



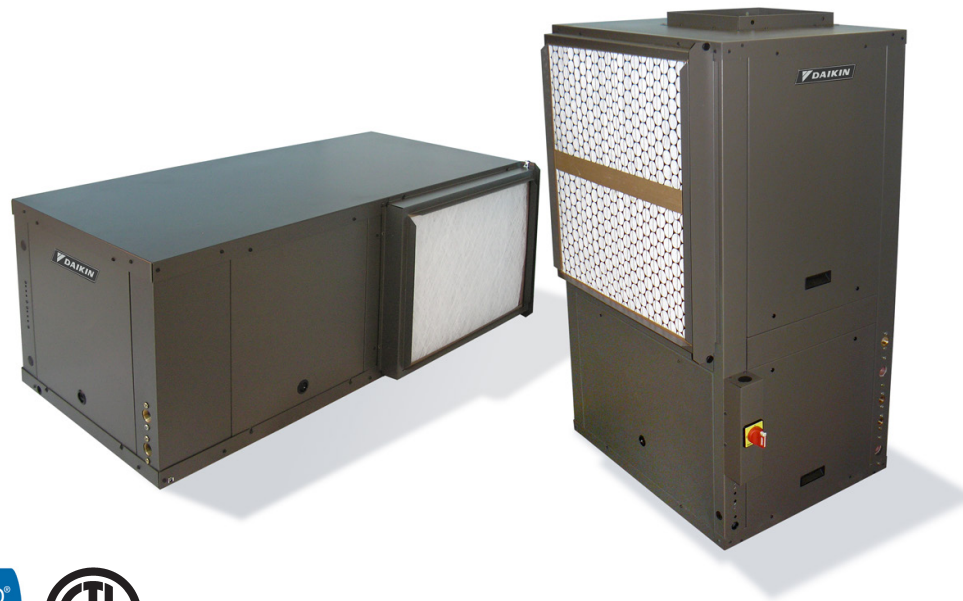
Catalog 1114-13

SmartSource® Two-Stage Horizontal & Vertical Water Source Heat Pumps

GTH - Horizontal Ceiling

GTV - Vertical Floor

Unit Sizes 026 – 072 • R-410A Refrigerant



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Note: Text displayed in ***Bold-Italics*** designate standard offering.

Category	Code Item	Code Option	Code Designation & Description (<i>Bold-Italic = Standard</i>)
Product Category	1	1	<i>W = Water Source Heat Pump</i>
Model Type	2	2-3	<i>GT = High Efficiency 2-Stage</i>
Configuration	3	4	<i>H = Horizontal</i> <i>V = Vertical</i>
Nominal Capacity	4	5-7	<i>026 = 26,000 Btuh Nominal Cooling</i> <i>032 = 32,000 Btuh Nominal Cooling</i> <i>038 = 38,000 Btuh Nominal Cooling</i> <i>044 = 44,000 Btuh Nominal Cooling</i> <i>049 = 49,000 Btuh Nominal Cooling</i> <i>064 = 64,000 Btuh Nominal Cooling</i> <i>072 = 72,000 Btuh Nominal Cooling</i>
Unit Control	5	8	<i>B = MicroTech III SmartSource Unit Controller</i>
Design Series (Vintage)	6	9	1 = Revision / Design Series 1
Voltage	7	10	<i>E = 208-230/60/1</i> F = 208-230/60/3 J = 265/60/1 K = 460/60/3
Range for Entering Water/Glycol Temp.	8	11-12	GW = Ground Water <i>WL = Water Loop</i> GL = Ground Loop
Return Air Location	9	13	L = Left-Hand Return Air & Right-Hand Piping <i>R = Right-Hand Return Air & Right-Hand Piping</i>
Discharge Air Location	10	14	E = End (Horizontal Unit Only) <i>T = Top (Vertical Unit Only)</i> <i>S = Straight (Horizontal Unit Only)</i>
Fan Motor	11	15	<i>4 = ECM Constant CFM</i>
Dehumidification Option	12	16	B = Hot Gas Reheat Smart Dehumidification C = Simplified Dehumidification (Lower CFM no HGRH or no Humidistat) D = Humidistat Controlled Dehumidification (No HGRH) E = Humidistat Only <i>Y = None</i>
Sound Package	13	17	<i>Y = None</i> A = Premium
Coaxial Heat Exchanger Construction (Supply Liquid / Refrigerant)	15	19	<i>C = Copper Inner Tube - Steel Outer Tube</i> S = Cupronickel Inner Tube - Steel Outer Tube
Primary Air Coil Option	16	20	<i>S = Standard</i> C = Corrosion Protection
Communication Module	19	24	B = BACnet L = LONWORKS <i>Y = None</i>
Filter Rack	20	25	<i>2 = 4-Sided, 2" w/Duct Collar & Door</i> 3 = 4-Sided, 2" w/Duct Collar, Door, Hi-Merv Seal 4 = 4-Sided, 4" w/Duct Collar, Door, Hi-Merv Seal Y = None
Filter Type	21	26	<i>A = Disposable</i> E = Merv 8 Factory-Installed G = Merv 13 (4-inch thick) Factory-Installed Y = None
Water Coil - Indoor Air	22	27	E = Waterside Economizer H = Hydronic Heat <i>Y = None</i>
Electric Heating - Indoor Air	23	28	C = 5.0 kW Internal Electric Heater E = 10.0 kW Internal Electric Heater F = 15.0 kW Internal Two Stage Electric Heater G = 20.0 kW Internal Two Stage Electric Heater P = Control for Electric Heat, Single 24V Signal (Field-installed Duct Heater by others) <i>Y = None</i>
Control Secondary Heat Type	24	29	B = Boilerless Electric Heat E = Emergency Electric Heat P = Primary Electric Heat (No Heat Pump Heating) S = Supplemental Heat <i>Y = None</i>

Category	Code Item	Code Option	Code Designation & Description (<i>Bold-Italic = Standard</i>)
Desuperheater (Hot Water Generator)	25	30	D = Desuperheater Y = None
Loop Pump	26	31-32	1S = One Low Head Pump 1L = One High Head Pump 2S = Two Low Head Pumps 2L = Two High Head Pumps YY = None
Coaxial Coil Supply Liquid Flow Control	27	33	B = 2-Way, Motorized - 24v Valve Control, NO Y = None
Coaxial Coil Supply Liquid Auto Flow Reg	28	34	A = Auto Flow Control 1.5 GPM B = Auto Flow Control 2.0 GPM C = Auto Flow Control 2.5 GPM D = Auto Flow Control 3.0 GPM E = Auto Flow Control 4.0 GPM G = Auto Flow Control 5.0 GPM H = Auto Flow Control 6.0 GPM I = Auto Flow Control 8.0 GPM J = Auto Flow Control 9.0 GPM K = Auto Flow Control 10.0 GPM L = Auto Flow Control 11.0 GPM M = Auto Flow Control 12.0 GPM N = Auto Flow Control 13.0 GPM P = Auto Flow Control 15.0 GPM S = Auto Flow Control 18.0 GPM Y = None
Water Pressure Differential Switch	30	36	D = Water Pressure Differential Switch Y = None
Desuperheater Water Flow Options	31	37	Q = Pump - 208-230/60/1 Voltage Y = None
Water Coil Piping Package Options (Hot Water or Waterside Economizer)	35	41	A = 3-Way Motorized - 24V Valve Control, NO to Coax
Primary Drain Pan Material	39	45	S - Stainless Steel
Compressor Insulation	41	47	B = Compressor Insulation Sound Blanket Y = None
Compressor Isolation	42	48	B = Isolated base
Unit Cabinet Insulation	43	49	S = 1/2" Fiberglass Skin-Face in Compressor Section, 1/2" Fiberglass Foil-Face Insulation in Airside Section I = Indoor Air Quality Insulation Package - 3/8" Closed Cell Foam in Compressor Section, 3/8" Closed Cell Foam Insulation in Airside Section R = Sound Reduction Package - 1/2" Fiberglass Skin-Face in Compressor Section with Compressor Sound Blanket, 3/4" Sound Insulation in Airside Section
Note: *Compressor sound blanket is not recommended on a unit with a rotary compressor			
Insulation - Piping	45	51	A = Insulated Piping Y = None
Cabinet Finish	47	53	A = Powder Coat Y = None
Cabinet Color	48	54	Y = None W = Off White T = Textured Charcoal Bronze
Fan Motor Control	50	56	C = Various Speeds with 4 Adjustment Settings
Disconnect Switch	53	60	Y = None N = Non-Fused
Control Transformer	55	62	1 = 50VA Control Transformer 2 = 75VA Control Transformer
Thermostat/Sensor Control	56	63	T = Thermostat Control S = Sensor Control
Expansion Device	75	82	A = Thermal Expansion Valve Thermal Bulb and Equalizer Tube
Alarm Relay	76	83	A = Alarm Relay (Dry Contacts) Y = None
Extended Warranty, Parts Only	91	105-106	YY = None 1E = 1-Year, Entire Unit Parts Only 2C = 2-Year Parts (Compressor Only) 2R = 2-Year Parts (Refrigerant Circuit) 3C = 3-Year Parts (Compressor Only) 3R = 3-Year Parts (Refrigerant Circuit) 4C = 4-Year Parts (Compressor Only) 4R = 4-Year Parts (Refrigerant Circuit)

Note: Rated in accordance with AHRI/ASHRAE/ISO Standard 13256-1.

Unit Size	Capacity Modulation	Pressure Drop		GPM	Cooling			Heating		
		PSI	Ft		CFM	Total Cap.	EER	CFM	Tot Cap.	COP
Water Loop										
026	Full load	2.5	5.7	6.5	800	26400	16.8	800	29300	5.7
	Part load	2.5	5.7	6.5	700	19800	18.2	700	21800	6.4
032	Full load	3.3	7.4	7.5	1000	32500	16.5	1000	36400	5.3
	Part load	3.3	7.4	7.5	875	24700	18.5	875	27800	6.0
038	Full load	2.0	4.7	9.0	1250	39000	17.6	1250	44400	5.6
	Part load	2.0	4.7	9.0	1090	28300	20.2	1090	32600	6.4
044	Full load	2.0	4.7	10.5	1400	44400	17.3	1400	50100	5.4
	Part load	2.0	4.7	10.5	1225	32900	19.7	1225	36600	6.0
049	Full load	2.7	6.2	12.2	1600	48900	16.7	1600	55300	5.3
	Part load	2.7	6.2	12.2	1400	36900	19.6	1400	40800	6.0
064	Full load	4.8	10.9	16.0	2000	64800	17.4	2000	76100	5.2
	Part load	4.8	10.9	16.0	1750	48200	19.7	1750	53800	5.8
072	Full load	5.7	12.9	17.5	2160	72700	15.9	2160	88400	5.0
	Part load	5.7	12.9	17.5	1920	56400	18.5	1920	64600	5.5
Ground Loop										
026	Full load	2.5	5.7	6.5	800	27600	19.3	800	18100	4.1
	Part load	2.5	5.7	6.5	700	22000	26.8	700	15100	4.6
032	Full load	3.3	7.4	7.5	1000	33800	18.9	1000	23700	4.1
	Part load	3.3	7.4	7.5	875	26800	25.9	875	19800	4.5
038	Full load	2.0	4.7	9.0	1250	40200	20.1	1250	28100	4.2
	Part load	2.0	4.7	9.0	1090	30500	28.9	1090	22500	4.7
044	Full load	2.0	4.7	10.5	1400	45900	19.8	1400	31700	4.0
	Part load	2.0	4.7	10.5	1225	35500	28.3	1225	25600	4.4
049	Full load	2.7	6.2	12.2	1600	50600	19.2	1600	35900	4.0
	Part load	2.7	6.2	12.2	1400	39600	28.2	1400	29200	4.4
064	Full load	4.8	10.9	16.0	2000	67100	19.7	2000	47000	3.9
	Part load	4.8	10.9	16.0	1750	52200	28.0	1750	38300	4.3
072	Full load	5.7	12.9	17.5	2160	75300	18.1	2160	55200	3.7
	Part load	5.7	12.9	17.5	1920	60700	26.1	1920	46200	4.2

Legend: COP = Coefficient of Performance
 Ft = Feet of Water
 PSI = Pounds per Square Inch

CFM = Airflow Rate, Cubic Feet per Minute
 EER = Energy Efficiency Ratio
 GPM = Gallons per Minute

Water Loop: 1. Cooling capacity based on 80.6°F db, 66.2°F wb (27/19°C) EAT and 86°F (30°C) EWT.
 2. Heating capacity is based on 68°F (20°C) EAT and 68°F (20°C) EWT.

Ground Water: 1. Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) EAT and 59°F (15°C) EWT.
 2. Heating capacity is based on 68°F (20°C) EAT and 50°F (10°C) EWT.

Ground Loop: 1. Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) EAT and 77°F (25°C) EWT at full load or 68°F (20°C) at part load.
 2. Heating capacity is based on 68°F (20°C) EAT and 32°F (0°C) EWT at full load or 41°F (5°C) at part load.

SmartSource® 2-Stage Horizontal & Vertical Water Source Heat Pumps

Industry Leading Efficiencies, Very Quiet Operation



SmartSource® water source heat pumps from Daikin combine industry-leading efficiencies with low-noise operation, high indoor air quality and consistent air temperatures. So now you can do your part to conserve energy and enjoy a quiet and comfortable indoor environment.

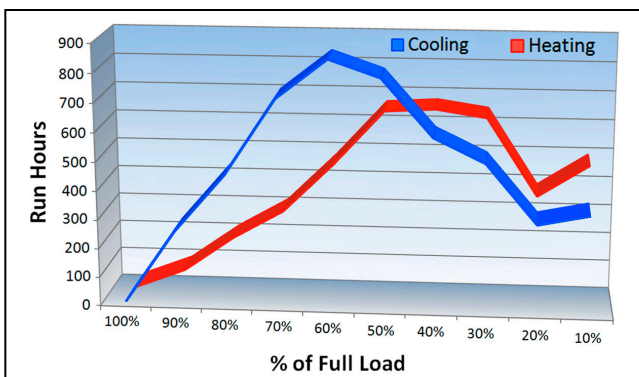
Why part load efficiency matters most

SmartSource water source heat pumps are available in both vertical and horizontal configurations and in sizes from 2 to 6 tons. Part load EERs range from 26.1 to 29.8 for geothermal applications, making these units one of the most efficient available to heat and cool a commercial space. They are ideal to assist with LEED certification and for earning energy rebates and tax deductions.

** Consult your utility provider for rebate opportunities.*

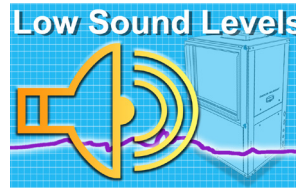
In most environments, heating and cooling systems operate at part load most of the time (see graph below). That's where SmartSource units with 2-stage compressors really shine. Here's how:

- **Quieter** – Units operate at lower fan speeds and compressor settings under part load. That significantly reduces noise.
- **More comfortable** – At lower fan speeds, more heat and humidity is removed as air passes through the unit. That means the air entering the room is more comfortable.
- **More consistent comfort** – At part load, 2-stage compressors run more often, delivering a more consistent room air temperature.
- **More energy savings** – At lower speeds, units use less energy, so you save on utility costs.
- **Lower operating costs** – When motors and compressors cycle on and off less, they last longer. That means fewer repairs and longer part life.



Sample building load profile, St. Louis, MO

Very quiet



SmartSource water source heat pumps are exceptionally quiet, with published sound ratings as low as 46 dBA. Sound reduction packages are available for even greater attenuation. These units

typically operate at low compressor and fan speeds a majority of the time. The result is even quieter operation, very low energy consumption and very uniform room air temperatures.

EC motors are standard on all units, with field-selectable CFM settings. EC motors are more efficient than traditional PSC motors, which is why most utilities offer rebates for their use. EC motors also provide near-constant fan speeds at static pressures up to one inch. The result is improved air filtration capabilities and more uniform air distribution.

Durable construction

Cabinets feature a rugged heavy gauge G-60 galvanized sheet metal for exceptional durability. Slotted handles make it easy to remove panels for maintenance and service. Cleanable, foil-faced fiberglass insulation is standard in the air-handling section to minimize sound transmission while preventing fibers in the air stream. High-IAQ options include 3/8-inch, closed-cell insulation in both the compressor and air-handling sections.

Wide range of options



Available options on all units include auxiliary electric heat in both internal (vertical units only) and external configurations. MERV 8 and 13 filters are available, with standard 2 inch filter rack or an optional 4 inch filter rack that accept a two-inch or four-inch cartridges. A desuperheater option

takes advantage of waste heat from the compressor to provide domestic hot water, ideal for apartments and condos. Also available is a waterside economizer or hydronic heat to minimize mechanical space conditioning by using loop water to condition the space.

Several methods of dehumidification options are available, including hot gas reheat. For geothermal applications, a unit-mounted loop pump option reduces system complexity by eliminating the need for a central pumping system.

Typical applications for SmartSource water source heat pumps include schools, clinics, office buildings, government offices, senior living facilities and other projects, both new construction and retrofit, where high efficiency is a key specification.

Model GTH-Horizontal & GTV-Vertical Unit



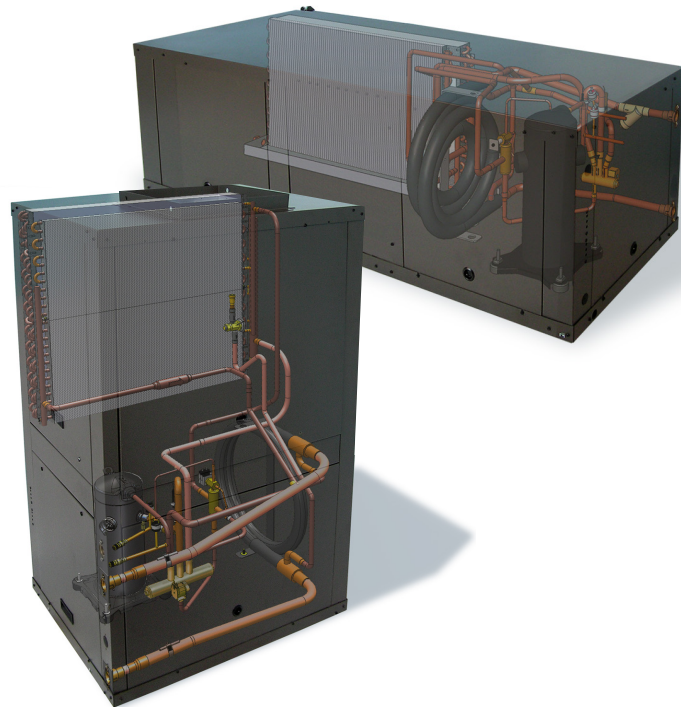
- 1 EC fan motor:**
 - 4 field adjustable fan settings and up to 7 operating mode options, provide a wide range of airflow selection (up to 28) for quieter operation and lower energy consumption.
- 2 Two-stage compressor:**
 - available in a variety of commercial voltages, mounted on a double isolation system for reduced sound and vibration transmission.
- 3 Refrigerant circuit:**
 - Utilizes R-410A refrigerant with a bi-flow thermal expansion valve for precise metering and four way solenoid reversing valve.
- 4 MicroTech® III, SmartSource controls:**
 - Easy open-protocol integration with optional LONWORKS® or BACnet®.
- 5 Unit status LED:**
 - Instant visuals on unit operation for easy troubleshooting and advanced diagnostics.
- 6 4-sides filter rack with standard 2" or optional 4" filters:**
 - Designed for easy filter maintenance.
 - MERV 8 & 13 filter options with gasketed filter seals to meet LEED-NC EQc5 applications with leakage rate at less than 4 CFM per square foot of filter area at 0.5" ESP.
- 7 Stainless steel drain pan:**
 - Sloped with lipless drain connection for positive condensate flow to meet ASHRAE 62.1 Section 5.11.
- 8 Flush mounted fittings:**
 - Easy one wrench connection, securely fastened to the cabinet corner posts.
- 9 Blower and motor orifice ring:**
 - Easy service without removing the blower housing or disconnecting the unit from the duct work.
- 10 Durable cabinet construction:**
 - Heavy gauge steel, available with an optional powder coated textured paint, (charcoal bronze), and lined with cleanable foil-faced insulation on the airside.

Four Unique Dehumidification Options:

- **Smart Dehumidification** – Uses hot gas reheat, humidistat, 2-stage thermostat & smart air flow management for precise humidity control.
- **Simplified Dehumidification** – Uses a 3-stage thermostat to optimize unit capacity and fan speed for maximum latent capacity while decreasing room humidity levels.
- **Humidistat Controlled Dehumidification** – Uses a humidistat and 2-stage thermostat to control room humidity levels.
- **Dehumidification Only** – Uses a humidistat in cooling only mode.

Hot Gas Reheat Coil

For improved indoor climate control, Daikin Applied offers accurate and cost effective dehumidification control using a hot gas reheat option known as smart dehumidification. Hot gas reheat with smart dehumidification is an excellent solution for applications where maintaining low humidity in a space is crucial. With smart dehumidification, once the space temperature is satisfied, the humidistat signal diverts the high temperature refrigerant gas to the reheat coil located downstream of the cooling coil. The conditioned and reheated air prevents over cooling of the space and maximizes moisture removal for improved indoor comfort. The smart EC fan system adjusts the air flow for optimal moisture removal, and helps keep sound levels at a minimum. It is especially effective during low load conditions when proper control is critical. Under humid conditions (60%RH) and typical loop water temperatures, the latent capacity is optimized for approximately 90% of the sensible capacity. With loop water conditions of 85°F, the leaving air temperature is approximately the same as the entering air temperature, resulting in effective dehumidification without over cooling the space.

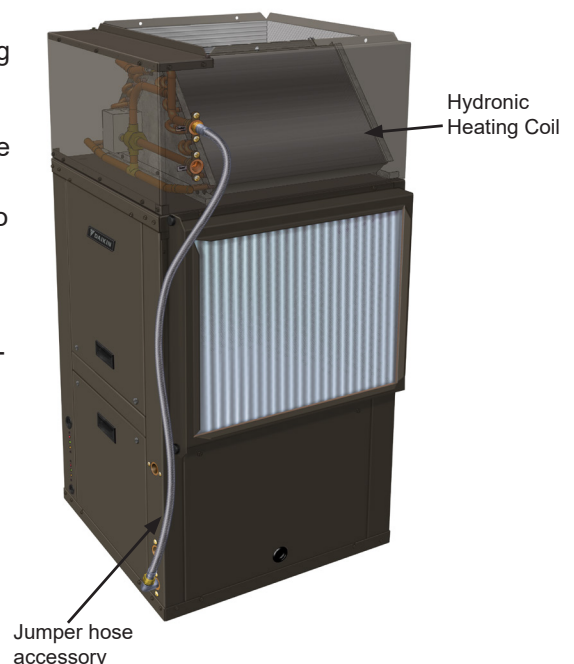


Hydronic Heat

The hydronic heat option helps to reduce energy consumption by using hot loop water temperatures to condition a space without energizing mechanical heating. Hydronic heat can help maximize heat transfer from rooms that require cooling to ones that require heating without the added cost of operating the compressor.

Variable flow pumping systems are recommended for these systems to further reduce energy consumption, while maintaining sufficient water flow during heating operation.

The unit includes a hydronic heating coil located downstream of the unit's evaporator coil and after the filter. When entering water temperatures are between 70° to 120°F, a 3-stage thermostat or room temperature sensor in conjunction with a factory-installed entering water temperature sensor and a 2-position 3-way diverting valve, determine when loop water can be diverted to the hydronic coil and the unit coax coil for hydronic heating. Smart fan controls further reduce energy consumption and sound levels by delivering optimum air flow during hydronic heat operation.

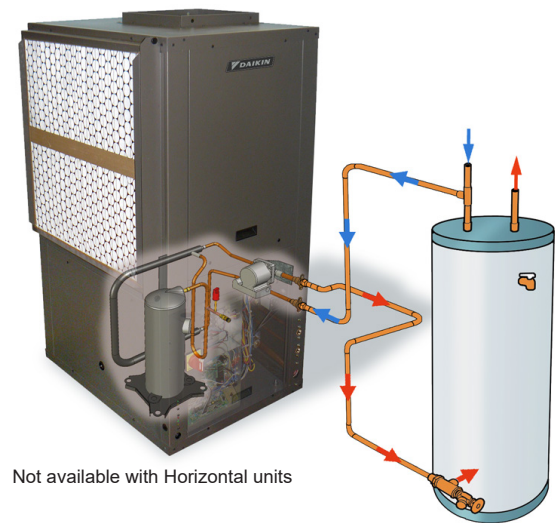


Desuperheater

The factory-installed desuperheater option saves energy by using heat that would otherwise be “wasted” to the water loop, and uses it to supplement the heating of domestic water. The desuperheater has a double-wall, vented coaxial heat exchanger, an optional water pump for 208/230- 1 and 3-phase applications, with controls to temper the make-up water.

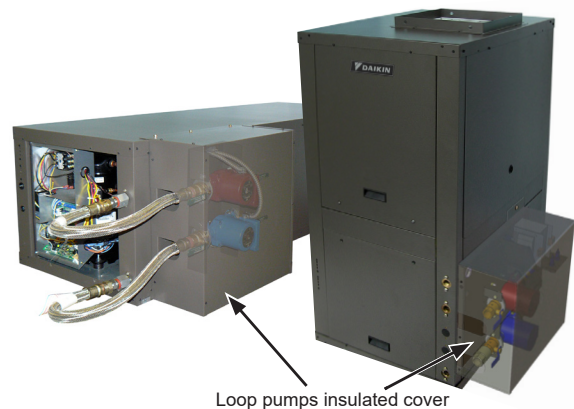
Controls include a refrigerant discharge line thermostat, an Entering Water Temperature (EWT) thermostat and an “on-off” switch located on the outside of the unit cabinet to deactivate the desuperheater system during the heating mode.

This option is available on vertical units sizes 2 tons and larger.



Loop Pump(s)

Unit-mounted loop pump(s), available on horizontal and vertical unit sizes 2 tons and larger, eliminate the need for a central pumping station. Several loop pump options are available to match the system flow and head requirements for most geothermal and water loop applications. Sized for approximately 3 GPM/ton, both low and high head options are available in a single or dual (series flow) configuration. The series configuration essentially doubles the head capabilities. A factory supplied transformer is provided for single-point power supply.

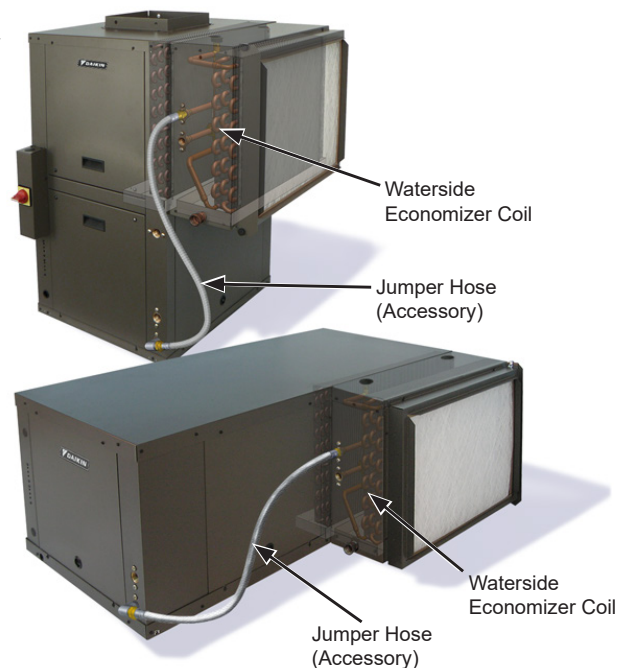


Waterside Economizer

The waterside economizer option helps to reduce energy consumption by using cool loop water temperatures to condition a space without energizing mechanical cooling. Even in the coldest weather a space can experience a build-up of ambient heat from people, equipment, lighting and the sun. Buildings with temperature controlled computer rooms, media/resource rooms or medical equipment rooms, benefit from the waterside economizer when the geothermal loop field or cooling tower temperatures are cool enough to provide air conditioning.

Variable flow pumping systems are recommended for these systems to further reduce energy consumption, while maintaining sufficient water flow during economizer operation.

The waterside economizer includes a hydronic cooling coil located upstream of the unit's evaporator coil and after the filter. When entering water temperatures are between 70° to 50°F, a 3-stage thermostat or room temperature sensor in conjunction with a factory-installed entering water temperature sensor and a 2-position 3-way diverting valve, determine when loop water can be diverted to the hydronic coil and the unit coax coil for economizer cooling. Smart fan controls further reduce energy consumption and sound levels by delivering optimum air flow during economizer operation. The MicroTech III SmartSource controller determines if the economizer and mechanical cooling can be activated together, while optimizing unit airflow. The controller also provides low temperature protection to avoid economizer operation when entering water temperatures are below 35°F.

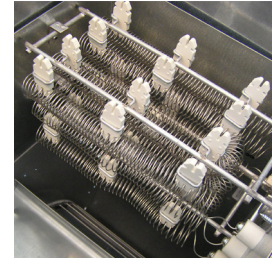


Electric Heat (internal or external)

Factory installed electric heaters are available on vertical units. These heaters are located above the blower housing inside the discharge air plenum. Horizontal units utilize an external duct-mounted electric heater for field-installation. Unit controls are available for boilerless, supplemental, primary or emergency electric heat to serve several different application needs. Boilerless electric heat will be energized when the entering water temperature falls below set point. This will allow electric heat to function while ensuring the compressor remains off. With supplemental electric heat control, the wall thermostat will activate the compressor and heater simultaneously if necessary to maintain room heating conditions. For primary heat applications, only the electric heater will provide heat without energizing the compressor. Emergency heat is activated by a 24V thermostat signal to energize the external duct-mounted electric heat. For available electric heat sizes and voltages see "Model Nomenclature" on page 3, Code Item "23".



Horizontal unit external duct-mounted electric heater



Vertical unit internal factory-installed electric heater

Designed-in Sound Reduction

Provided as standard, the compressor mount has a unique dual-level vibration isolation system. The compressor is mounted on vibration isolation grommets to a heavy gauge mounting plate, then isolated from the cabinet base with rubber grommets to minimize vibration transfer. The compressor is equipped with thermal overload protection and is located in a well-insulated compartment away from the air stream to minimize sound transmission. All access panels have acoustic seals to eliminate panel vibration and minimize radiated sound levels. Fan noise can be minimized at low airflow with field adjustable EC fan motor settings. An optional sound reduction kit adds a 3/4" thick acoustic foam panel of insulation to the fan section and a compressor blanket (unit sizes 026 to 072 only) to help further reduce operating sound levels.



Cabinet

The SmartSource vertical floor and horizontal ceiling cabinet comes with a standard rugged, textured- non-glare, powder-coat charcoal bronze paint. All cabinetry is fabricated from heavy gauge G-60 galvanized sheet metal.

The vertical floor unit offers two cabinet configurations with 4 unique cabinet sizes that make up the 2 through 6 ton vertical heat pump product line. For maximum flexibility, each vertical unit is available in either a left-hand or right-hand return air arrangement to provide the optimum piping location and service access. The mirror image design of the units allow for configuring the system using minimum ductwork and piping. This helps reduce design, material and installation costs.

Horizontal ceiling mounted units offer 4 cabinet sizes in four unique cabinet configurations with the smallest possible footprint, allowing for optimum design flexibility. Ceiling mounted units ship with heavy metal brackets, rubber isolators, fasteners and washers to suspend and isolate the unit from the building.

Cabinet Insulation

Premium type insulation is provided standard with all SmartSource horizontal and vertical unit cabinets providing a high level of indoor air quality. As a standard the compressor compartment surfaces are lined with 1/2" fiberglass – multicoated type insulation. Separated from the compressor section by a partition, the blower section comes standard with 1/2" thick fiberglass cleanable foil face insulation with edges sealed or tucked to prevent introduction of fibers into the discharge air stream, providing maximum sound attenuation. The standard cabinet insulation meets NFPA 90A requirements, air erosion and mold growth limits of UL-181, fungal resistance test per ASTM-C1071 and ASTM G21, and meets zero level bacteria growth per ASTM G22. All insulation has a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

Optional insulation is available in 3/8" thick closed-cell non fibrous insulation for Indoor Air Quality (IAQ).

A sound reduction package is available in 3/4" thick insulation as a factory installed option. Unit sizes 026 - 072 utilize a sound attenuating compressor blanket, combined with high technology sound material applied within the air handling compartment to further reduce sound transmitted by the unit.

Unit Configurations

Figure 1: Two vertical unit configurations

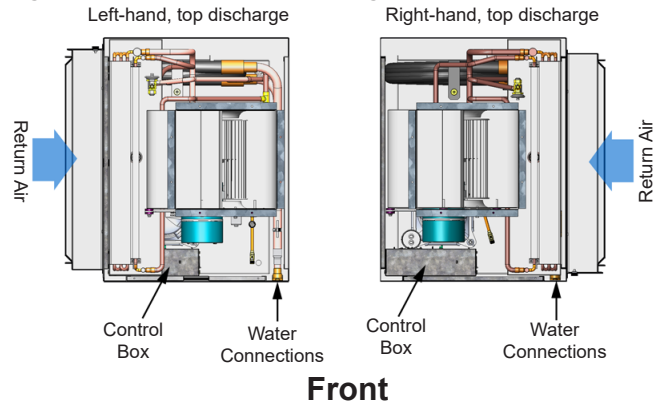
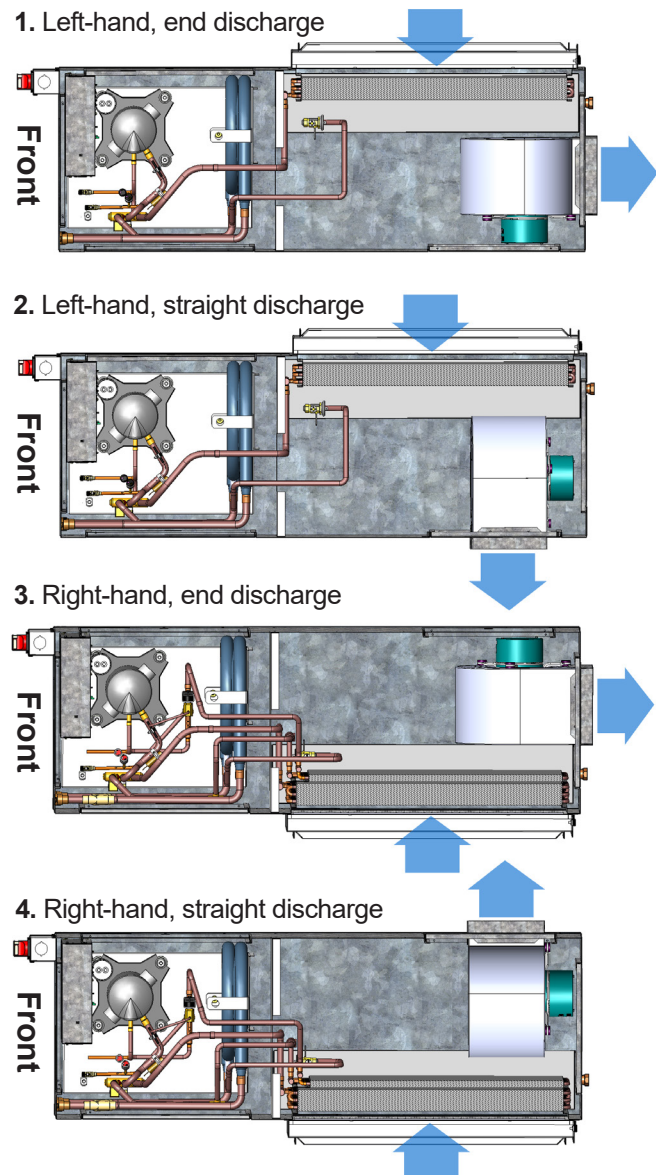


Figure 2: Four horizontal unit configurations



Note: Unit left or right hand is determined by facing the piping connection (front) side of unit

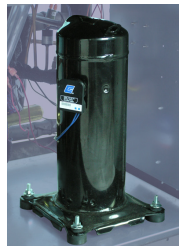
Field Adjustable EC Fan Motor

EC motors are standard on all units, with 4 field-selectable CFM settings and 28 programmed CFM values. EC motors provide the ultimate in efficiency, performance flexibility and reduced sound levels. With inherent high efficiencies compared to conventional PSC or fix speed motors, the EC motor can save operating energy. The factory installed fan speed selection switch allows for easy commissioning through a simple click of the switch to set the CFM delivered to the space. This allows for field adjustment of air delivery to the space for sound sensitive applications or for increased air distribution.



Two-Stage Compressors - Double Isolated

The two-stage unloading scroll compressor provides excellent part load performance for improved humidity control and increased efficiency. The compressor has a unique dual-level vibration isolation system. Mounted on vibration isolation grommets to a heavy gauge compressor mounting plate, then isolated from the cabinet base with rubber grommets to minimize vibration transfer. The compressor is equipped with thermal overload protection and is located in an insulated compartment away from the air stream to minimize sound transmission.



CorMax® Connections

Two CorMax valves are located inside the end access panel – one on the low side and one on the high side of the refrigeration circuit – for charging and servicing. All valves are 7/16" SAE fittings.



Water Connections

The water and condensate connections are FPT fittings, securely mounted flush to the corner post to allow for connection to a flexible hose without the use of a back-up wrench. This helps reduce the time required to connect the unit and helps prevent delays due to shipping damage. All vertical units are internally trapped with clear vinyl tubing, to allow inspection of condensate drain.



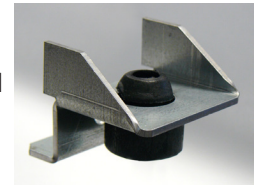
2-Way Motorized Water Valve

The optional 2-way valve is used for variable pumping applications when more than one unit is installed on a common loop. These valves are also used to conserve water when used for ground water applications.



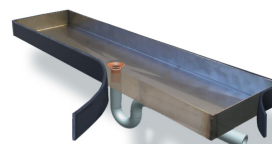
Horizontal Unit Hanger Bracket

Each horizontal unit is furnished with a mounting kit that includes heavy metal hanger brackets for hanging the unit from field-supplied hanger rods. Rubber isolators are included for sound and vibration attenuation, as are mounting washers, bolts and lock washers. The hangers are attached to fasteners at each corner of the unit, which are an integral part of the cabinet.



Stainless Steel Drain Pan

The vertical unit condensate drain pan is constructed of corrosion-resistant stainless steel. It is wrapped in closed-cell insulation, double-sloped with a "lipless", free-draining pipe connection for positive drainage and an internal trap for improved Indoor Environmental Quality (IEQ) that meets ASHRAE 62.1-2007 Section 5.11. The drain pan is provided with solid-state electronic condensate overflow protection, unlike the less reliable mechanical float switch used with many competitor drain pans. The horizontal unit condensate drain pan is sloped, allowing for the unit to be mounted level in the ceiling, without tilting the unit to encourage drainage as some competitor units require. It is constructed of the same high quality materials as the vertical unit drain pan.



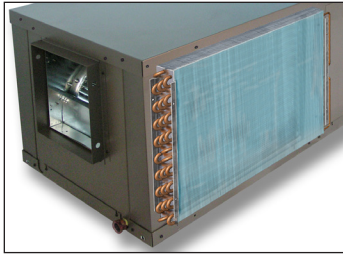
Vertical unit drain pan



Horizontal unit drain pan

Air-to-Refrigerant Coil

The air-to-refrigerant heat exchanger is a large face area coil with copper tubes and aluminum fins. The fins are lanced and mechanically bonded to the tubes using finned edges on the inside which expand during assembly to enhance heat transfer capabilities. The maximum working pressure of the heat exchanger is 600 psig (4137 kPa). The coil is designed for optimal performance in both heating and cooling while maintaining the benefit of a compact size. The coils can be coated with an optional inorganic, silicon-based nano-ceramic coating. This coating has a 3,000 hour salt spray rating per ASTM B117.



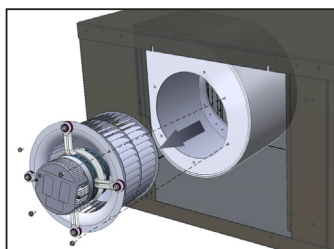
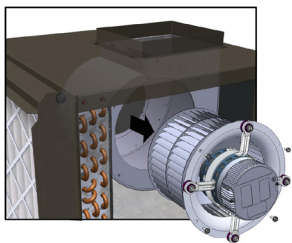
Refrigeration System

Units have a coaxial heat exchanger with a copper inner tube and a steel outer tube. The air coil is a large face area coil with copper tubes and aluminum fins. Safety controls include a 600 psi high-pressure switch and low-temperature sensor to lock out compressor operation at extreme conditions. For additional protection, a 7 psi (48 kPa) low-pressure switch to protect the compressor from low refrigerant charge. The low setting prevents nuisance trips while providing additional protection.



Blower Section

The blower section includes the EC motor, a direct-drive centrifugal fan, fan housing, and drain pan. A duct collar protrudes through the cabinet to facilitate field-supplied duct connection. The large size of the blower wheel allows it to rotate more slowly, reducing motor work to improve efficiency and provide for quiet operation. A large panel provides service access to the blower and motor. All blower/motor assemblies have a removable orifice ring on the housing to accommodate motor and blower removal without disconnecting the unit from the ductwork.



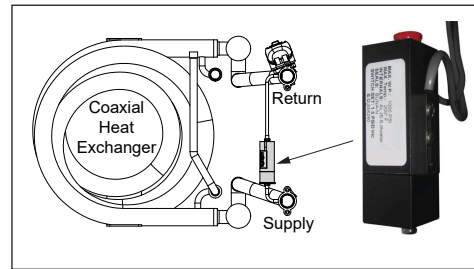
Disconnect Switch (Option)

SmartSource units are available with an optional non-fused disconnect switch, located on the unit front corner post. The disconnect switch is used to break power to the unit for ease of field service and is provided with a lockout/tag out feature.



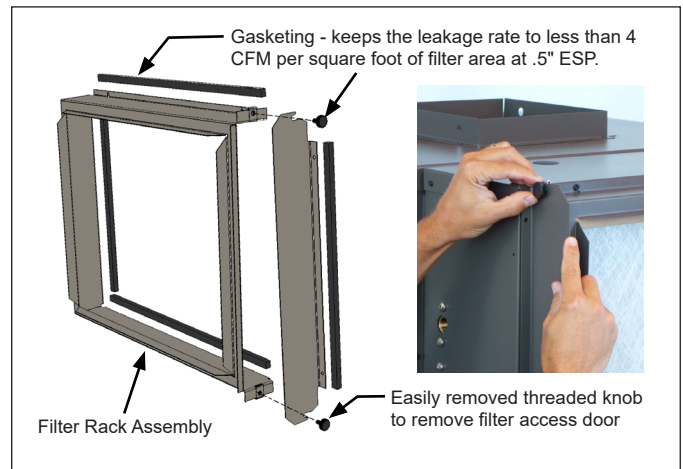
Water Pressure Differential Switch (Option)

The internal factory installed water pressure differential switch monitors water pressure drop across the heat exchanger and will disable compressor operation if flow is not detected.



Filter & Filter Rack

Units come standard with a 2" (51mm) thick factory-installed throwaway filter, mounted in a 4-sided combination filter rack and return air duct collar. Filters can be easily removed from either side by interchanging the removable filter door to the right or left side by rotating the filter rack assembly 180 degrees. A 2" or 4" filter rack is available as a factory-installed selectable option to accept a Merv 8 or Merv 13 filter. The high Merv filter rack option is available with gaskets between it and the cabinet and along the edge of the tool-less removable door. The gaskets maintain the leakage rate below 4 CFM per square foot of filter area at .5" ESP.



Unit Control

MicroTech III SmartSource Unit Control & I/O Expansion Module

The MicroTech III SmartSource Controller is a microprocessor-based control board in combination with an I/O Expansion Module for extra functionality. The control box is accessible through the left or right end corner panel on horizontal units and through the bottom-front access panel on the vertical unit. The unit controller is a hard wired interface and in combination with the I/O Expansion Module provides all the necessary field connections and functionality. All components are easily accessed for service or replacement.

Figure 3: MicroTech III SmartSource unit control board and I/O expansion module



Three control choices are offered with the MicroTech III SmartSource control system:

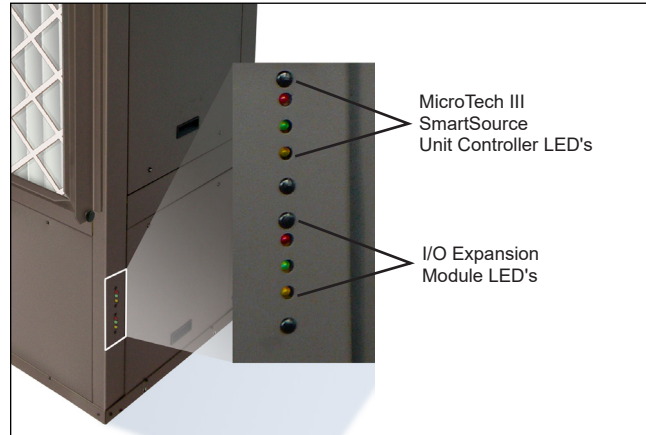
- MicroTech III SmartSource unit controller with I/O Expansion Module
- MicroTech III SmartSource unit controller with I/O expansion module and a LONWORKS® communication module
- MicroTech III SmartSource unit controller with I/O expansion module and a BACnet® communication module

Each option features direct quick-connect wiring to all unit-controlled components for “clean” wiring inside the control box. Each control circuit board receives power from a 50 VA or optional 75 VA transformer. The main board can be wired for 24-volt AC output to the wall thermostat by using terminals R & C.

Built-in Diagnostics

External LED annunciators are located on the front corner of the unit chassis to quickly check the operating status of the unit. The I/O Expansion Module has an independent LED annunciator to identify operational fault conditions.

Figure 4: External LED annunciators



Fan Speed Selector Switch

A 4-position fan speed selector switch located in the control box allows CFM settings to be field adjustable. Fan speed control optimizes unit fan speed based on thermostat/room sensor inputs. The fan speed switch allows for manually setting an optimal fan speed specific to the application requirements. Each position on the fan speed switch represents settings 1-4. See Table 1 below and Table 10 on page 44 for a complete list of fan speed selector switch settings.

Figure 5: 4-position fan speed selector switch

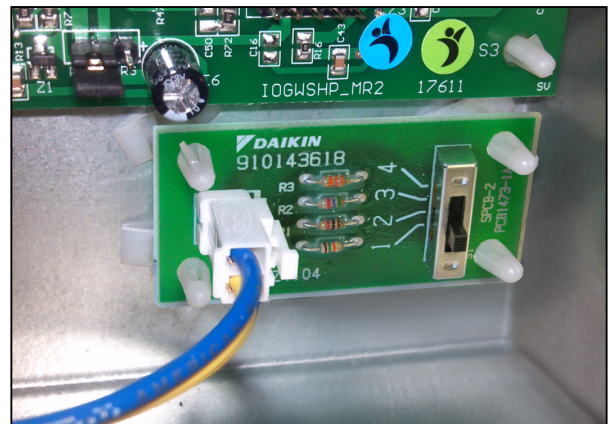


Table 1: Fan speed selector switch settings (2-ton unit example)

MicroTech III Unit Controller							I/O Expansion Module				
Setting	Maximum ESP (in. wc.) ²	¹ Low CFM Heat	¹ High CFM Heat	¹ Low CFM Cool	¹ High CFM Cool	Electric Heat	Setting	Fan Only	Dehumidification	Hydronic Heat	Waterside Economizer
4 (High)	.70	800	900	800	900	900	A	800	600	800	800
3 (Standard)	.70	700	800	700	800	900	B	700	600	700	700
2 (Medium)	.70	600	700	600	700	900	C	600	600	600	600
1 (Low)	.70	600	600	600	600	900	D	450	600	450	600

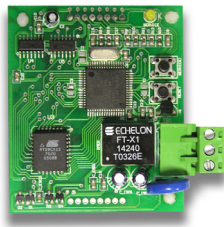
MicroTech® III SmartSource Controller with LONWORKS® Communication Module



Each Daikin water source heat pump can be equipped with a LONWORKS communication module that is LONMARK 3.4 certified. The controller is microprocessor-based and is designed to communicate over a LONWORKS communications network. It can be factory or field-installed.

The unit controller is programmed and tested with all the logic required to monitor and control the unit. An optional wall sensor may be used with the communication module to provide limited local control of the Water Source Heat Pump. The unit controller monitors water and air temperatures and passes information to the communication module. The module communicates with the BAS, to provide network control of the Water Source Heat Pump.

Figure 6: MicroTech III LONWORKS snap-in communication module



The MicroTech III SmartSource unit controller with communication module includes a unit-mounted return air, discharge air and leaving water temperature sensor. Wall mounted temperature sensors include setpoint adjustment and tenant override. The user has the capability of substituting the wall sensor with a duct-mounted return air sensor.

MicroTech III SmartSource Unit Controller with LONWORKS Communication Module orchestrates the following unit operations:

- Enable heating and cooling to maintain setpoint based on a room sensor
- Enable fan and compressor operation
- Monitors all equipment protection controls
- Monitors room and discharge air temperatures
- Monitors leaving water temperature
- Relays status of all vital unit functions

The MicroTech III SmartSource unit controller with communication module includes:

- A Return Air Temperature sensor (RAT) (factory provided, field-installed)
- A Discharge Air Temperature sensor (DAT) (factory provided, field-installed)
- A Leaving Water Temperature sensor (LWT)

Note: Refer to IM 956-X for details to install (RAT), (DAT) and (LWT) sensors.

The communication module provides access to setpoints for operational control

Available wall sensors include:

- Digitally Adjustable with Temperature & Humidity Display
- Adjustable Cool/Warm with Occupancy Switch
- Adjustable 55°F to 95°F
- Adjustable -3°F to +3°F (-1.5°C to +1.5°C)
- Basic Room Sensor With Cool to Warm
- Basic Room Sensor
- Basic Sensor

MicroTech III SmartSource Controller with BACnet® Communication Module



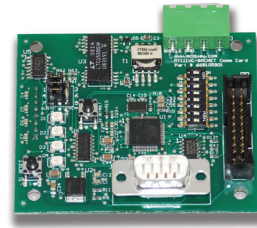
Daikin water source heat pumps are available with a BACnet MS/TP communication module that is designed to communicate over a BACnet MS/TP communications network to a building automation system (BAS). It can be factory or field-installed.

The unit controller is programmed and tested with all the logic required to monitor and control the unit. An optional wall sensor may be used with the communication module to provide limited local control of the water source heat pump. The unit controller monitors water and air temperatures and passes information to the communication module. The module communicates with the BAS, to provide network control of the water source heat pump.

The module makes operational data and commands available on a communications network using BACnet objects and properties:

- The network cable is a shielded twisted-pair cable
- Network communications run up to 76.8 Kbps
- DIP switches on the controller enable the MS/TP MAC address to be set in the range 0-127
- Four green status LEDs on the communication module indicate communication activity on the MS/TP communication network and with the unit controller

Figure 7: MicroTech III BACnet snap-in communication module



MicroTech III SmartSource unit controller with BACnet MS/TP Communication Module orchestrates the following unit operations:

- Enable heating and cooling to maintain setpoint based on a room sensor
- Enable fan and compressor operation
- Monitors all equipment protection controls
- Monitors room and discharge air temperatures
- Monitors leaving water temperature
- Relays status of all vital unit functions

The MicroTech III SmartSource unit controller with communication module includes:

- A Return Air Temperature sensor (RAT) (factory-provided, field-installed)
- A Discharge Air Temperature sensor (DAT) (factory-provided, field-installed)
- A Leaving Water Temperature sensor (LWT)

Note: Refer to IM 956-X for details to install (RAT), (DAT) and (LWT) sensors.

The communication module provides access to setpoints for operational control.

Available wall sensors include:

- Digitally Adjustable with Temperature & Humidity Display
- Adjustable Cool/Warm with Occupancy Switch
- Adjustable 55°F to 95°F
- Adjustable -3°F to +3°F (-1.5°C to +1.5°C)
- Basic Room Sensor With Cool to Warm
- Basic Room Sensor
- Basic Sensor

Hoses, Hose Kits and Shutoff Ball Valves for SmartSource Water Source Heat Pumps

Daikin sells a variety of flexible supply, return and condensate hoses and hose assemblies for connecting its water source heat pumps to a building's hard piping system. See catalog 1196-x for the complete hose and hose kit offering.

Figure 8: Flexible, steel braided supply and return hoses



Supply and return hoses have a swivel fitting at one end to facilitate removal of the unit for replacement or service.

Standard supply and return fire-rated hoses have either a thermoplastic rubber or synthetic polymer core with a braided covering of stainless steel. Fittings are either plated steel or brass.

Table 2: Available fire rated supply and return hoses

Description	Connection Size (O.D.)	Length
Supply and Return Hoses	1/2"	24"
		36"
	3/4"	24"
		36"
	1"	24"
		36"

Shutoff Ball Valves with Memory Stop

Constructed of brass and rated at 400 psig (2758 kPa) maximum working pressure. Valves have a built-in adjustable memory stop to eliminate rebalancing. Valves have FPT connections on both ends for connection to the water hose and to the field piping.

Figure 9: Shutoff ball valve with memory stop



2 & 3-Way Motorized Water Valves

2-way valves are used for variable pumping applications when more than one unit is installed on a common loop. These valves are also used to conserve water when used for ground water applications.

3-way valves are used for constant flow applications or installed at the end of a variable flow branch piping run to maintain minimum flow conditions.

Figure 10: 2-way and 3-way motorized water valves

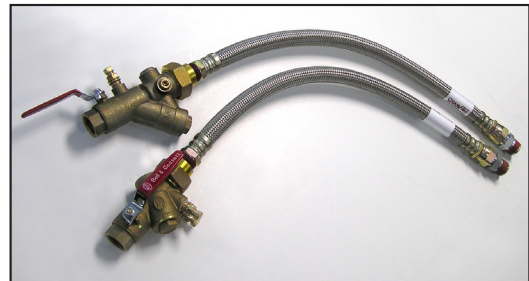


Table 3: Available motorized valves

Type	Size	Connection
2-Way Motorized	1/2"	Sweat
	3/4"	Sweat
	1"	Sweat
	1/2"	NPT
	3/4"	NPT
3-Way Motorized	1"	NPT
	1/2"	Sweat
	3/4"	Sweat
	1"	Sweat

Supply and Return Hose Kits

Figure 11: Supply and return hoses



Supply Hose - Combination Ball Valve & Strainer

The supply valve body is a combination Y-strainer full port shut-off valve and union for use in HVAC systems. Strainers are furnished with a 20 mesh stainless steel screen, hose end drain (blow down) valve for purging, one pressure/temperature port for commissioning, and one plugged bypass port. Three additional 1/4" taps are plugged and available for accessories when specified. A variety of pipe connections are available on both the fixed and union ends. Standard end connections are female pipe thread.

Condensate Hose Kits



Horizontal ceiling units require an external condensate hose. These can be ordered as the long clear plastic type with the necessary clamps and a MPT hose fittings, or fire rated type for connection to the FPT field piping.

Table 4: Available condensate hose kits

Description	Size & Nominal Length
Hose, Fire Rated Condensate	3/4" FPT x 24"
Hose, Fire Rated Condensate	3/4" FPT x 36"
Hose, Plastic Condensate w/Fittings	3/4" x 30"
Hose, Plastic Condensate w/Fittings	3/4" x 36"

Electric Duct Heaters (Horizontal Units)

Horizontal units utilize a (field-installed) external duct-mounted electric heater. With boilerless electric heat, if the EWT is above the set point of the EWT thermostat, a switch is located in the control box to activate electric heat in the event of a compressor failure. With supplemental electric heat control the compressor and heater operate simultaneously, activated by a wall thermostat. "Emergency heat" is activated by a 24V signal for external duct-mounted electric heat. This function is activated from the wall thermostat via the "Emergency Heat" switch.

Figure 12: External electric heater (field-installed)

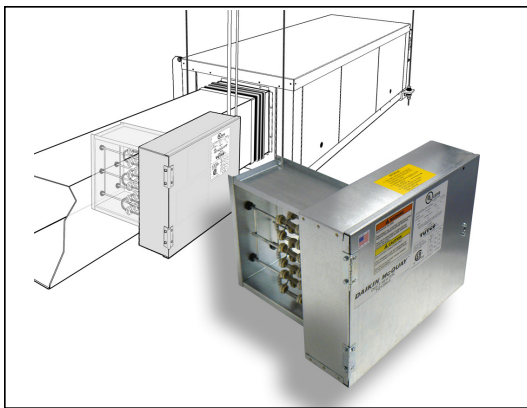
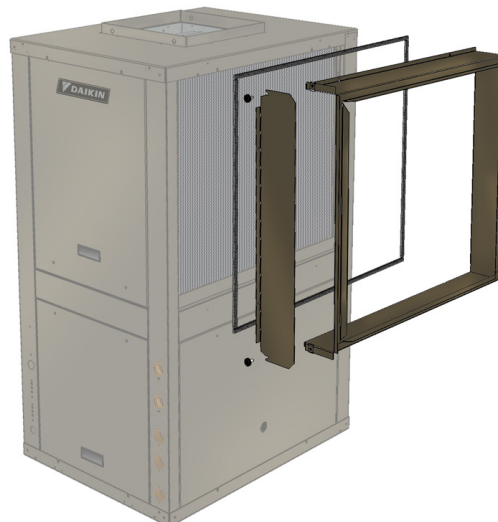


Table 5: Available electric duct heaters

Description	kW	Voltage/Hz/Phase	Unit Size
Electric Duct Heater Kit	5	208-240/60/1	024-032
		208-240/60/3	
		277/60/1	
		480/60/3	
	10	208-240/60/1	024-032
		208-240/60/3	
		277/60/1	
		480/60/3	
	5	208-240/60/1	036-072
		208-240/60/3	
		277/60/1	
		480/60/3	
10	208-240/60/1	036-072	
	208-240/60/3		
	277/60/1		
	480/60/3		
15	208-230/60/1	036-072	
	208-230/60/3		
	460/60/3		
	460/60/3		
20	208-230/60/1	036-072	
	208-230/60/3		
	460/60/3		

Filters

A 2" or 4" filter rack is available as a field-installed accessory to accept a Merv 8 or Merv 13 filter, for applications requiring optimal Indoor Air Quality (IAQ). The high Merv filter rack is provided with gaskets between it and the cabinet and along the edge of the tool-less removable door. The gaskets maintain the leakage rate below 4 CFM per square foot of filter area at .5" ESP.



Loop Circulating Pump Modules



Single pump module

Dual pump module

Features

- Fully insulated cabinet eliminates condensation
- No assembly required
- All pump modules are leak tested
- Full flow 1-1/8" brass valves
- Standard 1" NPT connections
- Compatible with all industry components
- Functions smoothly and quietly
- Easy access to valves and circulators for ease of service
- 14-3/4" x 13-1/4" x 7" unit size makes for a compact unit
- Installation hose kit available
- Five year parts & labor warranty

Operation

The circulator pumps in a geothermal loop energizes and circulates the liquid through a geothermal heat pump and the earth loop. This results in the transfer of heat.

Installation

Wall Mounting Designed for quick and easy installation, the loop pump module can be attached to most any wall using the screws and the mounting holes provided on the back flange of the pump module. External connections are standard 1" NPT to accommodate industry standard fittings.

Filling and Flushing

Filling and flushing of the pump module occurs through the connections at front. To direct flow, the module's two brass valves rotate to four positions.

Local Codes

The Daikin pump modules meet or exceed most city and state building codes, but it is recommend that installers always check local city installation requirements that may be unique to their geographic region.

Loop Pump Modules Specifications:

Single Pump Geothermal Loop Modules

Module Dimensions: 14 3/4" x 13 1/4" x 7 1/8"
 Available Bell & Gossett Circulators
 (All Circulators)..... 1 Phase 60 Hz
 Cast Iron 230 VAC
 Load:..... Low 0.6A /Med
 0.8A /High 1.2A
 Bronze 230 VAC
 Load:..... Low 0.6A /Med
 0.8A /High 1.2A

Approved Liquid Solutions:

Methanol, Exoendosol, Propylene Glycol

Additional Information:

Minimum Valve Bore:..... 1-1/8"
 External Piping Connections 1" NPT
 Maximum Operating Pressure:..... 150 PSI
 Minimum Operating Temperature: 0°F
 Maximum Operating Temperature: 225°F
 Weight: 34 lbs.

Dual Pump Geothermal Loop Modules

Module Dimensions: 14 3/4" x 13 1/4" x 7 1/8"
Available Bell & Gossett Circulators
 (All Circulators)..... 1 Phase 60 Hz
 Cast Iron 230 VAC..... (2 pumps)
 Load:..... Low 1.2A /Med
 1.6A / High 2.4A
 Bronze 230 VAC..... (2 pumps)
 Load:..... Low 1.2A /Med
 1.6A /High 2.4A

Approved Liquid Solutions:

Methanol, Exoendosol, Propylene Glycol

Additional Information:

Minimum Valve Bore:..... 1-1/8"
 External Piping Connections 1" NPT
 Maximum Operating Pressure:..... 150 PSI
 Minimum Operating Temperature: 0°F
 Maximum Operating Temperature: 225°F
 Weight: 44 lbs.

Figure 13: Single pump performance curve

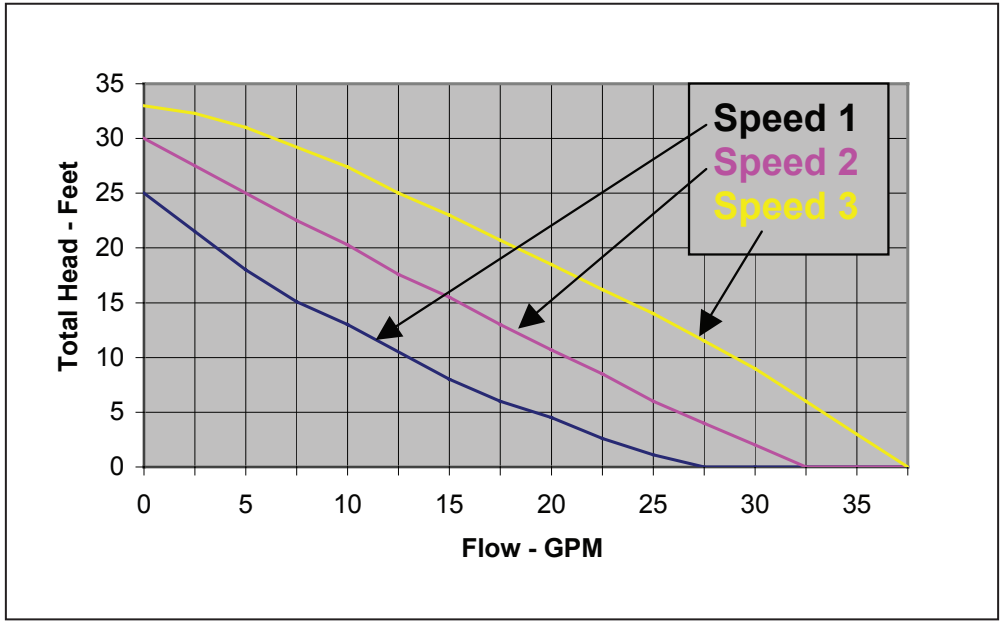
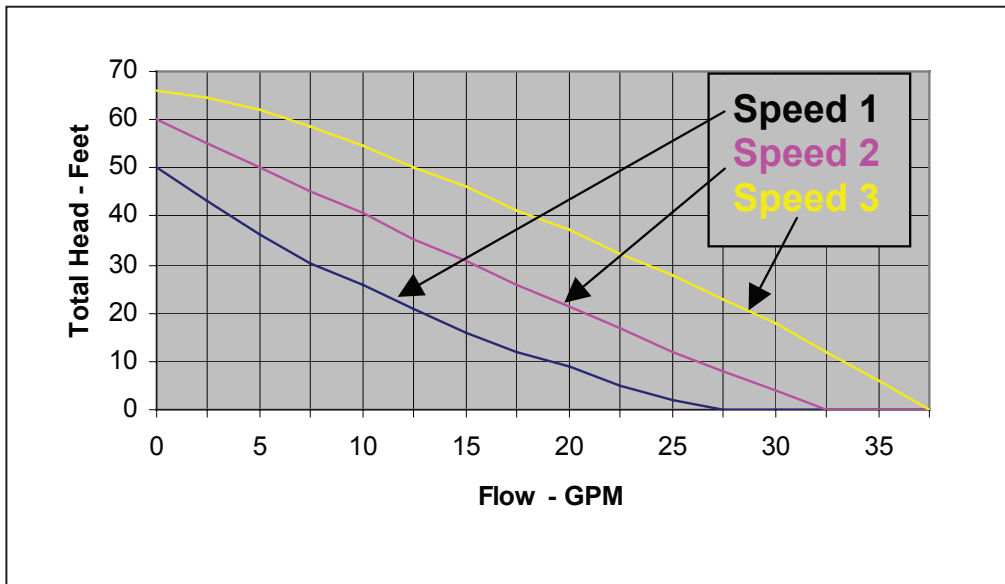


Figure 14: Dual pump performance curve



Typical Vertical Installation

Unit Location

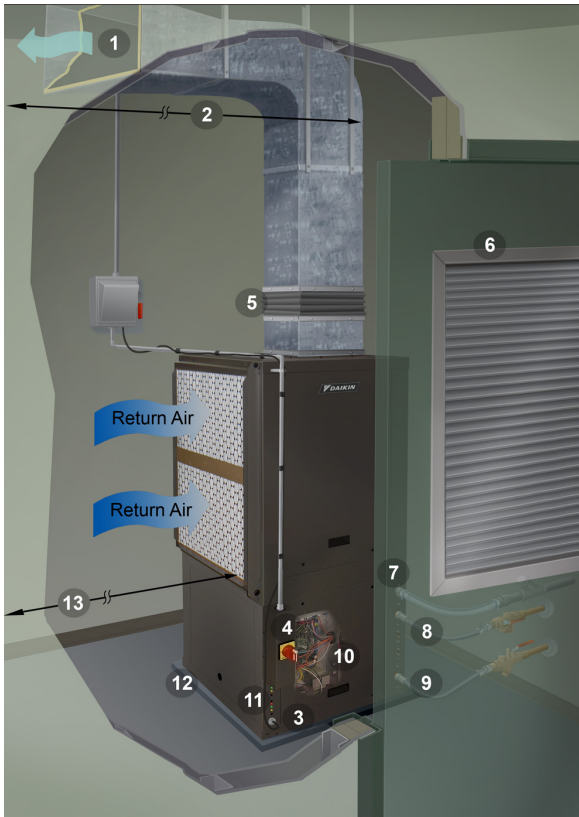
SmartSource vertical water source heat pumps can be installed “free standing” in an equipment room; however, closet installations are more common for the small vertical type units. Generally, the unit is located in the corner of a closet with the non-ducted return air facing 90° to the door and the major access panels facing the door as shown in Figure 15. Alternatively, the unit can have a ducted return air with the opening facing the door and the major access panels facing 90° to the door.

Locate a vertical unit to allow for easy removal of the filter and access panels. Allow a minimum of 18" (46 cm) clearance on each side of the unit for service and maintenance access. Always be sure to leave at least one side of the filter rack unobstructed so that the service personnel will be able to slide the filter out.

Install a field supplied line voltage disconnect for branch circuit protection.

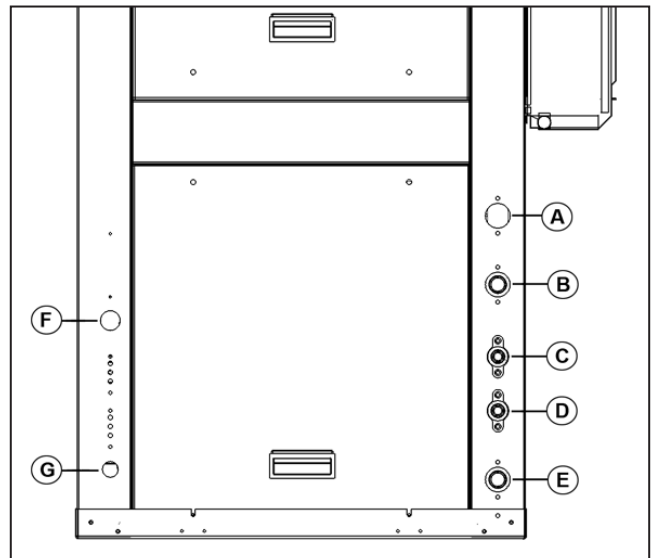
To reduce noise emissions, install a field-provided 1/2 inch thick, isolator pad below the entire base of the vertical unit. The pad should be equal to the overall foot-print size of the unit to provide sound dampening of the unit while in operation.

Figure 15: Typical closet installation - non-ducted application



1. Discharge air
2. Acoustic thermal duct lining - 10 feet
3. Low voltage wiring to unit control box
4. Line voltage disconnect
5. Flexible duct collar
6. Louvered closet door
7. Condensate drain
8. Flexible, braided, stainless steel return hose with flow controller/ball valve with port
9. Flexible, braided, stainless steel supply hose with Y-strainer/ball valve with port
10. Access to unit control box
11. LED annunciator lights indicate unit operation status and faults
12. Full vibration isolation pad between unit and floor
13. Minimum distance between return air duct collar and wall for non-ducted return applications
 - Size 007-012 – 5 inches
 - Size 015-024 – 5 inches
 - Size 030-036 – 6 inches
 - Size 042-048 – 8 inches
 - Size 060-070 – 10 inches

Figure 16: Vertical unit wiring & piping locations



- A- Condensate
- B- Water return
- C- Desuperheater water return (optional)
- D- Desuperheater water supply (optional)
- E- Water supply
- F- Line voltage unit power (electric entrance)
- G- Low voltage control Wiring (electric entrance)

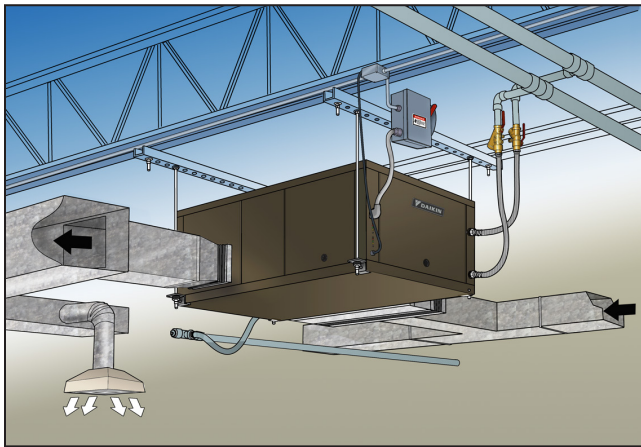
Typical Horizontal Installation

Unit Location

It is important to leave enough space for service personnel to perform maintenance or repair. Locate the horizontal unit to allow for easy removal of the filter and access panels. Allow a minimum of 18" (46 cm) clearance on each side of the unit for service and maintenance access and do not install the unit above any piping. Always be sure to leave at least one side of the filter rack unobstructed so that the service personnel will be able to slide the filter out. Each unit is suspended from the ceiling by four 3/8" threaded rods fastened to the unit by a hanger bracket and rubber isolator. The design should place the unit directly below the structural members so that it is securely anchored.

Avoid installing units directly above spaces where building occupants will reside (e.g. above office desks or classrooms) to reduce the requirement for noise attenuation. Do not place units above high traffic areas because service access may be limited during occupied hours. For example, units are typically installed above the hallway drop ceiling in schools and the supply and return air is routed directly into classrooms. Local code may require fire dampers to be used with this application.

Figure 17: Typical horizontal ceiling installation



Ductwork and Attenuation

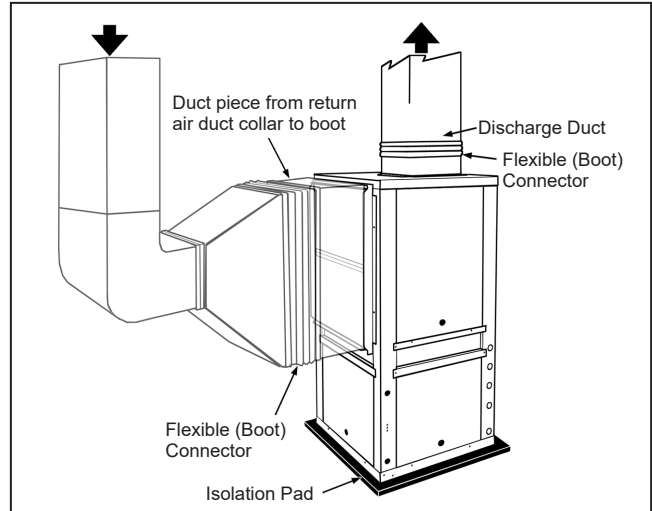
Vertical Unit

All ductwork should conform to industry standards of good practice as described in ASHRAE Systems Guide. The discharge duct system will normally consist of a flexible (boot) connector at the unit, a short run of acoustically insulated duct (approximately 10'), an 90° elbow without vanes, and a trunk duct teeing into a branch circuit with discharge diffusers as illustrated in Figure 19 on page 23.

Return air ducts can be brought in through a wall grille and then to the unit. The return duct system will normally consist of a flexible connector at the unit and a trunk duct to the return air grille. With metal duct material, the return air duct should be internally lined with acoustic insulation for sound attenuation.

Return air ductwork to the unit requires a 2" (51mm) return air duct collar and filter rack or an optional 4" (102 mm) return air duct collar and filter rack.

Figure 18: Typical installation using ducted return



Horizontal Unit

Ductwork is normally applied to ceiling-mounted heat pumps on the discharge side of the unit. A discharge collar is provided on all horizontal unit models for fastening the ductwork. Use a flexible connector between the discharge collar and the duct transformation to help reduce vibration transmission from the cabinet and to simplify disconnection of the unit from the ceiling ductwork. If return ductwork is to be used, attach a flexible connector to the filter rack collar to help reduce vibration transmission and removal of the unit. Return plenum ducting should be at least 12 inches away from the coil so that the coil is evenly loaded with return air.

As a general recommendation, duct interiors should have an acoustic / thermal lining at least 1/2 inch thick over the entire duct run. For better sound attenuation, line the last five diameters of duct before each register with a one-inch thick sound blanket. Elbows, tees and dampers can create turbulence or distortion in the airflow. Place a straight length of duct, 5 to 10 times the duct width, before the next fitting to smooth out airflow. Diffusers that are located in the bottom of a trunk duct can also produce noise. For this same reason, volume control dampers should be located several duct widths upstream from an air outlet.

Figure 19: Vertical unit duct example

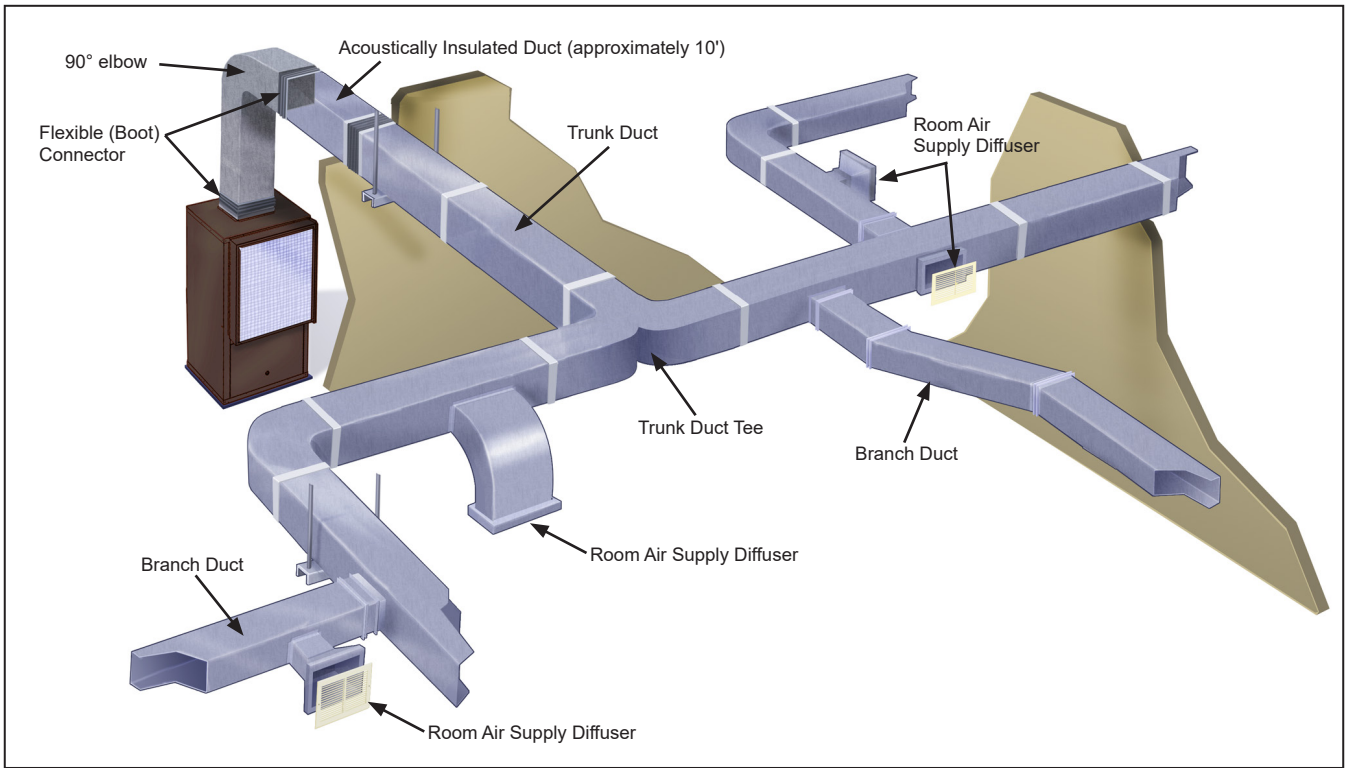
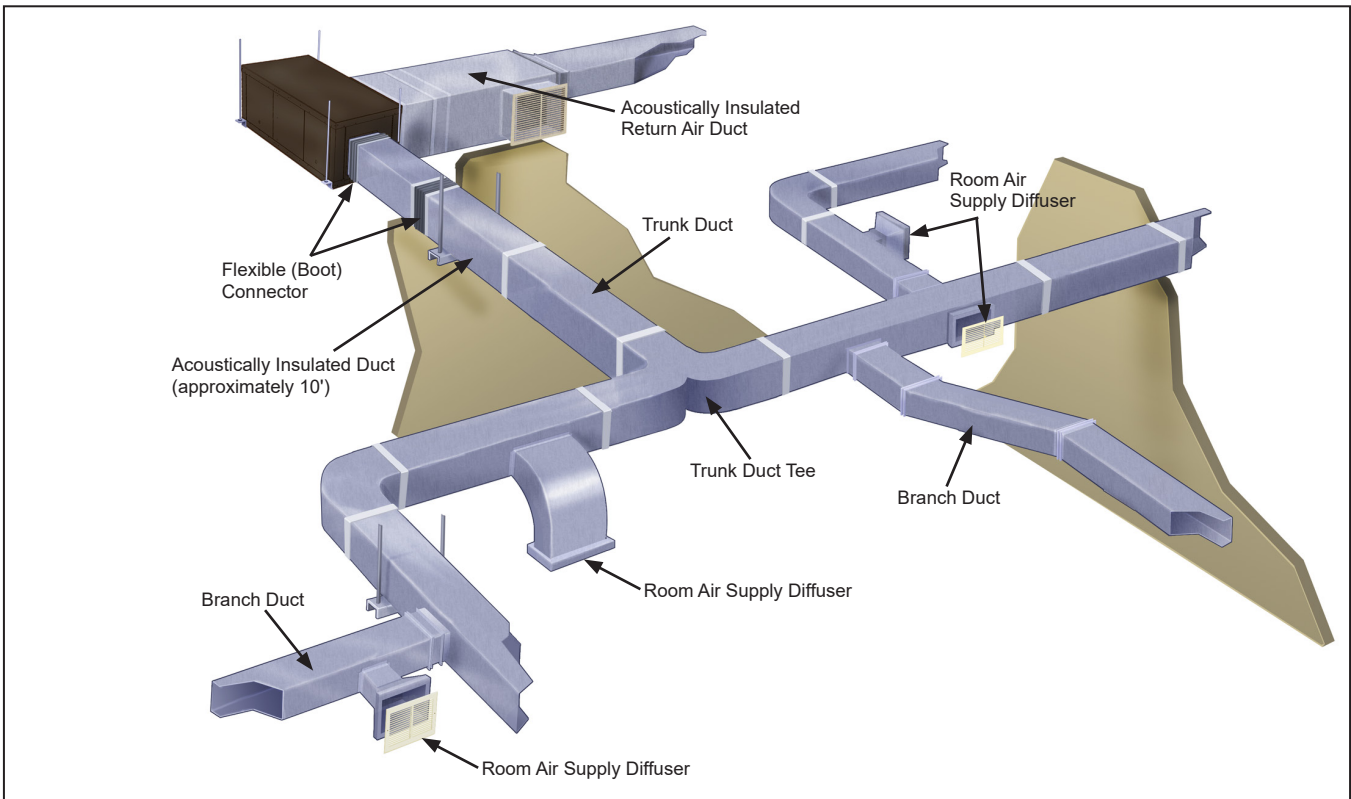


Figure 20: Horizontal unit duct example



- Notes:**
1. Do not install ducts so that the air flow is counter to fan rotation. If necessary, turn fan section.
 2. Transformations and units must be adequately supported so no weight is on the flexible boot connection.

Piping

The water source heat pump unit is typically connected to the supply / return piping using a “reverse return” piping system which includes a flow control device so that flow requirements are met for each zone. A short, high pressure “flexible hose” is used to connect the unit to the building’s hard piping and acts as a sound attenuator for both the unit operating noise and hydronic pumping noise. One end of the hose has a swivel fitting to facilitate removal of the unit for replacement or service. Include supply and return shutoff valves in the design to allow removal of a unit without the need to shut down the entire heat pump system. The return valve may be used for balancing and will typically have a “memory stop” so that it can be reopened to the proper position for the flow required. Fixed flow devices are commercially available and can be installed to eliminate the need for memory

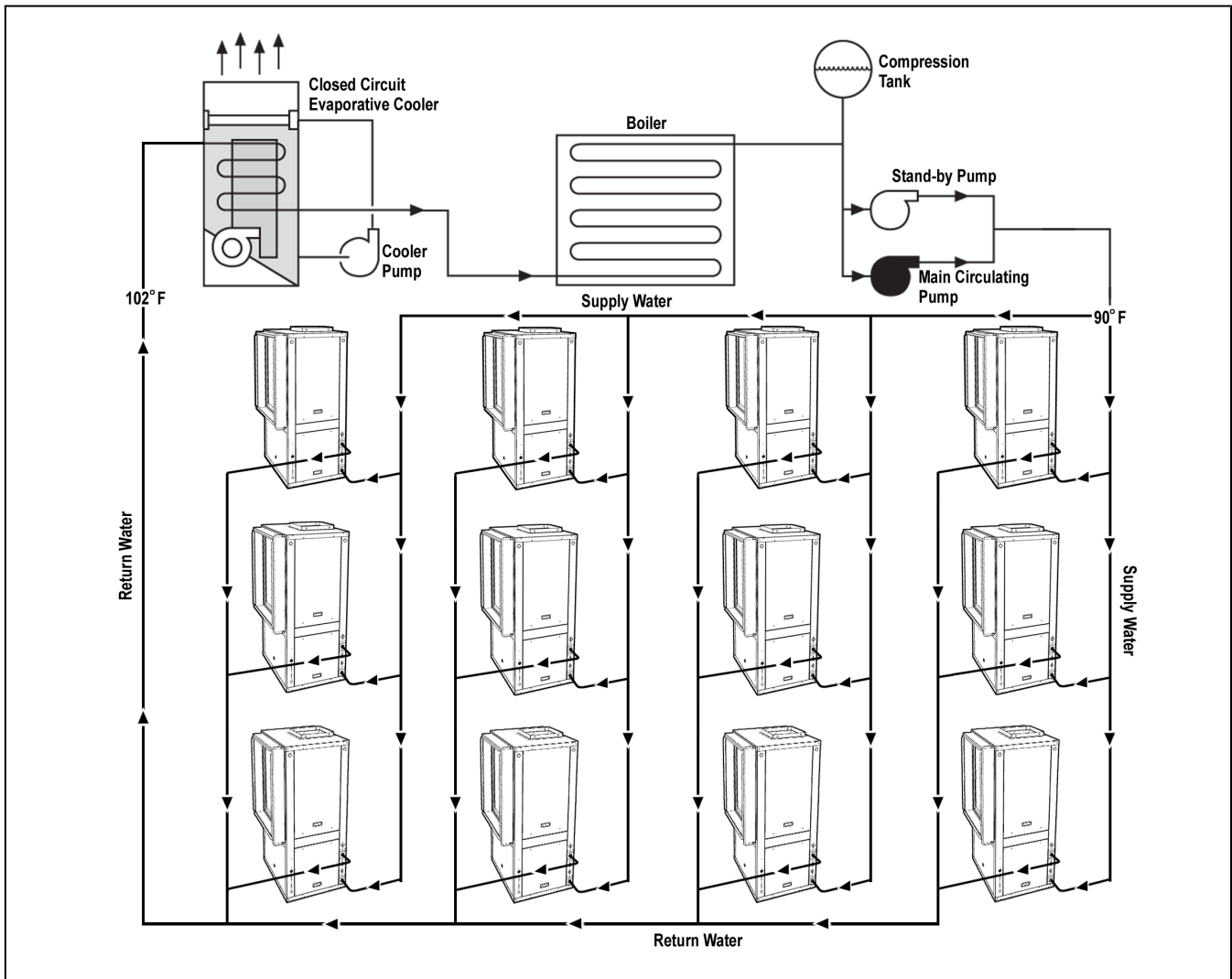
stop shut off valves. Include Pressure / Temperature ports to allow the service technician to measure water flow and unit operation.

Daikin has available optional hose kit combinations to better facilitate system flow balancing. These flexible hoses reduce vibration between the unit and the rigid piping system.

Polyolester Oil, commonly know as POE oil is a synthetic oil used in many refrigeration systems. POE oil, if ever in contact with PVC/CPVC will coat the inside wall of PVC/CPVC pipe causing environmental stress fractures.

Although there is no PVC/CPVC piping in this product, please keep this in mind when selecting piping materials for your application, as system failure and property damage could result.

Figure 21: Reverse return piping system



Water System Quality

The cleaning, flushing and chemical treatment of a water source heat pump system is fundamental to efficient operation and the life expectancy of the system.

Potential system problems produced by the use of water fall into three general categories:

1. Scale formation – Mineral deposits which result from the crystallization and precipitation of dissolved salts in the water. The deposits form an insulating barrier, reducing the heat transfer rate and impeding the circulation of fluids due to increased pressure drop.
2. Corrosion – Decomposition of the metal caused by absorption of gases from the air. Corrosion may occur in any metal component of the system.
3. Organic growths – Slime and algae which form under certain environmental conditions, and can reduce the heat transfer rate by forming an insulating coating or can promote corrosion by pitting.

The system water should be evaluated for degrees of impurity, with testing available from independent testing labs, health departments or state agencies.

Table 6 is a list of water characteristics, the potential impurities and their results and the recommended treatment.

Avoiding Potential Problems

As shown in Table 6, all water contains some degree of impurities which may affect the performance of a heat pump system. The use of a cupro-nickel coil can help avoid potential problems. Water flow rates should:

- A. Be high enough that the temperature rise through the heat exchanger does not exceed 10° F when operating in the cooling mode.
- B. Not exceed 4 GPM per nominal ton. Flow rates that have velocities of 10 feet per second or more may cause pipe erosion and heat exchanger failure.

Table 6: Water impurities, result & recommended water system application

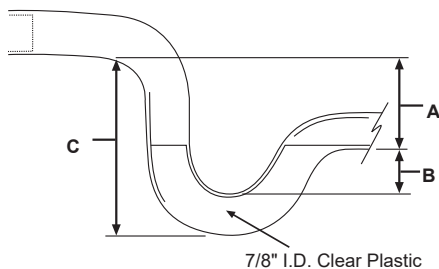
Impurity	Copper Coils	Cupro-nickel Coils	Result	Application	
				Open Recirculating	Closed Recirculating
Calcium & Magnesium Salts (hardness)	Less than 350 ppm	350 ppm Sea Water	Scaling	1. Bleed-off 2. Surface active agents such as polyphosphates. 3. Addition of acid. 4. pH adjustment. Other considerations: • Adequate fouling factor • Surface temperature • Water temperature • Clean system	No treatment required
Ironoxide	Low levels only	Moderate levels	Corrosion	1. Corrosion inhibitors in high concentrations (200 to 500 ppm). 2. Corrosion inhibitors in low concentrations (20 to 80 ppm). 3. pH control. 4. Proper materials of construction.	Corrosion inhibitors in high concentrations. Proper materials of construction.
pH	7 - 9	5 - 10			
Hydrogen Sulfide	Less than 10 ppm	10 - 50 ppm			
CO2	Less than 50 ppm	50 - 75 ppm			
Chloride	Less than 300 ppm	300 - 600 ppm			
Total Dissolved Solids	Less than 1000 ppm	1000 - 1500 ppm			
Slime & Algae	Slime and algae can form under certain environmental conditions		Reduced heat transfer due to forming of insulating coating, or pitting due to corrosion	Chlorinated phenols. Other biocides. Chlorine by hypochlorites or by liquid chlorine	No treatment required

- Notes:**
1. The tremendous variety in water quality around the country makes the recommendation of a single best method of treatment impossible. Consult a local water treatment specialist for specific treatment recommendations.
 2. Cupro-nickel is recommended if iron bacteria is high, suspended solids or dissolved oxygen levels are high.
 3. If the concentration of these corrosives exceeds the maximum tabulated in the cupro-nickel column, then the potential for serious corrosion problems exists.

Condensate Drain

Vertical units are factory provided with a condensate drain trap located inside the cabinet. Condensate removal piping must be pitched away from the unit not less than 1/4" per foot. A vent is required after the trap so that the condensate will drain away from the unit. The vent can also act as a clean out if the trap becomes clogged. To avoid having waste gases entering the building, the condensate drain should not be directly piped to a drain/waste/vent stack. See local codes for the correct application of condensate piping to drains.

Figure 22: Condensate trap detail



Improper trapping can lead to several problems. If the trap is too tall, negative pressure will prevent drainage, causing condensate backup. If the trap is too short the seal will be destroyed or nonexistent, producing the same effect as a non-trapped system.

Construct the trap of 7/8" clear plastic piping. The condensate piping from the drain trap must be sloped to facilitate proper drainage. The clear plastic trap should be clamped and removable for cleaning. It may be necessary to manually fill the trap at system startup, or to run the unit for sufficient time to build a condensate seal. The condensate trap and condensate piping drainage should be free of any foreign debris. Debris can prevent proper drainage and unit operation and result in condensate buildup.

Table 7: Condensate drain static pressures

Static Pressure	A	B	C
Standard	1-1/4"	5/8"	2-3/4"
High	1-1/2"	3/4"	3-1/8"

Operating Limits

Air Limits

Table 8: Air limits in °F (°C)

Air Limits	Standard Range Units		Extended Range (Geothermal) Units	
	Cooling	Heating	Cooling	Heating
Minimum Ambient Air ¹	50°F (10°C)	50°F (10°C)	40°F (4°C)	40°F (4°C)
Maximum Ambient Air ²	100°F/77°F (38°C/25°C)	85°F (29°C)	100°F/77°F (38°C/25°C)	85°F (29°C)
Minimum Entering Air ¹	65°F/55°F (18°C/13°C)	50°F (10°C)	65°F/55°F (18°C/13°C)	50°F (10°C)
Common Design Entering Air	75°F/63°F (24°C/17°C)	70°F (21°C)	75°F/63°F (24°C/17°C)	70°F (21°C)
Maximum Entering Air ²	85°F/71°F (29°C/22°C)	80°F (27°C)	85°F/71°F (29°C/22°C)	80°F (27°C)

Fluid Limits

Table 9: Fluid limits

Fluid Limits	Standard Range Units		Extended Range (Geothermal) Units	
	Cooling	Heating	Cooling	Heating
Minimum Entering Fluid	55°F (13°C)	55°F (13°C)	30°F (-1°C)	20°F (-6°C)
Common Design Entering Fluid	85-90°F (29-32°C)	70°F (21°C)	90°F (32°C)	35-60°F (1.5-16°C)
Maximum Entering Fluid	120°F (43°C)	90°F (32°C)	120°F (43°C)	90°F (32°C)
Minimum GPM/Ton	1.5			
Nominal GPM/Ton	3.0			
Maximum GPM/Ton	4.0			

- Notes:**
1. Maximum and minimum values may not be combined. If one value is at maximum or minimum, the other two conditions may not exceed the normal condition for standard units. Extended (Geothermal) range units may combine any two maximum conditions, but not more than two, with all other conditions being normal conditions.
 2. This is not a normal or continuous operating condition. It is assumed that such a start-up is for the purpose of bringing the building space up to occupancy temperature.

Unit Selection

Achieving optimal performance with water source heat pump systems requires both accurate system design and proper equipment selection. Use a building load program to determine the heating and cooling loads of each zone prior to making equipment selections. With this information, the Daikin SelectTools™ software selection program for Water Source Heat Pumps can be used to provide fast, accurate and complete selections of all water source heat pump products. SelectTools software is available by contacting your local Daikin Representative.

While it is recommend that you use SelectTools software for all unit selections, manual selections can be accomplished using the same zone load information and the capacity tables available in this catalog.

Boiler/Tower (Water Loop) Application:

The following example illustrates a typical selection for a unit in a boiler/tower system for a commercial building.

The load in this zone requires 41,099 Btuh of total cooling, 30,327 Btuh of sensible cooling and 37,758 Btuh of total heating. The entering water temperatures for the design conditions are 90°F for cooling and 70°F for heating. The return air temperature is 80°F dry bulb with 67°F wet bulb and 70°F for heating.

Zone Requirement:

Total Cooling Load	=	41,099 Btuh
Sensible Cooling Load	=	30,327 Btuh
Heating Load	=	37,758 Btuh
Design Air Flow	=	1,200 CFM
Return Air - Cooling	=	80°F DB/67°F WB
Return Air - Heating	=	70°F DB
Water Flow (Based on Cooling)	=	10.5 GPM

Since a Model GT *038 at full-load performance produces approximately 38,500 total cooling and 27,900 Btuh sensible cooling capacity, it is not sufficient for this zone and a model GT *044 should be considered.

Selection:

Model..... GT *044

After making the preliminary selection (GT*044 – Full Load), enter the performance from the tables on page 36 and [page 37](#)) at the design conditions and read Total Cooling, Sensible Cooling, and Heating Capacity at 10.5 GPM:

Total Cooling Capacity	=	44,000 Btuh
Sensible Cooling Capacity	=	31,900 Btuh
Heating Capacity	=	51,500 Btuh

Note: *The above performances are based on 1,400 CFM; therefore, the capacities need to be adjusted to reflect the unit performance at the zone required CFM.*

Determine the air flow correction factors from the table, "Air Flow Correction Factors – Full Load" on page [46](#).

For this example use Air Flow Setting #2 (1225 CFM):

$$\text{Corrected Total Cooling} = 44,000 \times 0.988 = 43,472 \text{ Btuh}$$

$$\text{Corrected Sensible Cooling} = 31,900 \times 0.954 = 30,433 \text{ Btuh}$$

$$\text{Corrected Total Heating} = 51,500 \times 0.991 = 51,037 \text{ Btuh}$$

Compare the corrected Total Cooling, Corrected Sensible Cooling, and the Corrected Total Heating figures to the Zone requirements. This selection meets the requirements.

Next, determine the power correction factors using the table, "Air Flow Correction Factors – Full Load" on page [46](#) using Air Flow Setting #2 (1225 CFM):

$$\text{Corrected Cooling Input Power} = 2.908 \times 0.985 = 2.864 \text{ kW}$$

$$\text{Corrected Heating Input Power} = 3.040 \times 0.998 = 3.034 \text{ kW}$$

The resulting efficiencies can be determined using the corrected capacities and input power:

$$\text{EER} = \text{Cooling Capacity (Btuh)} \div \text{Input Power (Watts)}$$

$$\text{EER} = 43,472 \text{ Btuh} \div (2.864 \text{ kW} \times 1000) = 15.2$$

$$\text{COP} = \text{Heating Capacity (Watts)} \div \text{Input Power (Watts)}$$

$$\text{COP} = (51,037 \text{ Btuh} \div 3.412) \div (3.034 \text{ kW} \times 1000) = 4.93$$

Geothermal (Ground Loop) Application:

The following example illustrates the same zone in a geothermal application.

The space requirements for the zone are the same as the previous example – 41,099 Btuh of total cooling and 30,327 Btuh of sensible cooling and 37,758 Btuh of heating. Geothermal loop software programs are available to help determine the size of the loop field based on:

- Desired entering water temperatures for the system.
- Specific loop field design criteria based on acreage available, loop field spacing, vertical bore depth, piping selected, flow rates, circulated heat transfer fluid, and local formation geology for the loop which produces specific min./max loop temperatures for the unit selection.

Entering fluid temperatures for geothermal systems can be as high as 110°F and as low as 20°F. Design entering fluid temperatures for heating and cooling are selected by the design engineer based on building loads, ground temperatures, and soil conditions. Typical design entering fluid temperatures are 90°F for cooling (summer) and 45°F for heating (winter). As a rule of thumb, the design entering fluid temperature for cooling is 10°F below the maximum outdoor air temperature, and the design entering fluid temperature for heating is 40°F above the minimum outdoor air temperature. Water flow rates are typically 2.5 to 3.0 GPM per ton and the use of anti-freeze is recommended in most northern applications.

Zone Requirement:

Total Cooling Zone	=	41,099 Btuh
Sensible Cooling Zone	=	30,327 Btuh
Heating Zone	=	37,758 Btuh
Design Air Flow	=	1,200 CFM
Return air – Cooling	=	80°F DB/67°F WB
Return air – Heating	=	70°F
Entering Fluid Temperature - Cooling	=	100°F – 20% P.G.
Entering Fluid Temperature - Heating	=	45°F – 20% P.G.

A Model GT *044 is chosen for this geothermal application. Model “GT” offers insulated water piping for condensation considerations and a different freestat setting to allow entering fluid temperatures down to 20°F (with antifreeze). Output capacities should be recalculated using the antifreeze correction tables that are shown on [page 53](#). The Model GT *044 is first considered but may not meet the Zone requirements due to the reduced entering fluid temperatures (45°F) and an antifreeze solution of 20% propylene Glycol.

Selection:

Model GT *044

From the capacity tables on [page 36](#) and [page 37](#).

Total cooling capacity	=	41,900 Btuh
Table Sensible cooling	=	31,100 Btuh
Total heating capacity	=	39,200 Btuh

Next, determine the airflow and antifreeze correction factors.

Corrected Capacity = Capacity Table Data × Air Flow Correction × Antifreeze Correction

Corrected Total Cooling = 41,900 × 0.988 × 0.980 = 40,569 Btuh

Corrected Sensible Cooling = 31,100 × 0.954 × 0.980 = 29,076 Btuh

Corrected Heating Capacity = 39,200 × 0.991 × 0.975 = 37,876 Btuh

Since the sensible capacity is slightly less than the design sensible load, judgment must be used to determine if the next larger capacity unit is necessary. Oversized equipment should be avoided to minimize the potential for humidity and comfort issues.

Next, determine the power correction factors from the table, "Air Flow Correction Factors – Full Load" on [page 46](#) using Air Flow Setting #2 (1225 CFM):

Corrected Cooling Input Power = 3.246 × 0.985 = 3.197 kW

Corrected Heating Input Power = 2.725 × 0.998 = 2.720 kW

The resulting efficiencies can be determined using the corrected capacities and corrected input power:

EER = Cooling Capacity (Btuh) ÷ Input Power (Watts)

EER = 40,569 Btuh ÷ (3.197 kW × 1000) = 12.7

COP = Heating Capacity (Watts) ÷ Input Power (Watts)

COP = (37,876 Btuh ÷ 3.412) ÷ (2.720 kW × 1000) = 4.08

* - indicates Vertical or Horizontal configuration.

Loop Pump Application and Selection

The SmartSource loop pump package is intended for systems designed specifically for distributed or decentralized pump applications eliminating the need for central pumping systems. These systems can be applied to geothermal or boiler/tower applications. However, geothermal applications tend to be more common since system head losses can be better managed to suite the system design requirements. To do so, attention must be given to minimize head loss in the piping system. These recommendations include:

- Minimize head loss in headers and unit flex hose connections to less than 4 ft. per 100 ft of pipe
- Vertical bore length should be limited to:
 - 200 ft for 3/4" HDPE U-tube pipe
 - 300 ft for 1" HDPE U-tube pipe
 - 500 ft for 1 1/4" HDPE U-tube pipe

- Notes:**
1. Unit head loss should not exceed 12 ft of water.
 2. Use ball or butterfly valves to minimize head loss.
 3. Do not use flow control devices such as Circuit Sentry™ flow regulating valves Control valves, if necessary, Cv should be greater than or equal to the unit flow rate.

The benefit of a decentralized system can be realized by minimizing head loss while allowing the SmartSource loop pump(s) to cycle on when there is a call for heating or cooling. This allows the loop pump(s) to remain off during the unit off-cycle. In a typical 40-hour per week operating schedule, a significant portion of the energy consumed by a central pumping systems occurs during unoccupied periods due to reduced pump efficiencies at part load. However, lower annual energy consumption can be realized with the decentralized SmartSource loop pump(s) when head loss and operating hours are minimized.

The maximum working pressure is 145 psi or 335 ft. of water. As a result, this pump system must be limited to mid-rise building applications of no more than approximately 30 stories high. Excessive working pressure can damage the pump seals and reduce the pump operating life. An intermediate heat exchanger should be considered for high-rise building applications to limit static pressures to no more than 145 psi or 335 ft. of water.

When selecting an appropriate SmartSource loop pump, the working fluid (water plus antifreeze), total head loss and flow must be known. The following represents the typical total head loss calculation for a decentralized geothermal loop pump application:

- Using nominal 2-ton vertical unit W.GTV.1.026
- Fluid – 15% Methanol Solution in Water
- Design EWT Heating - 35°F

(Maximum pressure drop occurs with high density fluid. As a result, the design heating EWT will be used to calculate the Total Head Loss)

- Design Water Flow – 3 gpm/ton or 6 gpm for a 2-ton unit
- Length of 1" HDPE piping between the unit and the loop field manifold – 40 feet of length
- Geothermal Loop – (1) 1" HDPE U-tube - 300 feet bore depth

Component	Head Loss (Ft. of W.C.)
1" HDPE Piping and Elbows	2.3
Geothermal Loop Piping	8.6
Unit – W.GTV.1.026	5.5
Total	16.4

For the design conditions of 6 gpm and a total head loss of 16.4 Ft., select the single pump option. The system curve and pump curve for this selection is shown in Figure 25. As a result, the actual calculated flow will be 7.56 gpm with a head on the pump of 28 Ft. Applications with higher head loss may require the (one) high head pump

option or one of the two-pump options using either (two) low head pumps or (two) high head pumps option, piped in series. Pumps piped in series provide approximately double the head capability compared to single pump systems. Also see "Loop Pump Performance" on page 47.

Figure 23: Dual Pumps - Heat Pump (side view)

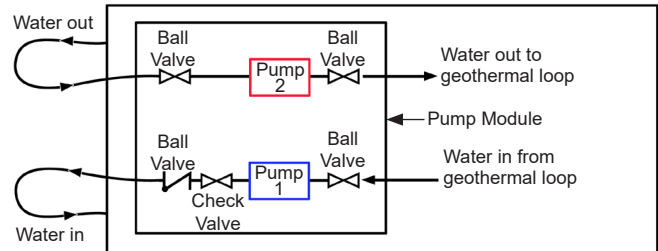


Figure 24: Single Pump - Heat Pump (side view)

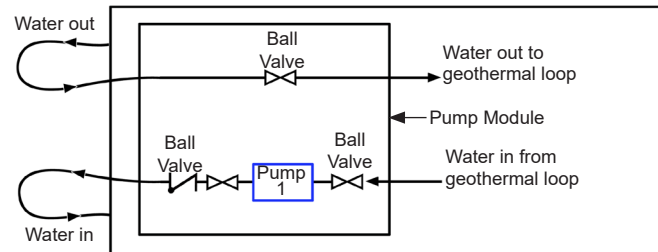
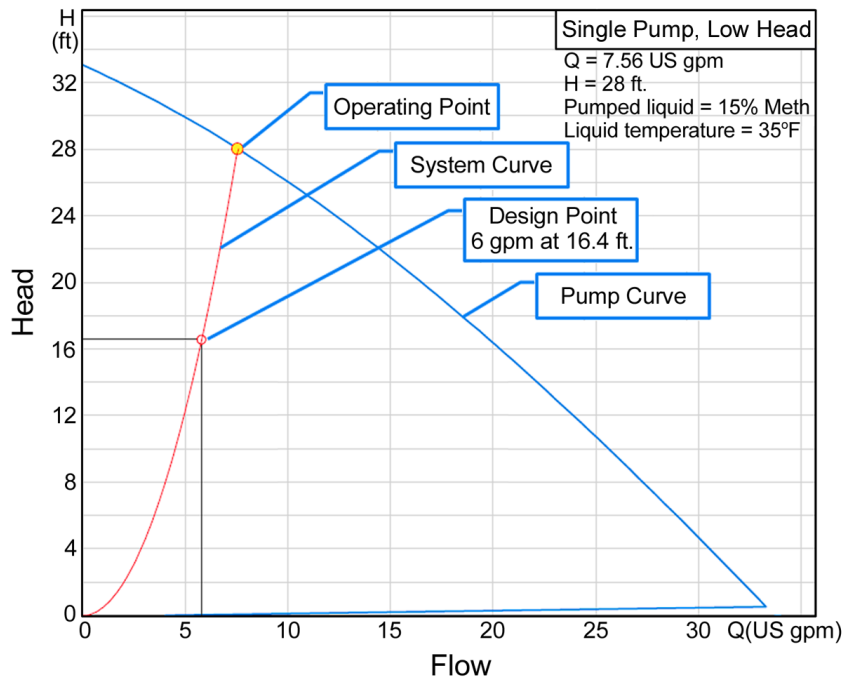


Figure 25: System and pump curve for one, low head pump option



Size 026 (800 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating															
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP											
20	4.0	1.2	2.7	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						14900	1.294	10500	83	3.37										
		1.2	2.7	70/59							14700	1.350	10100	87	3.19										
		1.2	2.7	75/63							14500	1.420	9700	92	2.99										
		1.2	2.7	80/67							14200	1.490	9100	96	2.79										
	6.0	2.5	5.7	65/55							15400	1.305	10900	84	3.46										
		2.5	5.7	70/59							15300	1.361	10700	88	3.29										
		2.5	5.7	75/63							15000	1.431	10100	92	3.07										
		2.5	5.7	80/67							14800	1.501	9700	97	2.89										
	8.0	4.2	9.6	65/55							16000	1.317	11500	84	3.56										
		4.2	9.6	70/59							15800	1.373	11100	88	3.37										
		4.2	9.6	75/63							15600	1.443	10700	93	3.17										
		4.2	9.6	80/67							15400	1.513	10200	98	2.98										
30	4.0	1.2	2.7	65/55						17500	1.336	12900	86	3.84											
		1.2	2.7	70/59						25400	19900	0.902	28500	28.2	17300	1.392	12500	90	3.64						
		1.2	2.7	75/63						27000	19600	0.918	30100	29.4	17100	1.462	12100	95	3.42						
		1.2	2.7	80/67						28600	19200	0.934	31800	30.6	16900	1.532	11700	99	3.23						
	6.0	2.4	5.5	65/55						30200	18800	0.950	33400	31.8											
		2.4	5.5	70/59						23800	21100	0.879	26800	27.1							18100	1.347	13500	87	3.93
		2.4	5.5	75/63						25400	20000	0.894	28500	28.4							17900	1.403	13100	91	3.74
		2.4	5.5	80/67						27100	19600	0.910	30200	29.8							17700	1.473	12700	95	3.52
	8.0	2.4	5.5	80/67						28700	19200	0.926	31900	31.0	17400	1.543	12100	100	3.30						
		2.4	5.5	85/71						30300	18900	0.942	33500	32.2											
		4.1	9.3	65/55						23900	21200	0.871	26900	27.4							18600	1.358	14000	87	4.01
		4.1	9.3	70/59						25500	20000	0.886	28500	28.8							18500	1.414	13700	91	3.83
4.1	9.3	75/63	27100	19600	0.902	30200	30.0	18200	1.484	13100	96	3.59													
40	4.0	1.1	2.6	65/55	24400	21600	0.986	27800	24.7	20400	1.394	15600	89	4.29											
		1.1	2.6	70/59	26000	20400	1.001	29400	26.0	20200	1.450	15300	93	4.08											
		1.1	2.6	75/63	27600	20100	1.017	31100	27.1	20000	1.520	14800	98	3.85											
		1.1	2.6	80/67	29200	19700	1.033	32700	28.3	19800	1.590	14400	103	3.65											
	6.0	1.1	2.6	85/71	30800	19300	1.049	34400	29.4																
		2.3	5.4	65/55	24400	21600	0.978	27700	24.9							21000	1.405	16200	90	4.38					
		2.3	5.4	70/59	26000	20500	0.993	29400	26.2							20800	1.461	15800	94	4.17					
		2.3	5.4	75/63	27700	20100	1.009	31100	27.5							20600	1.531	15400	99	3.94					
	8.0	2.3	5.4	80/67	29300	19700	1.025	32800	28.6	20300	1.601	14800	103	3.71											
		2.3	5.4	85/71	30900	19400	1.041	34500	29.7																
		4.0	9.0	65/55	24500	21700	0.970	27800	25.3							21500	1.416	16700	91	4.45					
		4.0	9.0	70/59	26100	20500	0.985	29500	26.5							21300	1.472	16300	95	4.24					
4.0	9.0	75/63	27700	20100	1.001	31100	27.7	21100	1.542							15800	99	4.01							
50	4.0	1.1	2.5	65/55	24600	22000	1.092	28300	22.5	23500	1.464	18500	93	4.70											
		1.1	2.5	70/59	26200	20800	1.107	30000	23.7	23300	1.520	18100	97	4.49											
		1.1	2.5	75/63	27800	20500	1.123	31600	24.8	23100	1.590	17700	102	4.25											
		1.1	2.5	80/67	29400	20100	1.139	33300	25.8	22800	1.660	17100	106	4.02											
	6.0	1.1	2.5	85/71	31000	19700	1.155	34900	26.8																
		2.3	5.2	65/55	24700	22000	1.084	28400	22.8							24000	1.475	19000	94	4.76					
		2.3	5.2	70/59	26300	20900	1.099	30100	23.9							23800	1.531	18600	97	4.55					
		2.3	5.2	75/63	27900	20500	1.115	31700	25.0							23600	1.601	18100	102	4.32					
	8.0	2.3	5.2	80/67	29500	20100	1.131	33400	26.1	23400	1.671	17700	107	4.10											
		2.3	5.2	85/71	31100	19800	1.147	35000	27.1																
		3.9	8.8	65/55	24700	22100	1.076	28400	23.0							24600	1.486	19500	94	4.85					
		3.9	8.8	70/59	26300	20900	1.092	30000	24.1							24400	1.542	19100	98	4.63					
3.9	8.8	75/63	27900	20500	1.108	31700	25.2	24200	1.612							18700	103	4.40							
60	4.0	3.9	8.8	80/67	29600	20100	1.124	33400	26.3	23900	1.682	18200	108	4.16											
		3.9	8.8	85/71	31200	19800	1.140	35100	27.4																
		1.1	2.4	65/55	24300	22000	1.207	28400	20.1							26600	1.541	21300	97	5.05					
		1.1	2.4	70/59	25900	20900	1.222	30100	21.2							26400	1.597	20900	100	4.84					
	1.1	2.4	75/63	27500	20500	1.238	31700	22.2	26200							1.667	20500	105	4.60						
	6.0	1.1	2.4	80/67	29100	20100	1.254	33400	23.2	25900	1.737	20000	110	4.37											
		1.1	2.4	85/71	30800	19800	1.270	35100	24.3																
		2.2	5.1	65/55	24400	22100	1.199	28500	20.4							27100	1.552	21800	97	5.11					
		2.2	5.1	70/59	26000	20900	1.214	30100	21.4							26900	1.608	21400	101	4.90					
	2.2	5.1	75/63	27600	20500	1.230	31800	22.4	26700							1.678	21000	106	4.66						
	8.0	2.2	5.1	80/67	29200	20200	1.246	33500	23.4	26500	1.748	20500	111	4.44											
		2.2	5.1	85/71	30800	19800	1.262	35100	24.4																
3.8		8.6	65/55	24400	22100	1.192	28500	20.5	27700							1.563	22400	98	5.19						
3.8		8.6	70/59	26000	20900	1.207	30100	21.5	27500							1.619	22000	102	4.97						
3.8	8.6	75/63	27700	20500	1.223	31900	22.6	27300	1.689							21500	106	4.73							
8.0	3.8	8.6	80/67	29300	20200	1.239	33500	23.6	27000	1.759	21000	111	4.49												
	3.8	8.6	85/71	30900	19800	1.255	35200	24.6																	

Size 026 (800 CFM) (continued)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	4.0	1.0	2.4	65/55	23500	21700	1.333	28000	17.6	29600	1.621	24100	100	
		1.0	2.4	70/59	25100	20500	1.348	29700	18.6	29400	1.677	23700	104	5.13
		1.0	2.4	75/63	26800	20200	1.364	31500	19.6	29200	1.747	23200	109	4.89
		1.0	2.4	80/67	28400	19800	1.380	33100	20.6	29000	1.817	22800	113	4.67
	6.0	2.2	5.0	65/55	23600	21700	1.325	28100	17.8	30200	1.632	24600	101	5.42
		2.2	5.0	70/59	25200	20600	1.340	29800	18.8	30000	1.688	24200	105	5.20
		2.2	5.0	75/63	26800	20200	1.356	31400	19.8	29800	1.758	23800	109	4.96
		2.2	5.0	80/67	28400	19800	1.372	33100	20.7	29500	1.828	23300	114	4.73
		2.2	5.0	85/71	30100	19500	1.388	34800	21.7					
		8.0	3.7	8.4	65/55	23700	21800	1.317	28200	18.0	30700	1.643	25100	101
	3.7		8.4	70/59	25300	20600	1.333	29800	19.0	30500	1.699	24700	105	5.26
	3.7		8.4	75/63	26900	20200	1.349	31500	19.9	30300	1.769	24300	110	5.02
3.7	8.4		80/67	28500	19800	1.365	33200	20.9	30100	1.839	23800	115	4.79	
80	4.0	1.0	2.3	65/55	22400	21100	1.471	27400	15.2	32500	1.699	26700	103	5.60
		1.0	2.3	70/59	24000	20000	1.486	29100	16.2	32300	1.755	26300	107	5.39
		1.0	2.3	75/63	25600	19600	1.502	30700	17.0	32100	1.825	25900	112	5.15
		1.0	2.3	80/67	27200	19200	1.518	32400	17.9	31900	1.895	25400	117	4.93
	6.0	2.1	4.9	65/55	22500	21200	1.464	27500	15.4	33100	1.710	27300	104	5.67
		2.1	4.9	70/59	24100	20000	1.479	29100	16.3	32900	1.766	26900	108	5.45
		2.1	4.9	75/63	25700	19600	1.495	30800	17.2	32600	1.836	26300	113	5.20
		2.1	4.9	80/67	27300	19300	1.511	32500	18.1	32400	1.906	25900	117	4.98
		2.1	4.9	85/71	28900	18900	1.527	34100	18.9					
		8.0	3.6	8.2	65/55	22500	21200	1.456	27500	15.5	33600	1.722	27700	105
	3.6		8.2	70/59	24100	20000	1.471	29100	16.4	33400	1.778	27300	108	5.50
	3.6		8.2	75/63	25700	19600	1.487	30800	17.3	33200	1.848	26900	113	5.26
3.6	8.2		80/67	27400	19300	1.503	32500	18.2	33000	1.918	26500	118	5.04	
90	4.0	1.0	2.3	65/55	21000	20500	1.624	26500	12.9	35100	1.772	29100	106	5.80
		1.0	2.3	70/59	22600	19300	1.639	28200	13.8	34900	1.828	28700	110	5.59
		1.0	2.3	75/63	24200	18900	1.655	29800	14.6	34700	1.898	28200	115	5.35
		1.0	2.3	80/67	25800	18600	1.671	31500	15.4	34500	1.968	27800	120	5.13
	6.0	2.1	4.8	65/55	21100	20500	1.616	26600	13.1	35700	1.783	29600	107	5.86
		2.1	4.8	70/59	22700	19300	1.631	28300	13.9	35500	1.839	29200	111	5.65
		2.1	4.8	75/63	24300	19000	1.647	29900	14.8	35300	1.909	28800	116	5.41
		2.1	4.8	80/67	25900	18600	1.663	31600	15.6	35100	1.979	28300	120	5.19
		2.1	4.8	85/71	27500	18200	1.680	33200	16.4					
		8.0	3.6	8.1	65/55	21100	20500	1.609	26600	13.1	36200	1.794	30100	108
	3.6		8.1	70/59	22700	19400	1.624	28200	14.0	36100	1.850	29800	112	5.71
	3.6		8.1	75/63	24300	19000	1.640	29900	14.8	35800	1.920	29200	116	5.46
3.6	8.1		80/67	26000	18600	1.656	31700	15.7	35600	1.990	28800	121	5.24	
100	4.0	1.0	2.3	65/55	19400	19900	1.793	25500	10.8					
		1.0	2.3	70/59	21000	18700	1.808	27200	11.6					
		1.0	2.3	75/63	22600	18300	1.824	28800	12.4					
		1.0	2.3	80/67	24200	17900	1.840	30500	13.2					
	6.0	2.1	4.7	65/55	19500	19900	1.785	25600	10.9					
		2.1	4.7	70/59	21100	18700	1.800	27200	11.7					
		2.1	4.7	75/63	22700	18300	1.816	28900	12.5					
		2.1	4.7	80/67	24300	18000	1.832	30600	13.3					
		2.1	4.7	85/71	25900	17600	1.848	32200	14.0					
		8.0	3.5	8.0	65/55	19500	19900	1.777	25600	11.0				
	3.5		8.0	70/59	21100	18700	1.793	27200	11.8					
	3.5		8.0	75/63	22700	18400	1.809	28900	12.5					
3.5	8.0		80/67	24400	18000	1.825	30600	13.4						
110	4.0	1.0	2.3	65/55	17600	19100	1.980	24400	8.9					
		1.0	2.3	70/59	19200	17900	1.995	26000	9.6					
		1.0	2.3	75/63	20800	17600	2.011	27700	10.3					
		1.0	2.3	80/67	22400	17200	2.027	29300	11.1					
	6.0	2.1	4.7	65/55	17600	19100	1.972	24300	8.9					
		2.1	4.7	70/59	19300	17900	1.987	26100	9.7					
		2.1	4.7	75/63	20900	17600	2.003	27700	10.4					
		2.1	4.7	80/67	22500	17200	2.019	29400	11.1					
		2.1	4.7	85/71	24100	16900	2.035	31000	11.8					
		8.0	3.5	7.9	65/55	17700	19200	1.964	24400	9.0				
	3.5		7.9	70/59	19300	18000	1.979	26100	9.8					
	3.5		7.9	75/63	20900	17600	1.995	27700	10.5					
3.5	7.9		80/67	22500	17200	2.011	29400	11.2						
		3.5	7.9	85/71	24200	16900	2.027	31100	11.9					

Tint = Operation Not Recommended

Notes:

1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
3. See performance correction tables for operating conditions other than those listed.
4. Interpolation is permissible; extrapolation is not.
5. For performance data outside the EAT listed, refer to the McQuay SelectTools selection program
6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
7. Data is base on unit at full load operation.

Size 032 (1000 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating																	
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP													
20	5.0	1.8	4.1	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						19500	1.694	13700	84	3.37												
		1.8	4.1	70/59							19300	1.768	13300	88	3.20												
		1.8	4.1	75/63							19100	1.861	12700	93	3.01												
		1.8	4.1	80/67							18900	1.954	12200	97	2.83												
		1.8	4.1	85/71																							
	7.5	3.7	8.5	65/55							20300	1.711	14500	85	3.47												
		3.7	8.5	70/59							20200	1.786	14100	89	3.31												
		3.7	8.5	75/63							20000	1.879	13600	93	3.12												
		3.7	8.5	80/67							19800	1.972	13100	98	2.94												
		3.7	8.5	85/71																							
	10.0	6.3	14.4	65/55							21200	1.729	15300	86	3.59												
		6.3	14.4	70/59							21100	1.803	14900	89	3.43												
		6.3	14.4	75/63							20900	1.896	14400	94	3.23												
		6.3	14.4	80/67							20600	1.989	13800	99	3.03												
		6.3	14.4	85/71																							
	30	5.0	1.7	4.0							65/55							22800	1.774	16700	87	3.76					
			1.7	4.0							70/59							30600	21900	1.245	34800	24.6	22600	1.849	16300	91	3.58
			1.7	4.0							75/63							32500	22500	1.266	36800	25.7	22400	1.942	15800	96	3.38
			1.7	4.0							80/67							34500	23200	1.286	38900	26.8	22200	2.035	15300	100	3.19
			1.7	4.0							85/71							36500	23800	1.307	41000	27.9					
7.5		3.6	8.3	65/55	23600	1.792	17500	88	3.86																		
		3.6	8.3	70/59	30700	21900	1.233	34900	24.9	23500	1.866							17100	92	3.69							
		3.6	8.3	75/63	32700	22600	1.253	37000	26.1	23300	1.959							16600	96	3.48							
		3.6	8.3	80/67	34600	23200	1.274	38900	27.2	23100	2.053							16100	101	3.29							
		3.6	8.3	85/71	36600	23800	1.294	41000	28.3																		
10.0		6.1	13.9	65/55	28800	22300	1.201	32900	24.0	24500	1.810							18300	89	3.96							
		6.1	13.9	70/59	30800	22000	1.221	35000	25.2	24400	1.884							18000	92	3.79							
		6.1	13.9	75/63	32800	22600	1.241	37000	26.4	24200	1.977							17500	97	3.58							
		6.1	13.9	80/67	34700	23200	1.262	39000	27.5	24000	2.070							16900	102	3.39							
		6.1	13.9	85/71	36700	23900	1.282	41100	28.6																		
40	5.0	1.7	3.9	65/55	29800	23100	1.347	34400	22.1	26300	1.853	20000	90	4.16													
		1.7	3.9	70/59	31800	22700	1.366	36500	23.3	26100	1.927	19500	94	3.97													
		1.7	3.9	75/63	33700	23300	1.386	38400	24.3	25900	2.020	19000	99	3.75													
		1.7	3.9	80/67	35700	24000	1.407	40500	25.4	25700	2.113	18500	104	3.56													
		1.7	3.9	85/71	37700	24600	1.427	42600	26.4																		
	7.5	3.5	8.0	65/55	29900	23100	1.334	34500	22.4	27100	1.870	20700	91	4.24													
		3.5	8.0	70/59	31900	22700	1.354	36500	23.6	27000	1.945	20400	95	4.06													
		3.5	8.0	75/63	33900	23400	1.374	38600	24.7	26800	2.038	19800	100	3.85													
		3.5	8.0	80/67	35800	24000	1.394	40600	25.7	26600	2.131	19300	104	3.65													
		3.5	8.0	85/71	37800	24600	1.415	42600	26.7																		
	10.0	5.9	13.5	65/55	30000	23100	1.322	34500	22.7	28000	1.888	21600	92	4.34													
		5.9	13.5	70/59	32000	22800	1.341	36600	23.9	27900	1.962	21200	96	4.16													
		5.9	13.5	75/63	34000	23400	1.362	38600	25.0	27700	2.055	20700	101	3.95													
		5.9	13.5	80/67	35900	24000	1.382	40600	26.0	27400	2.149	20100	105	3.73													
		5.9	13.5	85/71	37900	24700	1.403	42700	27.0																		
50	5.0	1.6	3.8	65/55	30100	23400	1.475	35100	20.4	29900	1.929	23300	94	4.54													
		1.6	3.8	70/59	32000	23000	1.495	37100	21.4	29700	2.003	22900	97	4.34													
		1.6	3.8	75/63	34000	23700	1.515	39200	22.4	29500	2.096	22300	102	4.12													
		1.6	3.8	80/67	36000	24300	1.536	41200	23.4	29300	2.189	21800	107	3.92													
		1.6	3.8	85/71	38000	24900	1.556	43300	24.4																		
	7.5	3.4	7.8	65/55	30200	23400	1.463	35200	20.6	30800	1.946	24200	94	4.63													
		3.4	7.8	70/59	32200	23100	1.482	37300	21.7	30600	2.021	23700	98	4.43													
		3.4	7.8	75/63	34100	23700	1.503	39200	22.7	30400	2.114	23200	103	4.21													
		3.4	7.8	80/67	36100	24300	1.523	41300	23.7	30200	2.207	22700	108	4.01													
		3.4	7.8	85/71	38100	25000	1.544	43400	24.7																		
	10.0	5.8	13.2	65/55	30300	23500	1.451	35300	20.9	31600	1.964	24900	95	4.71													
		5.8	13.2	70/59	32300	23100	1.470	37300	22.0	31500	2.038	24500	99	4.53													
		5.8	13.2	75/63	34200	23700	1.491	39300	22.9	31300	2.131	24000	104	4.30													
		5.8	13.2	80/67	36200	24400	1.511	41400	24.0	31100	2.224	23500	109	4.09													
		5.8	13.2	85/71	38200	25000	1.531	43400	25.0																		
60	5.0	1.6	3.7	65/55	29600	23300	1.617	35100	18.3	33500	2.002	26700	97	4.90													
		1.6	3.7	70/59	31600	23000	1.636	37200	19.3	33400	2.077	26300	101	4.71													
		1.6	3.7	75/63	33500	23600	1.657	39200	20.2	33200	2.170	25800	106	4.48													
		1.6	3.7	80/67	35500	24200	1.677	41200	21.2	33000	2.263	25300	110	4.27													
		1.6	3.7	85/71	37500	24800	1.698	43300	22.1																		
	7.5	3.3	7.6	65/55	29700	23300	1.604	35200	18.5	34400	2.020	27500	98	4.99													
		3.3	7.6	70/59	31700	23000	1.624	37200	19.5	34200	2.094	27100	101	4.78													
		3.3	7.6	75/63	33600	23600	1.644	39200	20.4	34000	2.187	26500	106	4.55													
		3.3	7.6	80/67	35600	24300	1.665	41300	21.4	33800	2.280	26000	111	4.34													
		3.3	7.6	85/71	37600	24900	1.685	43400	22.3																		
	10.0	5.6	12.8	65/55	29800	23400	1.592	35200	18.7	35300	2.037	28300	99	5.07													
		5.6	12.8	70/59	31800	23000	1.612	37300	19.7	35100	2.112	27900	102	4.87													
		5.6	12.8	75/63	33800	23700	1.632	39400	20.7	34900	2.205	27400	107	4.63													
		5.6	12.8	80/67	35700	24300	1.652	41300	21.6	34700	2.298	26900	112	4.42													
		5.6	12.8	85/71	37700	24900	1.673	43400	22.5																		

Size 038 (1250 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating											
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP							
20	6.0	2.1	4.8	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						23500	1.958	16800	83	3.51						
		2.1	4.8	70/59							23400	2.042	16400	87	3.36						
		2.1	4.8	75/63							23200	2.146	15900	92	3.17						
		2.1	4.8	80/67							23100	2.251	15400	97	3.00						
	9.0	4.4	10.1	65/55							24800	1.983	18000	84	3.66						
		4.4	10.1	70/59							24600	2.067	17500	88	3.48						
		4.4	10.1	75/63							24500	2.171	17100	93	3.30						
		4.4	10.1	80/67							24300	2.276	16500	98	3.13						
		4.4	10.1	85/71																	
	12.0	7.4	17.0	65/55							26000	2.008	19100	85	3.79						
		7.4	17.0	70/59							25900	2.092	18800	89	3.63						
		7.4	17.0	75/63							25700	2.196	18200	94	3.43						
		7.4	17.0	80/67							25600	2.301	17700	99	3.26						
		7.4	17.0	85/71																	
	30	6.0	2.0	4.7							65/55						26700	2.058	19700	86	3.80
			2.0	4.7							70/59						31500	2.142	19300	90	3.64
			2.0	4.7							75/63						33900	2.247	18700	94	3.44
			2.0	4.7							80/67						36200	2.351	18300	99	3.28
9.0		4.3	9.8	65/55	38500	2.083	20800	87	3.92												
		4.3	9.8	70/59	29400	2.167	20400	90	3.76												
		4.3	9.8	75/63	31700	2.272	19900	95	3.57												
		4.3	9.8	80/67	34000	2.376	19400	100	3.39												
		4.3	9.8	85/71	36300	2.479	18900	105	3.22												
12.0		7.2	16.4	65/55	38600	2.583	18400	110	3.05												
		7.2	16.4	70/59	29500	2.667	18000	114	2.89												
		7.2	16.4	75/63	31800	2.771	17500	118	2.73												
		7.2	16.4	80/67	34100	2.875	17000	123	2.57												
		7.2	16.4	85/71	36500	2.979	16500	128	2.41												
40		6.0	2.0	4.5	65/55						31100						2.154	23700	89	4.23	
			2.0	4.5	70/59						32200						2.238	23400	93	4.06	
			2.0	4.5	75/63						34500						2.343	22900	98	3.86	
			2.0	4.5	80/67						36800						2.447	22300	103	3.67	
	9.0	4.2	9.5	65/55	41400						2.551	21800	108	3.50							
		4.2	9.5	70/59	32300						2.635	21500	112	3.34							
		4.2	9.5	75/63	34600						2.739	21000	117	3.17							
		4.2	9.5	80/67	36900						2.843	20500	122	3.01							
		4.2	9.5	85/71	39200						2.947	20000	127	2.85							
	12.0	7.0	16.0	65/55	41600						3.051	19500	132	2.69							
		7.0	16.0	70/59	27700						3.135	19200	136	2.53							
		7.0	16.0	75/63	32500						3.239	18700	141	2.37							
		7.0	16.0	80/67	34800						3.343	18200	146	2.21							
		7.0	16.0	85/71	37100						3.447	17700	151	2.05							
	50	6.0	1.9	4.4	65/55											36000	2.205	26100	91	4.46	
			1.9	4.4	70/59											32200	2.288	25700	95	4.29	
			1.9	4.4	75/63											34500	2.393	25200	100	4.09	
			1.9	4.4	80/67											36800	2.497	24700	104	3.89	
9.0		4.0	9.2	65/55	41700	2.601	24200	109	3.73												
		4.0	9.2	70/59	32300	2.685	23900	113	3.57												
		4.0	9.2	75/63	34600	2.789	23400	118	3.41												
		4.0	9.2	80/67	36900	2.893	22900	123	3.25												
		4.0	9.2	85/71	39200	2.997	22400	128	3.09												
12.0		6.8	15.5	65/55	41600	3.101	23900	133	2.93												
		6.8	15.5	70/59	27700	3.185	23600	137	2.77												
		6.8	15.5	75/63	32500	3.289	23100	142	2.61												
		6.8	15.5	80/67	34800	3.393	22600	147	2.45												
		6.8	15.5	85/71	37100	3.497	22100	152	2.29												
60		6.0	1.9	4.3	65/55											40800	2.251	29500	93	4.81	
			1.9	4.3	70/59											34200	2.335	29200	97	4.63	
			1.9	4.3	75/63											36500	2.439	28700	102	4.44	
			1.9	4.3	80/67											38900	2.543	28200	107	4.26	
	9.0	3.9	9.0	65/55	43500						2.647	27700	112	4.09							
		3.9	9.0	70/59	34200						2.731	27400	116	3.93							
		3.9	9.0	75/63	36500						2.835	26900	121	3.77							
		3.9	9.0	80/67	39000						2.939	26400	126	3.61							
		3.9	9.0	85/71	41200						3.043	25900	131	3.45							
	12.0	6.6	15.2	65/55	43500						3.147	25400	136	3.29							
		6.6	15.2	70/59	34000						3.231	25100	140	3.13							
		6.6	15.2	75/63	37500						3.335	24600	145	2.97							
		6.6	15.2	80/67	39800						3.439	24100	150	2.81							
		6.6	15.2	85/71	42100						3.543	23600	155	2.65							

Size 044 (1400 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating					
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP	
20	7.0	1.1	2.5	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						25400	2.399	17200	83	3.10
		1.1	2.5	70/59							25300	2.504	16800	87	2.96
		1.1	2.5	75/63							25100	2.636	16100	92	2.79
		1.1	2.5	80/67							24900	2.768	15500	96	2.63
		1.1	2.5	85/71											
	10.5	2.3	5.4	65/55							27200	2.433	18900	84	3.27
		2.3	5.4	70/59							27000	2.539	18300	88	3.11
		2.3	5.4	75/63							26800	2.670	17700	93	2.94
		2.3	5.4	80/67							26600	2.802	17000	97	2.78
		2.3	5.4	85/71											
	14.0	4.0	9.2	65/55							28900	2.467	20500	85	3.43
		4.0	9.2	70/59							28800	2.573	20000	89	3.28
4.0		9.2	75/63	28600	2.705	19400	94	3.10							
4.0		9.2	80/67	28400	2.837	18700	99	2.93							
4.0		9.2	85/71												
30	7.0	1.1	2.4	65/55							30200	2.453	21800	86	3.60
		1.1	2.4	70/59							39100	2.558	21400	90	3.45
		1.1	2.4	75/63							41400	2.690	20700	95	3.25
		1.1	2.4	80/67							43700	2.822	20100	100	3.08
		1.1	2.4	85/71							46100	2.954	19500	105	2.91
	10.5	2.3	5.2	65/55							37000	2.487	23500	87	3.77
		2.3	5.2	70/59							39300	2.593	23000	91	3.59
		2.3	5.2	75/63							41600	2.725	22300	96	3.40
		2.3	5.2	80/67							43900	2.857	21600	101	3.22
		2.3	5.2	85/71							46300	2.989	21000	106	3.04
	14.0	3.9	8.9	65/55							37200	2.522	25100	88	3.91
		3.9	8.9	70/59							39500	2.627	24500	92	3.73
3.9		8.9	75/63	41800	2.759	23900	97	3.53							
3.9		8.9	80/67	44100	2.891	23300	102	3.36							
3.9		8.9	85/71	46500	3.023	22700	107	3.18							
40	7.0	1.0	2.4	65/55							35100	2.531	26500	89	4.06
		1.0	2.4	70/59							41600	2.637	26000	93	3.89
		1.0	2.4	75/63							43900	2.769	25300	98	3.68
		1.0	2.4	80/67							46300	2.901	24700	103	3.49
		1.0	2.4	85/71							48600	3.033	24100	108	3.30
	10.5	2.2	5.0	65/55							39500	2.566	28100	90	4.21
		2.2	5.0	70/59							41800	2.671	27600	94	4.02
		2.2	5.0	75/63							44100	2.803	26900	99	3.81
		2.2	5.0	80/67							46500	2.935	26300	104	3.62
		2.2	5.0	85/71							48800	3.067	25700	109	3.43
	14.0	3.8	8.6	65/55							39700	2.600	29700	91	4.35
		3.8	8.6	70/59							42000	2.706	29300	95	4.17
3.8		8.6	75/63	44300	2.838	28600	100	3.95							
3.8		8.6	80/67	46700	2.969	28000	105	3.76							
3.8		8.6	85/71	49000	3.101	27400	110	3.57							
50	7.0	1.0	2.3	65/55							40100	2.639	31100	92	4.45
		1.0	2.3	70/59							42300	2.745	30500	96	4.26
		1.0	2.3	75/63							44600	2.877	29900	101	4.04
		1.0	2.3	80/67							47000	3.009	29300	106	3.85
		1.0	2.3	85/71							49300	3.141	28700	111	3.66
	10.5	2.1	4.9	65/55							40200	2.674	32700	93	4.58
		2.1	4.9	70/59							42500	2.779	32200	97	4.39
		2.1	4.9	75/63							44800	2.911	31600	102	4.17
		2.1	4.9	80/67							47200	3.043	30900	107	3.97
		2.1	4.9	85/71							49500	3.175	30300	112	3.78
	14.0	3.7	8.4	65/55							40400	2.708	34400	95	4.71
		3.7	8.4	70/59							42700	2.814	33800	99	4.52
3.7		8.4	75/63	45000	2.946	33100	103	4.29							
3.7		8.4	80/67	47400	3.077	32500	108	4.09							
3.7		8.4	85/71	49700	3.209	31900	113	3.90							
60	7.0	1.0	2.3	65/55							45100	2.767	35700	96	4.77
		1.0	2.3	70/59							42100	2.873	35100	100	4.58
		1.0	2.3	75/63							44500	3.004	34400	104	4.36
		1.0	2.3	80/67							46800	3.136	33800	109	4.15
		1.0	2.3	85/71							49100	3.268	33200	114	3.96
	10.5	2.1	4.8	65/55							40000	2.801	37200	97	4.89
		2.1	4.8	70/59							42400	2.907	36700	101	4.69
		2.1	4.8	75/63							44700	3.039	36000	106	4.47
		2.1	4.8	80/67							47000	3.171	35500	110	4.28
		2.1	4.8	85/71							49300	3.303	34900	115	4.09
	14.0	3.6	8.2	65/55							40200	2.836	38800	98	5.01
		3.6	8.2	70/59							42600	2.941	38400	102	4.82
3.6		8.2	75/63	44900	3.073	37700	107	4.59							
3.6		8.2	80/67	47200	3.205	37100	112	4.39							
3.6		8.2	85/71	49500	3.337	36500	117	4.20							

Size 044 (1400 CFM) (continued)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	7.0	1.0	2.2	65/55	39300	31400	2.328	47200	16.9	49900	2.900	40000	99	5.04
		1.0	2.2	70/59	41600	30900	2.354	49600	17.7	49700	3.006	39400	103	4.84
		1.0	2.2	75/63	43900	31800	2.382	52000	18.4	49600	3.138	38900	108	4.63
		1.0	2.2	80/67	46200	32700	2.410	54400	19.2	49400	3.270	38200	112	4.42
	10.5	2.1	4.7	65/55	39500	31500	2.304	47400	17.1	51600	2.935	41600	100	5.15
		2.1	4.7	70/59	41800	31000	2.331	49800	17.9	51500	3.040	41100	104	4.96
		2.1	4.7	75/63	44100	31900	2.358	52100	18.7	51300	3.172	40500	109	4.74
		2.1	4.7	80/67	46400	32800	2.386	54500	19.4	51100	3.304	39800	114	4.53
		2.1	4.7	85/71	48700	33700	2.414	56900	20.2					
		14.0	3.5	8.0	65/55	39700	31600	2.280	47500	17.4	53400	2.969	43300	101
	3.5		8.0	70/59	42000	31100	2.307	49900	18.2	53200	3.075	42700	105	5.07
	3.5		8.0	75/63	44300	32000	2.335	52300	19.0	53000	3.207	42100	110	4.84
3.5	8.0		80/67	46600	32900	2.363	54700	19.7	52900	3.339	41500	115	4.64	
80	7.0	0.9	2.2	65/55	38300	31100	2.567	47100	14.9	54600	3.033	44200	102	5.27
		0.9	2.2	70/59	40600	30600	2.594	49500	15.7	54400	3.138	43700	106	5.08
		0.9	2.2	75/63	42900	31500	2.622	51800	16.4	54200	3.270	43000	111	4.85
		0.9	2.2	80/67	45300	32400	2.649	54300	17.1	54000	3.402	42400	116	4.65
	10.5	0.9	2.2	85/71	47600	33300	2.677	56700	17.8					
		2.0	4.6	65/55	38500	31200	2.543	47200	15.1	56300	3.067	45800	103	5.38
		2.0	4.6	70/59	40800	30700	2.570	49600	15.9	56200	3.173	45400	107	5.19
		2.0	4.6	75/63	43100	31600	2.598	52000	16.6	56000	3.305	44700	112	4.96
		2.0	4.6	80/67	45500	32500	2.626	54500	17.3	55800	3.437	44100	117	4.75
		2.0	4.6	85/71	47800	33400	2.654	56900	18.0					
	14.0	3.4	7.9	65/55	38700	31300	2.520	47300	15.4	58100	3.102	47500	104	5.48
		3.4	7.9	70/59	41000	30800	2.546	49700	16.1	57900	3.207	47000	108	5.29
3.4		7.9	75/63	43300	31700	2.574	52100	16.8	57700	3.339	46300	113	5.06	
3.4		7.9	80/67	45700	32600	2.602	54600	17.6	57500	3.471	45700	118	4.85	
3.4		7.9	85/71	48000	33500	2.630	57000	18.3						
90	7.0	0.9	2.1	65/55	36800	30600	2.849	46500	12.9	59000	3.176	48200	105	5.44
		0.9	2.1	70/59	39100	30100	2.876	48900	13.6	58800	3.282	47600	109	5.25
		0.9	2.1	75/63	41500	31000	2.904	51400	14.3	58600	3.414	46900	114	5.03
		0.9	2.1	80/67	43800	31900	2.932	53800	14.9	58400	3.546	46300	118	4.82
	10.5	0.9	2.1	85/71	46100	32700	2.960	56200	15.6					
		2.0	4.5	65/55	37000	30600	2.826	46600	13.1	60700	3.211	49700	106	5.54
		2.0	4.5	70/59	39300	30200	2.852	49000	13.8	60600	3.316	49300	110	5.35
		2.0	4.5	75/63	41700	31000	2.880	51500	14.5	60400	3.448	48600	115	5.13
		2.0	4.5	80/67	44000	31900	2.908	53900	15.1	60200	3.580	48000	120	4.92
		2.0	4.5	85/71	46300	32800	2.936	56300	15.8					
	14.0	3.4	7.7	65/55	37200	30700	2.802	46800	13.3	62500	3.245	51400	107	5.64
		3.4	7.7	70/59	39600	30200	2.828	49300	14.0	62300	3.351	50900	111	5.44
3.4		7.7	75/63	41900	31100	2.856	51600	14.7	62100	3.482	50200	116	5.22	
3.4		7.7	80/67	44200	32000	2.884	54000	15.3	61900	3.614	49600	121	5.02	
3.4		7.7	85/71	46500	32900	2.912	56400	16.0						
100	7.0	0.9	2.1	65/55	34700	29800	3.187	45600	10.9					
		0.9	2.1	70/59	37000	29300	3.214	48000	11.5					
		0.9	2.1	75/63	39400	30100	3.242	50500	12.2					
		0.9	2.1	80/67	41700	31000	3.270	52900	12.8					
	10.5	0.9	2.1	85/71	44000	31900	3.298	55300	13.3					
		2.0	4.5	65/55	34900	29800	3.164	45700	11.0					
		2.0	4.5	70/59	37200	29300	3.190	48100	11.7					
		2.0	4.5	75/63	39600	30200	3.218	50600	12.3					
		2.0	4.5	80/67	41900	31100	3.246	53000	12.9					
		2.0	4.5	85/71	44200	32000	3.274	55400	13.5					
	14.0	3.3	7.6	65/55	35100	29900	3.140	45800	11.2					
		3.3	7.6	70/59	37400	29400	3.166	48200	11.8					
3.3		7.6	75/63	39800	30300	3.194	50700	12.5						
3.3		7.6	80/67	42100	31200	3.222	53100	13.1						
3.3		7.6	85/71	44400	32100	3.250	55500	13.7						
110	7.0	0.9	2.1	65/55	32000	28800	3.594	44300	8.9					
		0.9	2.1	70/59	34300	28300	3.621	46700	9.5					
		0.9	2.1	75/63	36700	29200	3.649	49200	10.1					
		0.9	2.1	80/67	39000	30100	3.677	51500	10.6					
	10.5	0.9	2.1	85/71	41300	31000	3.705	53900	11.1					
		1.9	4.4	65/55	32200	28900	3.571	44400	9.0					
		1.9	4.4	70/59	34500	28400	3.597	46800	9.6					
		1.9	4.4	75/63	36900	29300	3.625	49300	10.2					
		1.9	4.4	80/67	39200	30200	3.653	51700	10.7					
		1.9	4.4	85/71	41500	31100	3.681	54100	11.3					
	14.0	3.3	7.5	65/55	32400	29000	3.547	44500	9.1					
		3.3	7.5	70/59	34800	28500	3.573	47000	9.7					
3.3		7.5	75/63	37100	29400	3.601	49400	10.3						
3.3		7.5	80/67	39400	30300	3.629	51800	10.9						
3.3		7.5	85/71	41700	31200	3.657	54200	11.4						

Tint = Operation Not Recommended

Notes:

1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
3. See performance correction tables for operating conditions other than those listed.
4. Interpolation is permissible; extrapolation is not.
5. For performance data outside the EAT listed, refer to the McQuay SelectTools selection program
6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
7. Data is base on unit at full load operation..

Size 049 (1600 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating											
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP							
20	8.0	1.4	3.2	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						27800	2.575	19000	82	3.16						
		1.4	3.2	70/59							27500	2.701	18300	86	2.98						
		1.4	3.2	75/63							27100	2.858	17300	91	2.78						
		1.4	3.2	80/67							26800	3.016	16500	95	2.60						
	12.0	3.0	6.9	65/55							30000	2.620	21100	83	3.35						
		3.0	6.9	70/59							29700	2.746	20300	87	3.17						
		3.0	6.9	75/63							29400	2.903	19500	92	2.97						
		3.0	6.9	80/67							29000	3.061	18600	97	2.77						
		3.0	6.9	85/71																	
	16.0	5.1	11.7	65/55							32300	2.664	23200	85	3.55						
		5.1	11.7	70/59							32000	2.790	22500	88	3.36						
		5.1	11.7	75/63							31600	2.948	21500	93	3.14						
		5.1	11.7	80/67							31300	3.105	20700	98	2.95						
		5.1	11.7	85/71																	
	30	8.0	1.4	3.1							65/55						33300	2.716	24000	85	3.59
			1.4	3.1							70/59						42900	32100	1.763	48900	24.3
1.4			3.1	75/63	45700	32900	1.796	51800	25.4	32600	3.000						22400	94	3.18		
1.4			3.1	80/67	48500	33700	1.829	54700	26.5	32300	3.157						21500	99	3.00		
12.0		2.9	6.7	65/55	51300	34500	1.862	57700	27.6												
		2.9	6.7	70/59	40400	33100	1.701	46200	23.8	35500	2.761						26100	86	3.76		
		2.9	6.7	75/63	43200	32200	1.732	49100	24.9	35200	2.887						25300	90	3.57		
		2.9	6.7	80/67	46000	33000	1.765	52000	26.1	34900	3.045						24500	95	3.36		
		2.9	6.7	85/71	48800	33800	1.798	54900	27.1	34500	3.202						23600	100	3.15		
16.0		5.0	11.4	65/55	51600	34600	1.831	57800	28.2												
		5.0	11.4	70/59	40700	33200	1.670	46400	24.4	37800	2.806						28200	88	3.94		
		5.0	11.4	75/63	43500	32300	1.701	49300	25.6	37500	2.932						27500	92	3.75		
		5.0	11.4	80/67	46200	33100	1.734	52100	26.6	37100	3.089						26600	96	3.52		
		5.0	11.4	85/71	49000	33900	1.767	55000	27.7	36800	3.247						25700	101	3.32		
40		8.0	1.3	3.0	65/55						39000						2.853	29300	88	4.00	
			1.3	3.0	70/59						43200						35000	1.971	49900	21.9	38700
	1.3		3.0	75/63	46000						34100	2.002	52800	23.0	38300	3.136	27600	97	3.58		
	1.3		3.0	80/67	48800						34900	2.035	55700	24.0	38000	3.294	26800	102	3.38		
	12.0	2.8	6.5	65/55	51600						35700	2.068	58700	25.0	38000	3.294	26800	102	3.38		
		2.8	6.5	70/59	54400						36500	2.100	61600	25.9							
		2.8	6.5	75/63	43500						35100	1.940	50100	22.4	41200	2.898	31300	90	4.16		
		2.8	6.5	80/67	46300						34200	1.971	53000	23.5	40900	3.024	30600	94	3.96		
		2.8	6.5	85/71	49000						35000	2.004	55800	24.5	40600	3.181	29700	98	3.74		
	16.0	4.8	11.0	65/55	51800						35800	2.036	58700	25.4	40200	3.339	28800	103	3.53		
		4.8	11.0	70/59	54600						36600	2.069	61700	26.4							
		4.8	11.0	75/63	46500						34400	1.940	53100	24.0	43400	2.943	33400	91	4.32		
		4.8	11.0	80/67	49300						35100	1.972	56000	25.0	43200	3.069	32700	95	4.12		
		4.8	11.0	85/71	52100						35900	2.005	58900	26.0	42800	3.226	31800	100	3.88		
	50	8.0	1.3	3.0	65/55											44700	2.985	34500	92	4.38	
			1.3	3.0	70/59											44400	36400	2.193	51900	20.2	44400
1.3			3.0	75/63	47100	35600	2.224	54700	21.2	44100						3.268	32900	100	3.95		
1.3			3.0	80/67	49900	36400	2.257	57600	22.1	43700						3.426	32000	105	3.73		
12.0		2.8	6.3	65/55	55500	37900	2.322	63400	23.9												
		2.8	6.3	70/59	44600	36500	2.162	52000	20.6	46900						3.029	36600	93	4.53		
		2.8	6.3	75/63	47400	35700	2.193	54900	21.6	46600						3.155	35800	97	4.32		
		2.8	6.3	80/67	50200	36500	2.226	57800	22.6	46300						3.313	35000	102	4.09		
		2.8	6.3	85/71	53000	37200	2.258	60700	23.5	46000						3.470	34200	106	3.88		
16.0		4.7	10.7	65/55	55700	38000	2.291	63500	24.3												
		4.7	10.7	70/59	44900	36700	2.131	52200	21.1	49200						3.074	38700	94	4.69		
		4.7	10.7	75/63	47600	35800	2.162	55000	22.0	48900						3.200	38000	98	4.47		
		4.7	10.7	80/67	50400	36600	2.195	57900	23.0	48600						3.358	37100	103	4.24		
		4.7	10.7	85/71	53200	37300	2.227	60800	23.9	48200						3.515	36200	108	4.02		
60		8.0	1.3	2.9	65/55											50300	3.111	39700	95	4.73	
			1.3	2.9	70/59											44300	36900	2.414	52500	18.4	50000
	1.3		2.9	75/63	47000						36000	2.445	55300	19.2	49700	3.395	38100	104	4.29		
	1.3		2.9	80/67	49800						36800	2.478	58300	20.1	49300	3.552	37200	108	4.06		
	12.0	2.7	6.1	65/55	55400						38400	2.543	64100	21.8							
		2.7	6.1	70/59	44500						37000	2.382	52600	18.7	52500	3.156	41700	96	4.87		
		2.7	6.1	75/63	47300						36100	2.414	55500	19.6	52200	3.282	41000	100	4.66		
		2.7	6.1	80/67	50100						36900	2.446	58400	20.5	51900	3.440	40200	105	4.42		
		2.7	6.1	85/71	52900						37700	2.479	61400	21.3	51600	3.597	39300	110	4.20		
	16.0	4.6	10.5	65/55	55700						38500	2.512	64300	22.2							
		4.6	10.5	70/59	44800						37100	2.351	52800	19.1	54800	3.201	43900	98	5.01		
		4.6	10.5	75/63	47600						36200	2.382	55700	20.0	54500	3.327	43100	101	4.80		
		4.6	10.5	80/67	50400						37000	2.415	58600	20.9	54100	3.485	42200	106	4.55		
		4.6	10.5	85/71	53100						37800	2.448	61500	21.7	53800	3.642	41400	111	4.33		

Size 064 (2000 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating																
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP												
20	10.0	2.2	5.1	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						35900	3.547	23800	83	2.96											
		2.2	5.1	70/59							35700	3.690	23100	86	2.83											
		2.2	5.1	75/63							35500	3.868	22300	91	2.69											
		2.2	5.1	80/67							35300	4.047	21500	96	2.55											
	15.0	4.9	11.1	65/55							39300	3.616	27000	84	3.18											
		4.9	11.1	70/59							39100	3.759	26300	88	3.05											
		4.9	11.1	75/63							38900	3.938	25500	93	2.89											
		4.9	11.1	80/67							38700	4.117	24600	98	2.75											
	20.0	8.4	19.2	65/55							42700	3.686	30100	86	3.39											
		8.4	19.2	70/59							42600	3.829	29500	90	3.26											
		8.4	19.2	75/63							42300	4.007	28600	94	3.09											
		8.4	19.2	80/67							42100	4.186	27800	99	2.94											
30	10.0	2.2	4.9	65/55							43400	3.636	31000	86	3.50											
		2.2	4.9	70/59							41700	34000	2.026	48600	20.6	43200	3.779	30300	90	3.35						
		2.2	4.9	75/63							45600	35300	2.066	52700	22.1	43000	3.958	29500	95	3.18						
		2.2	4.9	80/67							49600	36500	2.106	56800	23.6	42800	4.137	28700	100	3.03						
	15.0	2.2	4.9	85/71							53500	37800	2.146	60800	24.9											
		4.7	10.7	65/55							38200	34900	1.939	44800	19.7							46800	3.706	34200	88	3.70
		4.7	10.7	70/59							42100	34200	1.977	48800	21.3							46600	3.849	33500	91	3.55
		4.7	10.7	75/63							46100	35400	2.017	53000	22.9							46400	4.028	32700	96	3.37
	20.0	4.7	10.7	80/67							50000	36700	2.058	57000	24.3	46200	4.206	31800	101	3.22						
		4.7	10.7	85/71							53900	38000	2.098	61100	25.7											
		8.1	18.6	65/55							38600	35000	1.891	45100	20.4							50200	3.775	37300	89	3.89
		8.1	18.6	70/59							42500	34300	1.929	49100	22.0							50100	3.918	36700	93	3.74
8.1	18.6	75/63	46500	35600	1.969	53200	23.6	49800	4.097	35800	98	3.56														
40	10.0	8.1	18.6	80/67	50400	36900	2.009	57300	25.1	49600	4.276	35000	103	3.40												
		8.1	18.6	85/71	54300	38100	2.049	61300	26.5																	
		2.1	4.8	65/55	46900	40800	2.299	54700	20.4							50900	3.774	38000	89	3.95						
		2.1	4.8	70/59	50800	40100	2.337	58800	21.7							50700	3.917	37300	93	3.79						
	2.1	4.8	75/63	54700	41300	2.377	62800	23.0	50500							4.096	36500	98	3.61							
	15.0	2.1	4.8	80/67	58600	42600	2.417	66800	24.2	50300	4.275	35700	103	3.45												
		2.1	4.8	85/71	62500	43800	2.457	70900	25.4																	
		4.6	10.4	65/55	47300	40900	2.250	55000	21.0							54300	3.844	41200	91	4.14						
		4.6	10.4	70/59	51200	40200	2.288	59000	22.4							54100	3.987	40500	95	3.97						
	4.6	10.4	75/63	55100	41500	2.328	63000	23.7	53900							4.165	39700	100	3.79							
	20.0	4.6	10.4	80/67	59000	42700	2.368	67100	24.9	53700	4.344	38900	105	3.62												
		4.6	10.4	85/71	63000	44000	2.409	71200	26.2																	
7.9		18.0	65/55	47700	41100	2.202	55200	21.7	57700							3.913	44300	93	4.32							
7.9		18.0	70/59	51600	40400	2.240	59200	23.0	57600							4.056	43800	97	4.16							
7.9	18.0	75/63	55500	41600	2.280	63300	24.3	57300	4.235							42800	101	3.96								
50	10.0	7.9	18.0	80/67	59400	42900	2.320	67300	25.6	57100	4.414	42000	106	3.79												
		7.9	18.0	85/71	63400	44200	2.360	71500	26.9																	
		2.0	4.7	65/55	55300	45300	2.712	64600	20.4							58400	3.946	44900	93	4.33						
		2.0	4.7	70/59	59200	44600	2.750	68600	21.5							58200	4.089	44200	97	4.17						
	2.0	4.7	75/63	63200	45800	2.790	72700	22.7	58000							4.268	43400	102	3.98							
	15.0	2.0	4.7	80/67	67100	47100	2.830	76800	23.7	57800	4.447	42600	107	3.81												
		2.0	4.7	85/71	71000	48300	2.870	80800	24.7																	
		4.4	10.1	65/55	55700	45400	2.663	64800	20.9							61800	4.016	48100	94	4.51						
		4.4	10.1	70/59	59600	44700	2.701	68800	22.1							61600	4.159	47400	98	4.34						
	4.4	10.1	75/63	63600	46000	2.741	73000	23.2	61400							4.337	46600	103	4.15							
	20.0	4.4	10.1	80/67	67500	47200	2.782	77000	24.3	61200	4.516	45800	108	3.97												
		4.4	10.1	85/71	71400	48500	2.822	81000	25.3																	
7.7		17.5	65/55	56200	45600	2.615	65100	21.5	65200							4.085	51300	96	4.67							
7.7		17.5	70/59	60100	44900	2.653	69200	22.7	65100							4.228	50700	100	4.51							
7.7	17.5	75/63	64000	46200	2.693	73200	23.8	64800	4.407							49800	105	4.31								
60	10.0	7.7	17.5	80/67	67900	47400	2.733	77200	24.8	64600	4.586	48900	110	4.12												
		7.7	17.5	85/71	71800	48700	2.773	81300	25.9																	
		2.0	4.6	65/55	58800	47000	3.089	69300	19.0							65900	4.139	51800	96	4.66						
		2.0	4.6	70/59	62700	46300	3.127	73400	20.1							65700	4.282	51100	100	4.49						
	2.0	4.6	75/63	66600	47600	3.167	77400	21.0	65500							4.461	50300	105	4.30							
	15.0	2.0	4.6	80/67	70600	48900	3.207	81500	22.0	65300	4.639	49500	110	4.12												
		2.0	4.6	85/71	74500	50100	3.247	85600	22.9																	
		4.3	9.9	65/55	59200	47200	3.040	69600	19.5							69300	4.208	54900	98	4.82						
		4.3	9.9	70/59	63100	46500	3.078	73600	20.5							69100	4.351	54300	102	4.65						
	4.3	9.9	75/63	67000	47800	3.118	77600	21.5	68900							4.530	53400	107	4.45							
	20.0	4.3	9.9	80/67	71000	49000	3.159	81800	22.5	68700	4.709	52600	112	4.27												
		4.3	9.9	85/71	74900	50300	3.199	85800	23.4																	
7.5		17.1	65/55	59600	47400	2.992	69800	19.9	72700							4.278	58100	99	4.98							
7.5		17.1	70/59	63500	46700	3.030	73800	21.0	72600							4.421	57500	103	4.81							
7.5	17.1	75/63	67500	47900	3.070	78000	22.0	72300	4.600							56600	108	4.60								
20.0	7.5	17.1	80/67	71400	49200	3.110	82000	23.0	72100	4.778	55800	113	4.42													
	7.5	17.1	85/71	75300	50400	3.150	86100	23.9																		

Size 064 (2000 CFM) (continued)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating				
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP
70	10.0	2.0	4.5	65/55	57400	46600	3.415	69100	16.8	73400	4.338	58600	100	4.95
		2.0	4.5	70/59	61300	45900	3.453	73100	17.8	73200	4.481	57900	104	4.78
		2.0	4.5	75/63	65200	47100	3.493	77100	18.7	73000	4.660	57100	109	4.59
		2.0	4.5	80/67	69200	48400	3.533	81300	19.6	72800	4.839	56300	114	4.41
	15.0	4.2	9.7	65/55	57800	46700	3.366	69300	17.2	76800	4.408	61800	101	5.10
		4.2	9.7	70/59	61700	46000	3.405	73300	18.1	76600	4.551	61100	105	4.93
		4.2	9.7	75/63	65600	47300	3.445	77400	19.0	76400	4.730	60300	110	4.73
		4.2	9.7	80/67	69600	48500	3.485	81500	20.0	76200	4.908	59400	115	4.55
	20.0	7.3	16.8	65/55	58200	46900	3.318	69500	17.5	80200	4.477	64900	103	5.25
		7.3	16.8	70/59	62100	46200	3.356	73600	18.5	80100	4.620	64300	107	5.08
		7.3	16.8	75/63	66100	47400	3.396	77700	19.5	79800	4.799	63400	112	4.87
		7.3	16.8	80/67	70000	48700	3.436	81700	20.4	79600	4.978	62600	117	4.68
80	10.0	1.9	4.4	65/55	53600	45100	3.744	66400	14.3	80900	4.531	65400	103	5.23
		1.9	4.4	70/59	57500	44400	3.782	70400	15.2	80700	4.674	64700	107	5.06
		1.9	4.4	75/63	61400	45600	3.823	74400	16.1	80500	4.853	63900	112	4.86
		1.9	4.4	80/67	65400	46900	3.863	78600	16.9	80300	5.032	63100	117	4.67
	15.0	4.2	9.5	65/55	54000	45200	3.696	66600	14.6	84300	4.601	68600	105	5.36
		4.2	9.5	70/59	57900	44500	3.734	70600	15.5	84100	4.744	67900	109	5.19
		4.2	9.5	75/63	61900	45800	3.774	74800	16.4	83900	4.922	67100	114	4.99
		4.2	9.5	80/67	65800	47000	3.814	78800	17.3	83700	5.101	66300	119	4.80
	20.0	7.2	16.5	65/55	54400	45400	3.648	66900	14.9	87700	4.670	71800	106	5.50
		7.2	16.5	70/59	58300	44700	3.686	70900	15.8	87600	4.813	71200	110	5.33
		7.2	16.5	75/63	62300	45900	3.726	75000	16.7	87300	4.992	70300	115	5.12
		7.2	16.5	80/67	66200	47200	3.766	79100	17.6	87100	5.171	69500	120	4.93
90	10.0	1.9	4.3	65/55	50200	43800	4.146	64400	12.1	88400	4.703	72300	107	5.50
		1.9	4.3	70/59	54100	43100	4.184	68400	12.9	88200	4.846	71700	111	5.33
		1.9	4.3	75/63	58100	44400	4.224	72500	13.8	88000	5.025	70800	116	5.13
		1.9	4.3	80/67	62000	45600	4.264	76600	14.5	87800	5.204	70000	120	4.94
	15.0	4.1	9.3	65/55	50600	44000	4.098	64600	12.3	91800	4.773	75500	108	5.63
		4.1	9.3	70/59	54500	43300	4.136	68600	13.2	91600	4.916	74800	112	5.46
		4.1	9.3	75/63	58500	44500	4.176	72800	14.0	91400	5.095	74000	117	5.25
		4.1	9.3	80/67	62400	45800	4.216	76800	14.8	91200	5.273	73200	122	5.06
	20.0	7.1	16.2	65/55	51000	44100	4.049	64800	12.6	95200	4.842	78700	110	5.76
		7.1	16.2	70/59	55000	43400	4.087	68900	13.5	95100	4.985	78100	114	5.59
		7.1	16.2	75/63	58900	44700	4.127	73000	14.3	94800	5.164	77200	119	5.38
		7.1	16.2	80/67	62800	46000	4.167	77000	15.1	94600	5.343	76400	124	5.18
100	10.0	1.9	4.3	65/55	48100	43100	4.647	64000	10.4	Tint = Operation Not Recommended Notes: 1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution. 2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated. 3. See performance correction tables for operating conditions other than those listed. 4. Interpolation is permissible; extrapolation is not. 5. For performance data outside the EAT listed, refer to the McQuay SelectTools selection program 6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions. 7. Data is base on unit at full load operation..				
		1.9	4.3	70/59	52000	42400	4.685	68000	11.1					
		1.9	4.3	75/63	55900	43700	4.725	72000	11.8					
		1.9	4.3	80/67	59900	44900	4.765	76200	12.6					
	15.0	4.0	9.2	65/55	48500	43300	4.598	64200	10.5					
		4.0	9.2	70/59	52400	42600	4.636	68200	11.3					
		4.0	9.2	75/63	56400	43800	4.676	72400	12.1					
		4.0	9.2	80/67	60300	45100	4.717	76400	12.8					
	20.0	7.0	16.0	65/55	48900	43400	4.550	64400	10.7					
		7.0	16.0	70/59	52800	42700	4.588	68500	11.5					
		7.0	16.0	75/63	56800	44000	4.628	72600	12.3					
		7.0	16.0	80/67	60700	45200	4.668	76600	13.0					
110	10.0	1.8	4.2	65/55	44200	41400	5.179	61900	8.5					
		1.8	4.2	70/59	48100	40700	5.217	65900	9.2					
		1.8	4.2	75/63	52000	42000	5.257	69900	9.9					
		1.8	4.2	80/67	56000	43300	5.297	74100	10.6					
	15.0	4.0	9.1	65/55	44600	41600	5.131	62100	8.7					
		4.0	9.1	70/59	48500	40900	5.169	66100	9.4					
		4.0	9.1	75/63	52500	42200	5.209	70300	10.1					
		4.0	9.1	80/67	56400	43400	5.249	74300	10.7					
	20.0	6.9	15.8	65/55	45000	41800	5.083	62300	8.9					
		6.9	15.8	70/59	48900	41100	5.121	66400	9.5					
		6.9	15.8	75/63	52900	42300	5.161	70500	10.2					
		6.9	15.8	80/67	56800	43600	5.201	74600	10.9					

Size 072 (2160 CFM)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating											
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP							
20	12.0	3.2	7.2	65/55	Tint = Operation Not Recommended. (See "Appendixes" on page 71 for table legend)						43600	4.310	28900	85	2.96						
		3.2	7.2	70/59							43300	4.499	27900	88	2.82						
		3.2	7.2	75/63							43000	4.734	26800	93	2.66						
		3.2	7.2	80/67							42600	4.970	25600	98	2.51						
		3.2	7.2	85/71																	
	18.0	6.9	15.7	65/55							48800	4.411	33700	87	3.24						
		6.9	15.7	70/59							48500	4.599	32800	91	3.09						
		6.9	15.7	75/63							48100	4.835	31600	96	2.91						
		6.9	15.7	80/67							47700	5.070	30400	100	2.75						
		6.9	15.7	85/71																	
	24.0	11.9	27.1	65/55							53900	4.512	38500	89	3.50						
		11.9	27.1	70/59							53600	4.700	37600	93	3.34						
		11.9	27.1	75/63							53200	4.936	36400	98	3.16						
		11.9	27.1	80/67							52800	5.171	35200	103	2.99						
		11.9	27.1	85/71																	
	30	12.0	3.1	7.0							65/55	63100	47400	2.905	73000	21.7	51000	4.468	35800	88	3.34
			3.1	7.0							70/59	63100	47400	2.905	73000	21.7	50700	4.656	34800	92	3.19
			3.1	7.0							75/63	67000	48700	2.948	77100	22.7	50300	4.892	33600	96	3.01
			3.1	7.0							80/67	71000	50000	2.990	81200	23.7	49900	5.127	32400	101	2.85
			3.1	7.0							85/71	75000	51400	3.033	85400	24.7	49500	5.362	31200	106	2.69
18.0		6.7	15.2	65/55	59700	48700	2.795	69200	21.4	56100	4.569	40500	90	3.60							
		6.7	15.2	70/59	63700	47600	2.835	73400	22.5	55800	4.757	39600	94	3.43							
		6.7	15.2	75/63	67600	48900	2.878	77400	23.5	55400	4.993	38400	99	3.25							
		6.7	15.2	80/67	71600	50300	2.920	81600	24.5	55000	5.228	37200	103	3.08							
		6.7	15.2	85/71	75600	51600	2.963	85700	25.5	54600	5.463	36000	108	2.91							
24.0		11.5	26.3	65/55	60300	48900	2.725	69600	22.1	61200	4.670	45300	92	3.84							
		11.5	26.3	70/59	64300	47800	2.765	73700	23.3	60900	4.858	44300	96	3.67							
		11.5	26.3	75/63	68200	49200	2.808	77800	24.3	60500	5.094	43100	101	3.48							
		11.5	26.3	80/67	72200	50500	2.850	81900	25.3	60200	5.329	42000	106	3.31							
		11.5	26.3	85/71	76200	51800	2.892	86100	26.3	59800	5.564	40800	111	3.14							
40	12.0	3.0	6.8	65/55	64700	52400	3.169	75500	20.4	59000	4.642	43200	91	3.72							
		3.0	6.8	70/59	68700	51300	3.209	79700	21.4	58700	4.830	42200	95	3.56							
		3.0	6.8	75/63	72600	52600	3.251	83700	22.3	58300	5.066	41000	100	3.37							
		3.0	6.8	80/67	76600	53900	3.294	87800	23.3	58000	5.301	39900	105	3.20							
		3.0	6.8	85/71	80600	55300	3.336	92000	24.2	57600	5.536	38700	110	3.03							
	18.0	6.5	14.7	65/55	65300	52600	3.099	75900	21.1	64200	4.742	48000	93	3.96							
		6.5	14.7	70/59	69300	51500	3.139	80000	22.1	63800	4.931	47000	97	3.79							
		6.5	14.7	75/63	73200	52800	3.181	84100	23.0	63500	5.166	45900	102	3.60							
		6.5	14.7	80/67	77200	54200	3.224	88200	23.9	63100	5.402	44700	107	3.42							
		6.5	14.7	85/71	81200	55500	3.266	92300	24.9	62700	5.637	43500	112	3.25							
	24.0	11.2	25.5	65/55	65900	52800	3.029	76200	21.8	69300	4.843	52800	96	4.19							
		11.2	25.5	70/59	69900	51800	3.069	80400	22.8	69000	5.032	51800	99	4.02							
		11.2	25.5	75/63	73800	53100	3.111	84400	23.7	68600	5.267	50600	104	3.81							
		11.2	25.5	80/67	77800	54400	3.154	88600	24.7	68200	5.503	49400	109	3.63							
		11.2	25.5	85/71	81800	55700	3.196	92700	25.6	67800	5.738	48200	114	3.46							
50	12.0	2.9	6.6	65/55	66800	53900	3.492	78700	19.1	67800	4.831	51300	95	4.11							
		2.9	6.6	70/59	70800	52900	3.532	82900	20.0	67500	5.019	50400	99	3.94							
		2.9	6.6	75/63	74800	54200	3.575	87000	20.9	67100	5.255	49200	104	3.74							
		2.9	6.6	80/67	78700	55500	3.617	91000	21.8	66700	5.490	48000	108	3.56							
		2.9	6.6	85/71	82700	56800	3.660	95200	22.6	66300	5.725	46800	113	3.38							
	18.0	6.3	14.4	65/55	67400	54200	3.422	79100	19.7	72900	4.932	56100	97	4.33							
		6.3	14.4	70/59	71400	53100	3.462	83200	20.6	72600	5.120	55100	101	4.15							
		6.3	14.4	75/63	75300	54400	3.505	87300	21.5	72200	5.356	53900	106	3.95							
		6.3	14.4	80/67	79300	55800	3.547	91400	22.4	71800	5.591	52700	111	3.76							
		6.3	14.4	85/71	83300	57100	3.590	95600	23.2	71400	5.826	51500	116	3.58							
	24.0	10.9	24.9	65/55	68000	54400	3.352	79400	20.3	78000	5.032	60800	99	4.54							
		10.9	24.9	70/59	72000	53300	3.392	83600	21.2	77700	5.221	59900	103	4.36							
		10.9	24.9	75/63	75900	54700	3.435	87600	22.1	77300	5.456	58700	108	4.15							
		10.9	24.9	80/67	79900	56000	3.477	91800	23.0	77000	5.692	57600	113	3.96							
		10.9	24.9	85/71	83900	57300	3.520	95900	23.8	76600	5.927	56400	118	3.78							
60	12.0	2.8	6.5	65/55	66400	54000	3.825	79500	17.4	77200	5.036	60000	99	4.49							
		2.8	6.5	70/59	70300	52900	3.865	83500	18.2	76900	5.224	59100	103	4.31							
		2.8	6.5	75/63	74300	54200	3.908	87600	19.0	76500	5.460	57900	108	4.10							
		2.8	6.5	80/67	78300	55600	3.950	91800	19.8	76200	5.695	56800	112	3.92							
		2.8	6.5	85/71	82200	56900	3.993	95800	20.6	75800	5.930	55600	117	3.74							
	18.0	6.1	14.0	65/55	67000	54200	3.755	79800	17.8	82400	5.137	64900	101	4.70							
		6.1	14.0	70/59	70900	53100	3.795	83900	18.7	82100	5.325	63900	105	4.51							
		6.1	14.0	75/63	74900	54500	3.838	88000	19.5	81700	5.561	62700	110	4.30							
		6.1	14.0	80/67	78900	55800	3.880	92100	20.3	81300	5.796	61500	115	4.11							
		6.1	14.0	85/71	82800	57100	3.923	96200	21.1	80900	6.031	60300	120	3.92							
	24.0	10.6	24.3	65/55	67600	54400	3.685	80200	18.3	87500	5.237	69600	103	4.89							
		10.6	24.3	70/59	71500	53400	3.725	84200	19.2	87200	5.426	68700	107	4.71							
		10.6	24.3	75/63	75500	54700	3.768	88400	20.0	86800	5.661	67500	112	4.49							
		10.6	24.3	80/67	79500	56000	3.810	92500	20.9	86400	5.897	66300	117	4.29							
		10.6	24.3	85/71	83400	57400	3.853	96600	21.6	86000	6.132	65100	122	4.10							

Size 072 (2160 CFM) (continued)

EWT (°F)	GPM	WPD		EAT (°F)	Cooling					Heating					
		PSI	FT of W.C.		Total (Btu/hr)	Sensible (Btu/hr)	Power Input (kW)	THR (Btu/hr)	EER	Total (Btu/hr)	Power Input (kW)	THA (Btu/hr)	LAT (°F)	COP	
70	12.0	2.8	6.3	65/55	64200	53100	4.169	78400	15.4	87400	5.257	69500	103	4.87	
		2.8	6.3	70/59	68200	52100	4.209	82600	16.2	87100	5.445	68500	107	4.68	
		2.8	6.3	75/63	72100	53400	4.252	86600	17.0	86700	5.681	67300	112	4.47	
		2.8	6.3	80/67	76100	54700	4.294	90800	17.7	86300	5.916	66100	117	4.27	
	18.0	2.8	6.3	85/71	80100	56000	4.337	94900	18.5						
		6.0	13.7	65/55	64800	53400	4.099	78800	15.8	92500	5.357	74200	105	5.06	
		6.0	13.7	70/59	68800	52300	4.139	82900	16.6	92200	5.546	73300	109	4.87	
		6.0	13.7	75/63	72700	53600	4.182	87000	17.4	91800	5.781	72100	114	4.65	
	24.0	6.0	13.7	80/67	76700	54900	4.224	91100	18.2	91500	6.017	71000	119	4.45	
		6.0	13.7	85/71	80700	56300	4.267	95300	18.9						
		10.4	23.7	65/55	65400	53600	4.029	79200	16.2	97600	5.458	79000	108	5.24	
		10.4	23.7	70/59	69400	52500	4.069	83300	17.1	97300	5.647	78000	111	5.05	
	80	12.0	10.4	23.7	75/63	73300	53900	4.112	87300	17.8	97000	5.882	76900	116	4.83
			10.4	23.7	80/67	77300	55200	4.154	91500	18.6	96600	6.118	75700	121	4.62
			10.4	23.7	85/71	81300	56500	4.197	95600	19.4					
			2.7	6.2	65/55	61200	51900	4.535	76700	13.5	98300	5.493	79600	108	5.24
18.0		2.7	6.2	70/59	65100	50800	4.575	80700	14.2	98000	5.682	78600	112	5.05	
		2.7	6.2	75/63	69100	52200	4.618	84900	15.0	97600	5.917	77400	117	4.83	
		2.7	6.2	80/67	73000	53500	4.660	89900	15.7	97200	6.153	76200	121	4.63	
		2.7	6.2	85/71	77000	54800	4.703	93100	16.4						
24.0		5.9	13.5	65/55	61700	52100	4.465	76900	13.8	103400	5.594	84300	110	5.41	
		5.9	13.5	70/59	65700	51100	4.505	81100	14.6	103100	5.782	83400	114	5.22	
		5.9	13.5	75/63	69700	52400	4.548	85200	15.3	102700	6.018	82200	119	5.00	
		5.9	13.5	80/67	73600	53700	4.590	89300	16.0	102300	6.253	81000	124	4.79	
90		12.0	5.9	13.5	85/71	77600	55000	4.632	93400	16.8					
			10.2	23.3	65/55	62300	52400	4.395	77300	14.2	108500	5.695	89100	112	5.58
			10.2	23.3	70/59	66300	51300	4.435	81400	14.9	108200	5.883	88100	116	5.39
			10.2	23.3	75/63	70200	52600	4.478	85500	15.7	107800	6.119	86900	121	5.16
	18.0	10.2	23.3	80/67	74200	54000	4.520	89600	16.4	107500	6.354	85800	126	4.95	
		10.2	23.3	85/71	78200	55300	4.562	93800	17.1						
		2.7	6.1	65/55	57700	50600	4.940	74600	11.7	109800	5.745	90200	113	5.60	
		2.7	6.1	70/59	61600	49500	4.980	78600	12.4	109500	5.934	89200	117	5.40	
	24.0	2.7	6.1	75/63	65600	50900	5.023	82700	13.1	109200	6.169	88100	122	5.18	
		2.7	6.1	80/67	69600	52200	5.065	86900	13.7	108800	6.405	86900	126	4.97	
		2.7	6.1	85/71	73500	53500	5.108	90900	14.4						
		5.8	13.2	65/55	58300	50800	4.870	74900	12.0	115000	5.846	95000	115	5.76	
	100	12.0	5.8	13.2	70/59	62200	49800	4.910	79000	12.7	114700	6.035	94100	119	5.57
			5.8	13.2	75/63	66200	51100	4.953	83100	13.4	114300	6.270	92900	124	5.34
			5.8	13.2	80/67	70200	52400	4.995	87200	14.1	113900	6.506	91700	129	5.13
			5.8	13.2	85/71	74100	53800	5.038	91300	14.7					
18.0		10.0	22.9	65/55	58900	51100	4.800	75300	12.3	120100	5.947	99800	117	5.91	
		10.0	22.9	70/59	62800	50000	4.840	79300	13.0	119800	6.135	98900	121	5.72	
		10.0	22.9	75/63	66800	51300	4.883	83500	13.7	119400	6.371	97700	126	5.49	
		10.0	22.9	80/67	70800	52700	4.925	87600	14.4	119000	6.606	96500	131	5.27	
110		12.0	10.0	22.9	85/71	74700	54000	4.968	91700	15.0					
			2.6	6.0	65/55	54100	49400	5.407	72600	10.0					
			2.6	6.0	70/59	58100	48300	5.447	76700	10.7					
			2.6	6.0	75/63	62000	49600	5.489	80700	11.3					
		18.0	2.6	6.0	80/67	66000	51000	5.532	84900	11.9					
			2.6	6.0	85/71	70000	52300	5.574	89000	12.6					
			5.7	13.1	65/55	54700	49600	5.337	72900	10.2					
			5.7	13.1	70/59	58700	48500	5.377	77100	10.9					
	24.0	5.7	13.1	75/63	62600	49900	5.419	81100	11.6						
		5.7	13.1	80/67	66600	51200	5.462	85200	12.2						
		5.7	13.1	85/71	70600	52500	5.504	89400	12.8						
		9.9	22.6	65/55	55300	49800	5.267	73300	10.5						
	12.0	12.0	9.9	22.6	70/59	59300	48800	5.307	77400	11.2					
			9.9	22.6	75/63	63200	50100	5.349	81500	11.8					
			9.9	22.6	80/67	67200	51400	5.392	85600	12.5					
			9.9	22.6	85/71	71200	52800	5.434	89700	13.1					
18.0		2.6	6.0	65/55	50300	48100	5.958	70600	8.4						
		2.6	6.0	70/59	54200	47000	5.998	74700	9.0						
		2.6	6.0	75/63	58200	48400	6.041	78800	9.6						
		2.6	6.0	80/67	62200	49700	6.083	83000	10.2						
24.0		2.6	6.0	85/71	66100	51000	6.126	87000	10.8						
		5.7	12.9	65/55	50900	48300	5.888	71000	8.6						
		5.7	12.9	70/59	54800	47300	5.928	75000	9.2						
		5.7	12.9	75/63	58800	48600	5.971	79200	9.8						
18.0		5.7	12.9	80/67	62800	49900	6.013	83300	10.4						
		5.7	12.9	85/71	66700	51300	6.056	87400	11.0						
		9.8	22.4	65/55	51500	48600	5.818	71400	8.9						
		9.8	22.4	70/59	55400	47500	5.858	75400	9.5						
24.0	9.8	22.4	75/63	59400	48800	5.901	79500	10.1							
	9.8	22.4	80/67	63400	50200	5.943	83700	10.7							
	9.8	22.4	85/71	67300	51500	5.986	87700	11.2							

Tint = Operation Not Recommended

Notes:

1. Operation below 40°F EWT is based upon a 15% methanol antifreeze solution.
2. Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
3. See performance correction tables for operating conditions other than those listed.
4. Interpolation is permissible; extrapolation is not.
5. For performance data outside the EAT listed, refer to the McQuay SelectTools selection program
6. Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
7. Data is base on unit at full load operation..

Fan Performance – Constant CFM Type EC Motor

Table 10: Two stage units with constant CFM type EC motor

Unit Size	MicroTech III Unit Controller								I/O Expansion Module			
	Setting	Maximum ESP (in. wg.) ²	¹ Low CFM Heat	¹ High CFM Heat	¹ Low CFM Cool	¹ High CFM Cool	Dehumidification	Electric Heat	Setting	Fan Only	Hydronic Heat	Water-side Economizer
026	4 (High)	0.7	800	900	800	900	750	900	A	800	800	800
	3 (Standard)		700	800	700	800	650	900	B	700	700	700
	2 (Medium)		600	700	600	700	600	900	C	600	600	600
	1 (Low)		600	600	600	600	600	900	D	450	450	600
032	4 (High)	0.7	1000	1125	1000	1125	900	1125	A	1000	1000	1000
	3 (Standard)		875	1000	875	1000	800	1125	B	875	875	875
	2 (Medium)		750	875	750	875	750	1125	C	750	750	750
	1 (Low)		750	750	750	750	750	1125	D	560	560	750
038	4 (High)	0.7	1250	1400	1250	1400	1175	1400	A	1250	1250	1250
	3 (Standard)		1090	1250	1090	1250	1050	1400	B	1090	1090	1090
	2 (Medium)		940	1090	940	1090	940	1400	C	940	940	940
	1 (Low)		940	940	940	940	940	1400	D	700	700	940
044	4 (High)	0.7	1400	1575	1400	1575	1320	1575	A	1400	1400	1400
	3 (Standard)		1225	1400	1225	1400	1140	1575	B	1225	1225	1225
	2 (Medium)		1050	1225	1050	1225	1050	1575	C	1050	1050	1050
	1 (Low)		1050	1050	1050	1050	1050	1575	D	785	785	1050
049	4 (High)	0.7	1600	1800	1600	1800	1500	1800	A	1600	1600	1600
	3 (Standard)		1400	1600	1400	1600	1300	1800	B	1400	1400	1400
	2 (Medium)		1200	1400	1200	1400	1200	1800	C	1200	1200	1200
	1 (Low)		1200	1200	1200	1200	1200	1800	D	900	900	1200
064	4 (High)	0.7	2000	2250	2000	2250	1875	2250	A	2000	2000	2000
	3 (Standard)		1750	2000	1750	2000	1625	2250	B	1750	1750	1750
	2 (Medium)		1500	1750	1500	1750	1500	2250	C	1500	1500	1500
	1 (Low)		1500	1500	1500	1500	1500	2250	D	1120	1120	1500
072	4 (High)	0.7	2160	2400	2160	2400	2040	2400	A	2160	2160	2160
	3 (Standard)		1920	2160	1920	2160	1800	2400	B	1920	1920	1920
	2 (Medium)		1710	1920	1710	1920	1710	2400	C	1710	1710	1710
	1 (Low)		1710	1710	1710	1710	1710	2400	D	1330	1330	1710

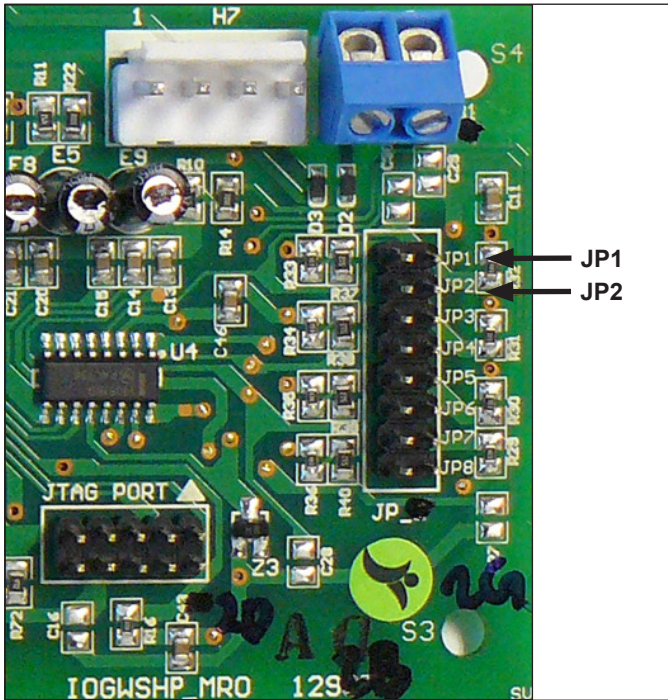
Notes: ¹ The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM fan performance. Standard operation with a 1-stage thermostat is indicated as High CFM fan performance.

² Applications up to 1.0" ESP (in. wg.) are possible. However, increased fan noise should be anticipated and appropriate noise attenuation should be considered.

Table 11: I/O expansion module jumper configuration

I/O Expansion board configuration		
Setting	JP1	JP2
A	Open	Open
B	Shorted	Open
C	Open	Shorted
D	Shorted	Shorted

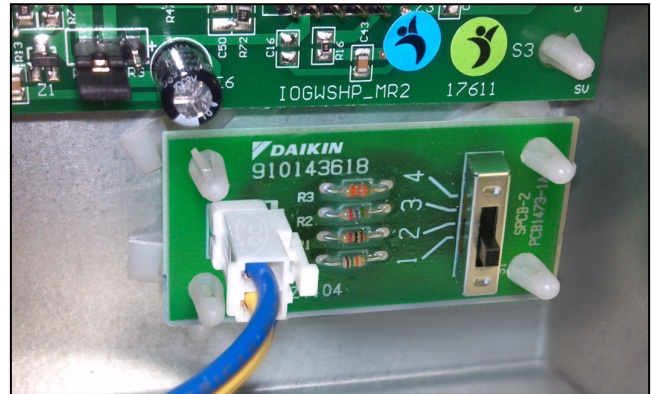
Figure 26: JP1 & JP2 location on the I/O expansion module



Fan Speed Selector Switch

A 4-position fan speed selector switch located in the control box allows CFM settings to be field adjustable. Fan speed control optimizes unit fan speed based on thermostat/room sensor inputs. The fan speed switch allows for manually setting an optimal fan speed specific to the application requirements. Each position on the fan speed switch represents settings 1-4. See [Table 10 on page 44](#) for the complete list of fan speed selector switch settings.

Figure 27: 4-position fan speed selector switch



Air Flow Correction Factors – Full Load

Table 12: Air flow correction factors (full load) – sizes 026-072

Unit Size	Air Flow Setting	Cooling			Heating	
		Total Capacity	Sensible Capacity	Power Input	Total Capacity	Power Input
026	Setting 4 (High)	1.013	1.070	1.016	1.009	0.996
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.987	0.938	0.985	0.992	1.004
	Setting 1 (Low)	0.975	0.884	0.970	0.983	1.008
032	Setting 4 (High)	1.018	1.091	1.028	1.006	0.997
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.983	0.923	0.974	0.994	1.003
	Setting 1 (Low)	0.966	0.857	0.948	0.987	1.006
036	Setting 4 (High)	1.015	1.061	1.024	1.010	1.004
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.985	0.946	0.977	0.991	0.997
	Setting 1 (Low)	0.970	0.897	0.956	0.981	0.993
044	Setting 4 (High)	1.012	1.050	1.015	1.009	1.002
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.988	0.954	0.985	0.991	0.998
	Setting 1 (Low)	0.976	0.913	0.971	0.982	0.996
049	Setting 4 (High)	1.020	1.079	1.027	1.009	1.003
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.981	0.932	0.974	0.991	0.997
	Setting 1 (Low)	0.962	0.873	0.950	0.982	0.993
064	Setting 4 (High)	1.012	1.070	1.041	0.990	0.987
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.988	0.939	0.962	1.010	1.014
	Setting 1 (Low)	0.976	0.885	0.927	1.021	1.028
072	Setting 4 (High)	1.013	1.075	1.040	1.014	1.020
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.987	0.935	0.963	0.986	0.981
	Setting 1 (Low)	0.975	0.878	0.928	0.973	0.963

Air Flow Correction Factors – Part Load

Table 13: Air flow correction factors (part load) – sizes 026-072

Unit Size	Air Flow Setting	Cooling			Heating	
		Total Capacity	Sensible Capacity	Power Input	Total Capacity	Power Input
026	Setting 4 (High)	1.011	1.080	1.017	1.005	0.991
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.989	0.931	0.984	0.995	1.009
	Setting 1 (Low)	0.989	0.931	0.984	0.995	1.009
032	Setting 4 (High)	1.010	1.046	1.015	1.009	1.005
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.990	0.958	0.985	0.991	0.995
	Setting 1 (Low)	0.990	0.958	0.985	0.991	0.995
036	Setting 4 (High)	1.012	1.066	1.024	1.010	1.004
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.988	0.941	0.977	0.990	0.996
	Setting 1 (Low)	0.988	0.941	0.977	0.990	0.996
044	Setting 4 (High)	1.013	1.086	1.019	1.020	1.003
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.987	0.927	0.982	0.981	0.997
	Setting 1 (Low)	0.987	0.927	0.982	0.981	0.997
049	Setting 4 (High)	1.017	1.094	1.026	1.009	1.002
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.984	0.921	0.975	0.991	0.998
	Setting 1 (Low)	0.984	0.921	0.975	0.991	0.998
064	Setting 4 (High)	1.011	1.070	1.038	1.009	1.014
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.989	0.939	0.965	0.991	0.987
	Setting 1 (Low)	0.989	0.939	0.965	0.991	0.987
072	Setting 4 (High)	1.004	1.075	1.053	1.012	1.025
	Setting 3 (Standard)	1.000	1.000	1.000	1.000	1.000
	Setting 2 (Medium)	0.996	0.935	0.952	0.989	0.976
	Setting 1 (Low)	0.996	0.935	0.952	0.989	0.976

Loop Pump Performance

Figure 28: Single pump performance curve

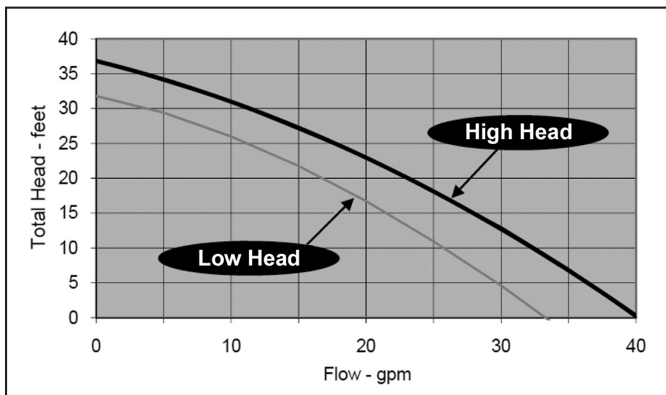
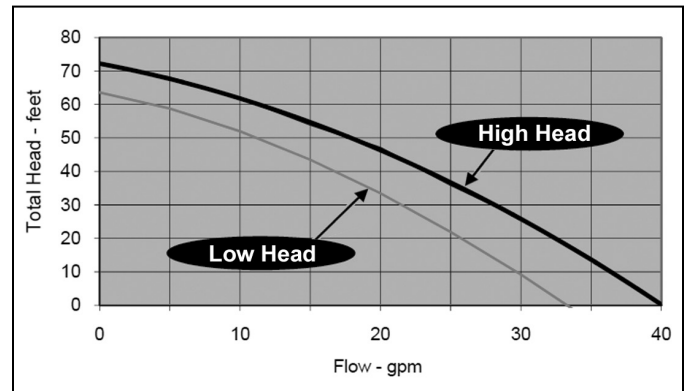


Figure 29: Dual pump performance curve



Desuperheater Performance

Table 14: Desuperheater

Unit Ton	Desuperheater GPM	Desuperheater EWT °F	Cooling Mode		Heating Mode	
			Unit EWT °F	Desuperheater Capacity Btu/hr.	Unit EWT °F	Desuperheater Capacity Btu/hr.
026	0.8	90	77	2,300	32	2,200
			90	2,875	70	3,520
032	1.0	90	77	2,875	32	2,750
			90	3,594	70	4,400
036	1.2	90	77	3,450	32	3,300
			90	4,313	70	5,280
044	1.4	90	77	4,025	32	3,850
			90	5,031	70	6,160
049	1.6	90	77	4,600	32	4,400
			90	5,750	70	7,040
064	2.0	90	77	5,750	32	5,500
			90	7,188	70	8,800
072	2.4	90	77	6,900	32	6,600
			90	8,625	70	10,560

Note: Capacity data based on nominal rated CFM and nominal rated GPM.

Electric Heat Performance

Table 15: Two stage electric heat

Nominal Size (Kw)	Applies to Unit Sizes	208V		230V		240V		265V		277V		460V		480V	
		kW	Btuh	kW	Btuh	kW	Btuh	kW	Btuh	kW	Btuh	kW	Btuh	kW	Btuh
5	026 - 072	3.8	12,826	4.6	15,683	5.0	17,076	4.6	15,628	5.0	17,076	4.6	15,683	5.0	17,076
10		7.5	25,652	9.2	31,365	10.0	34,152	8.8	30,007	9.6	32,786	8.8	30,110	9.6	32,786
15	038 - 072	11.3	38,478	13.8	47,048	15.0	51,228	-	-	-	-	13.8	47,048	15.0	51,228
20		14.9	51,047	18.3	62,417	19.9	67,962	-	-	-	-	18.4	62,730	20.0	68,304

Note: Electrical data for SmartSource units with options is available from the Daikin SelectTools™ software selection program. Consult your local Daikin representative for further information.

Waterside Economizer Cooling Capacity - Vertical Unit

Table 16: 600 to 1400 CFM¹

Unit Size	GPM	600 CFM		800 CFM		1000 CFM		1200 CFM		1400 CFM		³WPD ft. of wc.
		Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	
026, 032	4	20.2	15.6	22.8	18.9	24.8	21.8	26.4	24.1			3.59
	6	23.4	16.9	26.7	20.6	29.3	23.9	31.3	26.7			2.29
	8	25.5	17.8	29.6	21.8	32.7	25.3	35.1	28.5			1.27
	10	27.1	18.5	31.8	22.7	35.4	26.5	38.2	29.8			0.56
	²PD (" wc.)	0.07		0.108		0.152		0.201				
038	6			36.3	31.0	34.4	28.2	31.9	25.1	28.9	21.6	1.02
	9			43.1	34.1	40.4	30.9	37.3	27.3	33.3	23.4	2.35
	12			36.1	24.6	40.9	28.8	44.8	32.7	48.0	36.2	4.08
	²PD (" wc.)			0.081		0.115		0.152		0.193		
044, 049	8					36.8	27.2	40.0	30.8	42.7	34.1	1.53
	10					39.9	28.5	43.5	32.3	46.6	35.8	2.43
	12					42.2	29.5	46.4	33.5	49.9	37.2	3.46
	²PD (" wc.)					0.086		0.114		0.145		
064, 072	12.5									53.1	38.6	2.67
	15									56.2	39.9	3.79
	18									59.1	41.1	5.38
	²PD (" wc.)									0.141		

Table 17: 1600 to 2400 CFM¹

Unit Size	GPM	1600 CFM		1800 CFM		2000 CFM		2200 CFM		2400 CFM		³ WPD ft. of wc.
		Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	
044, 049	8	44.9	37.1	46.9	39.8							1.53
	10	49.2	39.0	51.6	42.1							2.43
	12	52.8	40.6	55.3	43.7							3.46
	² PD (" wc.)	0.177		0.211								
064, 072	12.5	56.5	42.5	59.5	46.0	62.2	49.3	64.6	52.4	66.8	55.3	2.67
	15	60.1	43.9	63.5	47.8	66.4	51.2	69.1	54.4	71.6	57.5	3.79
	18	63.5	45.3	67.3	49.3	70.7	53.0	73.7	56.5	76.4	59.7	5.38
	² PD (" wc.)	0.172		0.205		0.241		0.278		0.318		

Notes: ¹ Capacity is based on 80/67°F entering air and 45°F entering water temperatures. Total and sensible capacities are Mbtuh.

² Air PD is air pressure drop in inches of water column wet coil.

³ WPD is water side pressure drop in feet of water. Coil pressure drop only.

Waterside Economizer Cooling Capacity - Horizontal Unit

Table 18: 600 to 1400 CFM¹

Unit Size	GPM	600 CFM		800 CFM		1000 CFM		1200 CFM		1400 CFM		³ WPD ft. of wc.
		Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	
026, 032	4	21.6	16.2	24.6	19.6	26.8	22.6	28.6	25.1			0.85
	6	25.1	17.6	29.0	21.5	31.9	25.0	34.3	28.0			1.99
	8	27.3	18.6	32.0	22.8	35.6	26.5	38.5	29.9			3.46
	10	28.9	19.2	34.3	23.7	38.4	27.7	41.8	31.2			5.3
	² PD (" wc.)	0.069		0.108		0.152		0.203				
038	6			30.5	22.2	33.8	25.9	36.6	29.2	38.8	32.1	1.4
	9			34.9	24.1	39.4	28.2	42.9	31.9	45.9	35.3	3.07
	12			37.8	25.3	43.0	29.8	47.4	33.8	50.9	37.5	5.31
	² PD (" wc.)			0.075		0.105		0.138		0.174		
044, 049	8					39.9	28.5	43.7	32.3	46.8	35.8	2.54
	10					43.0	29.8	47.4	33.9	51.0	37.6	3.88
	12					45.4	30.8	50.3	35.1	54.4	39.1	5.48
	² PD (" wc.)					0.082		0.108		0.136		
064, 072	12.5									51.7	37.7	2.69
	15									55.1	39.1	3.82
	18									58.3	40.5	5.42
	² PD (" wc.)									0.115		

Table 19: 1600 to 2400 CFM¹

Unit Size	GPM	1600 CFM		1800 CFM		2000 CFM		2200 CFM		2400 CFM		³ WPD ft. of wc.
		Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	Total	Sensible	
044, 049	8	49.5	39.0	51.8	42.0							2.54
	10	54.1	41.0	56.8	44.2							3.88
	12	57.9	42.7	60.9	46.0							5.48
	² PD (" wc.)	0.166		0.199								
064, 072	12.5	55.0	41.3	57.8	44.6	60.4	47.7	62.7	50.6	64.8	53.3	2.69
	15	58.9	42.9	62.2	46.4	65.0	49.7	67.6	52.8	69.9	55.7	3.82
	18	62.6	44.5	66.3	48.1	69.6	51.6	72.5	54.9	75.2	57.9	5.42
	² PD (" wc.)	0.142		0.17		0.2		0.229		0.263		

Notes: ¹ Capacity is based on 80/67°F entering air and 45°F entering water temperatures. Total and sensible capacities are Mbtuh.

² Air PD is air pressure drop in inches of water column wet coil.

³ WPD is water side pressure drop in feet of water. Coil pressure drop only.

Hydronic Coil Performance

Table 20: Hydronic coil performance

Unit	Flow Rate (gpm)	Entering Water Temperature °F							
		90		100		110		120	
		Capacity (BTU's/hr)		Capacity (BTU's/hr)		Capacity (BTU's/hr)		Capacity (BTU's/hr)	
		WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)
026 700 CFM 0.061 in wg APD	3.00	13,689		20,129		26,687		33,350	
		0.44	80.8	0.45	86.5	0.45	92	0.46	97.5
	4.00	14,975		21,981		29,091		36,276	
		0.84	82.5	0.85	88.9	0.84	95.3	0.82	101.6
	6.00	16,127		23,543		30,976		38,435	
		1.82	84.6	1.79	92.1	1.77	99.6	1.74	107
8.00	16,519		24,075		31,652		39,247		
	3.11	85.8	3.06	93.9	3.01	102	2.96	110.1	
032 875 CFM 0.084 in wg APD	3.75	16,855		24,800		32,895		41,129	
		0.72	81	0.74	86.7	0.74	92.3	0.73	97.8
	5.00	18,425		27,059		35,738		44,404	
		1.3	82.6	1.28	89.1	1.26	95.6	1.24	102
	7.50	19,812		28,908		38,048		47,222	
		2.76	84.7	2.72	92.2	2.67	99.8	2.63	107.3
10.00	20,340		29,653		38,996		48,365		
	4.71	85.9	4.63	94	4.56	102.1	4.49	110.2	
038 1090 CFM 0.227 in wg APD	4.50	17,830		26,064		34,358		42,701	
		1.89	82	1.86	88.3	1.83	94.6	1.8	100.8
	6.00	19,487		28,473		37,519		46,613	
		3.21	83.5	3.16	90.4	3.11	97.4	3.06	104.3
	9.00	21,358		31,178		41,050		50,964	
		6.80	85.2	6.69	93	6.58	100.8	6.48	108.5
12.00	22,366		32,627		42,932		53,272		
	11.59	86.3	11.4	94.5	11.22	102.8	11.06	111	
044 1225 CFM 0.066 in wg APD	5.25	21,173		31,281		41,382		51,491	
		1.22	81.9	1.2	88	1.18	94.1	1.16	100.1
	7.00	23,177		33,896		44,705		55,587	
		2.08	83.3	2.04	90.2	2.01	97.1	1.98	103.9
	10.50	25,086		36,639		48,263		59,945	
		4.41	85.2	4.34	93	4.28	100.7	4.22	108.4
14.00	26,077		38,053		50,087		62,168		
	7.54	86.3	7.43	94.5	7.32	102.8	7.22	111	
049 1400 CFM 0.080 in wg APD	6.00	23,858		35,079		46,308		57,630	
		1.56	82	1.54	88.2	1.51	94.4	1.49	100.6
	8.00	25,928		37,927		50,029		62,217	
		2.66	83.5	2.62	90.4	2.58	97.4	2.55	104.3
	12.00	28,091		41,036		54,064		67,161	
		5.66	85.3	5.57	93.1	5.49	100.9	5.42	108.7
16.00	29,232		42,665		56,167		69,725		
	9.68	86.3	9.54	94.6	9.4	102.9	9.27	111.2	

Hydronic Coil Performance (continued)

Unit	Flow Rate (gpm)	Entering Water Temperature °F							
		90		100		110		120	
		Capacity (BTU's/hr)		Capacity (BTU's/hr)		Capacity (BTU's/hr)		Capacity (BTU's/hr)	
		WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)	WPD (ft w.c.)	LWT (°F)
064 1750 CFM 0.111 in wg APD	7.50	29,730		43,396		57,132		70,926	
		17.01	82.3	17.01	88.3	17.01	94.6	17.01	100.9
	10.00	31,916		46,568		61,290		76,066	
		28.89	83.6	28.89	90.6	28.89	97.6	28.89	104.6
	15.00	34,224		49,906		64,644		81,430	
		60.93	85.4	60.93	93.3	60.93	101.2	60.93	109.0
	20.00	35,418		51,622		67,874		84,166	
		103.46	86.4	103.46	94.8	103.46	103.1	103.46	111.5
072 1920 CFM 0.127 in wg APD	8.75	32,614		47,604		62,672		77,806	
		22.60	82.5	22.60	89.0	22.60	95.5	22.60	102.0
	11.67	34,846		50,842		66,912		83,044	
		38.39	84.0	38.39	91.2	38.39	98.4	38.39	105.6
	17.50	37,194		54,232		71,332		88,484	
		80.92	85.7	80.92	93.8	80.92	101.8	80.92	109.8
	23.33	38,416		55,990		73,616		91,284	
		137.36	86.7	137.36	95.2	137.36	103.6	137.36	112.1

Notes: Capacity is based on 68/59°F entering air.
 Air PD is air pressure drop in inches of water column wet coil.
 WPD is water side pressure drop in feet of water. Coil pressure drop only.

Table 21: Standard unit without options

Unit Size	Rated Voltage	Minimum Voltage	Compressor		Fan Motor FLA	Total Unit FLA	Minimum Circuit Amps	Maximum Fuse or HACR Breaker Size
	Voltage		RLA	LRA				
026	208-230/60/1	197	11.7	58.3	3.0	14.7	17.6	25
	265/60/1	239	9.1	54.0	2.6	11.7	14.0	20
	208-230/60/3	197	6.5	55.4	3.0	9.5	11.1	15
	*460/60/3	414	3.5	28.0	2.6	6.1	7.0	15
032	208-230/60/1	197	13.1	73.0	5.0	18.1	21.4	30
	265/60/1	239	10.2	60.0	4.1	14.3	16.9	25
	208-230/60/3	197	8.7	58.0	5.0	13.7	15.9	20
	*460/60/3	414	4.3	28.0	4.1	8.4	9.5	15
038	208-230/60/1	197	15.3	83.0	5.0	20.3	24.1	35
	208-230/60/3	197	11.6	73.0	5.0	16.6	19.5	30
	*460/60/3	414	5.7	38.0	4.1	9.8	11.2	15
044	208-230/60/1	197	17.9	96.0	7.3	25.2	29.7	45
	208-230/60/3	197	14.2	88.0	7.3	21.5	25.1	35
	*460/60/3	414	6.2	44.0	5.5	11.7	13.3	15
049	208-230/60/1	197	21.2	104.0	7.3	28.5	33.8	50
	208-230/60/3	197	14.0	83.1	7.3	21.3	24.8	35
	*460/60/3	414	6.4	41.0	5.5	11.9	13.5	15
064	208-230/60/1	197	27.1	152.9	9.4	36.5	43.3	60
	208-230/60/3	197	16.5	110.0	9.4	25.9	30.0	45
	*460/60/3	414	7.2	52.0	6.9	14.1	15.9	20
072	208-230/60/1	197	29.7	179.2	9.4	39.1	46.5	60
	208-230/60/3	197	17.6	136.0	9.4	27.0	31.4	45
	*460/60/3	414	8.5	66.1	6.9	15.4	17.5	25

Notes: Electrical data for units with loop pumps, electric heat and other options is available from the Daikin SelectTools™ software selection program for Water Source Heat Pumps. Consult your local Daikin representative for further information. *All 460/60/3 units require 4-wire power which includes a neutral wire. See "Appendix-B" on page 71.

Table 22: Electric heat availability

Model	Nominal Capacity	Unit Voltage	Single Power Point			Dual Power Point					
			Electric Heat		Secondary Heat Control	Electric Heat		Secondary Heat Control	Electric Heat		Secondary Heat Control
			5kW	10kW		5kW	10kW		15kW	20kW	
GTH & GTV	026	208-230/60/1	•	•	B,E,P	•	•	S			
		265/60/1	•		B,E,P	•		S			
		208-230/60/3	•	•	B,E,P	•	•	S			
		460/60/3	•	•	B,E,P	•	•	S			
	032	208-230/60/1	•	•	B,E,P	•	•	S			
		265/60/1	•		B,E,P	•		S			
		208-230/60/3	•	•	B,E,P	•	•	S			
		460/60/3	•	•	B,E,P	•	•	S			
	038	208-230/60/1	•	•	B,E,P	•	•	S	•		B,E,P,S
		208-230/60/3	•	•	B,E,P	•	•	S	•		B,E,P,S
		460/60/3	•	•	B,E,P	•	•	S	•		B,E,P,S
	044	208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
		460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
	049	208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
		460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
	064	208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
		460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
	072	208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
		460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S

Legend: B = Boilerless, E = Emergency, P = Primary, S = Supplemental

Motorized 2-Way Water Valve

Table 23: Motorized water valve correction factors

Unit Size	Cv	MOPD	Water Pressure Drop Adders		
			GPM	PSI	Ft of H ₂ O
026	10.3	150	4.0	0.15	0.35
			6.0	0.34	0.78
			8.0	0.60	1.39
032	10.3	150	5.0	0.24	0.54
			7.5	0.53	1.22
			10.0	0.94	2.17
036	8.9	150	6.0	0.45	1.05
			9.0	1.02	2.36
			12.0	1.82	4.19
044	8.9	150	7.0	0.62	1.43
			10.5	1.39	3.21
			14.0	2.47	5.71
049	8.9	150	8.0	0.81	1.86
			12.0	1.82	4.19
			16.0	3.23	7.46
064	8.9	150	10.0	1.26	2.91
			15.0	2.84	6.55
			20.0	5.05	11.65
072	8.9	150	11.7	1.72	3.96
			17.5	3.87	8.92
			23.3	6.87	15.86

Formula:

$$\Delta P = SL \left(\frac{QL}{Cv} \right)^2$$

Where:

- Cv** – Valve (Flow) coefficient for valves
- QL** – Liquid flow in gallons per minute (GPM)
- Qg** – Rate of gas flow in cubic feet per minute at standard conditions, 14.7 PSIA and 60°F (SCFM)
- P1** – Absolute inlet pressure (PSIA)
- P1** = Gauge pressure (PSIG) + 14.7
- P** – Pressure drop in pounds per square inch (PSI)
- SL** – Specific gravity of flowing liquid relative water at 60°F
- Sg** – Specific gravity of gas relative to air.
- T** – Absolute temperature in degrees Rankine, (°R)
- T** = °F+460

Antifreeze

Table 24: Antifreeze correction factors

	Antifreeze % by weight			
	15%	25%	35%	45%
Ethanol				
Cooling Capacity	0.985	–	–	–
Heating Capacity	0.9825	–	–	–
Pressure Drop	1.04			
Ethylene Glycol				
Cooling Capacity	0.9935	0.9895	0.985	0.981
Heating Capacity	0.9865	0.9795	0.973	0.965
Pressure Drop	1.10	1.16	1.22	1.27
Methanol				
Cooling Capacity	0.985	–	–	–
Heating Capacity	0.9825	–	–	–
Pressure Drop	1.04	–	–	–
Propylene Glycol				
Cooling Capacity	0.985	0.975	0.965	0.955
Heating Capacity	0.981	0.9685	0.952	0.936
Pressure Drop	1.11	1.20	1.31	1.40

Vertical Units

Table 25: Unit sizes 026 through 072

Description	Unit Size						
	026	032	038	044	049	064	072
Compressor Type	Scroll						
Refrigeration Charge (Oz.)	56	56	77	94	85	120	122
Fan Wheel (D x W)	9" x 7"		11" x 10"				
Fan Motor HP	1/3	1/2		3/4		1	
Water Connection Size (FPT)	3/4"			1"			
Desuperheater Connection Size (FPT)	1/2"						
Coax & Water Piping Volume (Gal. @ 70°F)	0.5		1.1	1.2		2.1	
Condensate Connection Size (FPT)	3/4"						
Air Coil Face Area (Sq Ft.)	4.1		4.9	5.6		6.4	
Air Coil Dimensions (H x W)	28" x 21.1"		26" x 27"	30" x 27"		34" x 27"	
Air Coil Rows	3						
Air Coil Tube Size	3/8"						
Nominal Filter Size	28" x 22"		29" x 26"	30" x 29"		34" x 29"	
Operating Weight	231	233	313	350	352	470	477
Shipping Weight	265	267	344	382	384	496	503

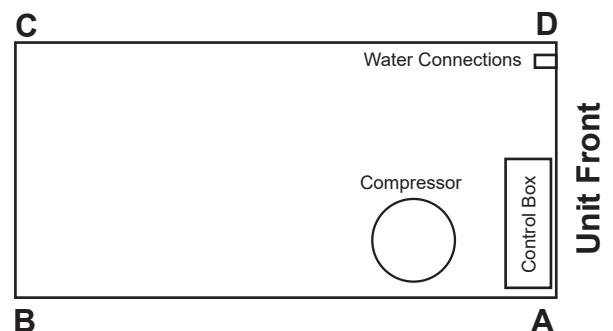
Horizontal Units

Table 26: Unit sizes 026 through 072

Description	Unit Size						
	026	032	038	044	049	064	072
Compressor Type	Scroll						
Refrigeration Charge (Oz.)	56	54	72	90	88	120	122
Fan Wheel (D x W)	9" x 7"		11" x 10"				
Fan Motor HP	1/3	1/2		3/4		1	
Water Connection Size (FPT)	3/4"			1"			
HDesuperheater Connection Size (FPT)	1/2"						
Coax & Water Piping Volume (Gal. @ 70°F)	0.5		1.1	1.2		2.1	
Condensate Connection Size (FPT)	3/4"						
Air Coil Face Area (Sq Ft.)	4.1		5.0	5.6		6.4	
Air Coil Dimensions (H x W)	18" x 32.5"		20" x 35.75"	20" x 40.5		20" x 45.9"	
Air Coil Rows	3						
Air Coil Tube Size	3/8"						
Nominal Filter Size	17" x 34"		19" x 37"	19" x 43"		19" x 48"	
Operating Weight	254	256	329	365	367	472	478
Shipping Weight	289	291	361	408	410	514	521

Table 27: Horizontal unit corner weights, percentage of total operating weight (base unit only)

Unit Size	Total Operating Weight (lbs.)	Corner Weight % of Total Operating Weight			
		A	B	C	D
026	254	30%	20%	20%	30%
032	256				
038	329				
044	365				
049	367				
064	472				
072	478				



Horizontal Unit

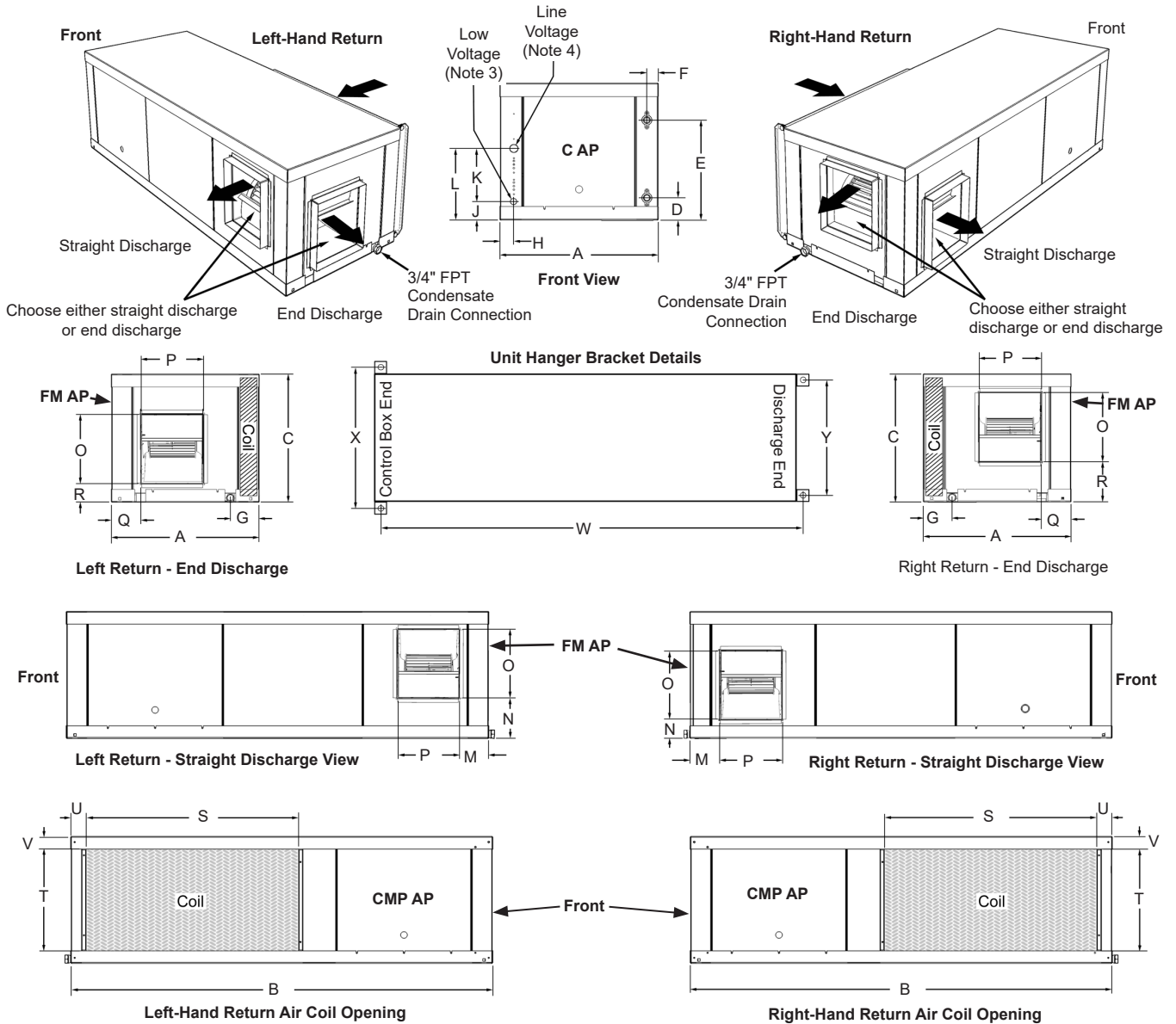


Table 28: Cabinet dimensions

GTH-Horizontal Unit	Overall Cabinet Dimensions in inches (mm)			Hanger Bracket Location Dimensions		
	A = Width	B = Length	C = Height	W	X	Y
026, 032	22.40" (569)	63.30" (1608)	19.30" (490)	62.16 (1579)	23.90 (607)	18.64 (474)
038	25.00" (635)	73.00" (1854)	21.30" (541)	72.16" (1833)	27" (686)	21.24" (539)
044, 049	25.00" (635)	78.40" (1991)	21.30" (541)	77.57" (1970)	27" (686)	21.24" (539)
064, 072	25.00" (635)	83.80" (2129)	21.30" (541)	82.97" (2107)	27" (686)	21.24" (539)

Notes: All dimensions within ± 0.10 inches (2.5 mm).

Legend: **CMP AP** = Compressor Compartment Access Panel
C AP = Control Access Panel
FM AP = Fan Motor Access Panel

Table 29: Piping connections dimensions

GTH Horizontal Unit	Piping Connections in inches (mm)				Electrical Connections in inches (mm)			
	D	E	F	G	H	J	K	L
	Supply	Return		Condensate Drain 3/4" FPT		Low Voltage ³	Between	Line Voltage ⁴
026, 032 ¹	2.58 (66)	13.39 (340)	1.57 (40)	4.29 (109)	1.94 (49)	2.57 (65)	7.36 (187)	9.93 (252)
038 ¹	2.76 (70)	13.57 (345)	1.57 (40)	4.36 (111)	1.94 (49)	3.57 (91)	8.23 (209)	11.81 (300)
044, 049 ²	3.07 (78)	13.88 (353)	1.57 (40)	4.36 (111)	1.94 (49)	3.57 (91)	8.23 (209)	11.81 (300)
064, 072 ²	3.07 (78)	13.88 (353)	1.57 (40)	4.36 (111)	1.94 (49)	3.57 (91)	8.23 (209)	11.81 (300)

- Notes: ¹ Supply and return piping connections = 3/4" (19 mm) FPT.
² Supply and return piping connections = 1" (25 mm) FPT.
³ Low voltage opening = 7/8" (22 mm) diameter.
⁴ Line voltage opening = 1-1/8" (29 mm) diameter.

Table 30: Discharge duct & return air coil opening dimensions

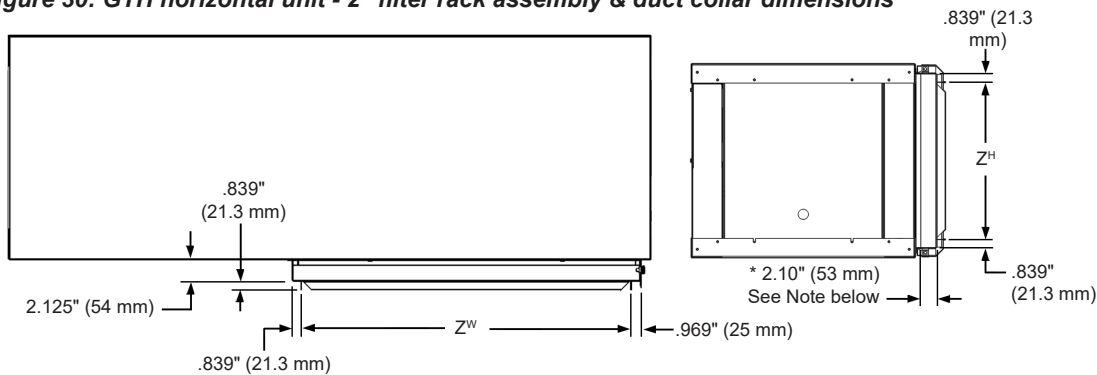
GTH Horizontal Unit	Discharge Air Duct Connection in inches (mm)								Return Air Coil Opening in inches (mm)			
	M	N		O	P	Q	R		S	T	U	V
		Left-hand	Right-hand				Left-hand	Right-hand				
026, 032	4.41 (112)	6.20 (157)	2.71 (69)	10.39 (264)	9.32 (237)	4.41 (112)	2.71 (69)	6.20 (157)	32.50 (826)	15.45 (392)	1.97 (50)	1.93 (49)
038	4.88 (124)	4.74 (120)	2.81 (71)	13.75 (349)	13.25 (337)	4.88 (124)	2.81 (71)	4.74 (120)	35.75 (908)	17.45 (443)	1.97 (50)	1.93 (49)
044, 049	4.88 (124)	4.74 (120)	2.81 (71)	13.75 (349)	13.25 (337)	4.88 (124)	2.81 (71)	4.74 (120)	41.15 (1045)	17.45 (443)	1.97 (50)	1.93 (49)
064, 072	4.88 (124)	4.74 (120)	2.81 (71)	13.75 (349)	13.25 (337)	4.88 (124)	2.81 (71)	4.74 (120)	46.56 (1183)	17.45 (443)	1.97 (50)	1.93 (49)

Note: All duct dimensions are referenced from the outside edge of the flange.

Table 31: 2" filter rack assembly & duct collar dimensions

Unit Size	Z ^H	Z ^W
026, 032	15.45 (392)	32.51 (826)
038	17.45" (443)	35.76" (908)
044, 049	17.45" (443)	41.15" (1045)
064, 072	17.45" (443)	46.55" (1182)

Figure 30: GTH horizontal unit - 2" filter rack assembly & duct collar dimensions



Note: * Optional 4" filter rack = 4.10" (104 mm).

Vertical Unit

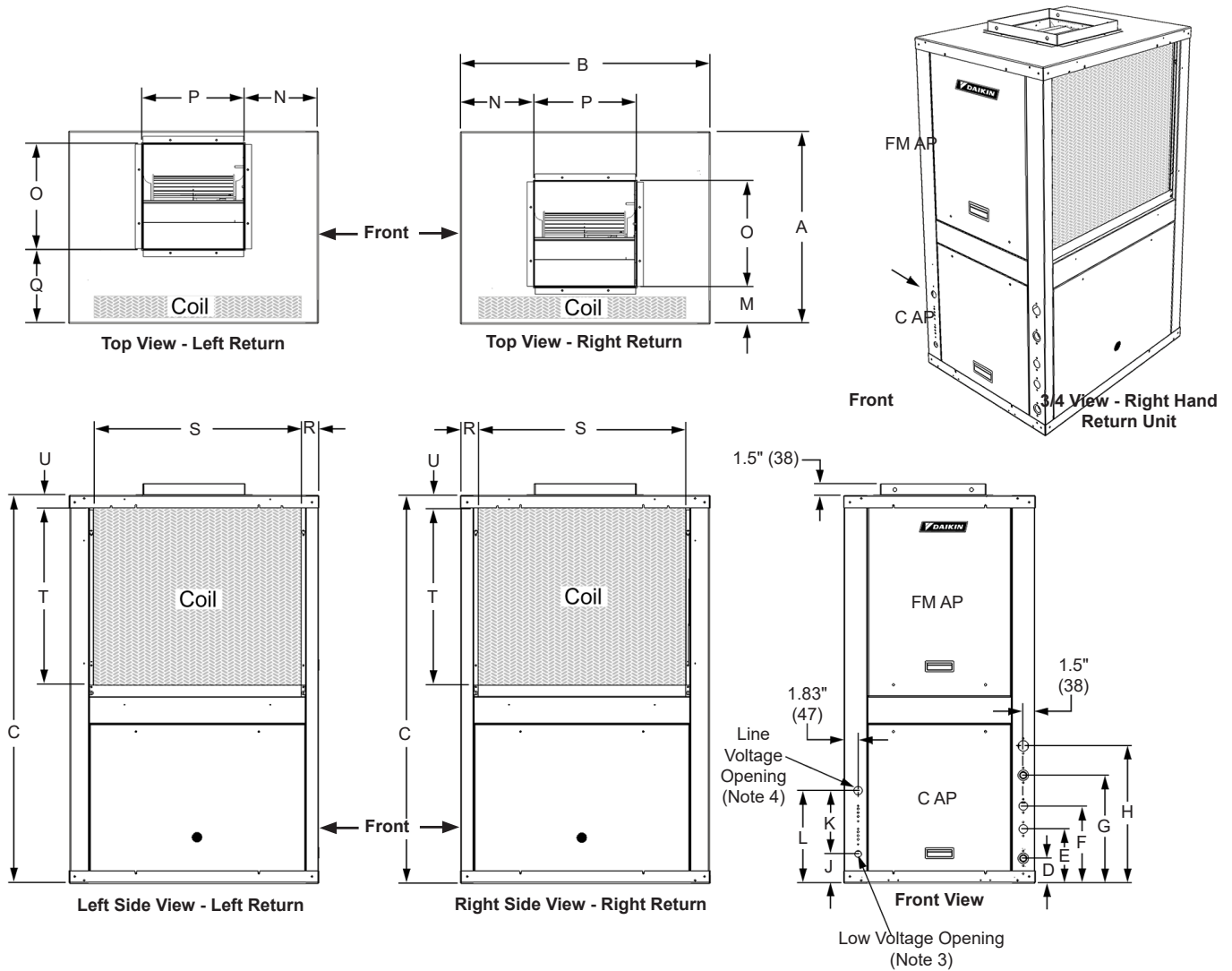


Table 32: Overall cabinet dimensions

GTV-Vertical Unit	Overall Cabinet Dimensions in inches (mm)		
	A = Width	B = Depth	C = Height
026, 032	22.40" (569)	26.00" (660)	48.00" (1219)
038	25.00" (635)	32.50" (826)	50.50" (1283)
044, 049	25.00" (635)	32.50" (826)	54.50" (1384)
064, 072	25.00" (635)	32.50" (826)	58.50" (1486)

Notes: All dimensions within ± 0.10 inches (2.5 mm).

Legend: CMP AP = Compressor Compartment Access Panel

C AP = Control Access Panel

FM AP = Fan Motor Access Panel

Table 33: Piping & electrical connections dimensions

GTV Vertical Unit	Piping Connections in inches (mm)					Electrical Connections in inches (mm)		
	D	E	F	G	H	J	K	L
	Supply	Desuperheater Water Supply	Desuperheater Water Return	Return	Condensate Drain 3/4"	Low Voltage ³	Between	Line Voltage ⁴
026, 032 ¹	2.58 (66)	6.68 (170)	9.68 (246)	13.39 (340)	17.39 (442)	2.45 (62)	8.63 (219)	11.07 (281)
038 ¹	3.26 (83)	7.07 (180)	10.07 (256)	14.07 (357)	17.88 (454)	2.82 (72)	9.25 (235)	12.07 (307)
044, 049 ²	3.07 (78)	7.07 (180)	10.07 (256)	13.88 (353)	17.88 (454)	2.82 (72)	9.25 (235)	12.07 (307)
064, 072 ²	3.07 (78)	7.07 (180)	10.07 (256)	13.88 (353)	17.88 (454)	2.82 (72)	9.25 (235)	12.07 (307)

- Notes: ¹ Supply and return piping connections = 3/4" (19 mm) FPT.
² Supply and return piping connections = 1" (25 mm) FPT.
³ Low voltage opening = 7/8" (22 mm) diameter.
⁴ Line voltage opening = 1-1/8" (29 mm) diameter.
 Condensate drain = 3/4" (19 mm) FPT.

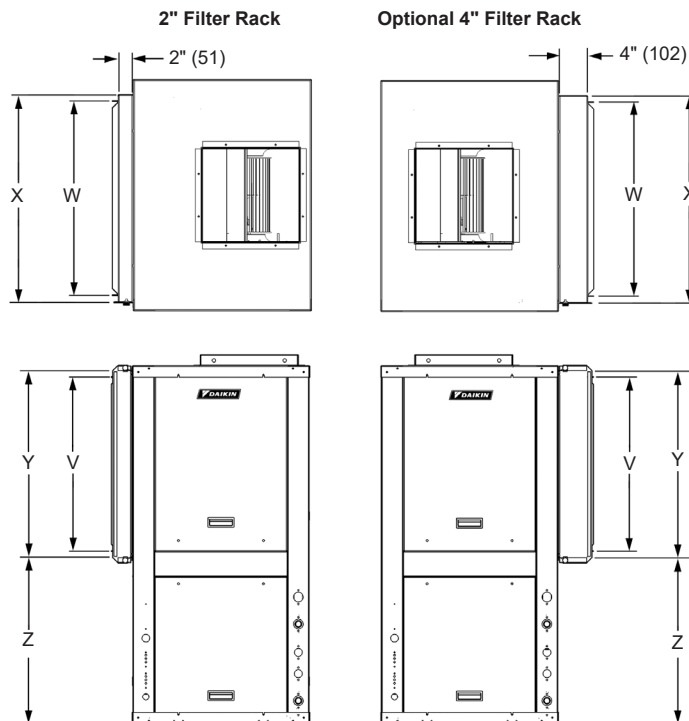
Table 34: Discharge duct collar & return air coil opening dimensions

GTV Vertical Unit	Discharge Duct Collar Connection in inches (mm)					Return Air Coil Opening in inches (mm)			
	M	N	O	P	Q	R	S	T	U
026, 032	5.75 (146)	8.37 (213)	10.39 (264)	9.32 (237)	10.55 (268)	2.87 (73)	20.50 (521)	25.45 (646)	1.62 (41)
038	6.44 (164)	9.63 (245)	13.75 (349)	13.25 (337)	9.63 (245)	2.25 (57)	27.00 (686)	23.10 (587)	1.62 (41)
044, 049	6.44 (164)	9.63 (245)	13.75 (349)	13.25 (337)	9.63 (245)	2.25 (57)	27.00 (686)	27.10 (688)	1.62 (41)
064, 072	6.44 (164)	9.63 (245)	13.75 (349)	13.25 (337)	9.63 (245)	2.25 (57)	27.00 (686)	31.10 (790)	1.62 (41)

Note: All duct dimensions are referenced from the outside edge of the flange.





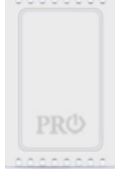
Table 35: Filter rack assembly & return air duct collar dimensions

Unit Size	V	W	X	Y	Z
026, 032	26.48" (673)	20.78" (528)	22.62" (575)	28.15 (715)	19.09 (485)
038	24.57" (624)	27.38" (696)	29.22" (742)	26.25 (667)	23.50 (597)
044, 049	28.57" (726)	27.38" (696)	29.22" (742)	30.25 (768)	23.50 (597)
064, 072	32.57" (827)	27.38" (696)	29.22" (742)	34.25 (870)	23.50 (597)







Thermostats and Remote Indoor Sensor

Table 36: Thermostat Selections

Wall Mounted Thermostats & Remote Sensor for use with all WSHP units: Console, V-Stack, Enfinity & SmartSource models		Thermostats				Remote Sensor
		Non-Programmable	Programmable (7 Day or 5+1+1) Non-Programmable		7 Day Programmable Non-Programmable	Remote Indoor Thermostat Sensor
		2H/2C	2H/2C	2H/3C Humidity Control	2H/3C Humidity Control WIFI	
						
Daikin Part Number		910411879	910411880	910417943	910417944	910420874
Feature						
LCD Display	Room Temperature & Setpoint	•	•	•	•	Allows Remote Temperature Sensing
	Room Humidity %			•	•	
Glow in the dark Display light		•	•	•	•	
Operating Modes	System	Heat-Off-Cool-Auto	Heat-Off-Cool-Auto	Heat-Off-Cool-Auto	Heat-Off-Cool-Auto	
	Fan	On-Auto	On-Auto	On-Auto-IAQ	On-Auto-IAQ	
Changeover	Manual	•	•	•	•	
	Auto	•	•	•	•	
Temperature Control Range		44° F to 90° F (7° C to 32° C)	44° F to 90° F (7° C to 32° C)	44° F to 90° F (7° C to 32° C)	44° F to 90° F (7° C to 32° C)	Use up to 16 sensors for temperature averaging
Adjustable Setpoint Limits		•	•	•	•	
Keypad Lockout				•	•	
Filter Change Reminder			•	•	•	
Programmable Fan		•	•	•	•	
Power Type	Battery	2 AA Alkaline Batteries				
	Hardwire (Common Wire)	18 to 30 VAC	18 to 30 VAC	18 to 30 VAC	18 to 30 VAC	
Permanent Memory Retention		•	•	•	•	
Remote Indoor Sensor Capable (Requires Daikin P/N: 910420874)			•	•	•	
Terminals		Rh, RC, G, Y, Y2, C, O, B, W/E, W2	Rh, RC, C, Y, Y2, W/E, W2, G, B, O, S1, S2	Rh, RC, C, Y, Y2, W/E, W2, G, B, O, S1, S2, H, D	Rh, RC, C, Y, Y2, W/E, W2, G, B, O, S1, S2, H, D	
Application						
Dehumidification	Smart Dehumidification			•	•	
	Simplified	•	•	•	•	
	Humidistat Controlled			•	•	
Electric Heat	Boilerless	•	•	•	•	
	Supplemental	•	•	•	•	
	Primary	•	•	•	•	
Waterside Economizer		•	•	•	•	
Hydronic Heat		•	•	•	•	

Room Temperature Sensors

Table 37: Room Temperature Sensors for BAS Operation

Room Sensors for use with all WSHP units with a BACnet or LonWorks Communication Module: Console, V-Stack, Enfinity & Smart-Source models		Room Temperature Sensors			
		Basic Room Sensor	Cool to Warm Adjust	Digitally Adjustable Display Sensor	
					
		Temperature Sensing, LED Status Indication, Override/Reset Button	Cool/Warm Temperature Sensing Adjustment, LED Status Indication, Override/Reset Button	Temperature, Occupancy, Alarm, Setpoint and Status display, Override/Reset and Occupied/Unoccupied Buttons	Temperature, Humidity, Occupancy, Alarm, Setpoint and Status display, Override/Reset and Occupied/Unoccupied Buttons
Daikin Part Number		910152149	910171464	910152147	910121754
Feature					
Setpoint Adjustment		None	Cool to Warm	Digitally Adjustable	Digitally Adjustable
Display	Room Temperature & Setpoint			•	•
	Room Humidity & Setpoint				•
Stages	Heating	4	4	4	4
	Cooling	3	3	3	3
Operating Modes	System				Heat-Off-Cool-Auto Dehumidify
	Fan				On-Auto
	Occupancy			LCD Display of Occupied-Unoccupied Icon	LCD Display of Occupied-Unoccupied Icon
Annunciation	Status LED	•	•	LCD Display of Unit Status	LCD Display of Unit Status
	LCD Alarm Display			•	•
Reset	Alarm	•	•	•	•
	Setback Override	•	•	•	•
Application					
Dehumidification	Smart Dehumidification				•
Electric Heat	Boilerless	•	•	•	•
	Supplemental	•	•	•	•
	Primary	•	•	•	•
Waterside Economizer		•	•	•	•
Hydronic Heat		•	•	•	•

Horizontal Unit

General

Units shall be supplied completely factory assembled, piped, internally wired, fully charged with R-410A and capable of operation with an entering water temperature range from 55°F to 120°F on water loop models, 20°F to 120°F on geothermal ground loop and ground water models. All equipment must be rated and certified in accordance with ARI / ISO 13256-1 and must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada. The units shall have AHRI/ISO and ETL-US-C labels. Each unit shall be run tested at the factory. The installing contractor shall be responsible for furnishing and installing Daikin Water Source Heat Pumps as indicated on the plans and per installation instructions.

Electrical

A control box shall be located within the unit and shall contain controls for compressor, reversing valve and fan motor operation and shall have either, a 50VA or 75VA transformer and a terminal block for low voltage field wiring connections. Unit shall be name-plated to accept time delay fuses or HACR circuit breaker for branch over-current protection of the power source. Unit control system shall provide heating or cooling as required by the set points of the wall thermostat. The unit control scheme shall provide for fan operation simultaneous with compressor operation (fan interlock) regardless of the thermostat type. The unit shall be capable of providing an output signal to an LED on the thermostat or to a central monitoring panel to indicate a "fault" condition from the activation of any one of the safety switches.

Casing and Cabinet

The outer cabinet shall be powder-coat painted as standard color textured paint.

- **Factory-installed option:** Unpainted cabinet
- **Factory-installed option:** Powder-coat painted color "off white"

Cabinets shall have separate openings and knockouts for entrance of line voltage and low voltage control wiring. Supply and return water connections shall be FPT fittings and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench.

It is the installing contractor's responsibility to provide sufficient clearance so that units can be easily removed for servicing.

The cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal with interior surfaces lined with the following insulation options:

Standard insulation in the compressor compartment shall be 1/2" fiberglass – multicoated type. Standard insulation on the air side shall be 1/2" fiberglass cleanable foil faced type with edges sealed or tucked in order to prevent introduction of fibers into the discharge air. Standard cabinet insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. All insulation shall have a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

- **Factory-installed option 1:** Standard Insulation Package
 - 1/2-inch fiberglass skin-face in compressor section, 1/2-inch foil-face insulation in airside section
- **Factory-installed option 2 :** Indoor Air Quality Insulation Package
 - 3/8-inch closed cell foam in compressor and airside sections
- **Factory-installed option 3 :** Sound Reduction Package
 - 1/2-inch fiberglass skin-face in compressor section with compressor sound blanket and 3/4-inch sound insulation in airside section (Unit Sizes 026 - 072)
- **Factory-installed unit application options:**
 - Water Loop (WL)-14°F suction line temp sensor with no insulation on refrigerant lines or coax or water lines
 - Ground Water (GW)-14°F suction line temp sensor with closed cell insulated refrigerant lines, coaxial condenser, and water lines
 - Ground Loop (GL)-7°F suction line temp sensor with closed cell insulated refrigerant lines, coaxial condenser, and water lines

Airflow Configurations

Units shall be configured in one of the following airflow arrangements:

- Left Return/End Discharge
- Left Return/Straight Discharge
- Right Return/End Discharge
- Right Return/Straight Discharge

Units shall have a factory-installed, 4-sided, 1" duct flange on the discharge of the blower to allow connection of field ductwork and must have a minimum of two access panels, one for the compressor compartment and one for the blower compartment. Unit shall have an insulated panel separating the blower compartment from the compressor compartment. Units are to ship with heavy metal brackets, rubber isolators, fasteners and washers to suspend and isolate the unit from the building.

Stainless Steel Drain Pan

Unit shall utilize corrosion resistant closed-cell insulated stainless steel drain pans. A stub out connection shall be provided. The drain pan shall be designed to ensure no pooling of condensate water per ASHRAE 62.2. The unit will be supplied with solid-state electronic condensate overflow protection as standard. Mechanical float switches will not be accepted.

Filter Rack and Filters

Unit shall come standard with a 2-inch disposable filter and a 2-inch, 4-sided factory-installed combination filter rack/return air duct collar. The filters shall be removable from either side of the unit.

As selectable options, unit shall have a 2-inch thick MERV 8 OR 4 inch MERV 13 filter, factory-installed with a 2-inch or 4- inch factory-installed combination filter rack/return air duct collar.

The optional factory-installed hi-MERV seal shall provide a leakage rate of less than 4 CFM per square foot of filter area at .5" ESP.

As factory installed options, units shall be available with no filter and filter rack, or no filter.

All filter racks shall be 4-sided with door and duct collar.

Fan and Motor Assembly

The fan shall be a centrifugal, direct drive type, utilizing a variable speed EC fan motor with soft start. The Fan motor shall be isolated from the housing by rubber isolation grommets, and shall be permanently lubricated and have thermal overload protection. The fan housing shall have a removable orifice ring to facilitate removal of the fan motor and fan wheel assembly, and the fan housing shall protrude through the cabinet to facilitate a field-supplied duct connection.

The EC motor shall maintain constant CFM over its static operating range. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule.

For unit sizes 015 – 070, the constant CFM EC motor shall deliver precise speed and economical performance up to the maximum published static pressure. Unit sizes 007 – 012 shall utilize a constant torque EC motor type.

Field adjustable air flow from an easily accessible 4-speed selector switch, located in the unit control box, shall allow for manual setting of the optimal fan speed specific to the application.

Disconnect Switch

This factory-installed option shall include the addition of a 3-pole switch mounted on the unit. The switch shall have a lockout/tag out feature. The switch shall be rated to be added to all units to handle the unit only (not to include units with optional factory-mounted electric heat). The switch shall be rated to handle all the voltages available for the unit. (460/3/60 requires 4-wire power service).

Refrigerant Circuit

Units shall have a sealed refrigerant circuit, which includes a non-CFC depleting R-410A refrigerant [rotary (sizes 007 – 019), and scroll compressors (sizes 024 to 070)]. In addition, each unit will have a thermostatic expansion valve, an aluminum fin and rifled copper tube refrigerant-to-air heat exchanger, a reversing valve and a water-to-refrigerant coaxial heat exchanger. The coaxial coils shall be made of [copper] [or optional cupronickel] and shall be deeply fluted to enhance heat transfer and minimize fouling and scaling. The coaxial coil shall have a working pressure of 500 psig on the waterside of the unit and 600 psig on the refrigerant side for all R-410A units.

The compressor shall have a dual level vibration isolation system. The compressor will be mounted on vibration isolation grommets to a heavy gauge compressor mounting plate, which is then isolated from the cabinet base with rubber grommets to minimize vibration transfer. Compressor shall have thermal overload protection. Compressor shall be located in an insulated compartment away from air stream to minimize sound transmission.

Refrigerant metering shall be regulated by a thermostatic expansion valve (TXV) only. Reversing valve shall be four-way solenoid activated refrigerant valve, which fails in the cooling “dominant” operation. Safety controls include a high-pressure switch, a low-pressure switch, and a low refrigerant temperature sensor. Refrigerant gauge access fittings shall be factory-installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety switch shall prevent the compressor from operating.

All air coils shall be coated with an optional inorganic, silicon-based nano-ceramic coating that must pass a ASTM B117 3,000 hour salt spray test to provide protection against corrosion due to acids, solvents, and salt found in the environment.

Hot Gas Reheat Smart Dehumidification Option

The optional factory-installed hot gas reheat coil shall be used as part of a dehumidification operating sequence. Hot gas reheat shall be enabled when the space humidity level is above a user selectable set point, typically, 50 to 55% RH. Superheated refrigerant gas shall be diverted to the reheat coil and unit fan shall operate at dehumidification fan speed upon a call for dehumidification. This option includes a hot gas reheat coil and a solenoid actuated 3-way valve. Coil shall be proof and leak tested. A corrosion resistant coated hot gas reheat coil shall be available as an option.

Simplified Dehumidification Option

Available as a factory-installed option, unit shall be configured to allow for maximum latent capacity while decreasing room humidity levels by optimizing blower fan speed for dehumidification. Option requires a thermostat with a minimum of 2 cooling stages.

Humidistat Controlled Dehumidification Option

Available as a factory-installed option, unit shall be configured to allow for maximum latent capacity while decreasing room humidity levels by optimizing blower fan speed for dehumidification. Option requires a humidistat as well as a thermostat with a minimum of 1 cooling stage.

Dehumidification Always Option

Available as a factory-installed option, for cooling only applications, this option shall utilize a humidistat only. Upon a call from the humidistat, the unit shall be configured to run at dehumidification blower speed combined with maximum compressor speed, allowing for maximum latent capacity.

Waterside Economizer

A factory mounted and wired waterside economizer shall consist of a hydronic cooling coil located between the unit filter rack and evaporator, a 2-position 3-way diverting valve, a manual air vent, and an entering fluid sensor. The waterside economizer outer cabinet shall be powder-coat painted with standard color textured paint. The cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal with interior surfaces lined with a minimum 3/8-inch thick closed-cell non-fibrous IAQ insulation. Components shall be accessible without removing economizer. An insulated stainless steel drain pan compliant with ASHRAE 62.1 including electronic condensate overflow protection shall be provided. Economizer flush mounted piping connections shall be on the same side as the WSHP unit piping connections. Hose kits shall be provided for field connection of economizer to WSHP unit. For corrosive environment applications, a corrosion resistant coated coil shall be available.

The unit mounted control system shall allow economizer operation for either supplemental to mechanical unit cooling or independent, based on entering fluid temperature and refrigerant suction temperature operating conditions. Economizer operation shall be permitted when entering fluid temperature is below 55°F yet adjustable between 70°F to 50°F. Economizer operation shall be initiated from a 3-stage wall mounted thermostat or room temperature sensor. Economizer operation shall not be permitted when entering fluid temperature is below 35°F.

Motorized Water Isolation Valves

The optional 2-way motorized isolation valve shall be factory-installed inside the compressor compartment. The valve actuator shall be factory wired to the Micro-Tech III SmartSource controller and be controlled when there is a call for heating or cooling. The valve shall have an end switch to ensure valve is fully open prior to compressor operation.

External Loop Pump(s)

This option includes the addition of an externally mounted water pump on unit sizes 2 tons and larger. Single pump or dual pumps available. Pumps shall be piped in series. The pump(s) shall be able to produce nominal GPM (3 GPM/ton) and be able to overcome the internal pressure drop of the coax heat exchanger, plus 30 feet additional water pressure drop with 25% PG antifreeze solution.

Sound Package

Available as a factory installed option, unit sizes 024 – 070 shall utilize sound attenuating compressor blankets combined with high technology sound attenuating material that is strategically applied within the air handling compartment to further reduce sound transmitted by the unit while in operation. Unit sizes 007 – 019 shall have sound attenuating material in the compressor compartment in lieu of a compressor blanket. Compressor sound blanket is not recommended on a unit with a rotary compressor.

Water Pressure Differential Switch

Available as a factory installed option, a pressure differential switch monitoring the water pressure drop across the heat exchanger shall be factory mounted internal to the cabinet and shall disable compressor operation if flow is not detected.

Coaxial Coil Supply Liquid Auto Flow Regulator

This factory-installed option includes the addition of an automatic flow control valve to set and limit the GPM through the unit. The valve shall have a “replaceable cartridge” capability. The valve shall be rated for 600 psig. Note: This option will not be available with External Water Pump option.

Solid-State Control System

MicroTech III SmartSource Control System - Unit shall have a microprocessor- based control system. The unit control logic shall provide cooling, heating, smart dehumidification, and/or economizer operation as required by the thermostat and/or sensor. The control system shall provide the following for stand-alone operation:

1. The use of standard non-programmable or programmable wall thermostats.
2. Fan operation simultaneous with the compressor (fan interlock) regardless of thermostat logic.
3. Time delay compressor operation.
4. Compressor short cycle protection of a minimum of three minutes before restart is possible.
5. Random unit start-up
6. Single grounded wire connection for activation of the unoccupied or unit shutdown modes.
7. Night setback temperature setpoint input signal from the wall thermostat.
8. Override signal from wall thermostat to override unoccupied mode for 2 hours.
9. Brownout protection to suspend unit operation if the supply voltage drops below 80% of normal.
10. Condensate overflow protection to suspend cooling operation in an event of a full drain pan.
11. Suspended compressor operation upon activation of the refrigerant pressure switch(es).
12. Cooling operation activated for 60 seconds upon activation of the low suction temperature sensor - defrost cycle.
13. Method of defeating compressor, reversing valve and fan time delays for fast service diagnostics.
14. Remote Alarm reset - Provides ability to remotely reset the unit upon a fault condition.
15. Fault Retry clears faults the first two times they occur within a 24-hour period and triggers automatic lock-out on third fault.
16. Control shall be configurable to accommodate thermostat or sensor based control.
17. EC fan motor control.

MicroTech™ III Control with LONWORKS Communication Module – Unit shall have a microprocessor-based control system. The unit control logic shall communicate over a LONMARK communications network. The unit controller is factory programmed [LONMARK ® 3.4 certified Application Code the current standard for new applications] and tested with all the logic required to monitor and control heating and cooling operation. The controller sets the unit mode of operation, monitors water and air temperatures, and can communicate fault conditions via a LONMARK communications network. Units with the MicroTech III and LONWORKS communication mod-

ule include return air, discharge air and leaving water temperature sensors. Space temperature sensor options include a set-point adjustment, tenant override button, and the capability of substituting the return air sensor with a wall-mounted room sensor.

MicroTech III SmartSource Control w/ BACnet Communication Module – Unit shall have a microprocessor-based control system. The unit control logic shall communicate over a BACnet communications network. The BACnet communication module shall incorporate an Atmel ARM7 Thumb series MCU and be capable of supporting a full MSTP BACnet implementation. The microprocessor shall also support SPI compatible communications with the MCU of the MicroTech III SmartSource unit controller. The physical interface to a BACnet BAS network shall be through an industry standard RS-485 transceiver capable of existing on an RS-485 network of up to 64 nodes. The unit controller is factory programmed and tested with all the logic required to monitor and control heating and cooling operation. The controller sets the unit mode of operation, monitors water and air temperatures, and can communicate fault conditions via a BACnet communications network. Units outfitted with Microtech III and BACnet Communication modules include return air, discharge air and leaving water temperature sensors. Space temperature sensor options include a set-point adjustment, tenant override button, and the capability of substituting the return air sensor with a wall-mounted room temperature sensor.

Each communicating unit controller performs the following unit operations:

- Enable heating and cooling to maintain space temperature set point at the room sensor
- Enable fan and compressor operation
- Monitor all safety controls
- Monitor discharge and return air temperature
- Monitor leaving water temperature
- Relay status of all vital unit functions
- Support optional control outputs

Unit mounted LED annunciators aid in diagnosing unit operation by indicating the water source heat pump operating mode and alarm conditions. If there are no current alarm conditions, a green LED on the annunciator board will indicate occupied unit operating mode. If an alarm condition exists, the MicroTech III SmartSource unit controller will send the fault condition to the LED annunciator, which will assist in troubleshooting the unit. Heat pumps with the MicroTech III SmartSource unit controller with a LONWORKS Communication Module is designed to be linked with a centralized Building Automation System (BAS) through a LONMARK communications network for centralized scheduling and management of multiple heat pumps.

Wall-mounted room sensors are available to control the heating and cooling operation of each MicroTech III Water Source Heat Pump.

Warranty

- An optional 2, 4, or 10-year extended compressor warranty covers the compressor from the date at which the unit ships from the factory.
- An optional 2, 4, or 10-year extended refrigeration circuit warranty covers the entire refrigeration circuit and related components for 5 years.

Field Installed Accessories

Wall-Mounted Thermostats:

- Programmable Touch Screen Thermostat
 1. Optional Remote Room Sensor
 2. Optional Outdoor Temperature Sensor
- Non-Programmable Thermostat
 1. Optional Remote Room Sensor
- Programmable Thermostat
 1. Optional Remote Room Sensor

Wall-Mounted Room Temperature Sensors for BAC-net and LonWorks Communications:

- Digitally Adjustable Wall Sensor with Temperature and Humidity Display
- Adjustable Cool/Warm with Occupancy Switch, Override/Reset Button, Status LED, Fan and System Switch
- Adjustable 55°-95°F and 12°-33°C, Override/Reset Button, Status LED, Fan and System Switch
- Adjustable -5°F to +5°F and -21°C to -15°C, Override/Reset Button, Status LED, Fan and System Switch
- Basic Sensor, Override/Reset Button, Status LED

Humidistat

To be used in conjunction with one of the dehumidification options. Humidistat to be wall mounted and capable of providing solid state input to unit controls to enable/disable dehumidification features.

Hose Kits

Supply and Return Hose Kits

Two fire-rated flexible hoses with ASTM ratings of Flame Spread 25, Fuel Contribution 25 and Smoke Density 50 for connection to unit and field piping. Hose shall be covered with stainless steel braiding to prevent damage.

The automatic flow hose kit shall include an automatic flow control valve, two ball valves, two flexible hoses, a high flow Y-strainer, and may include a strainer blow-down and various other accessories. The automatic flow control valve shall be factory set to a rated flow, and shall automatically control the flow to within 10% of the rated value over a 40 to 1 differential pressure, operating range (2 to 80 PSID). Operational temperature shall be rated from fluid freezing, to 225°F. The valve body shall be constructed from hot forged brass UNS C37700 per ASTM B-283 latest revision.

Jumper Hose Kit (Used with Waterside Economizer and Hydronic Heat)

The jumper hose kit used with waterside economizer and hydronic heat shall include a single UL-94 VO fire rated hose with 1-inch male JIC x 90 degree male pipe plated steel adapter.

Condensate Hose Kits

- Optional plastic hose including fittings
- Optional fire-rated, braided steel hose including fittings

Valve Options

- Optional 2-way, Normally Open (N.O.) or Normally Closed (N.C.) motorized valves
- Optional 2-way, mechanical ball valve

Replacement Filters

2-inch MERV 8, 4 inch MERV 13, and 2-inch disposable filters shall be available as direct replacement to factory-installed filters.

Electric Heat Coils

An optional 5, 10, 15, or 20 kW field installed duct heater shall be available. These heaters will require a field provided power source. 15 and 20 kW heaters shall be 2-stage.

Vertical Unit

General

Units shall be supplied completely factory assembled, piped, internally wired, fully charged with R-410A and capable of operation with an entering water temperature range from 55°F to 110°F on water loop models, 30°F to 110°F on geothermal ground loop and ground water models. All equipment must be rated and certified in accordance with ARI / ISO 13256-1 and must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-1995 for the United States and CAN/CSA-C22.2 NO.236 for Canada. The units shall have AHRI/ISO and ETL-US-C labels. Each unit shall be run tested at the factory. The installing contractor shall be responsible for furnishing and installing Daikin Water Source Heat Pumps as indicated on the plans and per installation instructions.

Electrical

A control box shall be located within the unit and shall contain controls for compressor, reversing valve and fan motor operation and shall have either, a 50VA or 75VA transformer and a terminal block for low voltage field wiring connections. Unit shall be name-plated to accept time delay fuses or HACR circuit breaker for branch over-current protection of the power source. Unit control system shall provide heating or cooling as required by the set points of the wall thermostat. The unit control scheme shall provide for fan operation simultaneous with compressor operation (fan interlock) regardless of the thermostat type. The unit shall be capable of providing an output signal to an LED on the thermostat or to a central monitoring panel to indicate a "fault" condition from the activation of any one of the safety switches.

Casing and Cabinet

The outer cabinet shall be powder-coat painted as standard color textured paint.

- Factory-installed option: Unpainted cabinet
- Factory-installed option: Powder-coat painted color "off white"

Cabinets shall have separate openings and knockouts for entrance of line voltage and low voltage control wiring. Supply and return water connections shall be FPT fittings and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench.

It is the installing contractor's responsibility to provide sufficient clearance so that units can be easily removed for servicing.

The cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal with interior surfaces lined with

the following insulation options:

Standard insulation in the compressor compartment shall be 1/2" fiberglass – multicoated type. Standard insulation on the air side shall be 1/2" fiberglass cleanable foil faced type with edges sealed or tucked in order to prevent introduction of fibers into the discharge air. Standard cabinet insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. All insulation shall have a flame spread of less than 25 and a smoke developed classification of less than 50 per ASTM E-84 and UL 723.

- **Factory-installed option 1:** Standard Insulation Package
 - 1/2-inch fiberglass skin-face in compressor section, 1/2-inch foil-face insulation in airside section
- **Factory-installed option 2:** Indoor Air Quality Insulation Package
 - 3/8-inch closed cell foam in compressor and air-side sections
- **Factory-installed option 3:** Sound Reduction Package
 - 1/2-inch fiberglass skin-face in compressor section with compressor sound blanket (Unit Sizes 026 - 072) and 3/4-inch sound insulation in airside section
- **Factory-installed unit application options:**
 - Water Loop (WL)-14°F suction line temp sensor with no insulation on refrigerant lines or coax or water lines
 - Ground Water (GW)-14°F suction line temp sensor with closed cell insulated refrigerant lines, coaxial condenser, and water lines
 - Ground Loop (GL)-7°F suction line temp sensor with closed cell insulated refrigerant lines, coaxial condenser, and water lines

Airflow Configurations

Units shall be configured in one of the following airflow arrangements:

- Left Return/Top Discharge
- Right Return/Top Discharge

Units shall have a factory-installed, 4-sided, 1" duct flange on the discharge of the blower to allow connection of field ductwork and must have a minimum of two access panels, one for the compressor compartment and one for the blower compartment. Unit shall have an insulated panel separating the blower compartment from the compressor compartment. Units are to ship with heavy metal brackets, rubber isolators, fasteners and washers to suspend and isolate the unit from the building.

Fan and Motor Assembly

The standard fan motor shall be EC type, isolated from the fan housing and shall have internal thermal overload protection. All units shall have a direct drive centrifugal fan. The fan housing shall have a removable orifice ring to facilitate fan motor and fan wheel removal. The fan housing shall protrude through the cabinet to facilitate field supply duct connection. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule. For unit sizes 015 – 072, the constant CFM EC motor shall deliver precise speed and economical performance regardless of system static pressure. Unit sizes 007 – 012 shall utilize a constant torque EC motor type.

The CFM settings shall be field-adjustable with easy to adjust fan speed selector switch. The unit shall be shipped at one fixed setting.

Stainless Steel Drain pan

Unit shall utilize corrosion resistant closed-cell insulated stainless steel drain pans. A stub out connection shall be provided. The drain pan shall be designed to ensure no pooling of condensate water per ASHRAE 62.2. The unit will be supplied with solid-state electronic condensate overflow protection as standard. Mechanical float switches will not be accepted.

Filter Rack and Filters

Unit shall come standard with a 2-inch disposable filter and a 2-inch, 4-sided factory-installed combination filter rack/return air duct collar. The filters shall be removable from either side of the unit.

As selectable options, unit shall have a 2-inch thick MERV 8 OR 4 inch MERV 13 filter, factory-installed with a 2-inch or 4- inch factory-installed combination filter rack/return air duct collar.

All filter racks shall be gasketed between the filter rack and the unit cabinet along with a gasket on the tool-less removable door to achieve a leakage rate of less than 4 CFM per square foot of filter area at .5" ESP. The rack shall be 4-sided with door and duct collar.

Refrigerant Circuit

Units shall have a sealed refrigerant circuit, which includes a non-CFC depleting R-410A refrigerant [rotary (sizes 007-019), and scroll compressor (sizes 024 to 070)]. In addition, each unit will have a thermostatic expansion valve, an aluminum fin and rifled copper tube refrigerant-to-air heat exchanger, a reversing valve and a water-to-refrigerant coaxial heat exchanger. The coaxial coils shall be made of [copper] [or optional cupronickel] and shall be deeply fluted to enhance heat transfer and minimize fouling and scaling. The coaxial coil shall have a working pressure of 500 psig on the waterside of the unit and 600 psig on the refrigerant side for all R-410A units.

The compressor shall have a dual level vibration isolation system. The compressor will be mounted on vibration isolation grommets to a heavy gauge compressor mounting plate, which is then isolated from the cabinet base with rubber grommets to minimize vibration transfer. Compressor shall have thermal overload protection. Compressor shall be located in an insulated compartment away from air stream to minimize sound transmission.

Refrigerant metering shall be regulated by a thermostatic expansion valve (TXV) only. Reversing valve shall be four-way solenoid activated refrigerant valve, which fails in the cooling “dominant” operation. Safety controls include a high-pressure switch, a low-pressure switch (sizes 019 to 070 only) and a low refrigerant temperature sensor. Refrigerant gauge access fittings shall be factory-installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety switch shall prevent the compressor from operating.

All air coils shall be coated with an optional inorganic, silicon-based nano-ceramic coating that must pass a ASTM B117 3,000 hour salt spray test to provide protection against corrosion due to acids, solvents, and salt found in the environment.

Electric Heat Coils

The optional 5, 10, 15, or 20 kW electric heat coil shall be factory-installed inside the unit cabinet, be integral to the supply fan housing and be used as boilerless, supplemental, primary, or emergency heat. 15 and 20 kW heaters shall be 2-stage.

Desuperheater

The optional desuperheater shall be factory-installed in the compressor compartment and used to add supplemental heating, using superheated refrigerant gas through a tube-in-tube heat exchanger to the domestic hot water supply. Water lines shall be fastened to the exterior panel with flush mounted brass NPT fittings.

- Factory-Installed Option: The desuperheater pump shall be factory-installed inside the unit. (Voltage 208-230/60/1 and 208-230/60/3 only)

Hydronic Heat Option

The factory installed hydronic heating option shall provide control of a factory installed two position valve connected to a hot water coil and shall operate when loop water temperature is warm enough for hydronic heating. Loop water temperature is sensed by a factory installed entering water temperature sensor located on the inlet water line. Hydronic heat circuit shall be independent and substitute the use of the compressor driven refrigeration circuit. Hydronic heating setpoint allowed range is 70°F to 120°F, with a 70°F default value.

Hot Gas Reheat Smart Dehumidification Option

The optional factory-installed hot gas reheat coil shall be used as part of a dehumidification operating sequence. Hot gas reheat shall be enabled when the space humidity level is above a user selectable set point, typically, 50 to 55% RH. Superheated refrigerant gas shall be diverted to the reheat coil and unit fan shall operate at dehumidification fan speed upon a call for dehumidification. This option includes a hot gas reheat coil and a solenoid actuated 3-way valve. Coil shall be proof and leak tested. A corrosion resistant coated hot gas reheat coil shall be available as an option.

Simplified Dehumidification Option

Available as a factory-installed option, unit shall be configured to allow for maximum latent capacity while decreasing room humidity levels by optimizing blower fan speed for dehumidification. Option requires a thermostat with a minimum of 3 cooling stages.

Humidistat Controlled Dehumidification Option

Available as a factory-installed option, unit shall be configured to allow for maximum latent capacity while decreasing room humidity levels by optimizing blower fan speed for dehumidification. Option requires a humidistat as well as a thermostat with a minimum of 2 cooling stages.

Dehumidification Always Option

Available as a factory-installed option, for cooling only applications, this option shall utilize a humidistat only. Upon a call from the humidistat, the unit shall be configured to run at dehumidification blower speed combined with maximum compressor speed, allowing for maximum latent capacity.

Waterside Economizer

A factory mounted and wired waterside economizer shall consist of a hydronic cooling coil located between the unit filter rack and evaporator, a 2-position 3-way diverting valve, a manual air vent, and an entering fluid sensor. The waterside economizer outer cabinet shall be powder-coat painted with standard color textured paint. The cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal with interior surfaces lined with a minimum 3/8-inch thick closed-cell non-fibrous IAQ insulation. Components shall be accessible without removing economizer. An insulated stainless steel drain pan compliant with ASHRAE 62.1 including electronic condensate overflow protection shall be provided. Economizer flush mounted piping connections shall be on the same side as the WSHP unit piping connections. Hose kits shall be provided for field connection of economizer to WSHP unit. For corrosive environment applications, a corrosion resistant coated coil shall be available.

The unit mounted control system shall allow economizer operation for either supplemental to mechanical unit cooling or independent, based on entering fluid temperature and refrigerant suction temperature operating conditions. Economizer operation shall be permitted when entering fluid temperature is below 55°F yet adjustable between 70°F to 50°F. Economizer operation shall be initiated from a 3-stage wall mounted thermostat or room temperature sensor. Economizer operation shall not be permitted when entering fluid temperature is below 35°F.

Motorized Water Isolation Valves

The optional 2-way motorized isolation valve shall be factory-installed inside the compressor compartment. The valve actuator shall be factory wired to the MicroTech III SmartSource controller and be controlled when there is a call for heating or cooling. The valve shall have an end switch to ensure valve is fully open prior to compressor operation.

External Loop Pump(s)

This option includes the addition of an externally mounted water pump on unit sizes 2 tons and larger. The pump shall be similar to a Grundfos U26-99 or U26-116, or equivalent. Single pump or dual pumps available. Pumps shall be piped in series. The pump(s) shall be able to produce nominal GPM (3 GPM/ton) and be able to overcome the internal pressure drop of the coax heat exchanger, plus 30 feet additional water pressure drop with 25% PG antifreeze solution.

Disconnect Switch

This factory-installed option shall include the addition of a 2 or 3-pole switch mounted inside the unit and the knob or handle protruding through the corner post. The switch shall have a lockout/tag out feature. The switch shall be rated to be added to all units to handle the unit only (not to include additional amperage from field installed accessories). The switch shall be rated to handle all the voltages available for the unit. (460/3/60 requires 4-wire power service.)

Sound Package

Available as a factory installed option, unit sizes 026 - 072 shall utilize sound attenuating compressor blankets combined with high technology sound attenuating material that is strategically applied within the air handling compartment to further reduce sound transmitted by the unit while in operation.

Water Pressure Differential Switch

Available as a factory installed option, a water pressure differential switch monitoring the water pressure drop across the heat exchanger shall be factory mounted internal to the cabinet and shall disable compressor operation if flow is not detected.

Coaxial Coil Supply Liquid Auto Flow Regulator

This factory-installed option includes the addition of an automatic flow control valve to set and limit the GPM through the unit. The valve shall have a “replaceable cartridge” capability. The valve shall be rated for 600 psig. Note: This option will not be available with External Water Pump option.

Solid-State Control System

MicroTech III Control System - Unit shall have a microprocessor-based control system. The unit control logic shall provide heating and cooling operation as required by the wall thermostat set point. The control system shall provide the following for stand-alone operation:

1. The use of standard non-programmable or programmable wall thermostats.
2. Fan operation simultaneous with the compressor (fan interlock) regardless of thermostat logic.
3. Time delay compressor operation.
4. Delayed de-energizing of the reversing valve for quiet reversing valve operation.
5. Compressor short cycle protection of a minimum of three minutes before restart is possible.
6. Random unit start-up
7. Single grounded wire connection for activation of the unoccupied or unit shutdown modes.
8. Night setback temperature setpoint input signal from the wall thermostat.
9. Override signal from wall thermostat to override unoccupied mode for 2 hours.
10. Brownout protection to suspend unit operation if the supply voltage drops below 80% of normal.
11. Condensate overflow protection to suspend cooling operation in an event of a full drain pan.
12. Suspended compressor operation upon activation of the refrigerant pressure switch(es).
13. Cooling operation activated for 60 seconds upon activation of the low suction temperature sensor - defrost cycle.
14. Method of defeating compressor, reversing valve and fan time delays for fast service diagnostics.
15. Remote reset - Provides means to remotely reset automatic lock-outs generated by high/low pressure faults and/or low temperature faults.
16. Fault Retry clears faults the first two times they occur within a 24-hour period and triggers automatic lock-out on third fault.

MicroTech™ III Control with LONWORKS Communication Module

– Unit shall have a microprocessor-based control system. The unit control logic shall communicate over a LONMARK communications network. The unit controller is factory programmed [LONMARK® 3.4 certified Application Code the current standard for new applications] and tested with all the logic required to monitor and control heating and cooling operation. The controller sets the unit mode of operation, monitors water and air temperatures, and can communicate fault conditions via a LONMARK communications network. Units with the MicroTech III and LONWORKS communication module include return air, discharge air and leaving water temperature sensors. Space temperature sensor options include a set-point adjustment, tenant override button, and the capability of substituting the return air sensor with a wall-mounted room sensor.

Microtech III Control w/ BACnet Communication Module

– Unit shall have a microprocessor-based control system. The unit control logic shall communicate over a BACnet communications network. The BACnet communication module shall incorporate an Atmel ARM7 Thumb series MCU and be capable of supporting a full MSTP BACnet implementation. The microprocessor shall also support SPI compatible communications with the MCU of the Microtech III controller. The physical interface to a BACnet BAS network shall be through an industry standard RS-485 transceiver capable of existing on an RS-485 network of up to 64 nodes. The unit controller is factory programmed and tested with all the logic required to monitor and control heating and cooling operation. The controller sets the unit mode of operation, monitors water and air temperatures, and can communicate fault conditions via a BACnet communications network. Units outfitted with Microtech III and BACnet Communication modules include return air, discharge air and leaving water temperature sensors. Space temperature sensor options include a set-point adjustment, tenant override button, and the capability of substituting the return air sensor with a wall-mounted room temperature sensor.

Each communicating unit controller performs the following unit operations:

- Enable heating and cooling to maintain space temperature set point at the room sensor
- Enable fan and compressor operation
- Monitor all safety controls
- Monitor discharge and return air temperature
- Monitor leaving water temperature
- Relay status of all vital unit functions
- Support optional control outputs

Unit mounted LED annunciators aid in diagnosing unit operation by indicating the water source heat pump operating mode and alarm conditions. If there are no current alarm conditions, a green LED on the annunciator board will indicate normal unit operating mode. If an alarm condition exists, the MicroTech III SmartSource unit controller will send the fault condition to the LED annunciator, which will assist in troubleshooting the unit. Heat pumps with the MicroTech III SmartSource unit controller with a LONWORKS Communication Module is designed to be linked with a centralized Building Automation System (BAS) through a LONMARK communications network for centralized scheduling and management of multiple heat pumps.

Wall-mounted room sensors are available to control the heating and cooling operation of each MicroTech III Water Source Heat Pump.

Warranty

- An optional 1-year extended compressor warranty covers the compressor for 2 years from the date at which the unit ships from the factory.
- An optional 1-year extended refrigeration circuit warranty covers the entire refrigeration circuit and related components for 2 years
- An optional 1-year extended complete parts warranty covers all parts components for 2 years.
- An optional 4-year extended compressor warranty covers the compressor for 5 years from the date at which the unit ships from the factory.
- An optional 4-year extended refrigeration circuit warranty covers the entire refrigeration circuit and related components for 5 years
- An optional 4-year extended complete parts warranty covers all parts components for 5 years.

In addition to the above warranties an optional 1st year labor allowance is available.

When an extended 4 year complete parts warranty is selected, an optional 5 year labor allowance is available.

Field Installed Accessories

Wall-Mounted Thermostats:

- Programmable Touch Screen Thermostat
 1. Optional Remote Room Sensor
 2. Optional Outdoor Temperature Sensor
- Non-Programmable Thermostat
 1. Optional Remote Room Sensor
- Programmable Thermostat
 1. Optional Remote Room Sensor

Wall Mounted Room Temperature Sensors for BACnet and LONWORKS Communications:

- Digitally Adjustable Wall Sensor with Temperature and Humidity Display

- Adjustable Cool/Warm with Occupancy Switch, Override/Reset Button, Status LED, Fan and System Switch
- Adjustable 55°F to 95°F and 12°C to 33°C, Override/Reset Button, Status LED, Fan and System Switch
- Adjustable -5°F to +5°F and -21°C to -15°C, Override/Reset Button, Status LED, Fan and System Switch
- Basic Sensor, Override/Reset Button, Status LED

Humidistat

To be used in conjunction with one of the dehumidification options. Humidistat to be wall mounted and capable of providing solid state input to unit controls to enable/disable dehumidification features.

Hose Kits

Supply and Return Hose Kits

Two fire-rated flexible hoses with ASTM ratings of Flame Spread 25, Fuel Contribution 25 and Smoke Density 50 for connection to unit and field piping. Hoses shall be covered with stainless steel braiding to prevent damage. The automatic flow hose kit shall include an automatic flow control valve, two ball valves, two flexible hoses, a high flow Y-strainer, and may include a strainer blow-down and various other accessories. The automatic flow control valve shall be factory set to a rated flow, and shall automatically control the flow to within 10% of the rated value over a 40 to 1 differential pressure, operating range (2 to 80 PSID). Operational temperature shall be rated from fluid freezing, to 225°F. The valve body shall be constructed from hot forged brass UNS C37700 per ASTM B-283 latest revision.

Jumper Hose Kit (Used with Waterside Economizer & Hydronic Heat)

The jumper hose kit used with waterside economizer and hydronic heat shall include a single UL-94 VO fire rated hose with 1-inch male JIC x 90 degree male pipe plated steel adapter.

Condensate Hose Kits

- Optional plastic hose including fittings
- Optional fire-rated, braided steel hose including fittings

Valve Options

- Optional 2-way, Normally Open (N.O.) or Normally Closed (N.C.) motorized valves.
- Optional 2-way, mechanical ball valve

Replacement Filters

2-inch MERV 8, 4 inch MERV 13, and 2-inch disposable filters shall be available as direct replacement to factory-installed filters.

Electric Heat Coils

An optional 5, 10, 15, or 20 kW field installed duct heater shall be available. These heaters will require a field provided power source. 15 and 20 kW heaters shall be 2-stage.

Appendix-A

Capacity table legend:

Btu/hr = British Thermal Units per Hour

CFM = Airflow Rate, Cubic Feet per Minute

COP = Coefficient of Performance

EAT = Entering Air Temperature

EER = Energy Efficiency Ratio

EWT = Entering Water Temperature

Ft of W.C. = Feet of Water Column

GPM = Gallons per Minute

kW = Kilowatts

LAT = Leaving Air Temperature

PSI = Pounds per Square Inch

THA = Total Heat of Absorption

THR = Total Heat of Rejection

WPD = Waterside Pressure Drop

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Appendix-B

Note: *EC motors on 460/60/3 volt units require a 265 volt power supply. Both a hot AND a neutral wire are required to obtain proper fan motor voltage. Therefore, 4-wires with a wye type wiring arrangement is required.*



Daikin Applied Training and Development

Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

Warranty

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied representative for warranty details. Refer to Form 933-430285Y. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

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To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

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