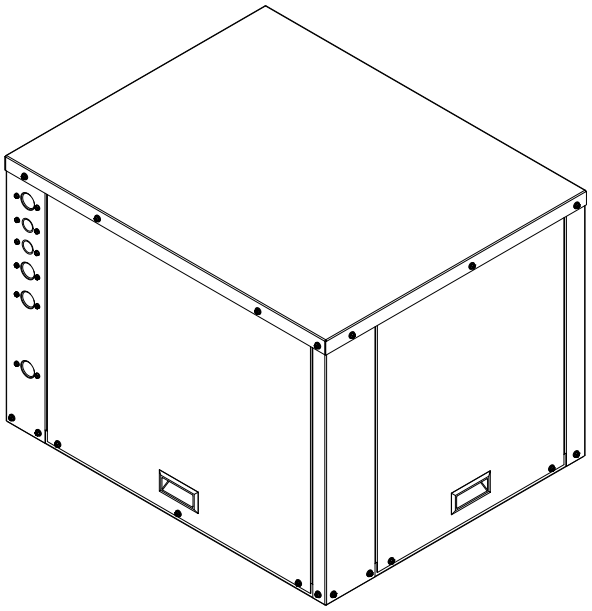
ENERTECH
ENERGY + TECHNOLOGY

Engineering Submittal Data

WS MODELS WATER-TO-WATER HEAT PUMPS



Project Name: _____
Engineer: _____
Contractor: _____
Architect: _____
Date Received: _____
Date Submitted: _____

Unit Tag	Model Number
_____	_____
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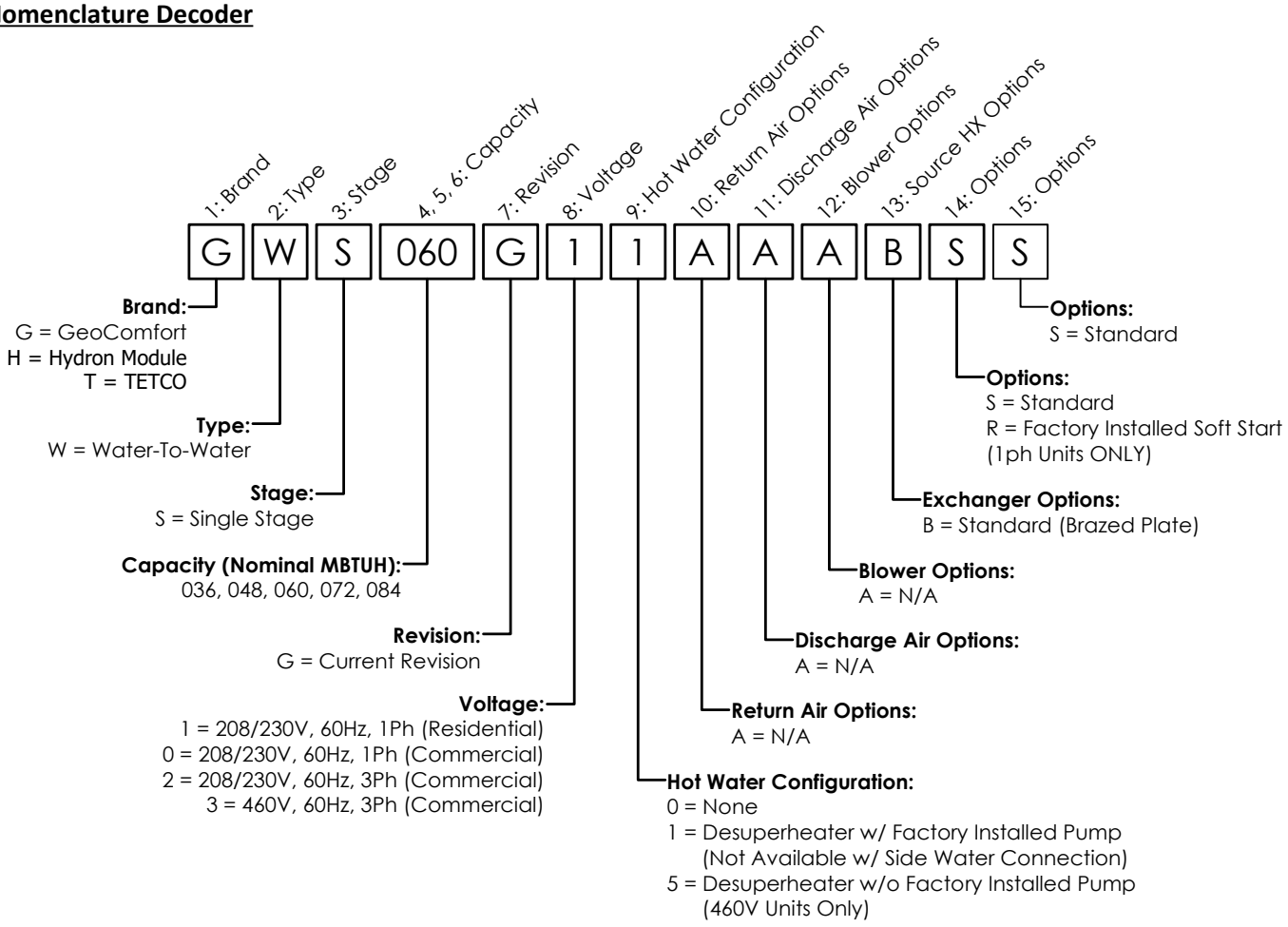
Notes:

20D835-26NN

Nomenclature Decoder



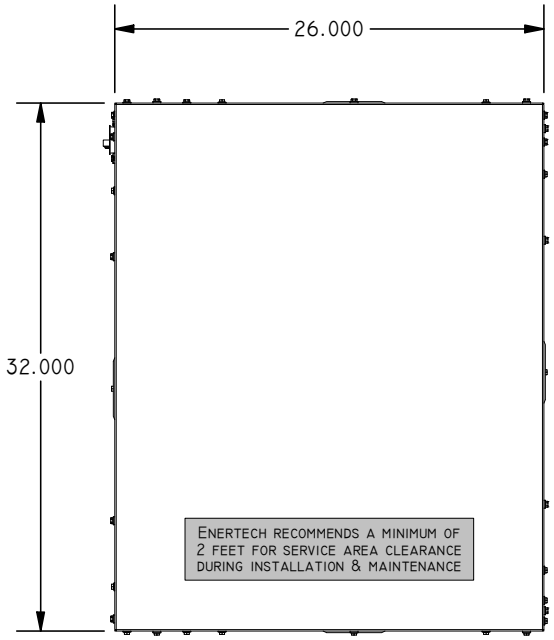
AHRI Performance Data

Model	Application	Full Load Cooling		Full Load Heating	
		Btu/hr	EER	Btu/hr	COP
WS036	Ground Loop	34,400	16.9	30,200	3.1
WS048	Ground Loop	50,600	16.2	45,400	3.1
WS060	Ground Loop	61,000	16.1	54,100	3.1
WS072	Ground Loop	76,600	17.8	63,200	3.1
WS084	Ground Loop	88,400	16.2	72,900	3.1

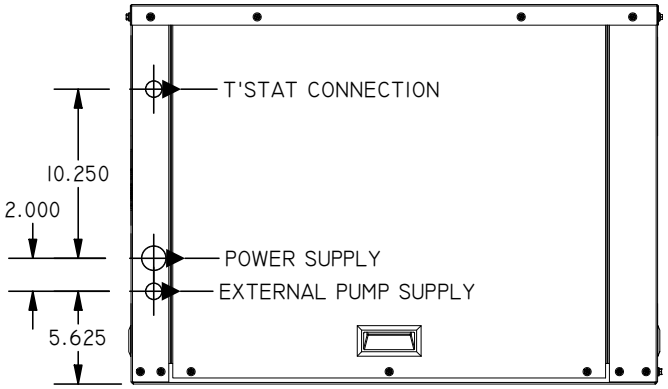
Ground Loop (GL) Notes:

- Rated in accordance with ISO Standard 13256-2 which includes Pump Penalties.
- Heating capacities based on 32°F EST & 104°F ELT.
- Cooling capacities based on 77°F EST & 53.6°F ELT.
- Entering load temperature over 120°F heating and under 45°F Cooling is not permissible.
- Floor heating is most generally designed for 85°F entering load temperature.

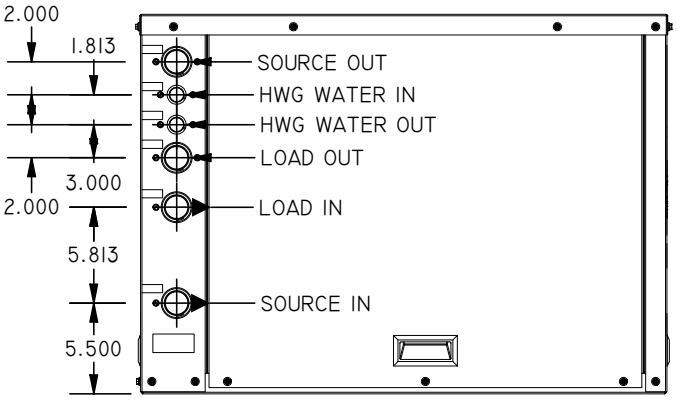
Unit Dimensional Data



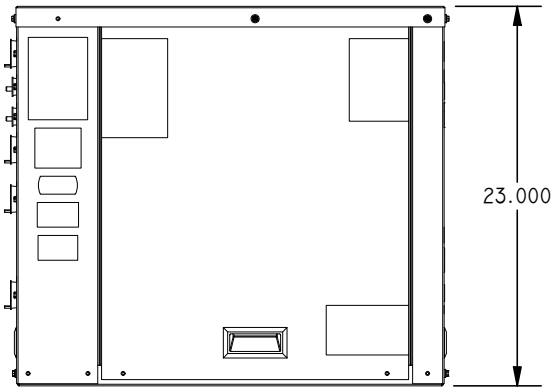
TOP VIEW



RIGHT SIDE VIEW



LEFT SIDE VIEW



FRONT VIEW

Single Compressor Unit								
MODEL	SOURCE Water: FPT		LOAD Water: FPT		HWG Water: FPT		Factory Charge	Unit Weight
	IN	OUT	IN	OUT	IN	OUT		
036	1-1/4"	1-1/4"	1-1/4"	1-1/4"	3/4"	3/4"	55 oz	259 Lbs
048							65 oz	277 Lbs
060							59 oz	277 Lbs
072							99 oz	327 Lbs
084							105 oz	348 Lbs

Notes:
- Electrical connections are 1" DIA for high voltage, & 1/2" DIA for low voltage.

Unit Electrical Data

Model	Voltage Code/ HWG Option	60 Hz Power		Compressor		HWG Pump FLA	Ext. Loop Pump FLA	Total Unit FLA	Min Circuit AMPS	Max Brkr HACR
		Volts	Phase	LRA	RLA					
WS036	00	208/230	1	109.0	16.7	0.0	0.0	16.7	20.9	35
	01	208/230	1	109.0	16.7	0.5	0.0	17.2	21.4	35
	10	208/230	1	109.0	16.7	0.0	4.0	20.7	24.9	40
	11	208/230	1	109.0	16.7	0.5	4.0	21.2	25.4	40
	20	208/230	3	84.0	11.2	0.0	0.0	11.2	14.0	25
	21	208/230	3	84.0	11.2	0.5	0.0	11.7	14.5	25
	30/35	460	3	44.0	5.6	0.0	0.0	5.6	7.0	15
WS048	00	208/230	1	144.2	24.4	0.0	0.0	24.4	30.5	50
	01	208/230	1	144.2	24.4	0.5	0.0	24.9	31.0	50
	10	208/230	1	144.2	24.4	0.0	5.5	29.9	36.0	60
	11	208/230	1	144.2	24.4	0.5	5.5	30.4	36.5	60
	20	208/230	3	110.0	16.0	0.0	0.0	16.0	20.0	35
	21	208/230	3	110.0	16.0	0.5	0.0	16.5	20.5	35
	30/35	460	3	52.0	7.8	0.0	0.0	7.8	9.8	15
WS060	00	208/230	1	178.0	30.8	0.0	0.0	30.8	38.5	60
	01	208/230	1	178.0	30.8	0.5	0.0	31.3	39.0	70
	10	208/230	1	178.0	30.8	0.0	5.5	36.3	44.0	70
	11	208/230	1	178.0	30.8	0.5	5.5	36.8	44.5	70
	20	208/230	3	136.0	19.6	0.0	0.0	19.6	24.5	40
	21	208/230	3	136.0	19.6	0.5	0.0	20.1	25.0	45
	30/35	460	3	66.1	8.2	0.0	0.0	8.2	10.3	15
WS072	00	208/230	1	148.0	32.1	0.0	0.0	32.1	40.1	70
	01	208/230	1	148.0	32.1	0.5	0.0	32.6	40.6	70
	10	208/230	1	148.0	32.1	0.0	5.5	37.6	45.6	70
	11	208/230	1	148.0	32.1	0.5	5.5	38.1	46.1	70
	20	208/230	3	164.0	23.2	0.0	0.0	23.2	29.0	50
	21	208/230	3	164.0	23.2	0.5	0.0	23.2	29.5	50
	30/35	460	3	75.0	11.2	0.0	0.0	11.2	14.0	25
WS084	00	208/230	1	185.0	32.1	0.0	0.0	32.1	40.1	70
	01	208/230	1	185.0	32.1	0.5	0.0	32.6	40.6	70
	10	208/230	1	185.0	32.1	0.0	5.5	37.6	45.6	70
	11	208/230	1	185.0	32.1	0.5	5.5	38.1	46.1	70
	20	208/230	3	164.0	25.0	0.0	0.0	25.0	31.3	50
	21	208/230	3	164.0	25.0	0.5	0.0	25.5	31.8	50
	30/35	460	3	100.0	12.2	0.0	0.0	12.2	15.3	25

Notes:

1. All line and low voltage wiring must adhere to the National Electrical Code and local codes, whichever is the most stringent.
2. In determining the correct supply wire size and maximum length, reference NFPA 70, Section 310. If the calculation is close to the maximum allowable ampacity of a particular wire size, use the next size up. This will ensure that no adverse effects occur, such as light dimming and/or shortened compressor life.
3. Min/Max Voltage: 208/230/60 = 187-252, 460/60 = 432-502
4. See Wiring Diagrams for proper 460V power.

*The external loop pump FLA is based on a maximum of three UP26-116F-230V pumps (1/2hp) for 048-084 and two pumps for 036.

Proper Power Supply Evaluation

When any compressor bearing unit is connected to a weak power supply, starting current will generate a significant “sag” in the voltage which reduces the starting torque of the compressor motor and increases the start time. This will influence the rest of the electrical system in the building by lowering the voltage to the lights. This momentary low voltage causes “light dimming”. The total electrical system should be evaluated with an electrician and HVAC technician. The evaluation should include all connections, sizes of wires, and size of the distribution panel between the unit and the utility’s connection. The transformer connection and sizing should be evaluated by the electric utility provider.

Glossary of Terms

COP = Coefficient of Performance = BTU Output / BTU Input	HR = Total Heat Of Rejection, Btu/hr
DH = Desuperheater Capacity, Btu/hr	KW = Total Power Unit Input, Kilowatts
EER = Energy Efficiency Ratio = BTU output/Watts input	LWT = Leaving Source Water Temperature, Fahrenheit
EST = Entering Source Water Temperature, Fahrenheit	LLT = Leaving Load Water Temperature, Fahrenheit
ELT = Entering Load Water Temperature, Fahrenheit	TC = Total Cooling Capacity, Btu/hr
GPM = Water Flow, Gallons Per Minute	HC = Heating Capacity, Btu/hr
HE = Total Heat Of Extraction, Btu/hr	WPD = Water Pressure Drop, PSI & Feet of Water

Heating & Cooling Calculations

Heating	Cooling
$LWT = EST - \frac{HE}{GPM \times 500^*}$	$LWT = EST + \frac{HR}{GPM \times 500^*}$
$HE = 500^* \times GPM \times (EWT - LWT)$	$HR = 500^* \times GPM \times (LWT - EWT)$

*500 = Constant factor for pure water. Brine should be 485.

Water Flow Calculations and Selection

Proper flow rate is crucial for reliable operation of geothermal heat pumps. The performance data shows three flow rates for each entering water temperature (EWT column). The general "rule of thumb" when selecting flow rates is the following.

Top flow rate: Open loop systems (1.5 to 2.0 gpm per ton)

Middle flow rate: Minimum closed loop system flow rate (2.25 to 2.50 gpm/ton)

Bottom flow rate: Nominal (optimum) closed loop system flow rate (3.0 gpm/ton)

It is important to design the system to maintain flow rates above the minimum to avoid a fault. Antifreeze is generally required for all closed loop (geothermal) applications. Extreme Southern U.S. locations are the only exception. Open loop (well water) systems cannot use antifreeze, and must have enough flow rate in order to avoid freezing conditions at the Leaving Source Water Temperature connection.

Note: Applications with Brazed Plate Heat Exchangers require antifreeze in the ground loop if units will operate in heating mode. Coaxial heat exchangers are recommended for systems without antifreeze. Antifreeze is required in the load piping for any unit that will be producing chilled water for cooling.

Application Notes for Performance Data

1. EWT (Entering Water Temperature) is also called EST (Entering Source Temperature).
2. It is permissible to operate in the shaded areas intermittently but it is recommended to avoid extended run time in these areas.
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions.
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side.
9. Interpolation of unit performance data is permissible; extrapolation is not.
10. Performance data is a result of lab testing and is not related to warranty
11. Due to variations in installation, actual unit performance may vary from the tabulated data.

WS036 : EXTENDED DATA																														
SOURCE SIDE					LOAD SIDE, COOLING MODE, FULL LOAD																									
EST	Source Flow			ELT	Load Flow GPM 5								Load Flow GPM 7								Load Flow GPM 9									
	GPM	Source Flow WPD			Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh		
40	9	2.2	5.0	40	Operation Not Recommended								Operation Not Recommended								Operation Not Recommended									
		2.2	5.0	50																										
		2.2	5.0	60																										
		2.2	5.0	75									1.3	3.0	60.5	49.4	53.7	1.25	39.4	4.5	1.8	4.1	63.1	51.7	55.5	1.26	41.2	4.6		
		2.2	5.0	90	0.7	1.7	68.8	47.8	52.0	1.26	37.8	5.0	1.2	2.7	74.4	51.8	55.6	1.26	40.9	5.1	1.6	3.7	77.6	54.2	57.4	1.27	42.7	5.3		
50	5	1.3	3.1	40	0.9	2.1	29.0	27.9	33.6	1.46	19.0	5.1	1.5	3.4	31.3	30.2	35.9	1.46	20.6	5.2	2.0	4.6	32.7	31.6	37.1	1.47	21.5	5.4		
		1.3	3.1	50	0.9	2.1	36.7	32.7	38.7	1.48	22.2	5.4	1.5	3.4	39.7	35.5	41.4	1.48	24.0	5.6	2.0	4.6	41.4	37.2	42.7	1.48	25.1	5.7		
		1.3	3.1	60	0.9	2.1	44.2	38.6	44.6	1.50	25.8	5.7	1.5	3.4	47.8	41.8	47.7	1.50	28.0	5.9	2.0	4.6	49.9	43.8	49.2	1.50	29.2	6.0		
		1.3	3.1	75	0.8	1.9	55.9	45.0	51.3	1.53	29.5	6.2	1.3	3.0	60.5	48.8	54.8	1.53	31.9	6.4	1.8	4.1	63.2	51.1	56.6	1.54	33.3	6.5		
		1.3	3.1	90	0.7	1.7	68.8	47.2	53.0	1.55	30.6	7.1	1.2	2.7	74.4	51.1	56.7	1.55	33.1	7.3	1.6	3.7	77.7	53.6	58.5	1.55	34.6	7.5		
	7	1.7	3.9	40	0.9	2.1	28.9	27.8	33.4	1.38	20.1	4.7	1.5	3.4	31.3	30.1	35.7	1.39	21.7	4.9	2.0	4.6	32.7	31.5	36.8	1.39	22.7	5.0		
		1.7	3.9	50	0.9	2.1	36.6	32.7	38.4	1.40	23.4	5.0	1.5	3.4	39.6	35.4	41.1	1.40	25.3	5.2	2.0	4.6	41.3	37.1	42.4	1.40	26.5	5.3		
		1.7	3.9	60	0.9	2.1	44.1	38.5	44.3	1.41	27.2	5.3	1.5	3.4	47.7	41.7	47.3	1.42	29.5	5.4	2.0	4.6	49.8	43.7	48.9	1.42	30.8	5.6		
		1.7	3.9	75	0.8	1.9	55.8	44.9	50.9	1.45	31.1	5.8	1.3	3.0	60.4	48.7	54.4	1.45	33.6	5.9	1.8	4.1	63.1	51.0	E	1.45	35.1	6.1		
		1.7	3.9	90	0.7	1.7	68.7	47.1	52.6	1.46	32.2	6.6	1.2	2.7	74.3	51.0	56.3	1.46	34.9	6.8	1.6	3.7	77.5	53.5	58.1	1.47	36.4	7.0		
	9	2.1	4.9	40	0.9	2.1	29.0	27.7	33.0	1.35	20.5	4.3	1.5	3.4	31.3	30.0	35.3	1.35	22.2	4.5	2.0	4.6	32.7	31.5	36.4	1.36	23.2	4.6		
		2.1	4.9	50	0.9	2.1	36.7	32.6	38.0	1.36	23.9	4.7	1.5	3.4	39.7	35.3	40.6	1.36	25.9	4.8	2.0	4.6	41.4	37.0	42.0	1.37	27.1	4.9		
		2.1	4.9	60	0.9	2.1	44.2	38.4	43.8	1.38	27.8	4.9	1.5	3.4	47.8	41.6	46.8	1.38	30.1	5.0	2.0	4.6	49.9	43.6	48.3	1.39	31.5	5.1		
		2.1	4.9	75	0.8	1.9	55.9	44.8	50.4	1.41	31.8	5.3	1.3	3.0	60.5	48.6	53.8	1.41	34.4	5.5	1.8	4.1	63.2	50.9	55.6	1.42	35.9	5.6		
		2.1	4.9	90	0.7	1.7	68.8	47.0	52.1	1.43	32.9	6.1	1.2	2.7	74.4	50.9	55.7	1.43	35.7	6.3	1.6	3.7	77.7	53.3	57.5	1.43	37.2	6.4		
70	5	1.3	2.9	40	0.9	2.1	29.3	26.5	33.0	1.88	14.1	8.0	1.5	3.4	31.7	28.7	35.3	1.88	15.3	8.2	2.0	4.6	33.1	30.1	36.4	1.89	16.0	8.4		
		1.3	2.9	50	0.9	2.1	37.1	31.2	38.0	1.89	16.5	8.6	1.5	3.4	40.2	33.8	40.6	1.89	17.8	8.8	2.0	4.6	41.9	35.4	42.0	1.90	18.6	9.0		
		1.3	2.9	60	0.9	2.1	44.7	36.8	43.8	1.92	19.2	9.0	1.5	3.4	48.4	39.8	46.8	1.92	20.8	9.2	2.0	4.6	50.5	41.7	48.3	1.93	21.7	9.5		
		1.3	2.9	75	0.8	1.9	56.6	42.9	50.4	1.96	21.9	9.8	1.3	3.0	61.2	46.5	53.9	1.96	23.7	10.1	1.8	4.1	63.9	48.7	55.6	1.97	24.7	10.3		
		1.3	2.9	90	0.7	1.7	69.6	45.0	52.1	2.0	22.7	11.2	1.2	2.7	75.3	48.7	55.7	2.0	24.6	11.6	1.6	3.7	78.6	51.1	57.5	1.99	25.7	11.8		
	7	1.6	3.7	40	0.9	2.1	29.3	26.5	32.8	1.78	14.9	7.4	1.5	3.4	31.7	28.7	35.0	1.78	16.1	E	2.0	4.6	33.1	30.1	36.2	1.78	16.8	7.8		
		1.6	3.7	50	0.9	2.1	37.1	31.1	37.7	1.79	17.4	8.0	1.5	3.4	40.1	33.7	40.3	1.79	18.8	8.2	2.0	4.6	41.8	35.3	41.7	1.80	19.6	8.4		
		1.6	3.7	60	0.9	2.1	44.7	36.7	43.5	1.82	20.2	8.3	1.5	3.4	48.3	39.7	46.5	1.82	21.9	8.6	2.0	4.6	50.4	41.6	48.0	1.82	22.8	8.8		
		1.6	3.7	75	0.8	1.9	56.5	42.8	50.0	1.86	23.0	9.1	1.3	3.0	61.1	46.4	53.5	1.86	25.0	9.3	1.8	4.1	63.8	48.6	55.2	1.86	26.1	9.6		
		1.6	3.7	90	0.7	1.7	69.5	44.9	51.7	1.9	23.9	10.4	1.2	2.7	75.2	48.6	55.3	1.9	25.9	10.7	1.6	3.7	78.5	50.9	57.1	1.88	27.0	11.0		
	9	2.0	4.7	40	0.9	2.1	29.3	26.4	32.4	1.73	15.2	6.9	1.5	3.4	31.7	28.6	34.6	1.74	16.5	7.1	2.0	4.6	33.1	30.0	35.8	1.74	17.2	7.2		
		2.0	4.7	50	0.9	2.1	37.1	31.0	37.3	1.75	17.8	7.3	1.5	3.4	40.2	33.6	39.9	1.75	19.2	7.5	2.0	4.6	41.9	35.2	41.2	1.75	20.1	7.7		
		2.0	4.7	60	0.9	2.1	44.7	36.6	43.0	1.77	20.7	7.7	1.5	3.4	48.4	39.7	46.0	1.77	22.4	7.9	2.0	4.6	50.5	41.6	47.5	1.78	23.4	8.1		
		2.0	4.7	75	0.8	1.9	56.6	42.7	49.5	1.81	23.6	8.4	1.3	3.0	61.2	46.2	52.9	1.81	25.5	8.6	1.8	4.1	63.9	48.5	54.6	1.82	26.6	8.8		
		2.0	4.7	90	0.7	1.7	69.6	44.8	51.1	1.8	24.5	9.6	1.2	2.7	75.3	48.5	54.7	1.8	26.5	9.9	1.6	3.7	78.6	50.8	56.4	1.84	27.6	10.1		
90	5	1.3	2.9	40	0.9	2.1	29.7	24.2	32.0	2.45	9.9	11.5	1.5	3.4	32.1	26.2	34.2	2.45	10.7	11.9	2.0	4.6	33.6	27.5	35.3	2.46	11.2	12.2		
		1.3	2.9	50	0.9	2.1	37.6	28.4	36.8	2.47	11.5	12.3	1.5	3.4	40.7	30.8	39.4	2.47	12.5	12.7	2.0	4.6	42.5	32.3	40.7	2.48	13.0	13.0		
		1.3	2.9	60	0.9	2.1	45.3	33.5	42.4	2.50	13.4	12.9	1.5	3.4	49.0	36.3	45.4	2.50	14.5	13.3	2.0	4.6	51.2	38.1	46.8	2.51	15.2	13.6		
		1.3	2.9	75	0.8	1.9	57.4	39.1	48.8	2.56	15.3	14.1	1.3	3.0	62.1	42.4	52.2	2.56	16.6	14.5	1.8	4.1	64.8	44.4	53.9	2.57	17.3	14.8		
		1.3	2.9	90	0.7	1.7	70.6	41.0	50.5	2.6	15.9	16.2	1.2	2.7	76.3	44.4	53.9	2.6	17.2	16.6	1.6	3.7	79.7	46.6	55.7	2.60	18.0	17.1		
	7	1.6	3.7	40	0.9	2.1	29.7	24.1	31.7	2.32	10.4	10.7	1.5	3.4	32.1	26.2	33.9	2.32	11.3	11.0	2.0	4.6	33.5	27.4	35.0	2.33	11.8	11.3		
		1.6	3.7	50	0.9	2.1	37.6	28.4	36.6	2.34	12.2	11.5	1.5	3.4	40.6	30.7	39.1	2.34	13.2	11.8	2.0	4.6	42.4	32.2	40.4	2.34	13.7	12.1		
		1.6	3.7	60	0.9	2.1	45.2	33.5	42.1	2.37	14.1	12.0	1.5	3.4	48.9	36.3	45.0	2.37	15.3	12.4	2.0	4.6	51.1	38.0	46.5	2.38	16.0	12.7		
		1.6	3.7	75	0.8	1.9	57.3	39.0	48.5	2.42	16.1	13.1	1.3	3.0	62.0	42.3	51.8	2.42	17.5	13.5	1.8	4.1	64.7	44.3	53.5	2.43	18.2	13.8		
		1.6	3.7	90	0.7	1.7	70.4	40.9	50.1	2.4	16.7	15.0	1.2	2.7	76.2	44.3	53.6	2.4	18.1	15.5	1.6	3.7	79.5	46.5	55.3	2.46	18.9	15.8		
	9	2.0	4.7	40	0.9	2.1	29.7	24.1	31.4	2.26	10.7	9.9	1.5	3.4	32.1	26.1	33.6	2.26	11.5	10.2	2.0	4.6	33.6	27.4	34.7	2.27	12.0	10.4		
		2.0	4.7	50	0.9	2.1	37.6	28.3	36.2	2.28	12.4	10.6	1.5	3.4	40.7	30.7	38.7	2.28	13.5	10.9	2.0	4.6	42.5	32.2	39.9	2.29	14.1	11.1		
		2.0	4.7	60	0.9	2.1	45.3	33.4	41.7	2.31	14.5	11.1	1.5	3.4	49.0	36.2	44.5	2.31	15.6	11.4	2.0	4.6	51.2	37.9	46.0	2.32	16.3	11.7		
		2.0	4.7	75	0.8	1.9	57.4	38.9	47.9	2.36	16.5	12.0	1.3	3.0	62.1	42.2	51.2	2.36	17.8	12.4	1.8	4.1	64.8	44.2	52.9	2.37	18.6	12.7		
		2.0	4.7	90	0.7	1.7	70.6	40.8	49.6	2.4	17.1	13.8	1.2	2.7	76.3	44.2	53.0	2.4	18.5	14.2	1.6	3.7	79.7	46.4	54.7	2.40	19.3	14.6		
110	5	1.2	2.9	40	0.9	2.1	30.4	21.4	30.4	3.22	6.7	15.5	1.5	3.4	32.9	23.2	32.5	3.22	7.2	16.0	2.0	4.6	34.3	24.3	33.5	3.23	7.5	16.3		
		1.2	2.9	50	0.9	2.1	38.5	25.2	35.0	3.25	7.8	16.6	1.5	3.4	41.6	27.3	37.4	3.25	8.4	17.1	2.0	4.6	43.5	28.6	38.6	3.26	8.8	17.5		
		1.2	2.9	60	0.9	2.1	46.4	29.7	40.3	3.29	9.0	17.4	1.5	3.4	50.2	32.1	43.1	3.29	9.8	17.9	2.0	4.6	52.4	33.7	44.5	3.30	10.2	18.3		
		1.2	2.9	75	0.8	1.9	58.7	34.6	46.3	3.37	10.3	18.9	1.3	3.0	63.5	37.5	49.5	3.37	11.1	19.4	1.8	4.1	66.3	39.3	51.2	3.38	11.6	19.9		
		1.2	2.9	90	0.7	1.7	72.2	36.3	47.9	3.4	10.7	21.7	1.2	2.7	78.1	39.3	51.2	3.4	11.6	22.4	1.6	3.7	81.5	41.2	52.9	3.41	12.1	22.9		
	7	1.6	3.7	40	0.9	2.1	30.4	21.4	30.1	3.05	7.0	14.4	1.5	3.4	32.8	23.1	32.2	3.05	7.6	14.8	2.0	4.6	34.3	24.2	33.3	3.06	7.9	15.2		
		1.6	3.7	50	0.9	2.1	38.4	25.1	34.7	3.07	8.2	15.4	1.5	3.4	41.6	27.2	37.1	3.07	8.8	15.8	2.0	4.6	43.4	28.5	38.3	3.08	9.2	16.2		
		1.6	3.7	60	0.9	2.1	46.3	29.6	40.0	3.11	9.5	16.1	1.5	3.4	50.1	32.1	42.8	3.11	10.3	16.6	2.0	4.6	52.3	33.6	44.1	3.13	10.7	17.0		
		1.6	3.7	75	0.8	1.9	58.6	34.5	46.0	3.18	10.8	17.5	1.3	3.0	63.4	37.4	49.2	3.18	11.7	18.1	1.8	4.1	66.2	39.2	50.8	3.20	12.3	18.5		
		1.6	3.7	90	0.7	1.7	72.1	36.2	47.6	3.2	11.3	20.2	1.2	2.7	77.9	39.2	50.8	3.2	12.2	20.8	1.6	3.7	81.4	41.1	52.5	3.23	12.7	21.3		
	9	2.0	4.6	40	0.9	2.1	30.4	21.3	29.8	2.97	7.2	13.3	1.5	3.4	32.9	23.1	31.9	2.98	7.8	13.7	2.0	4.6	34.3	24.2	32.9	2.99	8.1	14.0		
		2.0	4.6	50	0.9	2.1	38.5	25.0	34.3	3.00	8.4	14.2	1.5	3.4	41.6	27.1	36.7	3.00	9.0	14.6	2.0	4.6	43.5	28.4	37.9	3.01	9.4	15.0		
		2.0	4.6	60	0.9	2.1	46.4	29.5	39.6	3.04	9.7	14.9	1.5	3.4	50.2	32.0	42.3	3.04	10.5	15.3	2.0	4.6	52.4	33.5	43.7	3.05	11.0	15.7		
		2.0	4.6	75	0.8	1.9	58.7	34.4	45.5	3.11	11.1	16.2	1.3	3.0	63.5	37.3	48.6	3.11	12.0	16.6	1.8	4.1	66.3	39.1	50.2	3.12	12.5	17.0		
		2.0	4.6	90	0.7	1.7	72.2	36.1	47.0	3.1	11.5	18.6	1.2	2.7	78.1	39.1	50.3	3.1	12.5	19.1	1.6	3.7	81.5	41.0	51.9	3.15	13.0	19.6		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS036 : EXTENDED DATA																														
SOURCE SIDE				LOAD SIDE, HEATING MODE, FULL LOAD																										
EST	Source Flow			ELT	Load Flow GPM				5				Load Flow GPM				7				Load Flow GPM				9					
	GPM	Source Flow WPD			Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh		
25	9	2.1	4.8	50	0.9	2.2	79.6	29.9	21.7	1.80	4.87	4.4	1.5	3.5	76.0	30.0	27.5	1.71	5.13	4.1	Operation Not Recommended									
		2.1	4.8	80	0.8	1.9	92.8	29.5	21.0	2.13	4.06	7.41	1.3	3.1	88.6	29.6	26.6	2.03	4.28	6.9	1.5	3.4	86.8	29.5	26.7	1.98	4.36	6.5		
		2.1	4.8	100	1.0	2.3	113.6	28.9	20.4	2.72	3.12	9.95	1.6	3.8	108.5	29.0	25.8	2.59	3.28	9.3	1.8	4.1	106.1	28.9	25.9	2.53	3.34	8.8		
		2.1	4.8	110	0.6	1.5	123.8	28.4	17.8	3.22	2.59	11.25	1.0	2.4	118.2	28.5	22.6	3.06	2.72	10.5	1.1	2.6	115.7	28.4	22.6	3.00	2.77	9.9		
		2.1	4.8	120	0.7	1.6	134.1	27.9	16.7	3.67	2.23	12.55	1.1	2.5	128.1	27.9	21.1	3.48	2.35	11.7	1.2	2.8	125.4	27.8	21.2	3.41	2.39	11.0		
30	5	1.3	3.0	50	0.9	2.2	79.7	29.4	21.1	1.86	4.63	4.4	1.5	3.5	76.1	29.4	27.8	1.77	4.88	4.1	Operation Not Recommended									
		1.3	3.0	80	0.8	1.9	92.9	29.0	20.4	2.20	3.87	7.34	1.3	3.1	88.7	29.1	26.8	2.09	4.07	6.8	1.5	3.4	86.8	29.0	26.9	2.05	4.15	6.5		
		1.3	3.0	100	1.0	2.3	113.6	28.4	19.8	2.81	2.97	9.85	1.6	3.8	108.5	28.5	26.1	2.67	3.12	9.2	1.8	4.1	106.2	28.4	26.2	2.62	3.18	8.7		
		1.3	3.0	110	0.6	1.5	123.9	27.9	17.3	3.33	2.46	11.14	1.0	2.4	118.3	28.0	22.8	3.16	2.59	10.4	1.1	2.6	115.8	27.9	22.9	3.10	2.64	9.8		
		1.3	3.0	120	0.7	1.6	134.2	27.4	16.2	3.79	2.12	12.42	1.1	2.5	128.2	27.4	21.3	3.60	2.24	11.6	1.2	2.8	125.4	27.3	21.4	3.52	2.28	10.9		
	7	1.6	3.8	50	0.9	2.2	80.0	30.9	22.8	1.85	4.87	4.44	1.5	3.5	76.4	30.9	29.2	1.76	5.13	4.1	Operation Not Recommended									
		1.6	3.8	80	0.8	1.9	93.2	30.5	22.0	2.20	4.07	7.43	1.3	3.1	89.1	30.5	28.2	2.09	4.29	6.9	1.5	3.4	87.2	30.4	28.3	2.04	4.37	6.5		
		1.6	3.8	100	1.0	2.3	114.1	29.9	21.4	2.81	3.12	9.98	1.6	3.8	109.0	29.9	27.4	2.67	3.29	9.3	1.8	4.1	106.6	29.8	27.5	2.61	3.35	8.8		
		1.6	3.8	110	0.6	1.5	124.3	29.3	18.7	3.32	2.59	11.28	1.0	2.4	118.8	29.4	23.9	3.16	2.73	10.5	1.1	2.6	116.2	29.3	24.0	3.09	2.78	9.9		
		1.6	3.8	120	0.7	1.6	134.7	28.7	17.5	3.78	2.23	12.59	1.1	2.5	128.7	28.8	22.4	3.59	2.35	11.7	1.2	2.8	125.9	28.7	22.5	3.52	2.40	11.1		
	9	2.1	4.8	50	0.9	2.2	80.1	31.7	23.7	1.85	5.02	4.49	1.5	3.5	76.5	31.8	30.0	1.76	5.29	4.2	Operation Not Recommended									
		2.1	4.8	80	0.8	1.9	93.4	31.3	22.9	2.19	4.19	7.52	1.3	3.1	89.2	31.4	29.0	2.09	4.42	7.0	1.5	3.4	87.3	31.3	29.1	2.04	4.50	6.6		
		2.1	4.8	100	1.0	2.3	114.3	30.7	22.2	2.80	3.22	10.09	1.6	3.8	109.1	30.8	28.2	2.66	3.39	9.4	1.8	4.1	106.8	30.7	28.3	2.61	3.45	8.9		
		2.1	4.8	110	0.6	1.5	124.6	30.1	19.4	3.32	2.67	11.41	1.0	2.4	119.0	30.2	24.6	3.15	2.81	10.6	1.1	2.6	116.4	30.1	24.7	3.08	2.86	10.0		
		2.1	4.8	120	0.7	1.6	135.0	29.6	18.2	3.77	2.30	12.73	1.1	2.5	128.9	29.6	23.1	3.59	2.42	11.9	1.2	2.8	126.2	29.5	23.2	3.51	2.47	11.2		
50	5	1.4	3.2	50	0.9	2.2	81.2	39.0	30.4	1.82	6.28	4.57	1.5	3.5	77.5	39.1	40.0	1.73	6.62	4.3	1.7	3.8	75.9	39.0	40.2	1.69	6.74	4.0		
		1.4	3.2	80	0.8	1.9	94.6	38.5	29.4	2.15	5.24	7.65	1.3	3.1	90.4	38.6	38.6	2.05	5.53	7.1	1.5	3.4	88.5	38.5	38.8	2.00	5.63	6.7		
		1.4	3.2	100	1.0	2.3	115.8	37.7	28.5	2.75	4.02	10.27	1.6	3.8	110.6	37.8	37.5	2.61	4.24	9.6	1.8	4.1	108.2	37.7	37.7	2.56	4.32	9.0		
		1.4	3.2	110	0.6	1.5	126.2	37.0	24.9	3.25	3.34	11.61	1.0	2.4	120.5	37.1	32.8	3.09	3.52	10.8	1.1	2.6	118.0	37.0	32.9	3.03	3.58	10.2		
		1.4	3.2	120	0.7	1.6	136.8	36.4	23.4	3.7	2.9	12.9	1.1	2.5	130.6	36.4	30.7	3.5	3.0	12.1	1.2	2.8	127.8	36.3	30.9	3.44	3.09	11.4		
	7	1.8	4.1	50	0.9	2.2	81.5	41.0	32.8	1.81	6.61	4.63	1.5	3.5	77.8	41.1	42.1	1.72	6.97	4.3	1.7	3.8	76.2	40.9	42.2	1.69	7.10	4.1		
		1.8	4.1	80	0.8	1.9	95.0	40.5	31.6	2.15	5.52	7.75	1.3	3.1	90.7	40.5	40.5	2.04	5.82	7.2	1.5	3.4	88.8	40.4	40.7	2.00	5.92	6.8		
		1.8	4.1	100	1.0	2.3	116.3	39.6	30.7	2.74	4.24	10.40	1.6	3.8	111.0	39.7	39.4	2.61	4.46	9.7	1.8	4.1	108.7	39.6	39.6	2.55	4.55	9.2		
		1.8	4.1	110	0.6	1.5	126.7	38.9	26.9	3.25	3.51	11.76	1.0	2.4	121.0	39.0	34.4	3.09	3.70	11.0	1.1	2.6	118.4	38.9	34.6	3.02	3.77	10.3		
		1.8	4.1	120	0.7	1.6	137.3	38.2	25.2	3.7	3.0	13.1	1.1	2.5	131.1	38.3	32.3	3.5	3.2	12.2	1.2	2.8	128.3	38.1	32.4	3.44	3.25	11.5		
	9	2.3	5.2	50	0.9	2.2	81.6	42.2	34.1	1.81	6.81	4.68	1.5	3.5	78.0	42.2	43.3	1.72	7.18	4.4	1.7	3.8	76.3	42.1	43.4	1.68	7.31	4.1		
		2.3	5.2	80	0.8	1.9	95.2	41.6	32.9	2.14	5.69	7.84	1.3	3.1	90.9	41.7	41.7	2.04	5.99	7.3	1.5	3.4	89.0	41.6	41.9	1.99	6.10	6.9		
		2.3	5.2	100	1.0	2.3	116.5	40.8	32.0	2.74	4.36	10.52	1.6	3.8	111.2	40.9	40.6	2.60	4.60	9.8	1.8	4.1	108.8	40.7	40.7	2.55	4.68	9.3		
		2.3	5.2	110	0.6	1.5	126.9	40.0	28.0	3.24	3.62	11.89	1.0	2.4	121.2	40.1	35.4	3.08	3.82	11.1	1.1	2.6	118.6	40.0	35.6	3.01	3.89	10.5		
		2.3	5.2	120	0.7	1.6	137.5	39.3	26.2	3.7	3.1	13.3	1.1	2.5	131.4	39.4	33.2	3.5	3.3	12.4	1.2	2.8	128.6	39.2	33.3	3.43	3.35	11.7		
70	5	1.4	3.1	50	0.9	2.2	83.0	49.2	40.3	1.82	7.91	5.13	1.5	3.5	79.3	49.3	53.0	1.73	8.33	4.8	1.7	3.8	77.6	49.1	53.2	1.69	8.49	4.5		
		1.4	3.1	80	0.8	1.9	96.8	48.5	38.8	2.16	6.60	8.58	1.3	3.1	92.4	48.6	51.1	2.05	6.96	8.0	1.5	3.4	90.4	48.5	51.3	2.00	7.09	7.6		
		1.4	3.1	100	1.0	2.3	118.4	47.6	37.8	2.75	5.06	11.52	1.6	3.8	113.1	47.7	49.6	2.62	5.34	10.7	1.8	4.1	110.6	47.5	49.8	2.56	5.44	10.1		
		1.4	3.1	110	0.6	1.5	129.0	46.7	33.0	3.26	4.20	13.03	1.0	2.4	123.2	46.8	43.4	3.10	4.43	12.1	1.1	2.6	120.6	46.6	43.5	3.03	4.51	11.5		
		1.4	3.1	120	0.7	1.6	139.8	45.8	30.9	3.7	3.6	14.5	1.1	2.5	133.5	45.9	40.7	3.5	3.8	13.6	1.2	2.8	130.7	45.8	40.8	3.45	3.89	12.8		
	7	1.7	4.0	50	0.9	2.2	83.3	51.6	43.4	1.82	8.32	5.20	1.5	3.5	79.6	51.7	55.6	1.73	8.77	4.8	1.7	3.8	77.9	51.6	55.8	1.69	8.93	4.6		
		1.7	4.0	80	0.8	1.9	97.1	51.0	41.8	2.15	6.95	8.70	1.3	3.1	92.8	51.1	53.6	2.04	7.32	8.1	1.5	3.4	90.8	50.9	53.8	2.00	7.46	7.7		
		1.7	4.0	100	1.0	2.3	118.8	50.0	40.7	2.75	5.33	11.67	1.6	3.8	113.5	50.1	52.1	2.61	5.62	10.9	1.8	4.1	111.1	49.9	52.3	2.56	5.72	10.3		
		1.7	4.0	110	0.6	1.5	129.5	49.0	35.5	3.25	4.42	13.20	1.0	2.4	123.7	49.1	45.5	3.09	4.66	12.3	1.1	2.6	121.1	49.0	45.7	3.02	4.75	11.6		
		1.7	4.0	120	0.7	1.6	140.4	48.1	33.3	3.7	3.8	14.7	1.1	2.5	134.1	48.2	42.7	3.5	4.0	13.7	1.2	2.8	131.2	48.1	42.9	3.44	4.09	13.0		
	9	2.2	5.1	50	0.9	2.2	83.5	53.1	45.1	1.81	8.58	5.26	1.5	3.5	79.7	53.2	57.2	1.72	9.04	4.9	1.7	3.8	78.0	53.1	57.4	1.69	9.20	4.6		
		2.2	5.1	80	0.8	1.9	97.3	52.4	43.5	2.15	7.16	8.79	1.3	3.1	92.9	52.6	55.2	2.04	7.54	8.2	1.5	3.4	90.9	52.4	55.4	2.00	7.69	7.7		
		2.2	5.1	100	1.0	2.3	119.0	51.4	42.3	2.74	5.49	11.80	1.6	3.8	113.7	51.5	53.6	2.61	5.79	11.0	1.8	4.1	111.3	51.3	53.8	2.55	5.90	10.4		
		2.2	5.1	110	0.6	1.5	129.8	50.4	37.0	3.25	4.56	13.35	1.0	2.4	123.9	50.5	46.8	3.08	4.80	12.4	1.1	2.6	121.3	50.4	47.0	3.02	4.89	11.7		
		2.2	5.1	120	0.7	1.6	140.6	49.5	34.7	3.7	3.9	14.9	1.1	2.5	134.3	49.6	43.9	3.5	4.1	13.9	1.2	2.8	131.4	49.4	44.1	3.43	4.22	13.1		
90	5	1.3	3.0	50	0.9	2.2	84.6	59.2	49.8	1.85	9.38	6.23	1.5	3.5	80.8	59.3	65.4	1.75	9.88	5.8	1.7	3.8	79.1	59.1	65.7	1.72	10.07	5.5		
		1.3	3.0	80	0.8	1.9	98.7	58.4	48.0	2.19	7.83	10.42	1.3	3.1	94.3	58.6	63.1	2.08	8.25	9.7	1.5	3.4	92.2	58.4	63.3	2.03	8.40	9.2		
		1.3	3.0	100	1.0	2.3	120.7	57.3	46.6	2.79	6.01	13.98	1.6	3.8	115.3	57.4	61.3	2.66	6.33	13.0	1.8	4.1	112.9	57.2	61.6	2.60	6.45	12.3		
		1.3	3.0	110	0.6	1.5	131.6	56.2	40.7	3.31	4.98	15.81	1.0	2.4	125.7	56.3	53.6	3.14	5.25	14.7	1.1	2.6	123.0	56.1	53.8	3.07	5.35	13.9		
		1.3	3.0	120	0.7	1.6	142.6	55.1	38.2	3.8	4.3	17.6	1.1	2.5	136.2	55.3	50.2	3.6	4.5	16.4	1.2	2.8	133.3	55.1	50.4	3.50	4.61	15.5		
	7	1.6	3.8	50	0.9	2.2	85.0	62.2	53.6	1.84	9.87	6.31	1.5	3.5	81.2	62.3	68.7	1.75	10.40	5.9	1.7	3.8	79.4	62.1	69.0	1.71	10.60	5.6		
		1.6	3.8	80	0.8	1.9	99.1	61.4	51.7	2.18	8.24	10.56	1.3	3.1	94.6	61.5	66.3	2.07	8.68	9.8	1.5	3.4	92.6	61.3	66.5	2.03	8.85	9.3		
		1.6	3.8	100	1.0	2.3	121.2	60.1	50.2	2.79	6.32	14.17	1.6	3.8	115.8	60.3	64.4	2.65	6.66	13.2	1.8	4.1	113.3	60.1	64.7	2.59	6.79	12.5		
		1.6	3.8	110	0.6	1.5	132.1	59.0	43.9	3.30	5.25	16.02	1.0	2.4	126.2	59.1	56.3	3.14	5.53	14.9	1.1	2.6	123.5	58.9	56.5	3.07	5.63	14.1		
		1.6	3.8	120	0.7	1.6	143.2	57.9	41.1	3.8	4.5	17.9	1.1	2.5	136.7	58.0	52.7	3.6	4.8	16.7	1.2	2.8	133.8	57.8	53.0	3.49	4.86	15.7		
	9	2.1	4.8	50	0.9	2.2	85.1	63.9	55.8	1.84	10.17	6.38	1.5	3.5	81.3	64.1	70.7	1.75	10.72	5.9	1.7	3.8	79.6	63.9	71.0	1.71	10.92	5.6		
		2.1	4.8	80	0.8	1.9	99.2	63.1	53.8	2.18	8.49	10.67	1.3	3.1	94.8	63.3	68.2	2.07	8.95	10.0	1.5	3.4	92.8	63.0	68.4	2.03	9.11	9.4		
		2.1	4.8	100	1.0	2.3	121.4	61.9	52.3	2.78	6.52	14.32	1.6	3.8	116.0	62.0	66.3	2.65	6.87	13.4	1.8	4.1	113.5	61.8	66.5	2.59	6.99	12.6		
		2.1	4.8	110	0.6	1.5	132.4	60.7	45.7	3.29	5.41	16.20	1.0	2.4	126.4	60.8	57.9	3.13	5.70	15.1	1.1	2.6	123.7	60.6	58.1	3.06	5.80	14.3		
		2.1	4.8	120	0.7	1.6	143.4	59.6	42.8	3.7	4.7	18.1	1.1	2.5	137.0	59.7	54.3	3.6	4.9	16.9	1.2	2.8	134.1	59.5	54.5	3.49	5.00	15.9		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS048 - Heating - Full Load Performance Data

WS048 : EXTENDED DATA																														
SOURCE SIDE				LOAD SIDE, HEATING MODE, FULL LOAD																										
EST	Source Flow			ELT	Load Flow GPM 6								Load Flow GPM 9								Load Flow GPM 12									
	GPM	Source Flow WPD			Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh		
25	12	2.3	5.3	50	0.4	0.9	84.7	45.7	33.1	2.75	4.86	4.3	1.4	3.2	79.7	45.3	43.8	2.57	5.15	4.0	Operation Not Recommended									
		2.3	5.3	80	0.3	0.8	96.1	45.6	32.1	3.17	4.22	7.25	1.3	2.9	90.4	45.2	42.4	2.97	4.47	6.6	1.9	4.4	87.8	44.5	42.1	2.88	4.53	6.2		
		2.3	5.3	100	0.2	0.5	117.2	44.3	29.7	4.26	3.05	9.73	0.8	1.9	110.3	43.9	39.3	3.99	3.23	8.9	1.3	2.9	107.1	43.2	39.0	3.87	3.27	8.3		
		2.3	5.3	110	0.3	0.6	127.7	44.2	27.7	4.72	2.75	11.00	1.0	2.4	120.2	43.9	36.6	4.42	2.91	10.0	1.6	3.7	116.7	43.2	36.4	4.30	2.95	9.4		
		2.3	5.3	120	0.3	0.6	138.2	43.0	25.3	5.41	2.33	12.27	1.0	2.4	130.1	42.7	33.5	5.06	2.47	11.2	1.6	3.7	126.3	42.0	33.2	4.92	2.50	10.5		
30	6	1.0	2.3	50	0.4	0.9	84.3	44.9	32.2	2.74	4.79	4.3	1.4	3.2	79.3	44.5	43.7	2.57	5.08	3.9	Operation Not Recommended									
		1.0	2.3	80	0.3	0.8	95.6	44.9	31.2	3.16	4.16	7.13	1.3	2.9	90.0	44.5	42.3	2.96	4.41	6.5	1.9	4.4	87.4	43.8	42.0	2.88	4.47	6.1		
		1.0	2.3	100	0.2	0.5	116.6	43.5	28.9	4.25	3.01	9.57	0.8	1.9	109.7	43.2	39.2	3.98	3.18	8.7	1.3	2.9	106.6	42.5	39.0	3.86	3.23	8.2		
		1.0	2.3	110	0.3	0.6	127.1	43.5	27.0	4.71	2.71	10.81	1.0	2.4	119.6	43.2	36.6	4.41	2.87	9.9	1.6	3.7	116.1	42.5	36.3	4.29	2.91	9.2		
		1.0	2.3	120	0.3	0.6	137.5	42.3	24.6	5.40	2.30	12.06	1.0	2.4	129.4	42.0	33.4	5.05	2.44	11.0	1.6	3.7	125.7	41.3	33.2	4.91	2.47	10.3		
	9	1.5	3.5	50	0.4	0.9	84.9	47.3	34.5	2.76	5.01	4.33	1.4	3.2	79.9	46.9	46.0	2.59	5.30	4.0	Operation Not Recommended									
		1.5	3.5	80	0.3	0.8	96.4	47.2	33.5	3.19	4.35	7.25	1.3	2.9	90.7	46.8	44.6	2.98	4.60	6.6	1.9	4.4	88.1	46.1	44.3	2.90	4.66	6.2		
		1.5	3.5	100	0.2	0.5	117.5	45.8	31.0	4.28	3.14	9.73	0.8	1.9	110.6	45.5	41.3	4.01	3.33	8.9	1.3	2.9	107.4	44.8	41.0	3.90	3.37	8.3		
		1.5	3.5	110	0.3	0.6	128.1	45.8	28.9	4.75	2.83	11.00	1.0	2.4	120.5	45.4	38.5	4.45	3.00	10.0	1.6	3.7	117.0	44.8	38.2	4.32	3.03	9.4		
		1.5	3.5	120	0.3	0.6	138.6	44.6	26.4	5.44	2.40	12.27	1.0	2.4	130.5	44.2	35.2	5.09	2.54	11.2	1.6	3.7	126.7	43.5	34.9	4.95	2.58	10.5		
	12	2.3	5.2	50	0.4	0.9	85.0	48.5	35.7	2.76	5.14	4.39	1.4	3.2	80.0	48.1	47.2	2.58	5.45	4.0	Operation Not Recommended									
		2.3	5.2	80	0.3	0.8	96.4	48.5	34.6	3.18	4.47	7.35	1.3	2.9	90.7	48.0	45.7	2.98	4.73	6.7	1.9	4.4	88.1	47.3	45.4	2.89	4.79	6.3		
		2.3	5.2	100	0.2	0.5	117.6	47.0	32.1	4.27	3.23	9.86	0.8	1.9	110.6	46.6	42.4	4.00	3.42	9.0	1.3	2.9	107.4	45.9	42.1	3.89	3.46	8.4		
		2.3	5.2	110	0.3	0.6	128.1	47.0	29.9	4.74	2.91	11.15	1.0	2.4	120.6	46.6	39.5	4.44	3.08	10.2	1.6	3.7	117.1	45.9	39.2	4.32	3.12	9.5		
		2.3	5.2	120	0.3	0.6	138.7	45.7	27.3	5.43	2.47	12.44	1.0	2.4	130.5	45.3	36.1	5.09	2.61	11.4	1.6	3.7	126.7	44.6	35.8	4.94	2.65	10.6		
50	6	1.0	2.2	50	0.4	0.9	86.1	58.0	45.5	2.82	6.03	4.44	1.4	3.2	81.0	57.5	61.7	2.64	6.38	4.1	2.1	4.9	78.7	56.7	61.2	2.56	6.47	3.8		
		1.0	2.2	80	0.3	0.8	97.7	58.0	44.0	3.25	5.23	7.43	1.3	2.9	91.9	57.5	59.7	3.04	5.54	6.8	1.9	4.4	89.3	56.6	59.3	2.96	5.61	6.4		
		1.0	2.2	100	0.2	0.5	119.1	56.3	40.8	4.37	3.78	9.97	0.8	1.9	112.1	55.8	55.3	4.09	4.00	9.1	1.3	2.9	108.9	54.9	54.9	3.97	4.05	8.5		
		1.0	2.2	110	0.3	0.6	129.8	56.3	38.0	4.84	3.40	11.27	1.0	2.4	122.2	55.8	51.6	4.53	3.61	10.3	1.6	3.7	118.6	54.9	51.2	4.41	3.65	9.6		
		1.0	2.2	120	0.3	0.6	140.5	54.7	34.8	5.5	2.9	12.6	1.0	2.4	132.3	54.2	47.1	5.2	3.1	11.5	1.6	3.7	128.4	53.4	46.8	5.05	3.10	10.8		
	9	1.4	3.3	50	0.4	0.9	86.8	61.1	48.7	2.84	6.29	4.52	1.4	3.2	81.7	60.6	64.9	2.66	6.67	4.1	2.1	4.9	79.3	59.7	64.5	2.58	6.75	3.9		
		1.4	3.3	80	0.3	0.8	98.5	61.0	47.2	3.27	5.47	7.56	1.3	2.9	92.7	60.5	62.9	3.07	5.79	6.9	1.9	4.4	90.0	59.6	62.4	2.98	5.86	6.5		
		1.4	3.3	100	0.2	0.5	120.1	59.2	43.7	4.40	3.95	10.14	0.8	1.9	113.0	58.7	58.3	4.12	4.18	9.3	1.3	2.9	109.7	57.8	57.9	4.00	4.23	8.7		
		1.4	3.3	110	0.3	0.6	130.9	59.2	40.7	4.88	3.56	11.47	1.0	2.4	123.2	58.7	54.3	4.57	3.77	10.5	1.6	3.7	119.6	57.8	53.9	4.44	3.82	9.8		
		1.4	3.3	120	0.3	0.6	141.6	57.6	37.2	5.6	3.0	12.8	1.0	2.4	133.3	57.1	49.6	5.2	3.2	11.7	1.6	3.7	129.4	56.2	49.3	5.09	3.24	10.9		
	12	2.1	4.9	50	0.4	0.9	86.8	62.7	50.4	2.84	6.47	4.58	1.4	3.2	81.7	62.2	66.6	2.66	6.85	4.2	2.1	4.9	79.3	61.2	66.1	2.58	6.94	3.9		
		2.1	4.9	80	0.3	0.8	98.5	62.6	48.8	3.27	5.62	7.66	1.3	2.9	92.7	62.1	64.5	3.06	5.95	7.0	1.9	4.4	90.0	61.1	64.1	2.97	6.03	6.6		
		2.1	4.9	100	0.2	0.5	120.1	60.8	45.2	4.39	4.06	10.28	0.8	1.9	113.1	60.3	59.8	4.11	4.30	9.4	1.3	2.9	109.8	59.3	59.4	4.00	4.35	8.8		
		2.1	4.9	110	0.3	0.6	130.9	60.8	42.1	4.87	3.65	11.63	1.0	2.4	123.2	60.2	55.7	4.56	3.87	10.6	1.6	3.7	119.6	59.3	55.3	4.44	3.92	9.9		
		2.1	4.9	120	0.3	0.6	141.7	59.1	38.5	5.6	3.1	13.0	1.0	2.4	133.4	58.6	50.9	5.2	3.3	11.8	1.6	3.7	129.5	57.7	50.6	5.08	3.33	11.1		
70	6	0.9	2.1	50	0.4	0.9	88.3	74.5	61.6	2.88	7.58	4.98	1.4	3.2	83.1	73.9	83.5	2.69	8.03	4.5	2.1	4.9	80.7	72.8	83.0	2.62	8.14	4.3		
		0.9	2.1	80	0.3	0.8	100.2	74.4	59.7	3.32	6.58	8.34	1.3	2.9	94.3	73.8	80.9	3.10	6.97	7.6	1.9	4.4	91.6	72.7	80.4	3.02	7.06	7.1		
		0.9	2.1	100	0.2	0.5	122.2	72.3	55.3	4.46	4.75	11.19	0.8	1.9	115.0	71.6	75.0	4.17	5.04	10.2	1.3	2.9	111.7	70.5	74.5	4.05	5.10	9.6		
		0.9	2.1	110	0.3	0.6	133.2	72.2	51.5	4.94	4.28	12.65	1.0	2.4	125.3	71.6	69.9	4.63	4.54	11.6	1.6	3.7	121.7	70.5	69.4	4.50	4.60	10.8		
		0.9	2.1	120	0.3	0.6	144.1	70.2	47.1	5.7	3.6	14.1	1.0	2.4	135.7	69.6	63.9	5.3	3.9	12.9	1.6	3.7	131.7	68.6	63.4	5.15	3.90	12.1		
	9	1.4	3.2	50	0.4	0.9	89.0	78.5	66.0	2.90	7.92	5.07	1.4	3.2	83.8	77.8	88.0	2.71	8.39	4.6	2.1	4.9	81.4	76.6	87.3	2.64	8.50	4.3		
		1.4	3.2	80	0.3	0.8	101.0	78.4	63.9	3.34	6.88	8.48	1.3	2.9	95.1	77.7	85.2	3.13	7.28	7.7	1.9	4.4	92.3	76.5	84.6	3.04	7.38	7.3		
		1.4	3.2	100	0.2	0.5	123.2	76.1	59.2	4.49	4.97	11.38	0.8	1.9	115.9	75.4	79.0	4.20	5.26	10.4	1.3	2.9	112.6	74.3	78.4	4.09	5.33	9.7		
		1.4	3.2	110	0.3	0.6	134.2	76.1	55.2	4.98	4.47	12.87	1.0	2.4	126.3	75.4	73.6	4.67	4.74	11.8	1.6	3.7	122.7	74.3	73.0	4.53	4.80	11.0		
		1.4	3.2	120	0.3	0.6	145.3	74.0	50.5	5.7	3.8	14.4	1.0	2.4	136.7	73.3	67.2	5.3	4.0	13.1	1.6	3.7	132.8	72.2	66.8	5.19	4.08	12.3		
	12	2.0	4.7	50	0.4	0.9	89.1	80.5	68.3	2.90	8.14	5.14	1.4	3.2	83.8	79.8	90.3	2.71	8.62	4.7	2.1	4.9	81.4	78.6	89.6	2.63	8.73	4.4		
		2.0	4.7	80	0.3	0.8	101.0	80.4	66.1	3.34	7.07	8.60	1.3	2.9	95.1	79.7	87.4	3.12	7.48	7.8	1.9	4.4	92.3	78.5	86.8	3.04	7.58	7.4		
		2.0	4.7	100	0.2	0.5	123.2	78.1	61.3	4.48	5.10	11.54	0.8	1.9	116.0	77.4	81.0	4.20	5.40	10.5	1.3	2.9	112.6	76.2	80.4	4.08	5.48	9.9		
		2.0	4.7	110	0.3	0.6	134.3	78.0	57.1	4.98	4.60	13.05	1.0	2.4	126.4	77.4	75.5	4.66	4.87	11.9	1.6	3.7	122.7	76.2	74.9	4.53	4.93	11.2		
		2.0	4.7	120	0.3	0.6	145.3	75.9	52.2	5.7	3.9	14.6	1.0	2.4	136.8	75.2	69.0	5.3	4.1	13.3	1.6	3.7	132.8	74.1	68.5	5.18	4.19	12.4		
90	6	0.9	2.0	50	0.4	0.9	90.4	90.4	77.8	2.92	9.07	6.05	1.4	3.2	85.1	89.7	105.5	2.73	9.61	5.5	2.1	4.9	82.6	88.3	104.7	2.65	9.74	5.2		
		0.9	2.0	80	0.3	0.8	102.6	90.3	75.4	3.36	7.88	10.12	1.3	2.9	96.6	89.5	102.2	3.15	8.35	9.2	1.9	4.4	93.8	88.2	101.5	3.06	8.46	8.7		
		0.9	2.0	100	0.2	0.5	125.1	87.7	69.8	4.52	5.69	13.58	0.8	1.9	117.8	86.9	94.7	4.23	6.03	12.4	1.3	2.9	114.4	85.6	94.0	4.11	6.11	11.6		
		0.9	2.0	110	0.3	0.6	136.4	87.7	65.1	5.01	5.13	15.36	1.0	2.4	128.3	86.9	88.2	4.69	5.43	14.0	1.6	3.7	124.6	85.6	87.6	4.56	5.50	13.1		
		0.9	2.0	120	0.3	0.6	147.6	85.2	59.5	5.7	4.4	17.1	1.0	2.4	138.9	84.5	80.6	5.4	4.6	15.6	1.6	3.7	134.9	83.2	80.1	5.22	4.67	14.6		
	9	1.3	3.0	50	0.4	0.9	91.2	95.2	83.3	2.94	9.48	6.15	1.4	3.2	85.8	94.4	111.1	2.75	10.04	5.6	2.1	4.9	83.3	93.0	110.3	2.67	10.17	5.3		
		1.3	3.0	80	0.3	0.8	103.4	95.1	80.7	3.39	8.23	10.29	1.3	2.9	97.3	94.3	107.6	3.17	8.72	9.4	1.9	4.4	94.5	92.8	106.8	3.08	8.83	8.8		
		1.3	3.0	100	0.2	0.5	126.1	92.3	74.8	4.55	5.94	13.82	0.8	1.9	118.7	91.5	99.7	4.26	6.30	12.6	1.3	2.9	115.3	90.1	99.0	4.14	6.38	11.8		
		1.3	3.0	110	0.3	0.6	137.5	92.3	69.7	5.05	5.36	15.62	1.0	2.4	129.4	91.5	92.9	4.73	5.67	14.3	1.6	3.7	125.6	90.1	92.2	4.60	5.75	13.4		
		1.3	3.0	120	0.3	0.6	148.8	89.7	63.7	5.8	4.5	17.4	1.0	2.4	140.0	89.0	84.9	5.4	4.8	15.9	1.6	3.7	136.0	87.6	84.3	5.26	4.88	14.9		
	12	1.9	4.4	50	0.4	0.9	91.2	97.7	86.2	2.93	9.74	6.24	1.4	3.2	85.8	96.9	114.0	2.75	10.32	5.7	2.1	4.9	83.3	95.4	113.1	2.67	10.45	5.3		
		1.9	4.4	80	0.3	0.8	103.4	97.6	83.5	3.38	8.46	10.43	1.3	2.9	97.4	96.7	110.4	3.17	8.96	9.5	1.9	4.4	94.5	95.3	109.6	3.08	9.08	8.9		
		1.9	4.4	100	0.2	0.5	126.2	94.7	77.4	4.55	6.11	14.01	0.8	1.9	118.8	93.9	102.3	4.25	6.47	12.8	1.3	2.9	115.3	92.4	101.6	4.14	6.55	12.0		
		1.9	4.4	110	0.3	0.6	137.5	94.7	72.1	5.04	5.50	15.84	1.0	2.4	129.4	93.9	95.3	4.72	5.83	14.5	1.6	3.7	125.7	92.4	94.6	4.59	5.90	13.5		
		1.9	4.4	120	0.3	0.6	148.8	92.1	65.9	5.8	4.7	17.7	1.0	2.4	140.1	91.3	87.1	5.4	4.9	16.1	1.6	3.7	136.0	89.9	86.5	5.26	5.01	15.1		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS048 : EXTENDED DATA				LOAD SIDE, COOLING MODE, FULL LOAD																										
SOURCE SIDE																														
EST	Source Flow		ELT	Load Flow GPM 6								Load Flow GPM 9								Load Flow GPM 12										
	GPM	Source Flow WPD			Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh		
40	12	2.2	5.0	40	Operation Not Recommended								Operation Not Recommended								Operation Not Recommended									
		2.2	5.0	50																										
		2.2	5.0	60																										
		2.2	5.0	75									1.4	3.2	58.2	74.9	82.0	1.97	38.1	4.0	2.3	5.4	61.6	78.2	84.5	1.97	39.7	4.1		
		2.2	5.0	90	1.9	4.3	69.4	81.0	87.3	2.02	40.2	4.4	1.9	4.4	71.6	82.2	88.8	2.02	40.7	4.5	3.2	7.4	75.7	85.8	91.5	2.02	42.4	4.7		
50		1.0	2.3	40	0.8	1.9	29.5	42.7	52.2	2.33	18.3	5.0	0.8	1.9	30.5	43.4	53.1	2.34	18.6	5.2	1.4	3.2	32.2	45.2	54.8	2.34	19.4	5.3		
	6	1.0	2.3	50	0.8	1.8	37.6	50.4	59.0	2.36	21.4	5.3	0.8	1.9	38.8	51.2	60.0	2.36	21.6	5.5	1.3	3.1	41.0	53.4	61.9	2.37	22.5	5.7		
		1.0	2.3	60	1.0	2.3	45.2	59.2	68.5	2.41	24.6	5.6	1.0	2.4	46.7	60.1	69.6	2.41	24.9	5.8	1.7	4.0	49.4	62.7	71.8	2.41	26.0	6.0		
		1.0	2.3	75	1.4	3.2	56.4	72.7	82.0	2.49	29.2	6.1	1.4	3.2	58.2	73.8	83.4	2.49	29.6	6.3	2.3	5.4	61.6	77.0	86.0	2.50	30.8	6.5		
		1.0	2.3	90	1.9	4.3	69.4	79.8	88.8	2.56	31.2	7.0	1.9	4.4	71.6	81.0	90.3	2.56	31.6	7.2	3.2	7.4	75.8	84.5	93.1	2.57	32.9	7.4		
	9	1.4	3.3	40	0.8	1.9	29.6	42.6	51.8	2.17	19.7	4.4	0.8	1.9	30.5	43.2	52.7	2.17	19.9	4.6	1.4	3.2	32.3	45.1	54.3	2.18	20.8	4.7		
		1.4	3.3	50	0.8	1.8	37.6	50.3	58.6	2.19	22.9	4.7	0.8	1.9	38.8	51.0	59.5	2.20	23.2	4.9	1.3	3.1	41.1	53.2	61.4	2.20	24.2	5.1		
		1.4	3.3	60	1.0	2.3	45.3	59.0	67.9	2.24	26.4	5.0	1.0	2.4	46.7	59.9	69.1	2.24	26.7	5.1	1.7	4.0	49.4	62.5	71.3	2.25	27.8	5.3		
		1.4	3.3	75	1.4	3.2	56.5	72.5	81.4	2.31	31.3	5.4	1.4	3.2	58.3	73.6	82.7	2.32	31.8	5.6	2.3	5.4	61.7	76.8	E	2.32	33.1	5.8		
		1.4	3.3	90	1.9	4.3	69.5	79.6	88.1	2.38	33.5	6.2	1.9	4.4	71.7	80.8	89.6	2.38	33.9	6.4	3.2	7.4	75.9	84.3	92.4	2.39	35.3	6.6		
	12	2.1	4.9	40	0.8	1.9	29.6	42.8	51.4	2.08	20.6	3.8	0.8	1.9	30.5	43.4	52.3	2.09	20.8	4.0	1.4	3.2	32.3	45.3	53.9	2.09	21.7	4.1		
		2.1	4.9	50	0.8	1.8	37.7	50.5	58.1	2.11	24.0	4.1	0.8	1.9	38.9	51.3	59.1	2.11	24.3	4.2	1.3	3.1	41.1	53.5	60.9	2.12	25.3	4.4		
		2.1	4.9	60	1.0	2.3	45.3	59.3	67.4	2.15	27.6	4.3	1.0	2.4	46.8	60.2	68.6	2.15	27.9	4.4	1.7	4.0	49.5	62.8	70.7	2.16	29.1	4.6		
		2.1	4.9	75	1.4	3.2	56.6	72.9	80.7	2.22	32.8	4.6	1.4	3.2	58.4	74.0	82.1	2.23	33.2	4.8	2.3	5.4	61.8	77.2	84.7	2.23	34.6	5.0		
		2.1	4.9	90	1.9	4.3	69.6	80.0	87.4	2.28	35.0	5.3	1.9	4.4	71.8	81.2	88.9	2.29	35.5	5.5	3.2	7.4	75.9	84.7	91.7	2.29	36.9	5.7		
70		0.9	2.1	40	0.8	1.9	29.9	39.9	50.6	3.00	13.3	7.8	0.8	1.9	30.8	40.5	51.5	3.00	13.5	8.1	1.4	3.2	32.6	42.3	53.1	3.01	14.1	8.4		
	6	0.9	2.1	50	0.8	1.8	38.0	47.1	57.2	3.04	15.5	8.4	0.8	1.9	39.2	47.8	58.2	3.04	15.7	8.7	1.3	3.1	41.5	49.9	60.0	3.05	16.4	9.0		
		0.9	2.1	60	1.0	2.3	45.8	55.3	66.4	3.09	17.9	8.8	1.0	2.4	47.2	56.2	67.5	3.10	18.1	9.1	1.7	4.0	50.0	58.6	69.6	3.11	18.9	9.4		
		0.9	2.1	75	1.4	3.2	57.1	68.0	79.5	3.20	21.2	9.6	1.4	3.2	59.0	69.0	80.9	3.21	21.5	9.9	2.3	5.4	62.4	72.0	83.4	3.21	22.4	10.2		
		0.9	2.1	90	1.9	4.3	70.3	74.6	86.1	3.3	22.7	11.0	1.9	4.4	72.5	75.7	87.6	3.3	23.0	11.4	3.2	7.4	76.7	79.0	90.3	3.30	23.9	11.7		
	9	1.4	3.1	40	0.8	1.9	29.9	39.8	50.2	2.79	14.3	7.0	0.8	1.9	30.9	40.4	51.1	2.79	14.5	E	1.4	3.2	32.7	42.2	52.7	2.80	15.1	7.5		
		1.4	3.1	50	0.8	1.8	38.1	47.0	56.8	2.82	16.6	7.5	0.8	1.9	39.3	47.7	57.7	2.83	16.9	7.8	1.3	3.1	41.6	49.8	59.6	2.83	17.6	8.0		
		1.4	3.1	60	1.0	2.3	45.8	55.2	65.9	2.88	19.2	7.8	1.0	2.4	47.3	56.0	67.0	2.88	19.4	8.1	1.7	4.0	50.0	58.4	69.1	2.89	20.2	8.4		
		1.4	3.1	75	1.4	3.2	57.2	67.8	78.9	2.98	22.8	8.5	1.4	3.2	59.0	68.8	80.2	2.98	23.1	8.8	2.3	5.4	62.5	71.8	82.7	2.99	24.0	9.1		
		1.4	3.1	90	1.9	4.3	70.4	74.4	85.5	3.1	24.3	9.8	1.9	4.4	72.6	75.5	86.9	3.1	24.6	10.1	3.2	7.4	76.8	78.8	89.6	3.07	25.7	10.4		
	12	2.0	4.6	40	0.8	1.9	30.0	40.0	49.9	2.68	14.9	6.0	0.8	1.9	30.9	40.6	50.7	2.68	15.1	6.2	1.4	3.2	32.7	42.4	52.3	2.69	15.8	6.4		
		2.0	4.6	50	0.8	1.8	38.1	47.2	56.4	2.71	17.4	6.4	0.8	1.9	39.3	47.9	57.3	2.72	17.6	6.7	1.3	3.1	41.6	50.0	59.1	2.72	18.4	6.9		
		2.0	4.6	60	1.0	2.3	45.9	55.4	65.4	2.77	20.0	6.7	1.0	2.4	47.4	56.3	66.5	2.77	20.3	7.0	1.7	4.0	50.1	58.7	68.6	2.78	21.1	7.2		
		2.0	4.6	75	1.4	3.2	57.3	68.1	78.3	2.86	23.8	7.3	1.4	3.2	59.1	69.1	79.6	2.87	24.1	7.6	2.3	5.4	62.5	72.1	82.1	2.87	25.1	7.8		
		2.0	4.6	90	1.9	4.3	70.4	74.7	84.8	2.9	25.4	8.4	1.9	4.4	72.7	75.9	86.2	2.9	25.8	8.7	3.2	7.4	76.9	79.1	88.9	2.95	26.8	9.0		
90		0.9	2.0	40	0.8	1.9	30.4	36.5	49.8	3.97	9.2	11.3	0.8	1.9	31.4	37.1	50.7	3.98	9.3	11.7	1.4	3.2	33.2	38.7	52.3	3.98	9.7	12.1		
	6	0.9	2.0	50	0.8	1.8	38.7	43.1	56.3	4.02	10.7	12.1	0.8	1.9	39.9	43.7	57.3	4.03	10.9	12.6	1.3	3.1	42.3	45.6	59.1	4.03	11.3	12.9		
		0.9	2.0	60	1.0	2.3	46.6	50.6	65.4	4.10	12.4	12.7	1.0	2.4	48.1	51.4	66.5	4.10	12.5	13.2	1.7	4.0	50.9	53.6	68.5	4.11	13.0	13.5		
		0.9	2.0	75	1.4	3.2	58.2	62.2	78.3	4.24	14.7	13.8	1.4	3.2	60.0	63.1	79.6	4.24	14.9	14.3	2.3	5.4	63.5	65.8	82.1	4.25	15.5	14.7		
		0.9	2.0	90	1.9	4.3	71.5	68.2	84.8	4.4	15.7	15.8	1.9	4.4	73.8	69.2	86.2	4.4	15.9	16.4	3.2	7.4	78.1	72.3	88.9	4.37	16.5	16.9		
	9	1.3	3.0	40	0.8	1.9	30.5	36.4	49.4	3.69	9.9	10.0	0.8	1.9	31.4	37.0	50.3	3.70	10.0	10.4	1.4	3.2	33.3	38.6	51.8	3.70	10.4	10.7		
		1.3	3.0	50	0.8	1.8	38.8	43.0	55.9	3.74	11.5	10.8	0.8	1.9	40.0	43.6	56.8	3.74	11.7	11.2	1.3	3.1	42.3	45.5	58.6	3.75	12.1	11.5		
		1.3	3.0	60	1.0	2.3	46.6	50.5	64.8	3.81	13.2	11.3	1.0	2.4	48.1	51.2	65.9	3.82	13.4	11.7	1.7	4.0	50.9	53.4	68.0	3.82	14.0	12.0		
		1.3	3.0	75	1.4	3.2	58.2	62.0	77.6	3.94	15.7	12.2	1.4	3.2	60.1	62.9	78.9	3.95	15.9	12.7	2.3	5.4	63.6	65.7	81.4	3.95	16.6	13.1		
		1.3	3.0	90	1.9	4.3	71.6	68.0	84.1	4.0	16.8	14.1	1.9	4.4	73.9	69.1	85.5	4.1	17.0	14.6	3.2	7.4	78.2	72.1	88.2	4.06	17.7	15.0		
	12	1.9	4.4	40	0.8	1.9	30.5	36.6	49.1	3.55	10.3	8.7	0.8	1.9	31.5	37.1	49.9	3.55	10.5	9.0	1.4	3.2	33.3	38.7	51.5	3.56	10.9	9.3		
		1.9	4.4	50	0.8	1.8	38.8	43.2	55.5	3.59	12.0	9.3	0.8	1.9	40.0	43.8	56.4	3.60	12.2	9.6	1.3	3.1	42.4	45.7	58.2	3.60	12.7	9.9		
		1.9	4.4	60	1.0	2.3	46.7	50.7	64.4	3.66	13.8	9.7	1.0	2.4	48.2	51.4	65.4	3.67	14.0	10.1	1.7	4.0	51.0	53.7	67.5	3.67	14.6	10.4		
		1.9	4.4	75	1.4	3.2	58.3	62.3	77.1	3.78	16.5	10.6	1.4	3.2	60.1	63.2	78.3	3.79	16.7	11.0	2.3	5.4	63.6	66.0	80.8	3.80	17.4	11.3		
		1.9	4.4	90	1.9	4.3	71.7	68.3	83.5	3.9	17.6	12.1	1.9	4.4	74.0	69.4	84.9	3.9	17.8	12.6	3.2	7.4	78.2	72.4	87.5	3.90	18.5	13.0		
110		0.8	1.9	40	0.8	1.9	31.0	31.6	47.5	5.27	6.0	15.2	0.8	1.9	32.0	32.1	48.3	5.28	6.1	15.8	1.4	3.2	33.9	33.4	49.8	5.28	6.3	16.2		
	6	0.8	1.9	50	0.8	1.8	39.5	37.3	53.7	5.33	7.0	16.3	0.8	1.9	40.7	37.8	54.6	5.34	7.1	16.9	1.3	3.1	43.1	39.5	56.3	5.35	7.4	17.4		
		0.8	1.9	60	1.0	2.3	47.5	43.8	62.3	5.43	8.1	17.0	1.0	2.4	49.0	44.4	63.4	5.44	8.2	17.7	1.7	4.0	51.9	46.3	65.4	5.45	8.5	18.2		
		0.8	1.9	75	1.4	3.2	59.3	53.8	74.6	5.62	9.6	18.5	1.4	3.2	61.2	54.6	75.9	5.63	9.7	19.2	2.3	5.4	64.7	56.9	78.3	5.64	10.1	19.8		
		0.8	1.9	90	1.9	4.3	72.9	59.0	80.8	5.8	10.2	21.2	1.9	4.4	75.2	59.9	82.2	5.8	10.4	22.1	3.2	7.4	79.6	62.5	84.8	5.79	10.8	22.7		
	9	1.2	2.9	40	0.8	1.9	31.1	31.5	47.1	4.90	6.4	13.5	0.8	1.9	32.0	32.0	47.9	4.91	6.5	14.0	1.4	3.2	33.9	33.4	49.4	4.91	6.8	14.4		
		1.2	2.9	50	0.8	1.8	39.5	37.2	53.3	4.96	7.5	14.4	0.8	1.9	40.8	37.7	54.2	4.97	7.6	15.0	1.3	3.1	43.1	39.4	55.9	4.97	7.9	15.4		
		1.2	2.9	60	1.0	2.3	47.6	43.6	61.8	5.05	8.6	15.1	1.0	2.4	49.1	44.3	62.9	5.06	8.8	15.7	1.7	4.0	51.9	46.2	64.9	5.07	9.1	16.2		
		1.2	2.9	75	1.4	3.2	59.4	53.6	74.0	5.23	10.3	16.4	1.4	3.2	61.3	54.4	75.3	5.24	10.4	17.0	2.3	5.4	64.8	56.8	77.6	5.24	10.8	17.6		
		1.2	2.9	90	1.9	4.3	73.0	58.9	80.2	5.4	11.0	18.9	1.9	4.4	75.3	59.7	81.5	5.4	11.1	19.6	3.2	7.4	79.7	62.3	84.1	5.39	11.6	20.2		
	12	1.8	4.2	40	0.8	1.9	31.1	31.6	46.8	4.70	6.7	11.6	0.8	1.9	32.1	32.1	47.6	4.71	6.8	12.1	1.4	3.2	33.9	33.5	49.1	4.72	7.1	12.4		
		1.8	4.2	50	0.8	1.8	39.5	37.3	52.9	4.76	7.8	12.5	0.8	1.9	40.8	37.9	53.8	4.77	7.9	13.0	1.3	3.1	43.2	39.5	55.5	4.78	8.3	13.3		
		1.8	4.2	60	1.0	2.3	47.6	43.8	61.4	4.86	9.0	13.0	1.0	2.4	49.1	44.5	62.4	4.86	9.1	13.5	1.7	4.0	52.0	46.4	64.4	4.87	9.5	14.0		
		1.8	4.2	75	1.4	3.2	59.4	53.9	73.5	5.02	10.7	14.2	1.4	3.2	61.3	54.7	74.7	5.03	10.9	14.7	2.3	5.4	64.9	57.1	77.1	5.04	11.3	15.2		
		1.8	4.2	90	1.9	4.3	73.1	59.1	79.6	5.2	11.5	16.3	1.9	4.4	75.4	60.0	80.9	5.2	11.6	16.9	3.2	7.4	79.8	62.6	83.5	5.18	12.1	17.4		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side.
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions.
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data.

WS060 : EXTENDED DATA																													
SOURCE SIDE				LOAD SIDE, HEATING MODE, FULL LOAD																									
EST	Source Flow		ELT	Load Flow GPM				7				Load Flow GPM				11				Load Flow GPM				15					
	GPM	Source Flow WPD		Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh		
25	15	3.5	8.0	50	1.5	3.4	87.4	50.7	35.9	3.46	4.29	4.2	2.2	5.0	82.4	50.5	47.5	3.27	4.52	3.8	Operation Not Recommended								
		3.5	8.0	80	1.3	3.0	95.5	51.2	35.2	3.82	3.93	7.10	1.9	4.4	90.0	51.0	46.5	3.61	4.14	6.4	2.7	6.3	87.4	52.0	47.7	3.51	4.35	6.0		
		3.5	8.0	100	1.3	3.1	116.6	49.4	33.2	4.89	2.96	9.53	1.9	4.5	109.9	49.3	43.9	4.63	3.12	8.6	2.8	6.5	106.7	50.2	45.1	4.49	3.28	8.0		
		3.5	8.0	110	1.1	2.5	127.2	48.1	29.1	5.66	2.49	10.77	1.6	3.6	119.9	47.9	38.5	5.35	2.62	9.7	2.3	5.3	116.4	48.8	39.6	5.20	2.76	9.0		
		3.5	8.0	120	1.1	2.4	137.4	47.0	26.8	6.42	2.14	12.01	1.5	3.5	129.5	46.8	35.4	6.08	2.26	10.8	2.2	5.1	125.7	47.7	36.4	5.90	2.37	10.1		
30	7	1.1	2.6	50	1.5	3.4	86.9	48.7	34.4	3.46	4.13	4.1	2.2	5.0	81.9	48.5	47.4	3.27	4.35	3.7	Operation Not Recommended								
		1.1	2.6	80	1.3	3.0	95.0	49.2	33.7	3.82	3.78	6.94	1.9	4.4	89.5	49.0	46.4	3.61	3.98	6.2	2.7	6.3	86.9	50.0	47.6	3.50	4.18	5.8		
		1.1	2.6	100	1.3	3.1	115.9	47.5	31.8	4.89	2.85	9.32	1.9	4.5	109.3	47.4	43.8	4.62	3.00	8.4	2.8	6.5	106.1	48.3	45.0	4.49	3.15	7.8		
		1.1	2.6	110	1.1	2.5	126.4	46.2	28.0	5.66	2.40	10.53	1.6	3.6	119.2	46.0	38.4	5.35	2.52	9.5	2.3	5.3	115.7	46.9	39.5	5.19	2.65	8.8		
		1.1	2.6	120	1.1	2.4	136.6	45.1	25.7	6.42	2.06	11.75	1.5	3.5	128.8	45.0	35.4	6.07	2.17	10.6	2.2	5.1	125.0	45.9	36.3	5.90	2.28	9.9		
	11	2.2	5.0	50	1.5	3.4	87.4	52.5	38.6	3.46	4.45	4.24	2.2	5.0	82.4	52.3	51.1	3.27	4.68	3.8	Operation Not Recommended								
		2.2	5.0	80	1.3	3.0	95.5	53.0	37.8	3.82	4.07	7.09	1.9	4.4	90.0	52.8	50.0	3.61	4.29	6.4	2.7	6.3	87.4	53.9	51.4	3.51	4.50	6.0		
		2.2	5.0	100	1.3	3.1	116.6	51.2	35.7	4.89	3.07	9.51	1.9	4.5	109.9	51.1	47.2	4.63	3.23	8.6	2.8	6.5	106.7	52.0	48.5	4.49	3.39	8.0		
		2.2	5.0	110	1.1	2.5	127.2	49.8	31.3	5.66	2.58	10.75	1.6	3.6	119.9	49.6	41.4	5.35	2.72	9.7	2.3	5.3	116.4	50.6	42.6	5.20	2.85	9.0		
		2.2	5.0	120	1.1	2.4	137.4	48.7	28.8	6.43	2.22	12.00	1.5	3.5	129.5	48.5	38.1	6.08	2.34	10.8	2.2	5.1	125.7	49.5	39.2	5.90	2.45	10.1		
	15	3.4	7.9	50	1.5	3.4	87.6	54.4	40.0	3.46	4.60	4.30	2.2	5.0	82.5	54.2	52.9	3.27	4.84	3.9	Operation Not Recommended								
		3.4	7.9	80	1.3	3.0	95.7	54.9	39.2	3.82	4.21	7.20	1.9	4.4	90.2	54.7	51.8	3.62	4.44	6.5	2.7	6.3	87.6	55.8	53.2	3.51	4.66	6.0		
		3.4	7.9	100	1.3	3.1	116.9	53.1	37.0	4.90	3.18	9.66	1.9	4.5	110.2	52.9	48.9	4.63	3.34	8.7	2.8	6.5	107.0	53.9	50.2	4.50	3.51	8.1		
		3.4	7.9	110	1.1	2.5	127.5	51.6	32.5	5.67	2.67	10.92	1.6	3.6	120.2	51.4	42.9	5.36	2.81	9.8	2.3	5.3	116.7	52.4	44.1	5.20	2.95	9.2		
		3.4	7.9	120	1.1	2.4	137.7	50.4	29.9	6.43	2.30	12.18	1.5	3.5	129.8	50.3	39.5	6.08	2.42	11.0	2.2	5.1	126.0	51.2	40.6	5.91	2.54	10.2		
50	7	1.1	2.5	50	1.5	3.4	88.6	63.4	48.2	3.54	5.25	4.33	2.2	5.0	83.6	63.2	66.2	3.34	5.53	3.9	3.1	7.2	81.1	64.4	68.0	3.25	5.81	3.6		
		1.1	2.5	80	1.3	3.0	96.9	64.1	47.2	3.91	4.81	7.24	1.9	4.4	91.4	63.9	64.8	3.69	5.06	6.5	2.7	6.3	88.7	65.1	66.6	3.59	5.32	6.1		
		1.1	2.5	100	1.3	3.1	118.3	61.9	44.5	5.00	3.63	9.71	1.9	4.5	111.5	61.7	61.2	4.73	3.82	8.7	2.8	6.5	108.3	62.9	62.9	4.60	4.01	8.2		
		1.1	2.5	110	1.1	2.5	129.0	60.2	39.1	5.79	3.05	10.98	1.6	3.6	121.6	60.0	53.7	5.47	3.21	9.9	2.3	5.3	118.1	61.1	55.2	5.32	3.37	9.2		
		1.1	2.5	120	1.1	2.4	139.4	58.8	36.0	6.6	2.6	12.2	1.5	3.5	131.4	58.6	49.4	6.2	2.8	11.0	2.2	5.1	127.6	59.8	50.8	6.04	2.90	10.3		
	11	2.1	4.7	50	1.5	3.4	89.2	68.4	54.0	3.54	5.66	4.42	2.2	5.0	84.0	68.2	71.4	3.35	5.96	4.0	3.1	7.2	81.6	69.5	73.3	3.25	6.25	3.7		
		2.1	4.7	80	1.3	3.0	97.5	69.1	52.9	3.91	5.18	7.39	1.9	4.4	91.9	68.8	69.9	3.70	5.45	6.6	2.7	6.3	89.2	70.2	71.8	3.59	5.73	6.2		
		2.1	4.7	100	1.3	3.1	119.0	66.7	49.9	5.01	3.91	9.91	1.9	4.5	112.2	66.5	66.0	4.74	4.11	8.9	2.8	6.5	108.9	67.8	67.8	4.60	4.32	8.3		
		2.1	4.7	110	1.1	2.5	129.8	64.9	43.8	5.80	3.28	11.21	1.6	3.6	122.3	64.7	57.9	5.48	3.46	10.1	2.3	5.3	118.8	65.9	59.5	5.32	3.63	9.4		
		2.1	4.7	120	1.1	2.4	140.2	63.4	40.3	6.6	2.8	12.5	1.5	3.5	132.2	63.2	53.3	6.2	3.0	11.3	2.2	5.1	128.3	64.4	54.7	6.04	3.12	10.5		
	15	3.3	7.6	50	1.5	3.4	89.4	70.8	55.9	3.54	5.86	4.48	2.2	5.0	84.2	70.6	73.9	3.35	6.16	4.0	3.1	7.2	81.8	72.0	76.0	3.25	6.47	3.8		
		3.3	7.6	80	1.3	3.0	97.7	71.5	54.8	3.91	5.36	7.50	1.9	4.4	92.1	71.3	72.4	3.70	5.64	6.8	2.7	6.3	89.4	72.7	74.4	3.59	5.93	6.3		
		3.3	7.6	100	1.3	3.1	119.3	69.1	51.7	5.01	4.04	10.07	1.9	4.5	112.4	68.9	68.4	4.74	4.26	9.1	2.8	6.5	109.2	70.2	70.2	4.60	4.47	8.5		
		3.3	7.6	110	1.1	2.5	130.1	67.2	45.4	5.80	3.40	11.38	1.6	3.6	122.6	67.0	60.0	5.49	3.58	10.2	2.3	5.3	119.1	68.3	61.7	5.33	3.76	9.6		
		3.3	7.6	120	1.1	2.4	140.5	65.7	41.8	6.6	2.9	12.7	1.5	3.5	132.5	65.5	55.2	6.2	3.1	11.4	2.2	5.1	128.6	66.7	56.7	6.05	3.23	10.7		
70	7	1.0	2.4	50	1.5	3.4	90.4	76.8	61.4	3.60	6.24	4.85	2.2	5.0	85.2	76.6	84.5	3.41	6.57	4.4	3.1	7.2	82.7	78.0	86.8	3.31	6.90	4.1		
		1.0	2.4	80	1.3	3.0	98.8	77.6	60.2	3.98	5.72	8.12	1.9	4.4	93.1	77.3	82.7	3.76	6.02	7.3	2.7	6.3	90.4	78.8	85.0	3.66	6.32	6.8		
		1.0	2.4	100	1.3	3.1	120.6	74.9	56.8	5.10	4.31	10.90	1.9	4.5	113.7	74.7	78.1	4.82	4.54	9.8	2.8	6.5	110.4	76.1	80.2	4.68	4.76	9.2		
		1.0	2.4	110	1.1	2.5	131.5	72.9	49.9	5.90	3.62	12.32	1.6	3.6	124.0	72.6	68.6	5.58	3.81	11.1	2.3	5.3	120.4	74.0	70.5	5.42	4.01	10.3		
		1.0	2.4	120	1.1	2.4	142.1	71.2	45.9	6.7	3.1	13.7	1.5	3.5	133.9	71.0	63.1	6.3	3.3	12.4	2.2	5.1	130.0	72.4	64.8	6.15	3.45	11.5		
	11	2.0	4.5	50	1.5	3.4	90.9	82.8	68.9	3.61	6.72	4.95	2.2	5.0	85.7	82.5	91.1	3.41	7.08	4.5	3.1	7.2	83.2	84.1	93.6	3.31	7.43	4.2		
		2.0	4.5	80	1.3	3.0	99.3	83.6	67.5	3.98	6.16	8.29	1.9	4.4	93.7	83.4	89.2	3.77	6.48	7.5	2.7	6.3	90.9	85.0	91.6	3.66	6.81	7.0		
		2.0	4.5	100	1.3	3.1	121.3	80.8	63.7	5.11	4.64	11.13	1.9	4.5	114.3	80.5	84.2	4.83	4.88	10.0	2.8	6.5	111.0	82.1	86.5	4.69	5.13	9.3		
		2.0	4.5	110	1.1	2.5	132.3	78.5	55.9	5.91	3.90	12.58	1.6	3.6	124.7	78.3	73.9	5.58	4.11	11.3	2.3	5.3	121.1	79.8	76.0	5.42	4.31	10.6		
		2.0	4.5	120	1.1	2.4	142.9	76.8	51.4	6.7	3.4	14.0	1.5	3.5	134.7	76.5	68.0	6.3	3.5	12.6	2.2	5.1	130.8	78.0	69.9	6.16	3.71	11.8		
	15	3.1	7.2	50	1.5	3.4	91.1	85.8	71.4	3.61	6.96	5.03	2.2	5.0	85.9	85.5	94.4	3.42	7.32	4.5	3.1	7.2	83.4	87.1	96.9	3.32	7.69	4.2		
		3.1	7.2	80	1.3	3.0	99.6	86.6	69.9	3.99	6.37	8.42	1.9	4.4	93.9	86.4	92.4	3.77	6.71	7.6	2.7	6.3	91.1	88.0	94.9	3.66	7.04	7.1		
		3.1	7.2	100	1.3	3.1	121.6	83.7	66.0	5.11	4.80	11.30	1.9	4.5	114.6	83.4	87.2	4.83	5.06	10.2	2.8	6.5	111.3	85.0	89.6	4.69	5.31	9.5		
		3.1	7.2	110	1.1	2.5	132.6	81.4	58.0	5.91	4.04	12.77	1.6	3.6	125.0	81.1	76.6	5.59	4.25	11.5	2.3	5.3	121.4	82.7	78.7	5.43	4.46	10.7		
		3.1	7.2	120	1.1	2.4	143.2	79.5	53.3	6.7	3.5	14.3	1.5	3.5	135.0	79.3	70.5	6.3	3.7	12.8	2.2	5.1	131.1	80.8	72.4	6.16	3.84	12.0		
90	7	1.0	2.3	50	1.5	3.4	91.7	89.4	73.4	3.67	7.14	5.89	2.2	5.0	86.4	89.1	100.9	3.47	7.51	5.3	3.1	7.2	83.9	90.8	103.6	3.37	7.89	4.9		
		1.0	2.3	80	1.3	3.0	100.2	90.3	71.9	4.05	6.54	9.86	1.9	4.4	94.5	90.0	98.8	3.83	6.88	8.9	2.7	6.3	91.7	91.8	101.5	3.72	7.23	8.3		
		1.0	2.3	100	1.3	3.1	122.4	87.2	67.8	5.19	4.93	13.23	1.9	4.5	115.4	87.0	93.3	4.91	5.19	11.9	2.8	6.5	112.0	88.6	95.8	4.77	5.45	11.1		
		1.0	2.3	110	1.1	2.5	133.5	84.8	59.6	6.01	4.14	14.96	1.6	3.6	125.8	84.5	81.9	5.68	4.36	13.5	2.3	5.3	122.2	86.2	84.1	5.51	4.58	12.6		
		1.0	2.3	120	1.1	2.4	144.2	82.9	54.8	6.8	3.6	16.7	1.5	3.5	135.9	82.6	75.3	6.4	3.8	15.0	2.2	5.1	132.0	84.2	77.4	6.26	3.94	14.0		
	11	1.9	4.3	50	1.5	3.4	92.2	96.4	82.2	3.67	7.69	6.01	2.2	5.0	86.9	96.1	108.8	3.47	8.09	5.4	3.1	7.2	84.4	97.9	111.7	3.37	8.50	5.1		
		1.9	4.3	80	1.3	3.0	100.8	97.4	80.5	4.06	7.04	10.06	1.9	4.4	95.0	97.1	106.5	3.84	7.41	9.1	2.7	6.3	92.3	98.9	109.4	3.73	7.78	8.4		
		1.9	4.3	100	1.3	3.1	123.1	94.0	76.0	5.20	5.31	13.50	1.9	4.5	116.0	93.8	100.6	4.92	5.59	12.2	2.8	6.5	112.6	95.6	103.3	4.77	5.87	11.3		
		1.9	4.3	110	1.1	2.5	134.2	91.4	66.8	6.01	4.46	15.27	1.6	3.6	126.5	91.1	88.3	5.69	4.70	13.7	2.3	5.3	122.9	92.9	90.7	5.52	4.93	12.8		
		1.9	4.3	120	1.1	2.4	145.0	89.4	61.4	6.8	3.8	17.0	1.5	3.5	136.7	89.1	81.2	6.5	4.0	15.3	2.2	5.1	132.7	90.8	83.4	6.27	4.25	14.3		
	15	3.0	6.9	50	1.5	3.4	92.4	99.8	85.3	3.68	7.96	6.11	2.2	5.0	87.1	99.5	112.7	3.48	8.38	5.5	3.1	7.2	84.6	101.5	115.8	3.38	8.80	5.1		
		3.0	6.9	80	1.3	3.0	101.0	100.9	83.5	4.06	7.29	10.22	1.9	4.4	95.3	100.5	110.4	3.84	7.67	9.2	2.7	6.3	92.5	102.5	113.4	3.73	8.06	8.6		
		3.0	6.9	100	1.3	3.1	123.3	97.4	78.8	5.20	5.49	13.71	1.9	4.5	116.3	97.1	104.2	4.92	5.78	12.3	2.8	6.5	112.9	99.0	107.0	4.78	6.07	11.5		
		3.0	6.9	110	1.1	2.5	134.5	94.7	69.2	6.02	4.62	15.50	1.6	3.6	126.8	94.4	91.5	5.69	4.86	14.0	2.3	5.3	123.1	96.3	94.0	5.53	5.11	13.0		
		3.0	6.9	120	1.1	2.4	145.3	92.6	63.7	6.8	4.0	17.3	1.5	3.5	137.0	92.3	84.1	6.5	4.2	15.6	2.2	5.1	133.0	94.1	86.4	6.27	4.39	14.5		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS060 : EXTENDED DATA				LOAD SIDE, COOLING MODE, FULL LOAD																										
SOURCE SIDE					Load Flow GPM 7								Load Flow GPM 11								Load Flow GPM 15									
EST	Source Flow GPM	Source Flow WPD		ELT	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh		
40	15	3.1	7.1	40	Operation Not Recommended								Operation Not Recommended								Operation Not Recommended									
		3.1	7.1	50																										
		3.1	7.1	60																										
		3.1	7.1	75									1.7	3.9	58.8	89.2	98.3	2.43	36.7	3.4	2.6	6.0	62.2	94.1	102.4	2.43	38.7	3.5		
		3.1	7.1	90	1.0	2.2	63.1	89.7	99.0	2.45	36.6	3.7	1.7	3.9	71.8	97.6	105.9	2.48	39.4	3.9	2.6	6.0	76.0	103.0	110.3	2.48	41.5	4.0		
50	7	1.1	2.4	40	1.1	2.5	26.8	48.9	59.9	2.78	17.6	4.9	1.9	4.5	30.5	53.2	64.1	2.81	18.9	5.1	3.0	6.9	32.3	56.1	66.7	2.81	19.9	5.3		
		1.1	2.4	50	1.1	2.5	34.0	57.3	68.1	2.81	20.4	5.2	1.9	4.5	38.7	62.3	72.9	2.84	21.9	5.5	3.0	6.9	41.0	65.7	75.9	2.84	23.1	5.6		
		1.1	2.4	60	1.0	2.4	41.1	66.7	77.5	2.86	23.3	5.5	1.8	4.2	46.8	72.6	82.9	2.89	25.1	5.7	2.8	6.4	49.5	76.6	86.3	2.89	26.4	5.9		
		1.1	2.4	75	1.0	2.2	51.7	80.9	92.4	2.99	27.1	5.9	1.7	3.9	58.8	88.1	98.9	3.02	29.1	6.2	2.6	6.0	62.2	92.9	103.0	3.02	30.7	6.4		
		1.1	2.4	90	1.0	2.2	63.2	88.6	99.6	3.05	29.1	6.8	1.7	3.9	71.8	96.3	106.5	3.08	31.3	7.2	2.6	6.0	76.0	101.6	111.0	3.08	32.9	7.4		
	11	1.9	4.5	40	1.1	2.5	26.8	48.8	59.6	2.57	19.0	4.1	1.9	4.5	30.4	53.1	63.8	2.60	20.4	4.3	3.0	6.9	32.2	56.0	66.4	2.60	21.5	4.4		
		1.9	4.5	50	1.1	2.5	34.0	57.2	67.8	2.60	22.0	4.4	1.9	4.5	38.6	62.2	72.5	2.63	23.7	4.6	3.0	6.9	40.9	65.7	75.6	2.63	25.0	4.7		
		1.9	4.5	60	1.0	2.4	41.1	66.7	77.1	2.64	25.2	4.6	1.8	4.2	46.7	72.5	82.5	2.67	27.1	4.8	2.8	6.4	49.4	76.5	85.9	2.68	28.6	4.9		
		1.9	4.5	75	1.0	2.2	51.6	80.9	92.0	2.76	29.3	5.0	1.7	3.9	58.7	88.0	98.4	2.79	31.5	5.2	2.6	6.0	62.2	92.8	E	2.80	33.2	5.4		
		1.9	4.5	90	1.0	2.2	63.1	88.5	99.1	2.82	31.4	5.7	1.7	3.9	71.7	96.2	106.0	2.85	33.8	6.0	2.6	6.0	75.9	101.5	110.5	2.85	35.6	6.2		
	15	3.0	7.0	40	1.1	2.5	26.8	49.1	59.3	2.50	19.6	3.3	1.9	4.5	30.4	53.4	63.4	2.53	21.1	3.4	3.0	6.9	32.2	56.3	66.1	2.53	22.3	3.5		
		3.0	7.0	50	1.1	2.5	34.0	57.5	67.4	2.52	22.8	3.5	1.9	4.5	38.6	62.5	72.1	2.55	24.5	3.7	3.0	6.9	40.9	65.9	75.1	2.56	25.8	3.8		
		3.0	7.0	60	1.0	2.4	41.1	67.0	76.7	2.57	26.1	3.7	1.8	4.2	46.7	72.8	82.0	2.60	28.0	3.8	2.8	6.4	49.4	76.8	85.5	2.60	29.5	4.0		
		3.0	7.0	75	1.0	2.2	51.6	81.2	91.5	2.68	30.3	4.0	1.7	3.9	58.7	88.3	97.9	2.71	32.6	4.2	2.6	6.0	62.2	93.2	102.0	2.72	34.3	4.3		
		3.0	7.0	90	1.0	2.2	63.1	88.9	98.6	2.74	32.5	4.6	1.7	3.9	71.7	96.6	105.5	2.77	34.9	4.8	2.6	6.0	75.9	101.9	109.9	2.77	36.8	4.9		
70	7	1.0	2.3	40	1.1	2.5	27.2	45.5	57.4	3.50	13.0	7.7	1.9	4.5	31.0	49.5	61.5	3.54	14.0	8.1	3.0	6.9	32.8	52.2	64.0	3.54	14.7	8.3		
		1.0	2.3	50	1.1	2.5	34.6	53.3	65.3	3.54	15.1	8.2	1.9	4.5	39.3	58.0	69.9	3.58	16.2	8.6	3.0	6.9	41.6	61.2	72.8	3.58	17.1	8.9		
		1.0	2.3	60	1.0	2.4	41.8	62.1	74.3	3.60	17.2	8.6	1.8	4.2	47.5	67.6	79.5	3.64	18.5	9.0	2.8	6.4	50.3	71.3	82.8	3.65	19.5	9.3		
		1.0	2.3	75	1.0	2.2	52.5	75.3	88.7	3.76	20.0	9.4	1.7	3.9	59.7	81.9	94.9	3.80	21.5	9.8	2.6	6.0	63.2	86.4	98.8	3.81	22.7	10.2		
		1.0	2.3	90	1.0	2.2	64.2	82.4	95.5	3.8	21.5	10.8	1.7	3.9	73.0	89.6	102.2	3.9	23.1	11.3	2.6	6.0	77.2	94.6	106.5	3.88	24.3	11.7		
	11	1.8	4.2	40	1.1	2.5	27.2	45.5	57.2	3.24	14.0	6.5	1.9	4.5	30.9	49.4	61.2	3.27	15.1	E	3.0	6.9	32.7	52.2	63.7	3.28	15.9	7.0		
		1.8	4.2	50	1.1	2.5	34.5	53.3	65.0	3.27	16.3	6.9	1.9	4.5	39.2	57.9	69.6	3.31	17.5	7.2	3.0	6.9	41.6	61.1	72.5	3.31	18.5	7.5		
		1.8	4.2	60	1.0	2.4	41.7	62.0	74.0	3.33	18.6	7.2	1.8	4.2	47.4	67.5	79.1	3.37	20.0	7.6	2.8	6.4	50.2	71.2	82.5	3.37	21.1	7.8		
		1.8	4.2	75	1.0	2.2	52.5	75.2	88.2	3.48	21.6	7.9	1.7	3.9	59.6	81.8	94.4	3.52	23.3	8.2	2.6	6.0	63.1	86.3	98.4	3.52	24.5	8.5		
		1.8	4.2	90	1.0	2.2	64.1	82.3	95.1	3.5	23.2	9.1	1.7	3.9	72.8	89.6	101.7	3.6	25.0	9.5	2.6	6.0	77.1	94.5	106.0	3.59	26.3	9.8		
	15	2.9	6.7	40	1.1	2.5	27.2	45.7	56.9	3.15	14.5	5.2	1.9	4.5	30.9	49.7	60.8	3.18	15.6	5.4	3.0	6.9	32.7	52.4	63.4	3.18	16.5	5.6		
		2.9	6.7	50	1.1	2.5	34.5	53.5	64.7	3.18	16.8	5.5	1.9	4.5	39.2	58.2	69.2	3.21	18.1	5.8	3.0	6.9	41.6	61.4	72.1	3.22	19.1	6.0		
		2.9	6.7	60	1.0	2.4	41.7	62.3	73.6	3.23	19.3	5.8	1.8	4.2	47.4	67.8	78.7	3.27	20.7	6.0	2.8	6.4	50.2	71.5	82.0	3.27	21.8	6.2		
		2.9	6.7	75	1.0	2.2	52.5	75.6	87.8	3.38	22.4	6.3	1.7	3.9	59.6	82.2	93.9	3.42	24.1	6.6	2.6	6.0	63.1	86.7	97.8	3.42	25.3	6.8		
		2.9	6.7	90	1.0	2.2	64.1	82.7	94.6	3.4	24.0	7.2	1.7	3.9	72.9	89.9	101.2	3.5	25.8	7.6	2.6	6.0	77.1	94.9	105.4	3.49	27.2	7.8		
90	7	1.0	2.3	40	1.1	2.5	27.7	41.2	55.2	4.50	9.2	11.0	1.9	4.5	31.5	44.8	59.1	4.55	9.9	11.5	3.0	6.9	33.4	47.3	61.5	4.55	10.4	11.9		
		1.0	2.3	50	1.1	2.5	35.2	48.3	62.8	4.54	10.6	11.8	1.9	4.5	40.0	52.5	67.2	4.59	11.4	12.3	3.0	6.9	42.4	55.4	70.0	4.60	12.0	12.8		
		1.0	2.3	60	1.0	2.4	42.5	56.2	71.4	4.62	12.2	12.4	1.8	4.2	48.4	61.2	76.4	4.68	13.1	12.9	2.8	6.4	51.2	64.5	79.6	4.68	13.8	13.4		
		1.0	2.3	75	1.0	2.2	53.5	68.2	85.2	4.83	14.1	13.5	1.7	3.9	60.8	74.2	91.2	4.89	15.2	14.1	2.6	6.0	64.4	78.3	95.0	4.89	16.0	14.5		
		1.0	2.3	90	1.0	2.2	65.3	74.6	91.8	4.9	15.1	15.5	1.7	3.9	74.3	81.2	98.2	5.0	16.3	16.2	2.6	6.0	78.7	85.6	102.4	4.99	17.2	16.7		
	11	1.8	4.2	40	1.1	2.5	27.7	41.2	55.0	4.16	9.9	9.2	1.9	4.5	31.5	44.8	58.8	4.20	10.7	9.7	3.0	6.9	33.3	47.2	61.3	4.21	11.2	10.0		
		1.8	4.2	50	1.1	2.5	35.2	48.2	62.5	4.20	11.5	9.9	1.9	4.5	40.0	52.4	66.9	4.25	12.3	10.3	3.0	6.9	42.3	55.3	69.7	4.25	13.0	10.7		
		1.8	4.2	60	1.0	2.4	42.5	56.2	71.1	4.27	13.1	10.4	1.8	4.2	48.3	61.1	76.1	4.32	14.1	10.8	2.8	6.4	51.1	64.4	79.3	4.33	14.9	11.2		
		1.8	4.2	75	1.0	2.2	53.4	68.1	84.8	4.47	15.3	11.3	1.7	3.9	60.7	74.1	90.8	4.52	16.4	11.8	2.6	6.0	64.3	78.2	94.6	4.52	17.3	12.2		
		1.8	4.2	90	1.0	2.2	65.3	74.5	91.4	4.6	16.4	13.0	1.7	3.9	74.2	81.1	97.8	4.6	17.6	13.6	2.6	6.0	78.5	85.5	101.9	4.61	18.5	14.0		
	15	2.9	6.7	40	1.1	2.5	27.7	41.3	54.7	4.04	10.2	7.4	1.9	4.5	31.5	45.0	58.5	4.08	11.0	7.7	3.0	6.9	33.3	47.4	60.9	4.09	11.6	8.0		
		2.9	6.7	50	1.1	2.5	35.2	48.4	62.2	4.08	11.9	7.9	1.9	4.5	40.0	52.7	66.5	4.13	12.8	8.3	3.0	6.9	42.3	55.6	69.3	4.13	13.4	8.5		
		2.9	6.7	60	1.0	2.4	42.5	56.4	70.7	4.15	13.6	8.3	1.8	4.2	48.3	61.4	75.7	4.20	14.6	8.6	2.8	6.4	51.1	64.7	78.8	4.21	15.4	8.9		
		2.9	6.7	75	1.0	2.2	53.4	68.4	84.4	4.34	15.8	9.0	1.7	3.9	60.7	74.4	90.3	4.39	17.0	9.4	2.6	6.0	64.3	78.5	94.0	4.39	17.9	9.7		
		2.9	6.7	90	1.0	2.2	65.3	74.9	90.9	4.4	16.9	10.3	1.7	3.9	74.2	81.4	97.3	4.5	18.2	10.8	2.6	6.0	78.5	85.9	101.3	4.48	19.2	11.2		
110	7	1.0	2.2	40	1.1	2.5	28.4	36.0	52.8	5.77	6.2	14.8	1.9	4.5	32.3	39.2	56.5	5.83	6.7	15.5	3.0	6.9	34.2	41.3	58.8	5.84	7.1	16.0		
		1.0	2.2	50	1.1	2.5	36.0	42.2	60.0	5.83	7.2	15.9	1.9	4.5	41.0	45.9	64.2	5.89	7.8	16.6	3.0	6.9	43.4	48.4	66.9	5.90	8.2	17.1		
		1.0	2.2	60	1.0	2.4	43.5	49.2	68.3	5.93	8.3	16.6	1.8	4.2	49.5	53.5	73.0	6.00	8.9	17.4	2.8	6.4	52.4	56.4	76.1	6.00	9.4	18.0		
		1.0	2.2	75	1.0	2.2	54.7	59.6	81.4	6.20	9.6	18.1	1.7	3.9	62.2	64.9	87.1	6.27	10.3	18.9	2.6	6.0	65.9	68.4	90.8	6.27	10.9	19.5		
		1.0	2.2	90	1.0	2.2	66.9	65.2	87.8	6.3	10.3	20.8	1.7	3.9	76.0	71.0	93.9	6.4	11.1	21.7	2.6	6.0	80.5	74.9	97.8	6.40	11.7	22.5		
	11	1.8	4.1	40	1.1	2.5	28.3	36.0	52.5	5.33	6.7	12.4	1.9	4.5	32.2	39.1	56.2	5.39	7.3	13.0	3.0	6.9	34.1	41.3	58.5	5.40	7.6	13.4		
		1.8	4.1	50	1.1	2.5	36.0	42.2	59.7	5.39	7.8	13.3	1.9	4.5	40.9	45.9	63.9	5.45	8.4	13.9	3.0	6.9	43.3	48.4	66.6	5.45	8.9	14.4		
		1.8	4.1	60	1.0	2.4	43.5	49.1	67.9	5.48	9.0	13.9	1.8	4.2	49.4	53.4	72.7	5.55	9.6	14.6	2.8	6.4	52.3	56.3	75.7	5.55	10.2	15.0		
		1.8	4.1	75	1.0	2.2	54.7	59.6	81.1	5.73	10.4	15.2	1.7	3.9	62.1	64.8	86.7	5.79	11.2	15.9	2.6	6.0	65.8	68.3	90.4	5.80	11.8	16.4		
		1.8	4.1	90	1.0	2.2	66.8	65.2	87.3	5.8	11.2	17.4	1.7	3.9	75.9	70.9	93.5	5.9	12.0	18.2	2.6	6.0	80.4	74.8	97.4	5.91	12.6	18.8		
	15	2.8	6.5	40	1.1	2.5	28.3	36.1	52.2	5.18	7.0	9.9	1.9	4.5	32.2	39.3	55.9	5.24	7.5	10.4	3.0	6.9	34.1	41.5	58.2	5.24	7.9	10.7		
		2.8	6.5	50	1.1	2.5	36.0	42.3	59.4	5.23	8.1	10.6	1.9	4.5	40.9	46.1	63.6	5.29	8.7	11.1	3.0	6.9	43.3	48.6	66.2	5.30	9.2	11.5		
		2.8	6.5	60	1.0	2.4	43.5	49.3	67.6	5.33	9.3	11.1	1.8	4.2	49.4	53.6	72.3	5.39	10.0	11.6	2.8	6.4	52.3	56.6	75.3	5.39	10.5	12.0		
		2.8	6.5	75	1.0	2.2	54.7	59.8	80.6	5.57	10.7	12.1	1.7	3.9	62.1	65.1	86.3	5.63	11.6	12.7	2.6	6.0	65.8	68.6	89.9	5.63	12.2	13.1		
		2.8	6.5	90	1.0	2.2	66.8	65.5	86.9	5.7	11.5	13.9	1.7	3.9	75.9	71.2	92.9	5.7	12.4	14.5	2.6	6.0	80.4	75.1	96.8	5.75	13.1	15.0		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side.
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions.
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data.

WS072 : EXTENDED DATA				LOAD SIDE, HEATING MODE, FULL LOAD																										
SOURCE SIDE				Load Flow GPM 9								Load Flow GPM 13								Load Flow GPM 18										
EST	Source Flow		ELT	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH			
	GPM	Source Flow WPD																												
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh			
25	18	3.3	7.7	60	1.4	3.3	72.2	61.8	43.2	3.14	4.35	4.8	2.0	4.7	69.0	62.1	57.1	2.99	4.60	4.5	Operation Not Recommended									
		3.3	7.7	80	1.3	3.0	94.7	61.3	42.6	4.34	4.14	6.78	1.8	4.2	90.5	61.6	56.4	4.12	4.39	6.2	3.0	6.9	87.6	62.0	56.9	3.98	4.56	5.7		
		3.3	7.7	100	1.2	2.8	114.6	55.6	37.4	5.67	2.88	9.08	1.7	4.0	109.5	55.9	49.4	5.38	3.05	8.4	2.8	6.4	106.0	56.2	49.9	5.20	3.17	7.7		
		3.3	7.7	110	1.2	2.8	125.6	56.4	34.5	6.57	2.52	10.28	1.7	4.0	120.1	56.7	45.6	6.24	2.67	9.5	2.8	6.4	116.2	57.1	46.0	6.03	2.77	8.7		
		3.3	7.7	120	1.1	2.6	135.4	54.6	30.8	7.57	2.12	11.43	1.6	3.7	129.4	54.9	40.7	7.19	2.24	10.5	2.6	6.0	125.3	55.2	41.1	6.95	2.33	9.7		
30	9	1.1	2.5	60	1.4	3.3	71.9	59.7	41.9	3.14	4.20	4.7	2.0	4.7	68.7	60.0	57.1	2.98	4.44	4.4	Operation Not Recommended									
		1.1	2.5	80	1.3	3.0	94.3	59.2	41.3	4.34	4.00	6.63	1.8	4.2	90.2	59.5	56.4	4.12	4.24	6.1	3.0	6.9	87.3	59.9	56.9	3.98	4.41	5.6		
		1.1	2.5	100	1.2	2.8	114.2	53.7	36.2	5.66	2.78	8.88	1.7	4.0	109.1	54.0	49.5	5.38	2.94	8.2	2.8	6.4	105.6	54.3	49.9	5.20	3.06	7.5		
		1.1	2.5	110	1.2	2.8	125.1	54.5	33.4	6.56	2.43	10.05	1.7	4.0	119.6	54.8	45.6	6.23	2.58	9.3	2.8	6.4	115.8	55.1	46.1	6.03	2.68	8.5		
		1.1	2.5	120	1.1	2.6	134.9	52.7	29.8	7.56	2.04	11.18	1.6	3.7	129.0	53.0	40.7	7.18	2.16	10.3	2.6	6.0	124.8	53.3	41.1	6.94	2.25	9.5		
	13	1.9	4.4	60	1.4	3.3	72.2	63.7	45.8	3.15	4.47	4.81	2.0	4.7	69.0	64.0	60.9	2.99	4.73	4.4	Operation Not Recommended									
		1.9	4.4	80	1.3	3.0	94.8	63.1	45.2	4.35	4.26	6.75	1.8	4.2	90.6	63.5	60.2	4.13	4.51	6.2	3.0	6.9	87.7	63.9	60.7	3.99	4.69	5.7		
		1.9	4.4	100	1.2	2.8	114.7	57.3	39.6	5.68	2.96	9.03	1.7	4.0	109.6	57.6	52.8	5.39	3.13	8.3	2.8	6.4	106.1	57.9	53.3	5.21	3.26	7.6		
		1.9	4.4	110	1.2	2.8	125.7	58.1	36.5	6.58	2.59	10.23	1.7	4.0	120.2	58.4	48.7	6.25	2.74	9.4	2.8	6.4	116.3	58.8	49.2	6.04	2.85	8.6		
		1.9	4.4	120	1.1	2.6	135.6	56.2	32.6	7.58	2.18	11.37	1.6	3.7	129.6	56.5	43.4	7.20	2.30	10.5	2.6	6.0	125.4	56.9	43.8	6.96	2.40	9.6		
	18	3.2	7.4	60	1.4	3.3	72.4	66.8	48.3	3.15	4.69	4.90	2.0	4.7	69.2	67.1	63.9	2.99	4.96	4.5	Operation Not Recommended									
		3.2	7.4	80	1.3	3.0	95.1	66.2	47.7	4.35	4.47	6.88	1.8	4.2	90.9	66.6	63.1	4.13	4.73	6.3	3.0	6.9	88.0	67.0	63.7	3.99	4.92	5.8		
		3.2	7.4	100	1.2	2.8	115.1	60.1	41.8	5.68	3.10	9.21	1.7	4.0	110.0	60.4	55.3	5.39	3.28	8.5	2.8	6.4	106.5	60.7	55.9	5.21	3.42	7.8		
		3.2	7.4	110	1.2	2.8	126.1	60.9	38.6	6.58	2.71	10.42	1.7	4.0	120.5	61.2	51.1	6.25	2.87	9.6	2.8	6.4	116.7	61.6	51.5	6.04	2.99	8.8		
		3.2	7.4	120	1.1	2.6	136.0	59.0	34.4	7.58	2.28	11.59	1.6	3.7	130.0	59.3	45.5	7.20	2.42	10.7	2.6	6.0	125.8	59.6	46.0	6.96	2.51	9.8		
50	9	1.0	2.3	60	1.4	3.3	73.5	80.7	61.6	3.20	5.57	4.93	2.0	4.7	70.3	81.1	84.1	3.04	5.90	4.5	3.3	7.6	68.0	81.6	84.9	2.94	6.14	4.2		
		1.0	2.3	80	1.3	3.0	96.5	80.1	60.8	4.42	5.31	6.91	1.8	4.2	92.2	80.5	83.0	4.20	5.62	6.4	3.0	6.9	89.3	80.9	83.8	4.06	5.85	5.8		
		1.0	2.3	100	1.2	2.8	116.8	72.6	53.3	5.77	3.69	9.25	1.7	4.0	111.6	73.0	72.8	5.48	3.90	8.5	2.8	6.4	108.0	73.4	73.5	5.30	4.06	7.8		
		1.0	2.3	110	1.2	2.8	128.0	73.7	49.2	6.69	3.23	10.47	1.7	4.0	122.3	74.0	67.2	6.35	3.42	9.6	2.8	6.4	118.4	74.5	67.8	6.14	3.55	8.9		
		1.0	2.3	120	1.1	2.6	138.0	71.3	43.9	7.7	2.7	11.7	1.6	3.7	131.9	71.7	59.9	7.3	2.9	10.7	2.6	6.0	127.6	72.1	60.5	7.08	2.99	9.9		
	13	1.8	4.1	60	1.4	3.3	73.9	86.1	67.3	3.21	5.93	5.02	2.0	4.7	70.6	86.5	89.7	3.05	6.28	4.6	3.3	7.6	68.3	87.0	90.5	2.95	6.53	4.2		
		1.8	4.1	80	1.3	3.0	96.9	85.4	66.5	4.43	5.65	7.04	1.8	4.2	92.6	85.8	88.5	4.21	5.98	6.5	3.0	6.9	89.7	86.3	89.4	4.07	6.22	6.0		
		1.8	4.1	100	1.2	2.8	117.3	77.4	58.3	5.79	3.92	9.42	1.7	4.0	112.1	77.8	77.6	5.49	4.15	8.7	2.8	6.4	108.5	78.3	78.4	5.31	4.32	8.0		
		1.8	4.1	110	1.2	2.8	128.6	78.6	53.8	6.71	3.43	10.66	1.7	4.0	122.9	79.0	71.6	6.37	3.64	9.8	2.8	6.4	118.9	79.4	72.3	6.15	3.78	9.0		
		1.8	4.1	120	1.1	2.6	138.6	76.1	48.0	7.7	2.9	11.9	1.6	3.7	132.5	76.5	63.9	7.3	3.1	10.9	2.6	6.0	128.2	76.9	64.5	7.09	3.18	10.0		
	18	3.0	6.9	60	1.4	3.3	74.1	90.3	71.1	3.21	6.22	5.11	2.0	4.7	70.8	90.7	94.1	3.05	6.58	4.7	3.3	7.6	68.5	91.3	95.0	2.95	6.85	4.3		
		3.0	6.9	80	1.3	3.0	97.2	89.5	70.2	4.43	5.92	7.17	1.8	4.2	92.9	90.0	92.8	4.21	6.27	6.6	3.0	6.9	90.0	90.5	93.7	4.07	6.53	6.1		
		3.0	6.9	100	1.2	2.8	117.7	81.2	61.6	5.79	4.11	9.60	1.7	4.0	112.5	81.6	81.4	5.49	4.36	8.8	2.8	6.4	108.9	82.1	82.2	5.31	4.53	8.1		
		3.0	6.9	110	1.2	2.8	129.0	82.4	56.8	6.70	3.60	10.86	1.7	4.0	123.3	82.8	75.1	6.37	3.81	10.0	2.8	6.4	119.3	83.3	75.9	6.15	3.97	9.2		
		3.0	6.9	120	1.1	2.6	139.1	79.8	50.7	7.7	3.0	12.1	1.6	3.7	132.9	80.2	67.0	7.3	3.2	11.1	2.6	6.0	128.6	80.7	67.7	7.09	3.33	10.2		
70	9	1.1	2.5	60	1.4	3.3	75.3	103.1	83.5	3.29	6.92	5.53	2.0	4.7	71.9	103.6	113.9	3.13	7.32	5.1	3.3	7.6	69.6	104.2	115.0	3.02	7.62	4.7		
		1.1	2.5	80	1.3	3.0	98.8	102.2	82.4	4.55	6.59	7.76	1.8	4.2	94.4	102.8	112.4	4.32	6.98	7.1	3.0	6.9	91.4	103.4	113.5	4.17	7.26	6.6		
		1.1	2.5	100	1.2	2.8	119.6	92.7	72.2	5.94	4.58	10.39	1.7	4.0	114.3	93.2	98.6	5.64	4.85	9.6	2.8	6.4	110.6	93.8	99.6	5.45	5.04	8.8		
		1.1	2.5	110	1.2	2.8	131.1	94.1	66.7	6.88	4.01	11.76	1.7	4.0	125.3	94.6	91.0	6.53	4.24	10.8	2.8	6.4	121.2	95.1	91.9	6.31	4.42	9.9		
		1.1	2.5	120	1.1	2.6	141.3	91.1	59.5	7.9	3.4	13.1	1.6	3.7	135.0	91.6	81.2	7.5	3.6	12.0	2.6	6.0	130.7	92.1	81.9	7.28	3.71	11.1		
	13	1.9	4.5	60	1.4	3.3	75.6	109.9	91.2	3.30	7.36	5.63	2.0	4.7	72.3	110.5	121.5	3.13	7.79	5.2	3.3	7.6	70.0	111.2	122.7	3.03	8.11	4.8		
		1.9	4.5	80	1.3	3.0	99.3	109.0	90.0	4.56	7.02	7.90	1.8	4.2	94.9	109.6	119.9	4.33	7.43	7.3	3.0	6.9	91.8	110.3	121.1	4.18	7.73	6.7		
		1.9	4.5	100	1.2	2.8	120.1	98.9	79.0	5.95	4.87	10.57	1.7	4.0	114.8	99.4	105.2	5.65	5.16	9.7	2.8	6.4	111.1	100.0	106.2	5.46	5.37	8.9		
		1.9	4.5	110	1.2	2.8	131.7	100.3	72.9	6.89	4.27	11.96	1.7	4.0	125.8	100.9	97.0	6.55	4.52	11.0	2.8	6.4	121.8	101.5	98.0	6.33	4.70	10.1		
		1.9	4.5	120	1.1	2.6	142.0	97.1	65.0	7.9	3.6	13.3	1.6	3.7	135.7	97.6	86.6	7.5	3.8	12.3	2.6	6.0	131.3	98.2	87.4	7.29	3.95	11.3		
	18	3.2	7.5	60	1.4	3.3	75.9	115.3	96.3	3.30	7.72	5.74	2.0	4.7	72.5	115.9	127.4	3.13	8.17	5.3	3.3	7.6	70.2	116.6	128.6	3.03	8.51	4.9		
		3.2	7.5	80	1.3	3.0	99.6	114.4	95.1	4.56	7.36	8.05	1.8	4.2	95.2	115.0	125.8	4.33	7.79	7.4	3.0	6.9	92.1	115.6	127.0	4.18	8.11	6.8		
		3.2	7.5	100	1.2	2.8	120.5	103.7	83.4	5.95	5.11	10.77	1.7	4.0	115.2	104.3	110.3	5.65	5.41	9.9	2.8	6.4	111.5	104.9	111.4	5.46	5.63	9.1		
		3.2	7.5	110	1.2	2.8	132.1	105.2	76.9	6.89	4.47	12.19	1.7	4.0	126.2	105.8	101.8	6.55	4.74	11.2	2.8	6.4	122.2	106.4	102.8	6.33	4.93	10.3		
		3.2	7.5	120	1.1	2.6	142.4	101.9	68.6	7.9	3.8	13.6	1.6	3.7	136.1	102.4	90.8	7.5	4.0	12.5	2.6	6.0	131.7	103.0	91.6	7.29	4.14	11.5		
90	9	1.1	2.5	60	1.4	3.3	76.6	121.0	101.3	3.39	7.90	6.71	2.0	4.7	73.2	121.6	138.2	3.21	8.36	6.2	3.3	7.6	70.9	122.3	139.5	3.11	8.70	5.7		
		1.1	2.5	80	1.3	3.0	100.6	120.0	99.9	4.67	7.53	9.42	1.8	4.2	96.1	120.6	136.4	4.44	7.97	8.7	3.0	6.9	93.0	121.4	137.7	4.29	8.29	8.0		
		1.1	2.5	100	1.2	2.8	121.7	108.9	87.7	6.10	5.23	12.60	1.7	4.0	116.3	109.4	119.6	5.79	5.54	11.6	2.8	6.4	112.6	110.1	120.8	5.60	5.76	10.7		
		1.1	2.5	110	1.2	2.8	133.4	110.4	80.9	7.07	4.58	14.27	1.7	4.0	127.5	111.0	110.4	6.71	4.85	13.1	2.8	6.4	123.4	111.7	111.5	6.49	5.04	12.1		
		1.1	2.5	120	1.1	2.6	143.8	106.9	72.1	8.1	3.8	15.9	1.6	3.7	137.4	107.5	98.5	7.7	4.1	14.6	2.6	6.0	133.0	108.1	99.4	7.48	4.24	13.4		
	13	1.9	4.4	60	1.4	3.3	77.0	129.0	110.6	3.39	8.41	6.83	2.0	4.7	73.6	129.7	147.4	3.22	8.90	6.3	3.3	7.6	71.2	130.5	148.8	3.11	9.26	5.8		
		1.9	4.4	80	1.3	3.0	101.0	128.0	109.2	4.68	8.01	9.58	1.8	4.2	96.6	128.7	145.5	4.45	8.48	8.8	3.0	6.9	93.5	129.4	146.9	4.30	8.83	8.1		
		1.9	4.4	100	1.2	2.8	122.3	116.1	95.8	6.12	5.57	12.83	1.7	4.0	116.9	116.7	127.6	5.81	5.89	11.8	2.8	6.4	113.1	117.4	128.8	5.61	6.13	10.8		
		1.9	4.4	110	1.2	2.8	134.0	117.8	88.4	7.09	4.87	14.52	1.7	4.0	128.1	118.4	117.7	6.73	5.16	13.4	2.8	6.4	124.0	119.1	118.9	6.50	5.37	12.3		
		1.9	4.4	120	1.1	2.6	144.5	114.0	78.8	8.2	4.1	16.2	1.6	3.7	138.1	114.6	105.0	7.8	4.3	14.9	2.6	6.0	133.7	115.3	106.0	7.49	4.51	13.7		
	18	3.2	7.3	60	1.4	3.3	77.2	135.3	116.9	3.39	8.82	6.96	2.0	4.7	73.8	136.0	154.6	3.22	9.34	6.4	3.3	7.6	71.4	136.8	156.1	3.11	9.71	5.9		
		3.2	7.3	80	1.3	3.0	101.3	134.2	115.4	4.68	8.40	9.77	1.8	4.2	96.9	134.9	152.6	4.45	8.90	9.0	3.0	6.9	93.8	135.7	154.0	4.30	9.26	8.3		
		3.2	7.3	100	1.2	2.8	122.7	121.8	101.2	6.12	5.84	13.07	1.7	4.0	117.2	122.4	133.8	5.81	6.18	12.0	2.8	6.4	113.5	123.1	135.1	5.61	6.43	11.1		
		3.2	7.3	110	1.2	2.8	134.4	123.5	93.4	7.09	5.11	14.79	1.7	4.0	128.5	124.2	123.5	6.73	5.41	13.6	2.8	6.4	124.4	124.9	124.7	6.50	5.63	12.5		
		3.2	7.3	120	1.1	2.6	144.9	119.6	83.3	8.2	4.3	16.5	1.6	3.7	138.5	120.2	110.1	7.8	4.5	15.2	2.6	6.0	134.1	120.9	111.2	7.49	4.73	13.9		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS072 : EXTENDED DATA				LOAD SIDE, COOLING MODE, FULL LOAD																										
SOURCE SIDE					Load Flow GPM 9								Load Flow GPM 13								Load Flow GPM 18									
EST	Source Flow GPM	Source Flow WPD		ELT	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh		
40	18	3.5	8.0	40	Operation Not Recommended								Operation Not Recommended								Operation Not Recommended									
		3.5	8.0	50																										
		3.5	8.0	60																										
		3.5	8.0	75									1.6	3.8	58.8	100.9	110.2	2.67	37.8	2.8	2.6	6.0	62.7	107.5	115.9	2.69	39.9	2.9		
		3.5	8.0	90	1.0	2.4	66.2	96.3	106.8	2.69	35.8	3.1	1.6	3.8	72.2	106.2	115.7	2.71	39.2	3.2	2.6	6.0	77.0	113.2	121.7	2.74	41.3	3.3		
50	9	1.6	3.8	40	1.1	2.6	27.8	56.5	69.6	3.02	18.7	4.6	1.8	4.1	30.3	62.3	75.4	3.04	20.5	4.8	2.8	6.4	32.3	66.3	79.3	3.06	21.6	5.0		
		1.6	3.8	50	1.2	2.7	35.1	68.2	80.8	3.09	22.1	4.9	1.9	4.4	38.3	75.2	87.5	3.11	24.2	5.1	3.0	6.9	40.8	80.1	92.1	3.14	25.5	5.3		
		1.6	3.8	60	1.1	2.6	42.5	80.1	93.4	3.17	25.3	5.1	1.8	4.1	46.3	88.3	101.1	3.19	27.7	5.3	2.8	6.4	49.3	94.1	106.4	3.22	29.2	5.6		
		1.6	3.8	75	1.0	2.4	53.9	92.4	105.8	3.28	28.2	5.6	1.6	3.8	58.8	101.9	114.6	3.30	30.9	5.8	2.6	6.0	62.6	108.6	120.6	3.33	32.6	6.0		
		1.6	3.8	90	1.0	2.4	66.1	97.3	111.1	3.33	29.2	6.4	1.6	3.8	72.2	107.3	120.4	3.36	31.9	6.7	2.6	6.0	76.9	114.3	126.6	3.39	33.7	7.0		
	13	2.3	5.3	40	1.1	2.6	27.7	56.5	69.1	2.84	19.9	3.7	1.8	4.1	30.3	62.3	74.8	2.86	21.8	3.9	2.8	6.4	32.2	66.4	78.7	2.88	23.0	4.0		
		2.3	5.3	50	1.2	2.7	35.0	68.3	80.2	2.91	23.5	4.0	1.9	4.4	38.2	75.3	86.8	2.93	25.7	4.2	3.0	6.9	40.7	80.2	91.4	2.95	27.1	4.3		
		2.3	5.3	60	1.1	2.6	42.4	80.2	92.6	2.98	26.9	4.2	1.8	4.1	46.2	88.4	100.3	3.00	29.4	4.4	2.8	6.4	49.2	94.2	105.6	3.03	31.1	4.5		
		2.3	5.3	75	1.0	2.4	53.7	92.5	105.0	3.09	30.0	4.6	1.6	3.8	58.6	102.0	113.7	3.11	32.8	4.7	2.6	6.0	62.5	108.7	E	3.14	34.6	4.9		
		2.3	5.3	90	1.0	2.4	66.0	97.4	110.3	3.14	31.0	5.3	1.6	3.8	72.0	107.4	119.4	3.16	34.0	5.5	2.6	6.0	76.7	114.4	125.6	3.19	35.9	5.7		
	18	3.4	7.9	40	1.1	2.6	27.6	57.3	69.3	2.74	20.9	2.7	1.8	4.1	30.2	63.2	75.1	2.76	22.9	2.8	2.8	6.4	32.1	67.4	79.0	2.78	24.2	2.9		
		3.4	7.9	50	1.2	2.7	34.9	69.2	80.5	2.80	24.7	2.9	1.9	4.4	38.1	76.4	87.2	2.82	27.1	3.0	3.0	6.9	40.6	81.4	91.7	2.85	28.6	3.1		
		3.4	7.9	60	1.1	2.6	42.2	81.3	93.0	2.88	28.3	3.0	1.8	4.1	46.0	89.7	100.7	2.90	31.0	3.1	2.8	6.4	49.0	95.5	106.0	2.92	32.7	3.3		
		3.4	7.9	75	1.0	2.4	53.6	93.8	105.4	2.98	31.5	3.3	1.6	3.8	58.4	103.5	114.2	3.00	34.5	3.4	2.6	6.0	62.2	110.3	120.1	3.02	36.4	3.5		
		3.4	7.9	90	1.0	2.4	65.8	98.8	110.7	3.03	32.6	3.8	1.6	3.8	71.7	108.9	119.9	3.05	35.7	3.9	2.6	6.0	76.4	116.1	126.1	3.07	37.7	4.1		
70	9	1.6	3.6	40	1.1	2.6	28.4	52.0	66.0	3.82	13.6	7.2	1.8	4.1	31.0	57.3	71.5	3.85	14.9	7.5	2.8	6.4	33.0	61.0	75.2	3.89	15.7	7.8		
		1.6	3.6	50	1.2	2.7	35.9	62.8	76.6	3.91	16.0	7.7	1.9	4.4	39.1	69.2	83.0	3.94	17.6	8.0	3.0	6.9	41.7	73.7	87.3	3.98	18.5	8.4		
		1.6	3.6	60	1.1	2.6	43.4	73.7	88.5	4.02	18.3	8.1	1.8	4.1	47.3	81.3	95.9	4.05	20.1	8.4	2.8	6.4	50.4	86.6	100.8	4.08	21.2	8.8		
		1.6	3.6	75	1.0	2.4	55.0	85.1	100.3	4.16	20.5	8.8	1.6	3.8	60.0	93.8	108.6	4.19	22.4	9.2	2.6	6.0	63.9	99.9	114.3	4.22	23.7	9.5		
		1.6	3.6	90	1.0	2.4	67.6	89.5	105.3	4.2	21.2	10.1	1.6	3.8	73.7	98.7	114.1	4.3	23.2	10.5	2.6	6.0	78.5	105.2	120.0	4.30	24.5	11.0		
	13	2.2	5.1	40	1.1	2.6	28.3	52.0	65.5	3.60	14.4	5.9	1.8	4.1	30.9	57.4	70.9	3.62	15.8	E	2.8	6.4	32.9	61.1	74.6	3.66	16.7	6.4		
		2.2	5.1	50	1.2	2.7	35.8	62.8	76.0	3.68	17.0	6.3	1.9	4.4	39.0	69.3	82.3	3.71	18.7	6.6	3.0	6.9	41.6	73.8	86.6	3.74	19.7	6.8		
		2.2	5.1	60	1.1	2.6	43.3	73.8	87.8	3.78	19.5	6.6	1.8	4.1	47.2	81.4	95.1	3.81	21.4	6.9	2.8	6.4	50.3	86.7	100.1	3.84	22.6	7.1		
		2.2	5.1	75	1.0	2.4	54.9	85.1	99.5	3.91	21.7	7.2	1.6	3.8	59.9	93.9	107.8	3.94	23.8	7.5	2.6	6.0	63.8	100.0	113.4	3.98	25.1	7.8		
		2.2	5.1	90	1.0	2.4	67.4	89.6	104.5	4.0	22.5	8.3	1.6	3.8	73.5	98.8	113.2	4.0	24.7	8.6	2.6	6.0	78.3	105.3	119.1	4.04	26.0	8.9		
	18	3.3	7.6	40	1.1	2.6	28.2	52.8	65.7	3.47	15.2	4.2	1.8	4.1	30.8	58.2	71.2	3.49	16.7	4.4	2.8	6.4	32.8	62.0	74.9	3.53	17.6	4.6		
		3.3	7.6	50	1.2	2.7	35.6	63.7	76.3	3.55	17.9	4.5	1.9	4.4	38.9	70.3	82.6	3.58	19.6	4.7	3.0	6.9	41.4	74.9	87.0	3.61	20.7	4.9		
		3.3	7.6	60	1.1	2.6	43.1	74.8	88.2	3.65	20.5	4.8	1.8	4.1	47.0	82.5	95.5	3.67	22.5	4.9	2.8	6.4	50.1	87.9	100.5	3.71	23.7	5.1		
		3.3	7.6	75	1.0	2.4	54.7	86.4	99.9	3.77	22.9	5.2	1.6	3.8	59.7	95.2	108.2	3.80	25.1	5.4	2.6	6.0	63.6	101.5	113.9	3.83	26.5	5.6		
		3.3	7.6	90	1.0	2.4	67.2	90.9	104.9	3.8	23.7	6.0	1.6	3.8	73.3	100.2	113.6	3.9	26.0	6.2	2.6	6.0	78.0	106.8	119.6	3.90	27.4	6.4		
90	9	1.4	3.2	40	1.1	2.6	28.9	46.6	63.2	4.97	9.4	10.4	1.8	4.1	31.6	51.4	68.5	5.00	10.3	10.8	2.8	6.4	33.6	54.8	72.1	5.05	10.9	11.3		
		1.4	3.2	50	1.2	2.7	36.5	56.3	73.4	5.09	11.1	11.2	1.9	4.4	39.8	62.1	79.5	5.12	12.1	11.6	3.0	6.9	42.4	66.2	83.7	5.17	12.8	12.1		
		1.4	3.2	60	1.1	2.6	44.2	66.1	84.8	5.22	12.7	11.7	1.8	4.1	48.2	72.9	91.9	5.25	13.9	12.1	2.8	6.4	51.3	77.7	96.7	5.30	14.7	12.6		
		1.4	3.2	75	1.0	2.4	56.1	76.3	96.2	5.40	14.1	12.7	1.6	3.8	61.1	84.2	104.1	5.44	15.5	13.2	2.6	6.0	65.1	89.7	109.6	5.49	16.3	13.7		
		1.4	3.2	90	1.0	2.4	68.8	80.3	101.0	5.5	14.6	14.6	1.6	3.8	75.1	88.6	109.3	5.5	16.0	15.2	2.6	6.0	80.0	94.4	115.0	5.58	16.9	15.8		
	13	1.9	4.4	40	1.1	2.6	28.9	46.7	62.8	4.67	10.0	8.5	1.8	4.1	31.5	51.5	68.0	4.71	10.9	8.8	2.8	6.4	33.5	54.8	71.5	4.75	11.5	9.2		
		1.9	4.4	50	1.2	2.7	36.4	56.4	72.9	4.79	11.8	9.1	1.9	4.4	39.7	62.2	78.9	4.82	12.9	9.5	3.0	6.9	42.3	66.3	83.0	4.86	13.6	9.8		
		1.9	4.4	60	1.1	2.6	44.1	66.2	84.2	4.91	13.5	9.5	1.8	4.1	48.1	73.0	91.2	4.95	14.8	9.9	2.8	6.4	51.2	77.8	95.9	4.99	15.6	10.3		
		1.9	4.4	75	1.0	2.4	55.9	76.4	95.4	5.08	15.0	10.4	1.6	3.8	61.0	84.3	103.3	5.12	16.5	10.8	2.6	6.0	65.0	89.8	108.7	5.17	17.4	11.2		
		1.9	4.4	90	1.0	2.4	68.6	80.4	100.2	5.2	15.6	11.9	1.6	3.8	74.9	88.7	108.5	5.2	17.0	12.4	2.6	6.0	79.8	94.5	114.1	5.25	18.0	12.9		
	18	2.9	6.6	40	1.1	2.6	28.8	47.4	63.0	4.51	10.5	6.1	1.8	4.1	31.4	52.2	68.2	4.54	11.5	6.4	2.8	6.4	33.4	55.6	71.8	4.58	12.1	6.6		
		2.9	6.6	50	1.2	2.7	36.3	57.2	73.1	4.61	12.4	6.5	1.9	4.4	39.6	63.1	79.2	4.65	13.6	6.8	3.0	6.9	42.2	67.2	83.3	4.69	14.3	7.1		
		2.9	6.6	60	1.1	2.6	43.9	67.2	84.5	4.74	14.2	6.9	1.8	4.1	47.9	74.1	91.5	4.77	15.5	7.1	2.8	6.4	51.0	78.9	96.3	4.81	16.4	7.4		
		2.9	6.6	75	1.0	2.4	55.7	77.5	95.8	4.90	15.8	7.5	1.6	3.8	60.8	85.5	103.8	4.93	17.3	7.8	2.6	6.0	64.7	91.1	109.2	4.98	18.3	8.1		
		2.9	6.6	90	1.0	2.4	68.4	81.6	100.6	5.0	16.4	8.6	1.6	3.8	74.6	90.0	108.9	5.0	17.9	8.9	2.6	6.0	79.5	95.9	114.6	5.06	18.9	9.3		
110	9	1.3	3.1	40	1.1	2.6	29.7	39.9	59.2	6.51	6.1	14.0	1.8	4.1	32.4	44.0	64.2	6.55	6.7	14.5	2.8	6.4	34.6	46.9	67.5	6.61	7.1	15.1		
		1.3	3.1	50	1.2	2.7	37.5	48.2	68.8	6.66	7.2	15.0	1.9	4.4	40.9	53.2	74.5	6.71	7.9	15.6	3.0	6.9	43.6	56.7	78.4	6.77	8.4	16.2		
		1.3	3.1	60	1.1	2.6	45.4	56.6	79.5	6.84	8.3	15.7	1.8	4.1	49.5	62.5	86.1	6.88	9.1	16.3	2.8	6.4	52.7	66.6	90.6	6.95	9.6	16.9		
		1.3	3.1	75	1.0	2.4	57.6	65.4	90.1	7.07	9.2	17.1	1.6	3.8	62.8	72.1	97.6	7.12	10.1	17.7	2.6	6.0	66.9	76.8	102.6	7.19	10.7	18.4		
		1.3	3.1	90	1.0	2.4	70.7	68.8	94.6	7.2	9.6	19.6	1.6	3.8	77.1	75.9	102.4	7.2	10.5	20.4	2.6	6.0	82.2	80.8	107.8	7.31	11.1	21.2		
	13	1.9	4.3	40	1.1	2.6	29.7	40.0	58.8	6.12	6.5	11.4	1.8	4.1	32.4	44.1	63.7	6.16	7.1	11.9	2.8	6.4	34.5	47.0	67.0	6.22	7.5	12.3		
		1.9	4.3	50	1.2	2.7	37.4	48.3	68.2	6.27	7.7	12.2	1.9	4.4	40.8	53.2	73.9	6.31	8.4	12.7	3.0	6.9	43.5	56.7	77.8	6.37	8.9	13.2		
		1.9	4.3	60	1.1	2.6	45.3	56.7	78.8	6.43	8.8	12.8	1.8	4.1	49.4	62.5	85.4	6.48	9.6	13.3	2.8	6.4	52.6	66.6	89.8	6.54	10.2	13.8		
		1.9	4.3	75	1.0	2.4	57.5	65.4	89.4	6.66	9.8	13.9	1.6	3.8	62.7	72.2	96.8	6.70	10.8	14.5	2.6	6.0	66.8	76.9	101.8	6.77	11.4	15.1		
		1.9	4.3	90	1.0	2.4	70.5	68.9	93.8	6.8	10.2	16.0	1.6	3.8	76.9	76.0	101.6	6.8	11.1	16.6	2.6	6.0	82.0	80.9	106.9	6.88	11.8	17.3		
	18	2.8	6.5	40	1.1	2.6	29.6	40.5	59.0	5.90	6.9	8.2	1.8	4.1	32.2	44.7	63.9	5.94	7.5	8.5	2.8	6.4	34.3	47.6	67.3	6.00	7.9	8.9		
		2.8	6.5	50	1.2	2.7	37.3	49.0	68.5	6.04	8.1	8.8	1.9	4.4	40.7	54.0	74.2	6.09	8.9	9.1	3.0	6.9	43.4	57.6	78.1	6.14	9.4	9.5		
		2.8	6.5	60	1.1	2.6	45.1	57.5	79.2	6.20	9.3	9.2	1.8	4.1	49.2	63.4	85.7	6.25	10.2	9.6	2.8	6.4	52.4	67.6	90.2	6.30	10.7	9.9		
		2.8	6.5	75	1.0	2.4	57.3	66.4	89.7	6.42	10.3	10.0	1.6	3.8	62.5	73.2	97.2	6.46	11.3	10.4	2.6	6.0	66.5	78.0	102.2	6.52	12.0	10.8		
		2.8	6.5	90	1.0	2.4	70.3	69.9	94.2	6.5	10.7	11.5	1.6	3.8	76.7	77.0	102.0	6.6	11.7	12.0	2.6	6.0	81.7	82.1	107.4	6.63	12.4	12.4		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side.
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions.
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data.

WS084 : EXTENDED DATA				LOAD SIDE, HEATING MODE, FULL LOAD																										
SOURCE SIDE				Load Flow GPM 10								Load Flow GPM 16								Load Flow GPM 21										
EST	Source Flow		ELT	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH	Load Flow WPD		LLT	HC	HE	Power	COP	DSH			
	GPM	Source Flow WPD																												
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh	kW	W/W	MBtuh			
25	21	5.8	13.3	60	1.7	3.9	75.8	69.2	50.4	4.20	5.02	4.8	3.5	8.1	71.3	69.1	67.1	3.96	5.32	4.3	Operation Not Recommended									
		5.8	13.3	80	1.7	3.9	95.5	71.8	50.9	5.08	4.14	6.66	3.5	8.1	89.8	71.7	67.8	4.79	4.39	6.0	5.8	13.3	87.5	71.6	68.4	4.68	4.49	5.5			
		5.8	13.3	100	1.7	3.9	116.3	68.9	46.5	6.38	3.16	8.96	3.5	8.1	109.4	68.7	62.0	6.01	3.35	8.0	5.8	13.3	106.5	68.7	62.5	5.87	3.43	7.3			
		5.8	13.3	110	1.6	3.7	126.8	67.1	43.0	7.21	2.72	10.13	3.4	7.8	119.3	66.9	57.3	6.80	2.89	9.1	5.6	12.9	116.1	66.8	57.7	6.64	2.95	8.3			
		5.8	13.3	115	1.7	3.9	131.9	66.0	41.2	7.66	2.52	10.70	3.5	8.0	124.1	65.9	54.8	7.22	2.67	9.6	5.8	13.3	120.8	65.8	55.3	7.05	2.74	8.8			
30	10	0.9	2.1	60	1.7	3.9	75.6	67.1	47.8	4.20	4.87	4.7	3.5	8.1	71.1	67.0	65.6	3.96	5.16	4.2	Operation Not Recommended									
		0.9	2.1	80	1.7	3.9	95.2	69.7	48.3	5.08	4.02	6.47	3.5	8.1	89.5	69.5	66.2	4.78	4.26	5.8	5.8	13.3	87.2	69.4	66.8	4.67	4.35	5.3			
		0.9	2.1	100	1.7	3.9	115.9	66.8	44.1	6.38	3.07	8.70	3.5	8.1	109.0	66.7	60.5	6.01	3.25	7.8	5.8	13.3	106.1	66.6	61.0	5.87	3.33	7.1			
		0.9	2.1	110	1.6	3.7	126.4	65.0	40.8	7.21	2.64	9.85	3.4	7.8	118.9	64.9	55.9	6.79	2.80	8.8	5.6	12.9	115.8	64.8	56.4	6.63	2.86	8.1			
		0.9	2.1	115	1.7	3.9	131.5	64.0	39.0	7.66	2.45	10.39	3.5	8.0	123.7	63.9	53.5	7.21	2.60	9.3	5.8	13.3	120.4	63.8	54.0	7.04	2.65	8.5			
	16	3.5	8.1	60	1.7	3.9	75.8	72.4	52.2	4.23	5.22	4.77	3.5	8.1	71.3	72.3	70.8	3.98	5.54	4.3	Operation Not Recommended									
		3.5	8.1	80	1.7	3.9	95.6	75.2	52.7	5.11	4.31	6.63	3.5	8.1	89.9	75.0	71.5	4.81	4.57	6.0	5.8	13.3	87.5	74.9	72.1	4.70	4.67	5.4			
		3.5	8.1	100	1.7	3.9	116.3	72.1	48.2	6.42	3.29	8.91	3.5	8.1	109.4	71.9	65.3	6.04	3.49	8.0	5.8	13.3	106.5	71.9	65.8	5.90	3.57	7.3			
		3.5	8.1	110	1.6	3.7	126.9	70.2	44.5	7.25	2.83	10.09	3.4	7.8	119.3	70.0	60.3	6.83	3.00	9.1	5.6	12.9	116.2	69.9	60.8	6.67	3.07	8.3			
		3.5	8.1	115	1.7	3.9	132.0	69.1	42.6	7.70	2.63	10.65	3.5	8.0	124.1	68.9	57.8	7.26	2.78	9.6	5.8	13.3	120.9	68.8	58.3	7.09	2.85	8.7			
	21	5.3	12.2	60	1.7	3.9	76.1	74.3	54.5	4.25	5.33	4.86	3.5	8.1	71.6	74.2	72.6	4.01	5.65	4.4	Operation Not Recommended									
		5.3	12.2	80	1.7	3.9	95.9	77.1	55.0	5.14	4.39	6.75	3.5	8.1	90.2	77.0	73.3	4.84	4.66	6.1	5.8	13.3	87.8	76.9	73.9	4.73	4.76	5.5			
		5.3	12.2	100	1.7	3.9	116.7	74.0	50.3	6.46	3.36	9.08	3.5	8.1	109.8	73.8	67.0	6.08	3.56	8.2	5.8	13.3	106.9	73.7	67.6	5.94	3.64	7.5			
		5.3	12.2	110	1.6	3.7	127.3	72.0	46.4	7.30	2.89	10.27	3.4	7.8	119.7	71.8	61.9	6.87	3.06	9.2	5.6	12.9	116.6	71.8	62.4	6.71	3.13	8.4			
		5.3	12.2	115	1.7	3.9	132.4	70.9	44.5	7.75	2.68	10.84	3.5	8.0	124.5	70.7	59.3	7.30	2.84	9.7	5.8	13.3	121.3	70.6	59.8	7.13	2.90	8.9			
50	10	0.9	2.1	60	1.7	3.9	77.1	88.9	69.1	4.39	6.17	4.85	3.5	8.1	72.5	88.7	94.8	4.14	6.54	4.4	5.8	13.3	70.6	88.6	95.6	4.04	6.69	4.0			
		0.9	2.1	80	1.7	3.9	97.1	92.3	69.8	5.31	5.09	6.75	3.5	8.1	91.3	92.1	95.7	5.00	5.40	6.1	5.8	13.3	88.9	92.0	96.5	4.89	5.52	5.5			
		0.9	2.1	100	1.7	3.9	118.3	88.5	63.8	6.67	3.89	9.07	3.5	8.1	111.2	88.3	87.5	6.28	4.12	8.1	5.8	13.3	108.3	88.2	88.2	6.13	4.21	7.4			
		0.9	2.1	110	1.6	3.7	129.0	86.1	58.9	7.54	3.35	10.26	3.4	7.8	121.3	86.0	80.8	7.10	3.55	9.2	5.6	12.9	118.1	85.8	81.5	6.93	3.63	8.4			
		0.9	2.1	115	1.7	3.9	134.2	84.8	56.4	8.0	3.1	10.8	3.5	8.0	126.2	84.6	77.4	7.5	3.3	9.7	5.8	13.3	122.8	84.5	78.0	7.36	3.36	8.9			
	16	3.5	8.2	60	1.7	3.9	77.4	96.0	75.5	4.42	6.62	4.97	3.5	8.1	72.8	95.8	102.3	4.16	7.02	4.5	5.8	13.3	70.8	95.6	103.1	4.06	7.17	4.1			
		3.5	8.2	80	1.7	3.9	97.5	99.6	76.2	5.34	5.46	6.91	3.5	8.1	91.7	99.4	103.3	5.03	5.79	6.2	5.8	13.3	89.2	99.3	104.2	4.92	5.92	5.7			
		3.5	8.2	100	1.7	3.9	118.7	95.5	69.6	6.71	4.17	9.29	3.5	8.1	111.6	95.3	94.4	6.32	4.42	8.3	5.8	13.3	108.7	95.2	95.2	6.17	4.52	7.6			
		3.5	8.2	110	1.6	3.7	129.4	93.0	64.3	7.58	3.59	10.51	3.4	7.8	121.7	92.8	87.2	7.14	3.81	9.4	5.6	12.9	118.5	92.6	87.9	6.97	3.89	8.6			
		3.5	8.2	115	1.7	3.9	134.6	91.5	61.6	8.1	3.3	11.1	3.5	8.0	126.6	91.3	83.5	7.6	3.5	10.0	5.8	13.3	123.3	91.2	84.2	7.41	3.61	9.1			
	21	5.4	12.3	60	1.7	3.9	77.6	98.4	78.7	4.45	6.75	5.06	3.5	8.1	73.0	98.2	104.9	4.19	7.15	4.5	5.8	13.3	71.1	98.1	105.8	4.09	7.32	4.2			
		5.4	12.3	80	1.7	3.9	97.8	102.2	79.5	5.38	5.57	7.04	3.5	8.1	92.0	102.0	106.0	5.06	5.90	6.3	5.8	13.3	89.5	101.8	106.9	4.94	6.03	5.8			
		5.4	12.3	100	1.7	3.9	119.1	98.0	72.7	6.75	4.25	9.47	3.5	8.1	112.0	97.8	96.8	6.36	4.51	8.5	5.8	13.3	109.0	97.6	97.6	6.21	4.61	7.8			
		5.4	12.3	110	1.6	3.7	129.9	95.4	67.1	7.63	3.66	10.71	3.4	7.8	122.1	95.2	89.5	7.18	3.88	9.6	5.6	12.9	118.9	95.0	90.2	7.02	3.97	8.8			
		5.4	12.3	115	1.7	3.9	135.1	93.9	64.3	8.1	3.4	11.3	3.5	8.0	127.0	93.7	85.7	7.6	3.6	10.2	5.8	13.3	123.7	93.5	86.4	7.45	3.68	9.3			
70	10	0.9	2.1	60	1.7	3.9	79.0	111.6	90.0	4.64	7.33	5.45	3.5	8.1	74.2	111.4	123.4	4.37	7.77	4.9	5.8	13.3	72.3	111.2	124.4	4.27	7.95	4.5			
		0.9	2.1	80	1.7	3.9	99.5	115.8	90.9	5.61	6.05	7.57	3.5	8.1	93.5	115.6	124.7	5.28	6.41	6.8	5.8	13.3	91.1	115.5	125.7	5.16	6.56	6.2			
		0.9	2.1	100	1.7	3.9	121.1	111.1	83.0	7.04	4.62	10.18	3.5	8.1	113.9	110.9	113.9	6.63	4.90	9.1	5.8	13.3	110.9	110.7	114.9	6.48	5.01	8.4			
		0.9	2.1	110	1.6	3.7	132.1	108.1	76.7	7.96	3.98	11.52	3.4	7.8	124.2	107.9	105.2	7.50	4.22	10.3	5.6	12.9	121.0	107.8	106.1	7.32	4.31	9.5			
		0.9	2.1	115	1.7	3.9	137.4	106.4	73.5	8.5	3.7	12.2	3.5	8.0	129.2	106.2	100.8	8.0	3.9	10.9	5.8	13.3	125.8	106.1	101.6	7.78	4.00	10.0			
	16	3.5	8.1	60	1.7	3.9	79.2	120.5	98.3	4.67	7.87	5.58	3.5	8.1	74.5	120.2	133.2	4.40	8.34	5.0	5.8	13.3	72.5	120.1	134.3	4.29	8.53	4.6			
		3.5	8.1	80	1.7	3.9	99.8	125.0	99.3	5.64	6.49	7.76	3.5	8.1	93.9	124.8	134.5	5.32	6.88	7.0	5.8	13.3	91.4	124.6	135.7	5.19	7.03	6.4			
		3.5	8.1	100	1.7	3.9	121.6	119.9	90.7	7.09	4.96	10.43	3.5	8.1	114.3	119.6	122.9	6.67	5.25	9.4	5.8	13.3	111.3	119.5	123.9	6.52	5.37	8.6			
		3.5	8.1	110	1.6	3.7	132.6	116.7	83.8	8.01	4.27	11.80	3.4	7.8	124.7	116.4	113.6	7.54	4.52	10.6	5.6	12.9	121.4	116.3	114.5	7.37	4.63	9.7			
		3.5	8.1	115	1.7	3.9	137.9	114.8	80.3	8.5	4.0	12.5	3.5	8.0	129.7	114.6	108.8	8.0	4.2	11.2	5.8	13.3	126.3	114.5	109.7	7.83	4.29	10.2			
	21	5.3	12.2	60	1.7	3.9	79.5	123.6	102.5	4.70	8.02	5.68	3.5	8.1	74.8	123.3	136.6	4.42	8.50	5.1	5.8	13.3	72.8	123.2	137.8	4.32	8.69	4.7			
		5.3	12.2	80	1.7	3.9	100.2	128.2	103.6	5.68	6.62	7.90	3.5	8.1	94.2	128.0	138.0	5.35	7.01	7.1	5.8	13.3	91.7	127.8	139.2	5.22	7.17	6.5			
		5.3	12.2	100	1.7	3.9	122.0	123.0	94.6	7.13	5.05	10.62	3.5	8.1	114.7	122.7	126.1	6.71	5.36	9.5	5.8	13.3	111.7	122.6	127.2	6.56	5.48	8.7			
		5.3	12.2	110	1.6	3.7	133.0	119.7	87.4	8.06	4.35	12.02	3.4	7.8	125.1	119.5	116.5	7.59	4.61	10.8	5.6	12.9	121.8	119.3	117.5	7.41	4.72	9.9			
		5.3	12.2	115	1.7	3.9	138.4	117.8	83.7	8.6	4.0	12.7	3.5	8.0	130.1	117.6	111.6	8.1	4.3	11.4	5.8	13.3	126.7	117.4	112.5	7.87	4.37	10.4			
90	10	0.9	2.0	60	1.7	3.9	79.6	121.4	100.1	4.77	7.75	6.61	3.5	8.1	74.9	121.2	137.3	4.50	8.22	5.9	5.8	13.3	72.9	121.0	138.5	4.39	8.41	5.4			
		0.9	2.0	80	1.7	3.9	100.3	126.0	101.1	5.77	6.40	9.19	3.5	8.1	94.4	125.8	138.7	5.44	6.78	8.3	5.8	13.3	91.9	125.6	139.9	5.31	6.93	7.5			
		0.9	2.0	100	1.7	3.9	122.2	120.9	92.4	7.25	4.89	12.36	3.5	8.1	114.9	120.6	126.7	6.83	5.18	11.1	5.8	13.3	111.9	120.4	127.8	6.67	5.30	10.1			
		0.9	2.0	110	1.6	3.7	133.3	117.6	85.4	8.19	4.21	13.98	3.4	7.8	125.3	117.4	117.1	7.72	4.46	12.6	5.6	12.9	122.0	117.3	118.1	7.53	4.56	11.5			
		0.9	2.0	115	1.7	3.9	138.6	115.8	81.8	8.7	3.9	14.8	3.5	8.0	130.3	115.6	112.1	8.2	4.1	13.3	5.8	13.3	126.9	115.4	113.1	8.00	4.23	12.1			
	16	3.5	8.0	60	1.7	3.9	79.9	131.1	109.3	4.80	8.32	6.77	3.5	8.1	75.2	130.8	148.2	4.52	8.82	6.1	5.8	13.3	73.2	130.6	149.4	4.42	9.01	5.6			
		3.5	8.0	80	1.7	3.9	100.7	136.0	110.5	5.81	6.86	9.41	3.5	8.1	94.7	135.7	149.7	5.47	7.27	8.5	5.8	13.3	92.2	135.6	151.0	5.34	7.44	7.7			
		3.5	8.0	100	1.7	3.9	122.6	130.4	100.9	7.29	5.24	12.66	3.5	8.1	115.3	130.2	136.8	6.87	5.55	11.4	5.8	13.3	112.3	130.0	137.9	6.71	5.68	10.4			
		3.5	8.0	110	1.6	3.7	133.7	127.0	93.2	8.24	4.51	14.32	3.4	7.8	125.8	126.7	126.3	7.76	4.78	12.9	5.6	12.9	122.4	126.5	127.4	7.58	4.89	11.7			
		3.5	8.0	115	1.7	3.9	139.1	124.9	89.3	8.8	4.2	15.1	3.5	8.0	130.8	124.7	121.0	8.2	4.4	13.6	5.8	13.3	127.4	124.5	122.0	8.05	4.53	12.4			
	21	5.2	12.1	60	1.7	3.9	80.2	134.4	114.1	4.83	8.48	6.90	3.5	8.1	75.4	134.2	152.0	4.55	8.99	6.2	5.8	13.3	73.4	134.0	153.3	4.44	9.19	5.7			
		5.2	12.1	80	1.7	3.9	101.0	139.5	115.2	5.84	7.00	9.59	3.5	8.1	95.0	139.3	153.6	5.50	7.42	8.6	5.8	13.3	92.5	139.1	154.9	5.37	7.58	7.9			
		5.2	12.1	100	1.7	3.9	123.0	133.8	105.3	7.34	5.34	12.89	3.5	8.1	115.7	133.5	140.3	6.91	5.66	11.6	5.8	13.3	112.6	133.3	141.5	6.75	5.79	10.6			
		5.2	12.1	110	1.6	3.7	134.2	130.2	97.3	8.29	4.60	14.59	3.4	7.8	126.2	130.0	129.6	7.81	4.88	13.1	5.6	12.9	122.8	129.8	130.7	7.63	4.99	12.0			
		5.2	12.1	115	1.7	3.9	139.6	128.2	93.2	8.8	4.3	15.4	3.5	8.0	131.2	127.9	124.1	8.3	4.5	13.8	5.8	13.3	127.8	127.8	125.2	8.10	4.62	12.6			

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data

WS084 : EXTENDED DATA				LOAD SIDE, COOLING MODE, FULL LOAD																										
SOURCE SIDE																														
EST	Source Flow				Load Flow GPM				10				Load Flow GPM				16				Load Flow GPM				21					
	GPM	Source Flow WPD		ELT	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH	Load Flow WPD		LLT	TC	HR	kW	EER	DSH		
°F		PSI	FT	°F	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh	PSI	FT	°F	MBtuh	MBtuh		W/W	MBtuh		
40	21	5.3	12.3	40	Operation Not Recommended								Operation Not Recommended								Operation Not Recommended									
		5.3	12.3	50																										
		5.3	12.3	60																										
		5.3	12.3	75									3.2	7.3	61.7	95.7	104.2	3.54	27.0	2.2	5.4	12.4	65.2	100.7	109.7	3.59	28.0	2.3		
		5.3	12.3	90	1.9	4.3	67.6	90.0	98.4	3.53	25.5	2.4	3.2	7.3	75.8	100.7	108.1	3.61	27.9	2.5	5.4	12.4	80.0	105.9	113.8	3.66	28.9	2.6		
50	10	1.6	3.7	40	1.9	4.5	27.8	62.2	73.4	3.75	16.6	4.4	3.3	7.6	31.2	69.6	80.6	3.84	18.1	4.7	5.6	12.9	32.9	73.2	84.8	3.90	18.8	4.9		
		1.6	3.7	50	1.9	4.5	34.9	75.6	86.7	3.92	19.3	4.8	3.3	7.6	39.1	84.6	95.2	4.02	21.0	5.0	5.6	12.9	41.3	89.0	100.2	4.07	21.8	5.2		
		1.6	3.7	60	1.9	4.5	42.5	84.8	95.2	4.07	20.8	5.0	3.3	7.6	47.6	94.8	104.6	4.17	22.7	5.2	5.6	12.9	50.3	99.8	110.1	4.23	23.5	5.4		
		1.6	3.7	75	1.9	4.3	54.7	89.6	101.3	4.18	21.4	5.4	3.2	7.3	61.3	100.2	111.2	4.28	23.4	5.7	5.4	12.4	64.7	105.4	117.0	4.35	24.2	5.9		
		1.6	3.7	90	1.9	4.3	67.2	94.2	105.0	4.27	22.1	6.2	3.2	7.3	75.2	105.4	115.4	4.37	24.1	6.6	5.4	12.4	79.5	110.9	121.4	4.43	25.0	6.8		
	16	3.5	8.0	40	1.9	4.5	27.7	62.4	72.5	3.52	17.7	3.2	3.3	7.6	31.1	69.8	79.6	3.60	19.4	3.3	5.6	12.9	32.8	73.4	83.8	3.66	20.1	3.5		
		3.5	8.0	50	1.9	4.5	34.8	75.9	85.7	3.68	20.6	3.4	3.3	7.6	39.0	84.9	94.1	3.76	22.5	3.6	5.6	12.9	41.2	89.3	99.1	3.82	23.4	3.7		
		3.5	8.0	60	1.9	4.5	42.3	85.0	94.1	3.82	22.3	3.5	3.3	7.6	47.4	95.1	103.4	3.91	24.3	3.7	5.6	12.9	50.0	100.1	108.8	3.97	25.2	3.9		
		3.5	8.0	75	1.9	4.3	54.5	89.9	100.1	3.92	22.9	3.8	3.2	7.3	61.0	100.5	109.9	4.02	25.0	4.0	5.4	12.4	64.5	105.8	E	4.07	25.9	4.2		
		3.5	8.0	90	1.9	4.3	66.9	94.5	103.8	4.00	23.6	4.4	3.2	7.3	74.9	105.8	114.0	4.10	25.8	4.7	5.4	12.4	79.1	111.2	120.0	4.16	26.8	4.8		
	21	5.3	12.3	40	1.9	4.5	27.7	62.9	72.8	3.46	18.2	2.1	3.3	7.6	31.0	70.3	79.9	3.54	19.9	2.2	5.6	12.9	32.8	74.0	84.1	3.59	20.6	2.3		
		5.3	12.3	50	1.9	4.5	34.8	76.4	86.0	3.61	21.1	2.2	3.3	7.6	38.9	85.5	94.5	3.70	23.1	2.3	5.6	12.9	41.1	89.9	99.4	3.75	23.9	2.4		
		5.3	12.3	60	1.9	4.5	42.3	85.6	94.5	3.75	22.8	2.3	3.3	7.6	47.4	95.8	103.8	3.84	24.9	2.5	5.6	12.9	50.0	100.8	109.2	3.90	25.8	2.6		
		5.3	12.3	75	1.9	4.3	54.5	90.5	100.5	3.85	23.5	2.5	3.2	7.3	61.0	101.3	110.3	3.95	25.6	2.7	5.4	12.4	64.4	106.5	116.1	4.00	26.6	2.8		
		5.3	12.3	90	1.9	4.3	66.9	95.2	104.2	3.93	24.2	2.9	3.2	7.3	74.9	106.5	114.4	4.02	26.4	3.1	5.4	12.4	79.1	112.0	120.4	4.08	27.4	3.2		
70	10	1.6	3.7	40	1.9	4.5	27.9	61.4	74.4	4.56	13.5	7.0	3.3	7.6	31.3	68.7	81.7	4.67	14.7	7.4	5.6	12.9	33.1	72.3	86.0	4.74	15.2	7.7		
		1.6	3.7	50	1.9	4.5	35.1	74.7	88.0	4.77	15.7	7.5	3.3	7.6	39.3	83.5	96.6	4.88	17.1	7.9	5.6	12.9	41.5	87.9	101.7	4.95	17.7	8.2		
		1.6	3.7	60	1.9	4.5	42.6	83.7	96.6	4.95	16.9	7.9	3.3	7.6	47.8	93.6	106.1	5.07	18.5	8.3	5.6	12.9	50.4	98.5	111.7	5.14	19.1	8.6		
		1.6	3.7	75	1.9	4.3	54.9	88.5	102.7	5.09	17.4	8.6	3.2	7.3	61.5	99.0	112.8	5.21	19.0	9.0	5.4	12.4	65.0	104.1	118.7	5.28	19.7	9.4		
		1.6	3.7	90	1.9	4.3	67.4	93.0	106.6	5.2	17.9	9.8	3.2	7.3	75.5	104.1	117.0	5.3	19.6	10.4	5.4	12.4	79.8	109.5	123.2	5.39	20.3	10.8		
	16	3.4	7.9	40	1.9	4.5	27.8	61.6	73.5	4.28	14.4	5.0	3.3	7.6	31.2	68.9	80.8	4.38	15.7	5.2	5.6	12.9	32.9	72.5	85.0	4.44	16.3	5.5		
		3.4	7.9	50	1.9	4.5	34.9	74.9	86.9	4.47	16.8	5.3	3.3	7.6	39.1	83.8	95.5	4.58	18.3	5.6	5.6	12.9	41.3	88.1	100.5	4.64	19.0	5.8		
		3.4	7.9	60	1.9	4.5	42.5	83.9	95.5	4.64	18.1	5.6	3.3	7.6	47.6	93.9	104.9	4.75	19.8	5.9	5.6	12.9	50.2	98.8	110.4	4.82	20.5	6.1		
		3.4	7.9	75	1.9	4.3	54.7	88.7	101.5	4.77	18.6	6.1	3.2	7.3	61.3	99.3	111.5	4.88	20.3	6.4	5.4	12.4	64.7	104.4	117.4	4.95	21.1	6.6		
		3.4	7.9	90	1.9	4.3	67.1	93.3	105.3	4.9	19.2	7.0	3.2	7.3	75.2	104.4	115.7	5.0	21.0	7.4	5.4	12.4	79.4	109.8	121.7	5.05	21.7	7.6		
	21	5.2	12.1	40	1.9	4.5	27.8	62.1	73.8	4.20	14.8	3.3	3.3	7.6	31.2	69.4	81.1	4.30	16.1	3.5	5.6	12.9	32.9	73.0	85.3	4.37	16.7	3.6		
		5.2	12.1	50	1.9	4.5	34.9	75.4	87.3	4.39	17.2	3.5	3.3	7.6	39.1	84.4	95.8	4.50	18.8	3.7	5.6	12.9	41.3	88.8	100.9	4.56	19.5	3.9		
		5.2	12.1	60	1.9	4.5	42.4	84.5	95.8	4.56	18.5	3.7	3.3	7.6	47.5	94.6	105.3	4.67	20.3	3.9	5.6	12.9	50.2	99.5	110.8	4.74	21.0	4.0		
		5.2	12.1	75	1.9	4.3	54.7	89.4	101.9	4.69	19.1	4.0	3.2	7.3	61.2	100.0	111.9	4.80	20.8	4.2	5.4	12.4	64.7	105.1	117.8	4.87	21.6	4.4		
		5.2	12.1	90	1.9	4.3	67.1	94.0	105.7	4.8	19.7	4.6	3.2	7.3	75.2	105.1	116.1	4.9	21.5	4.9	5.4	12.4	79.4	110.6	122.2	4.96	22.3	5.0		
90	10	1.6	3.7	40	1.9	4.5	28.5	55.5	70.6	5.60	9.9	10.1	3.3	7.6	31.9	62.1	77.5	5.74	10.8	10.6	5.6	12.9	33.7	65.3	81.6	5.82	11.2	11.0		
		1.6	3.7	50	1.9	4.5	35.8	67.4	83.4	5.86	11.5	10.8	3.3	7.6	40.0	75.4	91.6	6.00	12.6	11.3	5.6	12.9	42.3	79.4	96.4	6.08	13.0	11.8		
		1.6	3.7	60	1.9	4.5	43.5	75.6	91.6	6.08	12.4	11.3	3.3	7.6	48.7	84.6	100.6	6.23	13.6	11.9	5.6	12.9	51.4	88.9	105.9	6.32	14.1	12.3		
		1.6	3.7	75	1.9	4.3	56.0	79.9	97.4	6.25	12.8	12.3	3.2	7.3	62.7	89.4	107.0	6.40	14.0	12.9	5.4	12.4	66.3	94.0	112.6	6.49	14.5	13.4		
		1.6	3.7	90	1.9	4.3	68.8	84.0	101.1	6.4	13.2	14.1	3.2	7.3	77.0	94.0	111.0	6.5	14.4	14.8	5.4	12.4	81.3	98.9	116.8	6.62	14.9	15.4		
	16	3.4	7.9	40	1.9	4.5	28.4	55.6	69.8	5.25	10.6	7.1	3.3	7.6	31.8	62.3	76.6	5.38	11.6	7.5	5.6	12.9	33.6	65.5	80.6	5.46	12.0	7.8		
		3.4	7.9	50	1.9	4.5	35.6	67.6	82.5	5.49	12.3	7.6	3.3	7.6	39.9	75.7	90.6	5.62	13.5	8.0	5.6	12.9	42.1	79.6	95.3	5.70	14.0	8.3		
		3.4	7.9	60	1.9	4.5	43.3	75.8	90.6	5.70	13.3	8.0	3.3	7.6	48.5	84.8	99.5	5.84	14.5	8.4	5.6	12.9	51.2	89.2	104.7	5.92	15.1	8.7		
		3.4	7.9	75	1.9	4.3	55.8	80.1	96.3	5.86	13.7	8.7	3.2	7.3	62.5	89.6	105.8	6.00	14.9	9.2	5.4	12.4	66.0	94.3	111.3	6.08	15.5	9.5		
		3.4	7.9	90	1.9	4.3	68.5	84.3	99.9	6.0	14.1	10.0	3.2	7.3	76.7	94.3	109.7	6.1	15.4	10.5	5.4	12.4	81.0	99.2	115.5	6.20	16.0	10.9		
	21	5.2	12.1	40	1.9	4.5	28.4	56.0	70.0	5.16	10.9	4.7	3.3	7.6	31.8	62.7	76.9	5.29	11.9	5.0	5.6	12.9	33.5	65.9	80.9	5.36	12.3	5.2		
		5.2	12.1	50	1.9	4.5	35.6	68.1	82.8	5.39	12.6	5.0	3.3	7.6	39.9	76.2	90.9	5.52	13.8	5.3	5.6	12.9	42.1	80.2	95.7	5.60	14.3	5.5		
		5.2	12.1	60	1.9	4.5	43.3	76.3	90.9	5.60	13.6	5.3	3.3	7.6	48.5	85.4	99.8	5.74	14.9	5.6	5.6	12.9	51.2	89.8	105.1	5.82	15.4	5.8		
		5.2	12.1	75	1.9	4.3	55.7	80.7	96.7	5.75	14.0	5.7	3.2	7.3	62.4	90.3	106.2	5.89	15.3	6.0	5.4	12.4	65.9	95.0	111.7	5.98	15.9	6.3		
		5.2	12.1	90	1.9	4.3	68.4	84.9	100.3	5.9	14.5	6.6	3.2	7.3	76.6	94.9	110.1	6.0	15.8	7.0	5.4	12.4	80.9	99.9	115.9	6.10	16.4	7.2		
110	10	1.6	3.6	40	1.9	4.5	29.1	48.6	66.2	7.15	6.8	13.5	3.3	7.6	32.6	54.3	72.7	7.32	7.4	14.2	5.6	12.9	34.4	57.2	76.5	7.43	7.7	14.8		
		1.6	3.6	50	1.9	4.5	36.5	59.0	78.3	7.47	7.9	14.5	3.3	7.6	40.9	66.1	86.0	7.65	8.6	15.2	5.6	12.9	43.2	69.5	90.5	7.76	8.9	15.8		
		1.6	3.6	60	1.9	4.5	44.4	66.2	86.0	7.76	8.5	15.1	3.3	7.6	49.8	74.0	94.4	7.94	9.3	15.9	5.6	12.9	52.6	77.9	99.4	8.06	9.7	16.6		
		1.6	3.6	75	1.9	4.3	57.2	69.9	91.4	7.97	8.8	16.5	3.2	7.3	64.1	78.2	100.4	8.16	9.6	17.4	5.4	12.4	67.7	82.3	105.7	8.28	9.9	18.0		
		1.6	3.6	90	1.9	4.3	70.3	73.6	94.8	8.1	9.0	19.0	3.2	7.3	78.7	82.3	104.1	8.3	9.9	19.9	5.4	12.4	83.1	86.6	109.6	8.44	10.2	20.7		
	16	3.4	7.7	40	1.9	4.5	29.0	48.7	65.4	6.70	7.3	9.6	3.3	7.6	32.5	54.5	71.9	6.86	7.9	10.1	5.6	12.9	34.3	57.3	75.7	6.96	8.2	10.5		
		3.4	7.7	50	1.9	4.5	36.4	59.2	77.4	7.00	8.5	10.3	3.3	7.6	40.7	66.2	85.0	7.17	9.2	10.8	5.6	12.9	43.0	69.7	89.4	7.27	9.6	11.2		
		3.4	7.7	60	1.9	4.5	44.2	66.4	85.0	7.27	9.1	10.7	3.3	7.6	49.6	74.2	93.3	7.45	10.0	11.3	5.6	12.9	52.3	78.1	98.2	7.56	10.3	11.8		
		3.4	7.7	75	1.9	4.3	57.0	70.1	90.3	7.47	9.4	11.7	3.2	7.3	63.8	78.5	99.2	7.65	10.3	12.3	5.4	12.4	67.4	82.5	104.4	7.76	10.6	12.8		
		3.4	7.7	90	1.9	4.3	69.9	73.8	93.7	7.6	9.7	13.4	3.2	7.3	78.3	82.5	102.9	7.8	10.6	14.1	5.4	12.4	82.7	86.8	108.3	7.91	11.0	14.7		
	21	5.1	11.9	40	1.9	4.5	29.0	49.1	65.7	6.58	7.5	6.3	3.3	7.6	32.5	54.9	72.2	6.74	8.1	6.7	5.6	12.9	34.3	57.7	75.9	6.84	8.4	6.9		
		5.1	11.9	50	1.9	4.5	36.4	59.6	77.6	6.88	8.7	6.8	3.3	7.6	40.7	66.7	85.3	7.05	9.5	7.1	5.6	12.9	43.0	70.2	89.8	7.15	9.8	7.4		
		5.1	11.9	60	1.9	4.5	44.2	66.8	85.3	7.15	9.4	7.1	3.3	7.6	49.5	74.8	93.7	7.32	10.2	7.5	5.6	12.9	52.3	78.7	98.6	7.42	10.6	7.8		
		5.1	11.9	75	1.9	4.3	57.0	70.6	90.7	7.34	9.6	7.7	3.2	7.3	63.8	79.0	99.6	7.52	10.5	8.1	5.4	12.4	67.4	83.1	104.8	7.63	10.9	8.5		
		5.1	11.9	90	1.9	4.3	69.9	74.3	94.1	7.5	9.9	8.9	3.2	7.3	78.3	83.1	103.3	7.7	10.8	9.4	5.4	12.4	82.7	87.4	108.7	7.78	11.2	9.7		

1. It is permissible to run through the shaded areas in transient conditions but it is recommended to avoid extended operation in these areas.
2. Capacity data is based on 15% (by mass) methanol antifreeze solution (multiplier: 485) on the source side and pure water (multiplier: 500) on the load side.
3. Any condition outside this performance table is not allowed to ensure safe and continuous operation.
4. Performance data accurate within ±15%.
5. Unit performance test is run without hot water generation.
6. Capacity data includes the load-side internal pump power but not the source-side pump power and it does not reflect pump power correction for AHRI/ISO conditions.
7. Performance data is based upon the lower voltage of dual voltage rated units.
8. Interpolation of unit performance data is permissible; extrapolation is not.
9. Performance data is a result of lab testing and is not related to warranty.
10. Due to variations in installation, actual unit performance may vary from the tabulated data.

General Information

Packaged Geothermal Heat Pumps shall be constructed based on all information to follow. Equipment shall be completely assembled, piped, internally wired, charged with refrigerant, and tested.

Units shall be supplied factory built, capable of operating over an entering water temperature range from 25° to 120°F (-3.9° to 48.9°C) (extended data tables; Heating 25°F – 90°F, cooling 50°F – 110°F) as standard. All equipment listed in this section must be rated and certified in accordance with Air-Conditioning, Heating and Refrigeration Institute/International Standards Organization (AHRI/ISO 13256-1). All equipment must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada, by Intertek Testing Laboratories (ETL). The units shall have AHRI/ISO and ETL-US-C labels.

All units shall be quality tested by factory run testing under normal operating conditions as described herein. Quality control system shall automatically perform via computer: helium leak check of both the water and refrigerant circuits, pressure tests, double evacuation and accurately charged system, perform detailed heating and cooling mode tests, and quality cross check all operational and test conditions to pass/fail criteria.

Basic Construction

The heat pumps shall be fabricated from powder coated heavy gauge galvanized steel. This corrosion protection system shall meet the stringent 1000 hour salt spray test per ASTM B117.

All units must have a minimum of three access panels for serviceability of compressor compartment. See IOM manuals for service clearances. All interior surfaces shall be lined with acoustic type closed cell, non-porous, non-fibrous Nitrile/Vinyl insulation. Standard cabinet panel insulation must meet UL-1995 and ASTM E 84/UL 723 Flame 25 / Smoke 50 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. The insulation shall be UL-GREENGUARD certified under the Children and Schools classification and approved by the Factory Mutual Research Corporation. For added protection it shall be protected with an EPA-approved antimicrobial agent.

Cabinets 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. Supply and return water connections shall be copper MPT fittings, and shall be securely mounted flush to the cabinet allowing for connection to a flexible hose without the use of a back-up wrench. All water connections and electrical knockouts must be in the compressor compartment as to not interfere with the serviceability of unit.

The unit shall be supplied with extended range internal insulation. All internal water lines and the evaporator side refrigeration tubing shall all have closed cell EPDM insulation. The water to refrigerant brazed plate heat exchangers shall have 8lb. Envelo-Seal rigid closed cell spray foam applied.

Option: Sound attenuating compressor blanket for additional noise reduction.

Refrigerant Circuit

All units shall contain R-410A sealed refrigerant circuit including a high efficiency scroll compressor designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, reversing valve, brazed plate stainless steel refrigerant to water heat exchangers (source and load), and safety controls (see controls section). Refrigerant access ports shall be factory installed on high and low pressure refrigerant lines to facilitate field service. All units have factory installed bidirectional filter/drier for added moisture protection.

Hermetic compressors shall be internally sprung. The compressor shall have a dual level vibration isolation system. The compressor will be mounted on EPDM rubber grommets secured to a large heavy gauge compressor mounting plate, which is then mounted to the cabinet base with specially engineered sound-tested elastomeric foam vibration isolation pads for maximized vibration attenuation. Compressor shall have thermal overload protection. Compressor discharge and suction refrigerant lines to have shock loops directly at compressor for additional vibration elimination.

Refrigerant to water heat exchangers shall be of brazed plate stainless steel design, rated to withstand 625 PSIG (4309 kPa) working refrigerant pressure and 500 PSIG (3445 kPa) working water pressure, and designed to have a low water pressure drop (max.10ft.hd.).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced types with external equalizer for optimum refrigerant metering. The expansion valves must be bidirectional without the use of check valves. Units shall be designed and tested for operating ranges of entering water temperatures from 25° to 120°F (-3.9° to 48.9°C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function.

Option: The unit will be supplied with a cupronickel coaxial water to refrigerant heat exchanger (source heat exchanger only).

Option: The unit shall be supplied with a hot water generator (desuperheater) heat exchanger, which shall be double wall and vented.

Electrical

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer, 24 volt activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation and control. Reversing valve wiring shall be routed through this electronic controller. 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 aquastat/sensor.

Source pump high voltage terminal block including minimum 7amp circuit breaker protection to be provided for field wiring of source pumps.

A detachable low voltage thermostat terminal strip with screw terminals to be provided for field wiring.

Solid State Control Board System
Units shall have a solid-state control system. The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall interface with a heat pump type 24V thermostat. The control system shall have the following features:

- Anti-short cycle time delay (5 minutes) on compressor operation.
- Random start on power up mode.
- Low voltage protection.
- High voltage protection.
- Unit shutdown on high or low refrigerant pressures.
- Unit shutdown on low temperature (low source coil temp OR low air coil temp).
- Condensate overflow electronic protection.
- Option to reset unit at thermostat or disconnect (soft or hard reset functions)
- Fault retry logic. The same fault trip has to occur 3 times before a hard lockout. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur. A soft or hard reset will restart the unit.
- Ability to defeat time delays for servicing (test mode).
- Light emitting diode (LED) on circuit board to indicate high pressure, low pressure, low/high voltage, low water/air temperature, condensate overflow, high discharge gas temperature, faulty temperature sensor(s), and control voltage status.
- The low-pressure switch shall not be monitored for the first 90 seconds after a compressor start command to prevent nuisance safety trips.
- 24V output to cycle a motorized water valve or other device with compressor contactor.
- Water coil (evaporator) low temperature sensing selectable for water or anti-freeze.
- High discharge gas temperature sensing and protection.
- Smart desuperheater operation and logic to eliminate any heat transfer from the water tank to the source loop during cooling mode.

Revision Table

Date	Description of Revision	Page
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