconds
Blower Off Delay	30 seconds	2 seconds
Fault Recognition Delay – High Pressure	Less than 1 second	Less than 1 second
Start-Up Bypass – Low Pressure	2 minutes	30 seconds
Fault Recognition Delay – Low Pressure	30 seconds	30 seconds
Start-Up Bypass – Low Water/Air Coil Limit	2 minutes	30 seconds
Fault Recognition Delay – Low Water/Air Coil Limit	30 seconds	30 seconds
Fault Recognition Delay – Condensate Overflow	30 seconds	30 seconds
Thermostat Call Recognition Time	2 seconds	2 seconds
Auxiliary Heat Staging Delay	5 minutes	20 seconds
Emergency Heat Staging Delay	2 minutes	7.5 seconds
Water Valve Slow Open Delay	90 seconds	90 seconds
Reheat Delay	30 seconds	30 seconds

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

Random Start Delay	
Status LED (LED1, Green)	Fast Flash
Configuration LED (LED2, Yellow)	Fast Flash
Fault LED (LED3, Red)	Fast Flash

Status LED (LED1, Green)		Configuration LED (LED2, Yellow)		Fault LED (LED3, Red)	
Normal Mode	ON	No Software Override	Flash ECM Setting	Normal Mode	OFF
Control is Non-Functional	OFF	DIP Switch Override	Slow Flash	Input Fault Lockout	Flash Code 1
Test Mode	Slow Flash	ECM Configure Mode	Fast Flash	High Pressure Lockout	Flash Code 2
Lockout Active	Fast Flash	Reset Configure Mode	Off	Low Pressure Lockout	Flash Code 3
Dehumidification Mode	Flash Code 2			Low Air Coil Limit Lockout - FP2	Flash Code 4
Reserved	Flash Code 3			Low Water Coil Limit Lockout - FP1	Flash Code 5
Reserved	Flash Code 4			Reserved	Flash Code 6
Load Shed	Flash Code 5			Condensate Overflow Lockout	Flash Code 7
ESD	Flash Code 6			Over/Under Voltage Shutdown	Flash Code 8
Reserved	Flash Code 7			Reserved	Flash Code 9
				Reserved	Flash Code 10
				Air/Water Coil Limit Sensor Error	Flash Code 11

Legend

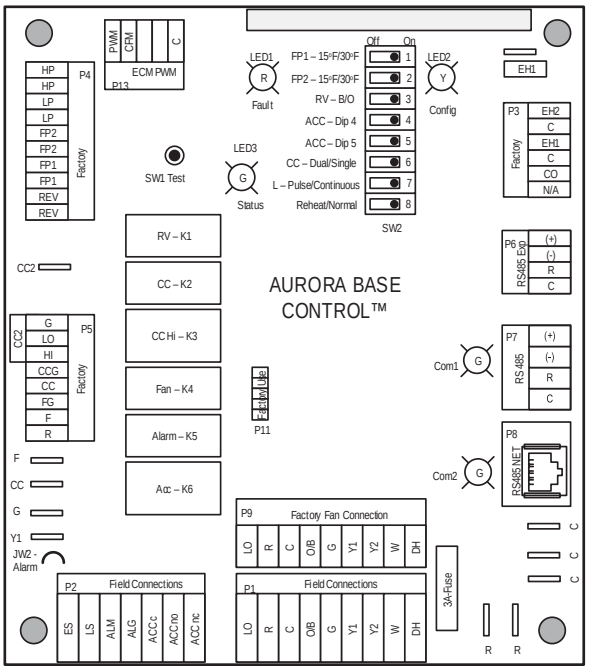
- Factory Low Voltage Wiring
- Factory Line Voltage Wiring
- Field Low Voltage Wiring
- Field Line Voltage Wiring
- Optional Block
- DC Voltage PCB Traces
- Field Zone Sensor Wiring
- Internal Junction
- Quick Connect Terminal
- L1 – Field Wiring Lug
- Ground
- Relay Contacts – N.O., N.C.
- Capacitor
- Fuse
- Temperature Switch
- Thermistor
- Relay Coil
- Switch - Condensate Overflow
- Switch - High pressure
- Switch - Low pressure
- 3 2 1 – Polarized connector
- G – Light Emitting Diode - Green
- Y – Light Emitting Diode - Yellow
- R – Light Emitting Diode - Red
- Wire nut

CC – Compressor Contactor
CO – Condensate Overflow Sensor
ES – Emergency Shutdown
HP – High Pressure Switch
LP – Low Pressure Switch
FD – Freeze Detection Sensor
F1 – Fuse

SW1 – Push button
SW2 – DIP package 8 position
PB – Power Block
RB – Blower Relay
RV – Reversing Valve Coil

Notes:

1 – Swap blue and red leads for 220V operation.
2 – Factory wired. Refer to blower table settings.
3 – Use ALG Output for 24V lockout.

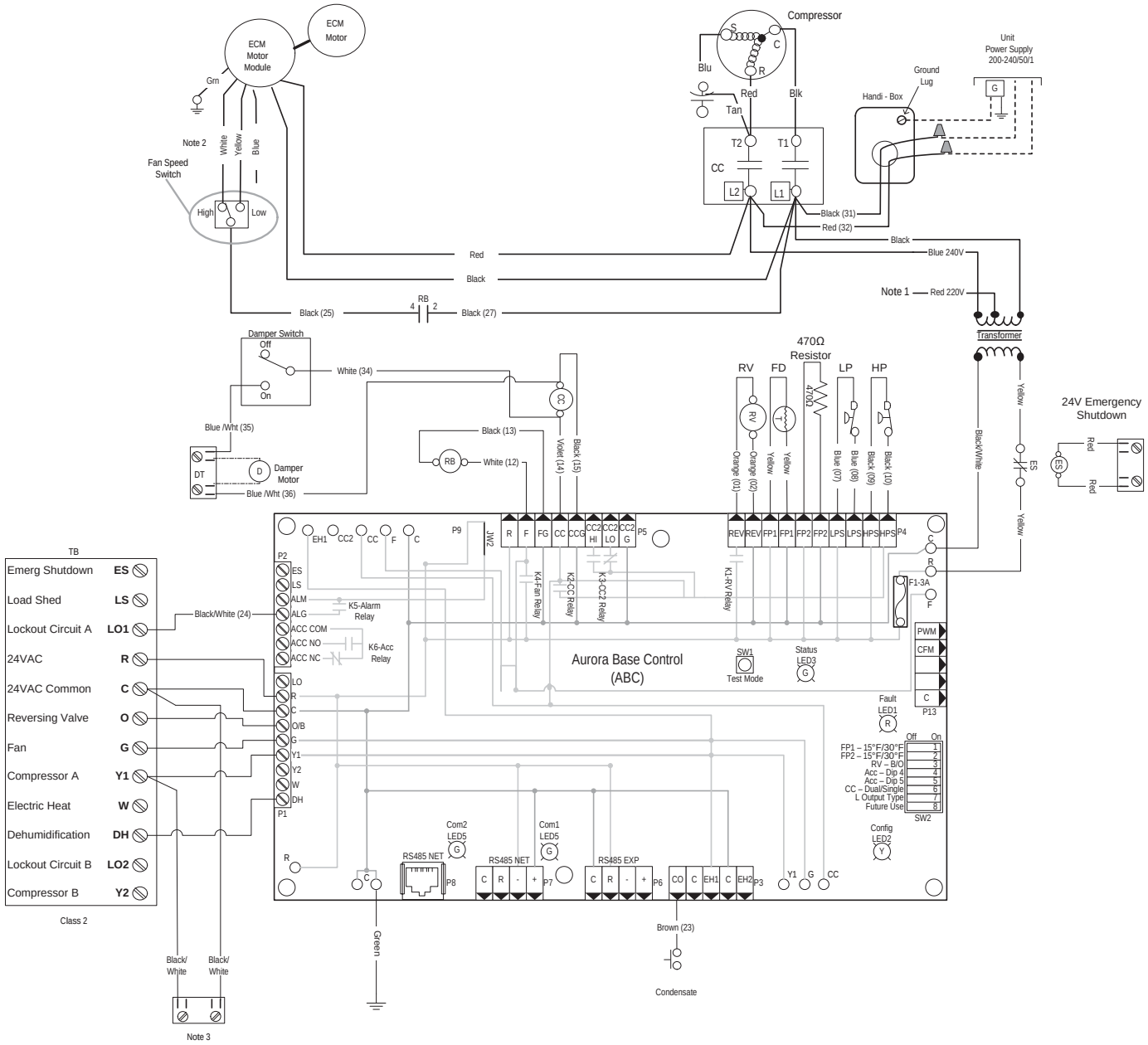


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Wiring Schematics cont.

ABC - ECM with Remote Stat

220-240/50/1



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Wiring Schematics cont.

ABC - ECM with Remote Stat **220-240/50/1**

Notes:

1 – Swap blue and red leads for 220V operation.
2 – Factory wired. Refer to blower table settings.
3 - When field installed 24VAC motorized valve is used, connect to C and Y.

Accessory Relay		
Operation	SW2-4	SW2-5
Cycle with Blower	On	On
Cycle with Compressor	Off	Off
Water Valve Slow Open	On	Off
Outdoor Air Damper	Off	On

Aurora Timing Events		
Event	Normal Mode	Test Mode
Random Start Delay	5 to 80 seconds	1 second
Compressor On Delay	5 seconds	< 1 second
Compressor Minimum On Time	2 minutes	5 seconds
Compressor Short Cycle Delay	4 minutes	15 seconds
Blower Off Delay	30 seconds	2 seconds
Fault Recognition Delay – High Pressure	Less than 1 second	Less than 1 second
Start-Up Bypass – Low Pressure	2 minutes	30 seconds
Fault Recognition Delay – Low Pressure	30 seconds	30 seconds
Start-Up Bypass – Low Water/Air Coil Limit	2 minutes	30 seconds
Fault Recognition Delay – Low Water/Air Coil Limit	30 seconds	30 seconds
Fault Recognition Delay – Condensate Overflow	30 seconds	30 seconds
Thermostat Call Recognition Time	2 seconds	2 seconds
Auxiliary Heat Staging Delay	5 minutes	20 seconds
Emergency Heat Staging Delay	2 minutes	7.5 seconds
Water Valve Slow Open Delay	90 seconds	90 seconds
Reheat Delay	30 seconds	30 seconds

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				
Random Start Delay					
Status LED (LED1, Green)	Fast Flash				
Configuration LED (LED2, Yellow)	Fast Flash				
Fault LED (LED3, Red)	Fast Flash				
Status LED (LED1, Green)		Configuration LED (LED2, Yellow)		Fault LED (LED3, Red)	
Normal Mode	ON	No Software Overide	Flash ECM Setting	Normal Mode	OFF
Control is Non-Functional	OFF	DIP Switch Overide	Slow Flash	Input Fault Lockout	Flash Code 1
Test Mode	Slow Flash	ECM Configure Mode	Fast Flash	High Pressure Lockout	Flash Code 2
Lockout Active	Fast Flash	Reset Configure Mode	Off	Low Pressure Lockout	Flash Code 3
Dehumidification Mode	Flash Code 2			Low Air Coil Limit Lockout - FP2	Flash Code 4
Reserved	Flash Code 3			Low Water Coil Limit Lockout - FP1	Flash Code 5
Reserved	Flash Code 4			Reserved	Flash Code 6
Load Shed	Flash Code 5			Condensate Overflow Lockout	Flash Code 7
ESD	Flash Code 6			Over/Under Voltage Shutdown	Flash Code 8
Reserved	Flash Code 7			Reserved	Flash Code 9
				Reserved	Flash Code 10
				Air/Water Coil Limit Sensor Error	Flash Code 11

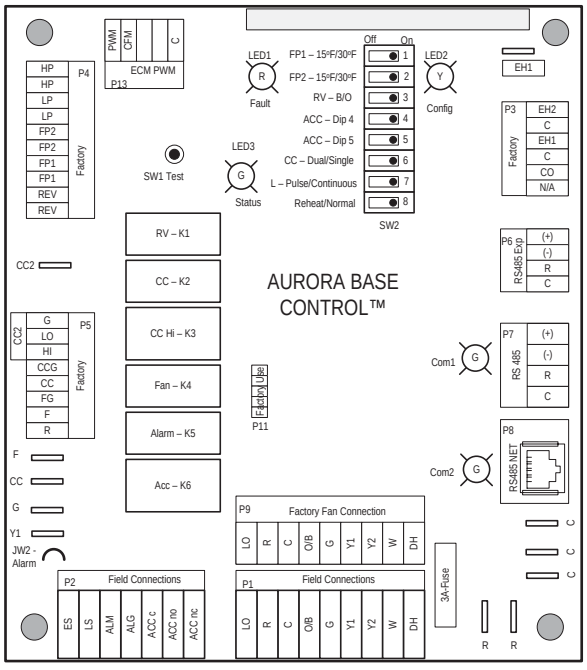
CHART 1		
Blower Settings		
	High	Low
NC*09	Yellow	White
NC*12	Blue	Yellow
NC*15	Yellow	White
NC*18	Blue	Yellow

Legend

- Factory Low Voltage Wiring
- Factory Line Voltage Wiring
- Field Low Voltage Wiring
- Field Line Voltage Wiring
- Optional Block
- DC Voltage PCB Traces
- Field Zone Sensor Wiring
- Internal Junction
- Quick Connect Terminal
- L1 Field Wiring Lug
- Ground
- Relay Contacts – N.O., N.C.
- Capacitor
- Fuse
- Temperature Switch
- Thermistor
- Relay Coil
- Switch - Condensate Overflow
- Switch - High pressure
- Switch - Low pressure
- 3 2 1 Polarized connector
- G Light Emitting Diode - Green
- Y Light Emitting Diode - Yellow
- R Light Emitting Diode - Red
- Wire nut

CC – Compressor Contactor
CO – Condensate Overflow Sensor
ES – Emergency Shutdown
HP – High Pressure Switch
LP – Low Pressure Switch
FD – Freeze Detection Sensor
F1 – Fuse

SW1 – Push button
SW2 – DIP package 8 position
PB – Power Block
RB – Blower Relay
RV – Reversing Valve Coil



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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. Chassis shall be installed with factory built cabinet or other custom cabinet approved by WaterFurnace engineering. Chassis SHALL NOT be installed without an approved cabinet enclosure. Capacities and characteristics as listed in the schedule and the specifications that follow. The reverse cycle heating/cooling units shall be floor mounted console type with horizontal air inlet and up-flow air discharge. Units shall be AHRI/ISO 13256-1 certified and listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory. Each unit shall be computer run-tested at the factory with conditioned water and operation verified to catalog data. Each unit shall be mounted on a pallet and shipped in a corrugated box or stretch-wrapped. The units shall be designed to operate with entering liquid temperature between 20°F and 120°F [-6.7°C and 48.9°C].

Chassis and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with a beige textured epoxy powder coating on both sides for added protection. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117.

The cabinet shall be easily removable to allow for ease of service to the controls compartment, chassis, and piping. The top of the cabinet and grille is a horizontally flat (optional sloped) surface with a hinged control door cover. The return air filter shall be 1 in. (25.4 mm) fiberglass disposable type media.

The return and supply air sections are insulated with a 1/4 in. (6.4 mm) thick, dual density, 2 lb/ft3 (32 kg/m3) coated mat glass fiber with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge supply air through the aluminum grille. 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.

Option: A Super Quiet Sound package shall include multi-density full coverage compressor blanket.

Option: Shipped with motorized outside air damper and damper assembly for 25% make-up air.

The drain pan shall be of stainless steel 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 with microprocessor or Aurora Control option. Mechanical float switches WILL NOT be accepted. Condensate tube shall be constructed of stainless steel and have an internal factory installed condensate trap.

Refrigerant Circuit

All units shall utilize the non-ozone depleting and low global warming potential refrigerant R410A. All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bi-directional thermostatic expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, and service ports.

Compressors shall be high-efficiency single speed rotary type designed for heat pump duty and mounted on durometer grommets to provide vibration free compressor mounting. Compressor motors shall be single-phase PSC with external overload protection.

Refrigerant to air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled aluminum tube construction rated to withstand 600 psig (4135 kPa) refrigerant working pressure.

Option: AlumiSeal electro-coated air coil.

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 600 PSIG (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 600 PSIG (4135 kPa) working refrigerant pressure and 450 PSIG (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 bi-directionally without the use of check valves.

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Engineering Guide Specifications cont.

Option: Cupro-nickel refrigerant to water heat exchanger shall be of copper-nickel 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. Water lines shall also be of cupronickel construction.

Option: ThermaShield coated water-to-refrigerant heat exchanger, water lines and refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures below 50°F [10°C].

Blower Motor and Assembly

The blower shall be a direct drive centrifugal type with a twin dynamically balanced wheel. The housing and wheel shall be designed for quiet, low outlet velocity operation. The blower housing shall be constructed of galvanized steel and shall be removable from the unit for servicing of the blower motor. The blower motor shall be a two-speed type and shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection.

3-Speed high-efficiency electrically commutated motor (ECM)

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, and solid-state controller for complete unit operation. 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.

Unit mounted controls shall consist of switches for “OFF”, “FAN”, and “AUTO” or “HEAT/COOL”. An additional switch is provided for blower speed setting of “HI” or “LO”. The unit shall be equipped with a blower switch on the side of the control to provide “CONTINUOUS” or “CYCLED” blower operation. “CYCLED” blower will turn the blower on with the compressor. A unit-mounted electronic thermostat with a remote electronic thermistor located in the return air will control compressor operation in heating and cooling modes. Unit mounted thermostat shall be the standard thermostat option. All unit mounted thermostats shall be auto changeover. Manual changeover WILL NOT be accepted. Electro-mechanical operation WILL NOT be accepted.

Controls

Standard: A compressor control module (CCM) shall be included to disable compressor operation in the event of a trip of any of the safety switches and to send a signal to activate a fault indicator light at the thermostat. The CCM shall be capable of being reset from the thermostat or from the unit main disconnect switch. A terminal block with screw terminals shall be provided for field connection of all low-voltage wiring.

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.

Option: An Aurora Unitary Protocol Converter (UPC) shall be included that communicates directly with the Aurora Heat Pump Controls and allows access/control of a variety of internal Aurora heat pump operations such as sensors, relay operation, faults and other information. In turn, the UPC shall convert the internal Aurora Modbus protocol to BACnet MS/TP, or N2 protocols for communication over a BAS system. Additional individual unit configuration items such freeze protection settings shall be directly available over the BAS without the need for access to the actual heat pump.

Option: Aurora UPC DDC communication protocols: LonWorks

Option: Remote mounted thermostat is available for CCM and Aurora Base Control. A terminal block with screw terminals will be provided for field control wiring.

Piping

Supply and return water connections shall be 1/2 in. [12.7 mm] FPT copper threaded fittings. All water piping shall be insulated to prevent condensation at low liquid temperatures.

A stainless steel tube stubbed out from the chassis is provided for condensate drain attachment. A short piece of polyvinyl hose is supplied to assist in adapting to drain.

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Engineering Guide Specifications cont.

Accessories

Hose Kits – Ball Valves (field-installed)

A flexible steel braid hose featuring Kevlar® reinforced EPDM core with ANSI 302/304 stainless steel outer braid and fire rated materials per ASTM E 84-00 (NFPA 255, ANSI/UL 723 and UBC 8-1). Ball valve at one end; swivel connector with adapter at the other end (swivel to adapter connection via fiber or EPDM gasket). Swivel connection provides union between heat pump and piping system. The hoses feature brass fittings, stainless steel ferrules. A full port ball valve shall be provided with integral P/T (pressure/temperature) port on supply hose. Specifications: Temperature range of 35°F [2°C] to 180°F [82°C]. Max. working pressure of 400 psi [2757 kPa] for 1/2 in. and 3/4 in. hose kits; max. working pressure of 350 psi [2413 kPa] for 1 in. and 1-1/4 in. hose kits.

Hose Kits – Automatic Balancing and Ball Valves (field-installed)

A flexible steel braid hose featuring Kevlar® reinforced EPDM core with ANSI 302/304 stainless steel outer braid and fire rated materials per ASTM E 84-00 (NFPA 255, ANSI/UL 723 and UBC 8-1). Ball valve at one end; swivel connector with adapter at the other end (swivel to adapter connection via fiber or EPDM gasket). Swivel connection provides union between heat pump and piping system. The hoses feature brass fittings, stainless steel ferrules. A full port ball valve shall be provided with integral P/T (pressure/temperature) port on supply hose and automatic balancing valve with integral P/T ports and full port ball valve on return hose.
Specifications:

- Temperature range of 35°F [2°C] to 180°F [82°C].
- Max. working pressure of 400 psi [2757 kPa] for 1/2 in. and 3/4 in. hose kits; max. working pressure of 350 psi [2413 kPa] for 1 in. and 1-1/4 in. hose kits.
- Minimum burst pressure of four times working pressure.

Hose Kits – Automatic Balancing and Ball Valves with 'Y' strainer (field-installed)

A flexible steel braid hose featuring Kevlar® reinforced EPDM core with ANSI 302/304 stainless steel outer braid and fire rated materials per ASTM E 84-00 (NFPA 255, ANSI/UL 723 and UBC 8-1). Ball valve at one end; swivel connector with adapter at the other end (swivel to adapter connection via fiber or EPDM gasket). Swivel connection provides union between heat pump and piping system. The hoses feature brass fittings, stainless steel ferrules. A "y" strainer is provided on one end for fluid straining and integral "blowdown" valve.. A full port ball valve shall be provided with integral P/T (pressure/temperature) port on supply hose and automatic balancing valve with integral P/T ports and full port ball valve on return hose.
Specifications:

- Temperature range of 35°F [2°C] to 180°F [82°C].
- Max. working pressure of 400 psi [2757 kPa] for 1/2 in. and 3/4 in. hose kits; max. working pressure of 350 psi [2413 kPa] for 1 in. and 1-1/4 in. hose kits.
- Minimum burst pressure of four times working pressure.

WaterFurnace works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice. Please contact WaterFurnace at 1-888-929-2837 for latest design and specifications. Purchaser's approval of this data set signifies that the equipment is acceptable under the provisions of the job specification. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely WaterFurnace's opinion or commendation of its products. The latest version of this document is available at www.waterfurnace.com.

Revision Guide

Pages:	Description:	Date:	By:
ALL	Removed FX10 Control Option, Added Aurora Control Option, Removed PSC	02 Dec 2015	MA
All	Updated With Aluminum Air Coils	21 May 2014	DS
29	Added Revision Guide	21 May 2014	DS

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