



Geothermal Heat Pump Systems



Model HWW
036 - 120
60 Hz R-410A

Due to ongoing product improvements, design, specifications, performance data and material subject to change without notice.

SUBMITTAL DATA

Unit Designation _____
Job Name _____
Architect _____
Engineer _____
Contractor _____

PERFORMANCE DATA

Cooling Capacity _____ BTUH
EER _____
Heating Capacity _____ BTUH
COP _____
Ambient Air _____ °F
Entering Water Temp (Cooling) _____ °F
Entering Air Temp (Cooling) _____ °F
Entering Water Temp (Heating) _____ °F
Entering Air Temp (Heating) _____ °F
Airflow _____ CFM
Fan Speed or Motor RPM/Turns _____
Operating Weight _____ lb.

ELECTRICAL DATA

Power Supply _____ Volts Phase Hz
Minimum Circuit Ampacity _____
Maximum Overcurrent Protection _____

HEAT CONTROLLER, INC.

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THE QUALITY LEADER IN CONDITIONING AIR

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THE MODULAR WATER-TO-WATER (HWW) SERIES

The HWW water-to-water series offers high efficiency and high capacity with advanced features, quiet operation and application flexibility at competitive prices. The HWW series can be used for radiant floor heating, snow/ice melt, chilled water for fan coils, industrial process control, potable hot water generation*, hot/chilled water for make-up air, and many other types of HVAC and industrial applications that require cost effective heated or chilled water.

The (HWW) series exceeds ASHRAE 90.1 efficiencies, and also uses R-410A zero ozone depletion refrigerant, making it an extremely environmentally-friendly option.

The HWW series provides high capacity in a small footprint, which saves mechanical room space. The HWW has an extended range refrigerant circuit (refrigerant and water circuit insulation is standard), capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Standard features are many. Microprocessor controls, galvanized steel cabinet, polyester powder coat paint and TXV refrigerant metering device are just some of the features of the flexible HWW series. The uniquely-designed coaxial heat exchangers are designed for many years of reliable operation.

Heat Controller's dual-isolated compressor mounting and heavy gauge steel cabinet helps make the HWW series the quietest water-to-water units on the market. Scroll compressor(s) operate quietly, and provide part load operation (size 100) for capacity control. For ease of installation and service, access to the refrigeration service and electrical control panel is located at the front of the unit, allowing units to be installed side-by-side for large capacity applications (see below).

The HWW Series water-to-water heat pumps are designed to meet the challenges of today's HVAC demands with a high efficiency, high value solution.

UNIT FEATURES

- Size 036, 060 and 120
- Copeland scroll compressor(s)
- Exclusive single side service access (front of unit) allows multiple units to be installed side-by-side for large capacity installations
- Top water connections, staggered for ease of manifolding multiple units
- Exceeds ASHRAE 90.1 efficiencies
- Heavy gauge galvanized steel construction with polyester powder coat paint and front access panel
- Insulated compressor compartment
- Small footprint
- TXV metering devices
- Extended range (20 to 110°F, -6.7 to 43.3°C) operation
- Compressor "run" and "fault" lights on the front of the cabinet
- Seven safeties standard
- Copper or Cupro-Nickel heat exchanger options

*Requires field supplied secondary heat exchanger.

*Requires field supplied secondary heat exchanger.

Selection Procedure

Reference Calculations

<p>Heating</p> $LWT = EWT - \frac{HE}{GPM \times 500}$	<p>Cooling</p> $LWT = EWT + \frac{HR}{GPM \times 500}$
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Legend and Glossary of Abbreviations

<p>BTUH = BTU(British Thermal Unit) per hour CFM = airflow, cubic feet/minute COP = coefficient of performance = BTUH output/BTUH input DB = dry bulb temperature (°F) EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb) EER = energy efficiency ratio = BTUH output/Watt input EPT = external pipe thread ESP = external static pressure (inches w.g.) EWT = entering water temperature GPM = water flow in U.S. gallons/minute HE = total heat of extraction, BTUH HC = air heating capacity, BTUH HR = total heat of rejection, BTUH</p>	<p>HWC = hot water generator (desuperheater) capacity, Mbtuh IPT = internal pipe thread KW = total power unit input, kilowatts LAT = leaving air temperature, °F LC = latent cooling capacity, BTUH LWT = leaving water temperature, °F MBTUH = 1000 BTU per hour S/T = sensible to total cooling ratio SC = sensible cooling capacity, BTUH TC = total cooling capacity, BTUH WB = wet bulb temperature (°F) WPD = waterside pressure drop (psi & ft. of hd.)</p>
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Conversion Table - to convert inch-pound (English) to SI (Metric)

Water Flow	Water Pressure Drop
Water Flow (L/s) = gpm x 0.0631	PD (kPa) = PD (ft of hd) x 2.99

Selection Procedure

Step 1: Determine the actual heating and/or cooling loads at the applicable source (building loop) water temperature/ flow rate and load water temperature/flow rate. The source heat exchanger is the condenser in cooling/ evaporator in heating; the load heat exchanger is the evaporator in cooling/condenser in heating.

Step 2: Obtain the following design parameters: Entering source/load water temperature, source/load water flow rate in GPM and water flow pressure drop. Water flow rate is generally between 2.25 and 3.00 GPM/ton for closed loop (boiler/tower and geothermal) systems, and between 1.5 and 2.0 GPM/ton for open loop (well water) systems. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. Go to the appropriate tables and find the proper indicated water flow and water temperature.

Step 3: Determine application requirements. Water-to-water applications are almost always designed for a particular installation, which will change how the data tables are used for unit selection. For example, a water-to-water unit used for radiant floor heating on a geothermal closed loop is significantly different in unit selection from a water-to-water unit on a boiler/tower application used for generating chilled water for fan coil units. It is especially important to note that the load water flow rate must be maintained above minimum flow rates as shown in the data tables for proper refrigerant circuit operation and unit longevity. For example, most radiant floor applications require buffer (storage) tanks because the flow rate through the floor is usually lower than the minimum flow rate for the water-to-water unit. Therefore, selection of the heat pump is dependent upon maintaining a certain tank temperature and unit load flow rate. There would be a pump between the heat pump and the buffer tank, and a pump(s) between the buffer tank and radiant floor to maintain design flow rate on both sides.

Step 4: Enter tables at the design source water temperature and flow rate. Choose the appropriate load water temperature and flow rate. Read the total heating or cooling capacities (Note: interpolation is permissible; extrapolation is not).

Step 5: If the units selected are not within 10% of the load calculations, then review what effect changing the GPM and water temperature would have on the capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure.

Example Equipment Selection for Heating

Step 1 Load Determination:
Assume we have determined that the application will be heating only (radiant floor) for a large commercial warehouse, and that the appropriate heating load at design conditions is as follows:

Total heating210,000 BTUH

Step 2 Design Conditions:

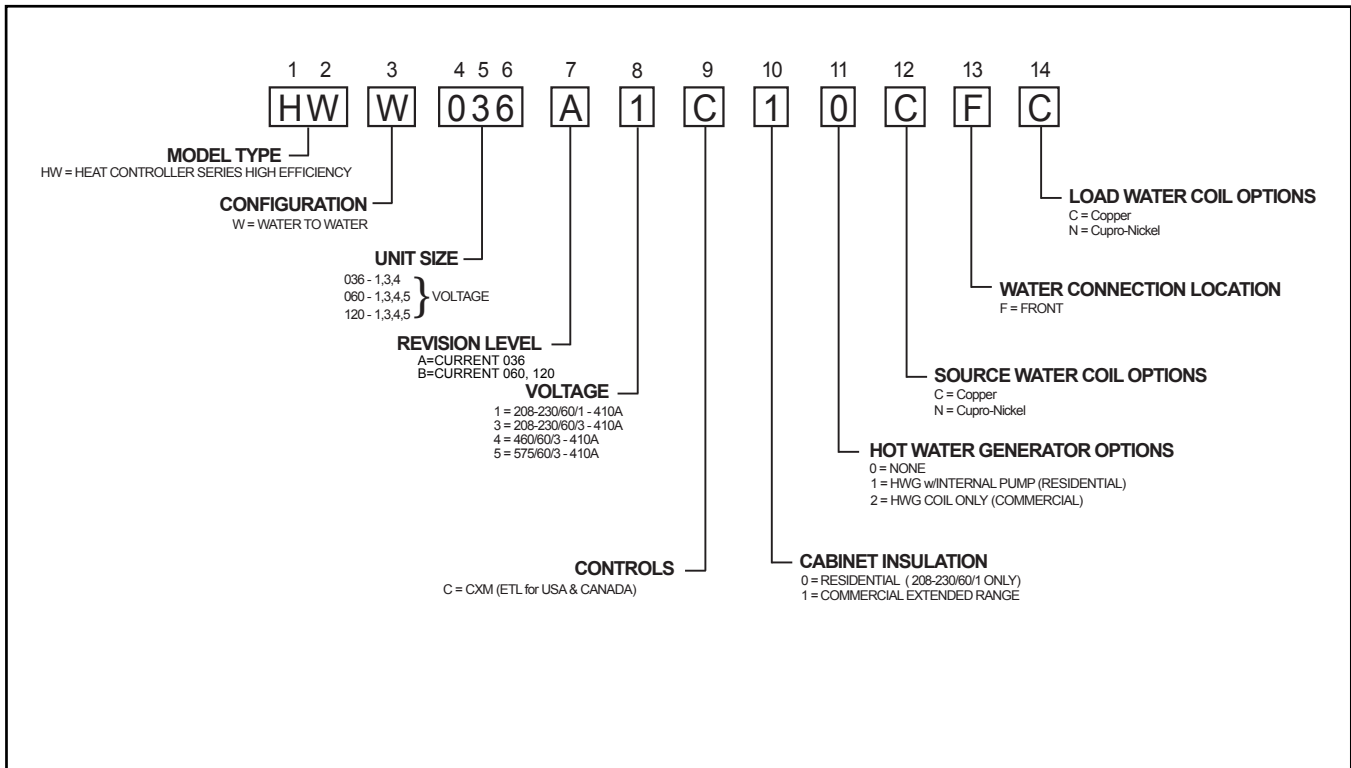
Entering source temperature 30°F (geothermal closed loop)
Source flow rate..... 53 GPM
Entering load temperature 100°F
Load flow rate 53 GPM

Steps 3, 4, 5 HP Selection:
We enter the tables at design source water temperature and flow rate, and select the appropriate load water temperature and flow rate. A HWW120 at design conditions supplies 211,100 BTUH, which meets the design heating load requirement.

HWW HIGH EFFICIENCY Water-to-Water R-410A Heat Pumps

Entering Water Temperature Range: 20 - 110°F (-6.7 - 43.3°C)
 Sizes 036, 060 & 120

HWW Model Structure



Basic Unit Description:

The basic unit price includes sealed heat pump refrigerant circuit.

- **Cabinet**- Heavy gauge galvanized steel with polyester powder coat paint – multiple removable panels for service access – interior surfaces lined with 1/2 inch dual density acoustic type glass fiber insulation – IPT water connections – high and low voltage knockouts.
- **Controls** - Solid state control system with seven standard safeties including anti-short cycle, over voltage, under voltage, high refrigerant pressure, loss of refrigerant charge, low source water temperature, low load water temperature – run and fault lights on cabinet exterior – alarm contact for remote monitoring of fault condition (field selectable for dry contact or 24vac).
- **Refrigerant Circuit** - Compressor(s) – coaxial source and load heat exchangers – reversing valve(s) – filter driers(s) – thermal expansion valve(s) – high pressure and loss of charge switches – high and low side Schrader ports for service – non-ozone depleting R-410A refrigerant.

- **Compressor(s)** - High efficiency scroll compressor - internally sprung and externally isolated using dual vibration isolation system for quiet operation. Mounting system includes rubber grommet mounts between the compressor and a mounting tray then another set of rubber mounts between the mounting tray and unit base pan.
- **Reversing Valve** - 4-way pilot operated, solenoid activated in cooling mode.
- **Safety Agency Listing** - Product is ETL Listed.
- **Application** - May be applied in water loop heat pump, ground water heat pump, and ground loop heat pump applications.

Performance Data
ARI/ASHRAE/ISO 13256-2

HWW 036-120 Performance Data ASHRAE/ARI/ISO 13256-2 60Hz English (I-P) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling		Heating		Cooling		Heating		Cooling		Heating	
	Indoor 53.6°F Outdoor 86°F		Indoor 104°F Outdoor 68°F		Indoor 53.6°F Outdoor 59°F		Indoor 104°F Outdoor 50°F		Indoor 53.6°F Outdoor 77°F		Indoor 104°F Outdoor 32°F	
	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
HWW036A	32,300	14.60	43,100	4.90	36,200	23.10	35,300	4.00	33,300	16.40	27,400	3.10
HWW060B	52,800	14.30	72,700	4.70	56,600	20.30	60,300	4.00	55,600	16.20	48,500	3.10
HWW120B	105,600	14.10	145,400	4.60	113,200	20.10	120,600	3.90	111,200	16.00	97,000	3.10

HWW 036-120 Performance Data ASHRAE/ARI/ISO 13256-2 60Hz Metric (SI) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling		Heating		Cooling		Heating		Cooling		Heating	
	Indoor 12°C Outdoor 30°C		Indoor 40°C Outdoor 20°C		Indoor 12°C Outdoor 15°C		Indoor 40°C Outdoor 10°C		Indoor 12°C Outdoor 25°C		Indoor 40°C Outdoor 0°C	
	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP	Capacity Watts	EER W/W	Capacity Watts	COP
HWW036A	9,472	4.28	12,639	4.90	10,616	6.77	10,352	4.00	9,765	4.81	8,035	3.10
HWW060B	15,484	4.19	21,320	4.70	16,598	5.95	17,683	4.00	16,305	4.75	14,223	3.10
HWW120B	30,968	4.13	42,639	4.60	33,196	5.89	35,367	3.90	32,610	4.69	28,446	3.10

**Performance Data
Selection Notes**

For operation in the shaded area when water is used in lieu of an anti-freeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level such that the LWT is maintained above 40°F [4.4°C] when the JW3 jumper is not clipped (see example below). This is due to the potential of the refrigerant temperature being as low as 32°F [0°C] with 40°F [4.4°C] LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. JW3 should never be clipped for standard range equipment or systems without antifreeze.

Example:

At 50°F EWT (Entering Water Temperature) and 1.5 gpm/ton, a 3 ton unit has a HE of 22,500 Btuh. To calculate LWT, rearrange the formula for HE as follows:

HE = TD x GPM x 500, where HE = Heat of Extraction (Btuh); TD = temperature difference (EWT - LWT) and GPM = U.S. Gallons per Minute.

TD = HE / (GPM x 500)

TD = 22,500 / (1.5 x 500)

TD = 10°F

LWT = EWT - TD

LWT = 50 - 10 = 40°F

In this example, as long as the EWT does not fall below 50°F, the system will operate as designed. For EWTs below 50°F, higher flow rates will be required (open loop systems, for example, require at least 2 gpm/ton when EWT is below 50°F).

GPM				Flow 70.0 GPM							
WWT °F	COP	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT °F	COP	WPD		
		PSI	FT						PSI	FT	
68.0	4.6	3.44	7.94	219.6	13.67	172.9	66.3	4.7	6.18	14.28	
87.4	3.4	3.15	7.28	200.7	16.95	142.9	85.7	3.5	5.67	13.09	
77	68.5	4.5	3.44	7.94	229.8	13.72	183.0	66.6	4.9	6.18	14.28
63	87.7	3.5	3.15	7.28	209.4	17.01	151.4	86.0	3.6	5.67	13.09
0.3	68.7	4.6	3.44	7.94	235.0	13.75	188.1	66.7	5.0	6.18	14.28
9.3	87.8	3.6	3.15	7.28	213.8	17.03	155.7	86.1	3.7	5.67	13.09
3.0	69.1	5.1	3.44	7.94	251.4	14.84	200.7	67.2	5.0	6.18	14.28
4.7	88.4	3.8	3.15	7.28	229.8	17.14	171.3	86.6	3.9	5.67	13.09
6.6	107.7	3.0	2.89	6.68	208.9	19.61	142.0	106.0	3.1	5.32	12.28
0	69.6	5.0	3.44	7.94	262.2	14.85	211.5	67.5	5.2	6.18	14.28
	88.8	4.0	3.15	7.28	239.6	17.21	180.8	86.8	4.1	5.67	13.09
	108.0	3.1	2.89	6.68	217.2	19.68	150.0	106.2	3.2	5.32	12.28
	69.8	5.1	3.44	7.94	267.6	14.85	216.9	67.6	5.3	6.18	14.28
	89	4.0	3.15	7.28	244.5	17.25	185.6	87.0	4.2	5.67	13.09
	3.2	2.89	6.68	221.3	19.72	154.1	106.3	3.3	5.32	12.28	
	5.6	3.44	7.94	277.2	14.86	226.5	67.9	5.5	6.18	14.28	
		3.15	7.28	257.1	17.35	197.9	87.3	4.3	5.67	13.09	
		2.89	6.68	236.8	19.85	169.1	106.8	3.5	5.32	12.28	
		7.94	288.4	14.87	237.7	68.2	5.7	6.18	14.28		
				17.44	208.2	87					

Performance Data
HWW036 (60Hz I-P) - Heating

SOURCE				LOAD																									
EWT	Flow			EWT	Flow 4.5 GPM							Flow 6.8 GPM							Flow 9.0 GPM										
	F	GPM	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD					
PSI			FT	PSI						FT	PSI						FT	PSI						FT	PSI	FT			
20	9.0	7.7	17.9	60	26.1	1.53	20.9	71.6	5.0	0.5	1.2	26.4	1.45	21.5	67.8	5.3	1.3	3.1	26.5	1.41	21.7	65.9	5.5	2.5	5.8				
				80	25.7	1.96	19.0	91.4	3.8	0.4	0.9	25.9	1.86	19.6	87.7	4.1	1.2	2.8	25.9	1.81	19.8	85.8	4.2	2.3	5.4				
				100	25.0	2.56	16.3	111.1	2.9	0.3	0.7	25.0	2.42	16.7	107.4	3.0	1.1	2.5	24.9	2.36	16.9	105.5	3.1	2.1	4.9				
30	4.5	1.7	4.0	60	27.1	1.54	21.9	72.1	5.2	0.5	1.2	27.5	1.45	22.5	68.1	5.5	1.3	3.1	27.6	1.42	22.7	66.1	5.7	2.5	5.8				
				80	26.7	1.97	20.0	91.9	4.0	0.4	0.9	27.0	1.86	20.6	88.0	4.2	1.2	2.8	27.0	1.81	20.8	86.0	4.4	2.3	5.4				
				100	26.1	2.56	17.3	111.6	3.0	0.3	0.7	26.1	2.43	17.8	107.7	3.2	1.1	2.5	26.0	2.36	18.0	105.8	3.2	2.1	4.9				
				120	25.1	3.32	13.8	131.2	2.2	0.2	0.5	24.9	3.14	14.2	127.4	2.3	0.9	2.1	24.7	3.06	14.3	125.5	2.4	1.8	4.3				
	6.8	4.1	9.4	60	28.4	1.54	23.2	72.6	5.4	0.5	1.2	28.8	1.46	23.8	68.5	5.8	1.3	3.1	28.9	1.42	24.1	66.4	6.0	2.5	5.8				
				80	27.9	1.97	21.2	92.4	4.2	0.4	0.9	28.2	1.87	21.8	88.4	4.4	1.2	2.8	28.2	1.82	22.0	86.3	4.6	2.3	5.4				
				100	27.1	2.57	18.3	112.0	3.1	0.3	0.7	27.2	2.43	18.9	108.0	3.3	1.1	2.5	27.1	2.37	19.0	106.0	3.4	2.1	4.9				
				120	25.9	3.33	14.6	131.5	2.3	0.2	0.5	25.7	3.15	15.0	127.6	2.4	0.9	2.1	25.6	3.07	15.1	125.7	2.4	1.8	4.3				
	9.0	7.1	16.4	60	29.2	1.54	23.9	73.0	5.5	0.5	1.2	29.6	1.46	24.6	68.8	5.9	1.3	3.1	29.7	1.42	24.8	66.6	6.1	2.5	5.8				
				80	28.6	1.98	21.9	92.7	4.2	0.4	0.9	28.9	1.87	22.5	88.6	4.5	1.2	2.8	28.9	1.82	22.7	86.4	4.7	2.3	5.4				
				100	27.7	2.58	18.9	112.3	3.2	0.3	0.7	27.8	2.44	19.5	108.2	3.3	1.1	2.5	27.7	2.37	19.6	106.2	3.4	2.1	4.9				
				120	26.4	3.34	15.0	131.7	2.3	0.2	0.5	26.2	3.16	15.4	127.8	2.4	0.9	2.1	26.1	3.08	15.6	125.8	2.5	1.8	4.3				
40	4.5	1.5	3.5	60	30.0	1.55	24.7	93.3	5.7	0.4	0.9	30.4	1.46	25.4	89.0	6.1	1.2	2.8	30.5	1.42	25.7	86.8	6.3	2.3	5.4				
				80	29.0	2.26	21.3	112.9	3.8	0.3	0.7	29.2	2.14	21.9	108.7	4.0	1.1	2.5	29.3	2.08	22.2	106.5	4.1	2.1	4.9				
				100	28.6	2.58	19.8	132.7	3.2	0.2	0.5	28.7	2.44	20.3	128.5	3.4	0.9	2.1	28.6	2.38	20.5	126.4	3.5	1.8	4.3				
				120	31.4	1.55	26.1	74.0	5.9	0.5	1.2	31.9	1.47	26.9	69.5	6.4	1.3	3.1	32.0	1.43	27.2	67.1	6.6	2.5	5.8				
	6.8	3.7	8.6	60	30.8	1.99	24.0	93.7	4.5	0.4	0.9	31.1	1.88	24.7	89.2	4.8	1.2	2.8	31.2	1.83	24.9	86.9	5.0	2.3	5.4				
				80	29.7	2.59	20.9	113.2	3.4	0.3	0.7	29.9	2.45	21.5	108.9	3.6	1.1	2.5	29.8	2.38	21.7	106.6	3.7	2.1	4.9				
				100	28.3	3.35	16.9	132.6	2.5	0.2	0.5	28.2	3.17	17.4	128.4	2.6	0.9	2.1	28.1	3.09	17.6	126.2	2.7	1.8	4.3				
				120	32.2	1.55	26.9	74.3	6.1	0.5	1.2	32.7	1.47	27.7	69.7	6.5	1.3	3.1	32.9	1.43	28.0	67.3	6.7	2.5	5.8				
	9.0	6.5	15.1	60	31.5	1.99	24.7	94.0	4.6	0.4	0.9	31.9	1.89	25.4	89.4	5.0	1.2	2.8	31.9	1.84	25.7	87.1	5.1	2.3	5.4				
				80	30.4	2.59	21.5	113.5	3.4	0.3	0.7	30.5	2.45	22.2	109.0	3.6	1.1	2.5	30.5	2.39	22.4	106.8	3.7	2.1	4.9				
				100	28.9	3.36	17.4	132.8	2.5	0.2	0.5	28.8	3.18	17.9	128.5	2.7	0.9	2.1	28.7	3.09	18.1	126.4	2.7	1.8	4.3				
				120	28.9	3.36	17.4	127.7	2.5	0.2	0.5	28.8	3.18	17.9	125.3	2.7	0.9	2.1	28.7	3.09	18.1	124.0	2.7	1.8	4.3				
50	4.5	1.5	3.1	60	35.9	1.55	30.6	76.0	6.8	0.5	1.2	36.5	1.47	31.5	70.8	7.3	1.3	3.1	36.7	1.43	31.8	68.2	7.5	2.5	5.8				
				80	35.0	2.00	28.2	95.6	5.1	0.4	0.9	35.5	1.89	29.0	90.5	5.5	1.2	2.8	35.6	1.84	29.3	87.9	5.7	2.3	5.4				
				100	33.8	2.60	24.9	115.0	3.8	0.3	0.7	34.0	2.46	25.6	110.1	4.1	1.1	2.5	34.0	2.39	25.9	107.6	4.2	2.1	4.9				
				120	32.2	3.36	20.7	134.3	2.8	0.2	0.5	32.1	3.18	21.3	129.5	3.0	0.9	2.1	32.1	3.09	21.5	127.1	3.0	1.8	4.3				
	6.75	3.4	7.8	130	OPERATION NOT RECOMMENDED								31.1	3.59	18.8	139.2	2.5	0.8	1.9	30.9	3.50	19.0	136.9	2.6	1.7	3.9			
				60	37.7	1.56	32.4	76.8	7.1	0.5	1.2	38.4	1.48	33.3	71.4	7.6	1.3	3.1	38.5	1.44	33.6	68.6	7.9	2.5	5.8				
				80	36.6	2.00	29.8	96.3	5.4	0.4	0.9	37.1	1.89	30.7	91.0	5.7	1.2	2.8	37.3	1.84	31.0	88.3	5.9	2.3	5.4				
				100	35.2	2.60	26.3	115.6	4.0	0.3	0.7	35.5	2.46	27.1	110.5	4.2	1.1	2.5	35.5	2.40	27.3	107.9	4.3	2.1	4.9				
	9.0	6.0	13.9	120	33.4	3.37	21.9	134.8	2.9	0.2	0.5	33.4	3.19	22.5	129.9	3.1	0.9	2.1	33.3	3.10	22.7	127.4	3.1	1.8	4.3				
				130	OPERATION NOT RECOMMENDED								32.2	3.60	19.9	139.5	2.6	0.8	1.9	32.0	3.51	20.1	137.1	2.7	1.7	3.9			
				60	38.6	1.56	33.3	77.2	7.2	0.5	1.2	39.3	1.48	34.3	71.7	7.8	1.3	3.1	39.5	1.44	34.6	68.8	8.0	2.5	5.8				
				80	37.5	2.01	30.7	96.7	5.5	0.4	0.9	38.0	1.90	31.6	91.3	5.9	1.2	2.8	38.2	1.85	31.9	88.5	6.1	2.3	5.4				
100	2.61	27.1	116.0	4.0	0.3	0.7	120	36.0	2.61	27.1	116.0	4.0	0.3	0.7	36.3	2.47	27.9	110.8	4.3	1.1	2.5	36.3	2.40	28.1	108.1	4.4	2.1	4.9	
							130	OPERATION NOT RECOMMENDED								34.1	3.19	23.2	130.1	3.1	0.9	2.1	34.0	3.11	23.4	127.6	3.2	1.8	4.3
							120	34.0	3.37	22.5	135.1	3.0	0.2	0.5	34.1	3.19	23.2	130.1	3.1	0.9	2.1	34.0	3.11	23.4	127.6	3.2	1.8	4.3	
							130	OPERATION NOT RECOMMENDED								32.8	3.61	20.5	139.7	2.7	0.8	1.9	32.6	3.52	20.6	137.3	2.7	1.7	3.9

Table Continued on Next Page

Interpolation is permissible, extrapolation is not
All performance data is based upon the lower voltage of dual voltage rated units
All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
Operation below 40F EWT is based upon 15% antifreeze solution
See performance data notes for operation in the shaded areas
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

**Performance Data
HWW036 (60Hz I-P) - Heating**

Continued From Previous Page

SOURCE				LOAD																								
EWT	Flow			EWT	Flow 4.5 GPM					Flow 6.8 GPM					Flow 9.0 GPM													
	F	GPM	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD		HC Mbtuh	Power KW	HE Mbtuh	LWT F	COP	WPD				
PSI			FT	PSI						FT	PSI						FT	PSI						FT				
20	9.0	7.7	17.9	60	26.1	1.53	20.9	71.6	5.0	0.5	1.2	26.4	1.45	21.5	67.8	5.3	1.3	3.1	26.5	1.41	21.7	65.9	5.5	2.5	5.8			
				80	25.7	1.96	19.0	91.4	3.8	0.4	0.9	25.9	1.86	19.6	87.7	4.1	1.2	2.8	25.9	1.81	19.8	85.8	4.2	2.3	5.4			
				100	25.0	2.56	16.3	111.1	2.9	0.3	0.7	25.0	2.42	16.7	107.4	3.0	1.1	2.5	24.9	2.36	16.9	105.5	3.1	2.1	4.9			
30	4.5	1.7	4.0	60	27.1	1.54	21.9	72.1	5.2	0.5	1.2	27.5	1.45	22.5	68.1	5.5	1.3	3.1	27.6	1.42	22.7	66.1	5.7	2.5	5.8			
				80	26.7	1.97	20.0	91.9	4.0	0.4	0.9	27.0	1.86	20.6	88.0	4.2	1.2	2.8	27.0	1.81	20.8	86.0	4.4	2.3	5.4			
				100	26.1	2.56	17.3	111.6	3.0	0.3	0.7	26.1	2.43	17.8	107.7	3.2	1.1	2.5	26.0	2.36	18.0	105.8	3.2	2.1	4.9			
				120	25.1	3.32	13.8	131.2	2.2	0.2	0.5	24.9	3.14	14.2	127.4	2.3	0.9	2.1	24.7	3.06	14.3	125.5	2.4	1.8	4.3			
	6.8	4.1	9.4	60	28.4	1.54	23.2	72.6	5.4	0.5	1.2	28.8	1.46	23.8	68.5	5.8	1.3	3.1	28.9	1.42	24.1	66.4	6.0	2.5	5.8			
				80	27.9	1.97	21.2	92.4	4.2	0.4	0.9	28.2	1.87	21.8	88.4	4.4	1.2	2.8	28.2	1.82	22.0	86.3	4.6	2.3	5.4			
				100	27.1	2.57	18.3	112.0	3.1	0.3	0.7	27.2	2.43	18.9	108.0	3.3	1.1	2.5	27.1	2.37	19.0	106.0	3.4	2.1	4.9			
				120	25.9	3.33	14.6	131.5	2.3	0.2	0.5	25.7	3.15	15.0	127.6	2.4	0.9	2.1	25.6	3.07	15.1	125.7	2.4	1.8	4.3			
	9.0	7.1	16.4	60	29.2	1.54	23.9	73.0	5.5	0.5	1.2	29.6	1.46	24.6	68.8	5.9	1.3	3.1	29.7	1.42	24.8	66.6	6.1	2.5	5.8			
				80	28.6	1.98	21.9	92.7	4.2	0.4	0.9	28.9	1.87	22.5	88.6	4.5	1.2	2.8	28.9	1.82	22.7	86.4	4.7	2.3	5.4			
				100	27.7	2.58	18.9	112.3	3.2	0.3	0.7	27.8	2.44	19.5	108.2	3.3	1.1	2.5	27.7	2.37	19.6	106.2	3.4	2.1	4.9			
				120	26.4	3.34	15.0	131.7	2.3	0.2	0.5	26.2	3.16	15.4	127.8	2.4	0.9	2.1	26.1	3.08	15.6	125.8	2.5	1.8	4.3			
40	4.5	1.5	3.5	60	30.0	1.55	24.7	93.3	5.7	0.4	0.9	30.4	1.46	25.4	89.0	6.1	1.2	2.8	30.5	1.42	25.7	86.8	6.3	2.3	5.4			
				80	29.0	2.26	21.3	112.9	3.8	0.3	0.7	29.2	2.14	21.9	108.7	4.0	1.1	2.5	29.3	2.08	22.2	106.5	4.1	2.1	4.9			
				100	28.6	2.58	19.8	132.7	3.2	0.2	0.5	28.7	2.44	20.3	128.5	3.4	0.9	2.1	28.6	2.38	20.5	126.4	3.5	1.8	4.3			
				120	31.4	1.55	26.1	74.0	5.9	0.5	1.2	31.9	1.47	26.9	69.5	6.4	1.3	3.1	32.0	1.43	27.2	67.1	6.6	2.5	5.8			
	6.8	3.7	8.6	60	30.8	1.99	24.0	93.7	4.5	0.4	0.9	31.1	1.88	24.7	89.2	4.8	1.2	2.8	31.2	1.83	24.9	86.9	5.0	2.3	5.4			
				80	29.7	2.59	20.9	113.2	3.4	0.3	0.7	29.9	2.45	21.5	108.9	3.6	1.1	2.5	29.8	2.38	21.7	106.6	3.7	2.1	4.9			
				100	28.3	3.35	16.9	132.6	2.5	0.2	0.5	28.2	3.17	17.4	128.4	2.6	0.9	2.1	28.1	3.09	17.6	126.2	2.7	1.8	4.3			
				120	32.2	1.55	26.9	74.3	6.1	0.5	1.2	32.7	1.47	27.7	69.7	6.5	1.3	3.1	32.9	1.43	28.0	67.3	6.7	2.5	5.8			
	9.0	6.5	15.1	60	31.5	1.99	24.7	94.0	4.6	0.4	0.9	31.9	1.89	25.4	89.4	5.0	1.2	2.8	31.9	1.84	25.7	87.1	5.1	2.3	5.4			
				80	30.4	2.59	21.5	113.5	3.4	0.3	0.7	30.5	2.45	22.2	109.0	3.6	1.1	2.5	30.5	2.39	22.4	106.8	3.7	2.1	4.9			
				100	28.9	3.36	17.4	132.8	2.5	0.2	0.5	28.8	3.18	17.9	128.5	2.7	0.9	2.1	28.7	3.09	18.1	126.4	2.7	1.8	4.3			
				120	28.9	3.36	17.4	127.7	2.5	0.2	0.5	28.8	3.18	17.9	125.3	2.7	0.9	2.1	28.7	3.09	18.1	124.0	2.7	1.8	4.3			
50	4.5	1.5	3.1	60	35.9	1.55	30.6	76.0	6.8	0.5	1.2	36.5	1.47	31.5	70.8	7.3	1.3	3.1	36.7	1.43	31.8	68.2	7.5	2.5	5.8			
				80	35.0	2.00	28.2	95.6	5.1	0.4	0.9	35.5	1.89	29.0	90.5	5.5	1.2	2.8	35.6	1.84	29.3	87.9	5.7	2.3	5.4			
				100	33.8	2.60	24.9	115.0	3.8	0.3	0.7	34.0	2.46	25.6	110.1	4.1	1.1	2.5	34.0	2.39	25.9	107.6	4.2	2.1	4.9			
				120	32.2	3.36	20.7	134.3	2.8	0.2	0.5	32.1	3.18	21.3	129.5	3.0	0.9	2.1	32.1	3.09	21.5	127.1	3.0	1.8	4.3			
	6.75	3.4	7.8	60	OPERATION NOT RECOMMENDED										31.1	3.59	18.8	139.2	2.5	0.8	1.9	30.9	3.50	19.0	136.9	2.6	1.7	3.9
				80	37.7	1.56	32.4	76.8	7.1	0.5	1.2	38.4	1.48	33.3	71.4	7.6	1.3	3.1	38.5	1.44	33.6	68.6	7.9	2.5	5.8			
				100	35.2	2.60	26.3	115.6	4.0	0.3	0.7	35.5	2.46	27.1	110.5	4.2	1.1	2.5	35.5	2.40	27.3	107.9	4.3	2.1	4.9			
				120	33.4	3.37	21.9	134.8	2.9	0.2	0.5	33.4	3.19	22.5	129.9	3.1	0.9	2.1	33.3	3.10	22.7	127.4	3.1	1.8	4.3			
	9.0	6.0	13.9	60	OPERATION NOT RECOMMENDED										32.2	3.60	19.9	139.5	2.6	0.8	1.9	32.0	3.51	20.1	137.1	2.7	1.7	3.9
				80	38.6	1.56	33.3	77.2	7.2	0.5	1.2	39.3	1.48	34.3	71.7	7.8	1.3	3.1	39.5	1.44	34.6	68.8	8.0	2.5	5.8			
				100	36.0	2.61	27.1	116.0	4.0	0.3	0.7	36.3	2.47	27.9	110.8	4.3	1.1	2.5	36.3	2.40	28.1	108.1	4.4	2.1	4.9			
				120	34.0	3.37	22.5	135.1	3.0	0.2	0.5	34.1	3.19	23.2	130.1	3.1	0.9	2.1	34.0	3.11	23.4	127.6	3.2	1.8	4.3			

Interpolation is permissible, extrapolation is not
 All performance data is based upon the lower voltage of dual voltage rated units
 All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
 Operation below 40°F EWT is based upon 15% methanol antifreeze solution
 See performance data notes for operation in the shaded areas
 Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

**Performance Data
HWW060 (60Hz I-P) - Cooling**

SOURCE				LOAD																					
EWT °F	Flow			EWT °F	Flow 7.5 GPM						Flow 11.25 GPM						Flow 15.0 GPM								
	GPM	WPD			TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD		TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD		TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD	
PSI		FT	PSI	FT						PSI	FT						PSI	FT						PSI	FT
50	7.5	1.3	2.9	50	52.6	2.20	60.1	38.2	23.9	1.4	3.3	53.5	2.23	61.1	41.0	24.0	3.5	8.0	55.3	2.25	63.0	42.5	24.6	4.8	11.0
				60	53.2	2.22	60.8	47.1	23.9	1.4	3.2	54.1	2.25	61.7	50.5	24.1	3.3	7.7	55.9	2.27	63.7	52.4	24.7	4.6	10.6
				70	53.8	2.24	61.4	56.0	24.0	1.3	3.0	54.7	2.26	62.4	60.0	24.1	3.2	7.4	56.6	2.29	64.4	62.2	24.7	4.4	10.1
				80	55.5	2.24	63.2	64.7	24.7	1.2	2.9	56.4	2.27	64.1	69.4	24.9	3.1	7.1	58.4	2.29	66.2	72.0	25.5	4.3	9.8
	90	57.2	2.25	64.9	73.5	25.5	1.2	2.7	58.1	2.27	65.9	78.9	25.6	3.0	6.9	60.2	2.29	68.0	81.8	26.3	4.1	9.5			
	11.25	3.4	7.9	50	53.4	2.23	61.0	38.0	24.0	1.4	3.3	54.1	2.25	61.8	40.8	24.1	3.5	8.0	56.0	2.27	63.8	42.3	24.7	4.8	11.0
				60	55.5	2.25	63.1	46.7	24.7	1.4	3.2	56.2	2.27	64.0	50.1	24.8	3.3	7.7	58.2	2.29	66.0	52.0	25.4	4.6	10.6
				70	57.5	2.26	65.3	55.4	25.4	1.3	3.0	58.3	2.29	66.1	59.4	25.5	3.2	7.4	60.4	2.31	68.3	61.6	26.1	4.4	10.2
				80	58.1	2.27	65.8	64.3	25.6	1.2	2.9	58.9	2.29	66.7	69.0	25.7	3.1	7.1	60.9	2.31	68.8	71.5	26.4	4.3	9.8
	90	58.6	2.27	66.3	73.2	25.8	1.2	2.7	59.4	2.29	67.2	78.5	25.9	3.0	6.9	61.5	2.31	69.4	81.4	26.6	4.1	9.5			
	15.0	6.2	14.2	50	55.6	2.25	63.2	35.8	24.7	1.4	3.3	56.5	2.27	64.2	40.3	24.9	3.5	8.0	57.9	2.29	65.8	42.1	25.2	4.8	11.1
				60	57.5	2.27	65.2	45.0	25.3	1.4	3.2	58.7	2.29	66.6	49.8	25.6	3.3	7.7	61.5	2.31	69.4	51.5	26.6	4.6	10.6
70				59.4	2.29	67.2	54.1	26.0	1.3	3.0	61.0	2.31	68.9	59.3	26.4	3.2	7.4	65.1	2.33	73.1	60.9	27.9	4.4	10.1	
80				60.3	2.29	68.1	63.5	26.4	1.2	2.9	61.8	2.31	69.7	68.7	26.7	3.1	7.1	65.8	2.34	73.8	70.8	28.2	4.2	9.8	
90	61.3	2.29	69.1	72.8	26.7	1.2	2.7	62.6	2.31	70.5	78.1	27.0	3.0	6.9	66.6	2.34	74.6	80.7	28.5	4.1	9.4				
70	7.5	1.1	2.5	50	49.1	2.82	58.7	38.1	17.4	1.4	3.3	50.3	2.85	60.0	41.1	17.7	3.5	8.0	52.0	2.88	61.8	42.9	18.1	4.7	11.0
				60	53.2	2.84	62.9	46.4	18.7	1.4	3.2	54.5	2.87	64.3	50.0	19.0	3.3	7.7	56.3	2.90	66.2	52.3	19.4	4.6	10.5
				70	57.2	2.86	67.0	54.8	20.0	1.3	3.0	58.7	2.89	68.5	59.1	20.3	3.2	7.4	60.6	2.92	70.6	61.7	20.8	4.4	10.1
				80	59.3	2.92	69.3	63.4	20.3	1.2	2.9	60.8	2.95	70.9	68.3	20.6	3.1	7.1	62.9	2.98	73.0	71.4	21.1	4.3	9.8
	90	61.4	2.98	71.6	71.9	20.6	1.2	2.7	63.0	3.01	73.3	77.6	20.9	3.0	6.9	65.1	3.04	75.5	81.1	21.4	4.1	9.5			
	11.25	3.0	6.9	50	50.2	2.85	59.9	38.0	17.6	1.4	3.3	51.4	2.88	61.2	41.0	17.8	3.5	8.0	53.1	2.91	63.0	42.8	18.3	4.8	11.0
				60	54.5	2.87	64.3	46.2	19.0	1.4	3.2	55.9	2.90	65.8	49.8	19.3	3.3	7.7	57.7	2.93	67.7	52.1	19.7	4.6	10.6
				70	58.9	2.89	68.8	54.5	20.4	1.3	3.0	60.4	2.92	70.3	58.8	20.7	3.2	7.4	62.4	2.94	72.4	61.4	21.2	4.4	10.2
				80	60.8	2.95	70.8	63.1	20.6	1.2	2.9	62.3	2.98	72.4	68.1	20.9	3.1	7.1	64.4	3.01	74.6	71.1	21.4	4.3	9.9
	90	62.6	3.01	72.9	71.7	20.8	1.2	2.7	64.2	3.04	74.5	77.3	21.1	3.0	6.9	66.3	3.07	76.8	80.8	21.6	4.1	9.6			
	15.0	5.5	12.8	50	51.2	2.88	61.0	36.9	17.8	1.4	3.3	53.3	2.91	63.2	40.8	18.3	3.5	8.0	54.3	2.94	64.3	42.6	18.5	4.8	11.0
				60	55.6	2.90	65.5	45.4	19.2	1.4	3.2	57.6	2.93	67.6	49.6	19.7	3.3	7.7	59.4	2.96	69.5	51.8	20.1	4.6	10.6
70				60.1	2.92	70.1	53.9	20.6	1.3	3.0	61.9	2.94	72.0	58.5	21.0	3.2	7.4	64.5	2.97	74.6	61.1	21.7	4.4	10.1	
80				62.3	2.98	72.5	62.7	20.9	1.2	2.9	64.1	3.01	74.4	67.8	21.3	3.1	7.1	67.1	3.04	77.5	70.6	22.1	4.2	9.8	
90	64.6	3.04	74.9	71.5	21.3	1.2	2.7	66.3	3.07	76.8	77.1	21.6	3.0	6.9	69.8	3.10	80.3	80.2	22.5	4.1	9.5				
80	7.5	0.9	2.1	50	47.3	3.13	58.0	38.0	15.1	1.4	3.3	48.7	3.16	59.5	41.1	15.4	3.5	8.0	50.3	3.19	61.2	43.1	15.8	4.7	10.9
				60	53.1	3.15	63.9	46.1	16.9	1.4	3.2	54.7	3.18	65.6	49.8	17.2	3.3	7.7	56.5	3.21	67.5	52.3	17.6	4.6	10.5
				70	58.9	3.17	69.7	54.2	18.6	1.3	3.0	60.7	3.20	71.6	58.6	19.0	3.2	7.4	62.7	3.23	73.7	61.5	19.4	4.4	10.1
				80	61.3	3.25	72.4	62.7	18.8	1.2	2.9	63.1	3.29	74.3	67.8	19.2	3.1	7.1	65.1	3.32	76.5	71.1	19.6	4.3	9.8
	90	63.6	3.34	75.0	71.1	19.0	1.2	2.7	65.4	3.38	77.0	76.9	19.4	3.0	6.9	67.6	3.41	79.2	80.7	19.8	4.1	9.6			
	11.25	2.7	6.1	50	48.5	3.16	59.3	38.0	15.3	1.4	3.3	50.0	3.19	60.9	41.1	15.6	3.5	8.0	51.6	3.23	62.6	43.0	16.0	4.8	11.1
				60	54.1	3.18	64.9	46.0	17.0	1.4	3.2	55.7	3.21	66.6	49.7	17.3	3.3	7.7	57.5	3.24	68.6	52.2	17.7	4.6	10.6
				70	59.6	3.20	70.5	54.0	18.7	1.3	3.0	61.4	3.23	72.4	58.4	19.0	3.2	7.4	63.4	3.26	74.5	61.3	19.4	4.4	10.2
				80	62.1	3.29	73.4	62.5	18.9	1.2	2.9	64.0	3.32	75.3	67.6	19.3	3.1	7.1	66.1	3.35	77.5	70.9	19.7	4.3	9.9
	90	64.6	3.38	76.2	71.0	19.1	1.2	2.7	66.6	3.41	78.2	76.8	19.5	3.0	6.9	68.7	3.45	80.5	80.6	19.9	4.2	9.6			
	15.0	5.0	11.6	50	49.0	3.19	59.9	37.4	15.3	1.4	3.3	51.7	3.23	62.7	41.0	16.0	3.5	8.0	52.4	3.26	63.5	42.9	16.1	4.8	11.0
				60	54.7	3.21	65.7	45.6	17.0	1.4	3.2	57.1	3.24	68.1	49.5	17.6	3.3	7.7	58.3	3.28	69.5	52.0	17.8	4.6	10.6
70				60.5	3.23	71.5	53.8	18.7	1.3	3.0	62.4	3.26	73.5	58.1	19.1	3.2	7.4	64.2	3.30	75.4	61.1	19.5	4.4	10.1	
80				63.3	3.32	74.7	62.3	19.1	1.2	2.9	65.3	3.35	76.7	67.4	19.5	3.1	7.1	67.8	3.39	79.3	70.5	20.0	4.3	9.8	
90	66.2	3.41	77.9	70.8	19.4	1.2	2.7	68.2	3.45	79.9	76.7	19.8	3.0	6.9	71.4	3.48	83.2	80.0	20.5	4.1	9.6				

Interpolation is permissible, extrapolation is not
 All performance data is based upon the lower voltage of dual voltage rated units
 All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
 See performance data notes for operation in the shaded areas
 Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

**Performance Data
HWW060 (60Hz I-P) - Heating**

SOURCE					LOAD																				
EWT °F	Flow			EWT °F	Flow 7.5 GPM						Flow 11.25 GPM						Flow 15.0 GPM								
	GPM	WPD			TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD		TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD		TC Mbtuh	Power kW	HR Mbtuh	LWT °F	EER	WPD	
		PSI	FT							PSI	FT						PSI	FT						PSI	FT
50	7.5	1.3	2.9	50	52.6	2.20	60.1	38.2	23.9	1.4	3.3	53.5	2.23	61.1	41.0	24.0	3.5	8.0	55.3	2.25	63.0	42.5	24.6	4.8	11.0
				60	53.2	2.22	60.8	47.1	23.9	1.4	3.2	54.1	2.25	61.7	50.5	24.1	3.3	7.7	55.9	2.27	63.7	52.4	24.7	4.6	10.6
				70	53.8	2.24	61.4	56.0	24.0	1.3	3.0	54.7	2.26	62.4	60.0	24.1	3.2	7.4	56.6	2.29	64.4	62.2	24.7	4.4	10.1
				80	55.5	2.24	63.2	64.7	24.7	1.2	2.9	56.4	2.27	64.1	69.4	24.9	3.1	7.1	58.4	2.29	66.2	72.0	25.5	4.3	9.8
	90	57.2	2.25	64.9	73.5	25.5	1.2	2.7	58.1	2.27	65.9	78.9	25.6	3.0	6.9	60.2	2.29	68.0	81.8	26.3	4.1	9.5			
	11.25	3.4	7.9	50	53.4	2.23	61.0	38.0	24.0	1.4	3.3	54.1	2.25	61.8	40.8	24.1	3.5	8.0	56.0	2.27	63.8	42.3	24.7	4.8	11.0
				60	55.5	2.25	63.1	46.7	24.7	1.4	3.2	56.2	2.27	64.0	50.1	24.8	3.3	7.7	58.2	2.29	66.0	52.0	25.4	4.6	10.6
				70	57.5	2.26	65.3	55.4	25.4	1.3	3.0	58.3	2.29	66.1	59.4	25.5	3.2	7.4	60.4	2.31	68.3	61.6	26.1	4.4	10.2
				80	58.1	2.27	65.8	64.3	25.6	1.2	2.9	58.9	2.29	66.7	69.0	25.7	3.1	7.1	60.9	2.31	68.8	71.5	26.4	4.3	9.8
	90	58.6	2.27	66.3	73.2	25.8	1.2	2.7	59.4	2.29	67.2	78.5	25.9	3.0	6.9	61.5	2.31	69.4	81.4	26.6	4.1	9.5			
	15.0	6.2	14.2	50	55.6	2.25	63.2	35.8	24.7	1.4	3.3	56.5	2.27	64.2	40.3	24.9	3.5	8.0	57.9	2.29	65.8	42.1	25.2	4.8	11.1
				60	57.5	2.27	65.2	45.0	25.3	1.4	3.2	58.7	2.29	66.6	49.8	25.6	3.3	7.7	61.5	2.31	69.4	51.5	26.6	4.6	10.6
70				59.4	2.29	67.2	54.1	26.0	1.3	3.0	61.0	2.31	68.9	59.3	26.4	3.2	7.4	65.1	2.33	73.1	60.9	27.9	4.4	10.1	
80				60.3	2.29	68.1	63.5	26.4	1.2	2.9	61.8	2.31	69.7	68.7	26.7	3.1	7.1	65.8	2.34	73.8	70.8	28.2	4.2	9.8	
90	61.3	2.29	69.1	72.8	26.7	1.2	2.7	62.6	2.31	70.5	78.1	27.0	3.0	6.9	66.6	2.34	74.6	80.7	28.5	4.1	9.4				
70	7.5	1.1	2.5	50	49.1	2.82	58.7	38.1	17.4	1.4	3.3	50.3	2.85	60.0	41.1	17.7	3.5	8.0	52.0	2.88	61.8	42.9	18.1	4.7	11.0
				60	53.2	2.84	62.9	46.4	18.7	1.4	3.2	54.5	2.87	64.3	50.0	19.0	3.3	7.7	56.3	2.90	66.2	52.3	19.4	4.6	10.5
				70	57.2	2.86	67.0	54.8	20.0	1.3	3.0	58.7	2.89	68.5	59.1	20.3	3.2	7.4	60.6	2.92	70.6	61.7	20.8	4.4	10.1
				80	59.3	2.92	69.3	63.4	20.3	1.2	2.9	60.8	2.95	70.9	68.3	20.6	3.1	7.1	62.9	2.98	73.0	71.4	21.1	4.3	9.8
	90	61.4	2.98	71.6	71.9	20.6	1.2	2.7	63.0	3.01	73.3	77.6	20.9	3.0	6.9	65.1	3.04	75.5	81.1	21.4	4.1	9.5			
	11.25	3.0	6.9	50	50.2	2.85	59.9	38.0	17.6	1.4	3.3	51.4	2.88	61.2	41.0	17.8	3.5	8.0	53.1	2.91	63.0	42.8	18.3	4.8	11.0
				60	54.5	2.87	64.3	46.2	19.0	1.4	3.2	55.9	2.90	65.8	49.8	19.3	3.3	7.7	57.7	2.93	67.7	52.1	19.7	4.6	10.6
				70	58.9	2.89	68.8	54.5	20.4	1.3	3.0	60.4	2.92	70.3	58.8	20.7	3.2	7.4	62.4	2.94	72.4	61.4	21.2	4.4	10.2
				80	60.8	2.95	70.8	63.1	20.6	1.2	2.9	62.3	2.98	72.4	68.1	20.9	3.1	7.1	64.4	3.01	74.6	71.1	21.4	4.3	9.9
	90	62.6	3.01	72.9	71.7	20.8	1.2	2.7	64.2	3.04	74.5	77.3	21.1	3.0	6.9	66.3	3.07	76.8	80.8	21.6	4.1	9.6			
	15.0	5.5	12.8	50	51.2	2.88	61.0	36.9	17.8	1.4	3.3	53.3	2.91	63.2	40.8	18.3	3.5	8.0	54.3	2.94	64.3	42.6	18.5	4.8	11.0
				60	55.6	2.90	65.5	45.4	19.2	1.4	3.2	57.6	2.93	67.6	49.6	19.7	3.3	7.7	59.4	2.96	69.5	51.8	20.1	4.6	10.6
70				60.1	2.92	70.1	53.9	20.6	1.3	3.0	61.9	2.94	72.0	58.5	21.0	3.2	7.4	64.5	2.97	74.6	61.1	21.7	4.4	10.1	
80				62.3	2.98	72.5	62.7	20.9	1.2	2.9	64.1	3.01	74.4	67.8	21.3	3.1	7.1	67.1	3.04	77.5	70.6	22.1	4.2	9.8	
90	64.6	3.04	74.9	71.5	21.3	1.2	2.7	66.3	3.07	76.8	77.1	21.6	3.0	6.9	69.8	3.10	80.3	80.2	22.5	4.1	9.5				

Table Continued on Next Page

Interpolation is permissible, extrapolation is not
 All performance data is based upon the lower voltage of dual voltage rated units
 All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
 Operation below 40F EWT is based upon 15% antifreeze solution
 See performance data notes for operation in the shaded areas
 Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

**Performance Data
HWW060 (60Hz I-P) - Heating**

Continued From Previous Page

SOURCE				LOAD																								
EWT °F	Flow			EWT °F	Flow 7.5 GPM						Flow 11.25 GPM						Flow 15.0 GPM											
	GPM	WPD			HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD			HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD			HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD		
		PSI	FT							PSI	FT	PSI						FT	PSI	FT						PSI	FT	
20	15.0	7.3	16.9	60	41.1	2.43	32.8	71.5	5.0	1.4	3.2	41.3	2.38	33.2	67.4	5.1	3.3	7.7	41.5	2.33	33.5	65.3	5.2	6.0	13.8			
				80	40.5	3.17	29.6	91.2	3.7	1.2	2.9	40.6	3.11	30.0	87.2	3.8	3.1	7.1	40.7	3.05	30.3	85.3	3.9	5.6	13.0			
				100	39.7	4.11	25.6	110.8	2.8	1.1	2.6	39.7	4.03	25.9	106.9	2.9	2.9	6.7	39.7	3.95	26.2	105.1	2.9	5.3	12.3			
30	7.5	1.5	3.5	60	47.8	2.52	39.2	73.3	5.6	1.4	3.2	48.0	2.47	39.6	68.6	5.7	3.3	7.7	48.3	2.42	40.0	66.3	5.8	6.0	13.8			
				80	46.9	3.28	35.7	92.9	4.2	1.2	2.9	47.1	3.21	36.1	88.4	4.3	3.1	7.1	47.2	3.15	36.5	86.1	4.4	5.6	13.0			
				100	45.8	4.22	31.4	112.4	3.2	1.1	2.6	45.9	4.14	31.8	108.1	3.3	2.9	6.7	45.9	4.05	32.1	105.9	3.3	5.3	12.3			
				120	44.6	5.36	26.3	131.9	2.4	1.1	2.4	44.5	5.25	26.6	127.7	2.5	2.8	6.4	44.4	5.14	26.9	125.7	2.5	5.1	11.7			
				60	50.0	2.56	41.3	73.6	5.7	1.4	3.2	50.3	2.51	41.7	68.9	5.9	3.3	7.7	50.5	2.46	42.1	66.6	6.0	6.0	13.8			
				80	49.0	3.33	37.6	93.3	4.3	1.2	2.9	49.1	3.26	38.0	88.7	4.4	3.1	7.1	49.3	3.20	38.4	86.5	4.5	5.6	13.0			
	11.25	4.0	9.2	60	47.8	4.36	34.7	112.8	3.3	1.1	2.6	49.7	4.21	33.5	108.4	3.3	2.9	6.7	47.9	4.12	33.9	106.2	3.4	5.3	12.3			
				80	46.6	5.45	28.0	132.1	2.5	1.1	2.4	46.5	5.34	28.3	128.0	2.6	2.8	6.4	46.4	5.23	28.6	125.9	2.6	5.1	11.7			
				60	52.0	2.61	43.1	73.9	5.8	1.4	3.2	52.2	2.55	43.5	69.1	6.0	3.3	7.7	52.5	2.50	43.9	66.8	6.1	6.0	13.8			
				80	50.9	3.39	39.3	93.4	4.4	1.2	2.9	51.1	3.32	39.7	88.9	4.5	3.1	7.1	51.2	3.25	40.1	86.6	4.6	5.6	13.0			
				100	49.6	4.36	34.7	112.9	3.3	1.1	2.6	49.7	4.28	35.1	108.6	3.4	2.9	6.7	49.7	4.19	35.4	106.4	3.5	5.3	12.3			
				120	48.1	5.54	29.2	132.3	2.5	1.1	2.4	48.0	5.43	29.5	128.2	2.6	2.8	6.4	47.9	5.32	29.8	126.1	2.6	5.1	11.7			
40	7.5	1.4	3.2	60	54.4	2.61	45.5	75.0	6.1	1.4	3.2	54.7	2.56	46.0	69.7	6.3	3.3	7.7	55.1	2.51	46.5	67.2	6.4	6.0	13.8			
				80	53.4	3.38	41.8	94.6	4.6	1.2	2.9	53.6	3.31	42.3	89.6	4.7	3.1	7.1	53.8	3.25	42.7	87.0	4.9	5.6	13.0			
				100	52.0	4.33	37.2	114.0	3.5	1.1	2.6	52.1	4.24	37.6	109.2	3.6	2.9	6.7	52.2	4.16	38.0	106.7	3.7	5.3	12.3			
				120	50.4	5.46	31.8	133.4	2.7	1.1	2.4	50.3	5.35	32.1	128.7	2.8	2.8	6.4	50.3	5.24	32.4	126.4	2.8	5.1	11.7			
				60	57.4	2.65	48.3	75.5	6.4	1.4	3.2	57.7	2.59	48.8	70.1	6.5	3.3	7.7	58.0	2.54	49.3	67.5	6.7	6.0	13.8			
				80	55.9	3.42	44.2	95.1	4.8	1.2	2.9	56.1	3.36	44.7	90.0	4.9	3.1	7.1	56.4	3.29	45.1	87.4	5.0	5.6	13.0			
	11.25	3.7	8.5	60	54.3	4.38	39.4	114.5	3.6	1.1	2.6	54.4	4.30	39.8	109.7	3.7	2.9	6.7	54.5	4.21	40.2	107.1	3.8	5.3	12.3			
				80	52.6	5.53	33.7	133.8	2.8	1.1	2.4	52.6	5.42	34.1	129.1	2.8	2.8	6.4	52.5	5.31	34.4	126.8	2.9	5.1	11.7			
				60	59.2	2.68	50.1	75.9	6.5	1.4	3.2	59.6	2.63	50.6	70.5	6.6	3.3	7.7	59.9	2.58	51.1	67.9	6.8	6.0	13.8			
				80	57.8	3.47	46.0	95.3	4.9	1.2	2.9	58.0	3.40	46.4	90.3	5.0	3.1	7.1	58.3	3.33	46.9	87.6	5.1	5.6	13.0			
				100	56.1	4.44	40.9	114.7	3.7	1.1	2.6	56.2	4.35	41.3	109.9	3.8	2.9	6.7	56.3	4.27	41.7	107.3	3.9	5.3	12.3			
				120	54.0	5.60	34.9	134.0	2.8	1.1	2.4	54.0	5.49	35.2	129.3	2.9	2.8	6.4	54.0	5.38	35.6	127.0	2.9	5.1	11.7			
50	7.5	1.3	2.9	60	61.1	2.70	51.9	76.8	6.6	1.4	3.2	61.5	2.65	52.4	70.8	6.8	3.3	7.7	61.8	2.60	53.0	68.1	7.0	6.0	13.8			
				80	59.8	3.48	47.9	96.3	5.0	1.2	2.9	60.1	3.41	48.4	90.8	5.2	3.1	7.1	60.3	3.34	48.9	87.8	5.3	5.6	13.0			
				100	58.2	4.43	43.0	115.6	3.8	1.1	2.6	58.3	4.34	43.5	110.4	3.9	2.9	6.7	58.5	4.26	43.9	107.5	4.0	5.3	12.3			
				120	56.2	5.55	37.2	134.9	3.0	1.1	2.4	56.2	5.44	37.6	129.7	3.0	2.8	6.4	56.2	5.33	38.0	127.2	3.1	5.1	11.7			
				130	55.2	6.28	33.8	144.6	2.6	1.0	2.2	55.2	6.16	34.2	139.8	2.6	2.7	6.2	55.1	6.03	34.5	137.2	2.7	5.0	11.5			
				60	64.7	2.73	55.4	77.4	6.9	1.4	3.2	65.1	2.68	56.0	71.3	7.1	3.3	7.7	65.5	2.62	56.5	68.5	7.3	6.0	13.8			
	11.25	3.4	7.9	60	62.8	3.52	50.8	96.9	5.2	1.2	2.9	63.1	3.45	51.4	91.3	5.4	3.1	7.1	63.4	3.38	51.9	88.3	5.5	5.6	13.0			
				80	60.8	4.48	45.5	116.2	4.0	1.1	2.6	61.0	4.39	46.0	110.9	4.1	2.9	6.7	61.1	4.30	46.5	108.0	4.2	5.3	12.3			
				100	58.6	5.61	39.4	135.4	3.1	1.1	2.4	58.6	5.50	39.8	130.2	3.1	2.8	6.4	58.6	5.39	40.2	127.7	3.2	5.1	11.7			
				120	58.0	6.34	36.3	144.8	2.7	1.0	2.2	57.9	6.22	36.7	139.9	2.7	2.7	6.2	57.8	6.09	37.1	137.3	2.8	5.0	11.5			
				60	66.5	2.76	57.1	78.0	7.1	1.4	3.2	66.9	2.70	57.7	71.9	7.3	3.3	7.7	67.3	2.65	58.3	69.0	7.4	6.0	13.8			
				80	64.7	3.55	52.6	97.2	5.3	1.2	2.9	65.0	3.48	53.1	91.6	5.5	3.1	7.1	65.3	3.41	53.6	88.6	5.6	5.6	13.0			
15.0	6.2	14.2	60	62.5	4.52	47.1	116.4	4.1	1.1	2.6	62.7	4.43	47.6	111.1	4.1	2.9	6.7	62.9	4.34	48.0	108.2	4.2	5.3	12.3				
			80	60.0	5.67	40.6	135.6	3.1	1.1	2.4	60.0	5.55	41.0	130.5	3.2	2.8	6.4	60.0	5.44	41.4	127.9	3.2	5.1	11.7				
			100	58.8	6.41	37.0	145.2	2.7	1.1	2.4	58.8	6.28	37.3	140.3	2.7	2.7	6.2	58.7	6.15	37.7	137.7	2.8	5.0	11.5				

Table Continued on Next Page

Interpolation is permissible, extrapolation is not

All performance data is based upon the lower voltage of dual voltage rated units

All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory

Operation below 40°F EWT is based upon 15% methanol antifreeze solution

See performance data notes for operation in the shaded areas

Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

Performance Data
HWW060 (60Hz I-P) - Heating

Table Continued from Previous Page

Table with columns: SOURCE, EWT °F, Flow (GPM, WPD, PSI, FT), LOAD (Flow 7.5 GPM, Flow 11.25 GPM, Flow 15.0 GPM), and various performance metrics (HC Mbtuh, Power kW, HE Mbtuh, LWT °F, COP, WPD, PSI, FT).

Interpolation is permissible, extrapolation is not
All performance data is based upon the lower voltage of dual voltage rated units
All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
Operation below 40°F EWT is based upon 15% methanol antifreeze solution
See performance data notes for operation in the shaded areas
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

Performance Data
HWW120 (60Hz I-P) - Cooling

Table with columns for SOURCE (EWT °F, Flow GPM, WPD PSI, FT) and LOAD (Flow 15.0 GPM, Flow 22.5 GPM, Flow 30.0 GPM). Each load section includes sub-columns for TC Mbtuh, Power kW, HR Mbtuh, LWT °F, EER, and WPD (PSI, FT). The table contains performance data for EWT values of 50, 60, 70, 80, and 90 °F across various flow and WPD conditions.

Table Continued on Next Page

Interpolation is permissible, extrapolation is not
All performance data is based upon the lower voltage of dual voltage rated units
All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
See performance data notes for operation in the shaded areas
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

Performance Data
HWW120 (60Hz I-P) - Cooling

Continued From Previous Page

Table with columns SOURCE (EWT, Flow) and LOAD (Flow 15.0 GPM, Flow 22.5 GPM, Flow 30.0 GPM). Rows represent various operating conditions for HWW120 units.

Interpolation is permissible, extrapolation is not
All performance data is based upon the lower voltage of dual voltage rated units
All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
See performance data notes for operation in the shaded areas
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

Performance Data
HWW120 (60Hz I-P) - Heating

SOURCE					LOAD																					
EWT °F	Flow				EWT °F	Flow 15.0 GPM							Flow 22.5 GPM							Flow 30.0 GPM						
	GPM	WPD		FT		HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD	HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD	HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD			
		PSI	FT							PSI	FT					PSI	FT					PSI	FT			
20	30.0	8.0	18.6	60	82.2	4.86	65.6	71.5	5.0	1.5	3.5	82.6	4.76	66.3	67.4	5.1	3.3	7.7	82.9	46.67	67.0	65.3	5.2	6.0	13.8	
				80	80.9	6.34	59.3	91.2	3.7	1.4	3.2	81.1	6.22	59.9	87.2	3.8	3.1	7.1	81.3	60.92	60.5	85.3	3.9	5.6	13.0	
				100	79.3	8.23	51.3	110.8	2.8	1.3	2.9	79.3	8.06	51.8	106.9	2.9	2.9	6.7	79.3	79.01	52.4	105.1	2.9	5.3	12.3	
	30	15.0	1.7	3.9	60	95.6	5.04	78.4	73.3	5.6	1.5	3.5	96.0	4.94	79.2	68.6	5.7	3.3	7.7	96.5	48.42	80.0	66.3	5.8	6.0	13.8
					80	93.8	6.55	71.5	92.9	4.2	1.4	3.2	94.1	6.42	72.2	88.4	4.3	3.1	7.1	94.4	62.91	73.0	86.1	4.4	5.6	13.0
					100	91.7	8.44	62.9	112.4	3.2	1.3	2.9	91.8	8.27	63.5	108.1	3.3	2.9	6.7	91.9	81.06	64.2	105.9	3.3	5.3	12.3
30		22.5	4.4	10.1	60	89.1	10.71	52.6	131.9	2.4	1.2	2.7	89.0	10.50	53.2	127.7	2.5	2.8	6.4	88.8	102.87	53.7	125.7	2.5	5.1	11.7
					80	100.0	5.13	82.5	73.6	5.7	1.5	3.5	100.5	5.02	83.4	68.9	5.9	3.3	7.7	101.0	49.23	84.2	66.6	6.0	6.0	13.8
					100	97.9	6.66	75.2	93.3	4.3	1.4	3.2	98.3	6.53	76.0	88.7	4.4	3.1	7.1	98.6	63.96	76.8	86.5	4.5	5.6	13.0
	30	30.0	7.6	17.5	60	103.9	5.21	86.1	73.9	5.8	1.5	3.5	104.4	5.11	87.0	69.1	6.0	3.3	7.7	105.0	50.05	87.9	66.8	6.1	6.0	13.8
					80	101.8	6.77	78.7	93.4	4.4	1.4	3.2	102.1	6.64	79.5	88.9	4.5	3.1	7.1	102.5	65.04	80.3	86.6	4.6	5.6	13.0
					100	99.2	8.73	69.4	112.9	3.3	1.3	2.9	99.3	8.55	70.1	108.6	3.4	2.9	6.7	99.4	83.81	70.8	106.4	3.5	5.3	12.3
40		15.0	1.5	3.5	60	108.9	5.22	91.1	75.0	6.1	1.5	3.5	109.5	5.12	92.0	69.7	6.3	3.3	7.7	110.1	50.16	93.0	67.2	6.4	6.0	13.8
					80	106.7	6.76	83.6	94.6	4.6	1.4	3.2	107.1	6.62	84.5	89.6	4.7	3.1	7.1	107.6	64.90	85.4	87.0	4.9	5.6	13.0
					100	104.0	8.65	74.5	114.0	3.5	1.3	2.9	104.2	8.48	75.3	109.2	3.6	2.9	6.7	104.4	83.11	76.1	106.7	3.7	5.3	12.3
	40	22.5	4.1	9.3	60	100.7	10.91	63.5	133.4	2.7	1.2	2.7	100.7	10.69	64.2	128.7	2.8	2.8	6.4	100.6	104.78	64.9	126.4	2.8	5.1	11.7
					80	114.7	5.29	96.7	75.5	6.4	1.5	3.5	115.4	5.19	97.7	70.1	6.5	3.3	7.7	116.0	50.83	98.7	67.5	6.7	6.0	13.8
					100	111.8	6.85	88.5	95.1	4.8	1.4	3.2	112.3	6.71	89.4	90.0	4.9	3.1	7.1	112.7	65.77	90.3	87.4	5.0	5.6	13.0
40		30.0	7.2	16.6	60	108.6	8.77	78.7	114.5	3.6	1.3	2.9	108.8	8.59	79.5	109.7	3.7	2.9	6.7	109.1	84.22	80.3	107.1	3.8	5.3	12.3
					80	105.2	11.06	67.4	133.8	2.8	1.2	2.7	105.1	10.84	68.1	129.1	2.8	2.8	6.4	105.1	106.19	68.8	126.8	2.9	5.1	11.7
					100	118.5	5.36	100.2	75.9	6.5	1.5	3.5	119.1	5.26	101.2	70.5	6.6	3.3	7.7	119.8	51.51	102.2	67.9	6.8	6.0	13.8
	50	15.0	1.4	3.2	60	115.6	6.94	91.9	95.3	4.9	1.4	3.2	116.1	6.80	92.8	90.3	5.0	3.1	7.1	116.5	66.65	93.8	87.6	5.1	5.6	13.0
					80	112.1	8.89	81.8	114.7	3.7	1.3	2.9	112.3	8.71	82.6	109.9	3.8	2.9	6.7	112.6	85.35	83.5	107.3	3.9	5.3	12.3
					100	108.0	11.21	69.8	134.0	2.8	1.2	2.7	108.0	10.98	70.5	129.3	2.9	2.8	6.4	107.9	107.61	71.2	127.0	2.9	5.1	11.7
50		22.5	3.8	8.7	60	122.2	5.40	103.8	76.8	6.6	1.5	3.5	122.9	5.30	104.9	70.8	6.8	3.3	7.7	123.7	51.91	106.0	68.1	7.0	6.0	13.8
					80	119.6	6.97	95.8	96.3	5.0	1.4	3.2	120.1	6.83	96.8	90.8	5.2	3.1	7.1	120.7	66.90	97.9	87.8	5.3	5.6	13.0
					100	116.3	8.87	86.1	115.6	3.8	1.3	2.9	116.6	8.69	87.0	110.4	3.9	2.9	6.7	117.0	85.16	87.9	107.5	4.0	5.3	12.3
	50	30.0	6.8	15.6	60	112.3	11.11	74.4	134.9	3.0	1.2	2.7	112.4	10.89	75.2	129.7	3.0	2.8	6.4	112.5	106.70	76.1	127.2	3.1	5.1	11.7
					80	OPERATION NOT RECOMMENDED																				
					100	110.3	12.31	68.3	139.8	2.6	2.7	6.2	110.2	120.64	69.1	137.2	2.7	5.0	11.5							
50		22.5	3.8	8.7	60	129.4	5.46	110.8	77.4	6.9	1.5	3.5	130.2	5.35	111.9	71.3	7.1	3.3	7.7	131.0	52.43	113.1	68.5	7.3	6.0	13.8
					80	125.7	7.04	101.7	96.9	5.2	1.4	3.2	126.3	6.90	102.7	91.3	5.4	3.1	7.1	126.8	67.57	103.8	88.3	5.5	5.6	13.0
					100	121.6	8.96	91.0	116.2	4.0	1.3	2.9	121.9	8.78	92.0	110.9	4.1	2.9	6.7	122.3	86.02	92.9	108.0	4.2	5.3	12.3
	50	30.0	6.8	15.6	60	117.2	11.22	78.9	135.4	3.1	1.2	2.7	117.2	11.00	79.7	130.2	3.1	2.8	6.4	117.3	107.77	80.5	127.7	3.2	5.1	11.7
					80	OPERATION NOT RECOMMENDED																				
					100	115.8	12.43	73.4	139.9	2.7	2.7	6.2	115.7	121.86	74.1	137.3	2.8	5.0	11.5							
50		30.0	6.8	15.6	60	133.0	5.51	114.2	78.0	7.1	1.5	3.5	133.8	5.40	115.3	71.9	7.3	3.3	7.7	134.6	52.96	116.5	69.0	7.4	6.0	13.8
					80	129.4	7.11	105.1	97.2	5.3	1.4	3.2	130.0	6.97	106.2	91.6	5.5	3.1	7.1	130.6	68.26	107.3	88.6	5.6	5.6	13.0
					100	125.0	9.05	94.2	116.4	4.1	1.3	2.9	125.4	8.87	95.1	111.1	4.1	2.9	6.7	125.7	86.89	96.1	108.2	4.2	5.3	12.3
	50	30.0	6.8	15.6	60	119.9	11.34	81.2	135.6	3.1	1.2	2.7	120.0	11.11	82.1	130.5	3.2	2.8	6.4	120.0	108.86	82.9	127.9	3.2	5.1	11.7
					80	OPERATION NOT RECOMMENDED																				
					100	117.5	12.56	74.7	140.3	2.7	2.7	6.2	117.4	123.09	75.4	137.7	2.8	5.0	11.5							

Table Continued on Next Page

Interpolation is permissible, extrapolation is not
 All performance data is based upon the lower voltage of dual voltage rated units
 All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
 Operation below 40°F EWT is based upon 15% methanol antifreeze solution
 See performance data notes for operation in the shaded areas
 Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

**Performance Data
HWW120 (60Hz I-P) - Heating**

Table Continued from Previous Page

SOURCE				LOAD																								
EWT °F	Flow			EWT °F	Flow 15.0 GPM						Flow 22.5 GPM						Flow 30.0 GPM											
	GPM	WPD			HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD	PSI	FT	HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD	PSI	FT	HC Mbtuh	Power kW	HE Mbtuh	LWT °F	COP	WPD	PSI	FT
		PSI	FT																									
60	15.0	1.3	3.0	60	129.7	5.51	110.9	78.5	6.9	1.5	3.5	130.5	5.40	112.1	71.7	7.1	3.3	7.7	131.3	52.96	113.2	68.6	7.3	6.0	13.8			
				80	129.6	7.09	105.4	98.1	5.4	1.4	3.2	130.2	6.95	106.5	91.8	5.5	3.1	7.1	130.9	68.09	107.6	88.6	5.6	5.6	13.0			
				100	127.3	8.98	96.7	117.6	4.2	1.3	2.9	127.7	8.80	97.7	111.5	4.3	2.9	6.7	128.2	86.27	98.7	108.4	4.4	5.3	12.3			
				120	122.8	11.19	84.7	136.7	3.2	1.2	2.7	123.0	10.97	85.6	130.9	3.3	2.8	6.4	123.2	107.48	86.5	128.0	3.4	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	22.5	3.5	8.1	60	135.5	5.57	116.4	79.0	7.1	1.5	3.5	136.3	5.46	117.6	72.2	7.3	3.3	7.7	137.1	53.49	118.8	69.1	7.5	6.0	13.8			
				80	135.3	7.16	110.9	98.7	5.5	1.4	3.2	136.0	7.02	112.1	92.3	5.7	3.1	7.1	136.7	68.78	113.2	89.1	5.8	5.6	13.0			
				100	132.9	9.09	101.9	118.1	4.3	1.3	2.9	133.3	8.90	102.9	112.0	4.4	2.9	6.7	133.7	87.26	104.0	108.9	4.5	5.3	12.3			
				120	128.0	11.34	89.3	137.2	3.3	1.2	2.7	128.2	11.12	90.2	131.3	3.4	2.8	6.4	128.3	108.94	91.2	128.5	3.5	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	30.0	6.4	14.8	60	140.0	5.63	120.8	79.4	7.3	1.5	3.5	140.8	5.51	122.0	72.6	7.5	3.3	7.7	141.7	54.03	123.2	69.5	7.7	6.0	13.8			
				80	140.1	7.23	115.4	99.0	5.7	1.4	3.2	140.8	7.09	116.6	92.6	5.8	3.1	7.1	141.5	69.47	117.7	89.4	6.0	5.6	13.0			
				100	137.6	9.19	106.2	118.3	4.4	1.3	2.9	138.0	9.01	107.3	112.2	4.5	2.9	6.7	138.5	88.27	108.4	109.1	4.6	5.3	12.3			
				120	132.4	11.50	93.2	137.4	3.4	1.2	2.7	132.6	11.27	94.1	131.6	3.4	2.8	6.4	132.7	110.42	95.1	128.7	3.5	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
70	15.0	1.2	2.7	60	137.2	5.62	118.0	80.1	7.2	1.5	3.5	138.1	5.51	119.3	72.6	7.3	3.3	7.7	138.9	54.00	120.5	69.2	7.5	6.0	13.8			
				80	139.6	7.21	115.0	100.0	5.7	1.4	3.2	140.3	7.07	116.2	92.8	5.8	3.1	7.1	141.1	69.28	117.4	89.4	6.0	5.6	13.0			
				100	138.3	9.01	107.3	119.5	4.5	1.3	2.9	138.8	8.92	108.4	112.6	4.6	2.9	6.7	139.4	87.37	109.6	109.3	4.7	5.3	12.3			
				120	133.3	11.27	94.9	138.5	3.5	1.2	2.7	133.6	11.05	95.9	132.0	3.5	2.8	6.4	133.9	108.27	96.9	128.9	3.6	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	22.5	3.3	7.6	60	141.5	5.68	122.1	80.7	7.3	1.5	3.5	142.3	5.57	123.3	73.2	7.5	3.3	7.7	143.2	54.55	124.6	69.7	7.7	6.0	13.8			
				80	145.0	7.29	120.1	100.5	5.8	1.4	3.2	145.7	7.14	121.4	93.3	6.0	3.1	7.1	146.5	69.98	122.6	89.9	6.1	5.6	13.0			
				100	144.1	9.22	112.7	119.9	4.6	1.3	2.9	144.7	9.03	113.9	113.1	4.7	2.9	6.7	145.2	88.50	115.0	109.7	4.8	5.3	12.3			
				120	138.9	11.46	99.7	139.0	3.5	1.2	2.7	139.1	11.24	100.8	132.4	3.6	2.8	6.4	139.4	110.11	101.8	129.3	3.7	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	30.0	6.1	14.1	60	146.9	5.74	127.3	80.9	7.5	1.5	3.5	147.8	5.62	126.6	73.4	7.7	3.3	7.7	148.7	55.01	129.9	70.0	7.9	6.0	13.8			
				80	150.8	7.36	125.7	100.7	6.0	1.4	3.2	151.6	7.21	126.9	93.5	6.2	3.1	7.1	152.3	70.69	128.2	90.1	6.3	5.6	13.0			
				100	150.1	9.33	118.3	120.2	4.7	1.3	2.9	150.7	9.15	119.5	113.3	4.8	2.9	6.7	151.3	89.65	120.7	109.9	4.9	5.3	12.3			
				120	144.9	11.66	105.1	139.2	3.6	1.2	2.7	145.2	11.43	106.2	132.7	3.7	2.8	6.4	145.5	111.99	107.3	129.5	3.8	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
80	15.0	1.1	2.5	60	144.7	5.73	125.2	81.7	7.4	1.5	3.5	145.6	5.62	126.5	73.5	7.6	3.3	7.7	146.5	55.05	127.8	69.8	7.8	6.0	13.8			
				80	149.6	7.34	124.6	101.8	6.0	1.4	3.2	150.4	7.19	125.9	93.9	6.1	3.1	7.1	151.2	70.47	127.2	90.2	6.3	5.6	13.0			
				100	149.3	9.21	117.9	121.4	4.8	1.3	2.9	149.9	9.03	119.1	113.8	4.9	2.9	6.7	150.6	88.47	120.4	110.2	5.0	5.3	12.3			
				120	143.8	11.35	105.1	140.4	3.7	1.2	2.7	144.2	11.13	106.2	133.2	3.8	2.8	6.4	144.5	109.05	107.3	129.8	3.9	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	22.5	3.1	7.1	60	147.5	5.79	127.7	82.3	7.5	1.5	3.5	148.4	5.67	129.0	74.1	7.7	3.3	7.7	149.3	55.61	130.3	70.3	7.9	6.0	13.8			
				80	154.7	7.41	129.4	102.3	6.1	1.4	3.2	155.5	7.26	130.7	94.3	6.3	3.1	7.1	156.3	71.18	132.0	90.6	6.4	5.6	13.0			
				100	155.4	9.34	123.5	121.8	4.9	1.3	2.9	156.0	9.16	124.8	114.2	5.0	2.9	6.7	156.7	89.74	126.1	110.6	5.1	5.3	12.3			
				120	149.7	11.59	110.2	140.7	3.8	1.2	2.7	150.1	11.35	111.3	133.5	3.9	2.8	6.4	150.4	111.28	112.5	130.1	4.0	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							
	30.0	5.8	13.4	60	153.9	5.85	133.9	82.4	7.7	1.5	3.5	154.8	5.73	135.3	74.2	7.9	3.3	7.7	155.8	56.17	136.6	70.4	8.1	6.0	13.8			
				80	161.5	7.49	135.9	102.5	6.3	1.4	3.2	162.3	7.34	137.3	94.5	6.5	3.1	7.1	163.2	71.90	138.7	90.8	6.7	5.6	13.0			
				100	162.7	9.48	130.3	122.0	5.0	1.3	2.9	163.3	9.29	131.6	114.4	5.2	2.9	6.7	164.0	91.03	133.0	110.8	5.3	5.3	12.3			
				120	157.4	11.82	117.1	141.0	3.9	1.2	2.7	157.8	11.59	118.3	133.8	4.0	2.8	6.4	158.2	113.55	119.4	130.4	4.1	5.1	11.7			
				130	OPERATION NOT RECOMMENDED																							

Interpolation is permissible, extrapolation is not
 All performance data is based upon the lower voltage of dual voltage rated units
 All performance data is based upon a load coaxial heat exchanger of single-walled copper construction. For vented double-wall performance consult the factory
 Operation below 40°F EWT is based upon 15% methanol antifreeze solution
 See performance data notes for operation in the shaded areas
 Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated

Antifreeze Correction Table

Antifreeze Type	Antifreeze %	Cooling			Heating		WPD Corr. Fct. EWT 30°F
		EWT 90°F			EWT 30°F		
		Total Cap	Sens Cap	Power	Htg Cap	Power	
Water	0	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.995	0.995	1.003	0.989	0.997	1.070
	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
Methanol	5	0.997	0.997	1.002	0.989	0.997	1.070
	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.140
	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
Ethylene Glycol	5	0.998	0.998	1.002	0.993	0.998	1.040
	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

Physical & Electrical Data

Physical Data

Model		036	060	120
Compressor (qty)		Scroll (1)		Scroll (2)
Factory Charge R410A (lbs) [kg] Per Circuit		4.5 [2.04]	5.5 [2.49]	5.5 [2.49]
Water Connection Size				
Source/Load (in)	Residential	1" Swivel	1" Swivel	1-1/2 IPT
	Commercial	3/4" IPT	1" IPT	
HWG (in)	Residential	1" Swivel	1" Swivel	1/2" IPT
	Commercial	1/2" IPT	1/2" IPT	
Weight - Operating (lbs) [kg]		348 [158]	360 [163]	726 [329]
Weight - Packaged (lbs) [kg]		373 [169]	385 [175]	770 [349]
Water Volume (Source)				
Gallons (Liters)		0.96 (3.64)	1.33 (5.04)	2.65 (10.02)

Dual isolated compressor mounting
 Balanced port expansion valve (TXV)
 Insulated Source and Load Water Coils standard
 Insulated Refrigerant Circuit standard
 Compressor on (green) and fault (red) light

Unit Maximum Water Working Pressure	
Options	Max Working Pressure PSIG [kPa]
Base Unit	500 [3,445]

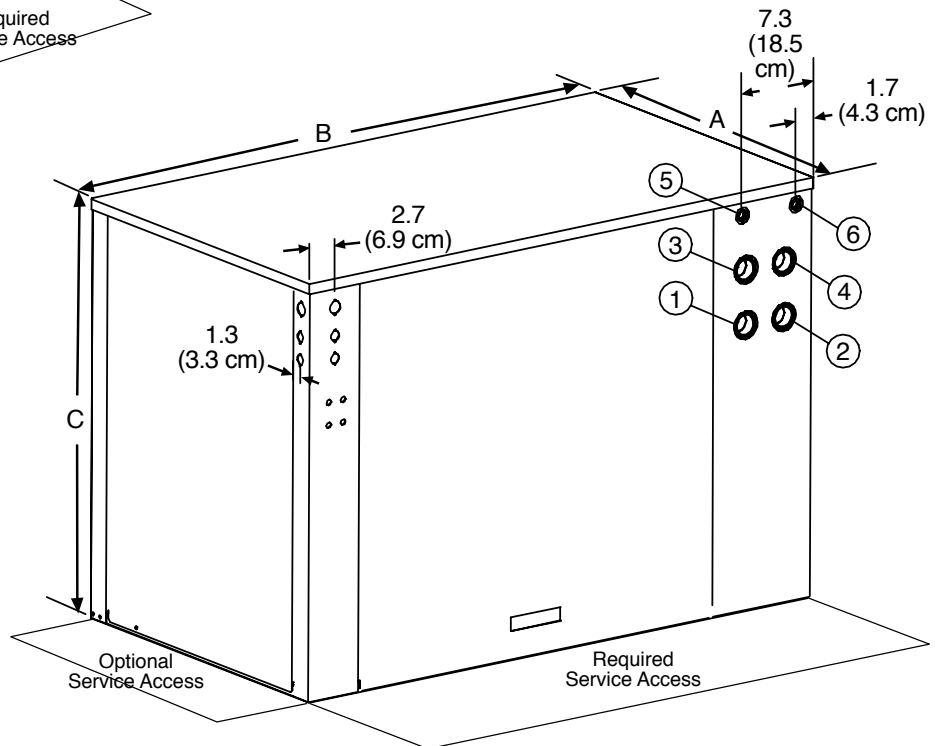
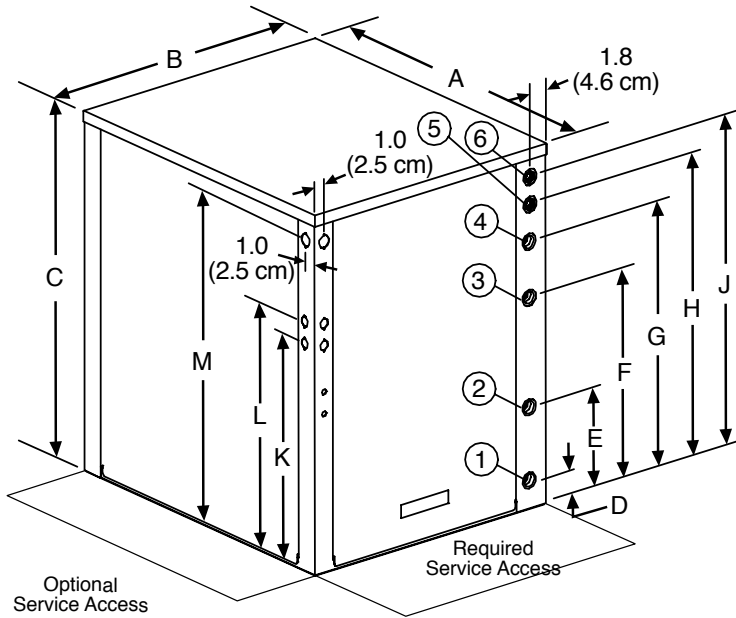
Electrical Data

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			HWG Pump FLA	EXT Loop Pump Fla	Total Unit FLA	Min Circuit Amps	Max Fuse/HACR
				QTY	RLA	LRA					
HWW036	1	208-230/60/1	187/254	1	16.7	79	0.4	4	16.7	20.8	35
	3	208-230/60/3	187/254	1	10.4	73	-	-	10.4	13.1	20
	4	460/60/3	414/506	1	5.8	38	-	-	5.8	7.2	15
	5	575/60/3	518/633	1	3.8	36.5	-	-	3.8	4.7	15
HWW060	1	208-230/60/1	187/254	1	26.3	134	0.4	4	26.3	32.9	50
	3	208-230/60/3	187/254	1	15.6	110	-	-	15.6	19.5	35
	4	460/60/3	414/506	1	7.8	52	-	-	7.8	9.8	15
	5	575/60/3	518/633	1	5.8	38.9	-	-	5.8	7.3	15
HWW120	1	208-230/60/1	187/254	2	26.3	134	0.4	4	52.6	59.2	80
	3	208-230/60/3	187/254	2	15.8	110	-	-	31.2	35.1	50
	4	460/60/3	414/506	2	7.8	52	-	-	15.6	17.6	25
	5	575/60/3	518/633	2	5.8	38.9	-	-	11.6	13.1	15

HACR circuit breaker in USA only

Dimensional Data

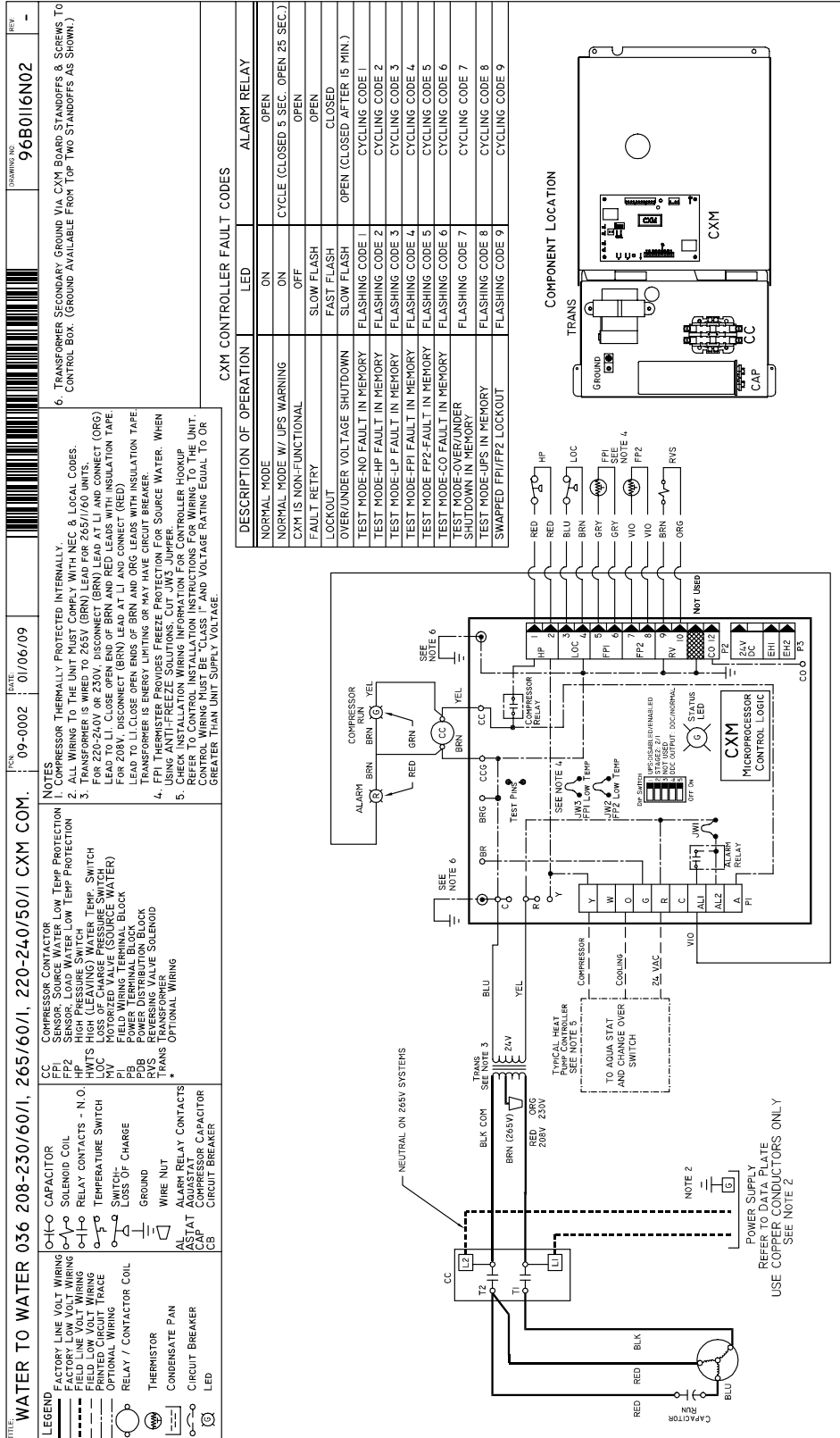
HWW036 - 120



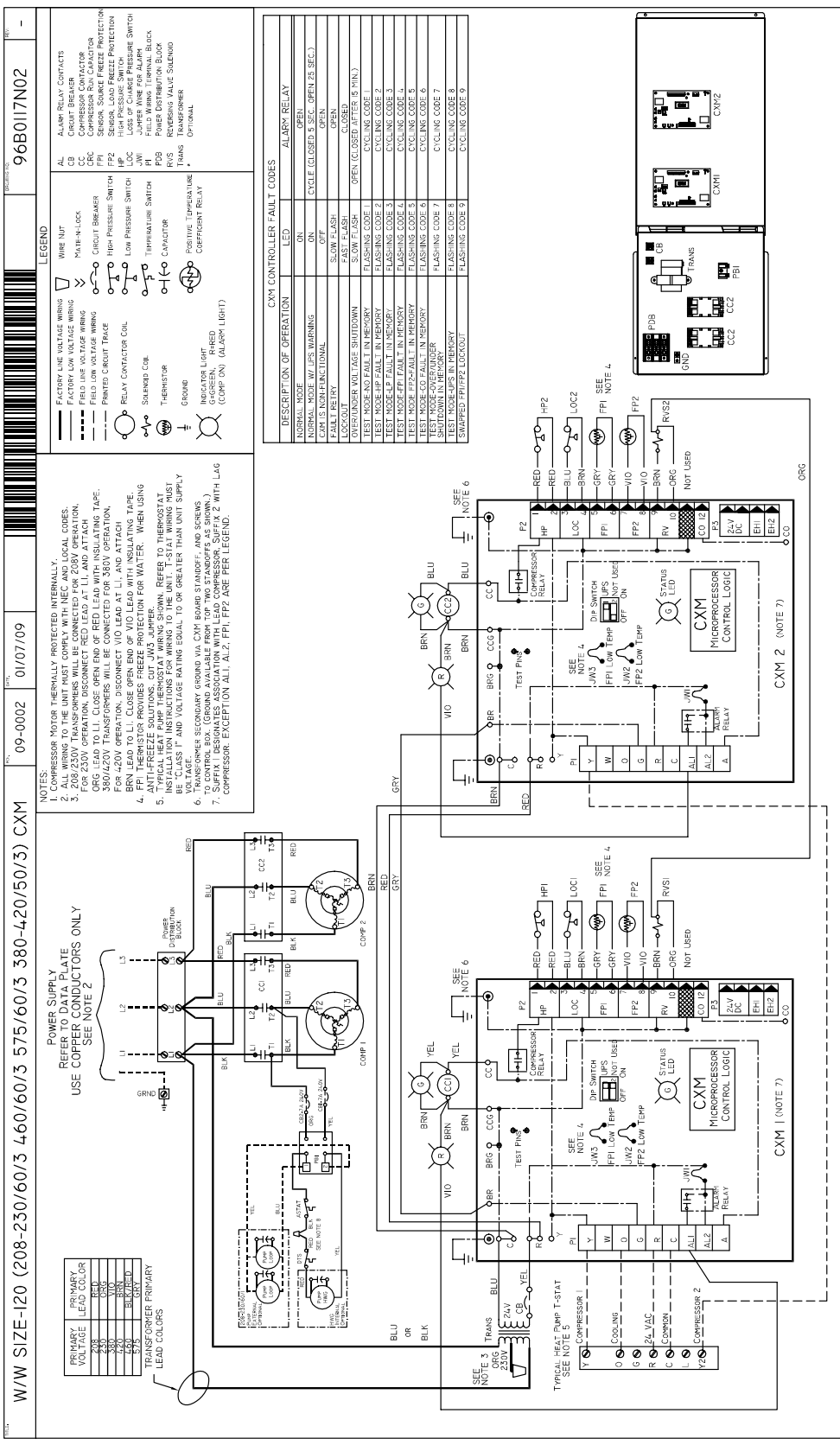
Water to Water	Overall Cabinet			Water Connections						Electric Access Plugs			
	A	B	C	1	2	3	4	5	6	K	L	M	
	Depth	Width	Height	D Source (Outdoor) Water In	E Source (Outdoor) Water Out	F Load (Indoor) Water In	G Load (Indoor) Water Out	H HWG Return In	J HWG Water Out	Low Voltage	External Pump	Power Supply	
036-060	in.	30.6	25.4	33	2.7	9.4	19.4	24.5	27.9	30.4	20.9	22.9	30.9
	cm.	77.8	64.5	83.8	6.9	23.9	49.3	62.2	70.9	77.2	53.1	58.2	78.5
120	in.	30.6	52.9	37	25.2	25.2	30.1	30.1	34.9	34.9	29.9	31.9	34.4
	cm.	77.8	134.4	94	64.0	64.0	76.5	76.5	88.6	88.6	75.9	81.0	87.4

HACR circuit breaker in USA only

Typical Wiring Diagram Single Phase HWW 036 With CXM



Typical Wiring Diagram Three Phase HWW 120 With CXM



Design, specifications, performance data and materials subject to change without notice.

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