



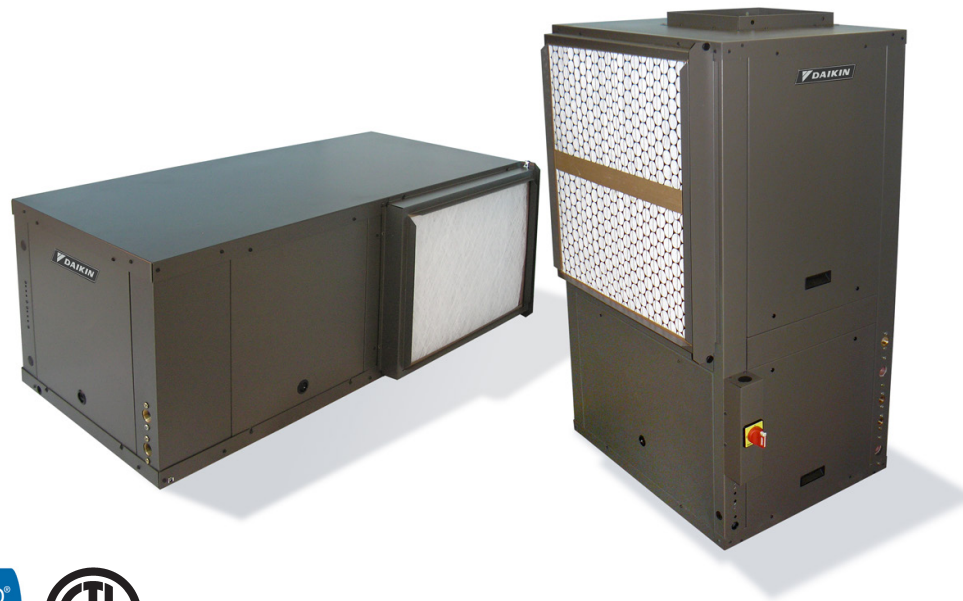
Catalog 1114-14

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</i> = <i>Water Source Heat Pump</i>
Model Type	2	2-3	<i>GT</i> = <i>High Efficiency 2-Stage</i>
Configuration	3	4	<i>H</i> = <i>Horizontal</i> <i>V</i> = <i>Vertical</i>
Nominal Capacity	4	5-7	<i>026</i> = <i>26,000 Btuh Nominal Cooling</i> <i>032</i> = <i>32,000 Btuh Nominal Cooling</i> <i>038</i> = <i>38,000 Btuh Nominal Cooling</i> <i>044</i> = <i>44,000 Btuh Nominal Cooling</i> <i>049</i> = <i>49,000 Btuh Nominal Cooling</i> <i>064</i> = <i>64,000 Btuh Nominal Cooling</i> <i>072</i> = <i>72,000 Btuh Nominal Cooling</i>
Unit Control	5	8	<i>B</i> = <i>MicroTech III SmartSource Unit Controller</i>
Design Series (Vintage)	6	9	1 = Revision / Design Series 1
Voltage	7	10	<i>E</i> = <i>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</i> = <i>Water Loop</i> GL = Ground Loop
Return Air Location	9	13	L = Left-Hand Return Air & Right-Hand Piping <i>R</i> = <i>Right-Hand Return Air & Right-Hand Piping</i>
Discharge Air Location	10	14	E = End (Horizontal Unit Only) <i>T</i> = <i>Top (Vertical Unit Only)</i> <i>S</i> = <i>Straight (Horizontal Unit Only)</i>
Fan Motor	11	15	<i>4</i> = <i>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</i> = <i>None</i>
Sound Package	13	17	<i>Y</i> = <i>None</i> A = Premium
Coaxial Heat Exchanger Construction (Supply Liquid / Refrigerant)	15	19	<i>C</i> = <i>Copper Inner Tube - Steel Outer Tube</i> S = Cupronickel Inner Tube - Steel Outer Tube
Primary Air Coil Option	16	20	<i>S</i> = <i>Standard</i> C = Corrosion Protection
Communication Module	19	24	B = BACnet L = LONWORKS <i>Y</i> = <i>None</i>
Filter Rack	20	25	<i>2</i> = <i>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</i> = <i>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</i> = <i>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</i> = <i>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</i> = <i>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.

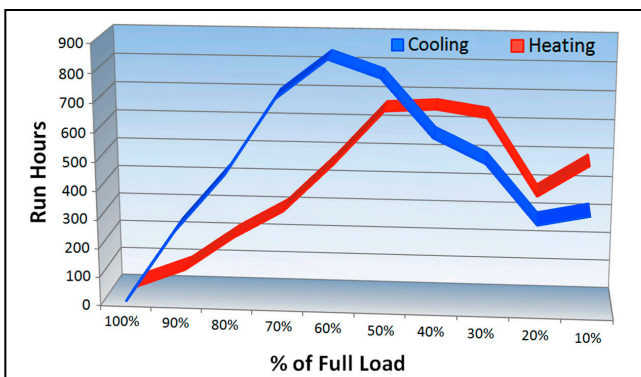
Why part load efficiency matters most

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.*

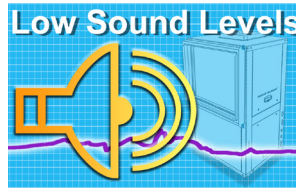
In most environments, heating and cooling systems operate at part load most of the time (see graph below). That's where SmartSource units with 2-stage compressors really shine. Here's how:

- **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

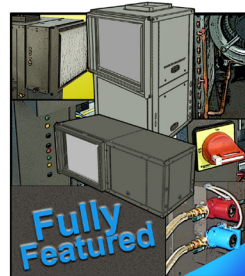
typically operate at low compressor and fan speeds a majority of the time. The result is even quieter operation, very low energy consumption and very uniform room air temperatures.

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



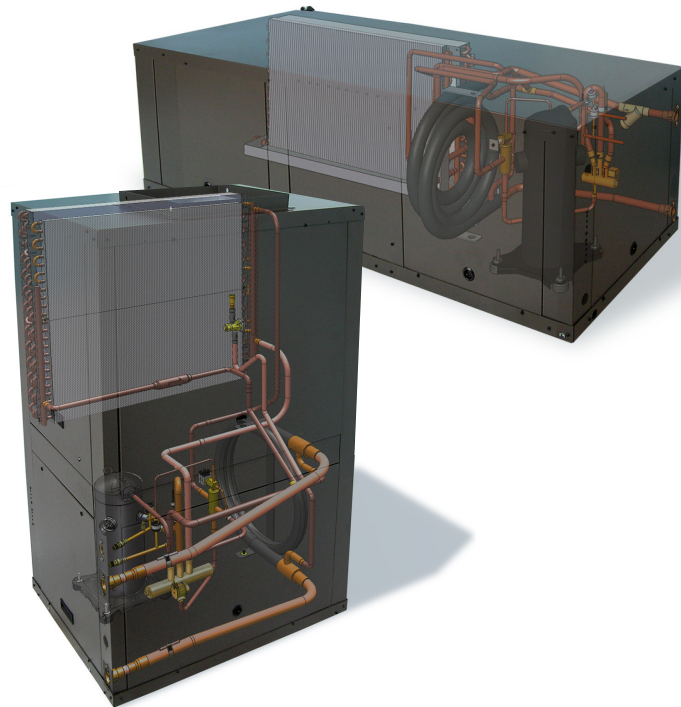
- 1 EC fan motor:**
 - 4 field adjustable fan settings and up to 7 operating mode options, provide a wide range of airflow selection (up to 28) for quieter operation and lower energy consumption.
- 2 Two-stage compressor:**
 - available in a variety of commercial voltages, mounted on a double isolation 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.

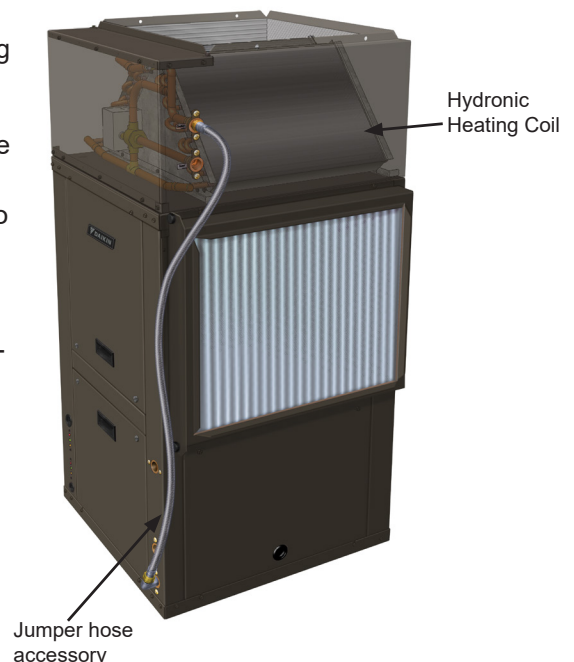


Hydronic Heat

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.

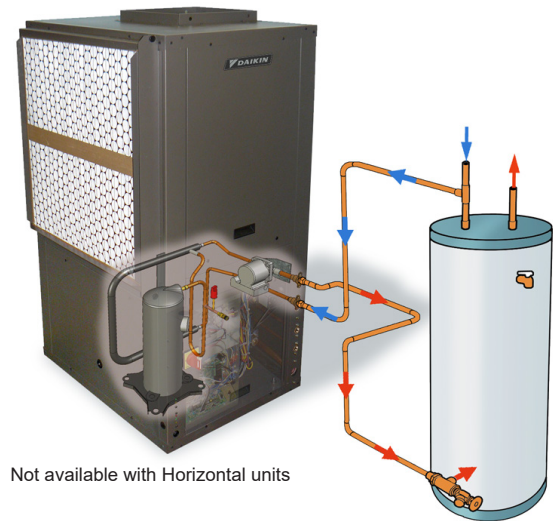


Desuperheater

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.

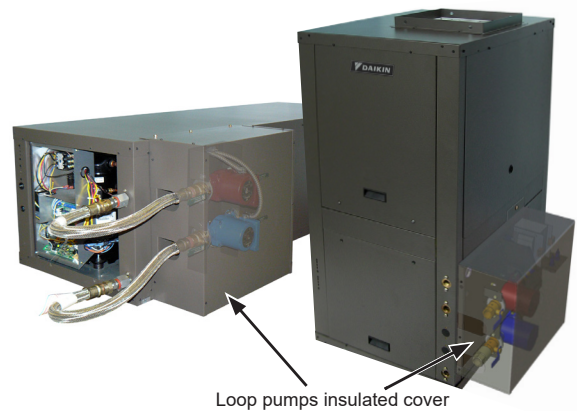
Controls include a refrigerant discharge line thermostat, an Entering Water Temperature (EWT) thermostat and an “on-off” switch located on the outside of the unit cabinet to deactivate the desuperheater system during the heating mode.

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.

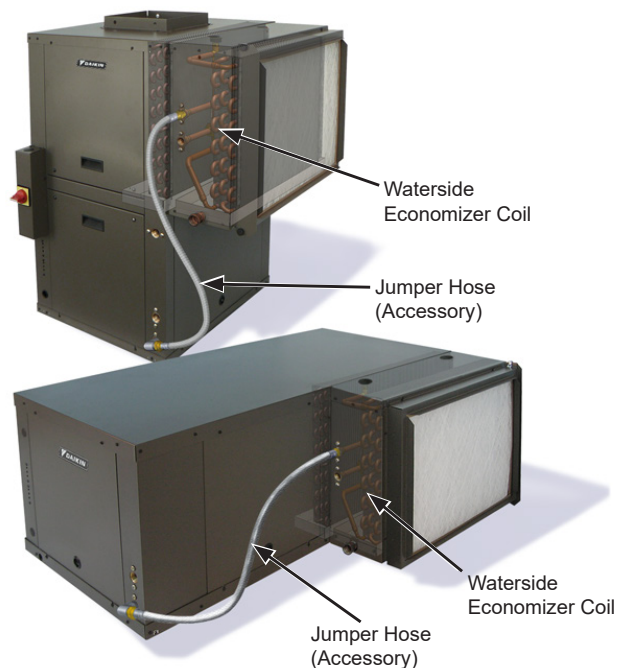


Waterside Economizer

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.

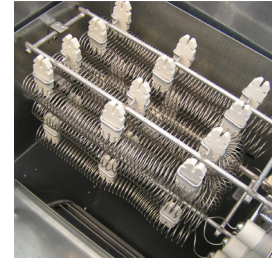


Electric Heat (internal or external)

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

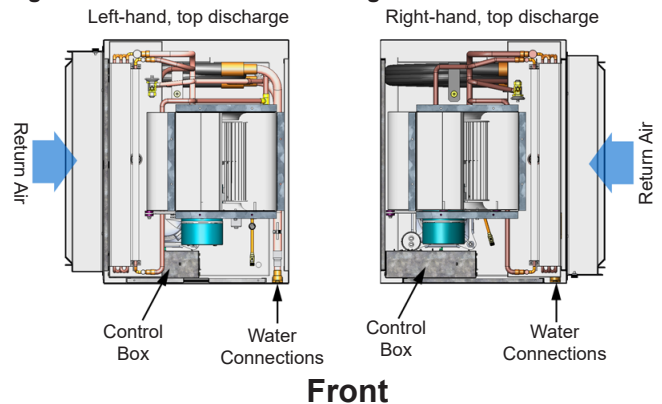
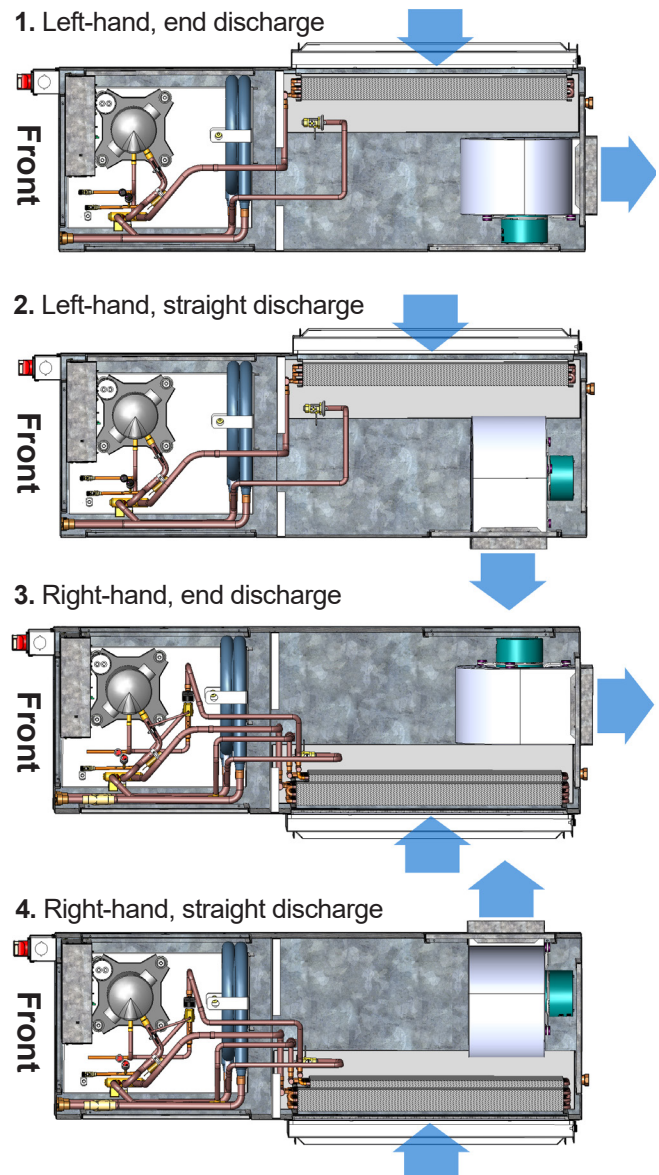


Figure 2: Four horizontal unit configurations



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.



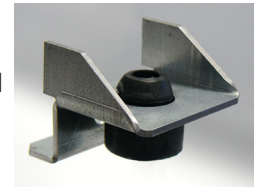
2-Way Motorized Water Valve

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.



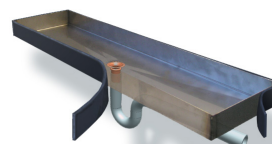
Horizontal Unit Hanger Bracket

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.



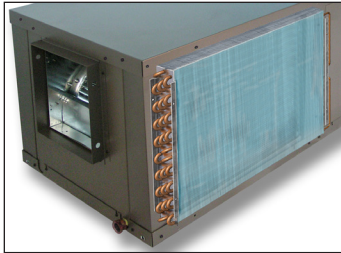
Vertical unit drain pan



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.



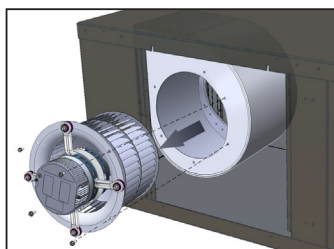
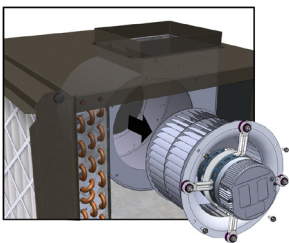
Refrigeration System

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.



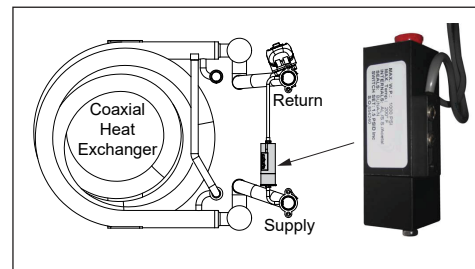
Disconnect Switch (Option)

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.



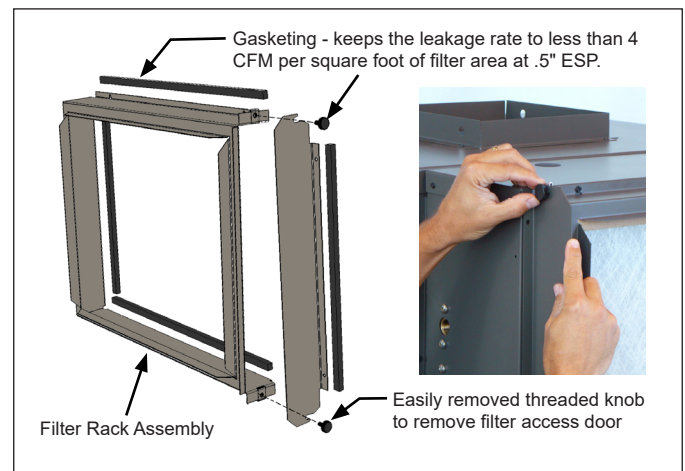
Water Pressure Differential Switch (Option)

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

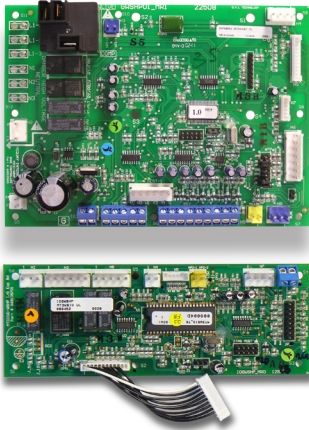
Units come standard with a 2" (51mm) thick factory-installed throwaway filter, mounted in a 4-sided combination filter rack and return air duct collar. Filters can be easily removed from either side by interchanging the removable filter door to the right or left side by rotating the filter rack assembly 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.



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:

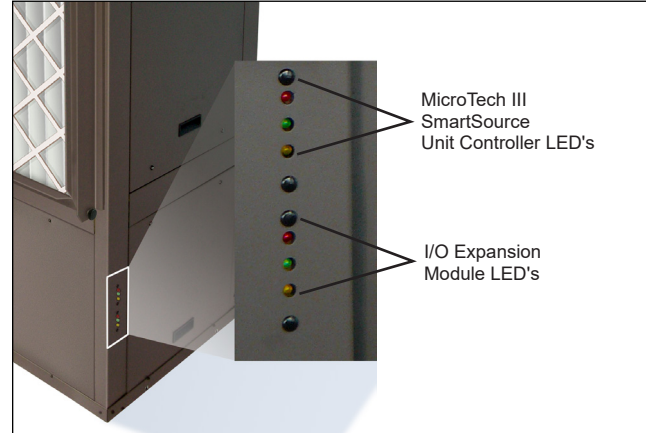
- MicroTech III SmartSource unit controller with I/O Expansion Module
- MicroTech III SmartSource unit controller with I/O expansion module and a LONWORKS® communication module
- MicroTech III SmartSource unit controller with I/O expansion module and a BACnet® communication module

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

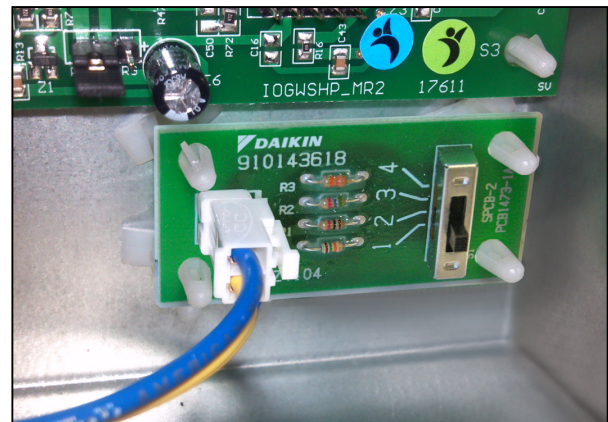


Table 1: Fan speed selector switch settings (2-ton unit example)

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

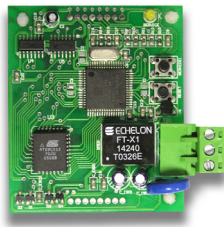
MicroTech® III SmartSource Controller with LONWORKS® Communication Module



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



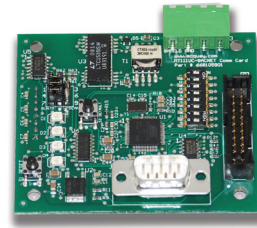
Daikin water source heat pumps are available with a BACnet MS/TP communication module that is designed to communicate over a BACnet MS/TP communications network to a building automation system (BAS). It can be factory or field-installed.

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.

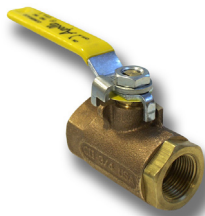
Table 2: Available fire rated supply and return hoses

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

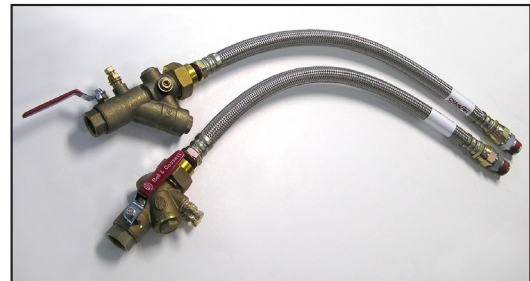


Table 3: Available motorized valves

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

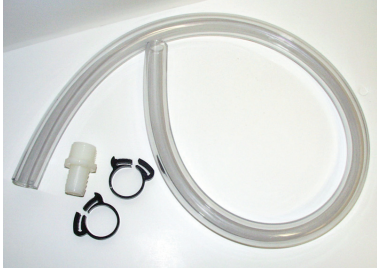
Figure 11: Supply and return hoses



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)

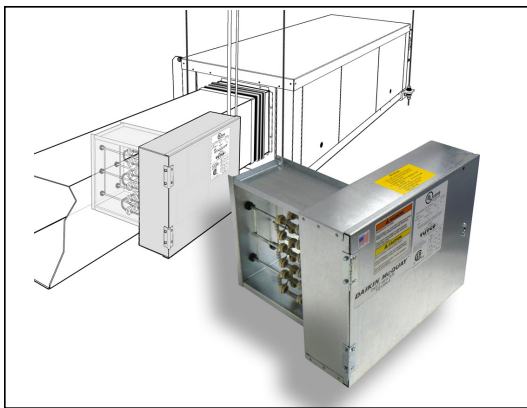
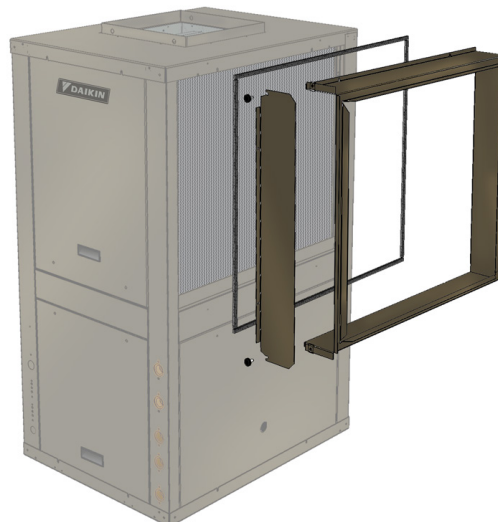


Table 5: Available electric duct heaters

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

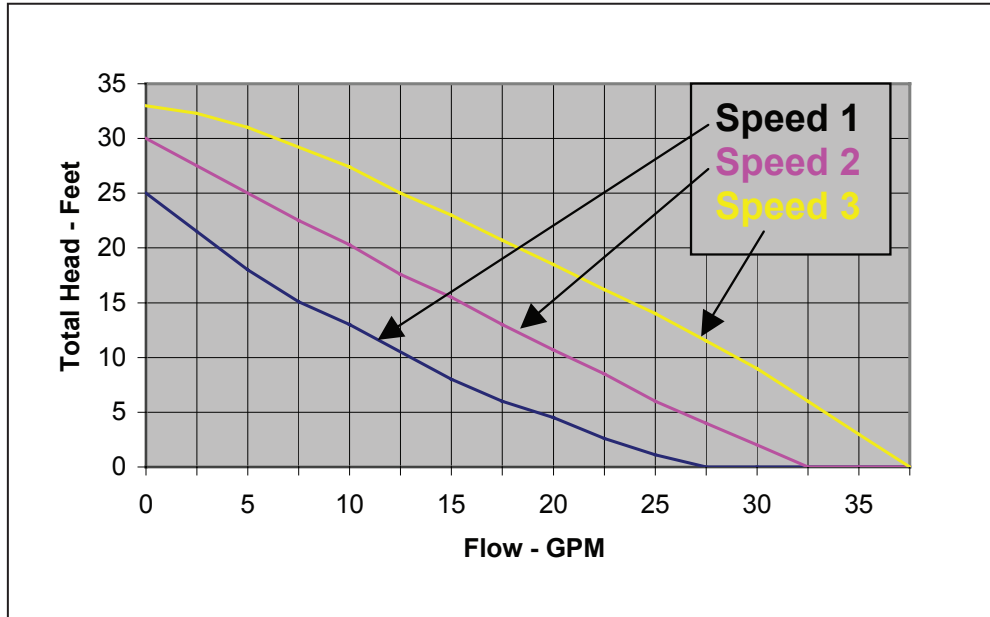
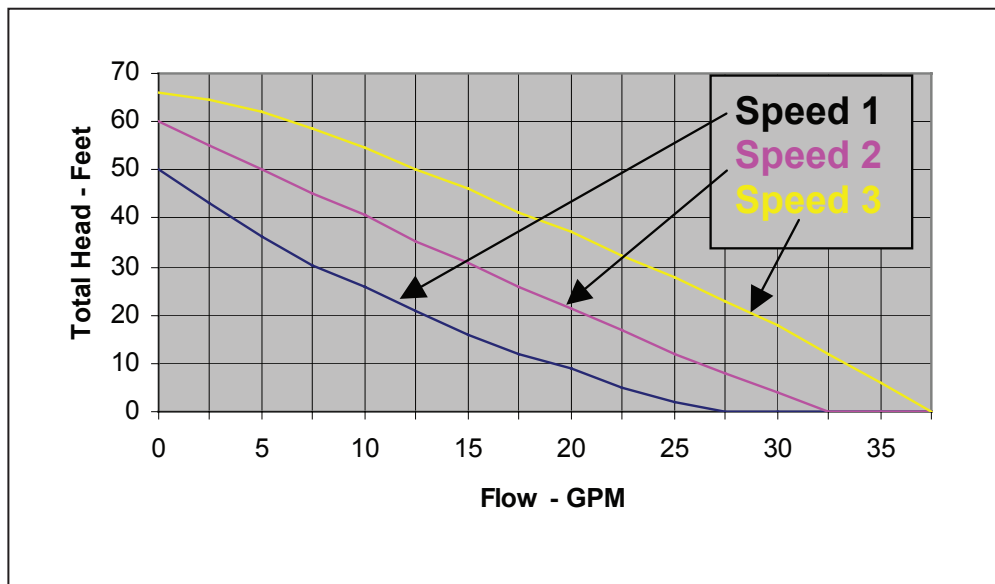


Figure 14: Dual pump performance curve



Typical Vertical Installation

Unit Location

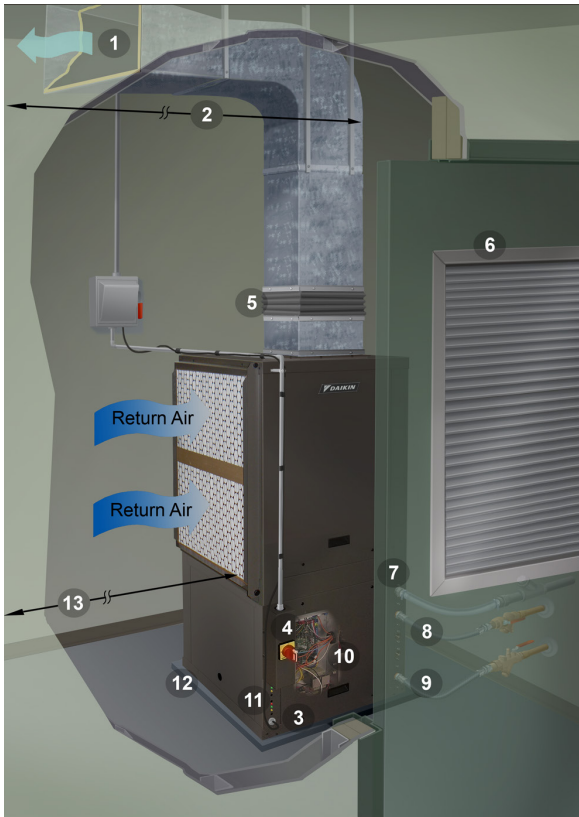
SmartSource vertical water source heat pumps can be installed “free standing” in an equipment room; however, closet installations are more common for the small vertical type units. Generally, the unit is located in the corner of a closet with the non-ducted return air facing 90° to the door and the major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

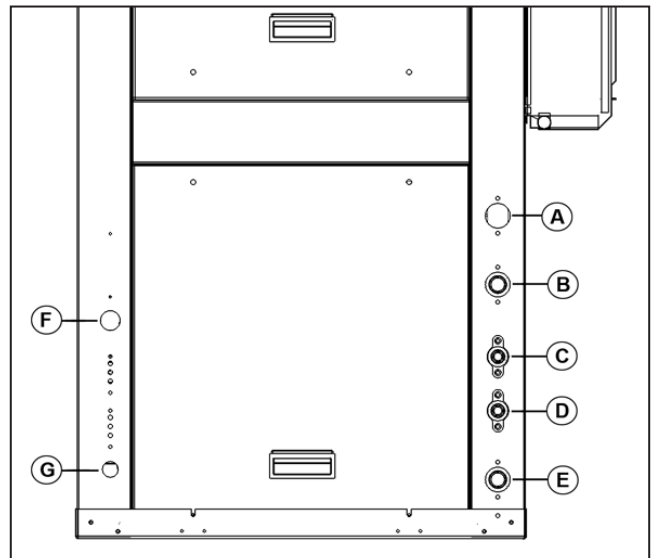
To reduce noise emissions, install a field-provided 1/2 inch thick, isolator pad below the entire base of the vertical unit. The pad should be equal to the overall foot-print size of the unit to provide sound dampening of the unit while in operation.

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)

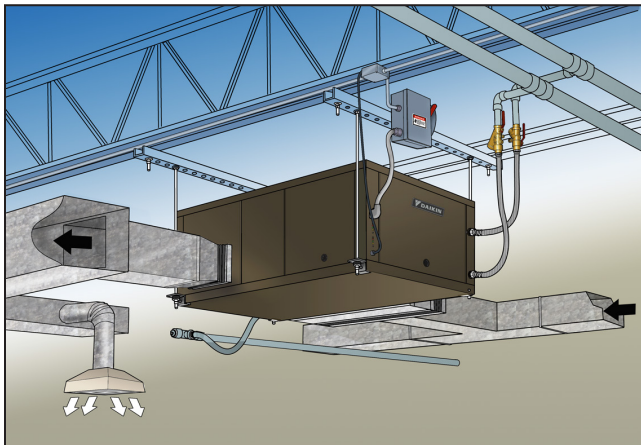
Typical Horizontal Installation

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

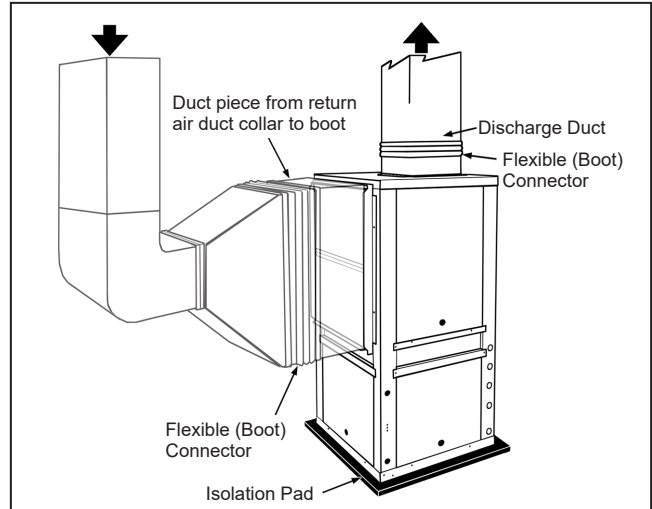
Vertical Unit

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

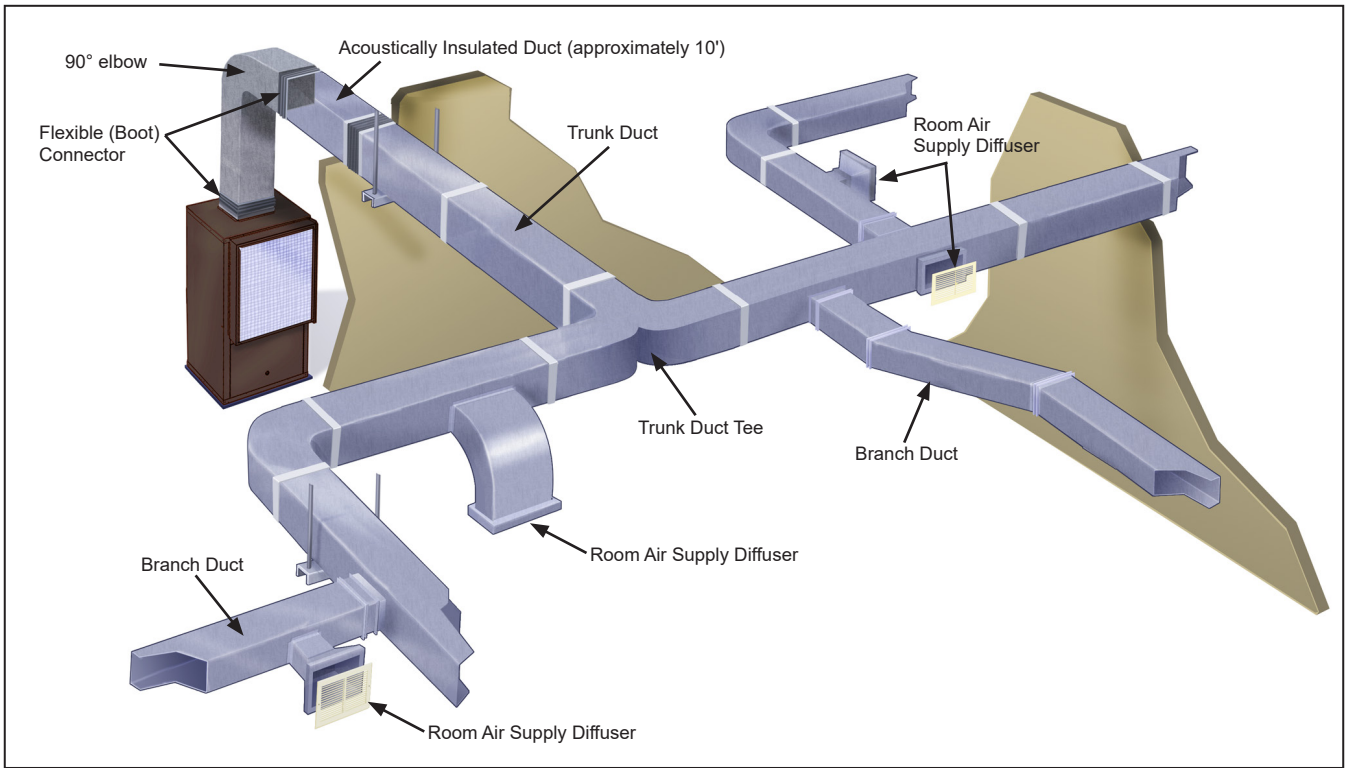
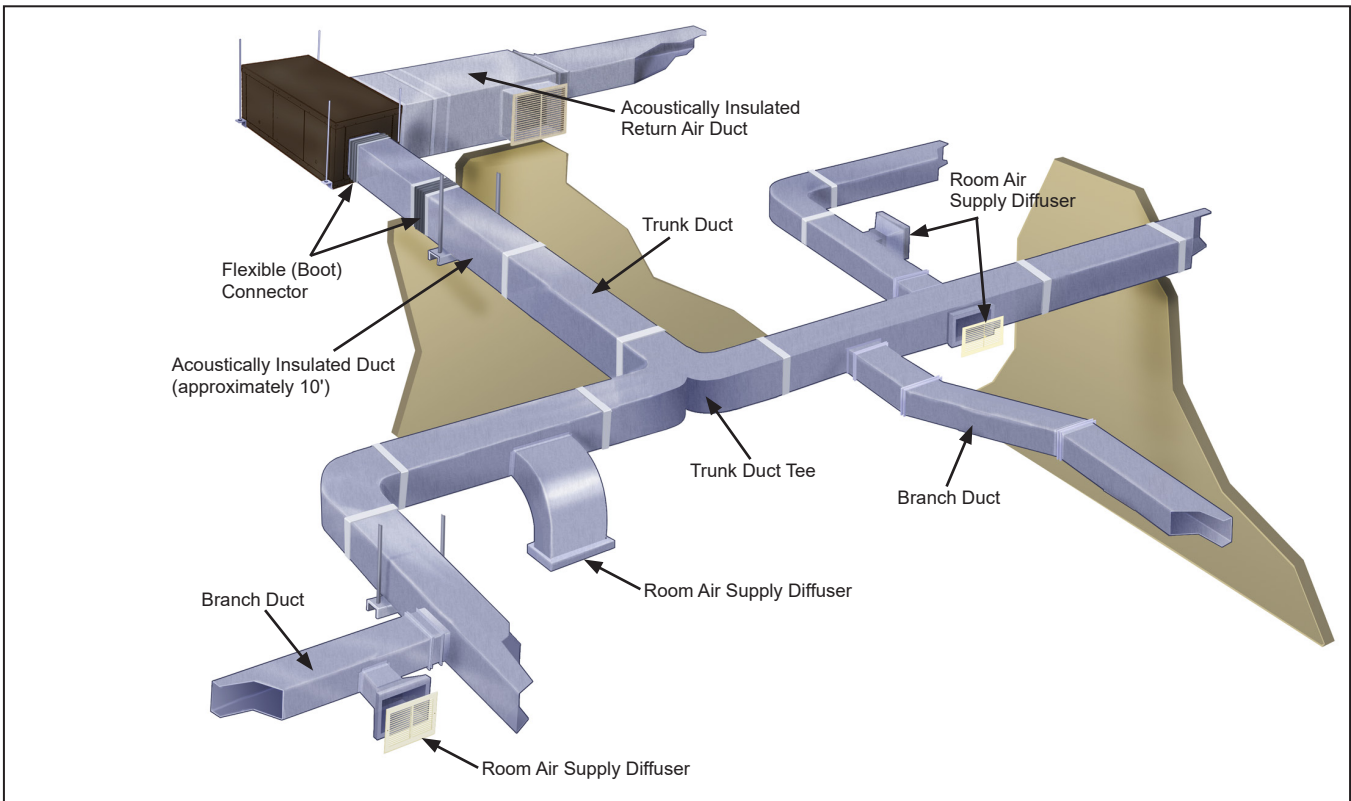


Figure 20: Horizontal unit duct example



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

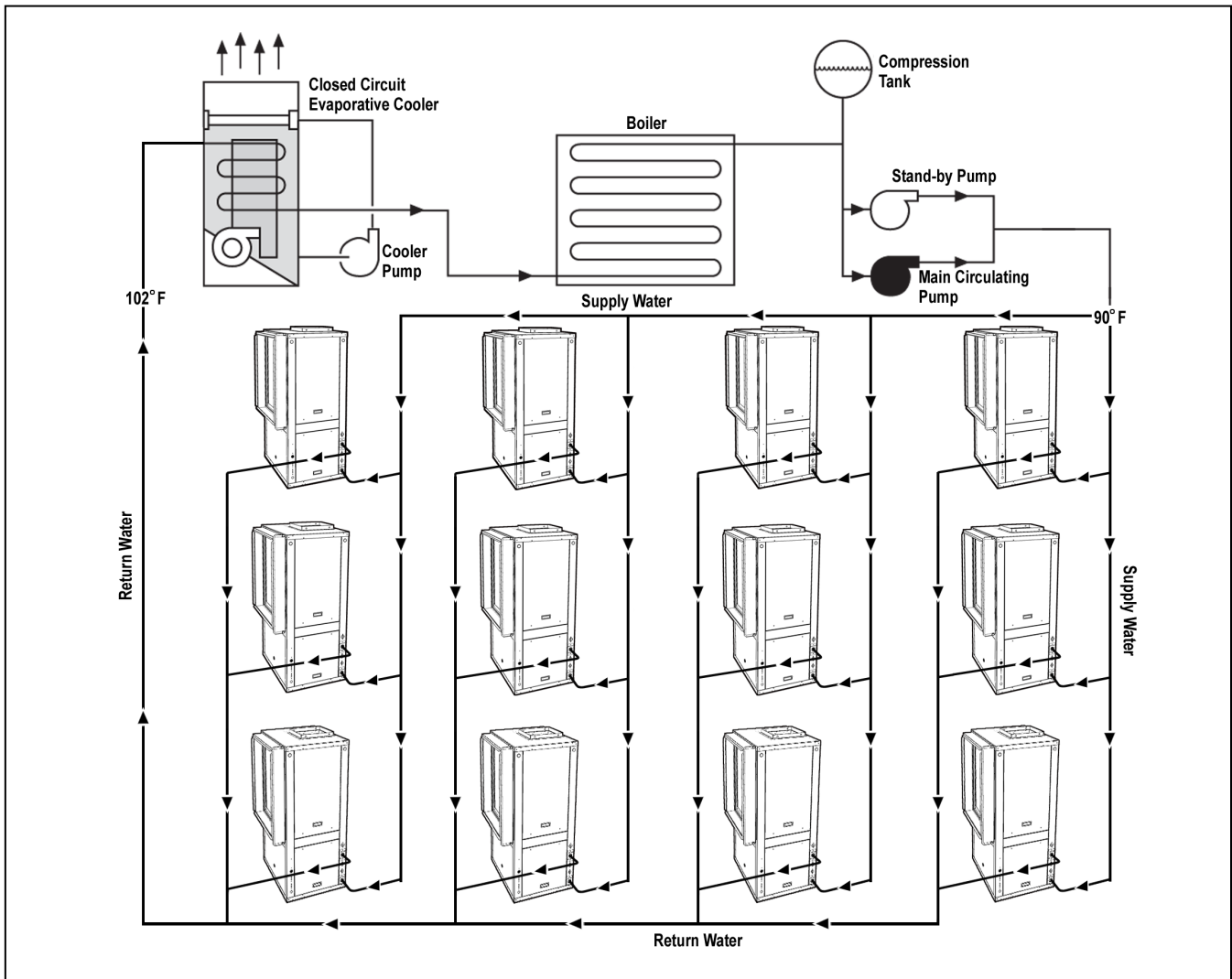
stop shut off valves. Include Pressure / Temperature ports to allow the service technician to measure water flow and unit operation.

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

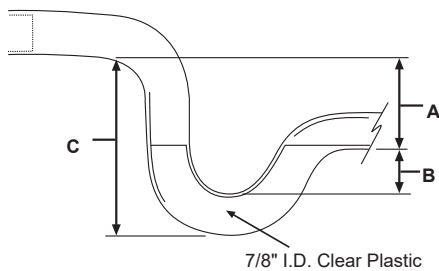
Impurity	Copper Coils	Cupro-nickel Coils	Result	Application	
				Open Recirculating	Closed Recirculating
Calcium & Magnesium Salts (hardness)	Less than 350 ppm	350 ppm Sea Water	Scaling	1. Bleed-off 2. Surface active agents such as polyphosphates. 3. Addition of acid. 4. pH adjustment. Other considerations: • 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 recommended 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)

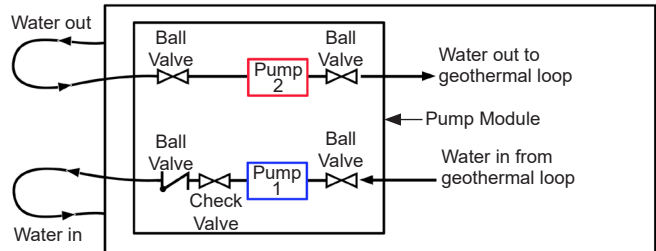


Figure 24: Single Pump - Heat Pump (side view)

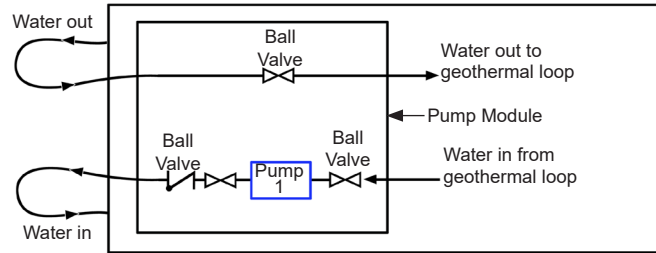
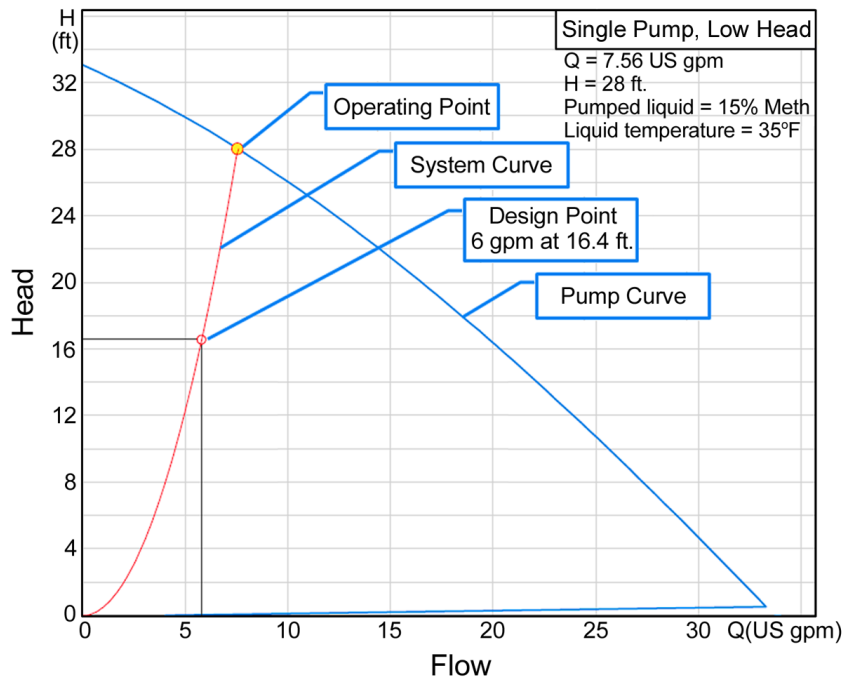


Figure 25: System and pump curve for one, low head pump option



Size 032 (1000 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	5.0	1.6	3.6	65/55	28600	22900	1.775	34700	16.1	37100	2.073	30000	100	5.24
		1.6	3.6	70/59	30600	22600	1.795	36700	17.0	36900	2.147	29600	104	5.03
		1.6	3.6	75/63	32500	23200	1.815	38700	17.9	36700	2.241	29100	109	4.80
		1.6	3.6	80/67	34500	23800	1.836	40800	18.8	36500	2.334	28500	114	4.58
	7.5	3.3	7.5	65/55	28700	23000	1.763	34700	16.3	38000	2.091	30900	101	5.32
		3.3	7.5	70/59	30700	22600	1.782	36800	17.2	37800	2.165	30400	105	5.11
		3.3	7.5	75/63	32600	23200	1.803	38800	18.1	37600	2.258	29900	110	4.88
		3.3	7.5	80/67	34600	23900	1.823	40800	19.0	37400	2.351	29400	114	4.66
	10.0	5.5	12.6	65/55	28800	23000	1.751	34800	16.4	38800	2.108	31600	102	5.39
		5.5	12.6	70/59	30800	22600	1.770	36800	17.4	38700	2.183	31200	106	5.19
		5.5	12.6	75/63	32700	23300	1.791	38800	18.3	38500	2.276	30700	110	4.95
		5.5	12.6	80/67	34700	23900	1.811	40900	19.2	38300	2.369	30200	115	4.73
80	5.0	1.5	3.5	65/55	27200	22300	1.955	33900	13.9	40400	2.142	33100	103	5.52
		1.5	3.5	70/59	29200	22000	1.975	35900	14.8	40300	2.216	32700	107	5.33
		1.5	3.5	75/63	31100	22600	1.995	37900	15.6	40100	2.309	32200	112	5.09
		1.5	3.5	80/67	33100	23200	2.016	40000	16.4	39900	2.402	31700	117	4.86
	7.5	3.2	7.3	65/55	27300	22400	1.943	33900	14.1	41300	2.159	33900	104	5.60
		3.2	7.3	70/59	29300	22000	1.962	36000	14.9	41200	2.234	33600	108	5.40
		3.2	7.3	75/63	31200	22700	1.983	38000	15.7	41000	2.327	33100	113	5.16
		3.2	7.3	80/67	33200	23300	2.003	40000	16.6	40700	2.420	32400	117	4.92
	10.0	5.4	12.3	65/55	27400	22400	1.931	34000	14.2	42200	2.177	34800	105	5.68
		5.4	12.3	70/59	29400	22100	1.950	36100	15.1	42000	2.251	34300	109	5.46
		5.4	12.3	75/63	31300	22700	1.971	38000	15.9	41800	2.344	33800	113	5.22
		5.4	12.3	80/67	33300	23300	1.991	40100	16.7	41600	2.437	33300	118	5.00
90	5.0	1.5	3.5	65/55	25600	21700	2.161	33000	11.8	43500	2.208	36000	106	5.77
		1.5	3.5	70/59	27600	21300	2.181	35000	12.7	43300	2.282	35500	110	5.56
		1.5	3.5	75/63	29500	22000	2.201	37000	13.4	43100	2.375	35000	115	5.31
		1.5	3.5	80/67	31500	22600	2.222	39100	14.2	42900	2.468	34500	120	5.09
	7.5	3.2	7.2	65/55	25700	21700	2.149	33000	12.0	44300	2.225	36700	107	5.83
		3.2	7.2	70/59	27700	21400	2.169	35100	12.8	44200	2.300	36400	111	5.63
		3.2	7.2	75/63	29600	22000	2.189	37100	13.5	44000	2.393	35800	116	5.38
		3.2	7.2	80/67	31600	22600	2.209	39100	14.3	43800	2.486	35300	120	5.16
	10.0	5.3	12.1	65/55	25800	21800	2.137	33100	12.1	45200	2.243	37500	108	5.90
		5.3	12.1	70/59	27800	21400	2.156	35200	12.9	45000	2.317	37100	111	5.69
		5.3	12.1	75/63	29700	22100	2.177	37100	13.6	44800	2.410	36600	116	5.44
		5.3	12.1	80/67	31700	22700	2.197	39200	14.4	44600	2.503	36100	121	5.22
100	5.0	1.5	3.4	65/55	23900	21100	2.398	32100	10.0	Tint = Operation Not Recommended				
		1.5	3.4	70/59	25900	20800	2.417	34100	10.7					
		1.5	3.4	75/63	27900	21400	2.438	36200	11.4					
		1.5	3.4	80/67	29800	22000	2.458	38200	12.1					
	7.5	3.1	7.1	65/55	24000	21200	2.386	32100	10.1					
		3.1	7.1	70/59	26000	20800	2.405	34200	10.8					
		3.1	7.1	75/63	28000	21400	2.425	36300	11.5					
		3.1	7.1	80/67	29900	22100	2.446	38200	12.2					
	10.0	5.2	12.0	65/55	24100	21200	2.373	32200	10.2					
		5.2	12.0	70/59	26100	20900	2.393	34300	10.9					
		5.2	12.0	75/63	28100	21500	2.413	36300	11.6					
		5.2	12.0	80/67	30000	22100	2.434	38300	12.3					
110	5.0	1.5	3.4	65/55	32000	22700	2.454	40400	13.0					
		1.5	3.4	70/59	22300	20700	2.669	31400	8.4					
		1.5	3.4	75/63	24200	20400	2.689	33400	9.0					
		1.5	3.4	80/67	26200	21000	2.709	35400	9.7					
	7.5	3.1	7.0	65/55	28200	21600	2.730	37500	10.3					
		3.1	7.0	70/59	30100	22300	2.750	39500	10.9					
		3.1	7.0	75/63	22400	20800	2.657	31500	8.4					
		3.1	7.0	80/67	24300	20400	2.676	33400	9.1					
	10.0	5.2	11.8	65/55	26300	21000	2.697	35500	9.8					
		5.2	11.8	70/59	28300	21700	2.717	37600	10.4					
		5.2	11.8	75/63	30200	22300	2.738	39500	11.0					
		5.2	11.8	80/67	32000	22900	2.758	41500	11.6					

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

Size 038 (1250 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	6.0	1.8	4.2	65/55	34600	28300	1.991	41400	17.4	45000	2.418	36700	99	5.45
		1.8	4.2	70/59	36900	27800	2.014	43800	18.3	44900	2.502	36400	103	5.25
		1.8	4.2	75/63	39200	28600	2.038	46200	19.2	44700	2.606	35800	108	5.02
		1.8	4.2	80/67	41600	29300	2.062	48600	20.2	44500	2.711	35200	113	4.81
	9.0	3.9	8.8	65/55	34800	28400	1.974	41500	17.6	46200	2.443	37900	100	5.54
		3.9	8.8	70/59	37100	27900	1.996	43900	18.6	46100	2.527	37500	104	5.34
		3.9	8.8	75/63	39400	28600	2.020	46300	19.5	46000	2.631	37000	109	5.12
		3.9	8.8	80/67	41700	29400	2.044	48700	20.4	45800	2.736	36500	114	4.90
	12.0	6.5	14.8	65/55	34900	28400	1.956	41600	17.8	47500	2.468	39100	101	5.64
		6.5	14.8	70/59	37200	27900	1.979	44000	18.8	47400	2.552	38700	105	5.44
		6.5	14.8	75/63	39500	28700	2.003	46300	19.7	47200	2.656	38100	110	5.20
		6.5	14.8	80/67	41800	29400	2.027	48700	20.6	47100	2.761	37700	115	5.00
80	6.0	1.8	4.1	65/55	33300	27700	2.199	40800	15.1	48500	2.497	40000	102	5.69
		1.8	4.1	70/59	35600	27200	2.221	43200	16.0	48300	2.581	39500	106	5.48
		1.8	4.1	75/63	38000	28000	2.245	45700	16.9	48200	2.686	39000	111	5.25
		1.8	4.1	80/67	40300	28700	2.269	48000	17.8	48000	2.790	38500	115	5.04
	9.0	3.8	8.6	65/55	33500	27800	2.181	40900	15.4	49700	2.522	41100	103	5.77
		3.8	8.6	70/59	35800	27300	2.204	43300	16.2	49600	2.606	40700	107	5.57
		3.8	8.6	75/63	38100	28000	2.228	45700	17.1	49400	2.711	40100	111	5.34
		3.8	8.6	80/67	40400	28800	2.252	48100	17.9	49300	2.815	39700	116	5.13
	12.0	6.4	14.6	65/55	33600	27800	2.164	41000	15.5	51000	2.547	42300	104	5.86
		6.4	14.6	70/59	35900	27300	2.187	43400	16.4	50800	2.631	41800	107	5.65
		6.4	14.6	75/63	38300	28100	2.211	45800	17.3	50700	2.736	41400	112	5.43
		6.4	14.6	80/67	40600	28900	2.235	48200	18.2	50500	2.841	40800	117	5.20
90	6.0	1.8	4.1	65/55	31400	26900	2.438	39700	12.9	51200	2.573	42400	104	5.83
		1.8	4.1	70/59	33700	26400	2.460	42100	13.7	51100	2.657	42000	108	5.63
		1.8	4.1	75/63	36000	27100	2.484	44500	14.5	50900	2.761	41500	112	5.40
		1.8	4.1	80/67	38300	27900	2.508	46900	15.3	50800	2.866	41000	117	5.19
	9.0	3.7	8.5	65/55	31500	26900	2.420	39800	13.0	52500	2.598	43600	105	5.92
		3.7	8.5	70/59	33800	26400	2.443	42100	13.8	52300	2.682	43100	109	5.71
		3.7	8.5	75/63	36200	27200	2.467	44600	14.7	52200	2.786	42700	113	5.49
		3.7	8.5	80/67	38500	27900	2.491	47000	15.5	52000	2.891	42100	118	5.27
	12.0	6.3	14.3	65/55	31700	27000	2.403	39900	13.2	53700	2.623	44700	106	5.99
		6.3	14.3	70/59	34000	26500	2.426	42300	14.0	53600	2.707	44400	109	5.80
		6.3	14.3	75/63	36300	27200	2.450	44700	14.8	53400	2.811	43800	114	5.56
		6.3	14.3	80/67	38600	28000	2.474	47000	15.6	53300	2.916	43300	119	5.35
100	6.0	1.8	4.0	65/55	29200	26100	2.709	38400	10.8	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 Daikin 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.				
		1.8	4.0	70/59	31500	25600	2.731	40800	11.5					
		1.8	4.0	75/63	33900	26300	2.755	43300	12.3					
		1.8	4.0	80/67	36200	27100	2.779	45700	13.0					
	9.0	3.7	8.4	65/55	29400	26100	2.691	38600	10.9					
		3.7	8.4	70/59	31700	25600	2.714	41000	11.7					
		3.7	8.4	75/63	34000	26400	2.738	43300	12.4					
		3.7	8.4	80/67	36300	27100	2.762	45700	13.1					
	12.0	6.2	14.1	65/55	29500	26200	2.674	38600	11.0					
		6.2	14.1	70/59	31800	25700	2.697	41000	11.8					
		6.2	14.1	75/63	34200	26400	2.721	43500	12.6					
		6.2	14.1	80/67	36500	27200	2.745	45900	13.3					
110	6.0	1.7	4.0	65/55	27600	25500	3.009	37900	9.2					
		1.7	4.0	70/59	29900	25000	3.031	40200	9.9					
		1.7	4.0	75/63	32300	25800	3.055	42700	10.6					
		1.7	4.0	80/67	34600	26500	3.079	45100	11.2					
	9.0	3.6	8.3	65/55	27800	25600	2.991	38000	9.3					
		3.6	8.3	70/59	30100	25100	3.014	40400	10.0					
		3.6	8.3	75/63	32400	25800	3.038	42800	10.7					
		3.6	8.3	80/67	34700	26600	3.062	45200	11.3					
	12.0	6.1	14.0	65/55	27900	25600	2.974	38100	9.4					
		6.1	14.0	70/59	30200	25100	2.997	40400	10.1					
		6.1	14.0	75/63	32600	25900	3.021	42900	10.8					
		6.1	14.0	80/67	34900	26600	3.045	45300	11.5					
		6.1	14.0	85/71	37200	27400	3.069	47700	12.1					

Size 044 (1400 CFM) (continued)

Table with columns: EWT (°F), GPM, WPD (PSI, FT of W.C.), EAT (°F), Cooling (Total, Sensible, Power Input, THR, EER), Heating (Total, Power Input, THA, LAT, COP). Rows are grouped by GPM (70, 80, 90, 100, 110) and sub-groups by WPD (7.0, 10.5, 14.0).

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 Daikin 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 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 "Appendix-A" on page 71 for table legend.)	41700	34000	2.026	48600	20.6	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	41700	34000	2.026	48600	20.6	43400	3.636	31000	86	3.50	
		2.2	4.9	70/59						43200	3.779	30300	90	3.35	
		2.2	4.9	75/63						43000	3.958	29500	95	3.18	
		2.2	4.9	80/67						42800	4.137	28700	100	3.03	
	15.0	4.7	10.7	65/55						46800	3.706	34200	88	3.70	
		4.7	10.7	70/59						46600	3.849	33500	91	3.55	
		4.7	10.7	75/63						46400	4.028	32700	96	3.37	
		4.7	10.7	80/67						46200	4.206	31800	101	3.22	
	20.0	8.1	18.6	65/55						50200	3.775	37300	89	3.89	
		8.1	18.6	70/59						50100	3.918	36700	93	3.74	
		8.1	18.6	75/63						49800	4.097	35800	98	3.56	
		8.1	18.6	80/67						49600	4.276	35000	103	3.40	
40	10.0	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	3.917	37300	93	3.79	
		2.1	4.8	75/63						50700	4.096	36500	98	3.61	
		2.1	4.8	80/67						50600	4.275	35700	103	3.45	
	15.0	4.6	10.4	65/55						54300	3.844	41200	91	4.14	
		4.6	10.4	70/59						54100	3.987	40500	95	3.97	
		4.6	10.4	75/63						53900	4.165	39700	100	3.79	
		4.6	10.4	80/67						53700	4.344	38900	105	3.62	
	20.0	7.9	18.0	65/55						57700	3.913	44300	93	4.32	
		7.9	18.0	70/59						57600	4.056	43800	97	4.16	
		7.9	18.0	75/63						57300	4.235	42800	101	3.96	
		7.9	18.0	80/67						57100	4.414	42000	106	3.79	
50	10.0	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						58200	4.089	44200	97	4.17	
		2.0	4.7	75/63						58000	4.268	43400	102	3.98	
		2.0	4.7	80/67						57800	4.447	42600	107	3.81	
	15.0	4.4	10.1	65/55						61800	4.016	48100	94	4.51	
		4.4	10.1	70/59						61600	4.159	47400	98	4.34	
		4.4	10.1	75/63						61400	4.337	46600	103	4.15	
		4.4	10.1	80/67						61200	4.516	45800	108	3.97	
	20.0	7.7	17.5	65/55						65200	4.085	51300	96	4.67	
		7.7	17.5	70/59						65100	4.228	50700	100	4.51	
		7.7	17.5	75/63						64800	4.407	49800	105	4.31	
		7.7	17.5	80/67						64600	4.586	48900	110	4.12	
60	10.0	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						65700	4.282	51100	100	4.49	
		2.0	4.6	75/63						65500	4.461	50300	105	4.30	
		2.0	4.6	80/67						65300	4.639	49500	110	4.12	
	15.0	4.3	9.9	65/55						69300	4.208	54900	98	4.82	
		4.3	9.9	70/59						69100	4.351	54300	102	4.65	
		4.3	9.9	75/63						68900	4.530	53400	107	4.45	
		4.3	9.9	80/67						68700	4.709	52600	112	4.27	
	20.0	7.5	17.1	65/55						72700	4.278	58100	99	4.98	
		7.5	17.1	70/59						72600	4.421	57500	103	4.81	
		7.5	17.1	75/63						72300	4.600	56600	108	4.60	
		7.5	17.1	80/67						72100	4.778	55800	113	4.42	

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 Daikin 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					
			60700	44800	5.241	78600	11.6							

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 "Appendix-A" 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
	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
	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
30	12.0	3.1	7.0	65/55						51000	4.468	35800	88	3.34	
		3.1	7.0	70/59						63100	4.740	47400	92	3.19	
		3.1	7.0	75/63						67000	4.870	48700	96	3.01	
		3.1	7.0	80/67						71000	5.000	50000	101	2.85	
	18.0	6.7	15.2	65/55						75000	5.140	51400	104	2.74	
		6.7	15.2	70/59						59700	4.870	48700	98	2.91	
		6.7	15.2	75/63						63700	4.760	47600	102	2.83	
		6.7	15.2	80/67						67600	4.890	48900	106	2.75	
	24.0	11.5	26.3	65/55						71600	5.030	50300	110	2.72	
		11.5	26.3	70/59						75600	5.160	51600	114	2.64	
		11.5	26.3	75/63						60300	4.890	48900	106	2.99	
		11.5	26.3	80/67						64300	4.780	47800	110	2.85	
40	12.0	3.0	6.8	65/55						61200	4.670	45300	92	3.84	
		3.0	6.8	70/59						64300	4.780	47800	96	3.67	
		3.0	6.8	75/63						68200	4.920	49200	101	3.48	
		3.0	6.8	80/67						72200	5.050	50500	106	3.31	
	18.0	6.5	14.7	65/55						76200	5.180	51800	110	2.89	
		6.5	14.7	70/59						60300	4.890	48900	106	3.24	
		6.5	14.7	75/63						64300	4.780	47800	110	2.85	
		6.5	14.7	80/67						68200	4.920	49200	114	2.76	
	24.0	11.2	25.5	65/55						76200	5.180	51800	114	2.76	
		11.2	25.5	70/59						69900	5.180	51800	118	2.68	
		11.2	25.5	75/63						63800	5.310	53100	123	2.60	
		11.2	25.5	80/67						67800	5.440	54400	127	2.52	
50	12.0	2.9	6.6	65/55						60200	4.620	43200	91	3.72	
		2.9	6.6	70/59						64700	4.830	47700	95	3.56	
		2.9	6.6	75/63						68700	5.066	50660	100	3.37	
		2.9	6.6	80/67						72600	5.301	53010	105	3.20	
	18.0	6.5	14.7	65/55						76600	5.336	53360	109	3.03	
		6.5	14.7	70/59						65300	5.260	52600	113	2.95	
		6.5	14.7	75/63						69300	5.150	51500	117	2.87	
		6.5	14.7	80/67						73200	5.224	52240	121	2.79	
	24.0	11.2	25.5	65/55						81200	5.550	55500	125	2.71	
		11.2	25.5	70/59						61200	5.032	50320	121	2.88	
		11.2	25.5	75/63						65900	5.267	52670	126	2.80	
		11.2	25.5	80/67						69900	5.503	55030	131	2.72	
60	12.0	2.9	6.6	65/55						68200	4.831	51300	95	4.11	
		2.9	6.6	70/59						66800	5.019	50400	99	3.94	
		2.9	6.6	75/63						70800	5.255	49200	104	3.74	
		2.9	6.6	80/67						74800	5.490	48000	108	3.56	
	18.0	6.3	14.4	65/55						82700	5.680	56800	132	2.66	
		6.3	14.4	70/59						67400	5.422	54200	127	2.79	
		6.3	14.4	75/63						71400	5.310	53100	132	2.71	
		6.3	14.4	80/67						75300	5.440	54400	137	2.63	
	24.0	10.9	24.9	65/55						79300	5.580	55800	142	2.55	
		10.9	24.9	70/59						83300	5.710	57100	147	2.47	
		10.9	24.9	75/63						68000	5.352	53520	142	2.69	
		10.9	24.9	80/67						72000	5.587	55870	147	2.61	
70	12.0	2.8	6.5	65/55						77200	5.036	60000	99	4.49	
		2.8	6.5	70/59						70300	5.224	59100	103	4.31	
		2.8	6.5	75/63						74300	5.460	57900	108	4.10	
		2.8	6.5	80/67						78300	5.695	56800	112	3.92	
	18.0	6.1	14.0	65/55						82200	5.690	56900	116	3.74	
		6.1	14.0	70/59						67000	5.420	54200	111	3.90	
		6.1	14.0	75/63						70900	5.310	53100	116	3.72	
		6.1	14.0	80/67						74900	5.450	54500	121	3.54	
	24.0	10.6	24.3	65/55						79300	5.580	55800	126	3.46	
		10.6	24.3	70/59						82800	5.710	57100	131	3.28	
		10.6	24.3	75/63						67600	5.365	53650	126	3.68	
		10.6	24.3	80/67						71500	5.600	56000	131	3.50	

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

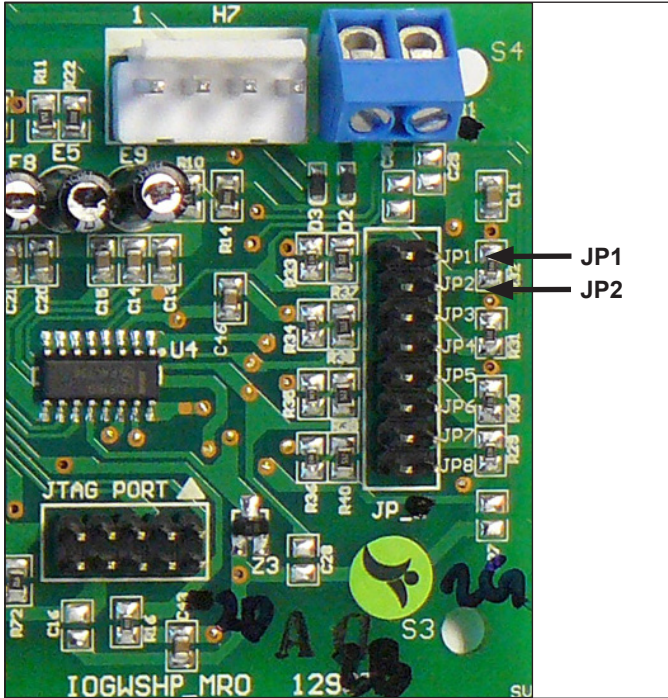
Notes: ¹ The unit is capable of high-low fan performance through the use of a 2-stage thermostat wired to specific terminals for High-Low CFM fan performance. Standard operation with a 1-stage thermostat is indicated as High CFM fan performance.

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

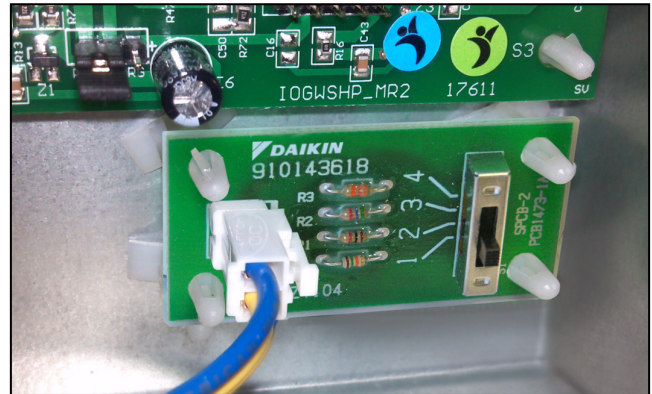
Figure 26: JP1 & JP2 location on the I/O expansion module



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

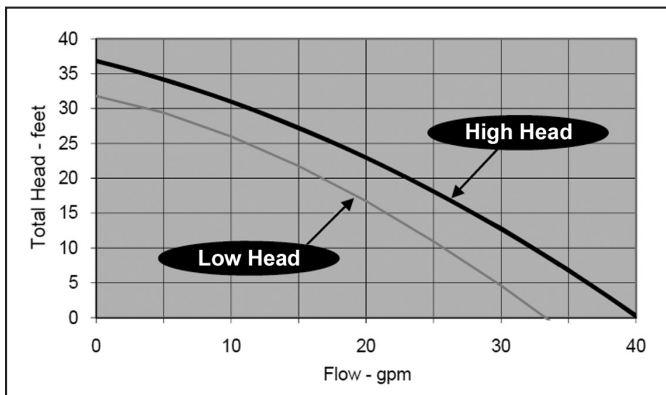
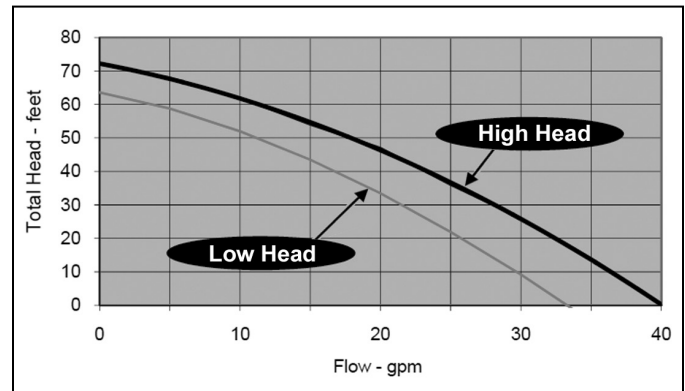


Figure 29: Dual pump performance curve



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	2.8	14.5	17.4	25
	265/60/1	239	9.1	54.0	2.4	11.5	13.8	20
	208-230/60/3	197	6.5	55.4	2.8	9.3	10.9	15
	*460/60/3	414	3.5	28.0	2.4	5.9	6.8	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	5.9	23.8	28.3	45
	208-230/60/3	197	14.2	88.0	5.9	20.1	23.7	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	5.9	27.1	32.4	50
	208-230/60/3	197	14.0	83.1	5.9	19.9	23.4	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	7.4	34.5	41.3	60
	208-230/60/3	197	16.5	110.0	7.4	23.9	28.0	40
	*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	7.4	37.1	44.5	60
	208-230/60/3	197	17.6	136.0	7.4	25.0	29.4	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
	044	460/60/3	•	•	B,E,P	•	•	S	•		B,E,P,S
		208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
	049	460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
	064	460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/1	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		208-230/60/3	•		B,E,P	•		S			
	072	460/60/3	•	•	B,E,P	•	•	S	•	•	B,E,P,S
		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	•	•

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

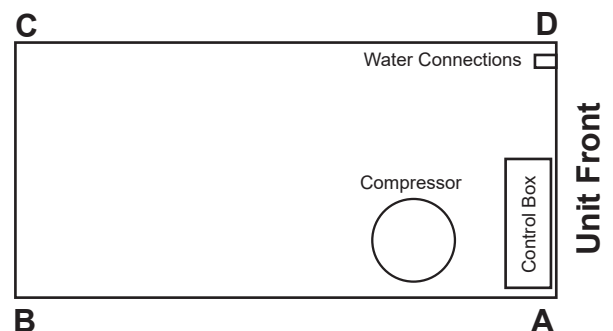
Horizontal Units

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

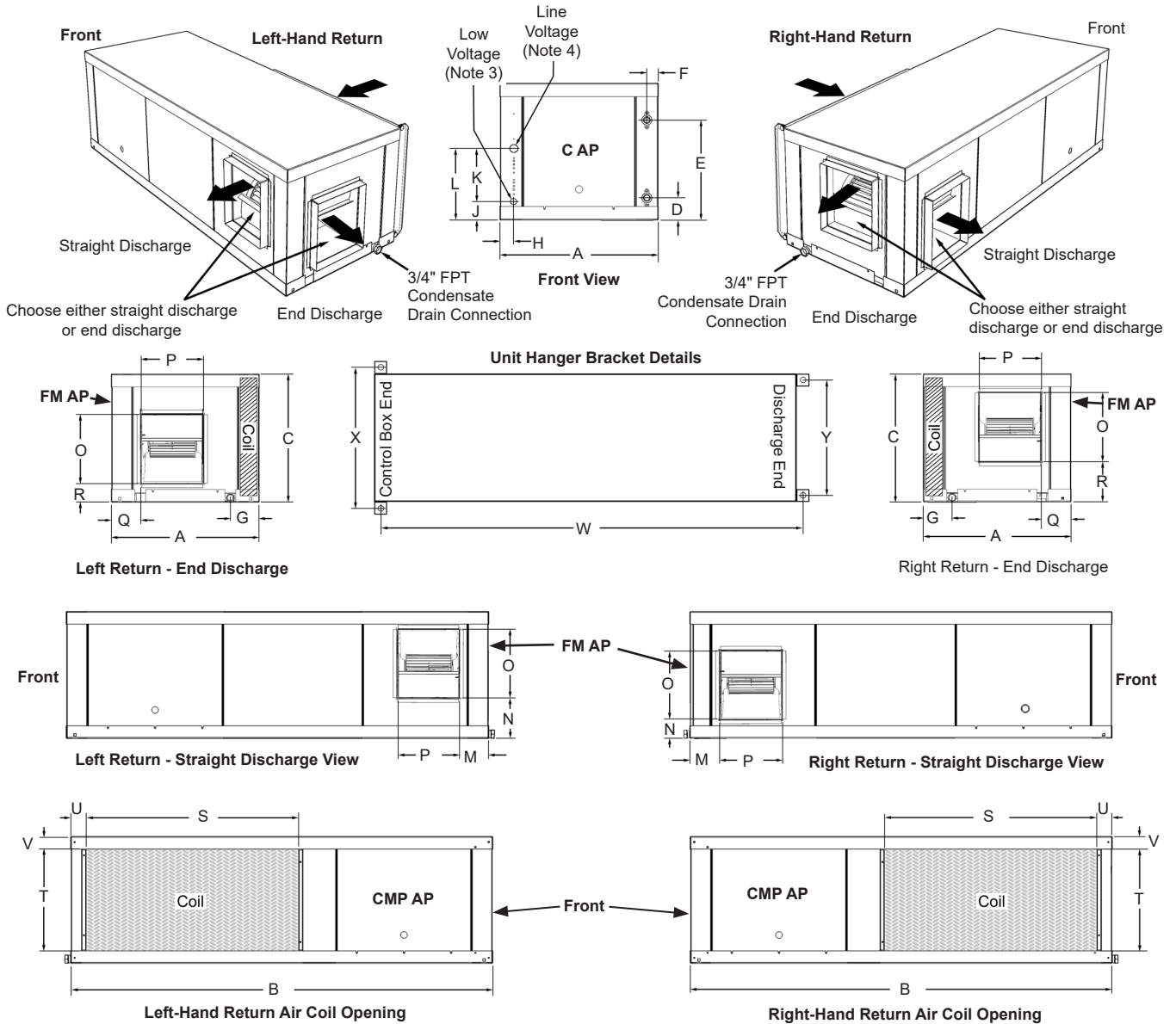


Table 28: Cabinet dimensions

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

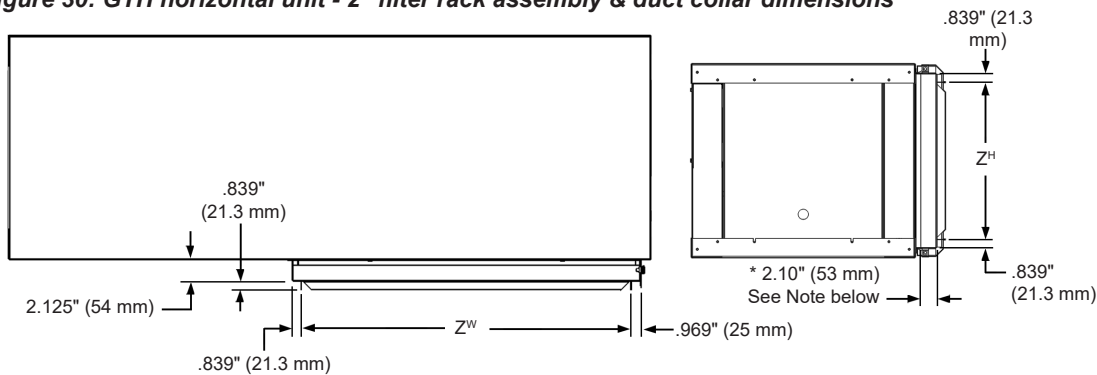
GTH Horizontal Unit	Discharge Air Duct Connection in inches (mm)							Return Air Coil Opening in inches (mm)				
	M	N		O	P	Q	R		S	T	U	V
		Left-hand	Right-hand				Left-hand	Right-hand				
026, 032	4.41 (112)	6.20 (157)	2.71 (69)	10.39 (264)	9.32 (237)	4.41 (112)	2.71 (69)	6.20 (157)	32.50 (826)	15.45 (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

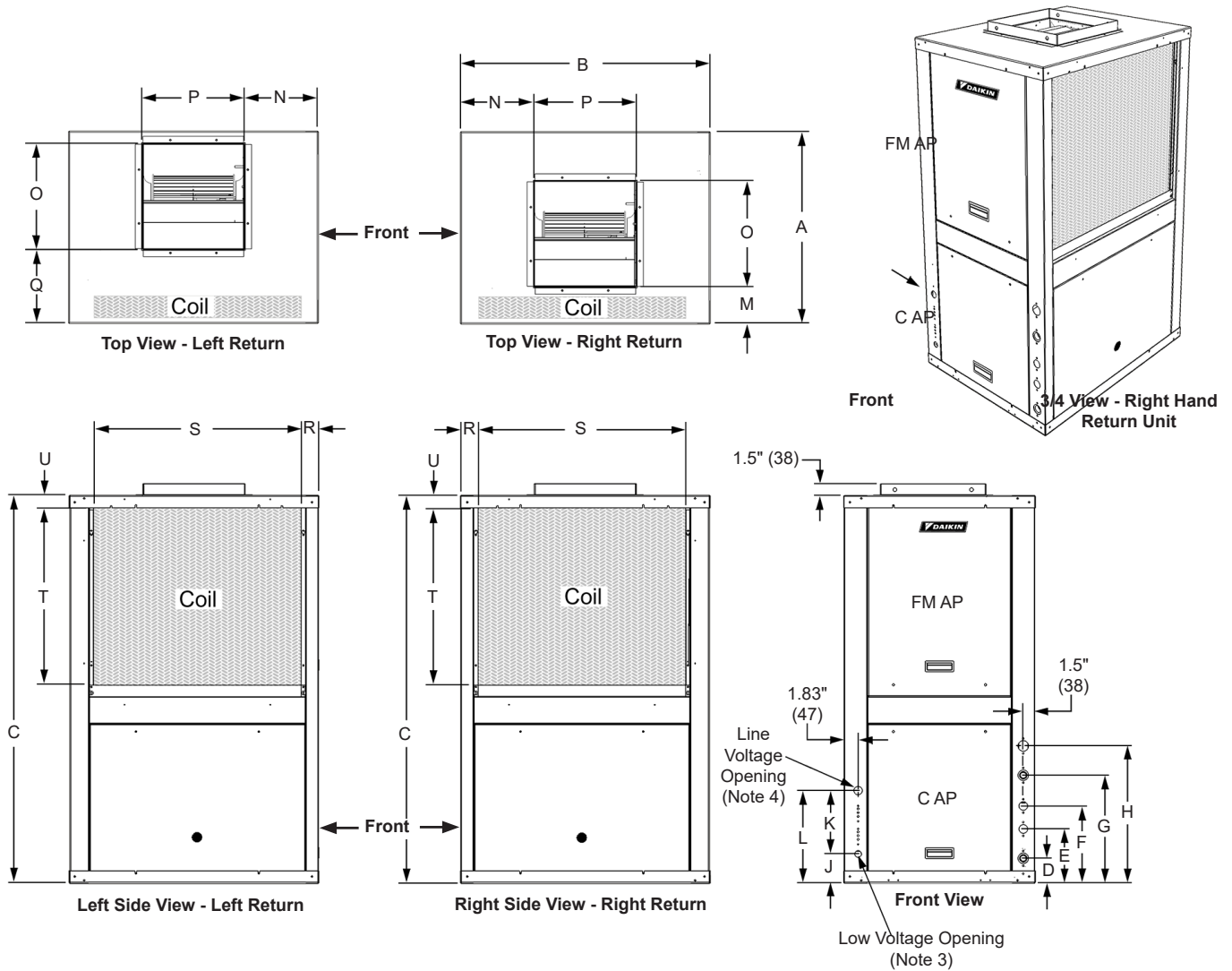


Table 32: Overall cabinet dimensions

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.

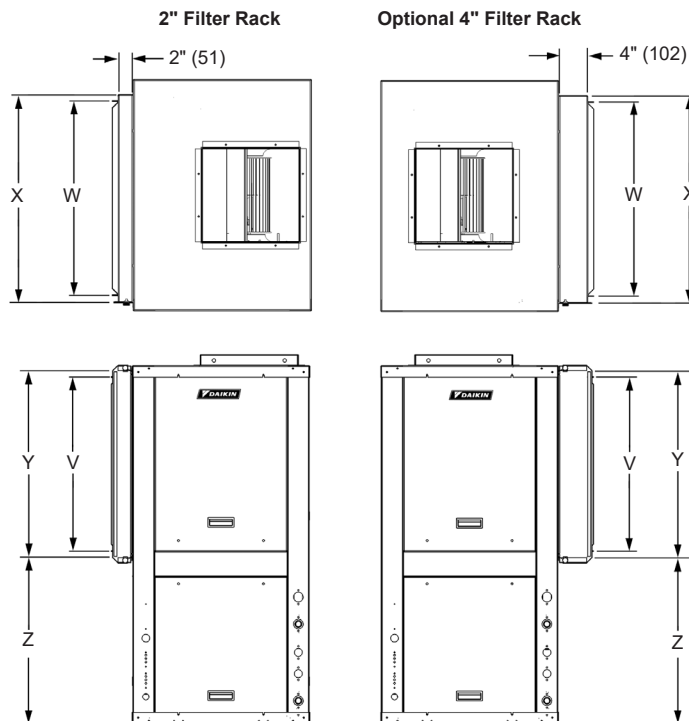
Table 34: Discharge duct collar & return air coil opening dimensions

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.





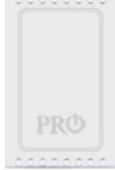
Table 35: Filter rack assembly & return air duct collar dimensions

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	•	•	•	•	Use up to 16 sensors for temperature averaging
	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)	
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

◀ *BACK TO Capacity Data Tables beginning on [page 30](#).*

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 Applied equipment, its care should be a high priority. For training information on all Daikin Applied 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 Applied 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.

Aftermarket Services

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.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.