ASTON SERIES

OptiHeat

VAPOR INJECTION TECHNOLOGY

SINGLE HYDRONIC

Residential 3 - 5 Ton

Water-to-Water Geothermal Heat Pump

Submittal Data

English Language

IP/Metric Units

SD2508WG 02/19

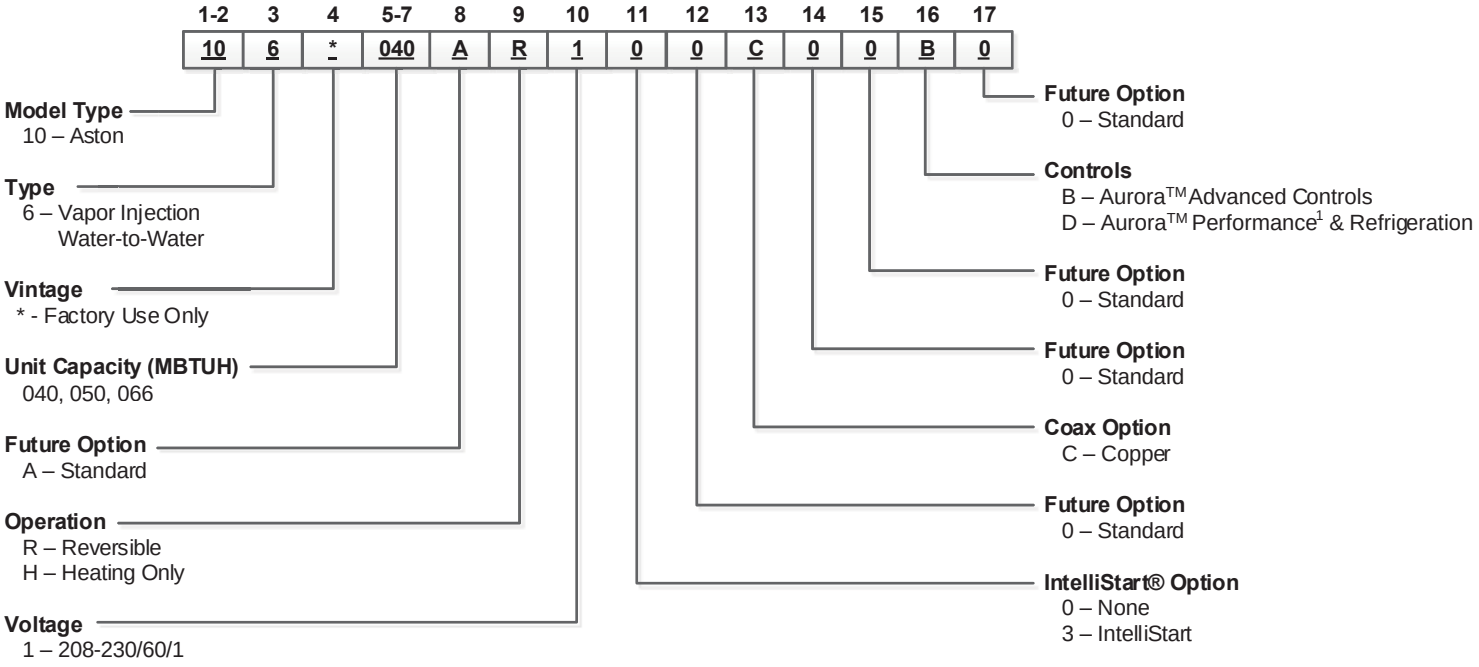
GEOSTAR

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Model Nomenclature



Rev.: A 9/27/18 ADL

NOTES: 1 – Flow meter for Performance and Refrigeration option is shipped inside the unit and must be externally field installed.

Voltage	NEW		
	040	050	066
208-230/60/1	••	•	•

• - Voltage available in this size

•• - Voltage and soft start available in this size

All Aston Single Hydronic with OptiHeat products are safety listed under UL1995 thru ETL and performance listed with AHRI in accordance with standard 13256-2. The Aston Single Hydronic with OptiHeat is also ENERGY STAR® rated.

Contractor: _____ P.O.: _____

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Project Name: _____ Unit Tag: _____

AHRI/ISO 13256-2 Performance Ratings

The performance standard AHRI/ASHRAE/ISO 13256-2 became effective January 1, 2000. This new standard has three major categories: Water Loop, Ground Water, and Ground Loop.

Unit of Measure: The Cooling COP

The cooling efficiency is measured in EER (US version measured in Btu/h per Watt. The Metric version is measured in a cooling COP (Watt per Watt) similar to the traditional COP measurement.

Pump Power Correction Calculation

Within each model, only one water flow rate is specified for all three groups and pumping Watts are calculated using the following formula. This additional power is added onto the existing power consumption.

• Pump power correction = (gpm x 0.0631) x (Press Drop x 2990) / 300

Where 'gpm' is waterflow in gpm and 'Press Drop' is the pressure drop through the unit heat exchanger at rated water flow in feet of head.

ISO Capacity and Efficiency Calculations

The following equations illustrate cooling calculations:

• ISO Cooling Capacity = Cooling Capacity (Btuh) x [Fan Power Correction (Watts) x 3.412]

• ISO EER Efficiency (Btuh/W) = ISO Cooling Capacity (Btuh) x [Power Input (Watts) - Fan Power Correction (Watts) + Pump Power Correction (Watts)]

The following equations illustrate heating calculations:

• ISO Heating Capacity = Heating Capacity (Btuh) x [Fan Power Correction (Watts) x 3.412]

• ISO COP Efficiency (Btuh/Btuh) = ISO Heating Capacity (Btuh) x 3.412/[Power Input (Watts) - Fan Power Correction (Watts) + Pump Power Correction (Watts)]

Test Conditions	ISO/AHRI 13256-2 WLHP	ISO/AHRI 13256-2 GWHP	ISO/AHRI 13256-2 GLHP
Cooling			
Liquid Entering Indoor Side - °F	53.6	53.6	53.6
Standard Rating Test			
Liquid Entering Heat Exchanger - °F	86	59	77
Part-load Rating Test			
Liquid Entering Heat Exchanger	86	59	68
Fluid Flow Rate	*	*	*
Heating			
Liquid Entering Indoor Side - °F	104	104	104
Standard Rating Test			
Liquid Entering Outdoor-side Heat Exchanger - °F	68	50	32
Part-load Rating Test			
Liquid Entering Outdoor-side Heat Exchanger	68	50	41
Fluid Flow Rate	*	*	*

NOTES: *Flow rate is specified by the manufacturer
WLHP = Water Loop Heat Pump; GWHP = Ground Water Heat Pump;
GLHP = Ground Loop Heat Pump

Conversions

Water Flow (lps) = gpm x 0.0631

Press Drop (Pascals) = Press Drop (ft hd) x 2990

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

AHRI/ISO 13256-2 Performance Ratings cont.

English (IP) Units

Model	Flow Rate		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
			Cooling 86°F Source 53.6°F Load		Heating 68°F Source 104°F Load		Cooling 59°F Source 53.6°F Load		Heating 50°F Source 104°F Load		Cooling 77°F Source 53.6°F Load		Heating 32°F Source 104°F Load	
	Load GPM	Source GPM	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
040	10	10	29,100	13.4	43,500	4.6	33,000	20.1	40,000	4.0	30,600	16.1	34,000	3.3
050	15	15	41,500	13.3	66,000	4.7	47,000	20.1	54,900	3.9	44,500	16.1	45,000	3.3
066	20	20	52,000	12.7	83,000	4.4	57,000	20.1	70,000	3.7	54,000	16.1	56,500	3.2

7/8/14

ENERGY STAR

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

040 - Performance Data

040-Heating

Source		Load Flow - 5 GPM							Load Flow - 8 GPM						Load Flow - 10 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F
30	5	60	72.7	31.7	1.8	25.4	5.0	19.5	68.0	32.0	1.8	25.8	5.2	19.3	66.4	32.2	1.8	26.2	5.4	19.2
		80	93.0	32.5	2.3	24.6	4.1	19.9	88.2	32.8	2.3	25.1	4.2	19.7	86.6	33.0	2.2	25.4	4.3	19.5
		100	113.3	33.4	3.0	23.3	3.3	20.4	108.4	33.7	2.9	23.9	3.4	20.2	106.8	33.9	2.8	24.3	3.5	20.0
		130	144.0	35.0	3.9	21.8	2.6	21.0	138.8	35.3	3.8	22.5	2.7	20.7	137.1	35.5	3.7	22.9	2.8	20.5
		140	Operation not recommended						148.9	35.5	4.2	21.2	2.5	21.3	147.1	35.7	4.1	21.7	2.5	21.1
	8	60	73.0	32.4	1.9	26.1	5.1	23.3	68.2	32.7	1.8	26.5	5.3	23.2	66.6	32.9	1.8	26.9	5.4	23.1
		80	93.3	33.2	2.5	24.7	3.9	23.6	88.4	33.5	2.4	25.3	4.1	23.5	86.7	33.7	2.4	25.6	4.2	23.4
		100	113.6	33.9	3.1	23.4	3.2	24.0	108.6	34.3	3.0	24.0	3.3	23.8	106.9	34.5	3.0	24.4	3.4	23.7
		130	144.0	35.1	4.0	21.3	2.5	24.5	138.9	35.4	3.9	22.0	2.6	24.3	137.1	35.6	3.8	22.5	2.7	24.2
		140	Operation not recommended						149.0	35.8	4.2	21.4	2.5	24.5	147.2	36.0	4.1	21.9	2.6	24.4
	10	60	73.2	32.9	1.9	26.5	5.2	24.5	68.3	33.2	1.8	27.0	5.4	24.4	66.7	33.4	1.8	27.3	5.5	24.4
		80	93.5	33.8	2.4	25.7	4.2	24.7	88.5	34.1	2.3	26.3	4.4	24.6	86.9	34.3	2.3	26.6	4.5	24.5
		100	113.8	34.5	3.0	24.3	3.4	25.0	108.7	34.8	2.9	24.9	3.5	24.9	107.0	35.0	2.8	25.3	3.6	24.8
		130	144.2	35.5	3.9	22.1	2.7	25.4	138.9	35.8	3.8	22.8	2.8	25.3	137.2	36.0	3.7	23.3	2.8	25.2
		140	Operation not recommended						149.0	36.0	4.2	21.5	2.5	25.6	147.2	36.2	4.2	22.0	2.6	25.5
50	5	60	74.8	37.0	1.8	30.9	6.1	37.3	69.3	37.3	1.7	31.4	6.3	37.1	67.5	37.5	1.7	31.7	6.5	36.9
		80	95.2	38.1	2.3	30.4	4.9	37.5	89.6	38.4	2.2	30.9	5.1	37.2	87.7	38.7	2.2	31.3	5.3	37.1
		100	115.6	39.0	3.0	29.0	3.9	38.1	109.8	39.4	2.9	29.6	4.0	37.8	107.9	39.6	2.8	30.0	4.1	37.6
		130	146.4	41.0	3.8	28.1	3.2	38.4	140.3	41.3	3.7	28.9	3.3	38.1	138.3	41.6	3.6	29.3	3.4	37.9
		140	Operation not recommended						Operation not recommended						148.4	42.0	4.2	27.8	3.0	38.5
	8	60	75.1	37.8	1.8	31.7	6.2	41.8	69.5	38.2	1.7	32.2	6.4	41.7	67.7	38.4	1.7	32.6	6.6	41.6
		80	95.5	38.8	2.4	30.4	4.6	42.2	89.8	39.2	2.4	31.0	4.8	42.0	87.9	39.4	2.3	31.4	5.0	41.9
		100	115.9	39.8	3.1	29.2	3.8	42.5	110.0	40.1	3.0	29.9	3.9	42.3	108.1	40.4	3.0	30.3	4.0	42.2
		130	146.5	41.2	4.1	27.3	3.0	43.0	140.4	41.6	4.0	28.1	3.1	42.8	138.4	41.9	3.9	28.6	3.2	42.6
		140	Operation not recommended						Operation not recommended						148.5	42.4	4.2	28.1	3.0	42.8
	10	60	75.4	38.4	1.8	32.2	6.2	43.4	69.7	38.7	1.8	32.8	6.5	43.2	67.8	39.0	1.7	33.1	6.6	43.2
		80	95.8	39.5	2.3	31.7	5.1	43.5	90.0	39.9	2.2	32.3	5.3	43.3	88.0	40.1	2.2	32.7	5.4	43.3
		100	116.1	40.3	3.0	30.2	4.0	43.8	110.2	40.7	2.9	30.9	4.1	43.6	108.2	40.9	2.8	31.3	4.2	43.5
		130	146.6	41.5	3.8	28.6	3.2	44.1	140.5	41.9	3.7	29.3	3.3	44.0	138.4	42.1	3.6	29.8	3.4	43.9
		140	Operation not recommended						Operation not recommended						148.5	42.6	4.2	28.3	3.0	44.2
70	5	60	77.1	42.8	1.8	36.8	7.1	54.8	70.8	43.2	1.7	37.3	7.4	54.6	68.7	43.4	1.7	37.7	7.6	54.4
		80	99.0	47.4	3.0	37.2	4.6	54.7	91.3	45.2	2.6	36.4	5.1	55.0	88.8	43.8	2.3	35.9	5.6	55.2
		100	120.8	52.0	4.2	37.6	3.6	54.5	111.9	47.6	3.4	36.0	4.1	55.2	108.9	44.7	2.9	34.9	4.5	55.6
		130	153.5	58.9	6.1	38.2	2.8	54.3	142.8	51.0	4.8	34.8	3.1	55.7	139.2	45.8	3.9	32.5	3.4	56.6
		140	Operation not recommended						Operation not recommended						149.2	45.9	4.2	31.6	3.2	57.0
	8	60	78.0	44.9	1.8	38.9	7.5	60.0	71.2	44.6	1.7	38.8	7.6	60.0	68.9	44.4	1.7	38.7	7.8	60.0
		80	99.9	49.7	3.0	39.5	4.9	59.8	91.7	46.8	2.6	38.0	5.3	60.2	89.0	44.9	2.3	37.0	5.7	60.5
		100	121.8	54.6	4.2	40.1	3.8	59.7	112.3	49.0	3.5	37.2	4.1	60.4	109.1	45.4	3.0	35.3	4.5	60.9
		130	154.7	61.8	6.1	41.0	3.0	59.4	143.1	52.4	4.8	36.0	3.2	60.7	139.2	46.1	3.9	32.7	3.4	61.6
		140	Operation not recommended						Operation not recommended						149.3	46.3	4.2	31.8	3.2	61.8
	10	60	78.5	46.3	1.8	40.3	7.7	61.7	71.4	45.6	1.7	39.7	7.8	61.8	69.0	45.1	1.7	39.4	7.9	61.9
		80	100.5	51.3	3.0	41.0	5.0	61.5	91.9	47.8	2.6	38.9	5.4	62.0	89.1	45.5	2.3	37.5	5.7	62.3
		100	122.5	56.3	4.3	41.8	3.9	61.4	112.6	50.2	3.4	38.5	4.3	62.1	109.2	46.2	2.9	36.3	4.7	62.5
		130	155.5	63.8	6.1	42.9	3.0	61.2	143.3	53.3	4.8	36.9	3.3	62.4	139.3	46.3	3.9	33.0	3.5	63.2
		140	Operation not recommended						Operation not recommended						149.3	46.5	4.2	32.0	3.2	63.4
90	5	60	81.1	52.7	1.7	47.0	9.1	70.6	73.3	53.2	1.7	47.6	9.4	70.4	70.7	53.5	1.6	48.0	9.6	70.2
		80	101.3	53.3	2.3	45.5	6.8	71.2	93.4	53.8	2.2	46.2	7.0	71.0	90.8	54.1	2.2	46.6	7.2	70.8
		100	121.7	54.3	2.9	44.6	5.6	71.6	113.7	54.8	2.8	45.3	5.7	71.3	111.0	55.2	2.8	45.7	5.8	71.1
		130	151.7	54.3	3.8	41.4	4.2	72.9	143.7	54.8	3.7	42.1	4.3	72.6	141.0	55.1	3.7	42.6	4.4	72.4
		140	Operation not recommended																	
	z8	60	81.6	54.0	1.7	48.2	9.3	77.6	73.6	54.4	1.7	48.8	9.6	77.4	71.0	54.8	1.6	49.2	9.8	77.3
		80	105.1	62.8	3.5	50.7	5.2	76.9	94.5	57.9	2.8	48.4	6.1	77.5	90.9	54.7	2.3	46.8	7.0	77.9
		100	128.6	71.6	5.4	53.2	3.9	76.3	115.3	61.4	3.9	47.9	4.6	77.6	110.9	54.5	3.0	44.4	5.4	78.5
		130	163.9	84.8	8.2	57.0	3.0	75.3	146.6	66.6	5.6	47.3	3.5	77.8	140.9	54.4	4.0	40.9	4.0	79.5
		140	Operation not recommended																	
	10	60	81.9	54.8	1.7	48.9	9.4	79.9	73.8	55.3	1.7	49.6	9.7	79.8	71.1	55.6	1.7	50.0	9.9	79.7
		80	102.1	55.4	2.3	47.5	7.0	80.2	94.0	55.9	2.3	48.1	7.2	80.1	91.2	56.2	2.2	48.6	7.4	80.0
		100	122.5	56.1	2.9	46.3	5.7	80.4	114.2	56.7	2.8	47.0	5.9	80.3	111.4	57.0	2.8	47.5	6.0	80.2
		130	152.0	55.0	3.8	42.0	4.2	81.3	143.9	55.5	3.7	42.7	4.4	81.2	141.2	55.8	3.7	43.2	4.4	81.1
		140	Operation not recommended																	

7/8/2014

4/14/15

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

040 - Performance Data cont.

040-Cooling

Source		Load Flow - 5 GPM							Load Flow - 8 GPM						Load Flow - 10 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F
50	5	50	38.7	28.3	1.62	33.8	17.5	63.5	42.7	29.1	1.62	34.6	18.0	63.9	44.1	29.7	1.62	35.2	18.3	64.1
		70	57.6	30.9	1.62	36.4	19.0	64.6	62.1	31.6	1.63	37.1	19.4	64.9	63.6	32.1	1.63	37.6	19.7	65.0
		90	76.6	33.5	1.63	39.1	20.6	65.6	81.5	34.1	1.63	39.6	20.9	65.9	83.1	34.4	1.63	40.0	21.1	66.0
		110	95.5	36.2	1.64	41.7	22.1	66.7	100.9	36.6	1.64	42.1	22.3	66.9	102.6	36.8	1.64	42.4	22.5	67.0
	8	50	39.0	27.4	1.56	32.7	17.6	58.2	43.0	28.1	1.56	33.5	18.0	58.4	44.3	28.6	1.56	34.0	18.3	58.5
		70	58.1	29.8	1.56	35.1	19.1	58.8	62.4	30.4	1.56	35.7	19.5	58.9	63.8	30.8	1.56	36.2	19.7	59.0
		90	77.2	32.1	1.56	37.4	20.6	59.4	81.8	32.7	1.56	38.0	20.9	59.5	83.4	33.0	1.56	38.3	21.1	59.6
		110	96.2	34.5	1.56	39.8	22.1	60.0	101.3	34.9	1.56	40.2	22.3	60.1	103.0	35.2	1.56	40.5	22.5	60.1
	10	50	39.3	26.8	1.52	32.0	17.6	56.4	43.1	27.5	1.52	32.7	18.1	56.5	44.4	28.0	1.52	33.1	18.4	56.6
		70	58.4	29.0	1.52	34.2	19.1	56.8	62.6	29.6	1.52	34.8	19.5	57.0	64.0	30.0	1.52	35.2	19.8	57.0
		90	77.5	31.2	1.52	36.4	20.6	57.3	82.1	31.7	1.52	36.9	20.9	57.4	83.6	32.1	1.52	37.2	21.2	57.4
		110	96.7	33.4	1.52	38.5	22.0	57.7	101.5	33.8	1.51	39.0	22.3	57.8	103.2	34.1	1.51	39.3	22.6	57.9
70	5	50	39.5	26.3	2.02	33.1	13.0	83.3	43.2	27.1	2.02	34.0	13.4	83.6	44.5	27.7	2.03	34.6	13.7	83.9
		70	58.1	29.7	2.04	36.7	14.6	84.7	62.4	30.5	2.04	37.5	14.9	85.0	63.8	31.1	2.05	38.1	15.2	85.2
		90	76.7	33.2	2.06	40.2	16.1	86.1	81.5	33.9	2.06	41.0	16.4	86.4	83.1	34.4	2.07	41.5	16.7	86.6
		110	95.3	36.7	2.08	43.8	17.6	87.5	100.7	37.3	2.08	44.4	17.9	87.8	102.4	37.8	2.09	44.9	18.1	88.0
	8	50	39.8	25.6	1.95	32.3	13.1	78.1	43.4	26.4	1.96	33.1	13.5	78.3	44.6	27.0	1.96	33.6	13.8	78.4
		70	58.5	28.9	1.96	35.6	14.7	78.9	62.6	29.7	1.97	36.4	15.1	79.1	64.0	30.2	1.97	36.9	15.3	79.2
		90	77.1	32.1	1.98	38.9	16.3	79.7	81.8	32.9	1.98	39.6	16.6	79.9	83.3	33.4	1.98	40.2	16.9	80.0
		110	95.8	35.4	1.99	42.2	17.8	80.5	101.0	36.1	1.99	42.9	18.1	80.7	102.7	36.6	1.99	43.4	18.4	80.9
	10	50	39.9	25.2	1.91	31.7	13.2	76.3	43.5	25.9	1.91	32.5	13.6	76.5	44.7	26.5	1.91	33.0	13.8	76.6
		70	58.7	28.3	1.92	34.8	14.8	77.0	62.7	29.1	1.92	35.6	15.2	77.1	64.1	29.6	1.92	36.1	15.4	77.2
		90	77.4	31.4	1.92	38.0	16.3	77.6	82.0	32.2	1.92	38.8	16.7	77.8	83.5	32.7	1.92	39.3	17.0	77.9
		110	96.2	34.5	1.93	41.1	17.9	78.2	101.2	35.3	1.93	41.9	18.3	78.4	102.8	35.8	1.93	42.4	18.6	78.5
90	5	50	40.3	24.2	2.41	32.5	10.0	103.0	43.7	25.1	2.42	33.4	10.4	103.4	44.8	25.8	2.43	34.0	10.6	103.6
		70	58.6	28.6	2.45	36.9	11.7	104.8	62.6	29.5	2.46	37.9	12.0	105.1	64.0	30.1	2.47	38.5	12.2	105.4
		90	76.9	32.9	2.49	41.4	13.2	106.5	81.6	33.8	2.50	42.3	13.5	106.9	83.1	34.4	2.50	42.9	13.7	107.2
		110	95.1	37.2	2.52	45.8	14.8	108.3	100.5	38.1	2.53	46.7	15.1	108.7	102.3	38.7	2.54	47.4	15.3	109.0
	8	50	40.5	23.8	2.34	31.8	10.2	98.0	43.8	24.7	2.35	32.7	10.5	98.2	44.9	25.3	2.36	33.3	10.7	98.3
		70	58.8	28.0	2.37	36.1	11.8	99.0	62.8	28.9	2.37	37.0	12.2	99.3	64.1	29.5	2.38	37.6	12.4	99.4
		90	77.1	32.1	2.39	40.3	13.4	100.1	81.7	33.1	2.40	41.3	13.8	100.3	83.2	33.8	2.40	42.0	14.1	100.5
		110	95.5	36.3	2.42	44.6	15.0	101.1	100.7	37.3	2.42	45.6	15.4	101.4	102.4	38.0	2.42	46.3	15.7	101.6
	10	50	40.6	23.5	2.30	31.3	10.2	96.3	43.9	24.4	2.30	32.2	10.6	96.4	45.0	25.0	2.31	32.8	10.8	96.6
		70	59.0	27.6	2.31	35.5	11.9	97.1	62.9	28.5	2.32	36.4	12.3	97.3	64.2	29.2	2.32	37.1	12.6	97.4
		90	77.3	31.7	2.33	39.6	13.6	97.9	81.8	32.7	2.33	40.6	14.0	98.1	83.3	33.4	2.33	41.3	14.3	98.3
		110	95.7	35.7	2.35	43.7	15.2	98.7	100.8	36.8	2.35	44.8	15.7	99.0	102.5	37.6	2.35	45.6	16.0	99.1
110	5	50	41.1	22.2	2.81	31.8	7.9	122.7	44.2	23.2	2.83	32.8	8.2	123.1	45.2	23.8	2.83	33.5	8.4	123.4
		70	59.0	27.4	2.86	37.2	9.6	124.9	62.9	28.4	2.88	38.2	9.9	125.3	64.2	29.1	2.89	38.9	10.1	125.6
		90	77.0	32.5	2.91	42.5	11.2	127.0	81.6	33.6	2.93	43.6	11.5	127.5	83.1	34.4	2.94	44.4	11.7	127.8
		110	94.9	37.7	2.96	47.8	12.7	129.1	100.3	38.9	2.98	49.0	13.1	129.6	102.1	39.7	2.99	49.9	13.3	129.9
	8	50	41.2	22.0	2.74	31.4	8.0	117.8	44.3	23.0	2.75	32.3	8.4	118.1	45.3	23.6	2.75	33.0	8.6	118.2
		70	59.2	27.1	2.77	36.5	9.8	119.1	63.0	28.2	2.78	37.7	10.1	119.4	64.2	28.9	2.79	38.4	10.4	119.6
		90	77.1	32.1	2.81	41.7	11.5	120.4	81.7	33.4	2.82	43.0	11.9	120.7	83.2	34.2	2.82	43.8	12.1	120.9
		110	95.1	37.2	2.84	46.9	13.1	121.7	100.4	38.6	2.85	48.3	13.5	122.1	102.1	39.5	2.85	49.2	13.8	122.3
	10	50	41.3	21.9	2.69	31.0	8.1	116.2	44.3	22.8	2.70	32.0	8.5	116.4	45.3	23.5	2.70	32.7	8.7	116.5
		70	59.2	26.9	2.71	36.1	9.9	117.2	63.0	28.0	2.72	37.3	10.3	117.5	64.3	28.7	2.72	38.0	10.6	117.6
		90	77.2	31.9	2.74	41.2	11.7	118.2	81.7	33.2	2.74	42.5	12.1	118.5	83.2	34.0	2.74	43.4	12.4	118.7
		110	95.2	36.9	2.76	46.3	13.4	119.3	100.4	38.4	2.76	47.8	13.9	119.6	102.1	39.3	2.76	48.8	14.2	119.8

7/8/14

050 - Performance Data cont.

050-Heating

Source		Load Flow - 8 GPM							Load Flow - 12 GPM						Load Flow - 15 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F
30	8	60	70.8	43.2	2.60	34.3	4.87	21.2	67.6	43.5	2.54	34.8	5.02	21.0	65.8	43.8	2.48	35.4	5.19	20.9
		80	91.0	43.9	3.33	32.6	3.87	21.6	87.7	44.3	3.25	33.2	3.99	21.5	85.9	44.6	3.17	33.8	4.12	21.3
		100	111.2	44.8	4.01	31.1	3.27	22.0	107.9	45.2	3.92	31.8	3.38	21.8	106.1	45.5	3.82	32.5	3.49	21.6
		130	141.7	46.9	5.19	29.2	2.65	22.5	138.2	47.2	5.07	29.9	2.73	22.3	136.3	47.6	4.95	30.7	2.82	22.1
		140	Operation not recommended						148.3	47.6	5.80	27.8	2.41	22.8	146.4	48.0	5.66	28.7	2.48	22.6
	12	60	71.0	44.0	2.61	35.1	4.94	23.7	67.7	44.3	2.55	35.6	5.09	23.6	66.0	44.7	2.49	36.2	5.26	23.5
		80	91.2	44.9	3.45	33.1	3.81	24.1	87.9	45.2	3.37	33.7	3.94	24.0	86.1	45.6	3.29	34.4	4.06	23.8
		100	111.4	45.8	4.29	31.1	3.13	24.4	108.0	46.1	4.19	31.8	3.23	24.3	106.2	46.5	4.08	32.5	3.34	24.2
		130	141.8	47.1	5.55	28.2	2.49	24.9	138.3	47.5	5.41	29.0	2.57	24.8	136.4	47.8	5.28	29.8	2.65	24.7
		140	Operation not recommended						148.3	47.9	5.82	28.1	2.41	25.0	146.4	48.3	5.68	28.9	2.49	24.8
	15	60	71.2	44.8	2.63	35.9	5.00	25.1	67.9	45.2	2.56	36.4	5.16	25.0	66.1	45.5	2.50	37.0	5.33	24.9
		80	91.4	45.6	3.36	34.1	3.98	25.3	88.0	46.0	3.28	34.8	4.11	25.2	86.2	46.3	3.20	35.4	4.24	25.1
		100	111.6	46.3	4.03	32.5	3.37	25.5	108.1	46.6	3.94	33.2	3.47	25.4	106.3	47.0	3.84	33.9	3.59	25.3
		130	141.9	47.5	5.23	29.6	2.66	25.9	138.3	47.8	5.10	30.4	2.75	25.8	136.4	48.2	4.98	31.2	2.84	25.7
		140	Operation not recommended						148.4	48.2	5.84	28.3	2.42	26.1	146.5	48.6	5.70	29.2	2.50	26.0
50	8	60	72.2	48.7	2.49	40.1	5.72	39.7	68.5	49.0	2.44	40.7	5.90	39.5	66.6	49.4	2.38	41.3	6.09	39.4
		80	92.6	50.4	3.38	38.8	4.37	40.0	88.8	50.8	3.30	39.5	4.51	39.8	86.8	51.1	3.22	40.2	4.66	39.7
		100	113.1	52.3	4.07	38.4	3.77	40.1	109.2	52.7	3.98	39.2	3.89	39.9	107.1	53.1	3.88	39.9	4.01	39.7
		130	144.0	56.0	5.24	38.1	3.13	40.2	139.8	56.4	5.12	39.0	3.23	40.0	137.6	56.9	4.99	39.8	3.34	39.7
		140	Operation not recommended						150.0	57.4	5.83	37.5	2.89	40.3	147.7	57.9	5.69	38.4	2.98	40.1
	12	60	72.4	49.6	2.51	41.0	5.80	42.6	68.7	50.0	2.45	41.6	5.98	42.5	66.7	50.4	2.39	42.2	6.18	42.4
		80	92.9	51.5	3.38	40.0	4.47	42.8	89.0	51.9	3.30	40.7	4.61	42.7	87.0	52.3	3.22	41.3	4.76	42.6
		100	113.4	53.5	4.25	39.0	3.69	43.0	109.4	53.9	4.15	39.7	3.81	42.9	107.2	54.3	4.05	40.5	3.93	42.7
		130	144.1	56.4	5.56	37.4	2.97	43.3	139.9	56.8	5.43	38.3	3.07	43.1	137.6	57.2	5.29	39.2	3.17	43.0
		140	Operation not recommended						150.1	57.8	5.85	37.8	2.89	43.2	147.8	58.2	5.71	38.7	2.99	43.1
	15	60	72.6	50.5	2.52	41.9	5.88	44.2	68.9	50.9	2.46	42.5	6.07	44.2	66.8	51.3	2.40	43.1	6.26	44.1
		80	93.1	52.3	3.41	40.7	4.49	44.4	89.2	52.7	3.33	41.3	4.64	44.3	87.1	53.1	3.25	42.0	4.79	44.2
		100	113.5	54.1	4.10	40.1	3.87	44.5	109.5	54.5	4.00	40.8	3.99	44.4	107.3	54.9	3.90	41.6	4.13	44.3
		130	144.2	56.7	5.28	38.7	3.15	44.7	139.9	57.2	5.16	39.6	3.25	44.6	137.7	57.6	5.03	40.4	3.36	44.4
		140	Operation not recommended						150.1	58.2	5.87	38.1	2.90	44.8	147.8	58.6	5.73	39.0	3.00	44.6
70	8	60	74.2	56.8	2.49	48.3	6.69	57.5	70.2	58.6	2.48	50.1	6.91	57.1	68.0	60.3	2.48	51.8	7.14	56.6
		80	94.9	59.4	3.74	46.7	4.66	58.0	90.6	60.9	3.72	48.2	4.80	57.6	88.3	62.4	3.69	49.8	4.95	57.2
		100	115.5	62.1	4.99	45.0	3.65	58.4	111.0	63.4	4.55	47.9	4.08	57.7	108.6	64.8	4.11	50.8	4.62	56.9
		130	146.5	66.0	6.86	42.6	2.82	59.0	141.7	67.1	6.18	46.0	3.18	58.1	139.1	68.2	5.50	49.5	3.64	57.3
		140	Operation not recommended						Operation not recommended						149.0	67.6	6.19	46.4	3.20	58.0
	12	60	74.7	58.7	2.47	50.3	6.97	61.0	70.4	60.1	2.48	51.6	7.11	60.7	68.2	61.4	2.49	53.0	7.24	60.5
		80	95.4	61.7	3.73	49.0	4.85	61.2	90.9	62.4	3.58	50.2	5.11	61.0	88.4	63.1	3.42	51.4	5.41	60.8
		100	116.2	64.7	5.00	47.7	3.80	61.5	111.3	64.7	4.67	48.8	4.06	61.3	108.6	64.7	4.35	49.9	4.36	61.1
		130	147.3	69.2	6.89	45.7	2.94	61.8	141.9	68.2	6.32	46.6	3.16	61.6	139.0	67.2	5.75	47.6	3.43	61.5
		140	Operation not recommended						Operation not recommended						149.1	68.0	6.21	46.8	3.21	61.6
	15	60	75.1	60.6	2.44	52.2	7.26	62.8	70.7	61.6	2.47	53.1	7.30	62.7	68.3	62.6	2.50	54.1	7.34	62.6
		80	96.0	64.0	3.72	51.2	5.03	63.0	91.2	64.4	3.73	51.6	5.06	62.9	88.6	64.8	3.73	52.0	5.09	62.8
		100	116.8	67.4	5.00	50.3	3.94	63.1	111.7	67.2	4.57	51.6	4.31	62.9	108.9	67.0	4.14	52.8	4.75	62.7
		130	148.1	72.5	6.92	48.8	3.07	63.3	142.3	70.8	6.23	49.5	3.33	63.2	139.2	69.1	5.54	50.2	3.66	63.1
		140	Operation not recommended						Operation not recommended						149.1	68.4	6.24	47.2	3.22	63.5
90	8	60	77.2	68.9	2.36	60.8	8.56	74.3	72.1	69.4	2.32	61.5	8.78	74.2	69.3	69.9	2.28	62.1	9.00	74.0
		80	97.5	70.0	3.28	58.8	6.26	74.8	92.3	70.5	3.22	59.5	6.41	74.7	89.5	71.1	3.17	60.3	6.57	74.5
		100	118.4	73.8	4.07	59.9	5.32	74.6	112.9	74.3	4.00	60.7	5.45	74.4	110.0	74.9	3.93	61.5	5.59	74.2
		130	148.6	74.5	5.55	55.6	3.93	75.7	143.1	75.1	5.46	56.4	4.03	75.5	140.1	75.6	5.36	57.3	4.13	75.2
		140	Operation not recommended																	
	12	60	77.5	70.2	2.37	62.1	8.68	78.9	72.3	70.7	2.33	62.8	8.90	78.7	69.5	71.3	2.29	63.4	9.13	78.6
		80	98.7	74.8	4.04	61.1	5.43	79.1	92.9	73.9	3.66	61.4	5.91	79.0	89.7	72.9	3.29	61.7	6.51	78.9
		100	119.9	79.5	5.71	60.0	4.08	79.2	113.4	77.1	5.00	60.0	4.52	79.2	110.0	74.6	4.28	60.0	5.11	79.2
		130	151.6	86.5	8.22	58.4	3.08	79.5	144.2	81.8	7.00	57.9	3.43	79.6	140.3	77.2	5.78	57.4	3.91	79.7
		140	Operation not recommended																	
	15	60	77.9	71.5	2.38	63.4	8.80	81.3	72.5	72.1	2.34	64.1	9.02	81.2	69.7	72.6	2.30	64.8	9.25	81.1
		80	98.2	72.7	3.31	61.4	6.43	81.6	92.7	73.2	3.26	62.1	6.59	81.5	89.8	73.8	3.20	62.9	6.76	81.4
		100	119.1	76.2	4.09	62.3	5.46	81.4	113.4	76.8	4.02	63.1	5.60	81.3	110.3	77.4	3.95	63.9	5.74	81.2
		130	148.9	75.5	5.59	56.4	3.96	82.2	143.2	76.0	5.49	57.3	4.06	82.1	140.2	76.6	5.40	58.2	4.16	82.0
		140	Operation not recommended																	

4/14/15

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

050 - Performance Data

050-Cooling

Source		Load Flow - 8 GPM							Load Flow - 12 GPM						Load Flow - 15 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F
50	8	50	38.9	44.4	2.27	52.1	19.6	63.0	42.2	45.1	2.27	52.8	19.8	63.2	43.9	45.7	2.27	53.5	20.1	63.4
		70	58.1	47.7	2.30	55.6	20.7	63.9	61.6	48.4	2.30	56.3	21.0	64.1	63.5	49.1	2.30	57.0	21.3	64.2
		90	77.2	51.1	2.33	59.0	21.9	64.8	81.0	51.8	2.33	59.7	22.2	64.9	83.0	52.5	2.33	60.5	22.5	65.1
		110	96.4	54.4	2.37	62.5	23.0	65.6	100.4	55.1	2.36	63.2	23.3	65.8	102.5	55.9	2.36	64.0	23.7	66.0
	12	50	39.1	43.7	2.25	51.4	19.4	58.9	42.3	44.2	2.26	51.9	19.6	59.0	44.0	44.8	2.26	52.5	19.8	59.1
		70	58.2	47.1	2.27	54.8	20.7	59.5	61.7	47.7	2.27	55.4	21.0	59.6	63.6	48.3	2.27	56.0	21.2	59.7
		90	77.4	50.4	2.28	58.2	22.1	60.1	81.1	51.1	2.28	58.9	22.4	60.2	83.1	51.8	2.28	59.6	22.7	60.4
		110	96.5	53.8	2.30	61.7	23.4	60.7	100.5	54.5	2.30	62.4	23.7	60.8	102.6	55.3	2.30	63.1	24.1	61.0
	15	50	39.3	43.0	2.24	50.6	19.2	56.7	42.4	43.4	2.25	51.1	19.3	56.8	44.1	43.9	2.25	51.6	19.5	56.9
		70	58.4	46.4	2.24	54.0	20.7	57.2	61.8	46.9	2.24	54.6	20.9	57.3	63.7	47.5	2.24	55.1	21.2	57.4
		90	77.5	49.8	2.24	57.4	22.3	57.7	81.2	50.4	2.24	58.1	22.5	57.7	83.2	51.0	2.24	58.7	22.8	57.8
		110	96.7	53.2	2.23	60.9	23.8	58.1	100.6	53.9	2.23	61.5	24.2	58.2	102.7	54.6	2.23	62.2	24.5	58.3
70	8	50	40.2	39.1	2.69	48.3	14.5	82.1	43.1	39.7	2.69	48.9	14.7	82.2	44.6	40.3	2.69	49.5	15.0	82.4
		70	58.6	45.5	2.74	54.8	16.6	83.7	62.0	46.1	2.74	55.5	16.8	83.9	63.8	46.8	2.74	56.1	17.1	84.0
		90	77.0	51.9	2.79	61.4	18.6	85.4	80.9	52.6	2.79	62.1	18.8	85.5	82.9	53.2	2.79	62.8	19.1	85.7
		110	95.4	58.3	2.85	68.0	20.5	87.0	99.7	59.0	2.84	68.7	20.7	87.2	102.0	59.7	2.84	69.4	21.0	87.3
	12	50	40.3	38.6	2.68	47.7	14.4	78.3	43.2	39.2	2.68	48.3	14.6	78.4	44.7	39.7	2.68	48.8	14.8	78.5
		70	58.7	45.1	2.70	54.3	16.7	79.4	62.1	45.7	2.71	54.9	16.9	79.6	63.8	46.3	2.71	55.5	17.1	79.7
		90	77.1	51.6	2.73	60.9	18.9	80.6	80.9	52.2	2.73	61.6	19.1	80.7	82.9	52.9	2.73	62.2	19.3	80.8
		110	95.5	58.0	2.76	67.5	21.0	81.7	99.8	58.8	2.76	68.2	21.3	81.9	102.1	59.5	2.76	68.9	21.5	82.0
	15	50	40.5	38.1	2.66	47.2	14.3	76.3	43.3	38.6	2.66	47.7	14.5	76.4	44.8	39.1	2.67	48.2	14.7	76.4
		70	58.8	44.7	2.67	53.8	16.8	77.2	62.1	45.3	2.67	54.4	17.0	77.2	63.9	45.8	2.67	55.0	17.2	77.3
		90	77.2	51.3	2.67	60.4	19.2	78.0	81.0	51.9	2.67	61.0	19.4	78.1	83.0	52.6	2.68	61.7	19.6	78.2
		110	95.5	57.8	2.68	67.0	21.6	78.9	99.8	58.6	2.68	67.7	21.9	79.0	102.1	59.3	2.68	68.5	22.1	79.1
90	8	50	41.5	33.8	3.12	44.4	10.8	101.1	44.0	34.4	3.11	45.0	11.0	101.2	45.3	34.9	3.11	45.5	11.2	101.4
		70	59.2	43.2	3.18	54.1	13.6	103.5	62.4	43.8	3.18	54.7	13.8	103.7	64.1	44.4	3.18	55.3	14.0	103.8
		90	76.8	52.7	3.25	63.8	16.2	105.9	80.7	53.3	3.25	64.4	16.4	106.1	82.8	54.0	3.25	65.1	16.6	106.3
		110	94.5	62.1	3.32	73.5	18.7	108.4	99.1	62.8	3.32	74.1	18.9	108.5	101.5	63.5	3.32	74.8	19.1	108.7
	12	50	41.6	33.5	3.10	44.1	10.8	97.7	44.1	34.1	3.10	44.6	11.0	97.8	45.4	34.6	3.10	45.2	11.2	97.9
		70	59.2	43.1	3.14	53.8	13.7	99.4	62.4	43.7	3.14	54.4	13.9	99.5	64.1	44.3	3.14	55.0	14.1	99.6
		90	76.8	52.7	3.18	63.5	16.6	101.1	80.7	53.4	3.18	64.2	16.8	101.2	82.8	54.0	3.18	64.9	17.0	101.3
		110	94.4	62.3	3.22	73.3	19.3	102.7	99.0	63.0	3.22	74.0	19.5	102.9	101.5	63.7	3.23	74.8	19.8	103.0
	15	50	41.7	33.3	3.08	43.8	10.8	95.8	44.1	33.8	3.08	44.3	11.0	95.9	45.4	34.3	3.08	44.8	11.1	96.0
		70	59.3	43.0	3.09	53.5	13.9	97.1	62.4	43.6	3.10	54.2	14.1	97.2	64.1	44.2	3.10	54.8	14.3	97.3
		90	76.8	52.7	3.11	63.3	17.0	98.4	80.7	53.4	3.11	64.0	17.2	98.5	82.8	54.1	3.12	64.7	17.4	98.6
		110	94.4	62.4	3.12	73.1	20.0	99.7	99.0	63.2	3.13	73.9	20.2	99.8	101.5	64.0	3.14	74.7	20.4	100.0
110	8	50	42.9	28.5	3.54	40.6	8.1	120.1	45.0	29.0	3.54	41.1	8.2	120.3	46.1	29.5	3.53	41.5	8.4	120.4
		70	59.8	41.0	3.63	53.4	11.3	123.3	62.8	41.6	3.62	53.9	11.5	123.5	64.4	42.1	3.62	54.5	11.6	123.6
		90	76.6	53.5	3.71	66.2	14.4	126.5	80.6	54.1	3.71	66.8	14.6	126.7	82.7	54.7	3.71	67.4	14.7	126.8
		110	93.5	66.0	3.80	79.0	17.4	129.7	98.4	66.7	3.80	79.6	17.5	129.9	101.0	67.3	3.80	80.3	17.7	130.1
	12	50	42.9	28.5	3.52	40.5	8.1	117.0	45.0	29.0	3.52	41.0	8.2	117.1	46.1	29.5	3.52	41.5	8.4	117.2
		70	59.7	41.1	3.57	53.3	11.5	119.3	62.7	41.7	3.57	53.9	11.7	119.4	64.4	42.3	3.57	54.5	11.8	119.5
		90	76.5	53.8	3.63	66.2	14.8	121.5	80.5	54.5	3.63	66.9	15.0	121.6	82.6	55.2	3.63	67.6	15.2	121.8
		110	93.4	66.5	3.68	79.1	18.1	123.7	98.3	67.2	3.69	79.8	18.2	123.9	100.9	68.0	3.69	80.6	18.4	124.0
	15	50	42.9	28.4	3.50	40.4	8.1	115.4	45.0	29.0	3.50	40.9	8.3	115.5	46.1	29.5	3.50	41.4	8.4	115.5
		70	59.7	41.3	3.52	53.3	11.7	117.1	62.7	41.9	3.53	53.9	11.9	117.2	64.3	42.6	3.53	54.6	12.1	117.3
		90	76.5	54.1	3.54	66.2	15.3	118.8	80.5	54.9	3.55	67.0	15.5	118.9	82.6	55.6	3.56	67.8	15.6	119.0
		110	93.3	67.0	3.56	79.1	18.8	120.6	98.2	67.8	3.57	80.0	19.0	120.7	100.8	68.7	3.59	80.9	19.1	120.8

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

066 - Performance Data cont.

066-Heating

Source		Load Flow - 10 GPM							Load Flow - 15 GPM						Load Flow - 20 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F	LLT °F	HC MBTUH	Power kW	HE MBTUH	COP	LST °F
30	10	60	70.6	53.2	3.05	42.8	5.12	21.2	67.1	53.6	2.98	43.5	5.28	21.0	65.4	54.0	2.90	44.1	5.45	20.9
		80	90.8	54.1	3.96	40.6	4.00	21.6	87.3	54.5	3.87	41.3	4.13	21.5	85.5	54.9	3.77	42.0	4.27	21.3
		100	111.0	55.2	5.14	37.7	3.15	22.2	107.4	55.6	5.02	38.5	3.25	22.1	105.6	56.0	4.90	39.3	3.36	21.9
		130	141.5	57.7	6.88	34.2	2.46	23.0	137.7	58.1	6.72	35.2	2.54	22.7	135.9	58.5	6.55	36.2	2.62	22.5
		140	Operation not recommended						147.8	58.5	7.51	32.9	2.28	23.2	145.9	58.9	7.33	33.9	2.36	23.0
	15	60	70.8	54.2	3.06	43.8	5.19	24.0	67.3	54.6	2.99	44.4	5.36	23.9	65.5	55.1	2.92	45.1	5.53	23.8
		80	91.1	55.3	4.23	40.9	3.83	24.4	87.4	55.7	4.13	41.6	3.96	24.3	85.6	56.1	4.03	42.4	4.09	24.2
		100	111.3	56.3	5.39	37.9	3.06	24.8	107.6	56.8	5.26	38.8	3.16	24.7	105.7	57.2	5.14	39.7	3.26	24.5
		130	141.6	57.9	7.14	33.5	2.38	25.4	137.8	58.3	6.97	34.6	2.45	25.2	135.9	58.8	6.80	35.6	2.53	25.1
		140	Operation not recommended						147.9	58.9	7.54	33.2	2.29	25.4	145.9	59.3	7.35	34.2	2.36	25.3
	20	60	71.1	55.3	3.08	44.8	5.26	25.4	67.4	55.7	3.01	45.4	5.43	25.3	65.6	56.1	2.93	46.1	5.61	25.2
		80	91.2	56.1	4.00	42.5	4.11	25.6	87.5	56.6	3.91	43.2	4.25	25.5	85.7	57.0	3.81	44.0	4.38	25.5
		100	111.4	57.0	5.17	39.4	3.24	25.9	107.7	57.5	5.04	40.3	3.34	25.8	105.8	57.9	4.92	41.1	3.45	25.8
		130	141.7	58.4	6.93	34.8	2.47	26.4	137.8	58.9	6.77	35.8	2.55	26.3	135.9	59.3	6.60	36.8	2.63	26.2
		140	Operation not recommended						147.9	59.3	7.56	33.4	2.30	26.6	146.0	59.7	7.38	34.5	2.37	26.4
50	10	60	72.8	64.2	3.10	53.6	6.08	38.9	68.6	64.7	3.02	54.4	6.27	38.8	66.5	65.2	2.95	55.1	6.48	38.6
		80	93.3	66.4	4.11	52.4	4.74	39.2	88.9	66.9	4.01	53.2	4.89	39.0	86.7	67.4	3.91	54.1	5.05	38.9
		100	113.6	67.9	5.38	49.5	3.70	39.8	109.1	68.4	5.25	50.5	3.82	39.6	106.9	68.9	5.12	51.4	3.94	39.4
		130	144.0	70.0	7.09	45.8	2.89	40.6	139.4	70.6	6.92	46.9	2.99	40.3	137.1	71.1	6.75	48.0	3.09	40.1
		140	Operation not recommended						149.5	71.3	7.73	45.0	2.71	40.7	147.2	71.9	7.54	46.2	2.79	40.5
	15	60	73.1	65.5	3.11	54.8	6.16	42.5	68.8	65.9	3.04	55.6	6.36	42.4	66.6	66.4	2.97	56.3	6.57	42.3
		80	93.4	66.9	4.32	52.2	4.54	42.8	89.0	67.4	4.22	53.0	4.68	42.7	86.8	67.9	4.11	53.9	4.84	42.6
		100	113.7	68.4	5.53	49.5	3.62	43.2	109.2	68.9	5.40	50.5	3.74	43.1	106.9	69.4	5.26	51.4	3.86	42.9
		130	144.1	70.5	7.34	45.5	2.82	43.7	139.5	71.1	7.16	46.6	2.91	43.6	137.2	71.6	6.99	47.8	3.00	43.4
		140	Operation not recommended						149.6	71.8	7.75	45.3	2.71	43.8	147.2	72.3	7.56	46.5	2.80	43.6
	20	60	73.3	66.7	3.13	56.0	6.25	44.2	69.0	67.2	3.05	56.8	6.45	44.1	66.8	67.7	2.98	57.5	6.66	44.1
		80	93.8	69.0	4.15	54.8	4.87	44.4	89.3	69.5	4.05	55.7	5.03	44.3	87.0	70.0	3.95	56.5	5.19	44.2
		100	114.0	70.1	5.41	51.7	3.80	44.7	109.4	70.7	5.28	52.7	3.92	44.6	107.1	71.2	5.15	53.6	4.05	44.5
		130	144.2	70.9	7.14	46.6	2.91	45.2	139.5	71.5	6.97	47.7	3.00	45.1	137.2	72.0	6.80	48.8	3.10	45.0
		140	Operation not recommended						149.6	72.3	7.78	45.7	2.72	45.3	147.3	72.8	7.59	46.9	2.81	45.2
70	10	60	74.2	70.8	3.11	60.2	6.67	57.6	69.9	74.1	3.05	63.7	7.12	56.9	67.7	77.3	2.99	67.1	7.59	56.2
		80	94.3	71.3	4.43	56.2	4.72	58.4	90.0	75.0	4.30	60.3	5.12	57.6	87.9	78.7	4.17	64.5	5.54	56.7
		100	114.4	71.8	5.74	52.2	3.66	59.2	110.2	76.2	5.56	57.2	4.02	58.2	108.1	80.5	5.37	62.2	4.39	57.2
		130	144.5	72.5	7.71	46.2	2.76	60.5	140.5	78.4	7.42	53.1	3.10	59.1	138.4	84.3	7.14	59.9	3.46	57.6
		140	Operation not recommended						Operation not recommended						148.5	85.0	7.73	58.6	3.22	57.9
	15	60	74.8	74.2	3.13	63.5	6.95	61.3	70.2	76.5	3.07	66.0	7.31	60.9	67.9	78.8	3.00	68.6	7.69	60.6
		80	95.0	74.9	4.46	59.6	4.92	61.8	90.4	77.7	4.32	62.9	5.26	61.4	88.0	80.5	4.19	66.2	5.63	60.9
		100	115.1	75.5	5.79	55.8	3.82	62.3	110.5	78.9	5.58	59.8	4.14	61.8	108.2	82.2	5.38	63.8	4.48	61.2
		130	145.3	76.6	7.79	50.0	2.88	63.1	140.8	80.6	7.47	55.1	3.16	62.4	138.5	84.7	7.16	60.3	3.47	61.7
		140	Operation not recommended						Operation not recommended						148.6	85.6	7.75	59.1	3.23	61.9
	20	60	75.5	77.5	3.14	66.8	7.23	63.1	70.5	78.9	3.08	68.4	7.51	62.9	68.0	80.3	3.02	70.0	7.80	62.8
		80	95.7	78.4	4.49	63.1	5.12	63.5	90.7	80.1	4.35	65.2	5.40	63.3	88.2	81.8	4.21	67.4	5.69	63.1
		100	115.9	79.3	5.84	59.4	3.98	63.9	110.8	81.3	5.62	62.1	4.24	63.6	108.3	83.2	5.40	64.8	4.52	63.3
		130	146.1	80.7	7.86	53.8	3.01	64.5	141.1	83.0	7.52	57.3	3.23	64.1	138.5	85.4	7.19	60.9	3.48	63.7
		140	Operation not recommended						Operation not recommended						148.6	86.1	7.78	59.6	3.24	63.9
90	10	60	77.3	86.3	3.14	75.6	8.04	74.4	71.6	87.0	3.09	76.4	8.25	74.2	68.8	87.6	3.04	77.3	8.45	74.1
		80	98.6	93.0	4.03	79.2	6.77	73.7	92.5	93.7	3.96	80.2	6.93	73.5	89.4	94.4	3.89	81.1	7.11	73.3
		100	119.2	95.8	5.05	78.6	5.57	73.8	112.9	96.6	4.96	79.6	5.70	73.6	109.7	97.3	4.88	80.6	5.85	73.4
		130	149.5	97.7	7.14	73.4	4.01	74.9	143.1	98.5	7.02	74.5	4.11	74.6	139.9	99.2	6.90	75.7	4.21	74.4
		140	Operation not recommended																	
	15	60	77.6	88.0	3.16	77.2	8.16	79.4	71.8	88.6	3.11	78.0	8.36	79.3	68.9	89.3	3.05	78.9	8.57	79.2
		80	97.6	88.2	4.64	72.4	5.58	80.1	91.9	89.6	4.46	74.4	5.89	79.8	89.1	91.0	4.28	76.3	6.22	79.5
		100	117.7	88.4	6.11	67.5	4.24	80.7	112.1	90.5	5.81	70.7	4.56	80.3	109.3	92.6	5.51	73.8	4.92	79.9
		130	147.7	88.7	8.32	60.3	3.12	81.7	142.3	91.9	7.84	65.1	3.44	81.0	139.5	95.1	7.36	70.0	3.79	80.4
		140	Operation not recommended																	
	20	60	77.9	89.6	3.18	78.8	8.27	81.9	72.0	90.3	3.12	79.7	8.48	81.8	69.1	91.0	3.07	80.5	8.69	81.7
		80	99.3	96.5	4.07	82.7	6.96	81.5	93.0	97.3	4.00	83.6	7.13	81.4	89.8	98.0	3.93	84.6	7.31	81.3
		100	119.8	99.0	5.07	81.7	5.72	81.6	113.3	99.7	4.99	82.7	5.86	81.5	110.1	100.5	4.90	83.8	6.01	81.4
		130	149.8	99.0	7.19	74.4	4.03	82.3	143.3	99.7	7.07	75.6	4.13	82.2	140.1	100.5	6.95	76.8	4.24	82.1
		140	Operation not recommended																	

4/14/15

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

066 - Performance Data cont.

066-Cooling

Source		Load Flow - 10 GPM							Load Flow - 15 GPM						Load Flow - 20 GPM					
EST °F	Flow GPM	ELT °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F	LLT °F	TC MBTUH	Power kW	HR MBTUH	EER	LST °F
50	10	50	39.8	51.1	2.98	61.3	17.2	62.3	43.1	51.8	2.99	62.1	17.3	62.4	44.7	52.6	3.00	62.8	17.5	62.6
		70	58.9	55.3	3.02	65.6	18.3	63.1	62.5	55.9	3.03	66.3	18.4	63.3	64.3	56.5	3.04	66.9	18.6	63.4
		90	78.1	59.5	3.07	69.9	19.4	64.0	82.0	60.0	3.07	70.5	19.5	64.1	84.0	60.5	3.07	71.0	19.7	64.2
		110	97.3	63.7	3.11	74.3	20.4	64.9	101.5	64.0	3.11	74.7	20.6	64.9	103.6	64.4	3.11	75.0	20.7	65.0
	15	50	40.0	50.0	2.90	59.8	17.2	58.0	43.2	50.7	2.91	60.6	17.4	58.1	44.9	51.4	2.92	61.4	17.6	58.2
		70	59.2	53.8	2.93	63.8	18.4	58.5	62.7	54.4	2.94	64.4	18.5	58.6	64.5	55.0	2.94	65.1	18.7	58.7
		90	78.5	57.6	2.96	67.7	19.5	59.0	82.2	58.1	2.97	68.3	19.6	59.1	84.1	58.7	2.97	68.8	19.7	59.2
		110	97.7	61.5	2.99	71.7	20.6	59.6	101.8	61.9	2.99	72.1	20.7	59.6	103.8	62.3	3.00	72.5	20.8	59.7
	20	50	40.2	48.8	2.82	58.4	17.3	55.8	43.4	49.5	2.82	59.2	17.5	55.9	45.0	50.3	2.83	59.9	17.7	56.0
		70	59.5	52.3	2.83	61.9	18.4	56.2	62.9	52.9	2.84	62.6	18.6	56.3	64.6	53.6	2.85	63.3	18.8	56.3
		90	78.8	55.8	2.85	65.5	19.6	56.6	82.5	56.3	2.86	66.1	19.7	56.6	84.3	56.8	2.87	66.6	19.8	56.7
		110	98.1	59.3	2.87	69.1	20.7	56.9	102.0	59.7	2.88	69.5	20.7	57.0	104.0	60.1	2.89	70.0	20.8	57.0
70	10	50	40.4	47.8	3.68	60.4	13.0	82.1	43.5	48.7	3.70	61.4	13.2	82.3	45.0	49.7	3.72	62.4	13.4	82.5
		70	59.3	53.7	3.76	66.6	14.3	83.3	62.7	54.5	3.77	67.4	14.5	83.5	64.5	55.4	3.78	68.3	14.6	83.7
		90	78.1	59.6	3.83	72.7	15.6	84.5	82.0	60.3	3.84	73.5	15.7	84.7	83.9	61.1	3.85	74.2	15.9	84.8
		110	96.9	65.5	3.91	78.9	16.8	85.8	101.2	66.1	3.91	79.5	16.9	85.9	103.3	66.7	3.92	80.1	17.0	86.0
	15	50	40.6	47.1	3.59	59.4	13.1	77.9	43.6	48.1	3.61	60.4	13.3	78.1	45.1	49.0	3.62	61.4	13.5	78.2
		70	59.4	52.8	3.65	65.2	14.5	78.7	62.9	53.6	3.66	66.1	14.6	78.8	64.6	54.4	3.67	67.0	14.8	78.9
		90	78.3	58.4	3.70	71.0	15.8	79.5	82.1	59.1	3.71	71.8	15.9	79.6	84.0	59.8	3.72	72.5	16.1	79.7
		110	97.2	64.0	3.76	76.9	17.0	80.2	101.4	64.6	3.77	77.5	17.1	80.3	103.5	65.2	3.78	78.1	17.3	80.4
	20	50	40.7	46.5	3.50	58.4	13.3	75.8	43.7	47.4	3.51	59.4	13.5	75.9	45.2	48.4	3.53	60.5	13.7	76.0
		70	59.6	51.8	3.54	63.9	14.6	76.4	63.0	52.7	3.55	64.8	14.8	76.5	64.7	53.5	3.56	65.6	15.0	76.6
		90	78.6	57.2	3.57	69.4	16.0	76.9	82.3	57.9	3.59	70.1	16.1	77.0	84.1	58.6	3.60	70.8	16.3	77.1
		110	97.5	62.5	3.61	74.9	17.3	77.5	101.6	63.1	3.62	75.4	17.4	77.5	103.6	63.6	3.64	76.0	17.5	77.6
90	10	50	41.1	44.5	4.39	59.5	10.2	101.9	43.9	45.6	4.41	60.7	10.4	102.1	45.3	46.8	4.43	61.9	10.5	102.4
		70	59.6	52.2	4.49	67.5	11.6	103.5	62.9	53.2	4.51	68.6	11.8	103.7	64.6	54.2	4.53	69.7	12.0	103.9
		90	78.0	59.8	4.60	75.5	13.0	105.1	81.9	60.7	4.61	76.4	13.2	105.3	83.8	61.6	4.63	77.4	13.3	105.5
		110	96.5	67.4	4.70	83.5	14.3	106.7	100.9	68.3	4.71	84.3	14.5	106.9	103.1	69.1	4.72	85.2	14.6	107.0
	15	50	41.1	44.3	4.29	59.0	10.3	97.9	43.9	45.5	4.31	60.2	10.6	98.0	45.3	46.7	4.33	61.4	10.8	98.2
		70	59.6	51.8	4.37	66.7	11.9	98.9	63.0	52.8	4.38	67.7	12.0	99.0	64.6	53.8	4.40	68.8	12.2	99.2
		90	78.2	59.2	4.45	74.4	13.3	99.9	82.0	60.1	4.46	75.3	13.5	100.0	83.9	60.9	4.48	76.2	13.6	100.2
		110	96.7	66.6	4.53	82.1	14.7	100.9	101.0	67.4	4.54	82.8	14.8	101.0	103.2	68.1	4.55	83.6	15.0	101.1
	20	50	41.2	44.1	4.19	58.4	10.5	95.8	44.0	45.4	4.20	59.7	10.8	96.0	45.3	46.6	4.22	61.0	11.0	96.1
		70	59.7	51.4	4.24	65.8	12.1	96.6	63.0	52.4	4.26	66.9	12.3	96.7	64.7	53.4	4.27	68.0	12.5	96.8
		90	78.3	58.6	4.30	73.2	13.6	97.3	82.1	59.4	4.31	74.1	13.8	97.4	84.0	60.3	4.33	75.0	13.9	97.5
		110	96.8	65.8	4.35	80.7	15.1	98.1	101.1	66.5	4.37	81.4	15.2	98.1	103.3	67.1	4.38	82.1	15.3	98.2
110	10	50	41.8	41.2	5.09	58.6	8.1	121.7	44.3	42.5	5.12	60.0	8.3	122.0	45.6	43.9	5.15	61.4	8.5	122.3
		70	59.9	50.6	5.22	68.4	9.7	123.7	63.1	51.8	5.25	69.7	9.9	123.9	64.7	53.0	5.28	71.0	10.1	124.2
		90	78.0	60.0	5.36	78.3	11.2	125.7	81.9	61.1	5.38	79.4	11.4	125.9	83.8	62.2	5.40	80.6	11.5	126.1
		110	96.1	69.3	5.50	88.1	12.6	127.6	100.6	70.4	5.51	89.2	12.8	127.8	102.9	71.4	5.53	90.2	12.9	128.0
	15	50	41.7	41.5	4.98	58.5	8.3	117.8	44.3	42.9	5.01	60.0	8.6	118.0	45.6	44.3	5.03	61.5	8.8	118.2
		70	59.9	50.7	5.09	68.1	10.0	119.1	63.1	52.0	5.11	69.4	10.2	119.3	64.7	53.2	5.13	70.7	10.4	119.4
		90	78.0	60.0	5.19	77.7	11.6	120.4	81.9	61.0	5.21	78.8	11.7	120.5	83.8	62.1	5.23	79.9	11.9	120.7
		110	96.2	69.2	5.30	87.3	13.1	121.6	100.7	70.1	5.31	88.2	13.2	121.8	102.9	71.0	5.33	89.2	13.3	121.9
	20	50	41.6	41.8	4.87	58.4	8.6	115.8	44.2	43.3	4.89	60.0	8.8	116.0	45.5	44.8	4.91	61.5	9.1	116.2
		70	59.8	50.9	4.95	67.8	10.3	116.8	63.0	52.1	4.97	69.1	10.5	116.9	64.7	53.4	4.98	70.4	10.7	117.0
		90	78.0	60.0	5.02	77.1	11.9	117.7	81.9	61.0	5.04	78.2	12.1	117.8	83.8	62.0	5.06	79.2	12.3	117.9
		110	96.2	69.1	5.10	86.4	13.6	118.6	100.7	69.8	5.11	87.3	13.7	118.7	102.9	70.6	5.13	88.1	13.8	118.8

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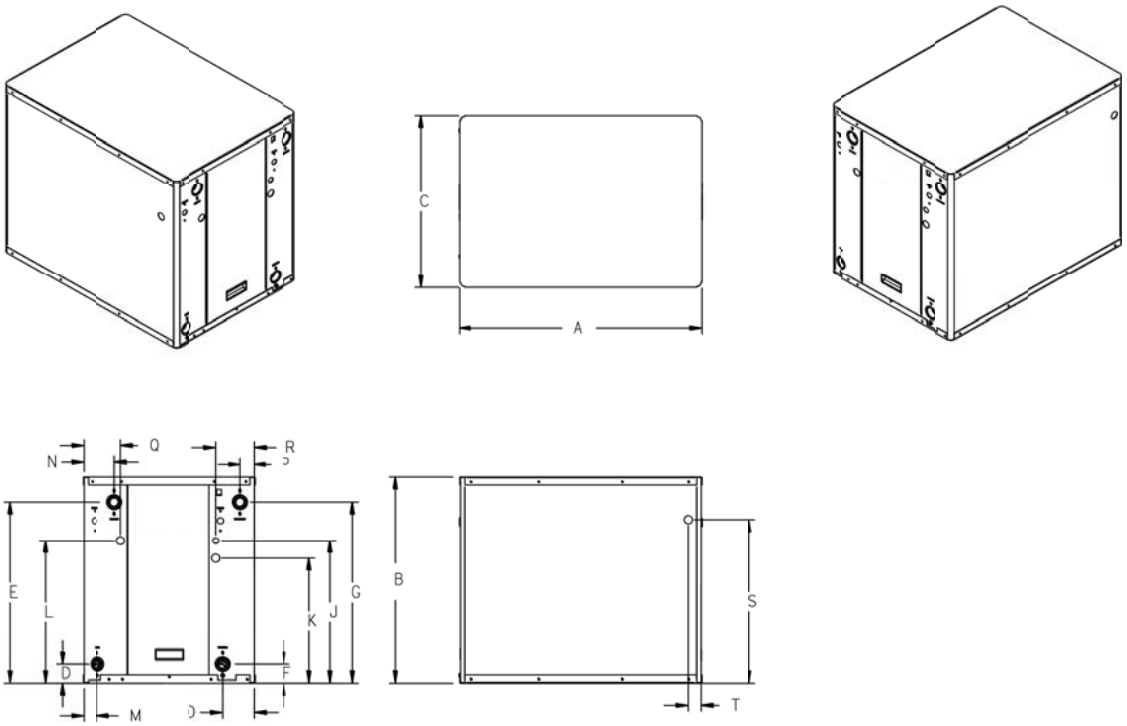
Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Dimensional Data



Model		Overall Cabinet			Water Connections						Electrical Knockouts		
		A	B	C	D	E	F	G			J	K	L
		Depth	Height	Width	Load Liquid In	Load Liquid Out	Source Liquid In	Source Liquid Out	Load Water FPT	Source Water FPT	1/2" cond Low Voltage	3/4" cond Ext Pump	3/4" cond Power Supply
040	in.	31.0	26.2	22.0	2.1	19.6	2.1	19.6	1"	1"	17.1	14.8	17.1
	mm	787.4	665.5	558.8	53.3	497.8	53.3	497.8	25.4	25.4	434.3	375.9	434.3
050	in.	31.0	26.2	22.0	2.2	20.6	2.2	20.6	1-1/4"	1-1/4"	17.1	14.8	17.1
	mm	787.4	665.5	558.8	55.9	523.2	55.9	523.2	31.8	31.8	434.3	375.9	434.3
066	in.	31.0	26.2	22.0	2.4	23.0	2.4	23.0	1-1/4"	1-1/4"	17.1	14.8	17.1
	mm	787.4	665.5	558.8	61.0	584.2	61.0	584.2	31.8	31.8	434.3	375.9	434.3

Water Connections				Electrical Knockout	
M	N	O	P	S	T
Load Liquid In	Load Liquid Out	Source Liquid In	Source Liquid Out	Power Supply	Low Voltage
1.6	2.8	2.8	1.6	2.0	1.8
40.6	69.9	69.9	40.6	50.8	45.7
1.8	3.6	3.6	1.8	2.1	1.8
45.7	91.4	91.4	45.7	53.3	45.7
1.8	4.0	4.0	1.8	4.2	1.4
45.7	101.6	101.6	45.7	106.7	35.6

8/28/2014

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Physical Data

Model	040	050	066
Compressor (1 each)	Scroll		
Factory Charge R410A, oz [kg]	94 [2.66]	108 [3.06]	142 [4.02]
Coax & Piping Water Volume - gal [l]	1.0 [3.94]	1.4 [5.25]	1.6 [6.13]
Weight - Operating, lb [kg]	305 [138.3]	340 [154.2]	360 [163.3]
Weight - Packaged, lb [kg]	320 [145.1]	355 [161.0]	375 [170.0]

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Electrical Data

Model	Rated Voltage	Voltage Min/Max	Compressor				Load Pump	Source Pump	Total Unit FLA	Min Ckt Amp	Maximum Fuse/HACR
			MCC	RLA	LRA	LRA*					
040	208-230/60/1	198/254	27.7	17.8	135.0	47.0	1.8	5.4	25.0	29.5	45
050	208-230/60/1	198/254	37.8	24.2	178.0	-	1.8	5.4	31.4	37.5	60
066	208-230/60/1	198/254	40.3	25.8	178.0	-	1.8	5.4	33.0	39.5	60

Notes:All fuses type “D” time delay (or HACR circuit breaker in USA). 7/08/14
Source pump amps shown are for up to a 1/2 HP pump
Load pump amps shown are for small circulators.
*LRA with IntelliStart installed

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Pressure Drop

Model	GPM	Pressure Drop (psi)						
		30°F	50°F	70°F	90°F	110°F	130°F	150°F
040	5.0	0.9	0.6	0.6	0.5	0.5	0.4	0.3
	7.5	2.3	2.1	2.0	1.9	1.8	1.6	1.5
	10.0	3.7	3.5	3.3	3.2	3.0	2.8	2.7
	12.5	5.0	4.7	4.4	4.2	4.1	3.9	3.7
050	8.0	1.7	1.4	1.4	1.3	1.3	1.2	1.1
	11.5	3.6	3.4	3.2	3.0	2.8	2.6	2.5
	15.0	5.6	5.4	5.0	4.6	4.4	4.3	4.1
	18.5	8.3	8.1	7.6	7.2	6.8	6.6	6.4
066	10.0	3.2	3.0	2.8	2.7	2.5	2.4	2.3
	14.5	5.5	5.3	5.1	4.9	4.7	4.6	4.5
	19.0	7.9	7.6	7.3	7.1	6.8	6.6	6.5
	23.5	11.5	11.3	11.0	10.8	10.3	10.1	9.9

7/8/14

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Correction Factor Tables

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 - °F [°C]		**80 [26.7]**	**30 [-1.1]**	**50 [10.0]**	**90 [32.2]**	**30 [-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 for the source and methanol 10% for the load. Determine the corrected heating at 30°F source and 80°F load as well as pressure drop at 30°F for an 050. Also, determine the corrected cooling at 90°F source and 50°F load.

The corrected heating capacity at 30°F/80°F would be:
45,600 BTU/H x 0.913 x 0.985 = 41,008 BTU/H
The corrected cooling capacity at 90°F/50°F would be:
41,700 x 0.969 x 0.962 = 38,871 BTU/H
The corrected pressure drop at 30°F and 15 GPM would be:
5.6 psi x 1.270 = 7.11 psi

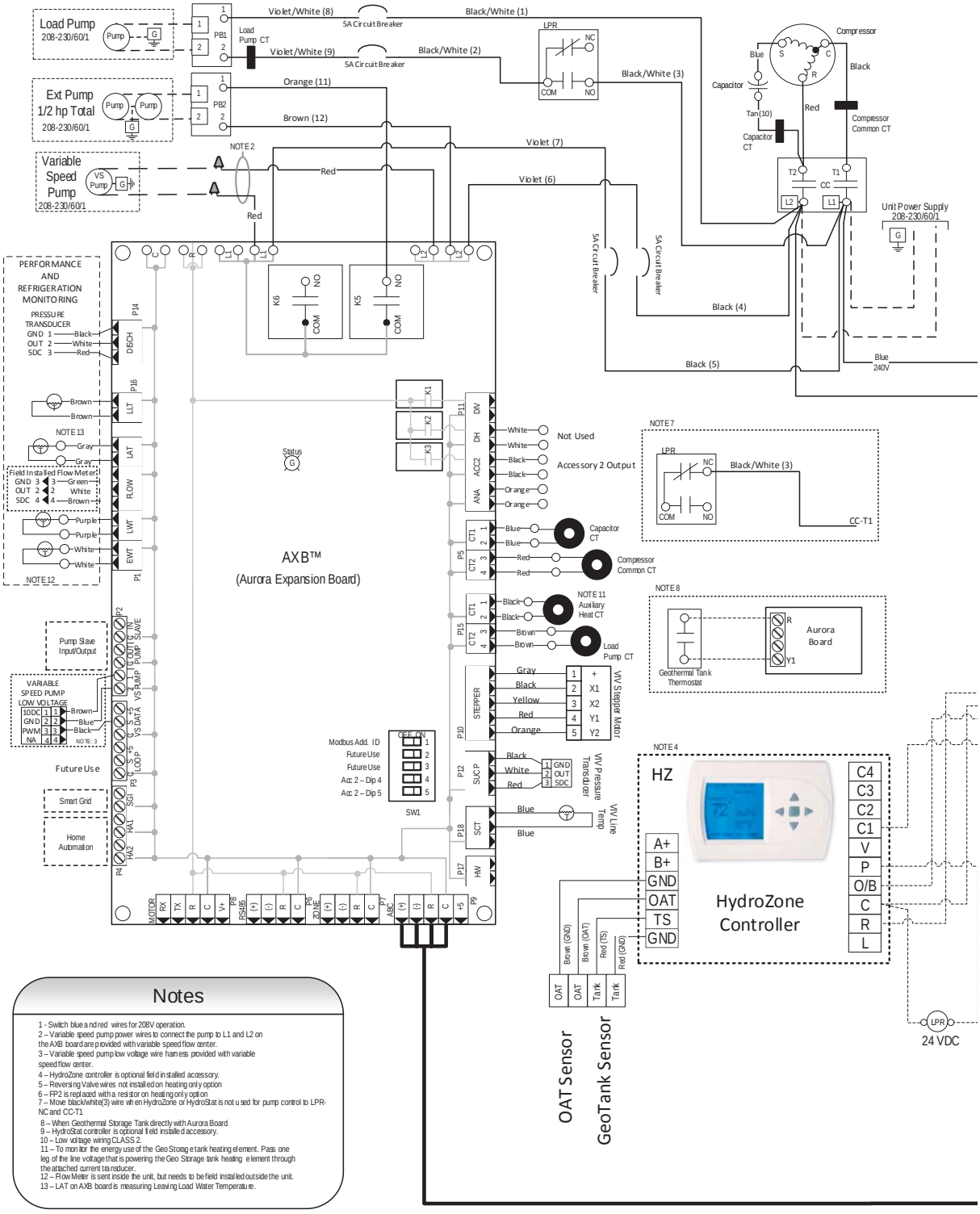
Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Wiring Schematics - Residential

Aurora Advanced EVI Water-Water 208-230/60/1

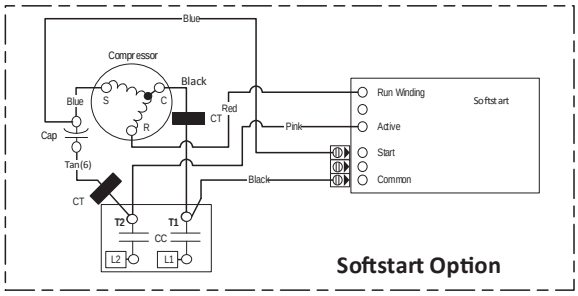


Notes

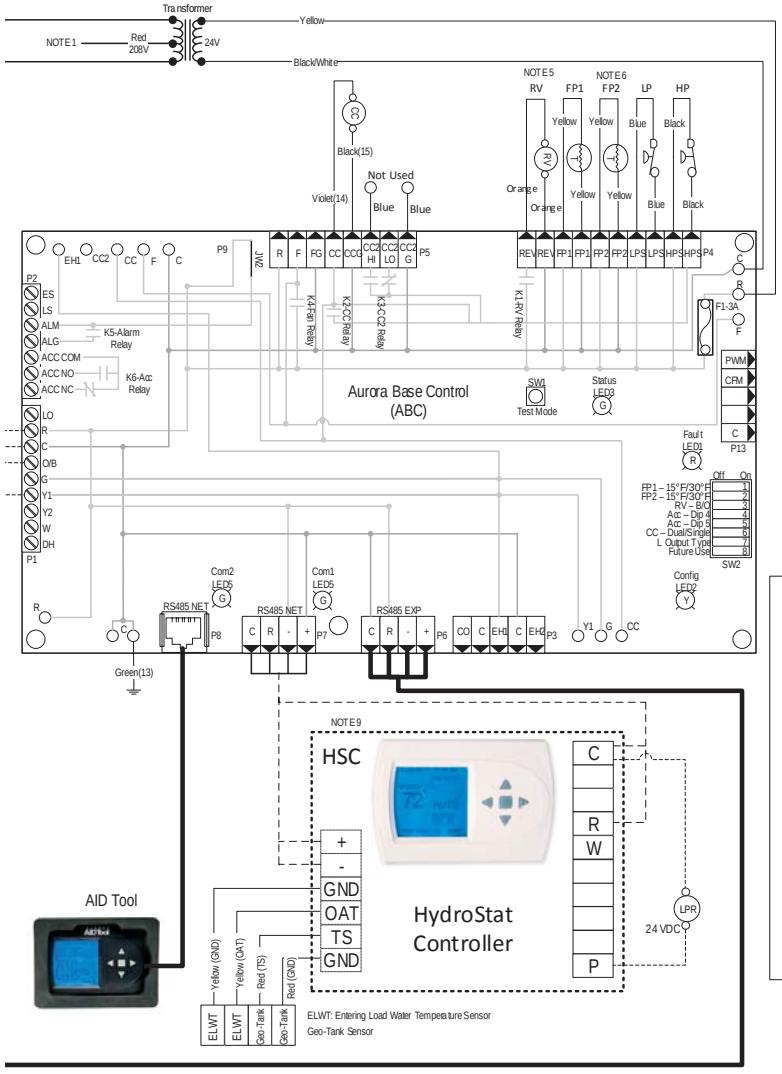
1 - Switch blue and red wires for 208V operation.
2 – Variable speed pump power wires to connect the pump to L1 and L2 on the AXB board are provided with variable speed flow center.
3 – Variable speed pump low voltage wire harness provided with variable speed flow center.
4 – HydroZone controller is optional field installed accessory.
5 – Reversing Valve wires not installed on heating only option
6 – FP2 is replaced with a resistor on heating only option
7 – Move black/white(3) wire when HydroZone or HydroStat is not used for pump control to LPR-NC and CC-T1.
8 – When Geothermal Storage Tank directly with Aurora Board
9 – HydroStat controller is optional field installed accessory.
10 – Low voltage wiring CLASS 2.
11 – To monitor the energy use of the Geo Storage tank heating element. Pass one leg of the line voltage that is powering the Geo Storage tank heating element through the attached current transducer.
12 – Flow Meter is sent inside the unit, but needs to be field installed outside the unit.
13 – LAT on AXB board is measuring Leaving Load Water Temperature.

Wiring Schematics - Residential cont.

Aurora Advanced EVI Water-Water 208-230/60/1

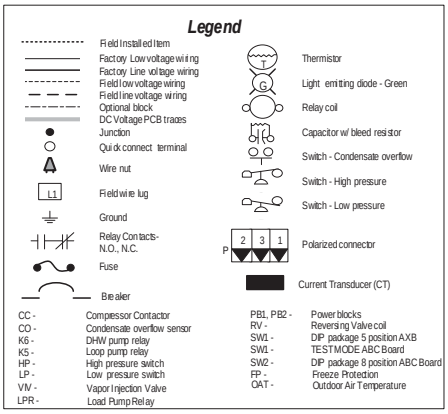


Aurora LED Flash Codes			
Slow Flash	1 second on and 1 second off		
Fast Flash	100 milliseconds on and 100 milliseconds off		
Flash Code	100 milliseconds on and 400 milliseconds off with a 2 second pause before repeating		
Random Start Delay (Alternating Colors)		Configuration LED (LED2, Yellow)	
Status LED (LED1, Green)	Fast Flash	No Software Override	OFF
Configuration LED (LED2, Yellow)	Fast Flash	DIP Switch Override	Slow Flash
Fault LED (LED3, Red)	Fast Flash		
Fault LED (LED1, Red)		Status LED (LED3, Green)	
Normal Mode	OFF	Normal Mode	ON
Input Fault Lockout	Flash Code 1	Control is Non-Functional	OFF
High Pressure Lockout	Flash Code 2	Test Mode	Slow Flash
Low Pressure Lockout	Flash Code 3	Lockout Active	Fast Flash
Future Use	Flash Code 4	Dehumidification Mode	Flash Code 2
Freeze Detection – FP1	Flash Code 5	Future Use	Flash Code 3
Reserved	Flash Code 6	Future Use	Flash Code 4
Condensate Overflow Lockout	Flash Code 7	Load Shed	Flash Code 5
Over/Under Voltage Shutdown	Flash Code 8	ESD	Flash Code 6
Future Use	Flash Code 9	On Peak Mode	Flash Code 7
Compressor Monitor	Flash Code 10		
FP1 Sensor Error	Flash Code 11		



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

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
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 Coil Limit	2 minutes	30 seconds
Fault Recognition Delay – Low Water Coil Limit	30 seconds	30 seconds
Fault Recognition Delay – Condensate Overflow	30 seconds	30 seconds
HydroZone Call Recognition Time	2 seconds	2 seconds
Water Valve Slow Open Delay	90 seconds	90 seconds



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Engineering Guide Specifications

General

The liquid source water-to-water heat pump shall be a single packaged heating only or reverse-cycle heating/cooling unit. The unit shall be listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory, Underwriters Laboratory (UL), or Canadian Standards Association (CSA). The unit shall be rated in accordance with Air Conditioning, Heating, and Refrigeration Institute/International Standards Organization (AHRI/ISO) and Canadian Standards Association (CSA-US). The liquid source water-to-water heat pump unit shall be designed to operate with source liquid temperatures between 50°F [10°C] and 110°F [43.3°C] in cooling, and between 30°F [-1°C] and 90°F [32.2°C] in heating.

Casing and Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel and finished with corrosion-resistant powder coating. This corrosion protection system shall meet the stringent 1,000 hour salt spray test per ASTM B117. The interior shall be insulated with ½ in. thick, multi-density, coated glass fiber for noise suppression.

All units shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. The control box shall be field switchable from front to back for improved application flexibility with quick attach low voltage harnesses. The control box is shipped standard on the opposite end of the water connections.

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, reversing valve, coaxial tube water-to-refrigerant heat exchanger, electronic expansion valve (VI circuit), and service ports.

Compressors shall be high-efficiency scroll type designed for vapor injection, 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. All models will feature a compressor discharge muffler to help quiet compressor gas pulsations. A high density sound attenuating blanket shall be factory installed around the compressor to reduce sound. Compressor motors shall be single-phase PSC with overload protection.

The coaxial water-to-refrigerant heat exchanger shall be designed for low water pressure drop and constructed of a convoluted copper inner tube and a steel outer tube. Refrigerant-to-water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 650 PSIG (4481 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 bidirectionally without the use of check valves.

Piping and Connections

Supply and return water connections shall be 1 in. [25.4 mm] for the 040, 1 ¼ in. [31.75 mm] for the 050-066. The FPT fittings shall be fixed to the cabinet by use of a captive fitting, which eliminates the need for backup pipe wrenches.

Electrical

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer with a built-in circuit breaker, 24 volt activated 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, a microprocessor-based controller, interfaces with an external control to monitor and control unit operation shall be provided. The unit control shall provide operational sequencing, high and low pressure switch monitoring, freeze detection, hot water limit thermistor sensing, lockout mode control, hot water, load and loop pump control, LED status and fault indicators, fault memory, field selectable options, and accessory output. The Lockout signal output shall have a pulsed option so that DDC systems can red specific lockout conditions from the control.

The Aurora Advanced Control shall also feature an Energy

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Engineering Guide Specifications cont.

Monitoring Package that will provide real time total power consumption, compressor monitoring, On Peak input signal for utility controlled demand programs, loop pump linking for multiple units driving a common flow center and up to two optional home automation inputs. Optional Performance and Refrigerant Monitoring package will provide real time data of the refrigeration circuit.

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

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.

Optional IntelliStart (compressor Soft Starter) (040 only) shall be factory installed for use in applications that require low starting amps, reduced compressor start-up noise, off-grid, and improved start-up behavior. IntelliStart shall reduce normal starting current by 60% on 208-230/60/1 units.

Accessories

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

WaterFurnace P/N - WFI-AYH100XF-XXX-24MO
(1 in. hose kit for 040)
WFI-AYH125XF-XXX-24MO
(1 ¼ in. hose kit for 050-066)

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 & 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 [2756 kPa] for ½ in. and ¾ in. hose kits; max. working pressure of 350 psi [2413 kPa] for 1 in. and 1 ¼ in. hose kits.
- Minimum burst pressure of four times working pressure.

Geothermal Storage Tanks

Available in 80 or 119 gallon capacities and are specifically designed with large plumbing connections, 2 in. (R-16) insulation, built-in temperature sensor, and *chilled water approved* make these tanks the perfect choice for geothermal hydronic systems. A pair of 1 in. connections on top of the storage tanks allow for easy installation and trouble-free operation in geothermal hot water assist systems. Large 1-1/2 in. FPT re-circulating side connections (shipped with threaded plugs) are included for high-flow water-to-water units. The upper element provides easy use of auxillary/backup heat. Sandhog low Watt density 4500 Watt Incoloy Steel Heating Element is designed to last 2 to 3 times longer than standard copper heating elements. The lower access panel houses a factory installed thermistor for accurate tank set-point control which is ideal for use with our HydroStat or HydroZone controllers.

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Revision Guide

Pages:	Description:	Date:	By:
Misc.	Added Compressor Monitoring kit, misc. updates	15 Feb 2019	JM
5-10	Updated Heating Performance Data	01 May 2015	MA
All	Literature Creation	05 Feb 2015	MA