



5 Series **502W12**

Geothermal heat pump
High Temp Hydronic Unit
7 ton

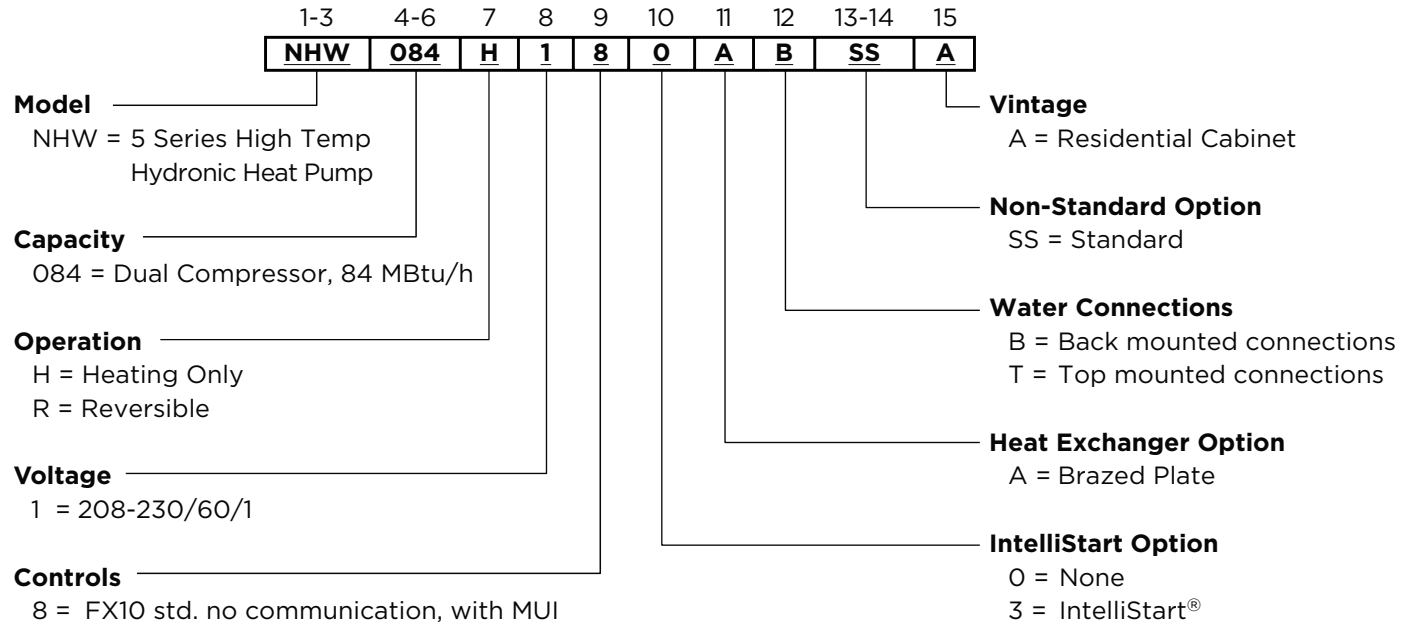


Submittal Data
English Language/IP Units
SD2517AN 03/13



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

Model Nomenclature



NOTE: MUI = Medium User Interface



All 5 Series 502W12 product is safety listed under UL1995 thru ETL and performance listed with AHRI in accordance with standard 13256-2. The 5 Series 502W12 is also Energy Star rated.

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Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



AHRI/ISO 13256-2 Performance Ratings

English (IP) Units

Model	Capacity Modulation	Flow Rate		Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
				Cooling EST 86°F ELT 53.6°F		Heating EST 68°F ELT 104°F		Cooling EST 59°F ELT 53.6°F		Heating EST 50°F ELT 104°F		Cooling Full EST 77°F Part EST 68°F ELT 53.6°F		Heating Full EST 32°F Part EST 41°F ELT 104°F	
		Sgpm	Lgpm	Capacity Btu/h	EER Btu/h per W	Capacity Btu/h	COP	Capacity Btu/h	EER Btu/h per W	Capacity Btu/h	COP	Capacity Btu/h	EER Btu/h per W	Capacity Btu/h	COP
084	Full	20	20	75,800	14.2	110,000	4.1	84,300	20.3	84,100	3.8	79,100	16.0	64,000	3.1
	Part	20	20	39,500	15.0	59,500	4.8	43,800	20.8	43,100	4.0	43,500	19.0	37,600	3.5

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Energy Star Compliance Table

Model	Tier 3	
	Ground Water	Ground Loop
084	Yes	Yes

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Energy Star Rating Criteria

In order for water-source heat pumps to be Energy Star rated they must meet or exceed the minimum efficiency requirements listed below.

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

	EER	COP
Closed loop water-to-air	17.1	3.6
Open loop water-to-air	21.1	4.1
Closed loop water-to-water	16.1	3.1
Open loop water-to-water	20.1	3.5



Contractor: _____ P.O.: _____

Engineer: _____

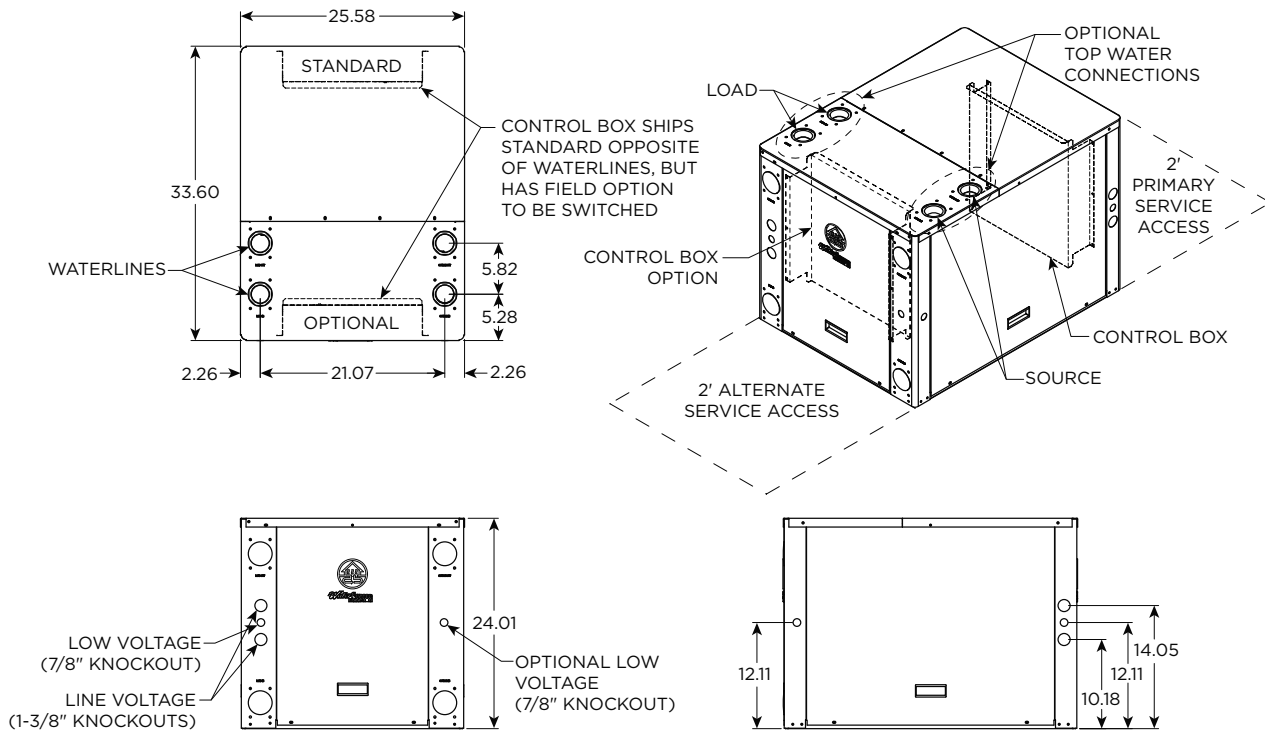
Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz

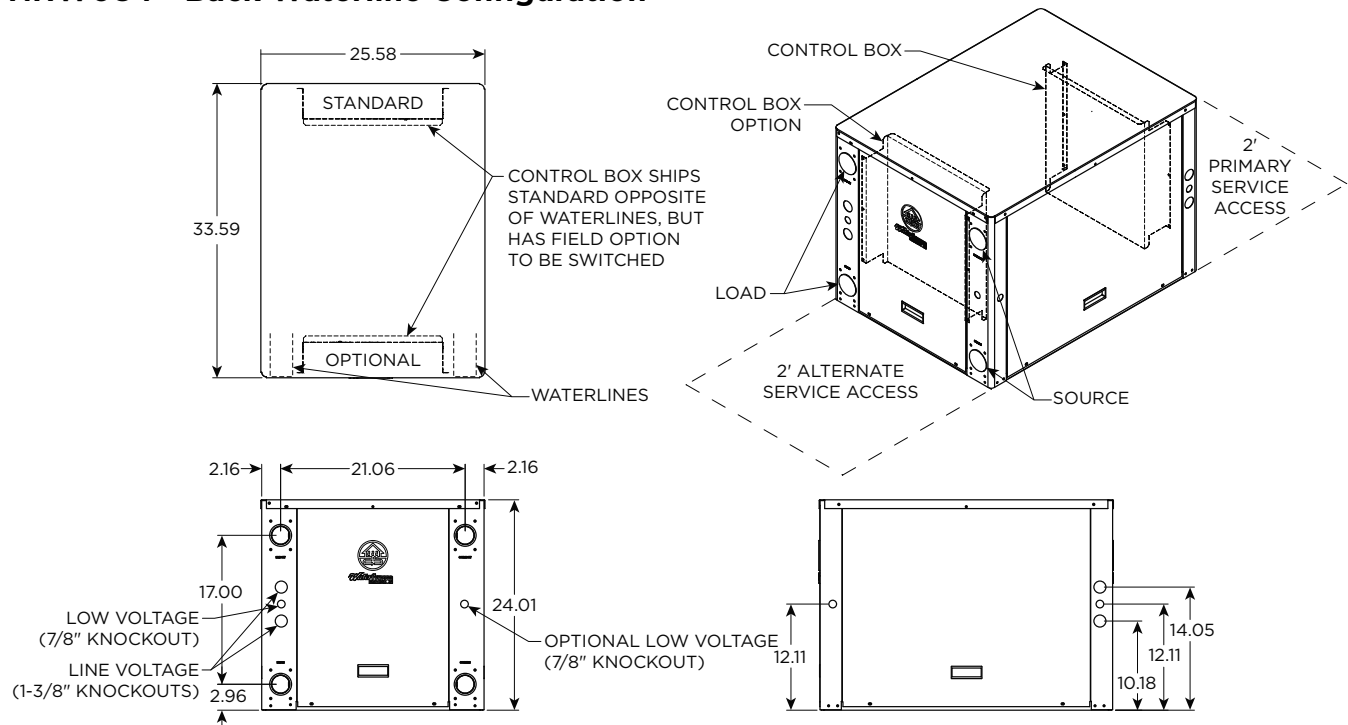


Dimensional Data

NHW084 - Top Waterline Configuration



NHW084 - Back Waterline Configuration



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

Physical Data

Model	084
Compressor (2 each)	Scroll
Factory Charge R-134a, oz [kg]	76 [2.16]
Load Water Connection	
FPT - in	1.25
Source Water Connection	
FPT - in	1.25
Weight - Operating, lb [kg]	420 [190]
Weight - Packaged, lb [kg]	415 [188]

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Electrical Data

Model	Supply Circuit	Rated Voltage	Voltage Min/Max	Compressor*				Load Pump FLA	Source Pump FLA	Total Unit FLA	Min Circ Amp	Max Fuse/HACR
				MCC	RLA	LRA	LRA**					
084	L1/L2	208-230/60/1	187/253	37.0	23.7	144.0	65.0	-	-	23.7	29.6	50
	L3/L4	208-230/60/1	187/253	37.0	23.7	144.0	65.0	4.2	4.2	32.1	38.0	60

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HACR circuit breaker in USA only

* Ratings per each compressor - unit supplied with two

** With optional IntelliStart

Reference Calculations

Heating Calculations: $LWT = EWT - \frac{HE}{gpm \times 500^*}$	Cooling Calculations: $LWT = EWT + \frac{HR}{gpm \times 500^*}$
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NOTE: * When using water. Use 485 for 15% methanol/water or Environol solution.

Legend

ABBREVIATIONS AND DEFINITIONS:

COP = coefficient of performance (HC/kW x 3.413)
 EER = cooling energy efficiency (TC/kW)
 ELT = entering load fluid temperature to heat pump
 EST = entering source fluid temperature to heat pump
 ft HD = pressure drop in feet of head
 HC = heating capacity in MBtu/h
 HE = total heat of extraction, MBtu/h
 HR = total heat of rejection, MBtu/h
 kW = total power unit input, kilowatts

Lgpm = load flow in gallons per minute
 LLT = leaving load fluid temperature from heat pump
 LST = leaving source fluid temperature from heat pump
 LWPD = load heat exchanger water pressure drop
 psi = pressure drop in pounds per square inch
 Sgpm = source flow in gallons per minute
 SWPD = source heat exchanger water pressure drop
 TC = total cooling capacity in MBtu/h

Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



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	Heating		Cooling		Pressure Drop
		Load	Source	Load	Source	
EWT - °F [°C]		90 [32.2]	30 [-1.1]	45 [7.2]	90 [32.2]	30 [-1.1]
Water	0	1.000	1.000	1.000	1.000	1.000
Ethylene Glycol	10	0.991	0.973	0.975	0.991	1.075
	20	0.979	0.943	0.946	0.979	1.163
	30	0.965	0.917	0.920	0.965	1.225
	40	0.955	0.890	0.895	0.955	1.324
	50	0.943	0.865	0.870	0.943	1.419
Propylene Glycol	10	0.981	0.958	0.959	0.981	1.130
	20	0.969	0.913	0.919	0.969	1.270
	30	0.950	0.854	0.866	0.950	1.433
	40	0.937	0.813	0.829	0.937	1.614
	50	0.922	0.770	0.789	0.922	1.816
Ethanol	10	0.991	0.927	0.941	0.991	1.242
	20	0.972	0.887	0.901	0.972	1.343
	30	0.947	0.856	0.866	0.947	1.383
	40	0.930	0.815	0.826	0.930	1.523
	50	0.911	0.779	0.791	0.911	1.639
Methanol	10	0.986	0.957	0.961	0.986	1.127
	20	0.970	0.924	0.928	0.970	1.197
	30	0.951	0.895	0.897	0.951	1.235
	40	0.936	0.863	0.865	0.936	1.323
	50	0.920	0.833	0.835	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. Both source and load flow rates are 25 gpm. Determine the corrected heating at 30°F source and 80°F load as well as pressure drop at 30°F for a 5 Series NHW084. Also, determine the corrected cooling at 90°F source and 50°F load.

The corrected heating capacity at 30°F/80°F would be:

$$68,800 \text{ MBtu/h} \times 0.913 \times 0.985 = 61,872 \text{ MBtu/h}$$

The corrected cooling capacity at 90°F/50°F would be:

$$74,600 \times 0.969 \times 0.962 = 69,540 \text{ MBtu/h}$$

The corrected pressure drop at 30°F and 36 gpm would be:

$$3.4 \text{ psi} \times 1.270 = 4.32 \text{ psi}$$

Load and Source Pressure Drop

Model	gpm	Pressure Drop (psi)				
		30°F	50°F	70°F	90°F	110°F
084	15	1.6	1.5	1.4	1.2	1.2
	20	2.5	2.4	2.2	1.9	1.9
	25	3.4	3.2	3.1	2.6	2.6

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 Engineer: _____
 Project Name: _____ Unit Tag: _____

Performance Data

NHW084 - Cooling Capacity

Source	ELT	Load Flow - 15 gpm							Load Flow - 20 gpm							Load Flow - 25 gpm						
		EST °F	Flow gpm	°F	LLT °F	HC MBtu/h	Power kW	HR MBtu/h	EER	LST °F	LLT °F	HC MBtu/h	Power kW	HR MBtu/h	EER	LST °F	LLT °F	HC MBtu/h	Power kW	HR MBtu/h	EER	LST °F
30	15	50	38.7	84.6	3.3	95.7	25.9	42.8	41.5	85.1	3.3	96.3	26.0	39.6	43.1	85.7	3.3	96.9	26.0	37.8		
		70	58.6	85.7	3.2	96.7	26.6	42.9	61.4	86.0	3.2	97.1	26.7	39.7	63.1	86.4	3.2	97.4	26.7	37.8		
		90	78.4	86.8	3.2	97.7	27.4	43.0	81.3	87.0	3.2	97.8	27.4	39.8	83.0	87.1	3.2	98.0	27.4	37.8		
		110	98.3	88.0	3.1	98.7	28.2	43.2	101.2	87.9	3.1	98.6	28.1	39.9	103.0	87.9	3.1	98.6	28.1	37.9		
	20	50	39.1	81.6	3.2	92.5	25.5	42.3	41.8	81.8	3.2	92.7	25.5	39.3	43.4	81.9	3.2	92.9	25.5	37.4		
		70	58.9	83.0	3.2	93.8	26.2	42.5	61.5	85.0	3.2	96.0	26.4	39.6	63.0	87.0	3.3	98.2	26.7	37.9		
		90	78.7	84.4	3.1	95.0	27.0	42.7	81.4	86.3	3.2	97.1	27.2	39.7	82.9	88.3	3.2	99.2	27.4	37.9		
		110	98.6	85.8	3.1	96.3	27.8	42.8	101.4	85.9	3.1	96.4	27.8	39.6	103.1	86.0	3.1	96.5	27.9	37.7		
	25	50	39.5	78.6	3.1	89.4	25.0	41.9	42.2	78.4	3.1	89.2	25.0	38.9	43.7	78.2	3.1	88.9	24.9	37.1		
		70	59.3	80.3	3.1	90.9	25.8	42.1	61.6	84.0	3.2	94.9	26.2	39.5	63.0	87.7	3.3	98.9	26.6	37.9		
		90	79.1	81.9	3.1	92.4	26.7	42.3	81.4	85.6	3.2	96.4	27.1	39.6	82.8	89.4	3.3	100.5	27.5	38.0		
		110	98.9	83.6	3.0	93.9	27.5	42.5	101.6	83.8	3.0	94.2	27.6	39.4	103.3	84.0	3.0	94.4	27.7	37.6		
50	15	50	38.6	85.2	3.8	98.2	22.3	63.1	41.2	87.5	3.9	100.7	22.7	60.1	42.8	89.9	3.9	103.2	23.0	58.3		
		70	57.1	97.1	3.9	110.5	24.7	64.7	60.1	98.8	4.0	112.3	24.9	61.2	62.0	100.4	4.0	114.1	25.1	59.1		
		90	75.5	109.0	4.1	122.9	26.8	66.4	79.0	110.0	4.1	123.9	27.0	62.4	81.1	111.0	4.1	124.9	27.1	60.0		
		110	93.9	120.9	4.2	135.2	28.9	68.0	97.9	121.2	4.2	135.5	29.0	63.6	100.3	121.5	4.2	135.8	29.0	60.9		
	20	50	38.6	85.4	3.8	98.2	22.7	63.1	41.3	87.4	3.8	100.3	23.0	60.0	42.9	89.4	3.8	102.4	23.3	58.2		
		70	57.3	95.6	3.9	108.7	24.8	64.5	60.3	97.0	3.9	110.3	25.0	61.0	62.1	98.5	3.9	111.8	25.2	58.9		
		90	75.9	105.8	4.0	119.2	26.8	65.9	79.3	106.7	4.0	120.2	26.9	62.0	81.4	107.6	4.0	121.2	27.0	59.7		
		110	94.5	116.0	4.0	129.8	28.6	67.3	98.4	116.3	4.1	130.2	28.7	63.0	100.7	116.7	4.1	130.6	28.7	60.4		
	25	50	38.6	85.5	3.7	98.2	23.1	63.1	41.3	87.2	3.7	100.0	23.3	60.0	42.9	88.9	3.8	101.7	23.6	58.1		
		70	57.5	94.0	3.8	106.9	24.9	64.3	60.5	95.3	3.8	108.3	25.1	60.8	62.3	96.6	3.8	109.6	25.3	58.8		
		90	76.3	102.5	3.8	115.6	26.7	65.4	79.7	103.4	3.9	116.5	26.8	61.7	81.7	104.3	3.9	117.5	26.9	59.4		
		110	95.2	111.0	3.9	124.3	28.4	66.6	98.9	111.5	3.9	124.8	28.4	62.5	101.0	111.9	3.9	125.4	28.4	60.0		
70	15	50	38.6	85.8	4.5	101.4	18.9	83.5	41.2	88.1	4.5	103.5	19.4	80.4	42.8	90.3	4.5	105.7	20.0	78.5		
		70	55.9	105.4	4.8	121.7	22.1	86.2	59.2	107.6	4.8	123.8	22.6	82.4	61.2	109.8	4.7	126.0	23.2	80.1		
		90	73.3	125.0	5.0	142.1	25.0	88.9	77.3	127.2	5.0	144.1	25.6	84.4	79.7	129.3	5.0	146.2	26.1	81.7		
		110	90.7	144.6	5.2	162.4	27.7	91.7	95.3	146.7	5.2	164.5	28.2	86.4	98.1	148.8	5.2	166.5	28.7	83.3		
	20	50	38.5	86.0	4.5	101.3	19.2	83.5	41.2	88.1	4.5	103.3	19.7	80.3	42.8	90.1	4.4	105.2	20.3	78.4		
		70	56.1	104.2	4.7	120.1	22.3	86.0	59.4	106.1	4.6	122.0	22.8	82.2	61.4	108.1	4.6	123.9	23.4	79.9		
		90	73.7	122.3	4.9	138.9	25.2	88.5	77.6	124.2	4.8	140.7	25.7	84.1	79.9	126.1	4.8	142.6	26.2	81.4		
		110	91.3	140.5	5.0	157.6	27.9	91.0	95.8	142.3	5.0	159.4	28.3	85.9	98.5	144.2	5.0	161.2	28.8	82.9		
	25	50	38.5	86.2	4.4	101.3	19.5	83.5	41.2	88.0	4.4	103.0	20.1	80.3	42.8	89.9	4.4	104.8	20.6	78.4		
		70	56.3	102.9	4.6	118.5	22.5	85.8	59.5	104.7	4.5	120.2	23.0	82.0	61.5	106.4	4.5	121.8	23.6	79.7		
		90	74.1	119.6	4.7	135.7	25.4	88.1	77.9	121.3	4.7	137.3	25.8	83.7	80.2	123.0	4.7	138.9	26.3	81.1		
		110	91.8	136.3	4.9	152.9	28.0	90.4	96.2	137.9	4.8	154.4	28.5	85.4	98.8	139.5	4.8	156.0	28.9	82.5		
90	15	50	40.5	70.9	5.5	89.6	12.9	101.9	42.7	72.6	5.4	91.0	13.5	99.1	44.1	74.3	5.3	92.3	14.0	97.4		
		70	57.4	94.6	5.8	114.5	16.2	105.3	60.3	96.9	5.8	116.5	16.8	101.7	62.1	99.2	5.7	118.6	17.5	99.5		
		90	74.2	118.3	6.2	139.4	19.1	108.6	77.9	121.2	6.1	142.1	19.8	104.2	80.1	124.1	6.1	144.8	20.5	101.6		
		110	Operation not recommended.																			
	20	50	40.5	71.0	5.4	89.5	13.2	101.9	42.7	72.7	5.3	90.8	13.7	99.1	44.0	74.4	5.2	92.2	14.3	97.4		
		70	57.5	93.8	5.7	113.3	16.5	105.1	60.4	95.9	5.6	115.1	17.1	101.5	62.2	98.1	5.5	117.0	17.7	99.4		
		90	74.4	116.6	6.0	137.1	19.4	108.3	78.1	119.2	5.9	139.4	20.1	103.9	80.3	121.7	5.9	141.8	20.7	101.3		
		110	Operation not recommended.																			
	25	50	40.5	71.2	5.3	89.3	13.4	101.9	42.7	72.9	5.2	90.7	14.0	99.1	44.0	74.6	5.1	92.0	14.6	97.4		
		70	57.6	93.1	5.6	112.1	16.7	104.9	60.5	95.0	5.5	113.7	17.3	101.4	62.2	96.9	5.4	115.4	17.9	99.2		
		90	74.7	114.9	5.8	134.8	19.8	108.0	78.3	117.1	5.8	136.8	20.4	103.7	80.5	119.3	5.7	138.7	21.0	101.1		
		110	Operation not recommended.																			
110	15	50	41.4	64.8	6.7	87.8	9.6	121.7	43.4	66.2	6.8	89.4	9.7	118.9	44.6	67.6	6.8	90.9	9.9	117.3		
		70	57.4	94.8	7.2	119.5	13.1	125.9	60.3	97.4	7.3	122.4	13.3	122.2	62.0	100.1	7.4	125.4	13.5	120.0		
		90	Operation not recommended.																			
		110	Operation not recommended.																			
	20	50	41.3	65.0	6.6	87.6	9.8	121.7	43.3	66.5	6.7	89.3	10.0	118.9	44.6	68.1	6.7	91.0	10.1	117.3		
		70	57.4	94.4	7.1	118.5	13.4	125.8	60.3	96.9	7.2	121.3	13.5	122.1	62.1	99.3	7.2	124.0	13.7	119.9		
		90	Operation not recommended.																			
		110	Operation not recommended.																			
	25	50	41.3	65.1	6.5	87.4	10.0	121.7	43.3	66.8	6.6	89.2	10.2	118.9	44.5	68.5	6.6	91.1	10.4	117.3		
		70	57.5	94.0	6.9	117.5	13.6	125.7	60.4	96.3	7.0	120.1	13.8	122.0	62.1	98.6	7.0	122.6	14.0	119.8		
		90	Operation not recommended.																			
		110	Operation not recommended.																			

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Engineer: _____

Project Name: _____ Unit Tag: _____

Performance Data cont.

NHW084 - Heating Capacity

Source	EST °F	Flow gpm	ELT °F	Load Flow - 15 gpm					Load Flow - 20 gpm					Load Flow - 25 gpm						
				LLT °F	HC MBtu/h	Power kW	HE MBtu/h	COP	LST °F	LLT °F	HC MBtu/h	Power kW	HE MBtu/h	COP	LST °F	LLT °F	HC MBtu/h	Power kW	HE MBtu/h	COP
30	15	60	69.1	68.1	3.8	55.1	5.2	22.7	66.8	67.7	3.8	54.8	5.3	24.5	65.4	67.3	3.7	54.6	5.3	22.7
		80	88.8	66.3	5.0	49.3	3.9	23.4	86.6	65.9	5.1	48.6	3.8	25.1	85.2	65.5	5.2	47.8	3.7	23.6
		100	108.6	64.5	6.2	43.5	3.1	24.2	106.4	64.1	6.4	42.3	2.9	25.8	105.1	63.6	6.6	41.1	2.8	24.5
		120	128.4	62.7	7.3	37.7	2.5	25.0	126.2	62.2	7.3	37.3	2.5	26.3	124.9	61.8	7.3	37.0	2.5	25.1
	140	148.1	61.0	8.5	31.9	2.1	25.7	146.0	60.4	8.4	31.7	2.1	26.8	144.8	59.9	8.3	31.5	2.1	25.8	
	20	60	69.3	70.1	3.8	57.0	5.4	24.3	67.0	69.7	3.8	56.8	5.4	24.3	65.5	69.3	3.7	56.5	5.4	24.3
		80	89.1	68.0	5.0	50.9	4.0	24.9	86.8	67.6	5.0	50.4	3.9	25.0	85.4	67.1	5.0	49.9	3.9	25.0
		100	108.8	66.0	6.2	44.9	3.1	25.5	106.5	65.5	6.3	44.1	3.1	25.6	105.2	64.9	6.3	43.3	3.0	25.7
		120	128.5	64.0	7.4	38.8	2.5	26.1	126.3	63.3	7.3	38.4	2.5	26.2	125.0	62.7	7.2	38.0	2.5	26.2
	140	148.3	61.9	8.6	32.7	2.1	26.7	146.1	61.2	8.5	32.4	2.1	26.8	144.8	60.5	8.4	32.0	2.1	26.8	
	25	60	69.6	72.1	3.9	58.9	5.5	25.3	67.2	71.7	3.8	58.7	5.5	24.1	65.7	71.3	3.8	58.5	5.6	25.3
		80	89.3	69.8	5.0	52.6	4.1	25.8	86.9	69.3	5.0	52.3	4.1	24.8	85.5	68.8	4.9	52.0	4.1	25.8
100		109.0	67.5	6.2	46.3	3.2	26.3	106.7	66.9	6.1	45.9	3.2	25.4	105.3	66.2	6.1	45.5	3.2	26.4	
120		128.7	65.2	7.4	39.9	2.6	26.8	126.4	64.4	7.3	39.5	2.6	26.1	125.1	63.6	7.2	39.0	2.6	26.9	
140	148.4	62.9	8.6	33.6	2.1	27.3	146.2	62.0	8.5	33.0	2.1	26.7	144.9	61.1	8.4	32.5	2.1	27.4		
50	15	60	72.6	94.2	4.2	80.1	6.7	39.3	69.3	92.9	4.1	79.0	6.7	42.1	67.3	91.6	4.0	77.9	6.7	39.6
		80	92.3	92.1	5.4	73.7	5.0	40.2	89.1	91.0	5.4	72.6	4.9	42.7	87.2	89.9	5.4	71.5	4.9	40.5
		100	112.0	90.0	6.7	67.3	4.0	41.0	108.9	89.2	6.7	66.2	3.9	43.4	107.1	88.3	6.8	65.1	3.8	41.3
		120	131.7	87.9	7.9	60.9	3.3	41.9	128.7	87.3	7.8	60.7	3.3	43.9	126.9	86.7	7.7	60.5	3.3	41.9
	140	151.4	85.8	9.2	54.6	2.7	42.7	148.5	85.4	9.0	54.8	2.8	44.5	146.8	85.1	8.8	55.0	2.8	42.7	
	20	60	72.8	95.8	4.2	81.6	6.7	41.8	69.4	94.4	4.1	80.4	6.8	42.0	67.4	92.9	4.0	79.2	6.8	42.1
		80	92.5	93.8	5.4	75.3	5.1	42.5	89.3	92.6	5.4	74.3	5.1	42.6	87.3	91.5	5.3	73.3	5.0	42.7
		100	112.2	91.8	6.7	69.0	4.0	43.1	109.1	90.9	6.7	68.1	4.0	43.2	107.2	90.0	6.6	67.3	4.0	43.3
		120	132.0	89.8	7.9	62.7	3.3	43.7	128.9	89.1	7.8	62.4	3.3	43.8	127.1	88.5	7.7	62.2	3.4	43.8
	140	151.7	87.8	9.2	56.4	2.8	44.4	148.7	87.4	9.0	56.5	2.8	44.3	147.0	87.0	8.9	56.7	2.9	44.3	
	25	60	73.0	97.4	4.2	83.1	6.8	43.3	69.6	95.8	4.1	81.9	6.9	41.8	67.5	94.3	4.0	80.6	6.9	43.6
		80	92.7	95.4	5.4	76.9	5.1	43.8	89.4	94.2	5.3	76.0	5.2	42.4	87.4	93.0	5.2	75.1	5.2	44.0
100		112.5	93.5	6.7	70.6	4.1	44.3	109.3	92.6	6.6	70.1	4.1	43.0	107.3	91.6	6.5	69.5	4.1	44.4	
120		132.2	91.6	8.0	64.4	3.4	44.8	129.1	90.9	7.8	64.2	3.4	43.6	127.2	90.2	7.7	64.0	3.4	44.9	
140	152.0	89.7	9.3	58.1	2.8	45.3	148.9	89.3	9.1	58.3	2.9	44.2	147.1	88.8	8.9	58.4	2.9	45.3		
70	15	60	76.1	120.4	4.5	105.1	7.8	56.0	71.8	118.1	4.4	103.1	7.9	59.7	69.3	115.8	4.3	101.2	7.9	56.5
		80	95.7	118.0	5.8	98.1	5.9	56.9	91.6	116.2	5.7	96.6	5.9	60.3	89.2	114.4	5.6	95.2	5.9	57.3
		100	115.4	115.5	7.1	91.2	4.7	57.8	111.4	114.3	7.1	90.2	4.7	61.0	109.0	113.0	7.0	89.2	4.7	58.1
		120	135.1	113.1	8.5	84.2	3.9	58.8	131.2	112.4	8.3	84.1	4.0	61.6	128.9	111.7	8.1	84.0	4.0	58.8
	140	154.8	110.6	9.8	77.2	3.3	59.7	151.0	110.4	9.6	77.8	3.4	62.2	148.8	110.3	9.3	78.4	3.5	59.5	
	20	60	76.2	121.5	4.5	106.2	7.9	59.4	71.9	119.1	4.4	104.1	7.9	59.6	69.3	116.6	4.3	101.9	8.0	59.8
		80	95.9	119.5	5.8	99.6	6.0	60.0	91.8	117.7	5.7	98.1	6.0	60.2	89.3	115.8	5.6	96.6	6.0	60.3
		100	115.7	117.5	7.2	93.1	4.8	60.7	111.6	116.3	7.1	92.2	4.8	60.8	109.2	115.0	6.9	91.3	4.9	60.9
		120	135.4	115.6	8.5	86.5	4.0	61.3	131.5	114.9	8.3	86.5	4.0	61.3	129.1	114.2	8.1	86.5	4.1	61.4
	140	155.1	113.6	9.8	80.0	3.4	62.0	151.3	113.5	9.6	80.7	3.5	61.9	149.1	113.4	9.4	81.4	3.5	61.9	
	25	60	76.4	122.6	4.5	107.3	8.0	61.4	72.0	120.0	4.4	105.0	8.0	59.5	69.4	117.3	4.3	102.7	8.0	61.8
		80	96.1	121.1	5.8	101.2	6.1	61.9	91.9	119.1	5.7	99.6	6.1	60.0	89.4	117.2	5.6	98.1	6.1	62.2
100		115.9	119.6	7.2	95.0	4.9	62.4	111.8	118.3	7.0	94.3	4.9	60.6	109.4	117.0	6.9	93.5	5.0	62.5	
120		135.7	118.0	8.6	88.8	4.0	62.9	131.7	117.4	8.4	88.9	4.1	61.1	129.3	116.8	8.2	89.0	4.2	62.9	
140	155.5	116.5	9.9	82.7	3.4	63.4	151.7	116.6	9.7	83.5	3.5	61.6	149.3	116.6	9.4	84.4	3.6	63.2		
90	15	60	79.5	146.6	4.8	130.0	8.9	72.7	74.3	143.3	4.7	127.3	8.9	77.3	71.2	140.1	4.6	124.5	9.0	73.4
		80	99.2	143.8	6.2	122.5	6.8	73.7	94.1	141.4	6.1	120.7	6.8	77.9	91.1	138.9	5.9	118.8	6.9	74.2
		100	118.8	141.0	7.6	115.0	5.4	74.7	113.9	139.4	7.4	114.1	5.5	78.6	111.0	137.8	7.2	113.2	5.6	74.9
		120	138.4	138.2	9.0	107.5	4.5	75.7	133.7	137.4	8.8	107.5	4.6	79.3	130.9	136.6	8.5	107.5	4.7	75.7
	Operation not recommended.																			
	20	60	79.6	147.2	4.8	130.8	8.9	76.9	74.4	143.7	4.7	127.7	9.0	77.2	71.2	140.2	4.6	124.6	9.0	77.5
		80	99.4	145.3	6.2	124.0	6.8	77.6	94.3	142.7	6.1	122.0	6.9	77.8	91.2	140.1	5.9	120.0	7.0	78.0
		100	119.1	143.3	7.7	117.2	5.5	78.3	114.2	141.7	7.4	116.3	5.6	78.4	111.2	140.1	7.2	115.4	5.7	78.5
120		138.8	141.3	9.1	110.4	4.6	79.0	134.1	140.7	8.8	110.6	4.7	78.9	131.2	140.0	8.6	110.7	4.8	78.9	
Operation not recommended.																				
25	60	99.6	146.8	6.2	125.5	6.9	80.0	94.4	144.1	6.1	123.3	6.9	77.7	91.3	141.3	5.9	121.1	7.0	80.3	
	80	119.4	145.6	7.7	119.4	5.6	80.4	114.4	144.0	7.5	118.5	5.6	78.2	111.4	142.4	7.3	117.5	5.7	80.6	
	100	139.3	144.5	9.1	113.3	4.6	80.9	134.4	143.9	8.9	113.6	4.8	78.6	131.5	143.4	8.6	113.9	4.9	80.9	
	120	154.1	143.6	10.2	108.7	4.1	81.3	149.4	143.8	9.9	110.0	4.2	79.0	146.5	144.1	9.6	111.2	4.4	81.1	
Operation not recommended.																				

2/14/12

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Contractor: _____ P.O.: _____

Engineer: _____

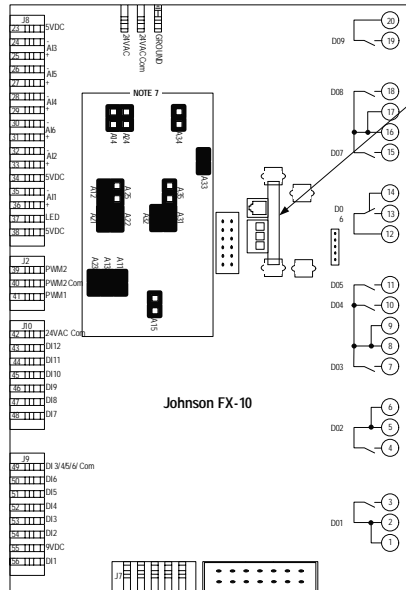
Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



Wiring Schematics

MUI Wiring Diagram

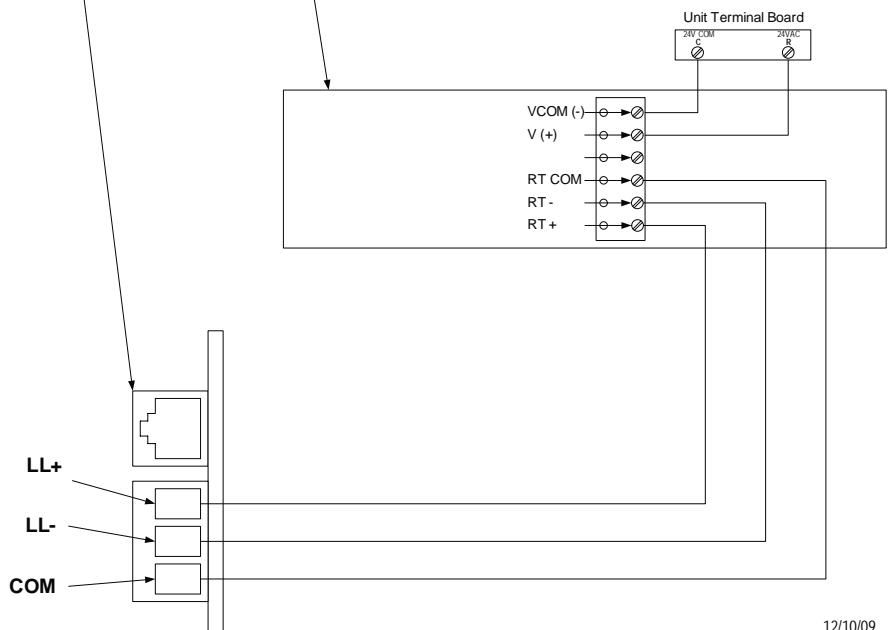


DLI Card

Instructions :

- 1.) Disconnect all power sources to the unit
- 2.) Remove MUI from Back Plate
- 3.) Follow Wiring Instruction Below
- 4.) Reinstall MUI to Back Plate

MUI Back Plate



12/10/09

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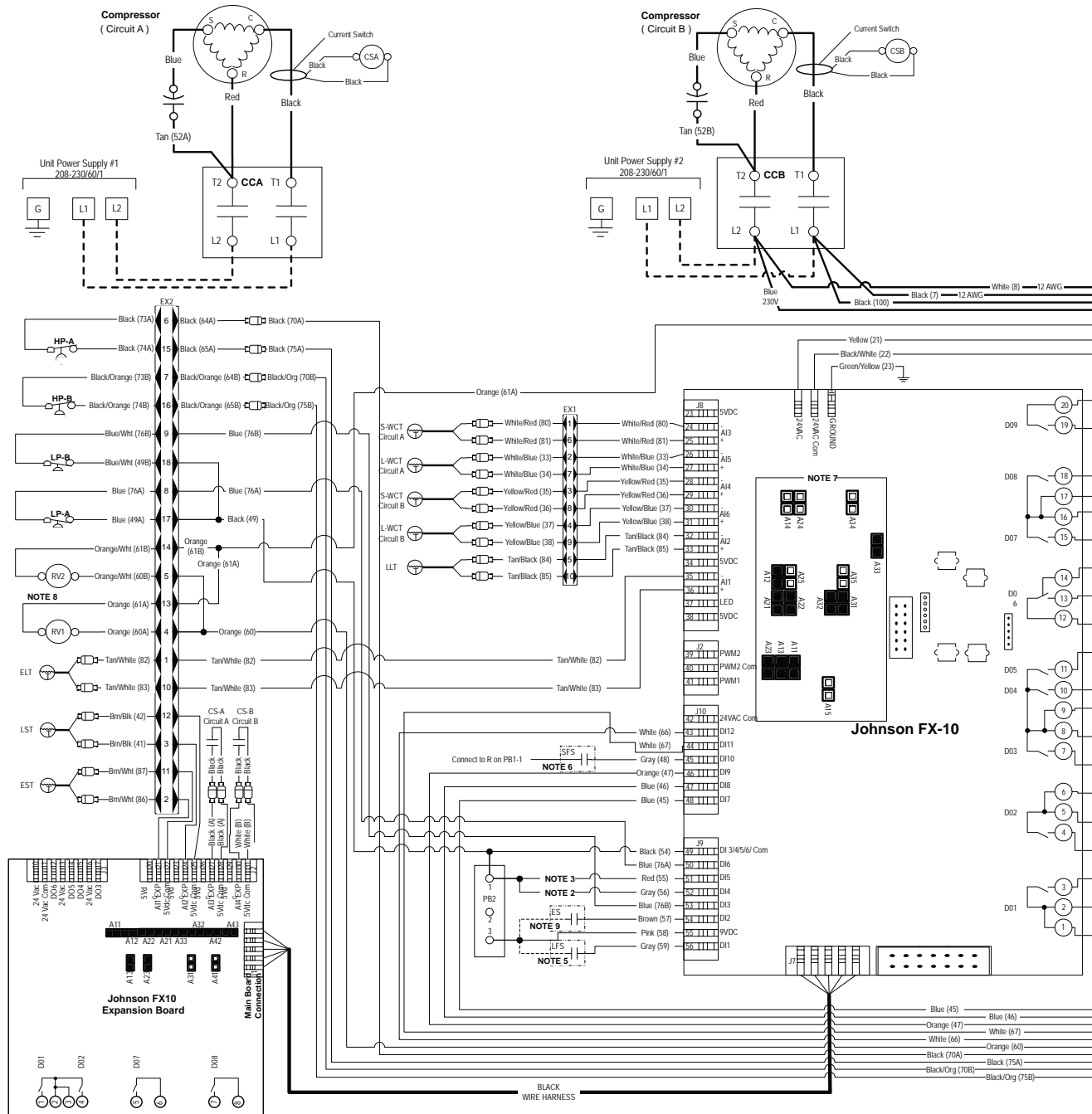
Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



Wiring Schematics cont.

208-230/60/1



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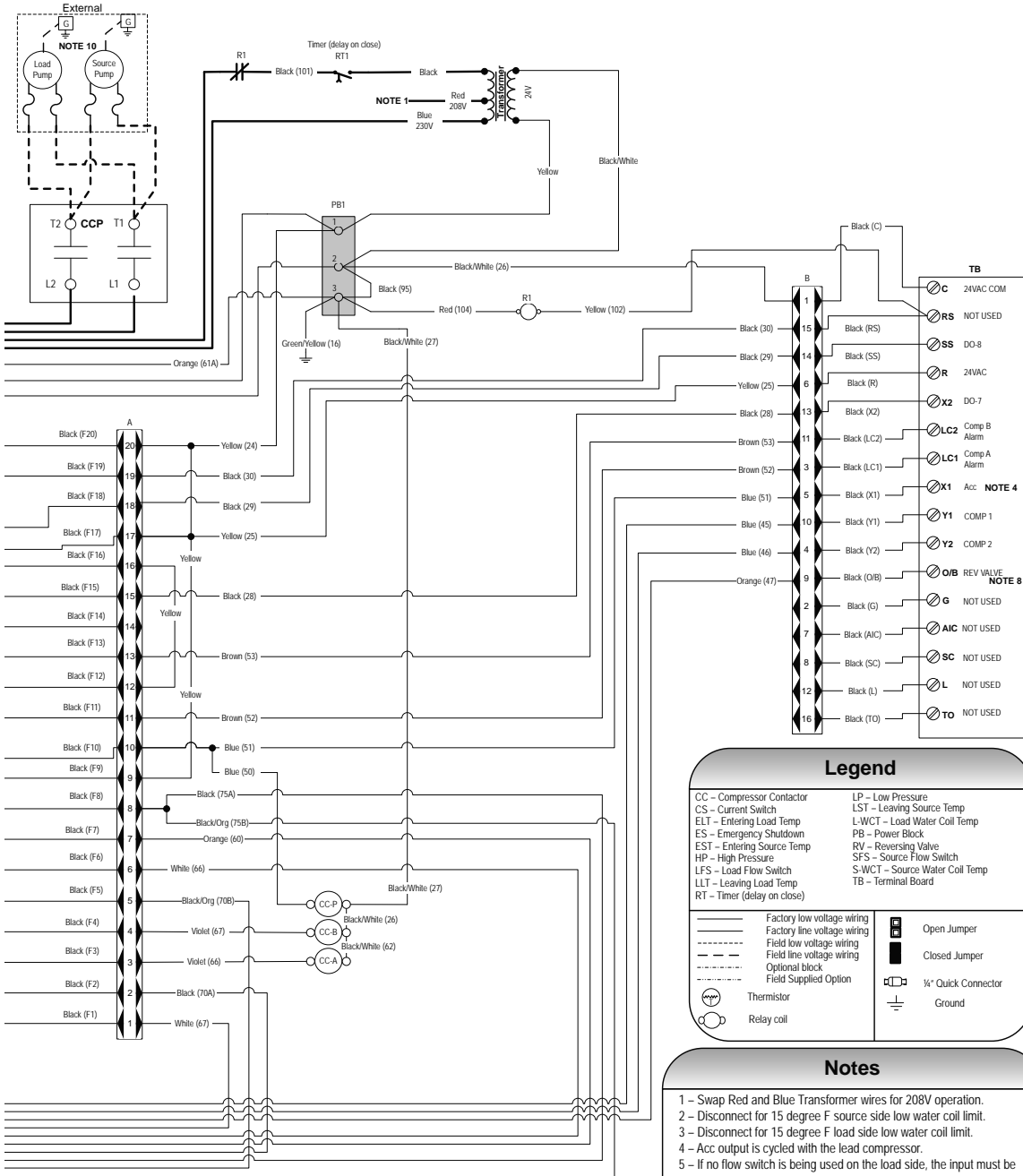
Contractor: _____ P.O.: _____
 Engineer: _____
 Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



Wiring Schematics cont.

208-230/60/1 cont.



97P841-01 03/15/12

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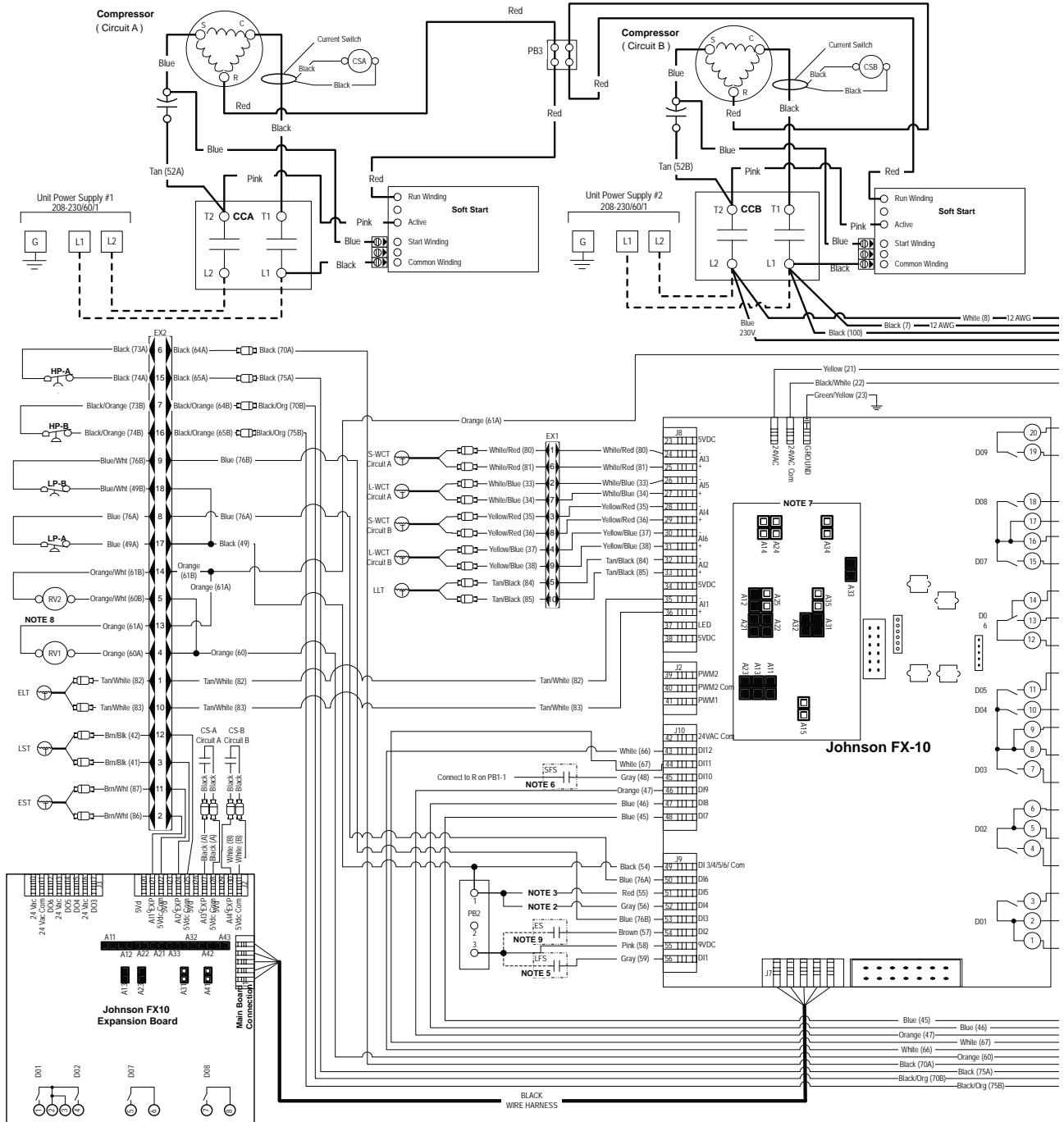
Contractor: _____ P.O.: _____
 Engineer: _____
 Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



Wiring Schematics cont.

208-230/60/1 with IntelliStart



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Contractor: _____ P.O.: _____

Engineer: _____

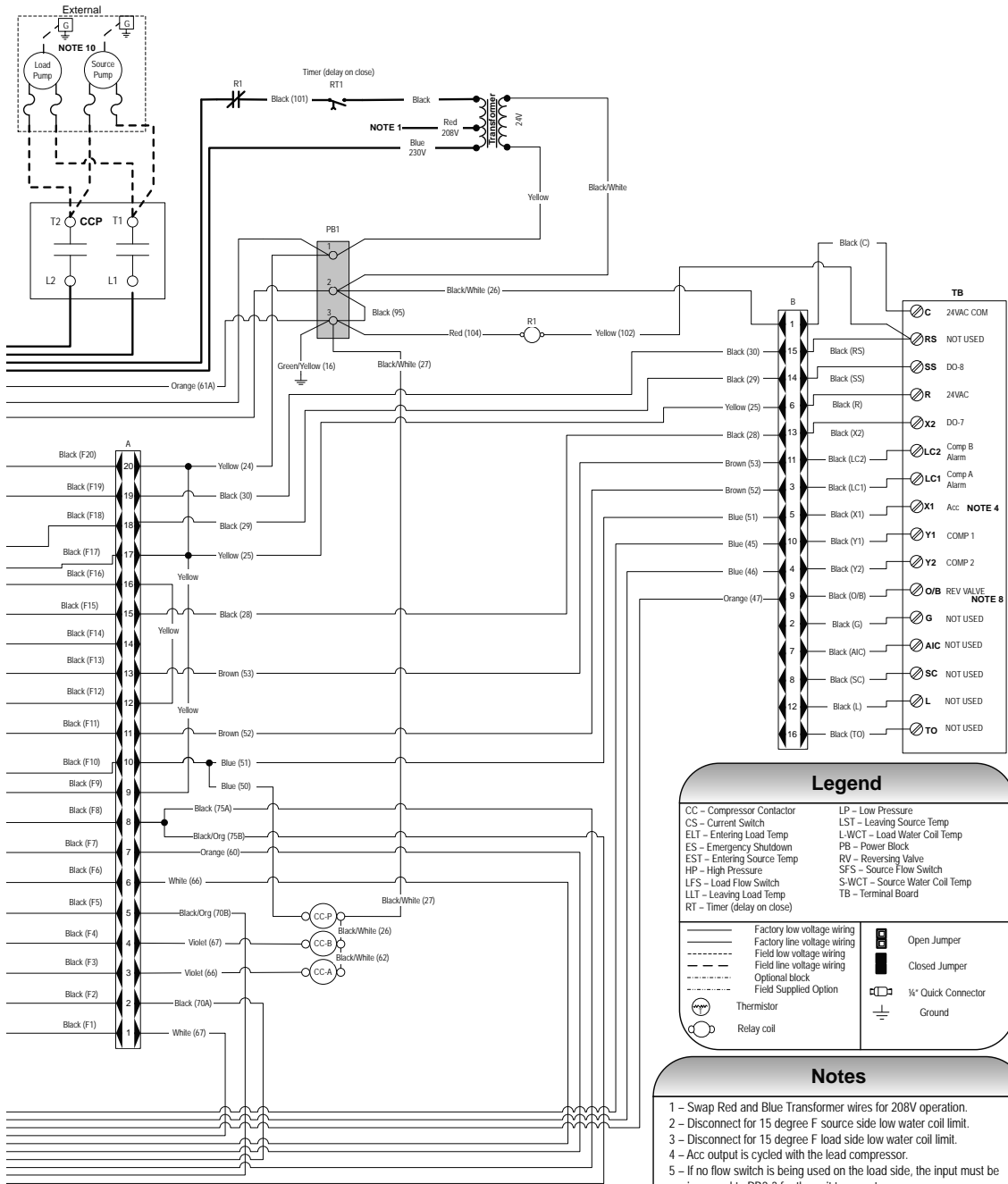
Project Name: _____ Unit Tag: _____

5 Series 502W12
8 Ton 60Hz



Wiring Schematics cont.

208-230/60/1 with IntelliStart cont.



Legend

CC - Compressor Contactor	LP - Low Pressure
CS - Current Switch	LST - Leaving Source Temp
ELT - Entering Load Temp	L-WCT - Load Water Coil Temp
ES - Emergency Shutdown	PB - Power Block
EST - Entering Source Temp	RV - Reversing Valve
HP - High Pressure	SFS - Source Flow Switch
LFS - Load Flow Switch	S-WCT - Source Water Coil Temp
LLT - Leaving Load Temp	TB - Terminal Board
RT - Timer (delay on close)	

Factory low voltage wiring	Open Jumper
Factory line voltage wiring	Closed Jumper
Field low voltage wiring	1/4" Quick Connector
Field line voltage wiring	Ground
Optional block	
Field Supplied Option	
Thermistor	
Relay coil	

- ### Notes
- 1 - Swap Red and Blue Transformer wires for 208V operation.
 - 2 - Disconnect for 15 degree F source side low water coil limit.
 - 3 - Disconnect for 15 degree F load side low water coil limit.
 - 4 - Acc output is cycled with the lead compressor.
 - 5 - If no flow switch is being used on the load side, the input must be jumpered to PB2-3 for the unit to operate.
 - 6 - If no flow switch is being used on the source side, the input must be jumpered to R on PB1-1 for the unit to operate.
 - 7 - Jumpers must be set as shown for correct control operation. If a communication card is present, it must be removed to verify jumper settings.
 - 8 - The reversing valve will be energized for cooling mode.
 - 9 - Used for Emergency Shutdown in conjunction with a normally open relay.
 - 10 - External load and source pumps must be externally fused.

97P841-02 03/15/12

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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 option 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, as manufactured by WaterFurnace International, Fort Wayne, Indiana, shall be designed to operate with source liquid temperatures between 30°F [1.1°C] and 110°F [43.3°C] in cooling, and between 30°F [-1.1°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 1/2 in. thick, multi-density, coated glass fiber for noise suppression.

The control box 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 contain two (2) sealed refrigerant circuits, each containing a hermetic motor scroll compressor, discharge muffler, bidirectional thermal expansion valve assemblies, optional reversing valve, braze plate heat exchangers, factory installed high and low pressure safety switches, freeze detection, service ports, and liquid line filter driers. Compressors shall be scroll types designed for heat pump duty with internal isolation and mounted on rubber vibration isolators. Compressor motors shall have internal overload protection. A high density sound attenuating blanket shall be factory installed around the compressor to reduce sound. Discharge mufflers shall be included to help quiet compressor discharge gas pulsations. The water-to-refrigerant heat exchangers shall be interlaced copper brazed, 316 stainless plate steel, capable of withstanding 450 psig [3108 kPa] working

pressure on the refrigerant side and 450 psig [3108 kPa] on the water side. The thermal expansion valve assembly shall provide proper superheat over the liquid temperature range with minimal "hunting." The assembly shall operate bidirectionally without the use of check valves for the reversible option. Externally mounted pressure controlled water regulating flow valves are not acceptable.

Piping and Connections

Supply and return water connections shall be 1-1/4 in. [31.8 mm] FPT copper fittings fixed to the cabinet by use of a captive fitting, which eliminates the need for backup pipe wrenches.

Optional Back/Top Mount Water Connections - shall be factory installed to the back corner post or top panel by use of a captive fitting, which eliminates the need for backup pipe wrenches.



WARNING: Warranty is void if strainers are not used on the entering side of the load and source.



WARNING: All field installed piping and piping connections must be rated for temperatures greater than 160°F. Materials such as PVC, CPVC, and DWV shall not be used.

Electrical

Controls and safety devices will be factory wired and mounted within the unit. Controls shall include 24 Volt activated compressor contactors, 24VAC-75VA transformer with built in circuit breaker, reversing valve coils, and anti short-cycle protection. A terminal block with screw in terminals will be provided for field control wiring. To prevent short cycling when the safety controls are activated, the reset relay shall provide a lockout circuit that requires resetting of low voltage supply or main circuit breaker. A lockout signal shall be provided to the display to indicate a lockout situation. 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.

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



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Engineering Guide Specifications cont.

Microprocessor Control

The unit shall be controlled using an FX10 microprocessor which sequences all functions and modes of operations. The control shall interface with a (Y,B) thermostat, mechanical or electronic. The control system shall have the following features:

1. Anti-short cycle time delay on compressor operation, time delay shall be a minimum of four minutes
2. Random start on power up mode
3. Low voltage protection
4. High voltage protection
5. Unit shutdown on high or low refrigerant pressures
6. Unit shutdown for low water temperature
7. Source and Load heat exchanger low water temperature cutout selectable for water or anti-freeze
8. Automatic intelligent reset (Unit will automatically reset 5 minutes after trip if the fault has cleared. Should a fault reoccur 3 times sequentially then permanent lockout will occur.)
9. A 4 x 20 digit backlit LCD to display the following:
 - a. Entering and leaving water temperatures
 - b. High pressure, low pressure, low voltage, high voltage, low water temperature cutout, and control status
10. The low pressure shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
11. Remote fault indication on the thermostat
12. An accessory relay output tied to each compressor selectable for normally open or normally closed

Accessories

Flow Proving Switch

WaterFurnace P/N - FPS300

A flow proving switch shall be available utilizing high reliability flow sensing technology.

Connection Kit

WaterFurnace P/N - CK5L

Kit includes a pair of forged brass street elbows (1-1/4 in. MPT x 1-1/4 in. hose barb) with 1/4 in. pressure/temperature plugs

Rubber Hose Kit Set

WaterFurnace P/N - CK5L-XL

1-1/4 in. rubber hose kit includes CK5L plus two 8 ft. pieces of 1-1/4 in. rubber hose, a pair of 1-1/4 in. hose barb x 1-1/4 in. XL style fittings, and steel hose clamps

Strainer Hose Kit Set

WaterFurnace P/N - CK5L-XLS

1-1/4 in. rubber hose kit includes all the same items from CK5L-XL plus 1-1/4 in. 20 mesh bronze strainer

5 Series 502W12
8 Ton 60Hz



Contractor: _____ P.O.: _____

Engineer: _____

Project Name: _____ Unit Tag: _____

Revision Guide

Pages:	Description:	Date:	By:
16	Added Revision Guide, Minor Formatting Corrections	18 Mar 2013	DS