

Versatec

Water Source/Geothermal Heat Pumps

- 7 thru 10 Ton Horizontal
- 7 thru 23 Ton Vertical

Design Features

Factory Options

Accessories

Dimensional Data

Physical Data

Performance Data

Engineering Guide Specifications



Versatec



WaterFurnace Versatec Series products are the units of choice for commercial or institutional applications where the best balance of performance and first cost is desired. Versatec units are available in both a VL group for water source heat pump applications, and a VX group for extended range geothermal applications. Available in 6 vertical sizes (7 through 23 tons) and 3 horizontal sizes (7 through 10 tons), Versatec units provide the user with a great combination of performance, flexibility, options and value.

All Versatec units utilize R-22 refrigerant and PSC blower motors. A standard FX10 microprocessor control is included for flexible integration into facilities with building automation control systems. Vertical units can be ordered in left or right-hand return air configurations with top discharge. Horizontal units are available with left or right-hand return, side or end discharge. Heavy gauge metal cabinets add durability to the system, and can be ordered with durable poly paint for added protection. The wide range of other options makes Versatec models an excellent choice for many types of applications.

Versatec Series products are performance-certified to ARI ISO 13256-1 standards and are ETL listed.

As a leader in the industry, WaterFurnace is dedicated to innovation, quality and customer satisfaction. In fact, every unit built is exposed to a wide range of quality control procedures throughout the assembly process and is then subjected to a rigorous battery of computerized run tests to certify that it meets or exceeds performance standards for efficiency and safety, and will perform flawlessly at startup. As further affirmation of our quality standards, each unit carries our exclusive Quality Assurance emblem, signed by the final test technician.

WaterFurnace International's corporate headquarters and manufacturing facility is located in Fort Wayne, Indiana. A scenic three-acre pond located in front of the building serves as our geothermal heating and cooling source to comfort-condition our 110,000 square feet of manufacturing and office space. As a pioneer, and now a leader in the industry, the team of WaterFurnace engineers, customer support staff and skilled assembly technicians is dedicated to providing the finest comfort systems available.

By choosing or specifying WaterFurnace Versatec Series products, you can be assured of many years of reliable service and performance at a value-oriented price.

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ARI Data

Performance Ratings-Water Loop (WLHP)

SIZE	CFM	GPM	COOLING 86° F EWT		HEATING 68° F EWT	
			BTU/HR	EER	BTU/HR	COP
HORIZONTAL UNITS						
V080	2800	22.0	77,900	13.1	95,000	4.7
V095	3200	24.0	93,000	13.0	114,000	4.6
V120	4400	28.0	116,000	12.0	155,000	4.3
VERTICAL UNITS						
V080	2800	22.0	82,000	14.5	96,000	5.0
V095	3200	24.0	93,000	13.3	112,000	4.3
V120	4000	28.0	118,000	12.4	158,000	4.3
V180*	6000	44.0	179,000	15.9	219,000	5.2
V240*	8000	56.0	246,000	14.5	310,000	4.8
V275*	10,000	70.0	275,000	11.6	355,000	4.5



ISO 13256-1

Notes: Cooling capacities based on 80.6°F DB, 66.2°F WB entering air temperature.
 Heating capacities are based on 68°F DB entering air temperature.
 Models V080, V095, and V120 are rated in accordance with ARI/ISO standard 13256-1: 1988.
 * Models V180, V240 and V275 ratings are outside the scope of the ARI Water to Air/Brine to Air Heat Pumps Certification Program.

Performance Ratings-Ground Loop (GLHP)

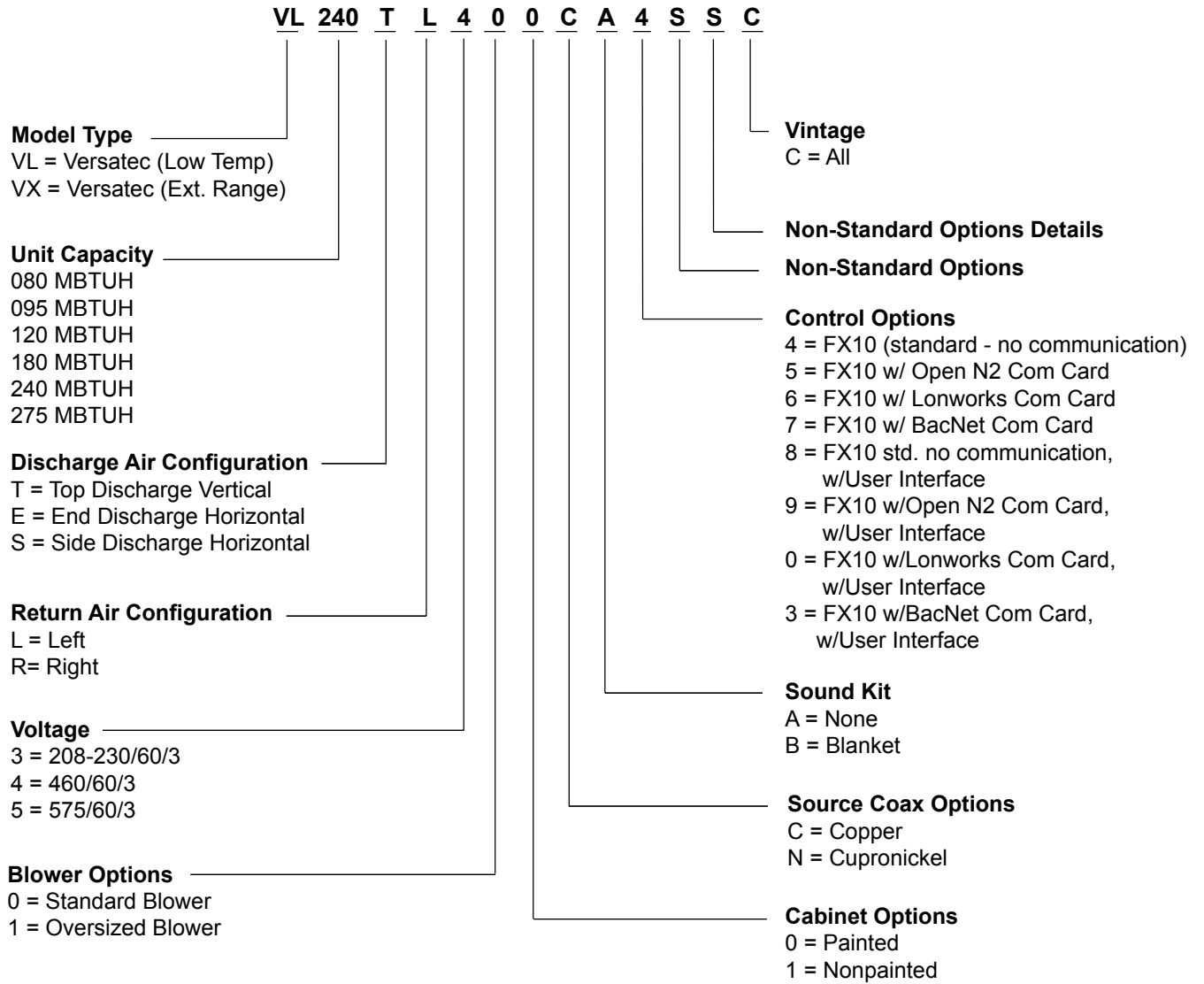
SIZE	CFM	GPM	COOLING 77° F EWT		HEATING 32° F EWT	
			BTU/HR	EER	BTU/HR	COP
HORIZONTAL UNITS						
V080	2800	22.0	83,000	14.8	53,600	3.1
V095	3200	24.0	95,000	14.2	65,500	3.0
V120	4400	28.0	120,000	14.0	98,500	3.2
VERTICAL UNITS						
V080	2800	22.0	87,000	15.5	56,000	3.2
V095	3200	24.0	98,000	15.0	64,500	3.2
V120	4000	28.0	122,000	14.0	93,500	3.2
V180*	6000	44.0	185,000	17.0	130,000	3.6
V240*	8000	56.0	250,000	15.8	194,000	3.5
V275*	10,000	70.0	280,000	12.6	220,000	3.3



ISO 13256-1

Notes: Cooling capacities based on 80.6°F DB, 66.2°F WB entering air temperature.
 Heating capacities are based on 68°F DB entering air temperature.
 Models V080, V095, and V120 are rated in accordance with ARI/ISO standard 13256-1: 1988.
 * Models V180, V240 and V275 ratings are outside the scope of the ARI Water to Air/Brine to Air Heat Pumps Certification Program.

Model Nomenclature



Design Features

Versatec 7-23 ton water source heat pumps are designed to meet the heating/air conditioning requirements of large zones found in offices, schools, factories, arenas, community centers and other applications. Versatec units 080 to 120 MBTUH are ISO rated and listed for safety through ETL. VX series units are designed to operate with entering water temperatures between 25°F and 110°F for geothermal earth loop applications. VL Series units are designed to operate with entering water temperature between 50°F and 110°F for boiler/tower applications.

Quality and Flexibility

Quality, flexibility, efficiency and performance are major requirements for all products, and our Versatec line is no exception. Each water source heat pump is factory assembled and computer run-tested to ensure reliability. All refrigerant brazing is performed in a nitrogen atmosphere and units are deep evacuated to less than 200 microns prior to refrigerant charging.

Each unit is stretch wrapped to permit visual inspection at the time of delivery. A heavy double-wall corrugated cardboard panel helps protect the air coil from fin damage.

For maximum flexibility, each unit is available in either a left-hand or right-hand air return to provide optimum piping location and service access. Vertical units are only available in top-flow air discharge.

Cabinet

The cabinet is constructed of environmentally responsible galvanized steel for maximum corrosion resistance. Service to all internal components is done easily through one or two large removable access panels in the air handler compartment and through three panels in the compressor compartment. The interiors of the top and side panels and the bottom of the air handling compartment are covered with 1/2-inch thick, 1 1/2-lb. density coated glass fiber. Horizontal units are supplied with hanger brackets and grommets to facilitate installation. The standard 2-inch filters are supported by factory mounted brackets which allow side removal.

The water connections are stubbed through the cabinet to allow easy access during installation. Threaded copper adaptors are low-temperature soldered to prevent misshaping or weakening of the fitting, eliminating potential start up leaks.

On horizontal units, the 3/4-inch sweat copper condensate connection protrudes through the outside of the cabinet for maximum accessibility. On vertical units, the 3/4-inch FPT (1 inch on V180, V240 and V275) copper condensate connection mounts flush to the outside of the cabinet.

The electrical components are located in the compressor section of the unit. Three knockouts (of both 7/8-inch

and 1 1/8-inch sizes) are provided on the side and front of the cabinet to facilitate main power and low voltage control wiring through separate holes. All wiring connections are made inside the cabinet for maximum safety. Power wiring is conveniently applied to a single terminal block. Each unit is rated to accept time delay fuses or HACR circuit breakers (USA only) for over-current protection of the branch circuit.

Compressor Section

Each refrigeration system includes hermetic compressors, reversing valves, water-to-refrigerant coaxial heat exchangers, high stability thermostatic expansion valves, air side coils and safety controls. Three panels allow for access to the compressor, coaxial heat exchanger, reversing valve and safety controls. High and low pressure ports are provided for easy servicing, and the coaxial heat exchanger and all refrigerant suction lines are insulated to prevent condensation at low entering water temperatures.

Efficient reciprocating, or scroll compressors provide super quiet operation with high reliability. All compressors are isolated from the bottom panel with rubber isolators. The compressor junction box is always located toward the front access panel.

The high stability bidirectional thermostatic expansion valve delivers optimum refrigerant flow over a wide range of conditions and provides bidirectional operation without troublesome check valves. External pressure regulating flow control valves are not recommended, as they tend to compete with the thermal expansion valve.

The reversing valve is "cool-brazed" at the factory to prevent damage from excess heat and is energized in the cooling mode.

The two heat exchangers incorporate the most recent heat transfer technologies. The oversized coaxial heat exchangers have a convoluted copper (optional cupronickel) inner tube and steel outer tube and are designed for a maximum heat transfer at normal and low water flow rates (down to 1.5 GPM per ton). This minimizes pressure drop and also enhances freeze protection.

The large face air coil consists of rifled copper tubes and lanced aluminum fins to provide high efficiencies at low face velocities and is three rows deep for good moisture removal.

Safety controls include a low suction temperature thermistor that is field switchable between well water and antifreeze settings. Low pressure switches (for loss of charge protection) and high pressure switches are designed to lock out compressor operation at extreme conditions. The low suction temperature thermistor provides the most reliable protection against freeze-up of the coaxial heat exchanger.

Design Features (cont.)

Fan Section

The one or two fan section access panels provide service access to the fan motor.

The drain pan is epoxy painted for corrosion protection and is internally trapped inside the cabinet in vertical models. A reliable impedance-type condensate sensor is standard on all units, providing added security especially in ceiling mounted systems.

A belt drive blower system with a single-speed motor is standard on the dual compressor 80 to 120 MBTUH units. 180, 240 and 275 models have twin blower wheels and motors. Fan speed is field adjustable via the drive sheave. All fan/motor assemblies are internally removable to accommodate motor and fan wheel replacement without disconnecting the ductwork. The discharge panel has 1-inch duct flanges allowing adequate material for connecting the ductwork.

Control Features

The Johnson Controls FX10 board is specifically designed for commercial heat pumps and provides control of the entire unit as well as input ports for Open N2, LonTalk, BacNet communication protocols as well as an input port for a user interface. The user interface is an accessory item that can be used to aid in diagnostics and unit setup. A 16 pin low voltage terminal board provides terminals for common field connections.

Startup

The unit will not operate until all the inputs and safety controls are checked for normal operating conditions.

Fault Retry

All faults are retried twice before finally locking the unit out to prevent nuisance service calls.

Component Sequencing Delays

Components are sequenced and delayed for optimum unit performance.

Short Cycle Protection and Random Start

The control allows a minimum compressor off time of 4 minutes and a minimum compressor run time of 2 minutes for short cycle protection. A random start delay of 1 to 120 seconds is generated after each power up to prevent simultaneous start-up of all units within a building after the release from an unoccupied cycle or power loss.

Emergency Shutdown

A field applied dry contact can be used to place the control into emergency shutdown mode. All outputs on the control board are disabled while the control is in emergency shutdown mode.

Condensate Overflow Protection

The board incorporates an impedance liquid sensor at the top of the condensate drain pan. Upon a continuous 30-second sensing of the condensate, the cooling operation of the unit is suspended.

Safety Controls

The board receives separate signals from a high pressure switch for safety, a low pressure switch to prevent loss of refrigerant charge and a low suction temperature thermistor for freeze protection. Upon a continuous 30-second measurement of the fault (immediate for high pressure), compressor operation is stopped.

Installation Options

Stand-alone unit controlled by a standard room thermostat.

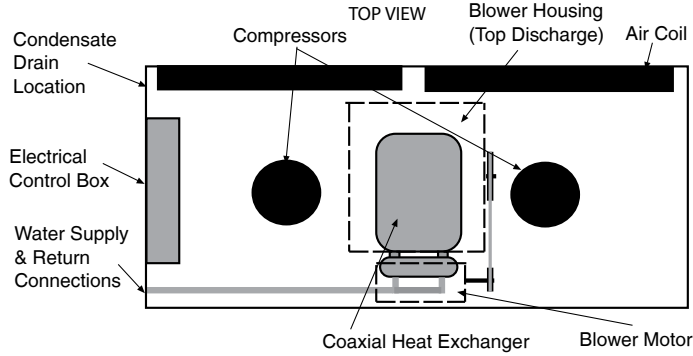
1. Stand-alone with a zone temperature sensor. (Must have a user interface to change set points.)
2. Can be integrated into a building automation system by adding a communication module for Open N2, LonTalk, or BacNet.

(For more information on this control, refer to Submittal Data SD1981 or Application Guide AGFX10).

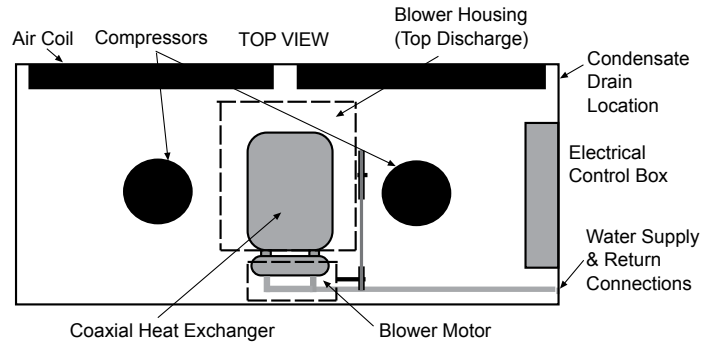
Cabinet Configuration

Vertical Units

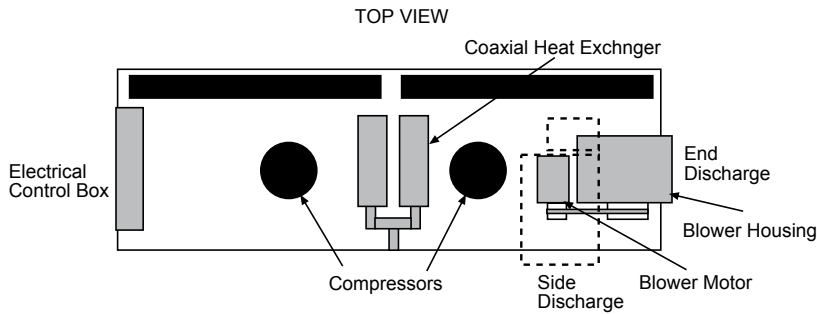
* Vertical Left Return Configuration



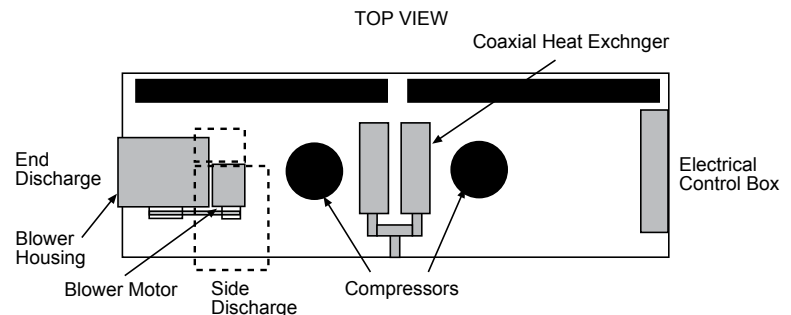
* Vertical Right Return Configuration



Horizontal Left Return Configuration



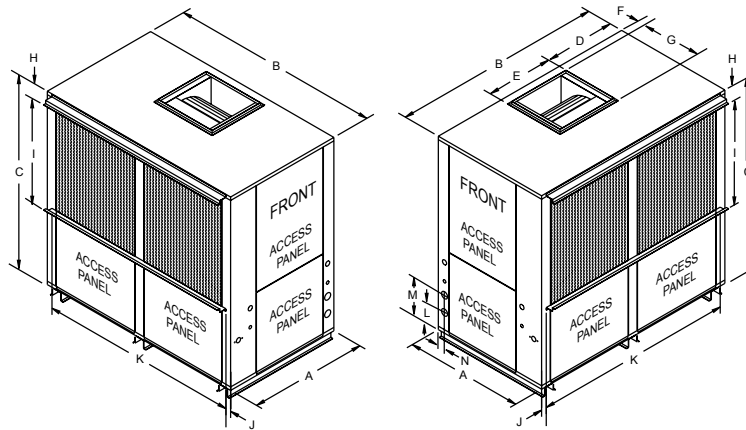
Horizontal Right Return Configuration



* Sizes 080-120 Vertical Units Shown. Sizes 180, 240 & 275 include dual blower motors

Vertical Dimensions

V080-V120



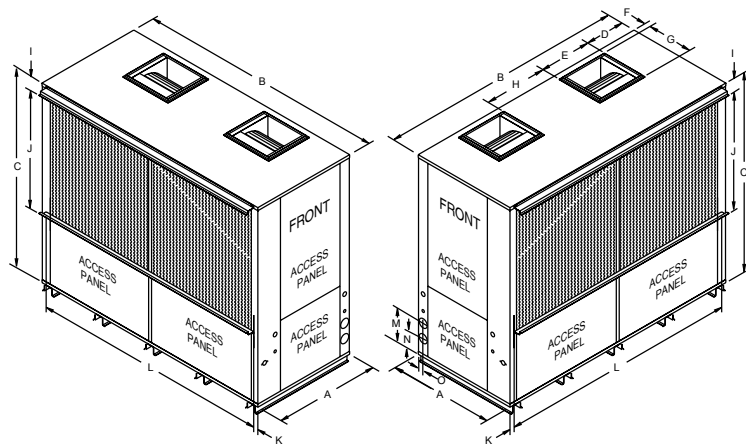
UNIT MOUNTS ON A 2.50" RAIL THAT IS NOT INCLUDED IN THE OVERALL HEIGHT DIMENSION.

MODEL	CABINET OVERALL DIMENSIONS			BLOWER OPENING AND LOCATION				DUCT LOCATION AND DIMENSIONS				WATER LINE LOCATION		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
V080, V095 V120	34.50	61.32	56.00	21.62	18.07	1.50	16.07	1.75	30.25	1.60	58.13	6.00	11.00	2.07

Notes: Line voltage knockouts are 7/8 inch - All low voltage knockouts are 7/8 inch and 1 1/8 inch
Filter rack extends beyond air coil side of cabinet 2 1/8 inch and is removable (includes 1 inch duct flange)

Vertical Dimensions

V180-V275



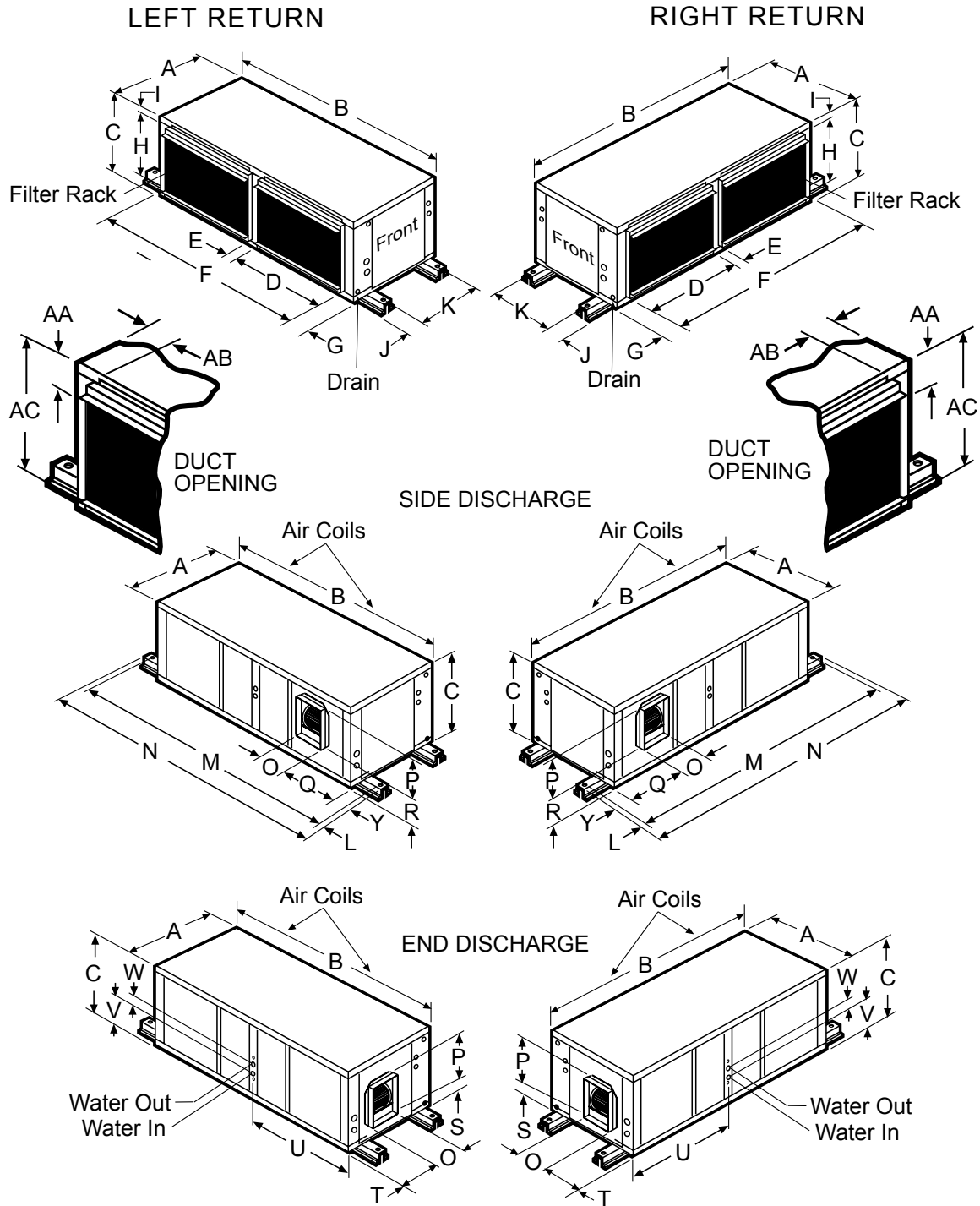
UNIT MOUNTS ON A 2.50" RAIL THAT IS NOT INCLUDED IN THE OVERALL HEIGHT DIMENSION.

MODEL	CABINET OVERALL DIMENSIONS			BLOWER OPENING AND LOCATION				DUCT LOCATION AND DIMENSIONS				WATER LINE LOCATION			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
V180 V240/275	34.50	88.13	63.96	13.98	18.07	1.50	16.07	24.02	1.68	38.39	1.00	86.13	11.00	6.00	2.07

Notes: Line voltage knockouts are 7/8 inch - All low voltage knockouts are 7/8 inch and 1 1/8 inch
Filter rack extends beyond air coil side of cabinet 2 1/8 inch and is removable (includes 1 inch duct flange)

Horizontal Dimensions

(See Table on Next Page)



Unit mounts on a 2.50 inch rail that is not included in the overall height dimension

Horizontal Dimensions (cont.)

(Refer to Drawings on Previous Page)

SIZE	CABINET OVERALL DIMENSIONS			AIR COIL DIMENSION AND LOCATION					UNIT MOUNTING DIMENSIONS					
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
V080	34.50	88.13	23.62	35.00	12.06	82.06	3.03	19.04	2.20	3.63	27.24	1.00	94.00	96.00
V095	34.50	88.13	23.62	35.00	12.06	82.06	3.03	19.04	2.20	3.63	27.24	1.00	94.00	96.00
V120	34.50	88.13	23.62	40.00	2.06	82.06	3.03	19.04	2.20	3.63	27.24	1.00	94.00	96.00

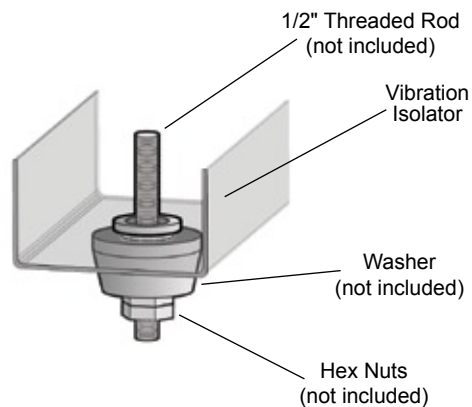
SIZE	BLOWER OPENING		DISCHARGE LOCATION				WATER LINE LOCATION				DUCT OPENING			
	O	P	Q	R	S	T	U	V	W	Y	AA	AB	AC	AD
V080	16.00	13.83	9.00	2.75	2.25	6.15	44.06	6.98	6.00	3.93	2.72	2.06	18.19	84.00
V095	16.00	13.83	9.00	2.75	2.25	6.15	44.06	6.98	6.00	3.93	2.72	2.06	18.19	84.00
V120	16.00	13.83	9.00	2.75	2.25	6.15	44.06	6.98	6.00	3.93	2.72	2.06	18.19	84.00

Notes: All water connections are 1 1/4 inch FPT - Condensate connections are 3/4" swt - Low voltage knockouts are 7/8 inch Line voltage knockouts are 1 1/8 inch - Rubber grommets and hanging brackets furnished; need 1/2 inch hanging rod

Hanger Assembly

(Horizontal Units Only)

Horizontal 7-10 ton units are built with twin 2 1/2-inch high runners under the entire length of the cabinet. Four vibration isolators are included with each horizontal unit for installation as shown.



Physical Data

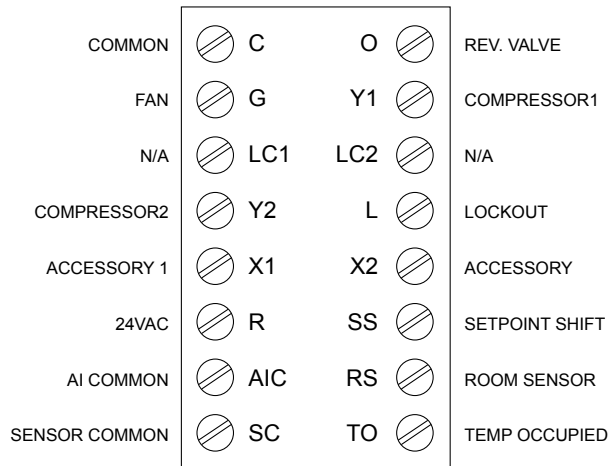
COMPONENT	HORIZONTAL			VERTICAL					
	V080	V095	V120	V080	V095	V120	V180	V240	V275
Fan Wheel Size (in.)	12 x 12	12 x 12	12 x 12	15 x 11	15 x 11	15 x 11	15 x 11	15 x 11	15 x 11
# of Fan Motors/# of Blowers	1/1	1/1	1/1	1/1	1/1	1/1	2/2	2/2	2/2
Fan Motor HP (standard)	1.5	2	3	1	1.5	2	1.5	2	3
Fan Motor HP (optional)	2	3	3	1.5	2	3	2	3	-
Compressors (2)	Recip	Recip	Scroll	Recip	Recip	Scroll	Recip	Recip	Recip
R22 (oz. per circuit)	82	80	102	97	86	106	192	209	215
Water Connection Size (fpt)	1.25"	1.25"	1.25"	1.25"	1.25"	1.25"	2"	2"	2"
Condensate Connection	0.75" SWT	0.75" SWT	0.75" SWT	0.75" FPT	0.75" FPT	0.75" FPT	1.0" FPT	1.0" FPT	1.0" FPT
Air Coil Dimensions (in. ea.)	20 x 35	20 x 35	20 x 40	25 x 28	25 x 28	25 x 32	40 x 40	40 x 40	40 x 40
Air Coil Face Area x 2 (sq. ft.)	4.9	4.9	5.6	4.9	4.9	5.6	11.1	11.1	11.1
Air Coil # Rows	3	3	3	3	3	3	3	3	3
Filter - 2" Throwaway (no.)	(3) 20 x 20 (1) 20 x 25	(3) 20 x 20 (1) 20 x 25	(3) 20 x 20 (1) 20 x 25	(2) 28 x 32	(2) 28 x 32	(2) 28 x 32	(2) 40 x 42	(2) 40 x 42	(2) 40 x 42
Weight - Packaged	725	737	813	850	900	960	1100	1200	1225

Control Wiring

16-Pin Terminal Board

Units using the FX 10 have three different installation options.

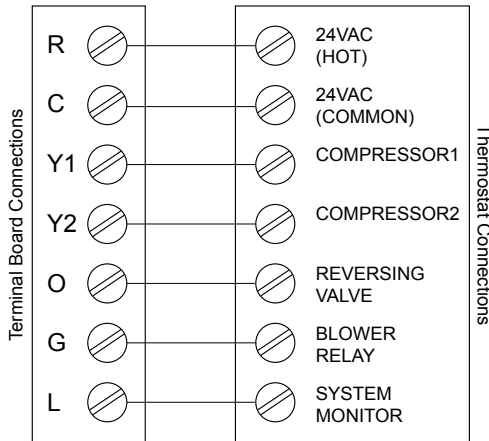
- Stand-alone unit controlled by an electronic thermostat.
- Stand-alone with a zone temperature sensor. A zone temperature sensor is a non-programmable temperature sensor that allows the user to adjust the zone temperature by +/- 5°F. A user interface (Kit # MUIK1) is required to change any zone temperature set points beyond 5 degrees.
- Integrated into a building automation system by using a zone temperature sensor and adding a communication module for Open N2, LonTalk, or BacNet.



Regardless of which installation option is chosen all low voltage wiring will be done through this terminal board.

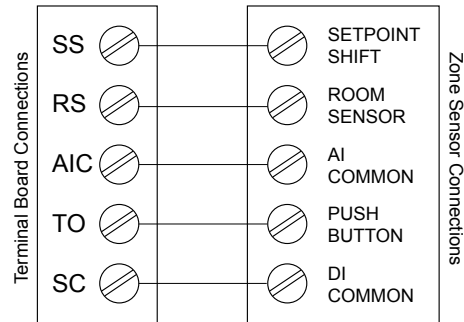
Electronic Thermostat Connections

If an electronic thermostat is being used, wire as shown in this picture.



Zone Sensor Wiring

Installation options 2 and 3 will use this wiring diagram for the zone temperature sensor.



Electrical Data

SIZE	RATED VOLTAGE	VOLTAGE MIN/MAX	COMPRESSOR*			FAN MOTOR FLA***	FAN HP	TOTAL UNIT FLA	MIN CIRC AMP	MAX FUSE	MAX HACR BREAKER	
			MCC	RLA	LRA							
HORIZONTAL	V080	208-230/60/3	197/253	14.0	9.0	70.0	5.6	1.5	23.6	25.9	30	30
		460/60/3	414/506	7.1	4.6	33.0	2.8	1.5	12.0	13.2	15	15
		575/60/3	518/633	5.3	3.4	27.0	2.0	1.5	8.8	9.7	10	10
	V080**	208-230/60/3	197/253	14.0	9.0	70.0	6.6	2.0	24.6	26.9	35	35
		460/60/3	414/506	7.1	4.6	33.0	3.5	2.0	12.7	13.9	15	15
		575/60/3	518/633	5.3	3.4	27.0	2.4	2.0	9.2	10.1	10	10
	V095	208-230/60/3	197/253	16.7	10.7	85.0	6.6	2.0	28.0	30.7	40	40
		460/60/3	414/506	8.2	5.3	42.0	3.5	2.0	14.1	15.4	20	20
		575/60/3	518/633	6.7	4.3	34.0	2.4	2.0	11.0	12.1	15	15
	V095**	208-230/60/3	197/253	16.7	10.7	85.0	9.2	3.0	30.6	33.3	40	40
		460/60/3	414/506	8.2	5.3	42.0	4.3	3.0	14.9	16.2	20	20
		575/60/3	518/633	6.7	4.3	34.0	3.6	3.0	12.2	13.3	15	15
	V120	208-230/60/3	197/253	27.0	17.3	123.0	9.2	3.0	43.8	48.1	60	60
		460/60/3	414/506	14.0	9.0	62.0	4.3	3.0	22.3	24.6	30	30
		575/60/3	518/633	11.0	7.1	50.0	3.6	3.0	17.8	19.6	25	25
VERTICAL	V080	208-230/60/3	197/253	14.0	9.0	70.0	3.8	1.0	21.8	24.1	30	30
		460/60/3	414/506	7.1	4.6	33.0	1.9	1.0	11.1	12.3	15	15
		575/60/3	518/633	5.3	3.4	27.0	2.0	1.5	8.8	9.7	10	10
	V080**	208-230/60/3	197/253	14.0	9.0	70.0	5.6	1.5	23.6	25.9	30	30
		460/60/3	414/506	7.1	4.6	33.0	2.8	1.5	12.0	13.2	15	15
	V095	208-230/60/3	197/253	16.7	10.7	85.0	5.6	1.5	27.0	29.7	40	40
		460/60/3	414/506	8.2	5.3	42.0	2.8	1.5	13.4	14.7	20	20
		575/60/3	518/633	6.7	4.3	34.0	2.0	1.5	10.6	11.7	15	15
	V095**	208-230/60/3	197/253	16.7	10.7	85.0	6.6	2.0	28.0	30.7	40	40
		460/60/3	414/506	8.2	5.3	42.0	3.5	2.0	14.1	15.4	20	20
		575/60/3	518/633	6.7	4.3	34.0	2.4	2.0	11.0	12.1	15	15
	V120	208-230/60/3	197/253	27.0	17.3	123.0	6.6	2.0	41.2	45.5	60	60
		460/60/3	414/506	14.0	9.0	62.0	3.5	2.0	21.5	23.8	30	30
		575/60/3	518/633	11.0	7.1	50.0	2.4	2.0	16.6	18.4	25	25
	V120**	208-230/60/3	197/253	27.0	17.3	123.0	9.2	3.0	43.8	48.1	60	60
460/60/3		414/506	14.0	9.0	62.0	4.3	3.0	22.3	24.6	30	30	
575/60/3		518/633	11.0	7.1	50.0	3.6	3.0	17.8	19.6	25	25	
V180	208-230/60/3	197/253	29.5	18.9	146.0	5.6	1.5	49.0	53.7	70	70	
	460/60/3	414/506	14.8	9.5	72.0	2.8	1.5	24.6	26.9	35	35	
	575/60/3	518/633	11.8	7.6	58.0	2.0	1.5	19.1	21.0	25	25	
V180**	208-230/60/3	197/253	29.5	18.9	146.0	6.6	2.0	51.0	55.7	70	70	
	460/60/3	414/506	14.8	9.5	72.0	3.5	2.0	26.0	28.3	35	35	
	575/60/3	518/633	11.8	7.6	58.0	2.4	2.0	19.9	21.8	25	25	
V240	208-230/60/3	197/253	47.0	30.1	225.0	6.6	2.0	73.5	81.0	110	110	
	460/60/3	414/506	24.2	15.5	114.0	3.5	2.0	38.0	41.9	50	50	
	575/60/3	518/633	18.9	12.1	80.0	2.4	2.0	29.0	32.1	40	40	
V240**	208-230/60/3	197/253	47.0	30.1	225.0	9.2	3.0	78.7	86.2	110	110	
	460/60/3	414/506	24.2	15.5	114.0	4.3	3.0	39.6	43.5	50	50	
	575/60/3	518/633	18.9	12.1	80.0	3.6	3.0	31.4	34.5	45	45	
V275	460/60/3	414/506	26.9	17.2	125.0	4.3	3.0	43.2	47.5	60	60	

Notes: HACR circuit breaker in USA only. All fuses Class RK-5.

* Ratings per each compressor - unit supplied with two.

** With optional Motor

*** Rating per each motor - V180, V240 and V275 supplied with two.

Fan Performance Data

SIZE	DRIVE SHEAVE	Airflow (CFM) at External Static Pressure (in. wg)															
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.8	2.0	
HORIZONTAL	V080	Closed	3900	3800	3650	3500	3300	3100	2950	2750	2450	3050	2650				
		1 Turn Open	3700	3550	3400	3200	3000	2800	2550	3200	3000	2800					
		2 Turns Open	3400	3200	3050	2850	2650	2400	3200	2900	2650						
		3 Turns Open	3050	2900	3650	2400	3300	3150	2900	2650							
		4 Turns Open	2800	2550	3350	3850	2900	2650									
	5 Turns Open	2450	3250	3000	2750												
	V095	Closed	4450	4350	4200	4050	3900	3750	3600	3400	3250	3050	3800	3450	3000		
		1 Turn Open	4350	4200	4050	3990	3750	3600	3400	3200	3000	3900	3400	2950			
		2 Turns Open	4150	4000	3950	3650	3500	3400	3200	2900	3850	3600	3250				
		3 Turns Open	3900	3800	3650	3500	3300	3100	2900	3500	3300	3000					
		4 Turns Open	3700	3550	3350	3050	2900	3400	3200	3000	2800						
	5 Turns Open	3450	3250	3000	3500	3300	3100	2850									
	V120	Closed			4900	4800	4900	4800	4700	4600	4450	4300	4000	3700	4550	4400	4150
		1 Turn Open			4900	4700	4700	4600	4450	4300	4200	4000	3700	4550	4300	4050	
		2 Turns Open		4800	4700	4550	4450	4300	4200	4050	3900	3750	3350	4300	4050		
3 Turns Open		4600	4450	4350	4250	4100	3950	3750	3650	3500	3250	4200	3950				
4 Turns Open		4400	4250	4100	4000	3850	3700	3550	3550	3200							
5 Turns Open	4200	4050	3950	3750	3600	3450	3200										
VERTICAL	V080	Closed	4225	4100	3900	3700	3500	3250	3000	2700	3600	3400	2900				
		1 Turn Open	4000	3825	3600	3400	3100	2850	3550	3350	3100	2800					
		2 Turns Open	3725	3500	3300	3000	2700	3300	3200	2850	2500						
		3 Turns Open	3400	3150	2900	2800	2700	2550									
		4 Turns Open	3050	2800	3150	2900	2600										
	5 Turns Open	3150	2900	2600													
	V095	Closed	4550	4400	4400	4250	3950	3850	3600	3400	3100	4550	4150	3700	3000		
		1 Turn Open	4550	4400	4200	4000	3800	3550	3300	3000	4350	4150	3700	3000			
		2 Turns Open	4300	4100	3900	3700	3450	3200	2900	4250	4000	3700	3100				
		3 Turns Open	4100	3850	3600	3400	3150	2900	4000	3800	3500	3200	2850				
		4 Turns Open	3800	3600	3350	3150	2850	3800	3550	3300	2950						
	5 Turns Open	3550	3300	3050	2750	3600	3400	3150	2800								
	V120	Closed							5100	4900	4800	4550	4100	4900	4500	4150	3650
		1 Turn Open					5200	5000	4800	4600	4400	4150	4950	4700	4360	3850	
		2 Turns Open			5000	4800	4650	4500	4400	4200	3950	3700	4850	4450	3900		
3 Turns Open				4900	4700	4500	4350	4150	3900	3600	4800	4450	3950				
4 Turns Open			4700	4600	4400	4200	4000	3700	4900	4700	4600	4050					
5 Turns Open	4800	4600	4350	4100	3900	3600	4700	4500	4300	4050	3500						
V180	Closed	9600	9200	8800	8500	8100	7600	7200	6600	6000	9200	8200	7000	5400			
	1 Turn Open	9600	8700	8400	7900	7400	7000	6400	5900	8500	8100	6900	5400				
	2 Turns Open	8600	8200	7800	7300	6800	6300	5800	8100	7700	7100	5800					
	3 Turns Open	8000	7600	7200	6700	6200	5800	8100	7600	7000	6200						
	4 Turns Open	7500	7000	6600	6000	7900	7700	7200	6500	5800	5400						
5 Turns Open	7000	6500	5900	7800	7400	6800	6100	5200									
V240	Closed					10400	10200	10000	9700	9400	9100	8300	9900	9000	8200	7200	
	1 Turn Open			10200	9900	9700	9400	9200	8900	8500	8100	9900	9200	8400	7400		
	2 Turns Open		9700	9400	9100	8900	8700	8400	8100	7700	7100	9200	8400	7300			
	3 Turns Open	10300	10000	9600	9200	8900	8500	8100	7600	7000	9600	8600	7500				
	4 Turns Open	9700	9300	9000	8500	8100	7700	7200	9500	9200	8700	7600					
5 Turns Open	9000	8600	8200	7800	7400	6800	9200	8800	8400	7800							
V275	Closed										10900	10400	9900	9000			
	1 Turn Open										10900	10400	9900	9200			
	2 Turns Open						11200	10900	10600	10250	9900	9200					
	3 Turns Open						10600	10300	10000	9800	9600	8600					
	4 Turns Open		11200	10900	10600	10250	9900	9700	9500	9200	8700						
5 Turns Open		10500	10200	9900	9500	9100	8900	8700									

Notes: Drive Sheave factory setting shown in bold. Shaded areas require larger blower motor and sheaves.

Reference Calculations

Heating Calculations	Cooling Calculations
$LWT = EWT - \frac{HE}{GPM \times 500}$	$LWT = EWT + \frac{HR}{GPM \times 500}$
$LAT = EAT + \frac{HC}{CFM \times 1.08}$	$LAT (DB) = EAT (DB) - \frac{SC}{CFM \times 1.08}$
$TH = HC + HW$	$LC = TC - SC$
	$S/T = \frac{SC}{TC}$

Correction Factors

AIRFLOW CONNECTION	PERCENT OF RATED* CFM						
	85%	90%	95%	100%	105%	110%	115%
Total Cooling Capacity	0.972	0.982	0.993	1.000	1.007	1.010	1.013
Sensible Cooling Capacity	0.926	0.948	0.974	1.000	1.027	1.055	1.066
KW - Cooling	0.977	0.984	0.993	1.000	1.011	1.018	1.028
Total Heat of Rejection	0.975	0.983	0.991	1.000	1.008	1.015	1.018
Total Heating Capacity	0.967	0.978	0.990	1.000	1.990	1.017	1.024
KW - Heating	1.009	1.006	1.003	1.000	0.997	0.995	0.993
Total Heat of Absorption	0.967	0.976	0.989	1.000	1.010	1.019	1.025

Notes: * Refer to the capacity data on pages 16-24.

Legends and Notes

ABBREVIATIONS AND DEFINITIONS

CFM = airflow, cubic feet/minute	HE = total heat of extraction, MBTUH
EWT = entering water temperature, Fahrenheit	HW = desuperheater capacity, MBTUH
GPM = water flow in gallons/minute	EER = Energy Efficient Ratio
WPD = water pressure drop, PSI and feet of water	= BTU output/Watt input
EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)	COP = Coefficient of Performance
HC = air heating capacity, MBTUH	= BTU output/BTU input
TC = total cooling capacity, MBTUH	LWT = leaving water temperature, °F
SC = sensible cooling capacity, MBTUH	LAT = leaving air temperature, °F
KW = total power unit input, kilowatts	TH = total heating capacity, MBTUH
HR = total heat of rejection, MBTUH	LC = latent cooling capacity, MBTUH
	S/T = sensible to total cooling ratio

Notes: Capacity data on pages 16-24 does not include water pumping watts and is based upon 15% methanol (by volume) antifreeze solution.

For nonstandard airflow conditions, apply the appropriate correction factors found above.

Interpolation between EWT, GPM and CFM data is permissible.

LAT published is approximate only.

Catalog illustrations cover the general appearance of products at time of publication.

V080 - Vertical

Cooling Capacity Data (2800 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	10.0	2.5	5.8	75/63	96.9	69.8	4.01	110.6	24.1
				80/67	105.3	72.7	4.10	119.3	25.7
				85/71	113.7	75.6	4.18	128.0	27.2
	16.0	5.4	12.5	75/63	95.1	67.5	3.85	108.2	24.7
				80/67	103.4	70.3	3.93	116.8	26.3
				85/71	111.6	73.1	4.00	125.3	27.9
	22.0	7.5	17.3	75/63	94.4	66.8	3.72	107.1	25.4
				80/67	102.6	69.6	3.80	115.6	27.0
				85/71	110.9	72.4	3.87	124.1	28.6
60	10.0	2.4	5.5	75/63	92.8	67.9	4.51	108.2	20.6
				80/67	100.8	70.7	4.60	116.5	21.9
				85/71	108.9	73.5	4.70	124.9	23.2
	16.0	5.3	12.3	75/63	91.7	66.3	4.32	106.4	21.2
				80/67	99.6	69.0	4.41	114.7	22.6
				85/71	107.6	71.8	4.50	123.0	23.9
	22.0	7.4	17.1	75/63	91.6	66.0	4.19	105.9	21.9
				80/67	99.6	68.7	4.3	114.2	23.3
				85/71	107.6	71.5	4.36	122.5	24.7
70	10.0	2.4	5.5	75/63	88.7	66.0	5.01	105.8	17.7
				80/67	96.4	68.7	5.11	113.9	18.9
				85/71	104.1	71.5	5.21	121.9	20.0
	16.0	5.2	12.0	75/63	88.2	65.1	4.80	104.6	18.4
				80/67	95.9	67.8	4.90	112.6	19.6
				85/71	103.6	70.5	5.00	120.6	20.7
	22.0	7.3	16.9	75/63	88.8	65.2	4.66	104.7	19.0
				80/67	96.5	67.9	4.76	112.8	20.3
				85/71	104.3	70.6	4.85	120.8	21.5
80	10.0	2.3	5.3	75/63	80.6	64.0	5.50	99.3	14.7
				80/67	87.6	66.7	5.61	106.7	15.6
				85/71	94.6	69.4	5.72	114.1	16.5
	16.0	5.1	11.8	75/63	80.7	63.9	5.28	98.7	15.3
				80/67	87.7	66.6	5.38	106.1	16.3
				85/71	94.8	69.2	5.49	113.5	17.3
	22.0	6.9	15.9	75/63	81.8	64.3	5.14	99.3	15.9
				80/67	88.9	67.0	5.24	106.8	17.0
				85/71	96.0	69.7	5.35	114.3	18.0
85	10.0	2.3	5.3	75/63	76.6	63.1	5.75	96.2	13.3
				80/67	83.2	65.7	5.86	103.3	14.2
				85/71	89.9	68.3	5.98	110.3	15.0
	16.0	5.1	11.8	75/63	77.0	63.3	5.51	95.8	14.0
				80/67	83.7	65.9	5.63	102.9	14.9
				85/71	90.4	68.6	5.74	110.0	15.8
	22.0	6.5	15.0	75/63	78.3	63.9	5.37	96.6	14.6
				80/67	85.1	66.6	5.5	103.8	15.5
				85/71	91.9	69.2	5.59	111.0	16.4
90	10.0	2.3	5.3	75/63	72.6	62.1	5.99	93.1	12.1
				80/67	79.0	64.7	6.11	99.8	12.9
				85/71	85.3	67.3	6.24	106.6	13.7
	16.0	5.0	11.6	75/63	73.3	62.7	5.75	92.9	12.7
				80/67	79.7	65.3	5.87	99.7	13.6
				85/71	86.0	67.9	5.98	106.4	14.4
	22.0	6.0	13.9	75/63	74.8	63.5	5.61	93.9	13.3
				80/67	81.3	66.1	5.72	100.8	14.2
				85/71	87.8	68.8	5.84	107.7	15.0
100	10.0	2.2	5.1	75/63	67.2	58.3	6.38	89.0	10.5
				80/67	73.1	60.7	6.51	95.3	11.2
				85/71	78.9	63.1	6.64	101.6	11.9
	16.0	5.0	11.6	75/63	68.3	59.4	6.13	89.2	11.1
				80/67	74.2	61.9	6.25	95.6	11.9
				85/71	80.2	64.4	6.38	102.0	12.6
	22.0	5.8	13.4	75/63	70.2	60.5	5.99	90.6	11.7
				80/67	76.3	63.0	6.11	97.1	12.5
				85/71	82.4	65.6	6.24	103.7	13.2
110	10.0	2.2	5.2	75/63	61.9	54.5	6.77	85.0	9.1
				80/67	67.3	56.7	6.91	90.9	9.7
				85/71	72.7	59.0	7.05	96.8	10.3
	16.0	4.9	11.3	75/63	63.4	56.2	6.50	85.6	9.7
				80/67	68.9	58.6	6.64	91.6	10.4
				85/71	74.4	60.9	6.77	97.5	11.0
	22.0	5.8	13.4	75/63	65.6	57.6	6.37	87.3	10.3
				80/67	71.3	60.0	6.50	93.5	11.0
				85/71	77.0	62.4	6.63	99.6	11.6

Heating Capacity Data (2800 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	10.0	2.6	6.0	60.0	56.7	4.25	42.1	78.7	3.90
				70.0	54.3	4.48	39.0	88.0	3.55
				80.0	51.9	4.70	35.9	97.2	3.24
	16.0	5.6	13.0	60.0	58.0	4.31	43.3	79.2	3.95
				70.0	55.6	4.54	40.1	88.4	3.59
				80.0	53.2	4.76	36.9	97.6	3.27
	22.0	7.9	18.3	60.0	60.0	4.31	45.2	79.8	4.07
				70.0	57.4	4.54	41.9	89.0	3.70
				80.0	54.8	4.77	38.5	98.1	3.37
40	10.0	2.5	5.7	60.0	66.8	4.56	51.2	82.1	4.29
				70.0	64.0	4.80	47.6	91.2	3.91
				80.0	61.3	5.04	44.1	100.3	3.56
	16.0	5.4	12.4	60.0	68.5	4.62	52.8	82.7	4.35
				70.0	65.7	4.86	49.1	91.7	3.96
				80.0	62.8	5.11	45.4	100.8	3.60
	22.0	7.8	18.0	60.0	70.6	4.64	54.8	83.3	4.46
				70.0	67.8	4.88	51.2	92.4	4.07
				80.0	64.8	5.13	47.3	101.4	3.71
50	10.0	2.5	5.8	60.0	76.8	4.86	60.2	85.4	4.63
				70.0	73.7	5.12	56.3	94.4	4.22
				80.0	70.7	5.38	52.3	103.4	3.85
	16.0	5.4	12.5	60.0	79.0	4.93	62.2	86.1	4.69
				70.0	75.8	5.19	58.1	95.1	4.28
				80.0	72.6	5.45	54.0	104.0	3.90
	22.0	7.5	17.3	60.0	81.6	4.96	64.7	87.0	4.82
				70.0	78.3	5.23	60.5	95.9	4.39
				80.0	75.0	5.49	56.2	104.8	4.00
60	10.0	2.4	5.5	60.0	87.8	5.10	70.4	89.0	5.04
				70.0	84.4	5.37	66.1	97.9	4.61
				80.0	81.0	5.64	61.8	106.8	4.21
	16.0	5.3	12.3	60.0	90.4	5.17	72.8	89.9	5.12
				70.0	86.9	5.45	68.3	98.7	4.68
				80.0	83.4	5.72	63.9	107.6	4.27
	22.0	7.4	17.1	60.0	93.5	5.22	75.7	90.9	5.24
				70.0	89.8	5.50	71.0	99.7	4.79
				80.0	86.1	5.77	66.4	108.5	4.37
70	10.0	2.4	5.5	60.0	98.8	5.34	80.6	92.7	5.43
				70.0	95.2	5.62	76.1	101.5	4.97
				80.0	91.6	5.90	71.5	110.3	4.55
	16.0	5.2	12.0	60.0	101.8	5.42	83.3	93.7	5.51
				70.0	98.1	5.70	78.6	102.4	5.04
				80.0	94.3	5.99	73.9	111.2	4.62
	22.0	7.3	16.9	60.0	105.2	5.48	86.5	94.8	5.62
				70.0	101.3	5.77	81.6	103.5	5.14
				80.0	97.4	6.06	76.7	112.2	4.71
80	10.0	2.3	5.3	60.0	111.3	5.66	92.0	96.8	5.76
				70.0	107.5	5.95	87.2	105.6	5.29
				80.0	103.7	6.25	82.4	114.3	4.86
	16.0	5.1	11.8	60.0	115.0	5.74	95.4	98.0	5.86
				70.0	111.0	6.05	90.4	106.7	5.38
				80.0	107.1	6.35	85.4	115.4	4.94
	22.0	6.9	15.9	60.0	118.8	5.83	98.9	99.3	5.97
				70.0	114.6	6.14	93.7	107.9	5.47
				80.0	110.5	6.44	88.5	116.6	5.03
90	10.0	2.3	5.3	60.0	123.8	5.98	103.4	100.9	6.07
				70.0	119.9	6.29	98.4	109.7	5.59
				80.0	116.1	6.60	93.5	118.4	5.15
	16.0	5.0	11.6	60.0	128.0	6.07	107.3	102.3	6.18
				70.0	124.0	6.39	102.2	111.0	5.69
				80.0	120.0	6.71	97.1	119.7	5.24
	22.0	6.0	13.9	60.0	132.2	6.18	111.1	103.7	6.27
				70.0	128.0	6.50	105.8	112.3	5.77
				80.0	123.8	6.83	100.5	120.9	5.31

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V080 - Horizontal

Cooling Capacity Data (2800 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	10.0	2.5	5.8	75/63	86.2	65.1	4.60	101.9	18.8
				80/67	93.7	67.8	4.69	109.7	20.0
				85/71	101.2	70.5	4.78	117.5	21.2
	16.0	5.4	12.5	75/63	86.0	63.7	4.36	100.9	19.8
				80/67	93.5	66.4	4.45	108.7	21.0
				85/71	101.0	69.0	4.53	116.5	22.3
	22.0	7.5	17.3	75/63	83.7	63.2	4.22	98.1	19.9
				80/67	91.0	65.9	4.30	105.7	21.1
				85/71	98.3	68.5	4.39	113.2	22.4
60	10.0	2.4	5.5	75/63	87.5	66.9	4.73	103.7	18.5
				80/67	95.1	69.7	4.83	111.6	19.7
				85/71	102.7	72.5	4.93	119.6	20.8
	16.0	5.3	12.2	75/63	88.1	66.1	4.50	103.4	19.6
				80/67	95.7	68.9	4.59	111.4	20.8
				85/71	103.4	71.6	4.69	119.4	22.1
	22.0	7.4	17.0	75/63	86.5	66.0	4.37	101.5	19.8
				80/67	94.1	68.7	4.46	109.3	21.1
				85/71	101.6	71.5	4.55	117.1	22.3
70	10.0	2.4	5.4	75/63	81.9	63.1	5.49	100.6	14.9
				80/67	89.0	65.7	5.60	108.1	15.9
				85/71	96.1	68.3	5.71	115.6	16.8
	16.0	5.2	11.9	75/63	83.1	63.0	5.24	101.0	15.9
				80/67	90.3	65.6	5.34	108.6	16.9
				85/71	97.6	68.2	5.45	116.2	17.9
	22.0	7.1	16.4	75/63	82.5	63.2	5.10	99.9	16.2
				80/67	89.7	65.9	5.21	107.5	17.2
				85/71	96.9	68.5	5.31	115.0	18.2
80	10.0	2.3	5.4	75/63	75.1	60.1	5.92	95.3	12.7
				80/67	81.6	62.6	6.04	102.2	13.5
				85/71	88.2	65.1	6.16	109.2	14.3
	16.0	5.1	11.8	75/63	76.9	60.6	5.66	96.2	13.6
				80/67	83.6	63.1	5.78	103.3	14.5
				85/71	90.2	65.7	5.89	110.4	15.3
	22.0	6.9	16.0	75/63	77.1	61.2	5.54	96.0	13.9
				80/67	83.8	63.7	5.65	103.1	14.8
				85/71	90.5	66.3	5.77	110.2	15.7
85	10.0	2.3	5.4	75/63	73.4	55.9	6.15	94.4	11.9
				80/67	79.8	58.2	6.28	101.2	12.7
				85/71	86.2	60.6	6.40	108.0	13.5
	16.0	5.1	11.8	75/63	75.5	56.7	5.90	95.6	12.8
				80/67	82.1	59.1	6.02	102.6	13.6
				85/71	88.6	61.4	6.14	109.6	14.4
	22.0	6.5	15.0	75/63	76.1	57.4	5.78	95.8	13.2
				80/67	82.7	59.8	5.90	102.9	14.0
				85/71	89.3	62.2	6.02	109.9	14.8
90	10.0	2.3	5.3	75/63	68.6	56.7	6.40	90.5	10.7
				80/67	74.6	59.1	6.53	96.9	11.4
				85/71	80.6	61.4	6.66	103.3	12.1
	16.0	5.0	11.6	75/63	70.9	57.8	6.14	91.9	11.5
				80/67	77.0	60.3	6.27	98.4	12.3
				85/71	83.2	62.7	6.40	105.0	13.0
	22.0	6.0	13.7	75/63	71.8	58.7	6.04	92.4	11.9
				80/67	78.1	61.2	6.16	99.1	12.7
				85/71	84.3	63.6	6.28	105.7	13.4
100	10.0	2.2	5.1	75/63	62.4	53.0	6.78	85.5	9.2
				80/67	67.8	55.2	6.92	91.4	9.8
				85/71	73.2	57.4	7.06	97.3	10.4
	16.0	5.0	11.6	75/63	65.0	54.6	6.53	87.3	10.0
				80/67	70.7	56.9	6.67	93.4	10.6
				85/71	76.3	59.2	6.80	99.5	11.2
	22.0	5.8	13.4	75/63	66.6	55.8	6.44	88.5	10.3
				80/67	72.4	58.1	6.57	94.8	11.0
				85/71	78.1	60.4	6.70	101.0	11.7
110	10.0	2.2	5.1	75/63	57.9	49.8	7.17	82.4	8.1
				80/67	62.9	51.9	7.32	87.9	8.6
				85/71	68.0	53.9	7.46	93.4	9.1
	16.0	4.9	11.2	75/63	60.9	51.9	6.94	84.6	8.8
				80/67	66.2	54.1	7.08	90.4	9.4
				85/71	71.5	56.2	7.22	96.2	9.9
	22.0	5.8	13.3	75/63	63.0	53.3	6.86	86.5	9.2
				80/67	68.5	55.5	7.00	92.4	9.8
				85/71	74.0	57.8	7.14	98.4	10.4

Heating Capacity Data (2800 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	10.0	2.6	6.0	60.0	55.4	4.45	40.2	78.3	3.65
				70.0	53.3	4.69	37.3	87.6	3.33
				80.0	51.1	4.92	34.3	96.9	3.04
	16.0	5.6	12.9	60.0	56.9	4.51	41.5	78.8	3.70
				70.0	54.6	4.75	38.4	88.1	3.37
				80.0	52.4	4.98	35.4	97.3	3.08
	22.0	7.9	18.3	60.0	59.0	4.58	43.4	79.5	3.78
				70.0	56.6	4.82	40.1	88.7	3.44
				80.0	54.2	5.06	36.9	97.9	3.14
40	10.0	2.5	5.8	60.0	67.3	4.77	51.0	82.2	4.14
				70.0	64.6	5.02	47.4	91.3	3.77
				80.0	61.8	5.27	43.9	100.5	3.44
	16.0	5.4	12.5	60.0	68.5	4.85	52.0	82.6	4.14
				70.0	65.7	5.10	48.3	91.7	3.78
				80.0	63.0	5.36	44.7	100.8	3.45
	22.0	7.8	18.0	60.0	70.6	4.91	53.9	83.4	4.21
				70.0	68.0	5.17	50.4	92.5	3.85
				80.0	65.1	5.43	46.6	101.5	3.51
50	10.0	2.5	5.8	60.0	77.8	5.05	60.5	85.7	4.51
				70.0	74.7	5.32	56.6	94.7	4.12
				80.0	71.7	5.59	52.6	103.7	3.76
	16.0	5.4	12.5	60.0	79.5	5.16	61.9	86.3	4.51
				70.0	76.4	5.43	57.8	95.2	4.12
				80.0	73.2	5.70	53.8	104.2	3.76
	22.0	7.5	17.3	60.0	82.1	5.23	64.3	87.2	4.60
				70.0	78.8	5.50	60.1	96.1	4.20
				80.0	75.6	5.78	55.9	105.0	3.83
60	10.0	2.4	5.5	60.0	89.3	5.22	71.5	89.5	5.01
				70.0	85.9	5.49	67.1	98.4	4.58
				80.0	82.5	5.77	62.8	107.3	4.19
	16.0	5.3	12.2	60.0	91.5	5.35	73.3	90.3	5.01
				70.0	88.0	5.63	68.8	99.1	4.58
				80.0	84.5	5.91	64.3	107.9	4.19
	22.0	7.4	17.0	60.0	94.4	5.41	75.9	91.2	5.11
				70.0	90.7	5.70	71.3	100.0	4.67
				80.0	87.0	5.98	66.6	108.8	4.26
70	10.0	2.4	5.4	60.0	97.9	5.48	79.2	92.4	5.24
				70.0	94.4	5.77	74.7	101.2	4.80
				80.0	90.9	6.05	70.3	110.1	4.40
	16.0	5.2	11.9	60.0	103.5	5.64	84.3	94.2	5.38
				70.0	99.8	5.93	79.5	103.0	4.93
				80.0	96.0	6.23	74.7	111.7	4.51
	22.0	7.1	16.3	60.0	106.5	5.70	87.1	95.2	5.48
				70.0	102.6	6.00	82.1	103.9	5.01
				80.0	98.7	6.30	77.2	112.6	4.59
80	10.0	2.3	5.4	60.0	113.7	5.82	93.9	97.6	5.73
				70.0	109.9	6.12	89.0	106.3	5.26
				80.0	106.0	6.43	84.1	115.1	4.83
	16.0	5.1	11.8	60.0	117.3	6.01	96.7	98.8	5.72
				70.0	113.3	6.33	91.7	107.5	5.25
				80.0	109.3	6.64	86.7	116.2	4.82
	22.0	6.9	16.0	60.0	120.4	6.07	99.7	99.8	5.81
				70.0	116.3	6.39	94.5	108.5	5.33
				80.0	112.2	6.71	89.3	117.1	4.90
90	10.0	2.3	5.3	60.0	126.2	6.14	105.3	101.7	6.02
				70.0	122.3	6.46	100.3	110.5	5.55
				80.0	118.4	6.79	95.3	119.2	5.11
	16.0	5.0	11.6	60.0	130.5	6.37	108.8	103.2	6.00
				70.0	126.5	6.71	103.6	111.8	5.53
				80.0	122.4	7.04	98.4	120.5	5.10
	22.0	6.0	13.7	60.0	133.7	6.42	111.8	104.2	6.10
				70.0	129.5	6.76	106.4	112.8	5.61
				80.0	125.3	7.10	101.1	121.5	5.17

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V095 - Vertical

Cooling Capacity Data (3200 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	12.0	2.2	5.1	75/63	106.0	77.2	5.41	124.5	19.6
				80/67	115.2	80.4	5.52	134.1	20.9
				85/71	124.5	83.6	5.63	143.7	22.1
	18.0	5.0	11.7	75/63	103.6	73.1	5.12	121.1	20.2
				80/67	112.7	76.2	5.23	130.5	21.6
				85/71	121.7	79.2	5.33	139.9	22.8
	24.0	8.6	19.9	75/63	100.8	72.5	4.96	117.7	20.3
				80/67	109.6	75.6	5.06	126.8	21.6
				85/71	118.3	78.6	5.16	135.9	22.9
60	12.0	2.2	5.0	75/63	101.9	74.6	5.91	122.1	17.2
				80/67	110.7	77.7	6.03	131.3	18.4
				85/71	119.6	80.8	6.15	140.6	19.4
	18.0	4.9	11.3	75/63	100.7	72.8	5.67	120.0	17.8
				80/67	109.4	75.9	5.78	129.2	18.9
				85/71	118.2	78.9	5.90	138.3	20.0
	24.0	8.4	19.4	75/63	100.6	72.5	5.49	119.4	18.3
				80/67	109.4	75.5	5.61	128.5	19.5
				85/71	118.1	78.6	5.72	137.7	20.7
70	12.0	2.4	5.5	75/63	100.5	72.7	6.50	122.6	15.5
				80/67	109.2	75.7	6.63	131.8	16.5
				85/71	117.9	78.7	6.77	141.0	17.4
	18.0	5.2	12.0	75/63	101.4	71.9	6.19	122.6	16.4
				80/67	110.3	74.9	6.31	131.8	17.5
				85/71	119.1	77.9	6.44	141.1	18.5
	24.0	8.2	18.9	75/63	100.5	72.5	6.03	121.1	16.7
				80/67	109.2	75.5	6.15	130.2	17.8
				85/71	118.0	78.5	6.27	139.4	18.8
80	12.0	2.3	5.3	75/63	91.0	72.5	7.00	114.9	13.0
				80/67	98.9	75.5	7.14	123.3	13.8
				85/71	106.8	78.5	7.28	131.6	14.7
	18.0	5.1	11.8	75/63	91.1	72.3	6.71	114.0	13.6
				80/67	99.0	75.4	6.85	122.4	14.5
				85/71	107.0	78.4	6.99	130.8	15.3
	24.0	7.9	18.3	75/63	92.3	72.8	6.54	114.6	14.1
				80/67	100.4	75.9	6.67	123.1	15.0
				85/71	108.4	78.5	6.79	131.4	15.8
85	12.0	2.3	5.3	75/63	86.4	70.6	7.21	110.9	12.0
				80/67	93.9	73.6	7.35	119.0	12.8
				85/71	101.4	76.5	7.50	127.0	13.5
	18.0	5.1	11.8	75/63	86.8	70.9	6.92	110.4	12.6
				80/67	94.4	73.8	7.06	118.4	13.4
				85/71	101.9	76.8	7.20	126.5	14.2
	24.0	7.8	18.0	75/63	88.3	71.5	6.74	111.3	13.1
				80/67	95.9	74.5	6.9	119.4	14.0
				85/71	103.6	77.5	7.01	127.5	14.8
90	12.0	2.3	5.2	75/63	81.8	68.8	7.41	107.1	11.0
				80/67	88.9	71.6	7.56	114.7	11.8
				85/71	96.0	74.5	7.72	122.3	12.4
	18.0	5.0	11.6	75/63	82.5	69.4	7.11	106.8	11.6
				80/67	89.7	72.3	7.26	114.5	12.4
				85/71	96.9	75.1	7.41	122.1	13.1
	24.0	7.7	17.8	75/63	84.2	70.2	6.94	107.9	12.1
				80/67	91.5	73.1	7.08	115.7	12.9
				85/71	98.8	76.1	7.22	123.5	13.7
100	12.0	2.2	5.1	75/63	75.2	62.9	7.95	102.4	9.5
				80/67	81.8	65.6	8.12	109.5	10.1
				85/71	88.3	68.2	8.28	116.6	10.7
	18.0	5.0	11.6	75/63	76.4	64.2	7.64	102.5	10.0
				80/67	83.1	66.9	7.79	109.7	10.7
				85/71	89.7	69.6	7.95	116.9	11.3
	24.0	7.5	17.3	75/63	78.5	65.4	7.47	104.0	10.5
				80/67	85.3	68.1	7.62	111.3	11.2
				85/71	92.2	70.8	7.77	118.7	11.9
110	12.0	2.2	5.1	75/63	68.8	57.3	8.49	97.8	8.1
				80/67	74.8	59.7	8.66	104.4	8.6
				85/71	80.8	62.0	8.84	110.9	9.1
	18.0	4.9	11.2	75/63	70.4	59.1	8.15	98.3	8.6
				80/67	76.6	61.6	8.32	105.0	9.2
				85/71	82.7	64.0	8.49	111.6	9.7
	24.0	7.4	17.1	75/63	72.9	60.5	7.99	100.1	9.1
				80/67	79.2	63.0	8.15	107.0	9.7
				85/71	85.5	65.6	8.32	113.9	10.3

Heating Capacity Data (3200 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	12.0	2.4	5.5	60.0	65.5	5.13	48.0	79.0	3.74
				70.0	62.9	5.40	44.4	88.2	3.41
				80.0	60.2	5.67	40.9	97.4	3.11
	18.0	5.5	12.7	60.0	66.8	5.31	48.7	79.3	3.68
				70.0	64.1	5.59	45.1	88.6	3.36
				80.0	61.5	5.87	41.5	97.8	3.07
	24.0	9.5	21.9	60.0	69.4	5.42	50.9	80.1	3.75
				70.0	66.6	5.70	47.1	89.3	3.42
				80.0	63.8	5.99	43.4	98.5	3.12
40	12.0	2.3	5.3	60.0	77.1	5.65	57.8	82.3	3.99
				70.0	74.1	5.95	53.7	91.4	3.65
				80.0	71.0	6.25	49.7	100.6	3.33
	18.0	5.3	12.2	60.0	79.1	5.73	59.6	82.9	4.05
				70.0	76.0	6.03	55.4	92.0	3.69
				80.0	72.9	6.33	51.2	101.1	3.37
	24.0	9.2	21.3	60.0	81.4	5.75	61.8	83.6	4.15
				70.0	78.4	6.05	57.8	92.7	3.80
				80.0	75.1	6.36	53.4	101.7	3.46
50	12.0	2.2	5.1	60.0	88.7	5.75	69.1	85.7	4.52
				70.0	85.3	6.05	64.6	94.7	4.13
				80.0	81.8	6.36	60.1	103.7	3.77
	18.0	5.0	11.7	60.0	90.7	5.97	70.3	86.2	4.45
				70.0	87.1	6.28	65.7	95.2	4.07
				80.0	83.6	6.59	61.1	104.2	3.72
	24.0	8.6	19.9	60.0	93.9	6.09	73.2	87.2	4.52
				70.0	90.2	6.41	68.4	96.1	4.13
				80.0	86.5	6.73	63.6	105.0	3.77
60	12.0	2.2	5.0	60.0	101.5	6.33	79.9	89.4	4.70
				70.0	97.8	6.66	75.0	98.3	4.30
				80.0	94.0	7.00	70.2	107.2	3.94
	18.0	4.9	11.3	60.0	104.5	6.42	82.6	90.2	4.77
				70.0	100.6	6.76	77.6	99.1	4.36
				80.0	96.8	7.10	72.5	108.0	3.99
	24.0	8.4	19.4	60.0	108.0	6.48	85.9	91.3	4.88
				70.0	103.9	6.82	80.6	100.1	4.46
				80.0	99.8	7.16	75.4	108.9	4.08
70	12.0	2.4	5.5	60.0	112.1	6.61	89.5	92.4	4.97
				70.0	108.2	6.96	84.5	101.3	4.56
				80.0	104.3	7.31	79.4	110.2	4.18
	18.0	5.2	12.0	60.0	118.0	6.75	95.0	94.2	5.12
				70.0	113.9	7.11	89.6	102.9	4.69
				80.0	109.7	7.46	84.2	111.7	4.31
	24.0	8.2	18.9	60.0	121.9	6.88	98.5	95.3	5.20
				70.0	117.6	7.24	92.9	104.0	4.76
				80.0	113.3	7.60	87.3	112.8	4.37
80	12.0	2.3	5.3	60.0	126.6	7.05	102.5	96.6	5.26
				70.0	122.5	7.42	97.2	105.5	4.84
				80.0	118.4	7.79	91.8	114.3	4.45
	18.0	5.1	11.8	60.0	130.7	7.16	106.3	97.8	5.35
				70.0	126.5	7.54	100.8	106.6	4.92
				80.0	122.2	7.91	95.2	115.4	4.53
	24.0	7.9	18.3	60.0	135.0	7.27	110.2	99.1	5.44
				70.0	130.6	7.65	104.5	107.8	5.00
				80.0	126.1	8.03	98.7	116.5	4.60
90	12.0	2.3	5.2	60.0	137.3	7.34	112.2	99.7	5.48
				70.0	133.3	7.73	106.9	108.6	5.05
				80.0	129.2	8.12	101.5	117.4	4.67
	18.0	5.0	11.6	60.0	143.7	7.51	118.0	101.6	5.60
				70.0	139.4	7.91	112.4	110.3	5.16
				80.0	135.1	8.31	106.8	119.1	4.77
	24.0	7.7	17.8	60.0	147.9	7.66	121.8	102.8	5.66
				70.0	143.5	8.06	116.0	111.5	5.22
				80.0	139.1	8.46	110.2	120.2	4.82

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V095 - Horizontal

Cooling Capacity Data (3200 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	12.0	2.2	5.1	75/63	103.5	77.1	6.15	124.5	16.8
				80/67	112.5	80.4	6.28	133.9	17.9
				85/71	121.5	83.6	6.41	143.3	19.0
	18.0	5.0	11.6	75/63	103.3	75.5	5.83	123.2	17.7
				80/67	112.3	78.6	5.95	132.6	18.9
				85/71	121.2	81.8	6.07	142.0	20.0
	24.0	8.6	19.9	75/63	100.5	74.9	5.65	119.7	17.8
				80/67	109.2	78.0	5.76	128.9	19.0
				85/71	117.9	81.1	5.88	138.0	20.1
60	12.0	2.2	5.0	75/63	98.1	74.6	6.52	120.4	15.0
				80/67	106.7	77.7	6.66	129.4	16.0
				85/71	115.2	80.8	6.79	138.4	17.0
	18.0	4.9	11.4	75/63	98.6	73.4	6.20	119.7	15.9
				80/67	107.1	76.4	6.33	128.7	16.9
				85/71	115.7	79.5	6.45	137.7	17.9
	24.0	8.4	19.4	75/63	96.7	73.4	6.02	117.2	16.1
				80/67	105.1	76.4	6.14	126.1	17.1
				85/71	113.5	79.5	6.26	134.9	18.1
70	12.0	2.4	5.4	75/63	92.9	72.1	6.89	116.5	13.5
				80/67	101.0	75.1	7.03	125.0	14.4
				85/71	109.1	78.1	7.17	133.6	15.2
	18.0	5.2	11.9	75/63	93.9	71.3	6.57	116.3	14.3
				80/67	102.1	74.2	6.70	124.9	15.2
				85/71	110.2	77.2	6.83	133.6	16.1
	24.0	8.2	18.9	75/63	92.9	71.9	6.39	114.8	14.5
				80/67	101.0	74.9	6.52	123.3	15.5
				85/71	109.1	77.9	6.65	131.8	16.4
80	12.0	2.3	5.4	75/63	87.8	69.7	7.25	112.6	12.1
				80/67	95.5	72.6	7.40	120.7	12.9
				85/71	103.1	75.5	7.55	128.9	13.7
	18.0	5.1	11.8	75/63	89.3	69.2	6.93	113.0	12.9
				80/67	97.1	72.1	7.07	121.2	13.7
				85/71	104.9	75.0	7.21	129.5	14.5
	24.0	7.9	18.2	75/63	89.2	70.3	6.76	112.3	13.2
				80/67	96.9	73.3	6.90	120.5	14.1
				85/71	104.7	76.2	7.04	128.7	14.9
85	12.0	2.3	5.4	75/63	85.3	68.4	7.43	110.7	11.5
				80/67	92.7	71.3	7.58	118.6	12.2
				85/71	100.2	74.1	7.74	126.6	12.9
	18.0	5.1	11.8	75/63	87.1	68.2	7.11	111.3	12.2
				80/67	94.6	71.0	7.26	119.4	13.0
				85/71	102.2	73.8	7.40	127.5	13.8
	24.0	7.8	18.0	75/63	87.3	69.6	6.95	111.0	12.6
				80/67	94.9	72.5	7.09	119.1	13.4
				85/71	102.5	75.4	7.23	127.2	14.2
90	12.0	2.3	5.3	75/63	82.8	67.2	7.61	108.8	10.9
				80/67	90.1	70.0	7.77	116.6	11.6
				85/71	97.3	72.8	7.92	124.3	12.3
	18.0	5.0	11.6	75/63	84.8	67.1	7.29	109.7	11.6
				80/67	92.2	69.9	7.44	117.6	12.4
				85/71	99.6	72.7	7.59	125.5	13.1
	24.0	7.7	17.7	75/63	85.4	68.8	7.13	109.8	12.0
				80/67	92.9	71.7	7.28	117.7	12.8
				85/71	100.3	74.6	7.42	125.6	13.5
100	12.0	2.2	5.1	75/63	76.1	61.8	8.14	103.9	9.3
				80/67	82.7	64.3	8.31	111.1	10.0
				85/71	89.3	66.9	8.48	118.2	10.5
	18.0	5.0	11.6	75/63	78.4	62.0	7.82	105.1	10.0
				80/67	85.2	64.6	7.98	112.5	10.7
				85/71	92.0	67.2	8.14	119.8	11.3
	24.0	7.5	17.3	75/63	79.7	64.1	7.67	105.9	10.4
				80/67	86.6	66.8	7.83	113.3	11.1
				85/71	93.6	69.4	7.99	120.8	11.7
110	12.0	2.2	5.1	75/63	69.5	56.4	8.67	99.1	8.0
				80/67	75.5	58.8	8.85	105.7	8.5
				85/71	81.6	61.1	9.02	112.4	9.0
	18.0	4.9	11.2	75/63	72.1	56.9	8.35	100.6	8.6
				80/67	78.4	59.3	8.52	107.4	9.2
				85/71	84.6	61.7	8.69	114.3	9.7
	24.0	7.4	17.1	75/63	73.9	59.4	8.21	102.0	9.0
				80/67	80.4	61.8	8.38	109.0	9.6
				85/71	86.8	64.3	8.55	116.0	10.2

Heating Capacity Data (3200 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	12.0	2.4	5.6	60.0	62.7	5.28	44.6	78.1	3.48
				70.0	60.3	5.56	41.3	87.4	3.18
				80.0	57.9	5.84	38.0	96.8	2.91
	18.0	5.5	12.8	60.0	64.9	5.36	46.6	78.8	3.55
				70.0	62.4	5.64	43.2	88.1	3.24
				80.0	59.9	5.92	39.7	97.3	2.96
	24.0	9.5	21.9	60.0	67.3	5.47	48.7	79.5	3.61
				70.0	64.7	5.75	45.1	88.7	3.30
				80.0	62.1	6.04	41.5	98.0	3.01
40	12.0	2.3	5.3	60.0	76.1	5.67	56.7	82.0	3.93
				70.0	73.1	5.97	52.7	91.2	3.59
				80.0	70.2	6.27	48.8	100.3	3.28
	18.0	5.3	12.2	60.0	78.7	5.76	59.0	82.8	4.00
				70.0	75.6	6.07	54.9	91.9	3.65
				80.0	72.5	6.37	50.8	101.0	3.34
	24.0	9.2	21.2	60.0	81.3	5.88	61.3	83.5	4.05
				70.0	78.4	6.19	57.2	92.7	3.71
				80.0	75.1	6.50	53.0	101.7	3.39
50	12.0	2.2	5.1	60.0	89.1	6.06	68.4	85.8	4.31
				70.0	85.7	6.38	64.0	94.8	3.94
				80.0	82.4	6.70	59.5	103.8	3.60
	18.0	5.0	11.6	60.0	92.4	6.17	71.4	86.7	4.39
				70.0	88.9	6.49	66.7	95.7	4.01
				80.0	85.3	6.82	62.0	104.7	3.67
	24.0	8.8	20.4	60.0	95.7	6.29	74.3	87.7	4.46
				70.0	92.0	6.62	69.4	96.6	4.07
				80.0	88.3	6.95	64.6	105.5	3.72
60	12.0	2.2	5.0	60.0	102.9	6.43	81.0	89.8	4.69
				70.0	99.2	6.77	76.0	98.7	4.29
				80.0	95.4	7.11	71.1	107.6	3.93
	18.0	4.9	11.4	60.0	107.0	6.55	84.6	91.0	4.78
				70.0	103.0	6.90	79.5	99.8	4.38
				80.0	99.0	7.24	74.3	108.7	4.01
	24.0	8.4	19.4	60.0	110.7	6.68	87.9	92.0	4.86
				70.0	106.5	7.03	82.5	100.8	4.44
				80.0	102.4	7.38	77.2	109.6	4.06
70	12.0	2.4	5.4	60.0	115.5	6.80	92.3	93.4	4.98
				70.0	111.5	7.16	87.0	102.3	4.56
				80.0	107.5	7.51	81.8	111.1	4.19
	18.0	5.2	11.9	60.0	121.5	6.94	97.8	95.2	5.13
				70.0	117.2	7.30	92.3	103.9	4.70
				80.0	112.9	7.67	86.8	112.7	4.32
	24.0	8.1	18.8	60.0	125.5	7.07	101.4	96.3	5.20
				70.0	121.1	7.44	95.7	105.0	4.77
				80.0	116.6	7.82	89.9	113.7	4.37
80	12.0	2.3	5.4	60.0	129.1	7.17	104.6	97.4	5.28
				70.0	124.9	7.54	99.2	106.2	4.85
				80.0	120.8	7.92	93.7	114.9	4.47
	18.0	5.1	11.8	60.0	134.8	7.33	109.8	99.0	5.39
				70.0	130.4	7.71	104.1	107.7	4.95
				80.0	126.0	8.10	98.4	116.5	4.56
	24.0	7.9	18.2	60.0	139.1	7.47	113.6	100.2	5.46
				70.0	134.5	7.86	107.7	108.9	5.01
				80.0	129.9	8.25	101.7	117.6	4.61
90	12.0	2.3	5.3	60.0	141.5	7.54	115.8	100.9	5.50
				70.0	137.3	7.93	110.2	109.7	5.07
				80.0	133.2	8.33	104.7	118.5	4.68
	18.0	5.0	11.6	60.0	148.0	7.72	121.7	102.8	5.62
				70.0	143.6	8.12	115.9	111.6	5.18
				80.0	139.2	8.53	110.1	120.3	4.78
	24.0	7.7	17.7	60.0	152.5	7.86	125.6	104.1	5.68
				70.0	147.9	8.28	119.6	112.8	5.24
				80.0	143.3	8.69	113.7	121.5	4.83

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V120 - Vertical

Cooling Capacity Data (4400 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	16.0	2.7	6.3	75/63	130.4	95.8	7.45	155.8	17.5
				80/67	141.7	99.8	7.61	167.7	18.6
				85/71	153.0	103.8	7.76	179.5	19.7
	22.0	5.1	11.8	75/63	127.9	92.6	7.14	152.3	17.9
				80/67	139.1	96.4	7.29	163.9	19.1
				85/71	150.2	100.3	7.43	175.6	20.2
	28.0	7.9	18.3	75/63	127.1	91.7	6.91	150.6	18.4
				80/67	138.1	95.5	7.05	162.2	19.6
				85/71	149.2	99.3	7.19	173.7	20.7
60	16.0	2.7	6.2	75/63	126.3	93.9	8.11	153.9	15.6
				80/67	137.2	97.8	8.28	165.5	16.6
				85/71	148.2	101.7	8.44	177.0	17.6
	22.0	5.0	11.7	75/63	124.7	91.7	7.78	151.3	16.0
				80/67	135.6	95.5	7.94	162.7	17.1
				85/71	146.4	99.3	8.09	174.1	18.1
	28.0	7.8	17.9	75/63	124.7	91.3	7.54	150.4	16.5
				80/67	135.6	95.1	7.69	161.8	17.6
				85/71	146.4	98.9	7.85	173.2	18.7
70	16.0	2.7	6.2	75/63	122.2	92.0	8.77	152.1	13.9
				80/67	132.8	95.8	8.95	163.4	14.8
				85/71	143.5	99.7	9.13	174.6	15.7
	22.0	4.9	11.3	75/63	121.6	90.8	8.41	150.3	14.5
				80/67	132.2	94.6	8.58	161.4	15.4
				85/71	142.7	98.4	8.75	172.6	16.3
	28.0	7.4	17.1	75/63	122.4	90.9	8.17	150.2	15.0
				80/67	133.0	94.7	8.33	161.5	16.0
				85/71	143.6	98.5	8.50	172.7	16.9
80	16.0	2.7	6.2	75/63	115.7	87.7	9.59	148.4	12.1
				80/67	125.8	91.3	9.79	159.2	12.8
				85/71	135.8	95.0	9.98	169.9	13.6
	22.0	4.8	11.1	75/63	115.9	87.5	9.20	147.3	12.6
				80/67	126.0	91.1	9.39	158.0	13.4
				85/71	136.1	94.7	9.58	168.7	14.2
	28.0	7.3	16.9	75/63	117.4	88.0	8.96	148.0	13.1
				80/67	127.7	91.7	9.14	158.9	14.0
				85/71	137.9	95.4	9.32	169.7	14.8
85	16.0	2.7	6.1	75/63	112.5	85.5	10.00	146.6	11.2
				80/67	122.3	89.1	10.21	157.1	12.0
				85/71	132.1	92.6	10.41	167.6	12.7
	22.0	4.8	11.0	75/63	113.1	85.8	9.60	145.8	11.8
				80/67	122.9	89.4	9.79	156.3	12.6
				85/71	132.8	93.0	9.99	166.8	13.3
	28.0	7.3	16.9	75/63	115.0	86.6	9.35	146.9	12.3
				80/67	125.0	90.2	9.5	157.6	13.1
				85/71	135.0	93.8	9.74	168.2	13.9
90	16.0	2.6	6.1	75/63	109.3	83.4	10.41	144.9	10.5
				80/67	118.8	86.9	10.63	155.1	11.2
				85/71	128.3	90.4	10.84	165.3	11.8
	22.0	4.7	10.9	75/63	110.3	84.2	9.99	144.4	11.0
				80/67	119.9	87.7	10.20	154.7	11.8
				85/71	129.5	91.2	10.40	165.0	12.4
	28.0	7.2	16.6	75/63	112.5	85.2	9.75	145.8	11.5
				80/67	122.3	88.7	9.95	156.3	12.3
				85/71	132.1	92.3	10.15	166.7	13.0
100	16.0	2.6	5.9	75/63	102.9	79.1	11.29	141.4	9.1
				80/67	111.8	82.4	11.53	151.2	9.7
				85/71	120.8	85.7	11.76	160.9	10.3
	22.0	4.7	10.7	75/63	104.6	80.7	10.84	141.6	9.6
				80/67	113.6	84.0	11.07	151.4	10.3
				85/71	122.7	87.4	11.29	161.3	10.9
	28.0	7.1	16.4	75/63	107.4	82.1	10.60	143.6	10.1
				80/67	116.7	85.6	10.82	153.7	10.8
				85/71	126.1	89.0	11.04	163.7	11.4
110	16.0	2.5	5.9	75/63	96.6	74.8	12.17	138.1	7.9
				80/67	105.0	78.0	12.42	147.4	8.5
				85/71	113.4	81.1	12.67	156.6	9.0
	22.0	4.6	10.6	75/63	98.9	77.3	11.69	138.8	8.5
				80/67	107.5	80.5	11.93	148.2	9.0
				85/71	116.1	83.7	12.17	157.6	9.5
	28.0	7.0	16.1	75/63	102.3	79.1	11.46	141.4	8.9
				80/67	111.2	82.4	11.69	151.1	9.5
				85/71	120.1	85.7	11.92	160.8	10.1

Heating Capacity Data (4400 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	16.0	3.0	6.9	60.0	97.7	8.16	69.8	82.6	3.51
				70.0	94.0	8.59	64.7	91.8	3.21
				80.0	90.3	9.02	59.5	100.9	2.93
	22.0	5.6	13.0	60.0	100.1	8.27	71.8	83.2	3.55
				70.0	96.2	8.70	66.5	92.3	3.24
				80.0	92.4	9.14	61.2	101.4	2.96
	28.0	8.7	20.1	60.0	103.3	8.27	75.0	83.9	3.66
				70.0	99.2	8.71	69.5	93.0	3.34
				80.0	95.1	9.15	63.9	102.0	3.05
40	16.0	2.9	6.6	60.0	116.1	8.55	86.9	86.9	3.98
				70.0	111.6	9.00	80.9	95.8	3.63
				80.0	107.1	9.45	74.8	104.8	3.32
	22.0	5.4	12.4	60.0	119.2	8.67	89.6	87.6	4.03
				70.0	114.5	9.12	83.4	96.5	3.68
				80.0	109.8	9.58	77.1	105.4	3.36
	28.0	8.3	19.2	60.0	122.7	8.70	93.0	88.4	4.13
				70.0	118.2	9.16	86.9	97.4	3.78
				80.0	113.2	9.61	80.4	106.2	3.45
50	16.0	2.7	6.3	60.0	134.4	8.94	103.9	91.1	4.40
				70.0	129.2	9.41	97.1	99.9	4.02
				80.0	124.0	9.88	90.3	108.7	3.68
	22.0	5.1	11.8	60.0	138.2	9.06	107.2	92.0	4.47
				70.0	132.8	9.54	100.2	100.7	4.08
				80.0	127.4	10.02	93.2	109.5	3.73
	28.0	7.9	18.3	60.0	142.8	9.12	111.7	93.1	4.59
				70.0	137.1	9.60	104.3	101.7	4.18
				80.0	131.5	10.08	97.0	110.4	3.82
60	16.0	2.7	6.2	60.0	148.2	9.43	116.0	94.3	4.60
				70.0	142.8	9.93	108.9	103.1	4.21
				80.0	137.4	10.43	101.9	111.8	3.86
	22.0	5.0	11.7	60.0	152.6	9.57	119.9	95.3	4.67
				70.0	147.0	10.07	112.6	104.0	4.28
				80.0	141.4	10.58	105.3	112.7	3.92
	28.0	7.8	17.9	60.0	157.6	9.66	124.7	96.5	4.78
				70.0	151.8	10.17	117.1	105.1	4.37
				80.0	145.9	10.68	109.5	113.8	4.00
70	16.0	2.7	6.2	60.0	162.1	9.92	128.3	97.5	4.79
				70.0	156.7	10.45	121.0	106.3	4.39
				80.0	151.2	10.97	113.7	115.0	4.04
	22.0	4.9	11.3	60.0	166.9	10.07	132.5	98.6	4.86
				70.0	161.2	10.60	125.0	107.3	4.46
				80.0	155.5	11.13	117.5	116.0	4.09
	28.0	7.6	17.6	60.0	172.4	10.19	137.6	99.9	4.95
				70.0	166.4	10.73	129.8	108.5	4.54
				80.0	160.5	11.27	122.0	117.1	4.17
80	16.0	2.7	6.2	60.0	178.9	10.35	143.6	101.4	5.07
				70.0	173.3	10.89	136.2	110.1	4.66
				80.0	167.7	11.43	128.7	118.8	4.30
	22.0	4.8	11.1	60.0	184.8	10.50	148.9	102.8	5.15
				70.0	178.9	11.06	141.2	111.4	4.74
				80.0	173.0	11.61	133.4	120.1	4.37
	28.0	7.3	16.9	60.0	190.8	10.66	154.4	104.2	5.24
				70.0	184.6	11.22	146.3	112.7	4.82
				80.0	178.5	11.78	138.3	121.3	4.44
90	16.0	2.6	6.1	60.0	195.8	10.76	159.1	105.3	5.33
				70.0	190.2	11.33	151.5	114.0	4.92
				80.0	184.6	11.90	144.0	122.7	4.55
	22.0	4.7	10.9	60.0	202.5	10.94	165.2	106.9	5.43
				70.0	196.6	11.51	157.3	115.5	5.00
				80.0	190.7	12.09	149.5	124.1	4.62
	28.0	7.2	16.6	60.0	209.0	11.13	171.0	108.4	5.50
				70.0	202.8	11.72	162.9	117.0	5.07
				80.0	196.7	12.30	154.7	125.5	4.69

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V120 - Horizontal

Cooling Capacity Data (4400 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	16.0	2.7	6.3	75/63	127.8	95.1	7.71	154.1	16.6
				80/67	139.0	99.0	7.86	165.8	17.7
				85/71	150.1	103.0	8.02	177.4	18.7
	22.0	5.1	11.8	75/63	125.5	91.9	7.39	150.7	17.0
				80/67	136.4	95.7	7.54	162.1	18.1
				85/71	147.3	99.6	7.69	173.5	19.2
	28.0	7.9	18.3	75/63	124.6	91.0	7.14	149.0	17.4
				80/67	135.4	94.8	7.29	160.3	18.6
				85/71	146.3	98.6	7.43	171.6	19.7
60	16.0	2.7	6.2	75/63	123.8	93.2	8.39	152.5	14.8
				80/67	134.6	97.1	8.56	163.8	15.7
				85/71	145.3	101.0	8.73	175.2	16.6
	22.0	5.0	11.7	75/63	122.3	91.0	8.04	149.8	15.2
				80/67	133.0	94.8	8.21	161.0	16.2
				85/71	143.6	98.6	8.37	172.2	17.2
	28.0	7.8	17.9	75/63	122.3	90.6	7.80	148.9	15.7
				80/67	132.9	94.4	7.96	160.1	16.7
				85/71	143.6	98.2	8.11	171.3	17.7
70	16.0	2.7	6.2	75/63	119.9	91.3	9.07	150.8	13.2
				80/67	130.3	95.1	9.26	161.9	14.1
				85/71	140.7	98.9	9.44	172.9	14.9
	22.0	4.9	11.3	75/63	119.2	90.1	8.70	148.9	13.7
				80/67	129.6	93.9	8.88	159.9	14.6
				85/71	140.0	97.7	9.06	170.9	15.5
	28.0	7.4	17.1	75/63	120.0	90.2	8.45	148.8	14.2
				80/67	130.4	94.0	8.62	159.9	15.1
				85/71	140.9	97.8	8.80	170.9	16.0
80	16.0	2.7	6.2	75/63	113.5	87.0	9.92	147.3	11.4
				80/67	123.3	90.7	10.13	157.9	12.2
				85/71	133.2	94.3	10.33	168.5	12.9
	22.0	4.8	11.1	75/63	113.7	86.8	9.52	146.2	11.9
				80/67	123.5	90.5	9.72	156.7	12.7
				85/71	133.4	94.1	9.91	167.3	13.5
	28.0	7.3	16.9	75/63	115.2	87.4	9.27	146.8	12.4
				80/67	125.2	91.1	9.46	157.5	13.2
				85/71	135.2	94.7	9.65	168.1	14.0
85	16.0	2.7	6.1	75/63	110.3	84.9	10.35	145.6	10.7
				80/67	119.9	88.5	10.56	156.0	11.4
				85/71	129.5	92.0	10.77	166.3	12.0
	22.0	4.8	11.0	75/63	110.9	85.2	9.93	144.8	11.2
				80/67	120.5	88.7	10.13	155.1	11.9
				85/71	130.2	92.3	10.34	165.5	12.6
	28.0	7.3	16.9	75/63	112.8	86.0	9.68	145.8	11.7
				80/67	122.6	89.6	9.9	156.3	12.4
				85/71	132.4	93.2	10.07	166.7	13.1
90	16.0	2.6	6.1	75/63	107.2	82.8	10.77	144.0	10.0
				80/67	116.5	86.3	10.99	154.1	10.6
				85/71	125.9	89.7	11.21	164.1	11.2
	22.0	4.7	10.9	75/63	108.2	83.6	10.34	143.4	10.5
				80/67	117.6	87.0	10.55	153.6	11.1
				85/71	127.0	90.5	10.76	163.7	11.8
	28.0	7.2	16.6	75/63	110.3	84.6	10.09	144.8	10.9
				80/67	119.9	88.1	10.29	155.1	11.7
				85/71	129.5	91.6	10.50	165.4	12.3
100	16.0	2.6	5.9	75/63	100.9	78.5	11.68	140.8	8.6
				80/67	109.7	81.8	11.92	150.4	9.2
				85/71	118.5	85.1	12.16	160.0	9.7
	22.0	4.7	10.7	75/63	102.5	80.1	11.22	140.8	9.1
				80/67	111.5	83.4	11.45	150.5	9.7
				85/71	120.4	86.8	11.68	160.2	10.3
	28.0	7.1	16.4	75/63	105.3	81.6	10.97	142.8	9.6
				80/67	114.5	85.0	11.19	152.7	10.2
				85/71	123.6	88.4	11.42	162.6	10.8
110	16.0	2.5	5.9	75/63	94.7	74.3	12.59	137.7	7.5
				80/67	103.0	77.4	12.85	146.8	8.0
				85/71	111.2	80.5	13.11	155.9	8.5
	22.0	4.6	10.6	75/63	97.0	76.7	12.09	138.3	8.0
				80/67	105.4	79.9	12.34	147.5	8.5
				85/71	113.8	83.1	12.59	156.8	9.0
	28.0	7.0	16.1	75/63	100.3	78.5	11.85	140.8	8.5
				80/67	109.0	81.8	12.09	150.3	9.0
				85/71	117.8	85.1	12.33	159.9	9.5

Heating Capacity Data (4400 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	16.0	3.0	6.9	60.0	90.9	8.40	62.3	79.1	3.17
				70.0	87.8	8.85	57.6	88.5	2.91
				80.0	84.7	9.29	53.0	97.8	2.67
	22.0	5.6	13.0	60.0	93.1	8.51	64.0	79.6	3.20
				70.0	89.9	8.96	59.3	88.9	2.94
				80.0	86.7	9.41	54.5	98.2	2.70
	28.0	8.7	20.1	60.0	95.9	8.52	66.9	80.2	3.30
				70.0	92.5	8.97	61.9	89.5	3.02
				80.0	89.1	9.42	56.9	98.7	2.77
40	16.0	2.9	6.6	60.0	107.5	8.81	77.5	82.6	3.58
				70.0	103.7	9.27	72.1	91.8	3.28
				80.0	99.9	9.74	66.7	101.0	3.01
	22.0	5.4	12.4	60.0	110.3	8.93	79.9	83.2	3.62
				70.0	106.4	9.40	74.3	92.4	3.32
				80.0	102.4	9.87	68.7	101.5	3.04
	28.0	8.3	19.2	60.0	113.5	8.96	82.9	83.9	3.71
				70.0	109.6	9.43	77.5	93.1	3.41
				80.0	105.4	9.90	71.6	102.2	3.12
50	16.0	2.7	6.3	60.0	124.0	9.21	92.6	86.1	3.95
				70.0	119.6	9.69	86.5	95.2	3.62
				80.0	115.2	10.18	80.5	104.2	3.32
	22.0	5.1	11.8	60.0	127.5	9.34	95.6	86.8	4.00
				70.0	122.9	9.83	89.3	95.9	3.66
				80.0	118.3	10.32	83.1	104.9	3.36
	28.0	7.9	18.3	60.0	131.6	9.40	99.5	87.7	4.10
				70.0	126.8	9.89	93.0	96.7	3.76
				80.0	122.0	10.39	86.5	105.7	3.44
60	16.0	2.7	6.2	60.0	141.7	9.66	108.7	89.8	4.30
				70.0	136.8	10.16	102.1	98.8	3.94
				80.0	131.9	10.67	95.5	107.8	3.62
	22.0	5.0	11.7	60.0	145.8	9.79	112.4	90.7	4.36
				70.0	140.7	10.31	105.6	99.6	4.00
				80.0	135.6	10.83	98.7	108.5	3.67
	28.0	7.8	17.9	60.0	150.6	9.89	116.9	91.7	4.46
				70.0	145.2	10.41	109.7	100.6	4.09
				80.0	139.9	10.93	102.6	109.4	3.75
70	16.0	2.7	6.2	60.0	159.4	10.10	125.0	93.5	4.63
				70.0	154.2	10.63	117.9	102.4	4.25
				80.0	148.9	11.16	110.8	111.3	3.91
	22.0	4.9	11.3	60.0	164.1	10.25	129.1	94.5	4.69
				70.0	158.6	10.79	121.8	103.4	4.31
				80.0	153.2	11.33	114.5	112.2	3.96
	28.0	7.5	17.3	60.0	169.4	10.37	134.0	95.7	4.79
				70.0	163.7	10.92	126.5	104.5	4.39
				80.0	158.0	11.47	118.9	113.2	4.04
80	16.0	2.7	6.2	60.0	175.9	10.53	140.0	97.0	4.90
				70.0	170.5	11.08	132.7	105.9	4.51
				80.0	165.1	11.63	125.4	114.7	4.16
	22.0	4.8	11.1	60.0	181.6	10.69	145.1	98.2	4.98
				70.0	175.9	11.25	137.5	107.0	4.58
				80.0	170.3	11.81	130.0	115.8	4.22
	28.0	7.3	16.9	60.0	187.4	10.85	150.4	99.4	5.06
				70.0	181.6	11.42	142.6	108.2	4.66
				80.0	175.7	11.99	134.7	117.0	4.29
90	16.0	2.6	6.1	60.0	192.4	10.95	155.1	100.5	5.15
				70.0	187.0	11.53	147.7	109.4	4.75
				80.0	181.6	12.10	140.3	118.2	4.40
	22.0	4.7	10.9	60.0	199.0	11.12	161.0	101.9	5.24
				70.0	193.3	11.71	153.3	110.7	4.84
				80.0	187.6	12.30	145.7	119.5	4.47
	28.0	7.2	16.6	60.0	205.3	11.32	166.7	103.2	5.31
				70.0	199.4	11.92	158.7	112.0	4.90
				80.0	193.5	12.51	150.8	120.7	4.53

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V180 - Vertical

Cooling Capacity Data (6000 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	20.0	1.7	3.9	75/63	179.3	139.7	9.73	212.5	18.4
				80/67	194.9	145.5	9.93	228.8	19.6
				85/71	210.5	151.3	10.13	245.1	20.8
	32.0	4.2	9.6	75/63	176.0	135.0	9.32	207.8	18.9
				80/67	191.3	140.6	9.51	223.8	20.1
				85/71	206.6	146.2	9.70	239.7	21.3
	44.0	7.8	18.1	75/63	174.8	133.6	9.02	205.6	19.4
				80/67	190.0	139.2	9.20	221.4	20.7
				85/71	205.2	144.8	9.38	237.2	21.9
60	20.0	1.6	3.7	75/63	175.4	136.7	10.39	210.9	16.9
				80/67	190.7	142.4	10.60	226.9	18.0
				85/71	205.9	148.1	10.81	242.8	19.0
	32.0	4.1	9.4	75/63	173.3	133.5	9.96	207.3	17.4
				80/67	188.4	139.1	10.16	223.1	18.5
				85/71	203.5	144.7	10.37	238.9	19.6
	44.0	7.6	17.6	75/63	173.3	133.0	9.65	206.2	18.0
				80/67	188.3	138.5	9.85	222.0	19.1
				85/71	203.4	144.0	10.05	237.7	20.2
70	20.0	1.5	3.5	75/63	171.6	133.9	11.05	209.3	15.5
				80/67	186.5	139.4	11.27	225.0	16.5
				85/71	201.4	145.0	11.50	240.6	17.5
	32.0	3.9	9.1	75/63	170.7	132.1	10.59	206.8	16.1
				80/67	185.5	137.6	10.81	222.4	17.2
				85/71	200.4	143.1	11.03	238.0	18.2
	44.0	7.4	17.1	75/63	171.8	132.3	10.29	206.9	16.7
				80/67	186.7	137.8	10.50	222.5	17.8
				85/71	201.6	143.3	10.71	238.2	18.8
80	20.0	1.5	3.5	75/63	165.5	131.8	12.26	207.3	13.5
				80/67	179.9	137.3	12.51	222.6	14.4
				85/71	194.3	142.7	12.76	237.8	15.2
	32.0	3.7	8.5	75/63	165.8	131.5	11.76	205.9	14.1
				80/67	180.2	137.0	12.00	221.1	15.0
				85/71	194.6	142.4	12.24	236.4	15.9
	44.0	7.2	16.6	75/63	168.0	132.4	11.45	207.0	14.7
				80/67	182.6	137.9	11.68	222.5	15.6
				85/71	197.2	143.4	11.91	237.9	16.6
85	20.0	1.5	3.5	75/63	162.5	130.7	12.86	206.4	12.6
				80/67	176.6	136.2	13.12	221.4	13.5
				85/71	190.8	141.6	13.38	236.4	14.3
	32.0	3.6	8.3	75/63	163.4	131.1	12.34	205.5	13.2
				80/67	177.6	136.6	12.59	220.5	14.1
				85/71	191.8	142.1	12.84	235.6	14.9
	44.0	7.1	16.4	75/63	166.1	132.4	12.02	207.1	13.8
				80/67	180.5	137.9	12.3	222.4	14.7
				85/71	195.0	143.4	12.52	237.7	15.6
90	20.0	1.5	3.3	75/63	159.5	129.7	13.46	205.5	11.9
				80/67	173.4	135.1	13.73	220.3	12.6
				85/71	187.3	140.5	14.01	235.1	13.4
	32.0	3.6	8.3	75/63	160.9	130.8	12.92	205.0	12.5
				80/67	174.9	136.3	13.18	219.9	13.3
				85/71	188.9	141.7	13.45	234.8	14.1
	44.0	7.1	16.4	75/63	164.2	132.4	12.60	207.2	13.0
				80/67	178.5	138.0	12.86	222.4	13.9
				85/71	192.8	143.5	13.12	237.5	14.7
100	20.0	1.3	3.1	75/63	151.0	122.8	14.38	200.0	10.5
				80/67	164.1	127.9	14.67	214.2	11.2
				85/71	177.2	133.1	14.96	228.3	11.8
	32.0	3.5	8.1	75/63	153.4	125.3	13.80	200.5	11.1
				80/67	166.8	130.6	14.08	214.8	11.8
				85/71	180.1	135.8	14.37	229.1	12.5
	44.0	6.0	13.9	75/63	157.6	127.6	13.49	203.7	11.7
				80/67	171.3	132.9	13.77	218.3	12.4
				85/71	185.0	138.2	14.05	233.0	13.2
110	20.0	1.2	2.9	75/63	142.6	116.1	15.29	194.8	9.3
				80/67	155.0	121.0	15.60	208.2	9.9
				85/71	167.4	125.8	15.91	221.7	10.5
	32.0	3.4	7.9	75/63	146.0	119.9	14.68	196.1	9.9
				80/67	158.7	124.9	14.98	209.8	10.6
				85/71	171.4	129.9	15.28	223.5	11.2
	44.0	6.4	14.8	75/63	151.0	122.8	14.39	200.1	10.5
				80/67	164.1	127.9	14.68	214.2	11.2
				85/71	177.3	133.0	14.97	228.4	11.8

Heating Capacity Data (6000 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	20.0	1.8	4.1	60.0	121.2	9.18	89.9	78.7	3.87
				70.0	116.2	9.67	83.2	87.9	3.52
				80.0	111.2	10.15	76.6	97.2	3.21
	32.0	4.4	10.1	60.0	124.2	9.30	92.4	79.2	3.91
				70.0	119.0	9.79	85.6	88.4	3.56
				80.0	113.8	10.28	78.7	97.6	3.24
	44.0	8.2	19.0	60.0	128.3	9.31	96.5	79.8	4.04
				70.0	122.8	9.80	89.4	89.0	3.67
				80.0	117.3	10.29	82.2	98.1	3.34
40	20.0	1.7	3.9	60.0	142.9	9.57	110.2	82.0	4.37
				70.0	136.9	10.08	102.5	91.1	3.98
				80.0	130.9	10.58	94.8	100.2	3.63
	32.0	4.3	9.9	60.0	146.7	9.70	113.6	82.6	4.43
				70.0	140.5	10.21	105.7	91.7	4.03
				80.0	134.3	10.72	97.7	100.7	3.67
	44.0	8.0	18.5	60.0	151.1	9.74	117.9	83.3	4.55
				70.0	145.2	10.25	110.2	92.4	4.15
				80.0	138.6	10.76	101.9	101.4	3.77
50	20.0	1.7	3.9	60.0	164.4	9.96	130.4	85.4	4.84
				70.0	157.6	10.49	121.9	94.3	4.41
				80.0	150.9	11.01	113.3	103.3	4.02
	32.0	4.2	9.6	60.0	169.1	10.10	134.6	86.1	4.91
				70.0	162.1	10.63	125.8	95.0	4.47
				80.0	155.1	11.16	117.0	103.9	4.07
	44.0	7.8	18.1	60.0	174.8	10.17	140.1	87.0	5.04
				70.0	167.5	10.70	131.0	95.8	4.59
				80.0	160.2	11.24	121.8	104.7	4.18
60	20.0	1.6	3.7	60.0	193.6	10.79	156.8	89.9	5.26
				70.0	186.0	11.36	147.2	98.7	4.80
				80.0	178.3	11.93	137.6	107.5	4.38
	32.0	4.1	9.4	60.0	199.4	10.95	162.1	90.8	5.34
				70.0	191.5	11.52	152.2	99.6	4.87
				80.0	183.6	12.10	142.3	108.3	4.45
	44.0	7.6	17.6	60.0	206.2	11.05	168.5	91.8	5.47
				70.0	197.9	11.63	158.2	100.5	4.99
				80.0	189.6	12.21	147.9	109.3	4.55
70	20.0	1.5	3.5	60.0	222.9	11.62	183.2	94.4	5.62
				70.0	214.6	12.23	172.9	103.1	5.14
				80.0	206.3	12.84	162.5	111.8	4.71
	32.0	3.9	9.1	60.0	229.6	11.79	189.4	95.4	5.71
				70.0	221.0	12.41	178.6	104.1	5.22
				80.0	212.4	13.03	167.9	112.8	4.78
	44.0	7.4	17.1	60.0	237.3	11.93	196.6	96.6	5.83
				70.0	228.3	12.56	185.4	105.2	5.33
				80.0	219.3	13.19	174.3	113.8	4.87
80	20.0	1.5	3.4	60.0	245.4	11.92	204.7	97.9	6.03
				70.0	236.9	12.55	194.1	106.6	5.53
				80.0	228.3	13.17	183.4	115.2	5.08
	32.0	3.7	8.5	60.0	253.6	12.10	212.3	99.1	6.14
				70.0	244.7	12.74	201.2	107.8	5.63
				80.0	235.8	13.38	190.1	116.4	5.16
	44.0	7.2	16.6	60.0	262.0	12.28	220.0	100.4	6.25
				70.0	252.7	12.93	208.6	109.0	5.73
				80.0	243.4	13.58	197.1	117.6	5.25
90	20.0	1.5	3.3	60.0	268.0	12.22	226.3	101.4	6.43
				70.0	259.5	12.86	215.6	110.0	5.91
				80.0	250.9	13.51	204.8	118.7	5.44
	32.0	3.6	8.3	60.0	277.4	12.41	235.0	102.8	6.55
				70.0	268.4	13.07	223.8	111.4	6.02
				80.0	259.4	13.72	212.6	120.0	5.54
	44.0	7.1	16.4	60.0	286.4	12.64	243.3	104.2	6.64
				70.0	277.1	13.30	231.7	112.8	6.10
				80.0	267.7	13.97	220.1	121.3	5.62

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V240 - Vertical

Cooling Capacity Data (8000 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	32.0	2.6	6.1	75/63	234.4	182.2	14.61	284.3	16.0
				80/67	254.8	189.7	14.91	305.7	17.1
				85/71	275.2	197.3	15.21	327.1	18.1
	44.0	4.8	11.1	75/63	230.1	176.1	14.00	277.9	16.4
				80/67	250.1	183.4	14.29	298.8	17.5
				85/71	270.1	190.7	14.58	319.8	18.5
	56.0	7.9	18.3	75/63	228.5	174.3	13.54	274.7	16.9
				80/67	248.3	181.6	13.82	295.5	18.0
				85/71	268.2	188.8	14.10	316.3	19.0
60	32.0	2.6	6.0	75/63	237.0	181.1	15.68	290.5	15.1
				80/67	257.6	188.6	16.00	312.2	16.1
				85/71	278.2	196.2	16.32	333.9	17.0
	44.0	4.8	11.0	75/63	234.1	176.9	15.04	285.5	15.6
				80/67	254.5	184.2	15.34	306.9	16.6
				85/71	274.9	191.6	15.65	328.3	17.6
	56.0	7.6	17.6	75/63	234.1	176.1	14.57	283.8	16.1
				80/67	254.4	183.4	14.87	305.2	17.1
				85/71	274.8	190.7	15.17	326.5	18.1
70	32.0	2.5	5.9	75/63	239.4	180.0	16.75	296.6	14.3
				80/67	260.2	187.5	17.09	318.5	15.2
				85/71	281.0	195.0	17.43	340.5	16.1
	44.0	4.6	10.7	75/63	238.2	177.6	16.06	293.0	14.8
				80/67	258.9	185.0	16.39	314.8	15.8
				85/71	279.6	192.4	16.72	336.6	16.7
	56.0	7.4	17.1	75/63	239.7	177.8	15.60	292.9	15.4
				80/67	260.5	185.2	15.92	314.9	16.4
				85/71	281.4	192.6	16.24	336.8	17.3
80	32.0	2.5	5.8	75/63	228.0	174.8	17.98	289.3	12.7
				80/67	247.8	182.1	18.34	310.4	13.5
				85/71	267.6	189.4	18.71	331.4	14.3
	44.0	4.6	10.5	75/63	228.3	174.4	17.24	287.2	13.2
				80/67	248.2	181.7	17.60	308.3	14.1
				85/71	268.1	189.0	17.95	329.3	14.9
	56.0	7.3	16.9	75/63	231.4	175.6	16.79	288.7	13.8
				80/67	251.5	182.9	17.13	310.0	14.7
				85/71	271.6	190.2	17.47	331.3	15.5
85	32.0	2.5	5.7	75/63	222.3	172.3	18.59	285.7	12.0
				80/67	241.6	179.4	18.97	306.4	12.7
				85/71	261.0	186.6	19.34	327.0	13.5
	44.0	4.5	10.4	75/63	223.5	172.8	17.83	284.4	12.5
				80/67	242.9	180.0	18.20	305.0	13.3
				85/71	262.4	187.2	18.56	325.7	14.1
	56.0	7.2	16.6	75/63	227.2	174.5	17.38	286.5	13.1
				80/67	247.0	181.7	17.7	307.5	13.9
				85/71	266.7	189.0	18.09	328.5	14.7
90	32.0	2.5	5.7	75/63	216.7	169.7	19.20	282.2	11.3
				80/67	235.6	176.8	19.59	302.4	12.0
				85/71	254.4	183.9	19.98	322.6	12.7
	44.0	4.5	10.4	75/63	218.7	171.2	18.42	281.5	11.9
				80/67	237.7	178.4	18.80	301.8	12.6
				85/71	256.7	185.5	19.17	322.1	13.4
	56.0	7.1	16.4	75/63	223.1	173.3	17.97	284.4	12.4
				80/67	242.5	180.6	18.34	305.1	13.2
				85/71	261.9	187.8	18.71	325.7	14.0
100	32.0	2.4	5.5	75/63	206.8	163.5	20.67	277.4	10.0
				80/67	224.8	170.3	21.09	296.8	10.7
				85/71	242.8	177.1	21.51	316.2	11.3
	44.0	4.4	10.1	75/63	210.2	166.8	19.85	277.9	10.6
				80/67	228.4	173.7	20.25	297.5	11.3
				85/71	246.7	180.7	20.66	317.2	11.9
	56.0	6.9	15.9	75/63	215.9	169.8	19.40	282.1	11.1
				80/67	234.6	176.9	19.80	302.2	11.9
				85/71	253.4	184.0	20.20	322.3	12.5
110	32.0	2.3	5.4	75/63	197.1	157.3	22.14	272.6	8.9
				80/67	214.2	163.9	22.59	291.3	9.5
				85/71	231.4	170.4	23.04	310.0	10.0
	44.0	4.3	9.9	75/63	201.8	162.4	21.26	274.3	9.5
				80/67	219.3	169.1	21.70	293.3	10.1
				85/71	236.8	175.9	22.13	312.4	10.7
	56.0	6.7	15.5	75/63	208.7	166.3	20.83	279.8	10.0
				80/67	226.8	173.2	21.26	299.4	10.7
				85/71	245.0	180.1	21.69	319.0	11.3

Heating Capacity Data (8000 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	32.0	2.9	6.7	60.0	185.8	14.99	134.6	81.5	3.63
				70.0	178.5	15.78	124.6	90.7	3.31
				80.0	171.2	16.57	114.7	99.8	3.03
	44.0	5.3	12.3	60.0	190.3	15.18	138.4	82.0	3.67
				70.0	182.7	15.98	128.2	91.2	3.35
				80.0	175.2	16.78	117.9	100.3	3.06
	56.0	8.7	20.0	60.0	196.4	15.20	144.5	82.7	3.79
				70.0	188.4	16.00	133.8	91.8	3.45
				80.0	180.5	16.80	123.1	100.9	3.15
40	32.0	2.8	6.4	60.0	215.0	15.55	162.0	84.9	4.05
				70.0	206.5	16.37	150.7	93.9	3.70
				80.0	198.0	17.19	139.4	102.9	3.38
	44.0	5.1	11.7	60.0	220.8	15.76	167.0	85.6	4.10
				70.0	211.9	16.59	155.3	94.5	3.74
				80.0	203.1	17.42	143.7	103.5	3.42
	56.0	8.3	19.2	60.0	227.3	15.82	173.3	86.3	4.21
				70.0	218.8	16.65	161.9	95.3	3.85
				80.0	209.5	17.48	149.8	104.2	3.51
50	32.0	2.6	6.1	60.0	244.2	16.10	189.2	88.3	4.44
				70.0	234.7	16.95	176.8	97.2	4.06
				80.0	225.2	17.80	164.5	106.1	3.71
	44.0	4.8	11.1	60.0	251.1	16.33	195.3	89.1	4.51
				70.0	241.2	17.19	182.5	97.9	4.11
				80.0	231.4	18.05	169.8	106.8	3.76
	56.0	7.9	18.3	60.0	259.4	16.44	203.4	90.0	4.63
				70.0	249.1	17.30	190.0	98.8	4.22
				80.0	238.7	18.17	176.7	107.6	3.85
60	32.0	2.6	6.0	60.0	276.1	16.49	219.8	92.0	4.91
				70.0	265.6	17.36	206.4	100.7	4.48
				80.0	255.2	18.22	193.0	109.5	4.10
	44.0	4.8	11.0	60.0	284.3	16.73	227.2	92.9	4.98
				70.0	273.5	17.61	213.4	101.7	4.55
				80.0	262.6	18.49	199.5	110.4	4.16
	56.0	7.6	17.6	60.0	293.8	16.88	236.2	94.0	5.10
				70.0	282.5	17.77	221.8	102.7	4.66
				80.0	271.1	18.66	207.4	111.4	4.26
70	32.0	2.5	5.9	60.0	308.1	16.87	250.6	95.7	5.35
				70.0	297.0	17.76	236.4	104.4	4.90
				80.0	285.8	18.64	222.2	113.1	4.49
	44.0	4.6	10.7	60.0	317.4	17.12	258.9	96.7	5.43
				70.0	305.8	18.02	244.3	105.4	4.97
				80.0	294.2	18.92	229.6	114.1	4.56
	56.0	7.4	17.1	60.0	327.9	17.33	268.8	98.0	5.54
				70.0	315.8	18.24	253.6	106.6	5.07
				80.0	303.7	19.15	238.4	115.2	4.65
80	32.0	2.5	5.8	60.0	334.5	17.55	274.6	98.7	5.58
				70.0	323.4	18.47	260.3	107.4	5.13
				80.0	312.2	19.40	246.0	116.1	4.72
	44.0	4.6	10.5	60.0	345.6	17.82	284.7	100.0	5.68
				70.0	333.9	18.76	269.9	108.6	5.22
				80.0	322.3	19.70	255.0	117.3	4.79
	56.0	7.3	16.9	60.0	356.9	18.09	295.2	101.3	5.78
				70.0	344.8	19.04	279.8	109.9	5.31
				80.0	332.6	19.99	264.4	118.5	4.87
90	32.0	2.5	5.7	60.0	361.1	18.23	298.9	101.8	5.81
				70.0	350.2	19.19	284.7	110.5	5.35
				80.0	339.2	20.15	270.5	119.3	4.93
	44.0	4.5	10.4	60.0	373.6	18.52	310.4	103.2	5.91
				70.0	362.1	19.49	295.6	111.9	5.44
				80.0	350.7	20.47	280.8	120.6	5.02
	56.0	7.2	16.5	60.0	385.6	18.85	321.3	104.6	5.99
				70.0	373.7	19.84	306.0	113.3	5.52
				80.0	361.8	20.83	290.7	121.9	5.09

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

V275 - Vertical

Cooling Capacity Data (10,000 CFM)

EWT	GPM	WPD		COOLING					
		PSI	FT	EA	TC	SC	KW	HR	EER
50	34.0	2.8	6.5	75/63	256.8	212.1	18.74	320.8	13.7
				80/67	279.2	220.9	19.12	344.4	14.6
				85/71	301.5	229.8	19.50	368.0	15.5
	52.0	7.4	17.2	75/63	252.1	205.0	17.96	313.3	14.0
				80/67	274.0	213.5	18.32	336.5	15.0
				85/71	295.9	222.1	18.69	359.7	15.8
	70.0	10.9	25.2	75/63	250.3	203.0	17.37	309.6	14.4
				80/67	272.1	211.4	17.72	332.6	15.4
				85/71	293.8	219.9	18.07	355.5	16.3
60	34.0	2.8	6.4	75/63	258.7	207.0	19.88	326.6	13.0
				80/67	281.2	215.6	20.29	350.5	13.9
				85/71	303.7	224.2	20.69	374.4	14.7
	52.0	7.4	17.0	75/63	255.7	202.1	19.06	320.7	13.4
				80/67	277.9	210.6	19.45	344.3	14.3
				85/71	300.1	219.0	19.84	367.8	15.1
	70.0	10.7	24.7	75/63	255.6	201.3	18.47	318.6	13.8
				80/67	277.8	209.6	18.85	342.1	14.7
				85/71	300.0	218.0	19.23	365.6	15.6
70	34.0	2.7	6.3	75/63	260.5	202.0	21.02	332.3	12.4
				80/67	283.2	210.4	21.45	356.4	13.2
				85/71	305.8	218.8	21.88	380.5	14.0
	52.0	7.1	16.5	75/63	259.2	199.3	20.16	328.0	12.9
				80/67	281.7	207.6	20.57	351.9	13.7
				85/71	304.2	215.9	20.98	375.9	14.5
	70.0	10.5	24.3	75/63	260.8	199.6	19.58	327.7	13.3
				80/67	283.5	207.9	19.98	351.7	14.2
				85/71	306.2	216.2	20.38	375.8	15.0
80	34.0	2.7	6.2	75/63	250.1	198.2	22.43	326.7	11.1
				80/67	271.9	206.4	22.89	350.0	11.9
				85/71	293.6	214.7	23.35	373.3	12.6
	52.0	7.0	16.3	75/63	250.5	197.7	21.52	324.0	11.6
				80/67	272.3	206.0	21.96	347.3	12.4
				85/71	294.1	214.2	22.40	370.6	13.1
	70.0	10.3	23.8	75/63	253.9	199.1	20.95	325.4	12.1
				80/67	275.9	207.4	21.38	348.9	12.9
				85/71	298.0	215.6	21.81	372.5	13.7
85	34.0	2.7	6.2	75/63	245.0	196.3	23.14	324.0	10.6
				80/67	266.3	204.5	23.61	346.9	11.3
				85/71	287.6	212.6	24.08	369.8	11.9
	52.0	6.9	16.0	75/63	246.3	196.9	22.20	322.0	11.1
				80/67	267.7	205.1	22.66	345.0	11.8
				85/71	289.1	213.3	23.11	368.0	12.5
	56.0	10.2	23.6	75/63	250.4	198.8	21.64	324.2	11.6
				80/67	272.2	207.1	22.1	347.5	12.3
				85/71	293.9	215.4	22.52	370.8	13.1
90	34.0	2.6	6.1	75/63	239.9	194.4	23.84	321.3	10.1
				80/67	260.7	202.5	24.33	343.8	10.7
				85/71	281.6	210.6	24.82	366.3	11.3
	52.0	6.9	16.0	75/63	242.0	196.1	22.88	320.1	10.6
				80/67	263.1	204.3	23.35	342.7	11.3
				85/71	284.1	212.5	23.82	365.4	11.9
	70.0	10.1	23.3	75/63	246.9	198.6	22.32	323.1	11.1
				80/67	268.4	206.8	22.78	346.1	11.8
				85/71	289.8	215.1	23.24	369.1	12.5
100	34.0	2.6	6.0	75/63	229.7	183.6	25.93	318.2	8.9
				80/67	249.6	191.2	26.46	340.0	9.4
				85/71	269.6	198.9	26.99	361.7	10.0
	52.0	6.8	15.6	75/63	233.4	187.3	24.90	318.4	9.4
				80/67	253.7	195.1	25.41	340.4	10.0
				85/71	274.0	202.9	25.91	362.4	10.6
	70.0	9.9	22.9	75/63	239.7	190.7	24.34	322.8	9.8
				80/67	260.6	198.7	24.84	345.4	10.5
				85/71	281.4	206.6	25.34	367.9	11.1
110	34.0	2.5	5.8	75/63	219.6	173.0	28.01	315.2	7.8
				80/67	238.7	180.2	28.58	336.3	8.4
				85/71	257.8	187.4	29.15	357.3	8.8
	52.0	6.6	15.3	75/63	224.9	178.6	26.90	316.7	8.4
				80/67	244.4	186.0	27.45	338.1	8.9
				85/71	264.0	193.5	28.00	359.5	9.4
	70.0	9.7	22.4	75/63	232.6	182.9	26.36	322.5	8.8
				80/67	252.8	190.5	26.90	344.6	9.4
				85/71	273.0	198.1	27.44	366.7	10.0

Heating Capacity Data (10,000 CFM)

EWT	GPM	WPD		HEATING					
		PSI	FT	EA	HC	KW	HE	LAT	COP
30	34.0	3.1	7.2	60.0	196.0	17.99	134.6	82.7	3.19
				70.0	189.3	18.94	124.6	91.9	2.93
				80.0	182.5	19.88	114.7	101.1	2.69
	52.0	8.2	18.9	60.0	200.6	18.22	138.4	83.2	3.23
				70.0	193.6	19.18	128.2	92.4	2.96
				80.0	186.7	20.14	117.9	101.6	2.72
	70.0	11.7	27.0	60.0	206.8	18.24	144.5	83.9	3.32
				70.0	213.4	19.20	133.8	94.7	3.26
				80.0	191.9	20.16	123.1	102.2	2.79
40	34.0	3.0	6.8	60.0	258.5	22.63	181.2	89.9	3.35
				70.0	249.9	23.82	168.6	98.9	3.07
				80.0	241.3	25.01	155.9	107.9	2.83
	52.0	7.8	18.1	60.0	265.1	22.93	186.8	90.7	3.39
				70.0	256.2	24.14	173.8	99.7	3.11
				80.0	247.3	25.35	160.8	108.6	2.86
	70.0	11.3	26.1	60.0	272.4	23.02	193.9	91.5	3.47
				70.0	263.9	24.23	181.2	100.5	3.19
				80.0	254.4	25.44	167.6	109.4	2.93
50	34.0	2.8	6.5	60.0	320.5	27.24	227.5	97.1	3.45
				70.0	310.5	28.67	212.7	105.9	3.17
				80.0	300.5	30.11	197.8	114.8	2.92
	52.0	7.4	17.2	60.0	329.2	27.62	234.9	98.1	3.49
				70.0	318.8	29.07	219.5	106.9	3.21
				80.0	308.3	30.52	204.2	115.7	2.96
	70.0	10.9	25.2	60.0	339.4	27.80	244.6	99.3	3.58
				70.0	328.4	29.26	228.6	108.0	3.29
				80.0	317.4	30.72	212.6	116.7	3.03
60	34.0	2.8	6.4	60.0	341.4	24.19	258.9	99.5	4.14
				70.0	330.0	25.46	243.1	108.2	3.80
				80.0	318.5	26.74	227.3	116.9	3.49
	52.0	7.4	17.0	60.0	351.4	24.54	267.6	100.7	4.20
				70.0	339.4	25.83	251.3	109.3	3.85
				80.0	327.5	27.12	235.0	117.9	3.54
	70.0	10.7	24.7	60.0	362.7	24.77	278.2	102.0	4.29
				70.0	350.2	26.07	261.2	110.5	3.94
				80.0	337.7	27.37	244.3	119.1	3.61
70	34.0	2.7	6.3	60.0	362.7	21.16	290.4	102.0	5.02
				70.0	350.0	22.27	274.0	110.5	4.60
				80.0	337.4	23.39	257.6	119.0	4.23
	52.0	7.1	16.5	60.0	373.4	21.48	300.1	103.2	5.09
				70.0	360.3	22.61	283.1	111.7	4.67
				80.0	347.2	23.74	266.1	120.2	4.29
	56.0	10.5	24.3	60.0	385.7	21.74	311.6	104.6	5.20
				70.0	372.0	22.88	293.9	113.1	4.76
				80.0	358.3	24.02	276.3	121.5	4.37
80	34.0	2.7	6.2	60.0	393.8	22.09	318.4	105.6	5.22
				70.0	381.1	23.25	301.8	114.1	4.80
				80.0	368.5	24.41	285.2	122.6	4.42
	52.0	7.0	16.3	60.0	406.6	22.43	330.1	107.1	5.31
				70.0	393.4	23.61	312.9	115.5	4.88
				80.0	380.3	24.79	295.7	124.0	4.49
	70.0	10.3	23.8	60.0	419.9	22.76	342.2	108.6	5.40
				70.0	406.1	23.96	324.3	117.0	4.97
				80.0	392.4	25.16	306.5	125.4	4.57
90	34.0	2.6	6.1	60.0	425.1	23.01	346.6	109.2	5.41
				70.0	412.7	24.22	330.1	117.8	4.99
				80.0	400.3	25.43	313.6	126.3	4.61
	52.0	6.9	16.0	60.0	439.6	23.37	359.8	110.9	5.51
				70.0	426.7	24.60	342.7	119.4	5.08
				80.0	413.7	25.83	325.6	127.9	4.69
	70.0	10.1	23.3	60.0	453.7	23.79	372.5	112.5	5.59
				70.0	440.2	25.04	354.7	120.9	5.15
				80.0	426.7	26.29	337.0	129.4	4.76

Notes: Multiple flow rates (for EWT) are shown in the tables above. The lowest flow rate shown is used for geothermal open loop/well water systems with a minimum 50°F. The second flow rate shown is the minimum geothermal closed loop flow rate. The third flow rate shown is optimum for geothermal closed loop and the suggested flow rate for boiler tower applications.

Engineering Guide Specs

General

The water source reverse cycle heating/cooling units shall be either a reverse cycle suspended type with horizontal air inlet and discharge or a floor mounted type with horizontal air inlet and vertical up-flow air discharge. Units shall be ISO performance certified and listed by a nationally recognized safety testing laboratory or agency, such as ETL Testing Laboratory or Canadian Standards Association (CSA). Each unit shall be computer run-tested at the factory, mounted on a pallet, and stretch wrapped for shipment.

The units shall be warranted by the manufacturer against defects in materials and workmanship for a period of 18 months from ship date on all parts. Optional warranties providing coverage up to 5 years shall be available.

The VX series units shall be designed to operate with entering water temperatures between 25°F and 110°F.

The VL series units shall be designed to operate with entering water temperatures between 50°F and 110°F.

Casing & Cabinet

The cabinet shall be fabricated from heavy-gauge galvanized steel. The interior shall be insulated with 1/2-inch thick, multi-density, coated glass fiber with edges sealed or tucked under flanges to prevent the introduction of glass fibers into the discharge air. One or two blower compartment access panels and three compressor compartment access panels shall be provided and shall be removable with supply and return ductwork in place. The internal component layout shall provide for major service with the unit in place for restricted access installations.

A 1-inch duct collar shall be provided on the supply air opening. Standard-size pleated air filters (2 inches on 80 to 275 MBTUH units) shall be provided with each unit. Vertical units shall have a return air filter rack/duct collar, and horizontal units a filter bracket. There shall be a filter rack/duct collar that accepts 2-inch air filters available for field assembly and mounting. The units shall have an insulated divider panel between the air handling section and the compressor section to minimize the transmission of compressor noise and to permit operational service testing without air bypass. Vertical units shall be supplied with a left or right horizontal air inlet and a top vertical air discharge. Horizontal units shall be supplied with a left or right air inlet and side or end air discharge.

Refrigerant Circuit

All units shall contain a sealed refrigerant circuit including a hermetic motor-compressor, bidirectional thermal expansion valve, finned tube air-to-refrigerant heat exchanger, reversing valve, coaxial tube water-to-refrigerant heat exchanger, and service ports. Dual compressor units (80 to 275 MBTUH) shall contain two refrigerant circuits.

Compressors shall be high-efficiency, reciprocating or scroll type designed for heat pump duty and mounted on vibration isolators. Compressor motors shall be three-phase with internal overload protection. The finned tube coil shall be sized for low-face velocity and constructed of lanced aluminum fins bonded to rifled copper tubes in a staggered pattern not less than three rows deep.

The coaxial water-to-refrigerant heat exchanger shall be designed for close approach temperatures, constructed of a convoluted copper (optional cupronickel) inner tube and a steel outer tube, and capable of 450 psi water and 450 psi refrigerant working pressures. The thermal expansion valve shall provide proper superheat over entire liquid temperature range with minimal "hunting." The valve shall operate bidirectional without the use of check valves. Externally mounted pressure regulating flow control valves are not acceptable.

The water-to-refrigerant heat exchanger and refrigerant suction lines shall be insulated to prevent condensation at low liquid temperatures (VX models only).

Fan Motor & Assembly

The fan shall be belt drive centrifugal type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet, low outlet velocity operation. The fan housing shall be constructed of galvanized steel. The motor shall be permanently lubricated and have thermal overload protection.

Electrical

A terminal block with screw terminals shall be provided for field low-voltage wiring, and a 75VA low-voltage transformer shall be provided.

Line voltage terminal block shall be provided for unit wiring. Units shall have knockouts for entrance of low and line voltage wiring.

Microprocessor

A stand-alone mounted Johnson Controls FX10 advanced controller that will monitor and control unit operation shall be provided. The control shall provide: operational sequencing, high and low pressure switch monitoring, general lockout, freeze protection, condensate overflow sensing, lockout mode control, emergency shutdown mode, random start, and short cycle protection. A terminal block with screw terminals shall be provided for field low-voltage wiring, and a 75VA low-voltage transformer shall be provided. Line voltage terminal block shall be provided for unit wiring. Units shall have knockouts for entrance of low and line voltage wiring. The control shall be factory mounted and tested. (For more information, refer to Submittal Data SD1981 or Application Guide AGFX10).

Engineering Guide Specs (cont.)

Piping

Supply and return water connections shall be copper threaded fittings mechanically fasted to unit cabinet. Threaded copper adaptors shall be low-temperature soldered to prevent misshaping or weakening of the fitting, eliminating potential start up leaks.

All VX series water piping shall be insulated to prevent condensation at low liquid temperatures.

The condensate connection on the units shall be constructed of copper as indicated in the equipment schedule. Vertical units shall have an internally trapped hose which can be routed to front or side locations.

Hanging Brackets

Factory-mounted hanging brackets and rubber isolators shall be provided on horizontal units, and 1/2-inch threaded rods shall be routed to front or side locations.

Optional Items

- An Open N2, LonTalk, or BacNet communication module shall be provided for interface to a building automation system.
- A cupronickel (90/10) coaxial heat exchanger shall be furnished.
- A compressor sound package shall be furnished. The package shall provide an acoustical wrap for the compressor.
- A supply-return stainless braided hose kit shall be furnished in appropriate size to match the heat pump's water connections. The hose kit shall be factory assembled complete with a Hays Mesurflo automatic flow control device sized for the heat pump, Y-strainer with blow-down valve, pressure temperature ports built-in, and brass ball valves for each hose. The hose kit shall be tagged with the heat pump's tagging for this project.
- A 24 VAC solenoid valve (24 VA maximum current draw) shall be furnished and field wired to the heat pump's microprocessor so as to be energized whenever there is a call for compressor operation. The body size of the valve shall match the water connection size of the heat pump.
- User Interface for use with units including FX10 Controller.



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Product: **Versatec**
Type: Water Source/Geothermal Heat Pumps
Size: 7 thru 23 Tons

Document Type: Specification Catalog
Part Number: SP2601
Release Date: 11/05
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