PREMIER™

Water-to-Water Heat Pumps:
34,000 and 56,000 BTUH

Residential
Specifications Catalog

- Applications
- Design Features
- Performance Data
- Electrical Schematics
- Dimensional Data
- Physical Data
- Engineering Guide Specifications

WaterFurnace®

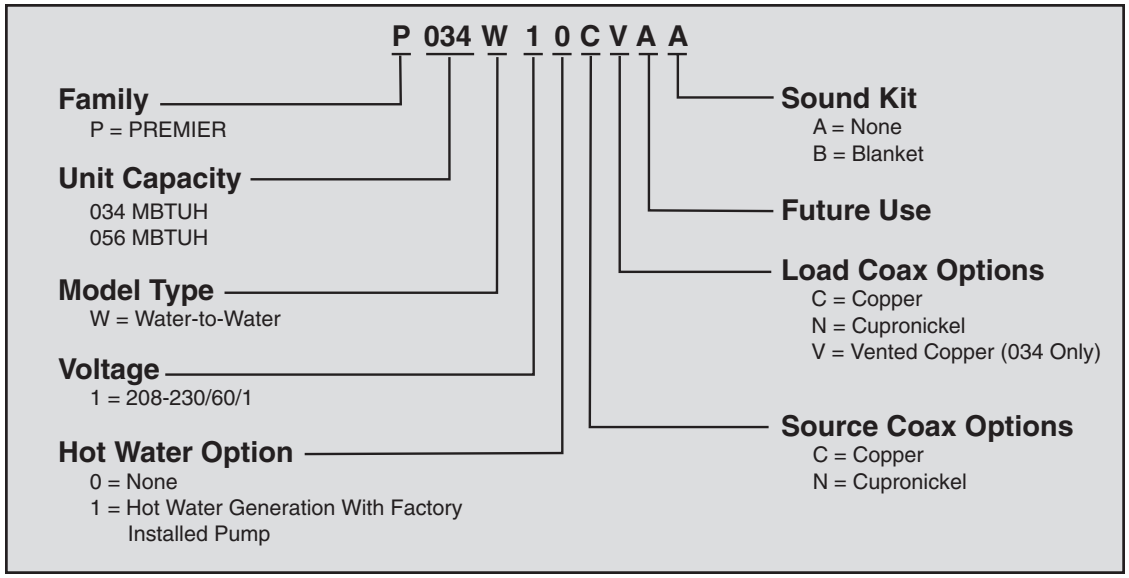
Geothermal Heating • Cooling • Hot Water

PREMIER™

Water-to-Water Heat Pumps: 34,000 and 56,000 BTUH
Specifications Catalog

Contents

Model Nomenclature



Hydronic Heating Systems

Heating with hot water is versatile because there are many ways of distributing the heat through the building. The options range from heavy cast iron radiators seen in older buildings to modern, baseboard-style convection radiation, and from invisible radiant floor heating to forced air systems using fan coil units.

A boiler is often used to make domestic hot water and to heat swimming pools or hot tubs.

The various distribution systems have all been used successfully with a geothermal heat pump system. When designing or retrofitting an existing hydronic heating system, however, the water temperature produced by the heat pump is a major consideration.

Heat pumps using R-22 refrigerant are not designed to produce water above 130°F. The efficiency decreases as the temperature difference (ΔT) between the heat load (generally the earth loop) and the supply water (to the distribution system) increases. Figure 1 illustrates the effect of source and load temperatures on the system. The heating capacity of the heat pump also decreases as the temperature difference increases.

When using the various types of hydronic heat distribution systems, the temperature limits of the geothermal system must be considered. In new

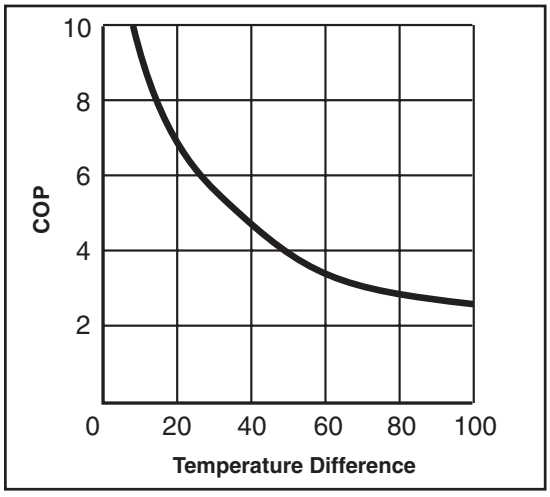


Figure 1: As the ΔT increases, the Coefficient of Performance (COP) decreases. When the system produces 130° F water from a 30° F earth loop, the ΔT is 100° F, and the COP is approximately 2.5. If the system is producing water at 90° F, the ΔT is 60° F and the COP rises to about 3.8, an increase of over 50%.

construction, the distribution system can easily be designed with the temperature limits in mind. In retrofits, care must be taken to address the operating temperature limits of the existing distribution system.

Baseboard Radiation: In existing systems, baseboard radiation is typically designed to operate with 160 to 240°F water or steam. Baseboard units are typically copper pipe with aluminum fins along the length of the pipe, as shown in Figure 2. A decorative cover is normally fitted over the fin tube.

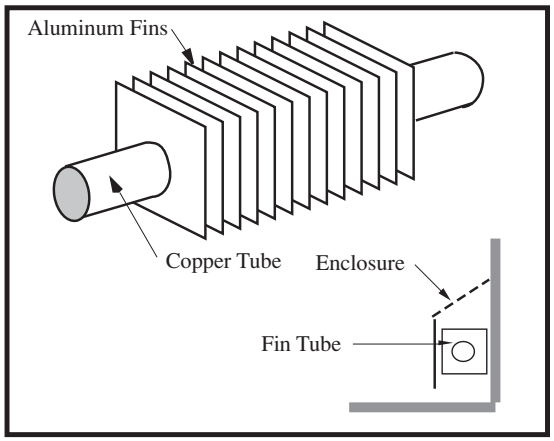


Figure 2: Baseboard radiators are typically constructed of copper tube with closely spaced aluminum fins attached to provide more surface area to dissipate heat. Some of the factors affecting the amount of heat given off by fin tube radiators are water temperature, water velocity, air temperature, and fin spacing and size.

The operation of a baseboard radiation system depends on setting up a convection current in the room: air is warmed by the fin tube, rises and is displaced by cool air.

The heating capacity of a baseboard system is a factor of the area of copper tube and fins exposed to the air and the temperature difference between the air and the fin tube. The velocity and volume of water flowing through the baseboard affects the temperature of the copper and fins. Baseboard units are normally rated in heat output/length of baseboard at a standard water temperature and flow. Manufacturers can provide charts which will give the capacities at temperatures and flows below the standard. Figure 3 shows approximate heating capacities for fin tube radiation using water from 100 to 130°F water.

Baseboards are available using two or three fin tubes tiered above one another in the same cabinet (see Figure 4). With the additional surface area, the air can be heated enough to set up a convection current with water temperatures as low as 110 to 130°F (see Figure 3).

It is important to ensure that the heat output of the system is adequate to meet the heat loss of the room or building at the temperatures the geothermal system is capable of producing.

Baseboard radiation is limited to space heating. Cooling is typically provided by a separate, forced air distribution system.

Heating output per linear foot

Average Water Temp.	Entering Air Temperature		
	55° F	65° F	70° F
110° F	190-380	**160-320**	150-300
120° F	240-480	**205-410**	195-390
130° F	295-590	**265-532**	245-490

Figure 3: The heating capacity (Btuh/linear foot) of baseboard radiators drops as the water temperature is reduced. The heating capacity of most baseboard radiators is rated using 200°F water, 65°F air temperature. Listed is the range of heating capacities of baseboard radiators at the standard temperatures and the range of capacities when the temperatures are reduced to the operating range of a heat pump system. Some of the factors that affect the capacity of a radiator are listed:

- *Size of the fins - range from 2.75" x 3" to 4" x 4"*
- *Fin spacing - 24 to 48/foot*
- *Diameter of copper tube - range from .75" to 2"*
- *Fin material - aluminum or steel*
- *Configuration and height of the enclosure*
- *Height unit is mounted from the floor*
- *Water flow through the radiator*

Generally, the smaller fins with fewer fins/foot will have lower heating capacity. Larger copper tube diameter and aluminum fins will have a higher capacity. Higher water flow will increase capacity. Adding a second fin tube to the same enclosure will increase the capacity by 50 to 60%. Adding two fin tubes will increase the capacity by 75 to 80%.

Cast Iron Radiation: Retrofit applications for hydronic/geothermal heat pump systems are often required to work with existing cast iron radiators or their replacements (see Figure 4). Typically, cast iron radiator systems operate with water temperatures of 125 to 160°F.

These temperatures are higher than geothermal water-to-water heat pumps are capable of providing. Cast iron radiators can work with geothermal systems, provided the heat output of the radiators will meet the maximum heat loss of the building at the lower temperatures.

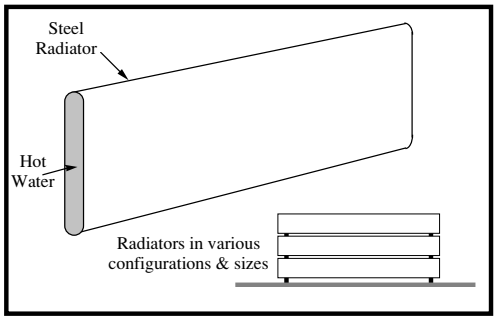


Figure 4: Many different configurations of radiators are available for replacements of old cast iron radiators to fit many different applications. Radiators are available for special applications such as towel drying racks. As with baseboard radiators, the heating capacity varies with water temperatures and velocities, air temperatures, and surface area.

If the insulation of the building has been upgraded since the original installation, it is possible that the lower temperatures will be able to meet the reduced heat loss of the building.

Radiant Floor Heating: Radiant floor heating has been the system of choice in many parts of Europe for some time. Manufacturers have developed tubing designed for installation in concrete floors and raised wood floors.

Floor heating systems have several benefits in residential, commercial and industrial heating applications. In a building with a radiant floor heating system, the entire floor acts as a heat source for the room. People feel comfortable with lower air temperatures if their feet are warm. Typically the space will feel comfortable with air temperatures as low as 65°F. Since the heat loss of a building is directly related to the temperature difference (ΔT) between the inside and outside, a lower ΔT means the heat loss is lower.

Air temperatures in a room with a forced air heating system tend to be warmer nearer to the ceiling than the floor (see Figure 5). The hot air rises and creates a greater pressure imbalance between the inside and outside. The infiltration increases, resulting in a higher heat loss. Air temperatures in a room with radiant floor heating tend to be warmer at the floor than the ceiling, helping to cut down on infiltration in the building. The energy savings in a building with radiant floor heating can range from 10 to 20%.

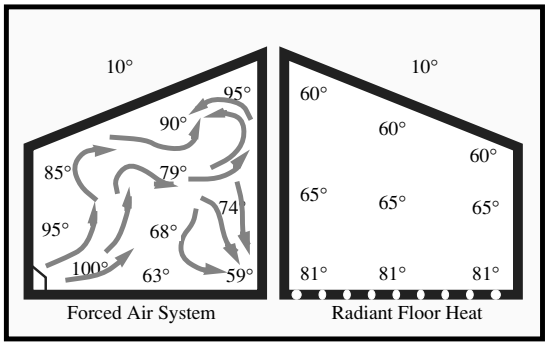


Illustration courtesy of WIRSBO Company

Figure 5: Temperatures in a forced air system tend to be more uneven than in a radiant floor heating system. The air temperatures in a forced air system tend to be much higher than with radiant floor heating, making the temperature difference between inside and outside higher. This results in a higher heat loss.

A floor heat system can be designed to heat a building with water temperatures as low as 90°F. Figure 1 shows how a geothermal system operates more efficiently with a lower ΔT between the source and the load. With only a 60°F temperature difference, a geothermal heat pump will operate at COPs over 4, about 20% higher than a forced air geothermal system in the same installation.

Some of the factors affecting the heating capacity of a floor heating system are as follows:

- The type of finish flooring
- The spacing of the pipe
- The water flow through the pipe
- The temperature of the supply water
- The floor material (wood, concrete or poured Gypcrete™)
- Insulation value under the floor
- The piping layout

The spacing of the pipe in residential applications can vary from 4" to 12". If the spacing is too large, the temperature of the floor can vary noticeably. In industrial applications, variation in the floor temperature is not as important, and the spacing is related directly to the heat output required.

Radiant floor heating systems work well with geothermal heat pump systems. For efficient operation, the system must be designed with the lowest possible water temperatures.

There are some drawbacks with a radiant floor heating system. Air conditioning is only possible by adding a second system using forced air. This can add substantial cost to an installation where air conditioning is also needed. A separate air handling system is needed to clean the air or to introduce fresh air.

Industrial buildings, especially those with high ceilings and large overhead doors, have an advantage with a radiant floor heating system. Heat is stored in the concrete floor, and when a door is opened, the stored heat is immediately released to the space. The larger the ΔT between the air in the space and the floor, the quicker the floor releases its heat to the space.

Maintenance garages benefit from radiant floor heating systems. Cold vehicles brought into the garage are warmed from underneath. The snow melts off the vehicle and dries much more quickly than when heated from above.

Some pipe manufacturers include an oxygen diffusion barrier in the pipe to prevent oxygen diffusion. Good system design and careful installation, however, will eliminate virtually all of the problems encountered with air in the system. As with earth loop design, it is important to design the system to facilitate flushing the air initially and ensuring that the flows can be balanced properly.

Fan Coil Units & Air Handlers: Fan coil units, air handlers, force flow units, etc. are all basically a hot water radiator or coil (usually copper piping with aluminum fins) with a fan or blower to move the air over the coil (see Figure 6). The term "fan coil units" typically applies to smaller units that are installed in the zone or area in which heating (or cooling) is needed. They are available in many different configurations, sizes and capacities. Fan coil units are designed to be connected to a ductwork system and can be used to replace a forced air furnace. Other units are designed for use without ductwork and are mounted in a suspended ceiling space with only a grill showing in place of a ceiling tile. Some can be mounted on a wall under a window, projecting 8" to 10" into the room or even flush to the wall surface, mounted between wall studs. Some are available with or without finished, decorative cabinets. For industrial applications, inexpensive "unit heaters" are available, with only a coil and an axial fan. Fan coil units and unit heaters are normally available with air handling capacities of 200 to 2,000 cfm.

The term "air handler" normally applies to larger units, mounted in mechanical rooms, mechanical crawl spaces or rooftops. They typically have an air handling capacity of over 2,000 cfm and are available for capacities of up to 50,000 cfm. Air handlers are typically built for a specific installation and are available with many different types of heating and cooling coils. They can include additional coils for heating make-up air, dehumidification and exhaust air heat recovery.

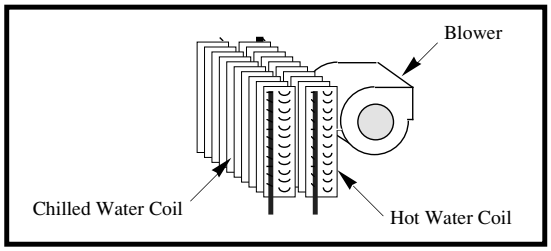


Figure 6: Fan coils and air handlers typically have one or two coils and a blower. Air is heated by hot water circulated through the hot water coil. Chilled water is circulated through the coil if air conditioning is needed. Blowers can be provided to fit various applications, with or without ductwork. Unit heaters typically use axial fans in applications where ductwork is not needed.

Fan coil units and air handlers are used in many different applications. They have been used to heat buildings using water temperatures as low as 90 to 100°F. New systems can be designed to operate very efficiently with a geothermal system.

In a retrofit situation when replacing a conventional boiler, care must be taken to ensure that any air handlers or fan coil units in the building will heat the building with water temperatures below 130°F.

Cooling a building with an existing radiant hydronic

Cooling with Hydronic Systems

heating system can be a challenge. If baseboard, cast iron radiators or a radiant floor heating system is cooled lower than the dew point, condensation will form on the floor or drip off the radiators.

There is generally minimal ductwork for ventilation or no ductwork in existing buildings with radiant hydronic heat. Typically, cooling is provided with separate units where it is needed. This is often done using through-the-wall or window air conditioners, ductless split air conditioning units, or rooftop units.

A water-to-water heat pump system can provide water to ducted or unducted fan coil units. The system can provide chilled water to cool the building, as well as hot water for the heating system when needed.

A limited amount of cooling can be done by circulating chilled water through the piping in the floor. This can be effective in buildings with high solar loads or lighting loads, where much of the heat gain is radiant heat being absorbed by the floor. Cooling fresh air used for ventilation as it is brought into the building, using a chilled water coil, can sometimes provide the additional cooling needed. Care must be taken to avoid cooling the floor below the dew point because condensation may form on the floor.

Buildings with fan coil units and air handlers can generally be easily retrofitted for cooling. Often it is simply a matter of adding a cooling coil to the existing air handlers and fan coil units. Water-to-water heat pumps can provide hot water for the heating coils as well as chilled water for the air conditioning.

Integrated Systems: In buildings with fairly balanced heating and cooling loads, a hydronic/ geothermal system can provide a significant efficiency advantage. When a heat pump is making hot water, it will take heat from the building when cooling is needed. When cooling is not needed, heat will be taken from the earth loop.

While cooling, heat is rejected directly into another part of the building making the heat virtually free. If it can't be used, it is stored in the ground loop.

Additional System Design Reference materials are available from WaterFurnace.

Design Features

Flexibility

- Designed to operate with liquid temperatures of 30°F to 120°F (30-90 EST, 30-120 ELT).
- Source side flow rates as low as 1.5 gpm/ton for well water (50°F min. EWT).
- Heated and chilled water from the same compact unit.
- Modularized design for optimum capacity matching and staging.
- Stackable for space conservation.
- Compact size allows passage through most doors.

Operating Efficiencies

- Optional desuperheater with internal pump generates hot water at considerable savings while improving overall system efficiency.
- High-stability expansion valve delivers optimum refrigerant flow over a wide range of conditions and provides bidirectional operation without troublesome check valves.
- Efficient scroll compressors operate quietly.
- Oversized coaxial tube water-to-refrigerant heat exchanger operates at low liquid pressure drops. Convoluted copper (or optional cupronickel) water tube functions efficiently at low-flow rates and provides greater durability.

Service Advantages

- Removable front and rear access panels provide quick access to all internal components.
- Designed for front-access in tight applications.
- High-and low-pressure service ports in refrigerant circuit.

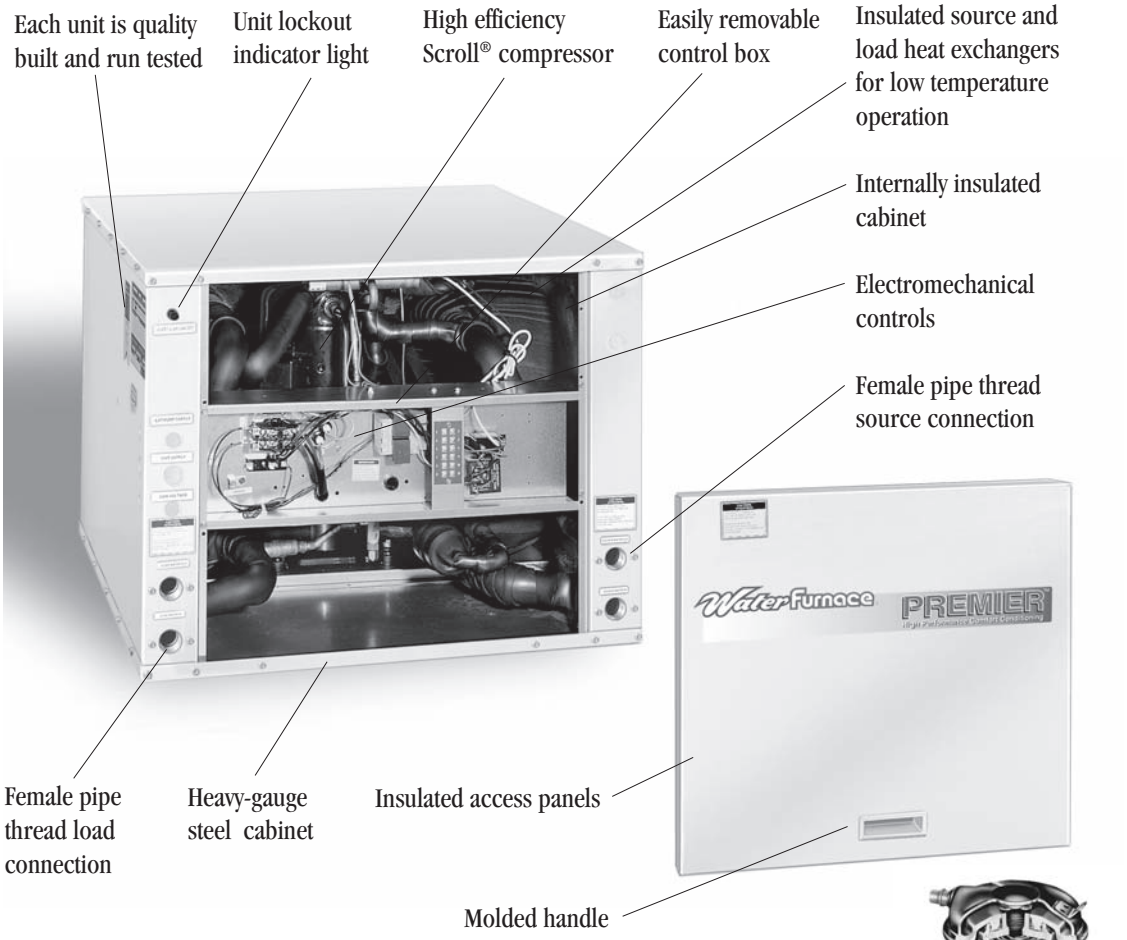
Factory Quality

- Heavy-gauge steel cabinets are finished with durable powder coat paint for long lasting beauty and service.
- All refrigerant brazing is performed in a nitrogen atmosphere.
- All units are deep evacuated to less than 150 microns prior to refrigerant charging.
- All joints are helium leak-tested to insure annual leak rate of less than 1/4 ounce.
- Coaxial heat exchangers, refrigerant suction lines, desuperheater coil, and all water pipes are fully insulated to reduce condensation problems in low temperature operation.
- Noise reduction features: isolation mounted compressors; insulated cabinet using 1/2" coated glass fiber.
- Safety features include high and low-pressure refrigerant controls to protect the compressor; hot water high-limit desuperheater pump shutdown.

Options & Accessories

- Optional desuperheater with internally mounted pump and water heater plumbing connector.
- Optional cupronickel coaxial heat exchanger.
- Closed loop flow center.
- Hose kits.
- Sound blanket for compressor.
- FPK Freeze protection kit 32°.
- FPKCL Freeze protection kit 15°.

Premier Features



All Premier units use the most advanced compressor technology Copeland™ scroll compressors. Compared to conventional reciprocating piston technology, these compressors are revolutionary, delivering unprecedented performance. Their simple design makes a major contribution to the outstanding efficiency, comfort, reliability and quiet operation of the Premier Series.

Reference Calculations

Heating Calculations:

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

Cooling Calculations:

$$LWT = EWT + \frac{HR}{GPM \times 500}$$

Legend

ELT = entering load fluid temperature to heat pump
SWPD = source coax water pressure drop
LLT = leaving load fluid temperature from heat pump
PSI = pressure drop in pounds per square inch
LGPM = load flow in gallons per minute
FT HD = pressure drop in feet of head
LWPD = load coax water pressure drop
LWT = leaving water temperature
EWT = entering water temperature
kW = kilowatts
EST = entering source fluid temperature to heat pump
HE = heat extracted in BTUH
LST = leaving source fluid temperature from heat pump
HC = total heating capacity in BTUH
COP = coefficient of performance, heating [HC/(kW x 3.413)]
EER = energy efficiency ratio, cooling
TC = total cooling capacity in BTUH
HR = heat rejected in BTUH

Unit Selection Calculations

Example #1 Selecting a single unit to heat and/or cool.

A) Determine System Design Conditions:

1) The "source" (heat source/heat sink) side - This could be an earth loop, well water, a boiler/tower loop, process water, condenser water, etc. The source liquid can be 25°F to 110°F entering the unit.
2) The "load" side - This could be a water coil(s) in an air handler unit(s), a fan coil unit(s), hydronic baseboard, in-slab piping, swimming pool, etc. The load liquid can be 30°F to 120°F entering the unit.
3) The load side of multiple units can be plumbed together in either parallel or series style to accomplish certain tasks.
   - Always use parallel flow for the source sides.
   - Use parallel flow for the load sides with the following needs:

• Heating and/or cooling capacity greater than the largest single unit can provide.
• To do staging of capacity.
• To reduce the pressure drop through the load side of the units, even when a single unit might meet capacity.
   - Use series flow for the load sides with the following needs:

• Leaving liquid temperature (LLT) greater than a single unit can produce on cooling. However, do not drop the entering liquid temperature (ELT) of any unit below 30°F.

B) Unit Selection Parameters:

	Load Side		Source Side	
	Heat	Cool	Heat	Cool
Entering Water (liquid) Temp.	110°F ELT	50°F ELT	50°F EST	80°F EST
Water (liquid) Flow Rate*	8.0 GPM	11.0 GPM	8.0 GPM	8.0 GPM
Water (liquid) Pressure Drop	12.0 ft hd	12.0 ft hd	7.0 ft hd	7.0 ft hd
Unit Electrical	230/1/60			
Coax Material	Cupronickel		Copper	

* As low as 1.5 GPM/ton for constant temperature liquid like well water that is in the 45° F to 60° F range to as high as 3.0 GPM/ton for variable temperature liquid.

C) Determine Unit Requirements:

	Load Side			Source Side	
	TC/HC	ELT	GPM	EST	GPM
Cooling	43,000 3.6 tons	50°F	11	80°F	8
Heating	54,000 4.5 tons	110°F	8	50°F	8

D) Initial Selection: Refer to the performance data tables (pages 14-17) and select possible units.

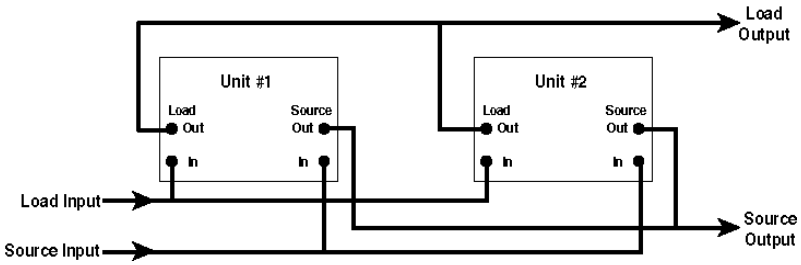
Unit possibility #1: P056W (pages 16 and 17) 5 ton unit—using interpolation.

	Load Side								Source Side (Parallel)			
	ELT	GPM	PD (ft hd)	TC/HC	KW	HR/HE	EER/COP	LLT	EST	GPM	PD	LST
Cooling	50	11.0	11.2	43,900	2.91	53,800	15.1	41.80	70	8.0	6.70	83.90
	50	**11.0**	**11.2**	**42,600**	**3.24**	**53,650**	**13.4**	**42.05**	**80**	**8.0**	**6.25**	**93.85**
	50	11.0	11.2	41,300	3.56	53,500	11.6	42.03	90	8.0	5.80	103.80
Heating	100	8.0	5.20	54,500	4.28	39,900	3.7	113.7	50	8.0	7.50	40.00
	110	**8.0**	**5.05**	**54,350**	**4.77**	**38,050**	**3.4**	**123.6**	**50**	**8.0**	**7.50**	**40.45**
	120	8.0	4.90	54,200	5.26	36,200	3.0	133.5	50	8.0	7.50	40.90

E) Final Results:

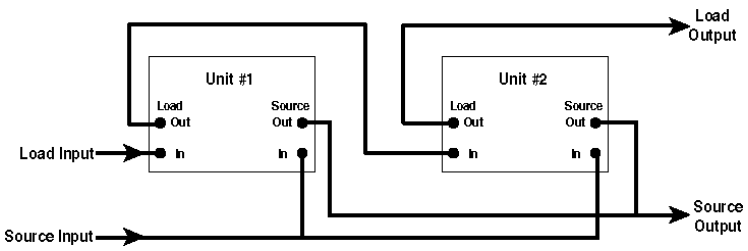
P056W (refer to Model Description Key on page 10)
Total Cooling Capacity (TC) = 42,600 BTUH (within 1% of needed capacity)
Total Heating Capacity (HC) = 54,350 BTUH
Since the LLT/LST are above freezing, no antifreeze is required

Example #2: Selecting multiple units to accomplish a heating and/or cooling task by piping the load sides in parallel flow.



By adding together the capacities of two units, increased capacities can be met, while the overall system pumping pressure drop is lowered, perhaps lowering the pump horsepower. In addition, by cycling one unit, capacity reduction can be accomplished.

Example #3: Selecting multiple units to accomplish a cooling task by piping the load sides in series flow.



This arrangement satisfies the requirement of achieving a 20°F drop in load liquid temperature. By piping the load sides in series, the LLT of the first unit becomes the ELT of the second unit. The overall system pumping pressure drop is increased and therefore requires increased pump horsepower. If at anytime, a 10°F drop would satisfy the requirements, one unit could be cycled off, but the pumping penalty would still remain.

P034W Heating Capacity Data

			LWPD		SOURCE 5.0 GPM						SWPD		SOURCE 7.0 GPM						SWPD		SOURCE 9.0 GPM						SWPD	
ELT	EST	LGPM	PSI	FT HD	LLT	HC	KW	HE	COP	LST	PSI	FT HD	LLT	HC	KW	HE	COP	LST	PSI	FT HD	LLT	HC	KW	HE	COP	LST	PSI	FT HD
60	30	5.0	1.6	3.7	69.5	23.1	1.53	17.9	4.4	22.8	1.7	3.9	69.9	23.8	1.53	18.6	4.6	24.1	3.5	8.1	70.4	24.5	1.52	19.4	4.7	25.4	5.3	12.2
		7.0	3.7	8.5	67.4	23.0	1.49	17.9	4.5	22.8	1.7	3.9	67.8	23.7	1.49	18.6	4.7	24.1	3.5	8.1	68.1	24.4	1.49	19.3	4.8	25.4	5.3	12.2
		9.0	5.1	11.8	65.4	22.9	1.45	17.9	4.6	22.8	1.7	3.9	65.6	23.5	1.45	18.6	4.8	24.1	3.5	8.1	65.8	24.2	1.45	19.2	4.9	25.4	5.3	12.2
60	40	5.0	1.6	3.7	71.2	27.1	1.56	21.8	5.1	31.0	1.7	3.9	71.6	28.0	1.55	22.7	5.3	32.7	3.5	8.0	72.0	28.9	1.55	23.6	5.5	34.5	5.3	12.2
		7.0	3.7	8.5	68.8	27.0	1.51	21.9	5.2	31.0	1.7	3.9	69.1	27.9	1.51	22.8	5.4	32.7	3.5	8.0	69.4	28.8	1.51	23.7	5.6	34.4	5.3	12.2
		9.0	5.1	11.8	66.3	26.9	1.47	21.9	5.4	31.0	1.7	3.9	66.6	27.8	1.47	22.8	5.6	32.7	3.5	8.0	66.8	28.7	1.47	23.7	5.7	34.4	5.3	12.2
60	50	5.0	1.6	3.7	72.9	31.1	1.59	25.7	5.7	39.3	1.6	3.7	73.3	32.2	1.58	26.8	6.0	41.4	3.4	7.9	73.7	33.3	1.58	27.9	6.2	43.5	5.2	12.0
		7.0	3.7	8.5	70.1	31.1	1.53	25.8	5.9	39.3	1.6	3.7	70.4	32.2	1.53	26.9	6.1	41.4	3.4	7.9	70.8	33.3	1.53	28.0	6.4	43.5	5.2	12.0
		9.0	5.1	11.8	67.3	31.0	1.48	26.0	6.1	39.3	1.6	3.7	67.5	32.1	1.48	27.1	6.3	41.4	3.4	7.9	67.8	33.2	1.48	28.2	6.6	43.4	5.2	12.0
60	60	5.0	1.6	3.7	74.4	35.1	1.61	29.6	6.4	47.6	1.6	3.7	74.9	36.4	1.61	30.9	6.6	50.1	3.4	7.7	75.4	37.7	1.61	32.2	6.9	52.5	5.1	11.8
		7.0	3.7	8.5	71.3	35.1	1.56	29.8	6.6	47.6	1.6	3.7	71.7	36.4	1.56	31.1	6.8	50.0	3.4	7.7	72.1	37.7	1.56	32.4	7.1	52.5	5.1	11.8
		9.0	5.1	11.8	68.2	35.1	1.50	30.0	6.9	47.5	1.6	3.7	68.5	36.5	1.51	31.3	7.1	50.0	3.4	7.7	68.8	37.8	1.51	32.6	7.3	52.5	5.1	11.8
60	70	5.0	1.6	3.7	75.9	39.1	1.64	33.5	7.0	55.9	1.6	3.7	76.4	40.6	1.64	35.0	7.2	58.7	3.3	7.6	77.0	42.0	1.64	36.4	7.5	61.6	5.0	11.6
		7.0	3.7	8.5	72.5	39.1	1.58	33.8	7.3	55.8	1.6	3.7	73.0	40.7	1.59	35.2	7.5	58.7	3.3	7.6	73.4	42.2	1.59	36.7	7.8	61.5	5.0	11.6
		9.0	5.1	11.8	69.2	39.2	1.52	34.0	7.6	55.7	1.6	3.7	69.5	40.8	1.53	35.5	7.8	58.6	3.3	7.6	69.9	42.3	1.55	37.1	8.0	61.5	5.0	11.6
80	30	5.0	1.5	3.5	89.6	23.0	1.90	16.5	3.5	23.5	1.7	3.9	89.9	23.6	1.90	17.1	3.6	24.7	3.5	8.1	90.1	24.2	1.90	17.7	3.7	25.9	5.3	12.2
		7.0	3.3	7.6	87.5	22.9	1.85	16.6	3.6	23.5	1.7	3.9	87.7	23.5	1.85	17.2	3.7	24.7	3.5	8.1	87.8	24.1	1.86	17.8	3.8	25.9	5.3	12.2
		9.0	5.0	11.6	85.3	22.8	1.80	16.7	3.7	23.5	1.7	3.9	85.5	23.4	1.81	17.2	3.8	24.7	3.5	8.1	85.6	24.0	1.81	17.8	3.9	25.9	5.3	12.2
80	40	5.0	1.5	3.5	91.1	26.8	1.93	20.2	4.1	31.9	1.7	3.9	91.4	27.6	1.94	21.0	4.2	33.4	3.5	8.0	91.7	28.4	1.94	21.8	4.3	35.0	5.3	12.2
		7.0	3.3	7.6	88.7	26.8	1.88	20.4	4.2	31.9	1.7	3.9	88.9	27.6	1.88	21.1	4.3	33.4	3.5	8.0	89.2	28.3	1.89	21.9	4.4	35.0	5.3	12.2
		9.0	5.0	11.6	86.2	26.7	1.82	20.5	4.3	31.8	1.7	3.9	86.4	27.5	1.83	21.2	4.4	33.4	3.5	8.0	86.6	28.3	1.83	22.0	4.5	34.9	5.3	12.2
80	50	5.0	1.5	3.5	92.6	30.7	1.97	24.0	4.6	40.3	1.6	3.7	93.0	31.7	1.97	24.9	4.7	42.2	3.4	7.9	93.4	32.6	1.98	25.9	4.8	44.0	5.2	12.0
		7.0	3.3	7.6	89.9	30.6	1.90	24.1	4.7	40.2	1.6	3.7	90.2	31.6	1.91	25.1	4.9	42.1	3.4	7.9	90.5	32.6	1.92	26.1	5.0	44.0	5.2	12.0
		9.0	5.0	11.6	87.1	30.6	1.84	24.3	4.9	40.2	1.6	3.7	87.4	31.6	1.85	25.3	5.0	42.1	3.4	7.9	87.6	32.6	1.86	26.2	5.1	44.0	5.2	12.0
80	60	5.0	1.5	3.5	94.1	34.5	2.00	27.7	5.1	48.6	1.6	3.7	94.6	35.7	2.01	28.9	5.2	50.9	3.4	7.8	95.0	36.9	2.01	30.0	5.4	53.1	5.1	11.8
		7.0	3.3	7.6	91.1	34.5	1.93	27.9	5.2	48.6	1.6	3.7	91.4	35.7	1.94	29.1	5.4	50.8	3.4	7.8	91.8	36.9	1.95	30.2	5.6	53.1	5.1	11.8
		9.0	5.0	11.6	88.0	34.4	1.86	28.1	5.4	48.5	1.6	3.7	88.3	35.7	1.87	29.3	5.6	50.8	3.4	7.8	88.6	36.9	1.88	30.5	5.8	53.1	5.1	11.8
80	70	5.0	1.5	3.5	95.7	38.4	2.03	31.5	5.5	57.0	1.6	3.7	96.2	39.7	2.04	32.8	5.7	59.6	3.3	7.6	96.7	41.1	2.05	34.1	5.9	62.2	5.0	11.6
		7.0	3.3	7.6	92.3	38.3	1.96	31.7	5.7	57.0	1.6	3.7	92.7	39.7	1.97	33.0	5.9	59.6	3.3	7.6	93.1	41.1	1.98	34.4	6.1	62.2	5.0	11.6
		9.0	5.0	11.6	88.9	38.3	1.88	31.9	6.0	56.9	1.6	3.7	89.3	39.7	1.89	33.3	6.2	59.5	3.3	7.6	89.6	41.2	1.90	34.7	6.3	62.1	5.0	11.6
100	30	5.0	1.4	3.2	109.4	22.9	2.49	14.4	2.7	24.3	1.7	3.9	109.6	23.4	2.49	14.9	2.8	25.3	3.5	8.1	109.8	23.8	2.49	15.3	2.8	26.4	5.3	12.2
		7.0	3.1	7.2	107.3	22.8	2.44	14.5	2.7	24.2	1.7	3.9	107.5	23.3	2.44	15.0	2.8	25.3	3.5	8.1	107.6	23.8	2.44	15.5	2.9	26.4	5.3	12.2
		9.0	4.7	10.9	105.2	22.7	2.39	14.6	2.8	24.2	1.7	3.9	105.3	23.3	2.39	15.1	2.9	25.3	3.5	8.1	105.4	23.8	2.39	15.7	2.9	26.4	5.3	12.2
100	40	5.0	1.4	3.2	110.9	26.6	2.52	18.0	3.1	32.7	1.7	3.9	111.2	27.3	2.52	18.6	3.2	34.1	3.5	8.0	111.4	27.9	2.53	19.3	3.2	35.5	5.3	12.2
		7.0	3.1	7.2	108.5	26.5	2.46	18.1	3.2	32.7	1.7	3.9	108.7	27.2	2.46	18.8	3.2	34.1	3.5	8.0	108.9	27.9	2.46	19.5	3.3	35.5	5.3	12.2
		9.0	4.7	10.9	106.1	26.4	2.40	18.2	3.2	32.6	1.7	3.9	106.2	27.1	2.40	18.9	3.3	34.1	3.5	8.0	106.4	27.9	2.40	19.7	3.4	35.5	5.3	12.2
100	50	5.0	1.4	3.2	112.4	30.3	2.56	21.6	3.5	41.2	1.6	3.7	112.7	31.1	2.56	22.4	3.6	42.9	3.4	7.9	113.1	32.0	2.57	23.3	3.7	44.6	5.2	12.0
		7.0	3.1	7.2	109.7	30.2	2.49	21.7	3.6	41.2	1.6	3.7	109.9	31.1	2.49	22.6	3.7	42.9	3.4	7.9	110.2	32.0	2.49	23.4	3.8	44.6	5.2	12.0
		9.0	4.7	10.9	107.0	30.1	2.41	21.8	3.7	41.1	1.6	3.7	107.2	31.0	2.42	22.7	3.8	42.8	3.4	7.9	107.4	31.9	2.42	23.6	3.9	44.6	5.2	12.0
100	60	5.0	1.4	3.2	113.9	34.0	2.60	25.1	3.8	49.7	1.6	3.7	114.3	35.0	2.60	26.2	3.9	51.7	3.4	7.7	114.7	36.1	2.61	27.2	4.1	53.7	5.1	11.8
		7.0	3.1	7.2	110.9	33.9	2.51	25.3	4.0	49.6	1.6	3.7	111.2	34.9	2.52	26.4	4.1	51.7	3.4	7.7	111.5	36.0	2.52	27.4	4.2	53.7	5.1	11.8
		9.0	4.7	10.9	107.8	33.7	2.43	25.5	4.1	49.6	1.6	3.7	108.1	34.9	2.43	26.6	4.2	51.6	3.4	7.7	108.3	36.0	2.44	27.6	4.3	53.7	5.1	11.8
100	70	5.0	1.4	3.2	115.4	37.7	2.63	28.7	4.2	58.1	1.6	3.7	115.9	38.9	2.64	29.9	4.3	60.5	3.3	7.6	116.3	40.2	2.65	31.2	4.5	62.8	5.0	11.6
		7.0	3.1	7.2	112.1	37.6	2.54	28.9	4.3	58.1	1.6	3.7	112.4	38.8	2.54	30.1	4.5	60.4	3.3	7.6	112.8	40.1	2.55	31.4	4.6	62.8	5.0	11.6
		9.0	4.7	10.9	108.7	37.4	2.44	29.1	4.5	58.0	1.6	3.7	109.0	38.7	2.45	30.4	4.6	60.4	3.3	7.6	109.3	40.0	2.46	31.6	4.8	62.8	5.0	11.6
120	30	5.0	1.3	3.0	129.1	22.8	3.07	12.3	2.2	25.0	1.7	4.0	129.3	23.1	3.07	12.6	2.2	25.9	3.5	8.1	129.5	23.5	3.07	13.0	2.2	26.8	5.3	12.2
		7.0	3.0	6.9	127.1	22.7	3.02	12.4	2.2	24.9	1.7	4.0	127.2	23.1	3.02	12.8	2.2	25.9	3.5	8.1	127.4	23.5	3.02	13.2	2.3	26.8	5.3	12.2
		9.0	4.5	10.4	125.1	22.7	2.98	12.5	2.2	24.9	1.7	4.0	125.2	23.2	2.97	13.0	2.3	25.9	3.5	8.1	125.3	23.6	2.97	13.5	2.3	26.9	5.3	12.2
120	40	5.0	1.3	3.0	130.6	26.3	3.11	15.7	2.5	33.6	1.7	3.9	130.9	26.9	3.11	16.3	2.5	34.8	3.5	8.0	131.1	27.4	3.11	16.8	2.6	36.0	5.3	12.2
		7.0	3.0	6.9	128.3	26.2	3.05	15.8	2.5	33.5	1.7	3.9	128.5	26.8	3.05	16.4	2.6	34.7	3.5	8.0	128.7	27.4	3.04	17.0	2.6	36.0	5.3	12.2
		9.0	4.5	10.4	126.0	26.1	2.98	16.0	2.6	33.5	1.7	3.9	126.1	26.8	2.98	16.6	2.6	34.7	3.5	8.0	126.2	27.4	2.98	17.3	2.7	36.0	5.3	12.2
120	50	5.0	1.3	3.0	132.2	29.9	3.15	19.1	2.8	42.1	1.6	3.7	132.5	30.6	3.15	19.9	2.8	43.6	3.4	7.9	132.8	31.4	3.16	20.6	2.9	45.1	5.2	12.0
		7.0	3.0	6.9	129.5	29.7	3.07	19.3	2.8	42.1	1.6	3.7	129.7	30.5	3.07	20.0	2.9	43.6	3.4	7.9	129.9	31.3	3.07	20.8	3.0	45.1	5.2	12.0
		9.0	4.5	10.4	126.8	29.6	2.99	19.4	2.9	42.0	1.6	3.7	127.0	30.4	2.99	20.2	3.0	43.6	3.4	7.9	127.1	31.2	2.99	21.0	3.1	45.1	5.2	12.0
120	60	5.0	1.3	3.0	133.7	33.4	3.19	22.5	3.1	50.7	1.6	3.7	134.0	34.4	3.20	23.5	3.2	52.5	3.4	7.7	134.4	35.3	3.20	24.4	3.2	54.3	5.1	11.8
		7.0	3.0	6.9	130.7	33.3	3.09	22.7	3.1	50.7	1.6	3.7	130.9	34.2	3.10	23.7	3.2	52.5	3.4	7.7	131.2	35.2	3.10	24.6	3.3	54.3	5.1	11.8
		9.0	4.5	10.4	127.6	33.1	2.99	22.8	3.2	50.6	1.6	3.7	127.8	34.1	3.00	23.8	3.3	52.4	3.4	7.7	128.1	35.1	3.00	24.8	3.4	54.3	5.1	11.8
120	70	5.0	1.3	3.0	135.2	37.0	3.24	26.0	3.4	59.3	1.6	3.7	135.6	38.1	3.24	27.1	3.5	61.4	3.3	7.6	136.0	39.3	3.24	28.2	3.6	63.5	5.0	11.6
		7.0	3.0	6.9	131.9	36.8	3.12	26.1	3.5	59.2	1.6	3.7	132.2	37.9	3.12	27.3	3.6	61.3	3.3	7.6	132.5	39.1	3.13	28.4	3.7	63.4	5.0	11.6
		9.0	4.5	10.4	128.5	36.5	3.00	26.3	3.6	59.2	1.6	3.7	128.7	37.7	3.01	27.4	3.7	61.3	3.3	7.6	129.0	38.9	3.01	28.6	3.8	63.4	5.0	11.6

ELT = entering load fluid temperature to heat pump
LLT = leaving load fluid temperature from heat pump
LGPM = load flow in gallons per minute
LWPD = load coax water pressure drop
EST = entering source fluid temperature to heat pump
LST = leaving source fluid temperature from heat pump

SWPD = source coax water pressure drop
PSI = pressure drop in pounds per square inch
FT HD = pressure drop in feet of head
KW = kilowatts
HE = heat extracted in BTUH
HC = total heating capacity in BTUH
COP = coefficient of performance [HC/(KW x 3.413)]

Multiple Flow Rates for Source Side and Load Side are shown. When selecting units and designing the system, actual operating parameters must fall within the temperature and flow rate ranges shown on the table. Using temperature/flow rate combinations outside the range of the table will result in performance problems.

P034W Cooling Capacity Data

			LWPD		SOURCE 5.0 GPM						SWPD		SOURCE 7.0 GPM						SWPD		SOURCE 9.0 GPM						SWPD	
ELT	EST	LGPM	PSI	FT HD	LLT	TC	KW	HR	EER	LST	PSI	FT HD	LLT	TC	KW	HR	EER	LST	PSI	FT HD	LLT	TC	KW	HR	EER	LST	PSI	FT HD
		5.0	1.7	3.9	22.4	18.5	1.33	23.0	13.9	59.5	1.6	3.7	22.4	18.3	1.29	22.7	14.2	56.7	3.9	9.0	22.5	18.2	1.25	22.4	14.5	55.1	5.2	12.0
30	50	7.0	4.0	9.2	24.3	19.2	1.35	23.8	14.3	59.8	1.6	3.7	24.4	19.0	1.30	23.4	14.6	56.9	3.9	9.0	24.5	18.7	1.26	23.0	14.8	55.3	5.2	12.0
		9.0	5.3	12.2	25.4	20.0	1.36	24.6	14.7	60.1	1.6	3.7	25.5	19.8	1.32	24.3	15.1	57.2	3.9	9.0	25.5	19.6	1.27	24.0	15.5	55.5	5.2	12.0
		5.0	1.7	3.9	23.0	16.9	1.71	22.7	9.9	79.4	1.6	3.7	23.1	16.8	1.66	22.4	10.1	76.6	3.5	8.1	23.1	16.6	1.61	22.1	10.3	75.1	5.0	11.6
30	70	7.0	4.0	9.2	24.8	17.6	1.72	23.4	10.2	79.7	1.6	3.7	24.9	17.4	1.67	23.1	10.4	76.8	3.5	8.1	24.9	17.3	1.62	22.8	10.7	75.2	5.0	11.6
		9.0	5.3	12.2	25.8	18.3	1.73	24.1	10.6	80.0	1.6	3.7	25.9	18.1	1.68	23.8	10.8	77.0	3.5	8.1	25.9	18.0	1.64	23.5	11.0	75.4	5.0	11.6
		5.0	1.7	3.9	23.7	15.3	2.08	22.4	7.4	99.2	1.5	3.5	23.7	15.2	2.03	22.1	7.5	96.5	3.2	7.4	23.8	15.1	1.97	21.8	7.6	95.0	4.9	11.3
30	90	7.0	4.0	9.2	25.3	15.9	2.09	23.1	7.6	99.5	1.5	3.5	25.6	14.9	2.04	21.8	7.3	96.4	3.2	7.4	25.9	13.8	1.99	20.6	7.0	94.7	4.9	11.3
		9.0	5.3	12.2	26.2	16.6	2.09	23.7	7.9	99.8	1.5	3.5	26.2	16.4	2.05	23.4	8.0	96.9	3.2	7.4	26.3	16.3	2.00	23.1	8.1	95.3	4.9	11.3
		5.0	1.6	3.7	39.2	26.1	1.12	29.9	23.3	42.3	1.7	3.9	39.4	25.7	1.09	29.4	23.7	38.7	4.0	9.2	39.5	25.4	1.05	28.9	24.2	36.6	5.3	12.2
50	30	7.0	3.9	9.0	42.0	27.1	1.13	31.0	24.0	42.8	1.7	3.9	42.1	26.7	1.10	30.5	24.4	39.0	4.0	9.2	42.2	26.4	1.06	30.0	24.9	36.9	5.3	12.2
		9.0	5.2	12.0	43.6	28.1	1.14	32.0	24.7	43.2	1.7	3.9	43.6	27.9	1.11	31.7	25.3	39.3	4.0	9.2	43.7	27.7	1.07	31.3	25.9	37.2	5.3	12.2
		5.0	1.6	3.7	39.5	25.6	1.35	30.2	18.9	62.4	1.6	3.7	39.4	25.6	1.31	30.1	19.5	58.9	3.9	9.0	39.4	25.7	1.27	30.1	20.2	56.9	5.2	12.0
50	50	7.0	3.9	9.0	42.2	26.6	1.36	31.2	19.5	62.9	1.6	3.7	42.1	26.7	1.32	31.2	20.2	59.2	3.9	9.0	42.1	26.7	1.28	31.1	20.9	57.1	5.2	12.0
		9.0	5.2	12.0	43.7	27.6	1.38	32.3	20.1	63.3	1.6	3.7	43.7	27.7	1.33	32.2	20.8	59.5	3.9	9.0	43.6	27.7	1.29	32.1	21.6	57.4	5.2	12.0
		5.0	1.6	3.7	40.2	23.7	1.78	29.8	13.3	82.3	1.6	3.7	40.2	23.8	1.73	29.7	13.8	78.7	3.5	8.1	40.2	23.8	1.67	29.6	14.3	76.8	5.0	11.6
50	70	7.0	3.9	9.0	42.7	24.6	1.79	30.8	13.7	82.7	1.6	3.7	42.7	24.7	1.74	30.7	14.2	79.0	3.5	8.1	42.7	24.8	1.68	30.5	14.7	77.0	5.0	11.6
		9.0	5.2	12.0	44.1	25.6	1.80	31.7	14.2	83.1	1.6	3.7	44.1	25.7	1.75	31.6	14.7	79.3	3.5	8.1	44.1	25.8	1.69	31.5	15.2	77.2	5.0	11.6
		5.0	1.6	3.7	41.0	21.8	2.22	29.4	9.9	102.1	1.5	3.5	41.0	21.9	2.14	29.2	10.2	98.6	3.2	7.4	40.9	22.0	2.07	29.1	10.6	96.7	4.9	11.3
50	90	7.0	3.9	9.0	43.3	22.7	2.22	30.3	10.2	102.5	1.5	3.5	43.3	22.8	2.15	30.1	10.6	98.9	3.2	7.4	43.3	22.9	2.09	30.0	11.0	96.9	4.9	11.3
		9.0	5.2	12.0	44.6	23.6	2.23	31.2	10.6	102.9	1.5	3.5	44.6	23.7	2.17	31.1	10.9	99.2	3.2	7.4	44.6	23.8	2.10	30.9	11.3	97.1	4.9	11.3
		5.0	1.6	3.7	57.0	31.4	1.17	35.4	26.8	44.6	1.7	3.9	57.7	29.9	1.12	33.7	26.7	39.9	4.0	9.2	58.3	28.4	1.07	32.0	26.5	37.3	5.3	12.2
70	30	7.0	3.5	8.1	60.4	32.7	1.18	36.7	27.6	45.1	1.7	3.9	60.9	30.9	1.13	34.8	27.3	40.2	4.0	9.2	61.4	29.1	1.08	32.8	27.0	37.5	5.3	12.2
		9.0	5.0	11.6	62.2	34.0	1.20	38.1	28.4	45.7	1.7	3.9	62.7	31.9	1.14	35.8	27.9	40.6	4.0	9.2	63.2	29.9	1.09	33.6	27.4	37.7	5.3	12.2
		5.0	1.6	3.7	56.8	31.9	1.51	37.1	21.1	65.3	1.6	3.7	57.2	31.1	1.45	36.0	21.4	60.6	3.9	9.0	57.5	30.3	1.39	35.0	21.7	58.0	5.2	12.0
70	50	7.0	3.5	8.1	60.2	33.2	1.53	38.4	21.8	65.8	1.6	3.7	60.5	32.2	1.46	37.2	22.0	61.0	3.9	9.0	60.8	31.2	1.40	36.0	22.2	58.2	5.2	12.0
		9.0	5.0	11.6	62.1	34.5	1.54	39.8	22.4	66.4	1.6	3.7	62.4	33.3	1.48	38.4	22.6	61.3	3.9	9.0	62.6	32.1	1.41	36.9	22.7	58.5	5.2	12.0
		5.0	1.6	3.7	56.6	32.4	1.85	38.7	17.5	86.0	1.6	3.7	56.7	32.3	1.78	38.4	18.1	81.3	3.5	8.1	56.7	32.2	1.71	38.0	18.8	78.7	5.0	11.6
70	70	7.0	3.5	8.1	60.1	33.7	1.87	40.1	18.1	86.5	1.6	3.7	60.1	33.5	1.80	39.6	18.6	81.7	3.5	8.1	60.2	33.3	1.72	39.1	19.3	79.0	5.0	11.6
		9.0	5.0	11.6	62.0	35.1	1.88	41.5	18.6	87.1	1.6	3.7	62.0	34.7	1.81	40.9	19.2	82.0	3.5	8.1	62.1	34.3	1.74	40.3	19.8	79.2	5.0	11.6
		5.0	1.6	3.7	57.5	30.3	2.27	38.0	13.3	105.7	1.5	3.5	57.5	30.4	2.19	37.9	13.9	101.2	3.2	7.4	57.4	30.5	2.10	37.7	14.5	98.6	4.9	11.3
70	90	7.0	3.5	8.1	60.7	31.5	2.28	39.3	13.8	106.2	1.5	3.5	60.7	31.7	2.20	39.2	14.4	101.6	3.2	7.4	60.6	31.9	2.11	39.2	15.1	99.0	4.9	11.3
		9.0	5.0	11.6	62.5	32.7	2.29	40.5	14.3	106.7	1.5	3.5	62.4	33.0	2.21	40.6	15.0	102.0	3.2	7.4	62.4	33.4	2.13	40.6	15.7	99.3	4.9	11.3
		5.0	1.5	3.5	74.9	36.7	1.22	40.9	30.1	46.9	1.7	3.9	76.0	34.0	1.16	38.0	29.5	41.2	4.0	9.2	77.1	31.4	1.09	35.1	28.8	38.0	5.3	12.2
90	30	7.0	3.2	7.4	78.7	38.3	1.24	42.5	30.9	47.5	1.7	3.9	79.7	35.0	1.17	39.0	29.9	41.5	4.0	9.2	80.7	31.7	1.10	35.5	28.8	38.1	5.3	12.2
		9.0	4.9	11.3	80.9	39.8	1.26	44.1	31.7	48.2	1.7	3.9	81.8	35.9	1.18	40.0	30.4	41.8	4.0	9.2	82.6	32.1	1.11	35.9	28.9	38.2	5.3	12.2
		5.0	1.5	3.5	72.1	43.5	1.52	48.7	28.6	70.1	1.6	3.7	72.4	42.7	1.45	47.6	29.4	64.0	3.9	9.0	72.7	41.9	1.38	46.6	30.4	60.7	5.2	12.0
90	50	7.0	3.2	7.4	76.6	45.4	1.55	50.6	29.4	70.9	1.6	3.7	77.1	43.9	1.47	48.9	29.9	64.4	3.9	9.0	77.5	42.4	1.40	47.2	30.4	60.8	5.2	12.0
		9.0	4.9	11.3	79.2	47.2	1.57	52.6	30.1	71.7	1.6	3.7	79.7	45.1	1.49	50.2	30.3	64.8	3.9	9.0	80.2	42.9	1.41	47.7	30.4	60.9	5.2	12.0
		5.0	1.5	3.5	73.0	41.1	1.93	47.7	21.4	89.7	1.6	3.7	73.2	40.8	1.84	47.1	22.2	83.9	3.5	8.1	73.3	40.5	1.76	46.5	23.1	80.6	5.0	11.6
90	70	7.0	3.2	7.4	77.4	42.8	1.94	49.5	22.1	90.4	1.6	3.7	77.5	42.3	1.86	48.6	22.8	84.3	3.5	8.1	77.7	41.7	1.77	47.7	23.6	80.9	5.0	11.6
		9.0	4.9	11.3	79.8	44.6	1.96	51.2	22.7	91.1	1.6	3.7	80.0	43.7	1.87	50.1	23.4	84.8	3.5	8.1	80.2	42.9	1.78	49.0	24.1	81.2	5.0	11.6
		5.0	1.5	3.5	74.0	38.7	2.33	46.7	16.6	109.0	1.5	3.5	74.0	38.9	2.23	46.5	17.4	104.1	3.2	7.4	73.9	39.0	2.13	46.3	18.3	99.2	4.9	11.3
90	90	7.0	3.2	7.4	77.2	40.3	2.34	48.3	17.2	109.7	1.5	3.5	77.1	40.6	2.24	48.3	18.1	105.0	3.2	7.4	77.0	41.0	2.14	48.3	19.2	100.3	4.9	11.3
		9.0	4.9	11.3	80.4	41.9	2.35	49.9	17.8	110.4	1.5	3.5	80.3	42.4	2.25	50.1	18.8	105.9	3.2	7.4	80.2	43.0	2.15	50.3	20.0	101.4	4.9	11.3

ELT = entering load fluid temperature to heat pump
LLT = leaving load fluid temperature from heat pump
LGPM = load flow in gallons per minute
LWPD = load coax water pressure drop
EST = entering source fluid temperature to heat pump
LST = leaving source fluid temperature from heat pump
SWPD = source coax water pressure drop
PSI = pressure drop in pounds per square inch
FT HD = pressure drop in feet of head
KW = kilowatts
HR = heat rejected in BTUH
TC = total cooling capacity in BTUH
EER = energy efficiency ratio (TC/KW)

Multiple Flow Rates for Source Side and Load Side are shown. When selecting units and designing the system, actual operating parameters must fall within the temperature and flow rate ranges shown on the table. Using temperature/flow rate combinations outside the range of the table will result in performance problems.

P056W Heating Capacity Data

			LWPD		SOURCE 8.0 GPM						SWPD		SOURCE 11.0 GPM						SWPD		SOURCE 14.0 GPM						SWPD	
ELT	EST	LGPM	PSI	FT HD	LLT	HC	kW	HE	COP	LST	PSI	FT HD	LLT	HC	kW	HE	COP	LST	PSI	FT HD	LLT	HC	kW	HE	COP	LST	PSI	FT HD
		8.0	2.6	5.9	70.7	41.1	2.16	33.7	5.6	21.8	3.5	8.1	71.0	41.7	2.19	34.2	5.6	23.4	6.4	14.7	71.3	42.3	2.23	34.7	5.6	25.1	9.2	21.3
60	30	11.0	4.3	10.0	68.2	40.5	2.15	33.2	5.5	21.8	3.5	8.1	68.5	41.8	2.15	34.4	5.7	23.4	6.4	14.7	68.9	43.0	2.16	35.6	5.8	25.0	9.2	21.3
		14.0	6.1	14.1	65.8	39.9	2.13	32.6	5.5	21.8	3.5	8.1	66.1	41.8	2.12	34.6	5.8	23.3	6.4	14.7	66.4	43.8	2.10	36.6	6.1	24.9	9.2	21.3
		8.0	2.6	5.9	72.4	48.1	2.24	40.5	6.3	30.0	3.4	7.8	72.7	48.7	2.26	41.0	6.3	32.0	6.1	14.1	73.0	49.2	2.28	41.5	6.3	34.0	8.9	20.4
60	40	11.0	4.3	10.0	69.5	47.1	2.20	39.6	6.3	30.0	3.4	7.8	69.9	48.6	2.20	41.1	6.5	32.0	6.1	14.1	70.2	50.1	2.21	42.6	6.6	33.9	8.9	20.4
		14.0	6.1	14.1	66.7	46.1	2.16	38.8	6.3	30.1	3.4	7.8	67.1	48.6	2.15	41.2	6.6	32.0	6.1	14.1	67.5	51.1	2.15	43.7	7.0	33.8	8.9	20.4
		8.0	2.6	5.9	74.1	55.2	2.31	47.3	7.0	38.2	3.3	7.5	74.4	55.7	2.32	47.8	7.0	40.6	5.9	13.6	74.6	56.2	2.33	48.2	7.1	43.0	8.5	19.6
60	50	11.0	4.3	10.0	70.9	53.8	2.25	46.1	7.0	38.3	3.3	7.5	71.2	55.5	2.26	47.8	7.2	40.6	5.9	13.6	71.6	57.3	2.26	49.5	7.4	42.9	8.5	19.6
		14.0	6.1	14.1	67.7	52.4	2.18	44.9	7.0	38.5	3.3	7.5	68.1	55.4	2.19	47.9	7.4	40.6	5.9	13.6	68.5	58.4	2.20	50.9	7.8	42.8	8.5	19.6
		8.0	2.6	6.0	75.8	62.3	2.39	54.1	7.6	46.4	3.1	7.2	76.0	62.7	2.39	54.5	7.7	49.2	5.6	13.0	76.3	63.1	2.39	55.0	7.7	52.0	8.1	18.7
60	60	11.0	4.3	9.9	72.2	60.4	2.30	52.6	7.7	46.6	3.1	7.2	72.6	62.4	2.31	54.5	7.9	49.2	5.6	13.0	72.9	64.4	2.31	56.5	8.2	51.9	8.1	18.7
		14.0	6.1	14.1	68.6	58.6	2.21	51.1	7.8	46.8	3.1	7.2	69.1	62.1	2.23	54.5	8.2	49.3	5.6	13.0	69.6	65.7	2.24	58.0	8.6	51.7	8.1	18.7
		8.0	2.6	5.9	77.6	69.4	2.47	60.9	8.2	54.6	3.0	6.9	77.7	69.7	2.45	61.3	8.3	57.8	5.4	12.4	77.9	70.1	2.44	61.7	8.4	61.0	7.7	17.8
60	70	11.0	4.3	10.0	73.6	67.1	2.35	59.1	8.4	54.8	3.0	6.9	73.9	69.3	2.36	61.3	8.6	57.8	5.4	12.4	74.3	71.5	2.37	63.4	8.9	60.9	7.7	17.8
		14.0	6.1	14.1	69.6	64.9	2.24	57.2	8.5	55.1	3.0	6.9	70.1	68.9	2.26	61.2	8.9	57.9	5.4	12.4	70.6	73.0	2.29	65.1	9.3	60.7	7.7	17.8
		8.0	2.4	5.5	90.5	41.0	3.13	30.3	3.8	22.5	3.5	8.1	90.8	41.4	3.16	30.6	3.8	24.1	6.4	14.7	91.0	41.7	3.19	30.8	3.8	25.6	9.2	21.3
80	30	11.0	4.1	9.5	88.2	40.4	3.09	29.8	3.8	22.6	3.5	8.1	88.4	41.4	3.10	30.8	3.9	24.0	6.4	14.7	88.6	42.4	3.11	31.8	4.0	25.5	9.2	21.3
		14.0	5.8	13.4	85.8	39.7	3.05	29.3	3.8	22.6	3.5	8.1	86.0	41.4	3.04	31.0	4.0	24.0	6.4	14.7	86.2	43.0	3.02	32.7	4.2	25.4	9.2	21.3
		8.0	2.4	5.5	92.2	47.9	3.21	37.0	4.4	30.8	3.4	7.8	92.5	48.3	3.23	37.2	4.4	32.7	6.2	14.1	92.7	48.6	3.26	37.5	4.4	34.6	8.9	20.4
80	40	11.0	4.1	9.5	89.5	46.9	3.15	36.2	4.4	30.9	3.4	7.8	89.7	48.2	3.16	37.4	4.5	32.7	6.2	14.1	90.0	49.4	3.16	38.6	4.6	34.5	8.9	20.4
		14.0	5.8	13.4	86.7	45.9	3.09	35.3	4.4	31.0	3.4	7.8	87.0	48.1	3.08	37.5	4.6	32.7	6.2	14.1	87.3	50.2	3.07	39.7	4.8	34.4	8.9	20.4
		8.0	2.4	5.5	93.9	54.9	3.30	43.6	4.9	39.1	3.3	7.5	94.2	55.2	3.31	43.9	4.9	41.3	5.9	13.6	94.4	55.5	3.32	44.2	4.9	43.6	8.5	19.6
80	50	11.0	4.1	9.5	90.8	53.5	3.21	42.5	4.9	39.2	3.3	7.5	91.1	55.0	3.22	44.0	5.0	41.3	5.9	13.6	91.4	56.5	3.22	45.5	5.1	43.5	8.5	19.6
		14.0	5.8	13.4	87.7	52.1	3.12	41.4	4.9	39.4	3.3	7.5	88.0	54.8	3.12	44.1	5.1	41.4	5.9	13.6	88.3	57.5	3.13	46.8	5.4	43.4	8.5	19.6
		8.0	2.4	5.5	95.6	61.8	3.38	50.2	5.4	47.3	3.1	7.2	95.9	62.1	3.38	50.5	5.4	50.0	5.6	13.0	96.1	62.4	3.39	50.8	5.4	52.6	8.1	18.7
80	60	11.0	4.1	9.5	92.1	60.0	3.27	48.9	5.4	47.5	3.1	7.2	92.4	61.8	3.27	50.6	5.5	50.0	5.6	13.0	92.7	63.5	3.28	52.3	5.7	52.5	8.1	18.7
		14.0	5.8	13.4	88.6	58.2	3.16	47.5	5.4	47.7	3.1	7.2	89.0	61.5	3.17	50.6	5.7	50.0	5.6	13.0	89.4	64.7	3.18	53.8	6.0	52.3	8.1	18.7
		8.0	2.4	5.5	97.3	68.7	3.46	56.9	5.8	55.6	3.0	6.9	97.6	69.0	3.46	57.2	5.9	58.6	5.4	12.4	97.8	69.3	3.45	57.5	5.9	61.6	7.7	17.8
80	70	11.0	4.1	9.5	93.4	66.6	3.33	55.2	5.9	55.9	3.0	6.9	93.8	68.6	3.33	57.2	6.0	58.7	5.4	12.4	94.1	70.6	3.34	59.2	6.2	61.5	7.7	17.8
		14.0	5.8	13.4	89.5	64.4	3.19	53.5	5.9	56.1	3.0	6.9	90.0	68.2	3.21	57.2	6.2	58.7	5.4	12.4	90.4	71.9	3.23	60.9	6.5	61.3	7.7	17.8
		8.0	2.3	5.2	110.4	41.0	4.10	27.0	2.9	23.3	3.5	8.1	110.5	41.0	4.13	26.9	2.9	24.7	6.4	14.7	110.7	41.1	4.16	26.9	2.9	26.2	9.2	21.3
100	30	11.0	3.9	9.0	108.1	40.2	4.04	26.5	2.9	23.3	3.5	8.1	108.2	41.0	4.04	27.2	3.0	24.7	6.4	14.7	108.4	41.7	4.05	27.9	3.0	26.1	9.2	21.3
		14.0	5.5	12.7	105.9	39.5	3.97	26.0	2.9	23.4	3.5	8.1	105.9	40.9	3.96	27.4	3.0	24.7	6.4	14.7	106.0	42.3	3.94	28.8	3.1	26.0	9.2	21.3
		8.0	2.3	5.3	112.0	47.7	4.19	33.4	3.3	31.6	3.4	7.8	112.2	47.8	4.21	33.5	3.3	33.4	6.2	14.1	112.5	48.0	4.23	33.5	3.3	35.2	8.9	20.4
100	40	11.0	3.9	9.0	109.4	46.7	4.10	32.7	3.3	31.7	3.4	7.8	109.6	47.7	4.11	33.7	3.4	33.4	6.2	14.1	109.8	48.7	4.11	34.6	3.5	35.1	8.9	20.4
		14.0	5.5	12.7	106.8	45.6	4.01	31.9	3.3	31.8	3.4	7.8	106.9	47.5	4.01	33.8	3.5	33.4	6.2	14.1	107.1	49.4	4.00	35.8	3.6	34.9	8.9	20.4
		8.0	2.3	5.2	113.7	54.5	4.28	39.9	3.7	40.0	3.3	7.5	114.0	54.7	4.29	40.0	3.7	42.1	5.9	13.6	114.2	54.8	4.31	40.1	3.7	44.2	8.5	19.6
100	50	11.0	3.9	9.0	110.7	53.1	4.17	38.9	3.7	40.1	3.3	7.5	110.9	54.4	4.17	40.2	3.8	42.1	5.9	13.6	111.2	55.7	4.18	41.4	3.9	44.1	8.5	19.6
		14.0	5.5	12.7	107.7	51.7	4.06	37.9	3.7	40.3	3.3	7.5	107.9	54.1	4.06	40.3	3.9	42.1	5.9	13.6	108.1	56.6	4.06	42.7	4.1	43.9	8.5	19.6
		8.0	2.3	5.3	115.4	61.3	4.37	46.4	4.1	48.3	3.1	7.2	115.7	61.5	4.38	46.5	4.1	50.7	5.6	13.0	116.0	61.7	4.38	46.7	4.1	53.2	8.1	18.7
100	60	11.0	3.9	9.0	112.0	59.6	4.23	45.1	4.1	48.5	3.1	7.2	112.3	61.1	4.24	46.7	4.2	50.8	5.6	13.0	112.6	62.7	4.25	48.2	4.3	53.1	8.1	18.7
		14.0	5.5	12.7	108.6	57.8	4.10	43.8	4.1	48.7	3.1	7.2	108.9	60.8	4.11	46.8	4.3	50.8	5.6	13.0	109.2	63.7	4.11	49.7	4.5	52.9	8.1	18.7
		8.0	2.3	5.3	117.1	68.1	4.46	52.8	4.5	56.7	3.0	6.9	117.4	68.3	4.46	53.1	4.5	59.4	5.4	12.4	117.7	68.6	4.46	53.3	4.5	62.2	7.7	17.8
100	70	11.0	3.9	9.0	113.3	66.0	4.30	51.3	4.5	56.9	3.0	6.9	113.6	67.9	4.31	53.1	4.6	59.5	5.4	12.4	114.0	69.7	4.32	55.0	4.7	62.1	7.7	17.8
		14.0	5.5	12.7	109.5	64.0	4.15	49.8	4.5	57.1	3.0	6.9	109.8	67.4	4.16	53.2	4.7	59.5	5.4	12.4	110.2	70.9	4.17	56.6	5.0	61.9	7.7	17.8
		8.0	2.1	4.9	130.2	40.9	5.07	23.6	2.4	24.0	3.5	8.1	130.3	40.7	5.10	23.3	2.3	25.4	6.4	14.7	130.4	40.5	5.12	23.0	2.3	26.7	9.2	21.3
120	30	11.0	3.7	8.4	128.1	40.1	4.98	23.1	2.4	24.1	3.5	8.1	128.1	40.6	4.99	23.5	2.4	25.4	6.4	14.7	128.1	41.0	4.99	24.0	2.4	26.6	9.2	21.3
		14.0	5.2	12.0	125.9	39.3	4.89	22.6	2.4	24.2	3.5	8.1	125.9	40.4	4.88	23.8	2.4	25.4	6.4	14.7	125.8	41.5	4.86	24.9	2.5	26.5	9.2	21.3
		8.0	2.1	4.9	131.9	47.5	5.17	29.9	2.7	32.4	3.4	7.8	132.0	47.4	5.19	29.7	2.7	34.1	6.2	14.1	132.2	47.3	5.21	29.6	2.7	35.7	8.9	20.4
120	40	11.0	3.7	8.5	129.3	46.4	5.05	29.2	2.7	32.6	3.4	7.8	129.4	47.2	5.06	29.9	2.7	34.1	6.2	14.1	129.5	48.0	5.07	30.7	2.8	35.6	8.9	20.4
		14.0	5.2	12.0	126.8	45.4	4.94	28.5	2.7	32.7	3.4	7.8	126.8	47.0	4.93	30.1	2.8	34.1	6.2	14.1	126.9	48.6	4.92	31.8	2.9	35.5	8.9	20.4
		8.0	2.1	4.9	133.5	54.2	5.26	36.2	3.0	40.9	3.3	7.5	133.8	54.2	5.28	36.1	3.0	42.8	5.9	13.6	134.0	54.2	5.30	36.1	3.0	44.8	8.5	19.6
120	50	11.0	3.7	8.4	130.6	52.8	5.13	35.3	3.0	41.0	3.3	7.5	130.8	53.8	5.13	36.3	3.1	42.8	5.9	13.6	131.0	54.9	5.14	37.4	3.1	44.6	8.5	19.6
		14.0	5.2	12.0	127.7	51.4	5.00	34.4	3.0	41.2	3.3	7.5	127.8	53.5	4.99	36.5	3.1	42.8	5.9	13.6	127.9	55.7	4.99	38.6	3.3	44.5	8.5	19.6
		8.0	2.1	4.9	135.2	60.8	5.36	42.5	3.3	49.3	3.1	7.2	135.5	60.9	5.37	42.6	3.3	51.5	5.6	13.0	135.8	61.0	5.38	42.6	3.3	53.8	8.1	18.7
120	60	11.0	3.7	8.5	131.8	59.1	5.20	41.4	3.3	49.5	3.1	7.2	132.1	60.5	5.21	42.7	3.4	51.5	5.6	13.0	132.4	61.9	5.22	44.1	3.5	53.6	8.1	18.7
		14.0	5.2	12.0	128.5	57.5	5.05	40.2	3.3	49.6	3.1	7.2	128.7	60.1	5.05	42.9	3.5	51.6	5.6	13.0	129.0	62.7	5.05	45.5	3.6	53.5	8.1	18.7
		8.0	2.1	4.9	136.8	67.4	5.45	48.8	3.6	57.7	3.0	6.9	137.2	67.6	5.46	49.0	3.6	60.3	5.4	12.4	137.6	67.8	5.47	49.1	3.6	62.8	7.7	17.8
120	70	11.0	3.7	8.4	133.1	65.5	5.28	47.4	3.6	57.9	3.0	6.9	133.5	67.1	5.28	49.1	3.7	60.3	5.4	12.4	133.8	68.8	5.29	50.7	3.8	62.7	7.7	17.8
		14.0	5.2	12.0	129.4	63.5	5.10	46.1	3.6	58.1	3.0	6.9	129.7	66.7	5.11	49.2	3.8	60.3	5.4	12.4	130.0	69.8	5.11	52.4	4.0	62.5	7.7	17.8

ELT = entering load fluid temperature to heat pump
LLT = leaving load fluid temperature from heat pump
LGPM = load flow in gallons per minute
LWPD = load coax water pressure drop
EST = entering source fluid temperature to heat pump
LST = leaving source fluid temperature from heat pump
SWPD = source coax water pressure drop
PSI = pressure drop in pounds per square
FT HD = pressure drop in feet of head
KW = kilowatts
HR = heat rejected in BTUH
TC = total cooling capacity in BTUH
EER = energy efficiency ratio (TC/KW)

Multiple Flow Rates for Source Side and Load Side are shown. When selecting units and designing the system, actual operating parameters must fall within the temperature and flow rate ranges shown on the table. Using temperature/flow rate combinations outside the range of the table will result in performance problems.

P056W Cooling Capacity Data

			LWPD		SOURCE 8.0 GPM						SWPD		SOURCE 11.0 GPM						SWPD		SOURCE 14.0 GPM						SWPD	
ELT	EST	LGPM	PSI	FT HD	LLT	TC	kW	HR	EER	LST	PSI	FT HD	LLT	TC	kW	HR	EER	LST	PSI	FT HD	LLT	TC	kW	HR	EER	LST	PSI	FT HD
		8.0	2.8	6.4	21.2	34.1	2.18	41.5	15.6	60.7	3.2	7.4	21.4	33.4	2.09	40.5	15.9	57.6	5.7	13.1	21.6	32.7	2.01	39.5	16.3	55.8	8.1	18.7
30	50	11.0	5.4	12.4	23.5	34.6	2.17	42.0	15.9	60.8	3.2	7.4	23.4	35.1	2.11	42.3	16.7	57.9	5.7	13.1	23.3	35.7	2.05	42.7	17.4	56.3	8.1	18.7
		14.0	8.0	18.4	24.8	35.1	2.16	42.4	16.2	60.9	3.2	7.4	24.6	36.9	2.12	44.1	17.4	58.3	5.7	13.1	24.3	38.7	2.09	45.8	18.5	56.7	8.1	18.7
		8.0	2.8	6.4	22.4	29.3	2.91	39.2	10.1	80.1	2.9	6.7	22.8	27.9	2.77	37.3	10.1	77.0	5.3	12.2	23.2	26.5	2.63	35.5	10.1	75.2	7.7	17.8
30	70	11.0	5.4	12.4	24.3	30.2	2.82	39.8	10.7	80.3	2.9	6.7	24.5	29.3	2.75	38.7	10.7	77.2	5.3	12.2	24.7	28.4	2.67	37.5	10.6	75.5	7.7	17.8
		14.0	8.0	18.4	25.4	31.1	2.74	40.5	11.4	80.4	2.9	6.7	25.5	30.7	2.73	40.0	11.2	77.5	5.3	12.2	25.5	30.2	2.72	39.5	11.1	75.8	7.7	17.8
		8.0	2.8	6.4	23.4	25.6	3.66	38.0	7.0	99.8	2.5	5.8	23.7	24.5	3.44	36.2	7.1	96.8	4.9	11.3	24.0	23.4	3.22	34.3	7.3	95.1	7.3	16.9
30	90	11.0	5.4	12.4	24.9	27.0	3.51	38.9	7.7	100.0	2.5	5.8	25.2	25.5	3.39	37.1	7.5	96.9	4.9	11.3	25.5	24.0	3.27	35.2	7.4	95.2	7.3	16.9
		14.0	8.0	18.4	25.8	28.4	3.35	39.8	8.5	100.3	2.5	5.8	26.1	26.6	3.33	37.9	8.0	97.1	4.9	11.3	26.4	24.7	3.32	36.0	7.5	95.3	7.3	16.9
		8.0	2.5	5.8	37.5	48.4	1.62	53.9	29.8	43.9	3.6	8.3	37.7	47.7	1.56	53.1	30.5	39.9	6.1	14.0	37.9	47.1	1.51	52.2	31.3	37.7	8.5	19.6
50	30	11.0	4.9	11.2	40.8	49.1	1.62	54.6	30.4	44.1	3.6	8.3	40.7	49.4	1.58	54.8	31.4	40.3	6.1	14.0	40.7	49.8	1.54	55.0	32.4	38.1	8.5	19.6
		14.0	7.2	16.6	42.7	49.9	1.62	55.4	30.9	44.3	3.6	8.3	42.5	51.2	1.59	56.6	32.2	40.6	6.1	14.0	42.3	52.5	1.57	57.8	33.5	38.5	8.5	19.6
		8.0	2.5	5.8	38.3	45.5	2.27	53.2	20.0	63.7	3.2	7.4	38.4	45.1	2.20	52.5	20.5	59.8	5.7	13.1	38.5	44.6	2.12	51.8	21.0	57.6	8.1	18.7
50	50	11.0	4.9	11.2	41.3	46.5	2.27	54.2	20.5	64.0	3.2	7.4	41.3	46.7	2.21	54.2	21.1	60.2	5.7	13.1	41.2	46.9	2.15	54.2	21.8	58.0	8.1	18.7
		14.0	7.2	16.6	43.0	47.5	2.26	55.2	21.0	64.2	3.2	7.4	42.9	48.3	2.22	55.9	21.8	60.5	5.7	13.1	42.8	49.1	2.18	56.5	22.5	58.3	8.1	18.7
		8.0	2.5	5.8	39.0	42.7	2.92	52.6	14.6	83.6	2.9	6.7	39.1	42.4	2.83	52.0	15.0	79.8	5.3	12.2	39.1	42.1	2.74	51.4	15.4	77.6	7.7	17.8
50	70	11.0	4.9	11.2	41.8	43.9	2.91	53.8	15.1	83.9	2.9	6.7	41.8	43.9	2.84	53.6	15.5	80.0	5.3	12.2	41.8	43.9	2.77	53.4	15.9	77.9	7.7	17.8
		14.0	7.2	16.6	43.4	45.2	2.91	55.1	15.5	84.2	2.9	6.7	43.3	45.5	2.85	55.2	15.9	80.3	5.3	12.2	43.3	45.8	2.80	55.3	16.4	78.1	7.7	17.8
		8.0	2.5	5.8	39.7	39.8	3.57	52.0	11.1	103.4	2.5	5.8	39.8	39.7	3.46	51.5	11.5	99.7	4.9	11.3	39.8	39.6	3.35	51.0	11.8	97.5	7.3	16.9
50	90	11.0	4.9	11.2	42.3	41.3	3.56	53.5	11.6	103.8	2.5	5.8	42.3	41.2	3.47	53.0	11.9	99.9	4.9	11.3	42.3	41.0	3.38	52.5	12.1	97.7	7.3	16.9
		14.0	7.2	16.6	43.7	42.8	3.55	54.9	12.1	104.2	2.5	5.8	43.7	42.6	3.48	54.5	12.2	100.2	4.9	11.3	43.8	42.4	3.41	54.0	12.4	98.0	7.3	16.9
		8.0	2.3	5.2	56.2	53.5	1.78	59.6	30.0	45.3	3.6	8.3	56.5	52.2	1.70	58.0	30.6	40.9	6.1	14.0	56.9	51.0	1.62	56.5	31.4	38.3	8.5	19.6
70	30	11.0	4.4	10.0	59.7	54.9	1.72	60.7	31.9	45.7	3.6	8.3	60.0	53.3	1.68	59.0	31.6	41.1	6.1	14.0	60.3	51.7	1.65	57.4	31.4	38.4	8.5	19.6
		14.0	6.5	14.9	61.7	56.2	1.66	61.9	34.0	46.0	3.6	8.3	62.0	54.4	1.66	60.1	32.7	41.3	6.1	14.0	62.3	52.5	1.67	58.2	31.4	38.6	8.5	19.6
		8.0	2.3	5.2	55.9	54.7	2.36	62.8	23.2	66.2	3.2	7.4	56.1	53.8	2.30	61.6	23.4	61.6	5.7	13.1	56.4	52.9	2.23	60.5	23.7	58.9	8.1	18.7
70	50	11.0	4.4	10.0	59.5	56.2	2.36	64.3	23.8	66.6	3.2	7.4	59.7	55.1	2.31	63.0	23.9	61.8	5.7	13.1	59.9	54.0	2.25	61.7	24.0	59.1	8.1	18.7
		14.0	6.5	14.9	61.5	57.7	2.36	65.8	24.4	67.0	3.2	7.4	61.7	56.5	2.32	64.4	24.4	62.1	5.7	13.1	61.9	55.2	2.27	63.0	24.3	59.3	8.1	18.7
		8.0	2.3	5.2	55.6	56.0	2.94	66.0	19.1	87.0	2.9	6.7	55.7	55.4	2.89	65.2	19.2	82.2	5.3	12.2	55.9	54.8	2.84	64.5	19.3	79.5	7.7	17.8
70	70	11.0	4.4	10.0	59.2	57.6	3.00	67.8	19.2	87.5	2.9	6.7	59.3	57.0	2.93	67.0	19.4	82.6	5.3	12.2	59.4	56.4	2.86	66.1	19.7	79.7	7.7	17.8
		14.0	6.5	14.9	61.3	59.2	3.07	69.7	19.3	88.0	2.9	6.7	61.4	58.6	2.97	68.7	19.7	82.9	5.3	12.2	61.5	57.9	2.87	67.7	20.2	80.0	7.7	17.8
		8.0	2.3	5.2	56.1	54.1	3.48	65.9	15.5	107.0	2.5	5.8	56.2	53.7	3.48	65.5	15.4	102.3	4.9	11.3	56.3	53.3	3.48	65.1	15.3	99.6	7.3	16.9
70	90	11.0	4.4	10.0	59.6	55.6	3.62	68.0	15.4	107.5	2.5	5.8	59.6	55.5	3.55	67.6	15.6	102.7	4.9	11.3	59.6	55.3	3.49	67.2	15.8	99.9	7.3	16.9
		14.0	6.5	14.9	61.6	57.2	3.75	70.0	15.3	108.0	2.5	5.8	61.6	57.3	3.63	69.7	15.8	103.1	4.9	11.3	61.6	57.4	3.51	69.3	16.4	100.2	7.3	16.9
		8.0	2.0	4.6	74.9	58.6	1.95	65.2	30.1	46.8	3.6	8.3	75.4	56.7	1.85	63.0	30.7	41.8	6.1	14.0	75.9	54.8	1.74	60.8	31.4	39.0	8.5	19.6
90	30	11.0	3.9	8.9	78.6	60.6	1.82	66.8	33.3	47.2	3.6	8.3	79.3	57.2	1.79	63.3	31.9	41.9	6.1	14.0	79.9	53.7	1.76	59.7	30.5	38.8	8.5	19.6
		14.0	5.7	13.2	80.8	62.6	1.70	68.4	36.9	47.6	3.6	8.3	81.5	57.6	1.74	63.5	33.1	41.9	6.1	14.0	82.3	52.6	1.78	58.6	29.5	38.6	8.5	19.6
		8.0	2.0	4.6	71.9	70.4	2.51	79.0	28.0	70.4	3.2	7.4	72.2	69.2	2.40	77.4	28.9	64.5	5.7	13.1	72.5	68.0	2.28	75.8	29.8	61.2	8.1	18.7
90	50	11.0	3.9	8.9	76.4	72.6	2.52	81.2	28.9	70.9	3.2	7.4	76.8	70.3	2.40	78.5	29.3	64.7	5.7	13.1	77.3	68.0	2.29	75.8	29.7	61.2	8.1	18.7
		14.0	5.7	13.2	79.0	74.8	2.52	83.4	29.7	71.5	3.2	7.4	79.5	71.4	2.41	79.6	29.6	64.9	5.7	13.1	80.0	67.9	2.30	75.7	29.5	61.2	8.1	18.7
		8.0	2.0	4.6	72.1	69.4	2.95	79.4	23.5	90.5	2.9	6.7	72.4	68.4	2.95	78.5	23.2	84.7	5.3	12.2	72.6	67.5	2.95	77.5	22.9	81.4	7.7	17.8
90	70	11.0	3.9	8.9	76.6	71.3	3.09	81.8	23.0	91.1	2.9	6.7	76.9	70.0	3.02	80.3	23.2	85.1	5.3	12.2	77.1	68.8	2.95	78.8	23.3	81.6	7.7	17.8
		14.0	5.7	13.2	79.2	73.2	3.24	84.2	22.6	91.7	2.9	6.7	79.4	71.7	3.09	82.2	23.2	85.4	5.3	12.2	79.7	70.1	2.95	80.2	23.8	81.8	7.7	17.8

ELT = entering load fluid temperature to heat pump
LLT = leaving load fluid temperature from heat pump
LGPM = load flow in gallons per minute
LWPD = load coax water pressure drop
EST = entering source fluid temperature to heat pump
LST = leaving source fluid temperature from heat pump

SWPD = source coax water pressure drop
PSI = pressure drop in pounds per square
FT HD = pressure drop in feet of head
KW = kilowatts
HR = heat rejected in BTUH
TC = total cooling capacity in BTUH
EER = energy efficiency ratio (TC/KW)

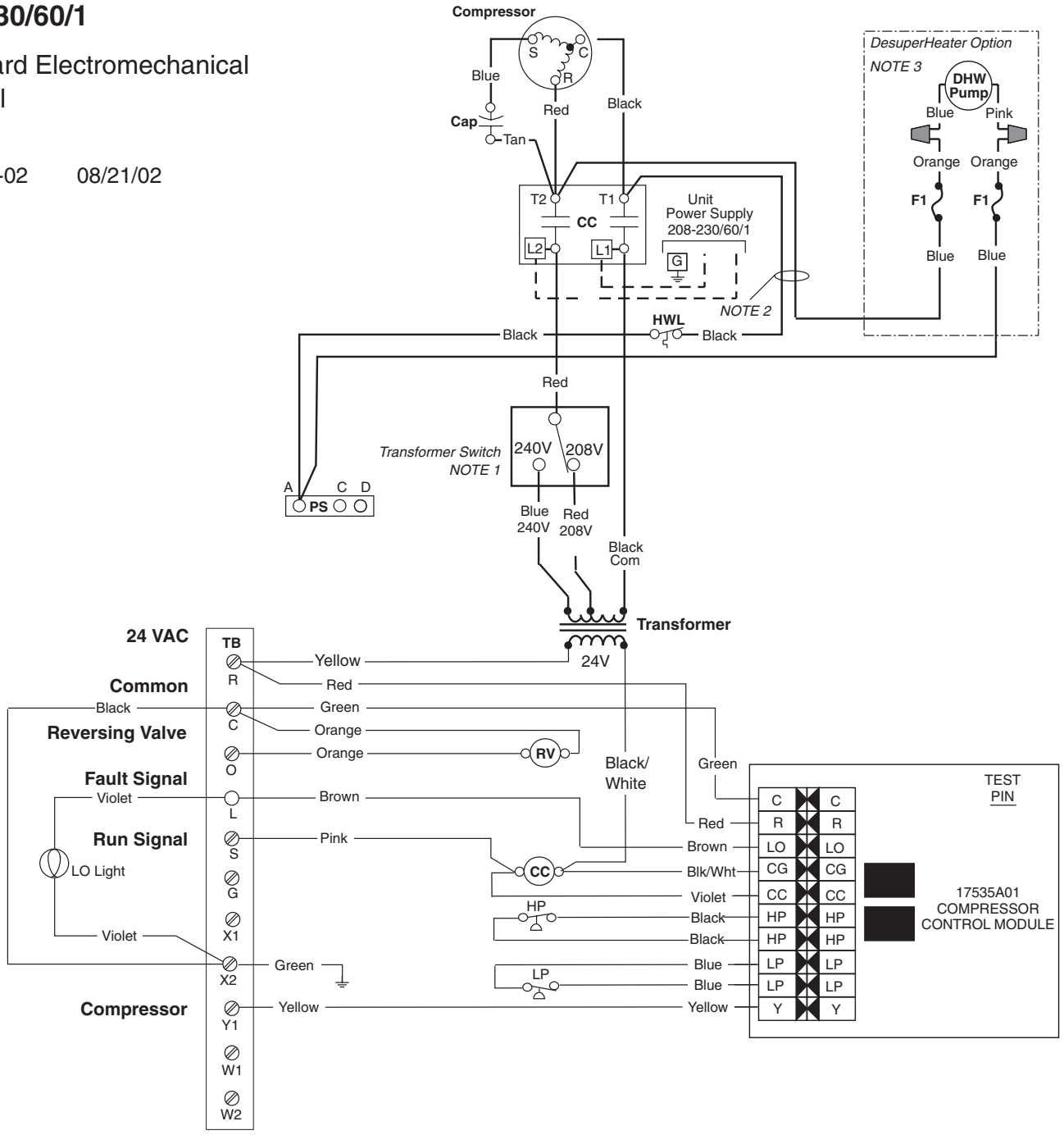
Multiple Flow Rates for Source Side and Load Side are shown. When selecting units and designing the system, actual operating parameters must fall within the temperature and flow rate ranges shown on the table. Using temperature/flow rate combinations outside the range of the table will result in performance problems.

Wiring Schematic

208-230/60/1

Standard Electromechanical Control

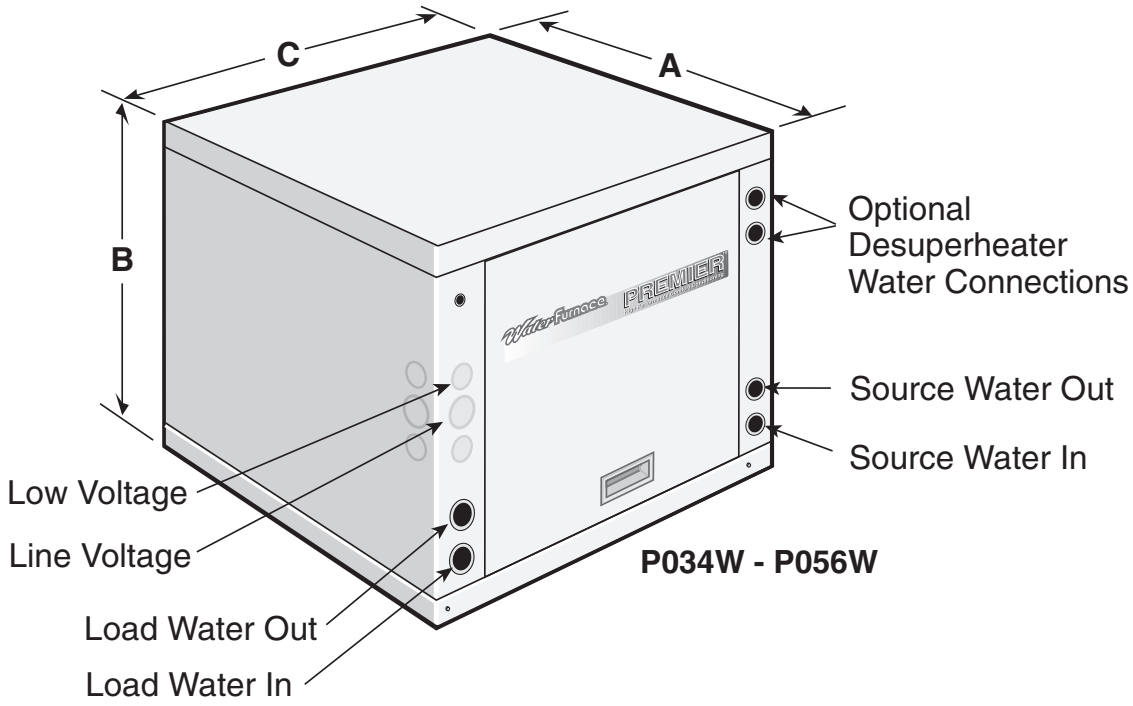
97P626-02 08/21/02



Legend

Factory low voltage wiring Factory line voltage wiring Field low voltage wiring Field line voltage wiring Optional block Quick connect terminal Screw terminal - field connection	CCM - Compressor Control Module CC - Compressor contactor HP - High pressure switch LP - Low pressure switch RV - Reversing valve coil TB - Terminal board	L1 Field wire lug Ground Relay Contacts - N.O., N.C. P 2 3 1 Polarized connector	Switch - High pressure Switch - Low pressure Relay coil Capacitor	**Notes:** 1 - Place switch to 208V position to operate unit at 208V. 2 - Black and Orange DSH pump wire is supplied desuperheater option but not connected at factory. 3 - Desuperheater option is only available on Residential Unit.

Physical Dimensions



Model	A	B	C	Load Liquid In FPT	Load Liquid Out FPT	Source Liquid In FPT	Source Liquid Out FPT	Desuperheater In FPT	Desuperheater Out FPT
P034W	30.50	23.50	30.50	.75	.75	.75	.75	.50	.50
P056W	30.50	23.50	30.50	1.00	1.00	1.00	1.00	.50	.50

All dimensions are in inches.

Physical Data

Unit Size	P034	P056
Compressor	Scroll	Scroll
Ref. Charge - R22 (oz.)	49.0	84.0
Unit Weight (lbs.)	244.0	275.0

Electrical Data

Model	Rated Voltage	Voltage Min/Max	Compressor			Int. Pump FLA	Ext. Pump FLA	Total Unit FLA	Min Ckt Amp	Max Fuse	Max Ckt Brk
			MCC	RLA	LRA						
P034W	208-230/60/1	197/254	21.0	13.5	72.5	0.4	5.4	19.3	22.6	35	35
P056W	208-230/60/1	197/254	31.0	19.9	137.0	0.4	5.4	25.7	30.6	50	50

All units rated 208-230 (min 197) volt single phase 60 cycle.

All fuses type "D" time delay (or HACR circuit breaker in USA).

Engineering Guide Specifications

General - The liquid source water-to-water heat pump shall be a single packaged reverse-cycle heating/cooling unit. The unit shall be listed by a nationally recognized safety-testing laboratory or agency, such as ETL Testing Laboratory. Each unit shall be computer run-tested at the factory. Each unit shall be pallet mounted and stretch-wrapped for shipping.

The geothermal water-to-water heat pump unit, manufactured by WaterFurnace International, Fort Wayne, Indiana, shall be designed to operate with source liquid temperature between 30°F and 90°F .

Casing and Cabinet - The cabinet shall be fabricated from heavy-gauge steel and finished with a corrosion-resistant powder coating. The interior shall be insulated with 1/2-inch thick, multi-density, coated glass fiber with edges sealed or tucked under flanges. All units shall have 7/8-inch and 1-1/8-inch knockouts for entrance of low and line voltage wiring.

Refrigerant Circuit - All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bidirectional thermal expansion valve assembly, reversing valve, two (2) coaxial tube water-to-refrigerant heat exchangers, factory-installed high and low-pressure safety switches and service ports, and a liquid line filter-dryer.

Compressors shall be high-efficiency compliant scroll designed for heat pump duty and mounted on rubber vibration isolators. Compressor motors shall be single-phase PSC with overload protection.

The coaxial water-to-refrigerant heat exchangers shall be designed for low water pressure drop and constructed of a convoluted copper (optional cupronickel) inner tube and a steel outer tube. The thermal expansion valve assembly shall provide proper superheat over the liquid temperature range with minimal "hunting." The valve shall operate bidirectionally without the use of check valves.

The water-to-refrigerant heat exchangers, optional desuperheater coil and refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures.

Electrical - Controls and safety devices will be factory wired and mounted within the unit. Controls shall include compressor contactor, high and low pressure switches, 24VAC-75VA transformer with built-in circuit breaker, reversing valve coil, compressor control module with intergal lockout mode and anti-short cycle protection. A terminal block with screw terminals will be provided for field control wiring.

Piping - All supply and return water connections (and optional desuperheater connections) shall be FPT flush-mounted copper threaded fittings mechanically fastened to the unit cabinet, eliminating the need for backup wrenches when making field piping connections. All water piping shall be insulated to prevent condensation at low liquid temperatures.

Accessories and Other Options

Desuperheater - An optional heat reclaiming desuperheater coil of vented double-wall copper construction suitable for potable water shall be provided. The coil and hot water circulating pump shall be factory mounted inside the unit. A coaxial design fitting for the DHW tank connection and a high temperature limit pump shut-off are supplied.

FPK - Freeze protection kit 39° +/-2°

Earth Loop Pump Kit (Field Installed) - A specially designed one- or two-pump module shall provide all liquid flow, fill and connection requirements for independent single unit systems, 230/1/60 only. The one-pump module is good to 20 feet of head at 16.0 GPM while the two-pump module is good to 40 feet of head at 16.0 GPM.

FPKCL - Freeze protection kit 20° +/-2°

Each WaterFurnace unit is computer run-tested in all operating modes to ensure efficiency and reliability. Each unit carries an exclusive Quality Assurance emblem which is personally signed by the quality-test technician.

Notes:

9000 Conservation Way
Fort Wayne, IN 46809-9794

Phone: 1-260-478-5667 or
1-800-222-5667
FAX: 1-800-783-5667
http://www.waterfurnace.com

PREMIER™

Residential Water-To-Water Heat Pump Specifications Catalog

WF1353 08/02

Printed on recycled paper