DAIKIN

Catalog 1116-9

SmartSource® Compact Vertical Water Source Heat Pumps

Model GCV - Vertical

Unit Sizes 007 – 070 (1/2 thru 6 tons)

AHRI CERTIFIED www.ahridirectory.org Water Source HP ANSI/AHRI/ASHRAE/ISO13256-1

c ETL LISTED US Intertek

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1	2-3	4	5-7	8	9	10-11	12	13	14	15	16-17	18	19	20	21	22	23-24	25	26
W	GC	V	007	E	1	LT	S	B	C	B	HG	1	1	P	F	S	75	C	D

Category	Code Option	Code Designation		Description
Product Category	1	W	=	Water Source Heat Pump
Model Type	2-3	GC	=	Compact
Configuration	4	V	=	Vertical
Nominal Capacity	5-7	007	=	7,000 Btuh Nominal Cooling
		009	=	9,000 Btuh Nominal Cooling
		012	=	12,000 Btuh Nominal Cooling
		015	=	15,000 Btuh Nominal Cooling
		019	=	19,000 Btuh Nominal Cooling
		024	=	24,000 Btuh Nominal Cooling
		030	=	30,000 Btuh Nominal Cooling
		042	=	42,000 Btuh Nominal Cooling
		048	=	48,000 Btuh Nominal Cooling
		060	=	60,000 Btuh Nominal Cooling
		070	=	70,000 Btuh Nominal Cooling
Voltage	8	A	=	115/60/1 (007-015)
		E	=	208-230/60/1 (007-070)
		F	=	208-230/60/3 (024-070)
		J	=	265/60/1 (007-036)
		K	=	460/60/3 (024-070)
		L	=	575/60/3 (048-070)
Design Series (Vintage)	9	1	=	Revision / Design Series 1
Return Air / Discharge Air	10-11	LT	=	Left-Hand Return / Top Discharge
		R	=	Right-Hand Return / Top Discharge
Water Coil Type	12	C	=	Copper Inner Tube
		S	=	Cupro-Nickel Inner Tube
		G	=	Geothermal - Copper Inner Tube
		J	=	Geothermal - Cupro-Nickel
Unit Control	13	B	=	MicroTech III SmartSource Unit Controller
		L	=	MicroTech III Unit Controller + Lon
		B	=	MicroTech III Unit Controller + BACnet
Fan Motor	14	P	=	PSC
		C	=	ECM Constant CFM
		T	=	ECM Constant Torque
Insulation (Compressor Side / Airside)	15	B	=	Standard (1/2" Fiberglass, Entire Unit)
		I	=	IAQ (Closed Cell Foam, Entire Unit)
		D	=	Dual Layer Fiberglass (Entire Unit) (sizes 007-019)
		F	=	Sound Blanket + Standard (1/2" Fiberglass)(sizes 024-070)
		G	=	Sound Blanket + IAQ (Closed Cell Foam) (sizes 024-070)
		H	=	Sound Blanket + Sound Package (1" Fiberglass / Dual Layer Fiberglass) (sizes 024-070)
Options	16-17	WE	=	Waterside Economizer
		HG	=	Hot Gas Reheat
		HH	=	Hydronic Heat
Filter & Racks	18	1	=	Standard 1" Rail - 1" Throwaway Filter
		2	=	2" Rack - 2" Filter (MERV 8)
		4	=	4" Rack - 4" Filter (MERV 13)
Piping Package	19	0	=	None
		1	=	Isolation Valve (NO)
		2	=	Isolation Valve (NC)
Electric Heat	20	0	=	None
		P	=	Control for Electric Heat Single 24V Signal (Field Installed Duct Heater by Others)
Freeze Fault Protection	21	0	=	None
		F	=	Freeze Fault Protection
Standard or Special	22	S	=	Standard
		X	=	Special
Transformer	23-24	50	=	50VA Transformer
		75	=	75VA Transformer
Corrosion Protection	25	0	=	None
		C	=	Corrosion Protection
Disconnect Switch	26	0	=	None
		D	=	Disconnect Switch

Compact model GCV with PSC motor

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

Unit Size	Motor Type	CFM	GPM	Water Loop (Boiler Tower)				Ground Loop (Geothermal)				Dimensions
				Cooling		Heating		Cooling		Heating		
				Btu/hr	EER	Btu/hr	COP	Btu/hr	EER	Btu/hr	COP	
007	PSC	250	1.8	6100	12.8	7000	4.5	6400	15.1	4800	3.3	19.0W x 19.0D x 24.0H
009		300	2.3	8000	12.2	9500	4.3	8400	14.8	6300	3.2	
012		400	3.0	10900	12.2	13600	4.3	11600	14.1	8900	3.2	
015	PSC	500	3.5	13700	13.8	16600	5.1	14500	15.6	10500	3.4	21.5W x 21.5D x 32.0H
019		600	4.5	17300	13.8	20300	4.7	18300	15.8	13000	3.4	
024	PSC	775	6.0	24000	13.4	25900	4.4	25200	15.5	17200	3.2	21.5W x 21.5D x 39.0H
030		1000	7.1	28900	14.0	33000	4.4	30500	16.0	21200	3.3	
036	PSC	1200	9.1	36100	13.0	42300	4.3	37900	15.0	27300	3.3	21.5W x 26.0D x 44.0H
042		1400	10.0	40300	13.7	45800	4.6	42000	15.7	29700	3.3	
048	PSC	1600	12.0	47800	14.2	58400	5.0	49800	16.3	38000	3.6	24.0W x 32.5D x 46.0H
060		2000	15.0	58700	13.2	74500	4.6	61400	14.8	49200	3.3	
070	PSC	2200	18.0	66500	13.5	79900	4.6	69000	14.9	53200	3.3	26.0W x 33.25D x 54.125H

Compact model GCV with EC motor

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

Unit Size	Motor Type	CFM	GPM	Water Loop (Boiler Tower)				Ground Loop (Geothermal)				Dimensions
				Cooling		Heating		Cooling		Heating		
				Btu/hr	EER	Btu/hr	COP	Btu/hr	EER	Btu/hr	COP	
007	*ECM	250	1.8	6200	13.8	6900	4.8	6500	16.2	4700	3.3	19.0W x 19.0D x 24.0H
009		300	2.3	8100	13.0	9200	4.3	8400	14.8	6100	3.2	
012		400	3.0	10900	13.2	13500	4.6	11700	15.1	8700	3.4	
015	ECM	500	3.5	13900	14.6	16400	5.2	14700	16.5	10300	3.5	21.5W x 21.5D x 32.0H
019		600	4.5	17500	14.3	20100	5.0	18500	16.7	12900	3.5	
024	ECM	775	6.0	24200	13.5	25700	4.5	25400	15.9	17100	3.4	21.5W x 21.5D x 39.0H
030		1000	7.1	28900	14.1	33000	4.4	30500	16.2	21200	3.3	
036	ECM	1200	9.1	36500	13.7	41900	4.5	38300	15.8	27000	3.4	21.5W x 26.0D x 44.0H
042		1400	10.0	41000	14.5	45000	4.8	42700	16.7	28900	3.4	
048	ECM	1600	12.0	48200	14.7	57400	5.1	50100	16.9	37000	3.6	24.0W x 32.5D x 46.0H
060		2000	15.0	59300	13.9	73100	4.9	62000	15.7	47800	3.6	
070	ECM	2200	18.0	67500	14.6	78900	4.8	70000	16.2	52200	3.5	26.0W x 33.25D x 54.125H

Legend: *Btuh = British Thermal Units per Hour* *CFM = Airflow Rate, Cubic Feet per Minute*
COP = Coefficient of Performance *EER = Energy Efficiency Ratio*
GPM = Gallons per Minute ** = Constant torque EC motor only*

Water Loop: *1. Cooling capacity is 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 db, 59.0°F wb (20/15°C) EAT and 68°F (20°C) EWT.
3. All ratings based on 208V operation.

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.*
2. Heating capacity is based on 68°F db, 59.0°F wb (20/15°C) EAT and 32°F (0°C) EWT.
3. All ratings based on 208V operation.

SmartSource® Compact Vertical Water Source Heat Pumps

Daikin SmartSource Compact vertical water source heat pumps (WSHPs) lead the way in small-scale, serviceable design that provides commercial building contractors and facility managers with a low-cost alternative to more expensive and larger WSHPs. Readily available in-stock, Compact units are ideal for new, existing, or replacement jobs where space is a premium and budgets are constrained. They can be configured for boiler tower or geothermal applications that are often found in schools, offices, lodging, condominiums, and retail facilities.

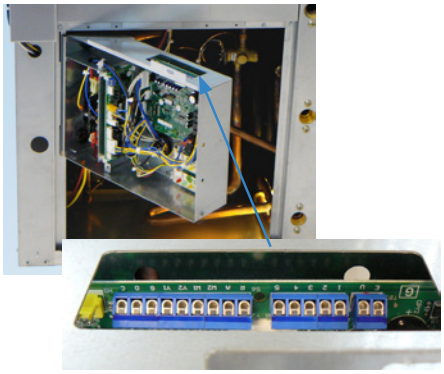
Although small in size, Compact units deliver big in performance capabilities. Specifying engineers will appreciate all the high-performing features and options we've built into the Compact; EC motors with adjustable air flow settings, dehumidification, and waterside economizers that typically are found only in larger WSHPs, are now fully selectable and available in this smaller packaged unit, and at a lower cost.

With so many performance design features and options available for Compact WSHPs, building owners can expect a quiet and more comfortable environment for occupants, in addition to a low first-installed cost, and efficient, cost-saving operation each year that lowers energy bills.

Big Features, Small Design, Perfect Fit

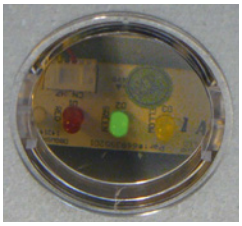
1 Non-fused disconnect (option)

2 Swing-out removable control box

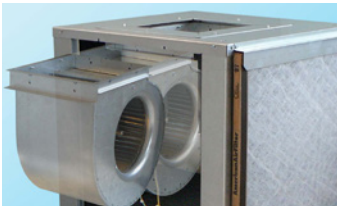


Easy access to terminal connections

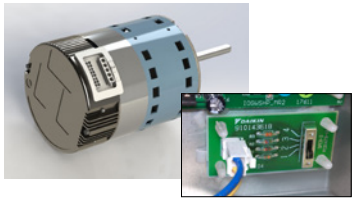
3 LED status sight glass



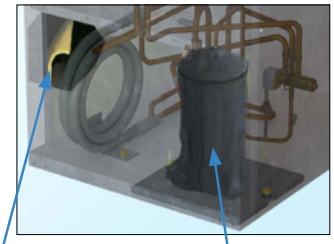
4 Slide-out fan motor & housing



5 4-position fan speed selector switch (option)



6 Sound options



Dual layer insulation

Compressor blanket

1 Non-fused disconnect (option)
- Convenient power shut-off and lockout at the unit

2 Swing-out removable control box
- Designed for easy access to control terminal connections and easy service access

3 LED status sight glass
- The LED status sight glass allows an instant visual of unit operation for quick troubleshooting and advanced diagnosis

4 Slide-out fan motor & housing (sizes 015-048)
- The motor and fan housing assembly slide-out along rails for easy removal and service access

5 Smart ECM fan control with 4-position switch (option)
- Quiet and efficient motors are available on all sizes.

6 Sound options
- Reduces sound levels for quieter operation

7 Smart dehumidification
- Uses hot gas reheat, humidistat & smart airflow management for humidity control (see "Hot Gas Reheat Coil" on page 6)

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. With the optional ECM fan system, the air flow is adjusted 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.

Hydronic Heat

The hydronic heat option helps to reduce energy consumption by using warm loop water temperatures to condition a space without energizing mechanical heating.

The unit includes a hydronic heating coil located downstream of the unit evaporator coil. When entering water temperatures are between 90° to 120°F, a call for heating will divert the warm water to the hydronic coil.

An optional control sequence allows compressor heating operation when the loop water is below 90° F. In this sequence, the control system will automatically switch from compressor heating to hydronic heating based on the loop temperature. With optional ECM smart fan controls sound levels can be reduced by adjusting air flow during hydronic heat operation.

Waterside Economizer

The waterside economizer option helps to reduce energy consumption by using cold loop water temperature 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 benefit from the waterside economizer when loop temperatures are cool enough to provide air conditioning.

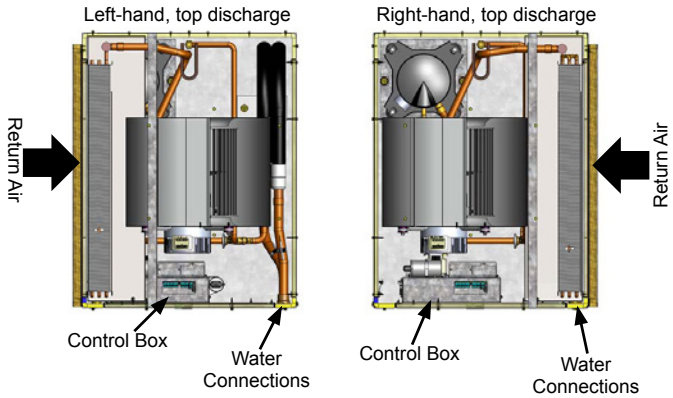
The waterside economizer includes a hydronic cooling coil located upstream of the unit's evaporator coil. When entering water temperatures are between 40° to 70°F, a call for 1st-stage cooling will divert the cold water to the economizer coil. A call for 2nd-stage cooling will allow simultaneous compressor operation whenever the loop temperature is below the changeover temperature.

Cabinet Configurations

The SmartSource compact cabinet is fabricated from heavy gauge G-60 galvanized sheet metal.

Two cabinet configurations are available in either a left-hand or right-hand return air arrangement to provide the optimum return air location and service access.

Figure 1: Two vertical unit configurations



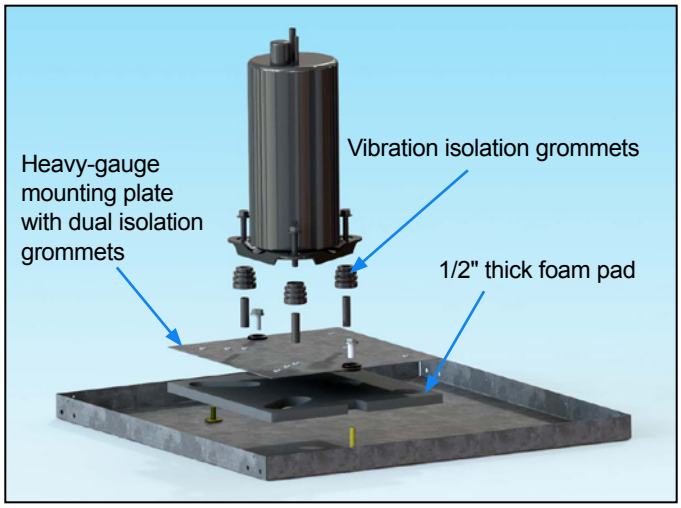
Note: *Unit left or right hand is determined by facing the piping connection (front) side of unit*

What our customers are saying;

"The service guys love the design of the GCV unit, serviceability overall is excellent."

Designed-in Sound Reduction

Provided as standard, the unit has a unique dual-level vibration isolation system. A heavy-gauge mounting plate is isolated from the cabinet base with a 1/2" thick dense foam pad to minimize vibration transfer. The compressor is then isolated from the mounting plate with isolation grommets. The compressor is located in a well-insulated compartment separated from the air stream to minimize sound transmission.

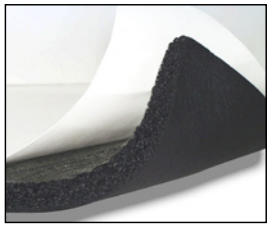


Cabinet Insulation

Dual density 1/2" fiberglass insulation is standard on all Vertical Compact units for improved thermal and acoustic performance. The 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.

IAQ Insulation (Option)

Optional insulation is available with closed-cell non fibrous insulation for Indoor Air Quality (IAQ).



Closed cell foam insulation

Sound Options

Sound Package

Available as a factory installed option, unit sizes 024-070 utilize sound attenuating compressor blankets combined with a dual layer of fiberglass insulation that is strategically placed in the air handling compartment. Unit sizes 007-019 have a dual layer of fiberglass insulation that is strategically placed in both the air handling and compressor compartments.

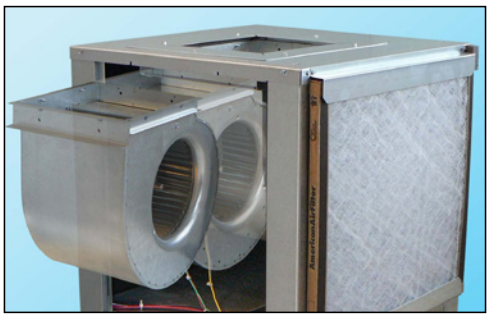
Sound Options

Sound attenuating compressor blankets for unit sizes 024-070 are available. They may be ordered on non sound package units as well.

Slide-Out Fan Motor & Housing

Unit sizes 015-048 provide easy fan and motor removal by sliding the fan assembly in or out along mounting rails.

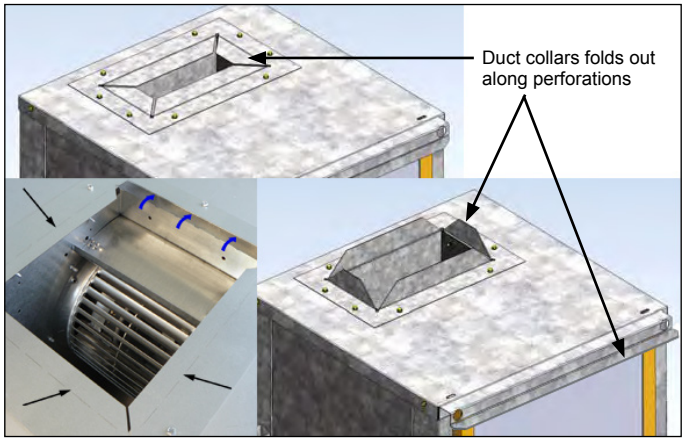
A large panel provides service access to the blower and motor. All blower/motor assemblies have a removable orifice ring on the housing to accommodate motor and blower removal without disconnecting the unit from the ductwork.



Motor and fan assembly removed by sliding out along mounting rails

Discharge & Return Fold Out Duct Collars

The standard unit discharge and return air duct collars are perforated and easily fold out for duct connection. This design helps to prevent damage during shipping and handling.



Stainless Steel Drain Pan

The condensate drain pan is constructed of corrosion-resistant stainless steel. It is tilted from two directions toward the drain end using tapered foam strips on its underside that also help minimize sound transmission between the pan and partition plate. The entire bottom of the drain pan is covered with 1/4" insulated foam that helps reduce sweating. The drain pan includes an electronic condensate overflow protection sensor, more reliable than a mechanical float switch used with many competitor pans.

Fan Motors

Permanent Split Capacitor Motor (PSC)

All units are equipped standard with a 3-speed PSC motor. The motors are permanently lubricated and include thermal overload protection for years of maintenance free service. The motor is factory wired to maximize performance and efficiency. The motor is isolated from the fan housing using rubber isolators to minimize vibration transmission. 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.

EC Constant Torque Fan Motor (Option)

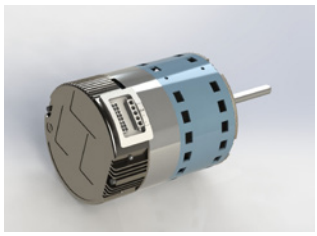
Constant Torque EC Motor Sizes 007-012

Constant Torque EC Motor Sizes 015-070

The optional constant torque EC blower motor offers increased efficiencies. This motor is similar in function to a PSC, but will deliver airflow at higher external static pressures. These motors are available for all sizes 007 to 070. Size 007 through 012 include a field adjustable 4-position fan speed selector switch. Unit sizes 015 through 070 offer five selectable motor speed taps. This EC motor option is an excellent choice for retrofit projects. These motors do not require a neutral wire for 460/3 electrical.

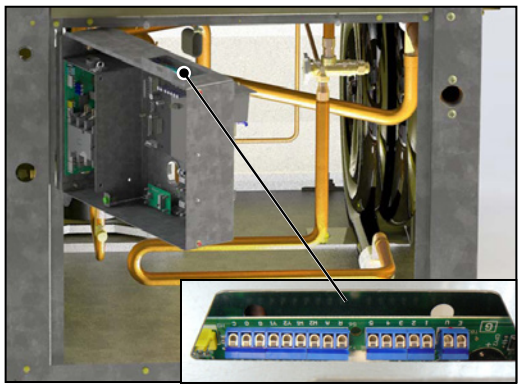
EC Constant CFM Fan Motor (Option)

For unit sizes 015 – 070, the high efficiency EC constant airflow motor option provides constant airflow and economical performance over a wide static pressure range. This motor is an ideal option for high filtration applications, utilizing an optional MERV-13 air filter. One of the many benefits of the EC motor is a soft start/stop feature for quiet operation. The 4-speed fan selector switch allows for quick fan speed adjustment to optimize unit performance.



Swing-Out Control Box

With the simple removal of one screw, the swing out control box can be swung open to allow access to all internal components, or completely removed to allow complete access to all electrical and refrigeration components. Terminal control connections have never been easier to accomplish through the cut out window in the top of the control box.



Non-Fused Disconnect Switch (Option)

Compact 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.

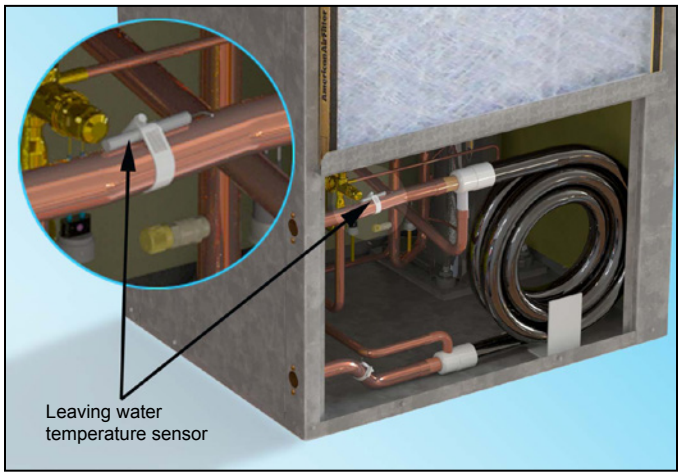
High Efficiency Rotary or Scroll Compressor

Compressors are high efficiency rotary (sizes 007-019) and scroll (sizes 024-070) designed for heat pump duty. Mounted on a dual isolation system for reduced sound and vibration.

Horizontal Rotary | Vertical Rotary | Scroll

Freeze Fault Protection (Option)

This factory installed option adds a leaving water temperature (LWT) sensor to disable compressor operation to protect against coil freeze-up.



2-Way Motorized Water Valve (Option)

The optional, factory-installed or field-installed 2-way valve is used in 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.

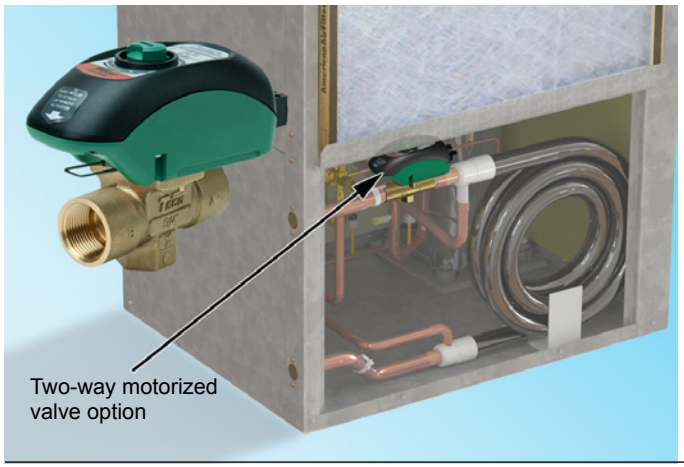


Table 1: Available motorized valves

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

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 for easy installation.

Service Valve Connections

Two service valves are located inside the lower-front access panel – one on the low side and one on the high side of the refrigeration circuit. Easily accessible for routine service.

Air-to-Refrigerant Coil

The air-to-refrigerant heat exchanger has 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 coil is designed for optimal performance in both heating and cooling while maintaining the benefit of a compact size. Coils can be provided with an optional E-coating for extra corrosion protection to meet ASTM B-117 3000 hours salt spray test.

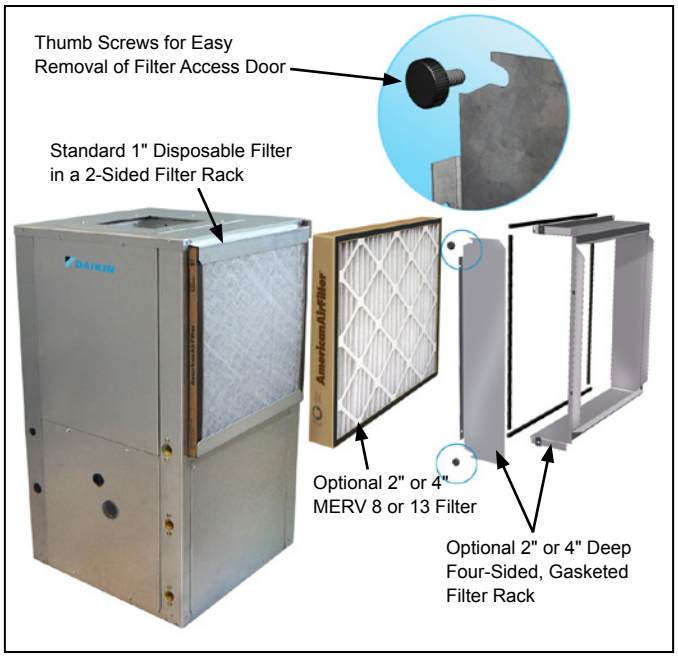
Coax Coil

The water-to-refrigerant heat exchanger is a coaxial coil with a convoluted copper inner tube and a steel outer tube. The convoluted tube has increased heat transfer surface area per unit length for enhanced performance. The coil is rated for 500 psig on the water side and 600 psig on the refrigerant side. An optional a cupro-nickel inner tube is available for applications with lower water quality.

Filters & Filter Racks

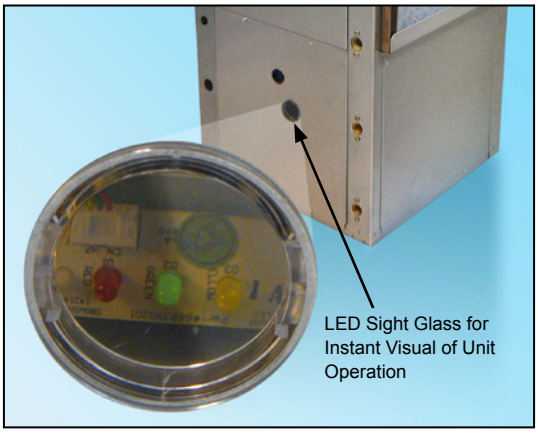
Units come standard with a 1" thick factory-installed disposable filter, mounted in a 2-sided filter rack. The filter rack has perforations that easily fold out to form a return air duct collar. The filter is easily removed from either side.

An optional 2" deep (4-sided, low leak) filter rack is available as a factory-installed selectable option to accept a MERV 8 filter. An optional 4" deep (4-sided, low leak) filter rack accepts a MERV 13 filter. These optional (low leak) racks include gaskets between the filter rack and cabinet that maintain the leakage rate below 4 CFM per square foot of filter area at .5" ESP. The 4-sided filter rack includes a removable access door with thumb screws for easy filter access and changeout without the use of a tool.



LED Sight Glass

The LED status sight glass allows an instant visual of unit operation for quick troubleshooting and advanced-diagnosis without removing the access panel.



Fan Speed Selector Switch

Available on units with EC constant torque motor (sizes 007-012) and EC constant CFM motor (sizes 015-070).

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 2 below and Table 13 on page 28 for a complete list of fan speed selector switch settngs.

Table 2: Single stage unit with constant CFM type EC motor - Fan speed selector switch settings example

Unit Size	Setting	Maximum ESP (in. wg.)[2]	[1]Low CFM Heat	[1]High CFM Heat	[1]Low CFM Cool	[1]High CFM Cool	Fan Only	Dehumidification	Electric Heat
024	Setting 4 (High)	1.0	800	900	800	900	600	600	900
	Setting 3 (Standard)		700	800	700	800	600	600	900
	Setting 2 (Medium)		600	700	600	700	450	600	900
	Setting 1 (Low)		600	600	600	600	450	600	900

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*
[2] *Units are shipped at setting 3 (standard). Fan speed settings may be changed via the 4-position fan speed selector switch located inside the control box.*

Unit Control

MicroTech® III Unit Controller

The MicroTech III controller is a microprocessor-based controller and is provided on every SmartSource GCV unit. The controller monitors the safety devices to protect the unit from unsafe operating conditions, controls the reversing valve, compressor and fan operation for efficient unit operation. This controller also protects against freezing of the water to refrigerant and air to refrigerant heat exchanger as well as condensate overflow.

Safety Controls included as standard:

- High pressure switch located in the refrigerant discharge line.
- Low pressure switch located in the refrigerant suction line for loss of refrigerant charge protection.
- Low suction temperature sensor located in the compressor suction line to protect against coil freeze-up.
- Condensate overflow protection sensor is factory mounted in the drain pan of the unit.

The controller is accessible within the electrical control box through the bottom-front access panel.

For additional information on the MicroTech III controller, see OM 1149.

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

Status LED annunciator lights are located on the interior of the unit, easily viewable through the sight glass to quickly check the operating status of the unit. The I/O Expansion Module has an independent LED annunciator to identify operational fault conditions.

By adding a communication module, LonWorks or BACnet, network Building Automation System (BAS) integration is possible.

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

- MicroTech III SmartSource unit controller (Standalone)
- MicroTech III SmartSource unit controller with LonWorks® communication module
- MicroTech III SmartSource unit controller with BACnet® communication module

Controls Integration

For protocol information including, integration points list for LonWorks and BACnet networks, Refer to ED 15103

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.

For installation details of the field-installed kit, "MicroTech III Water Source Heat Pump LonWorks Communication Module", refer to IM 927.

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 MicroTech III SmartSource unit controller with communication module includes a factory installed leaving water temperature sensor, field installed discharge air and return air temperature sensor. A Daikin wall-mounted temperature sensor may be used in place of the factory provided return air temperature sensor.

MicroTech III SmartSource Controller with BACnet® Communication Module

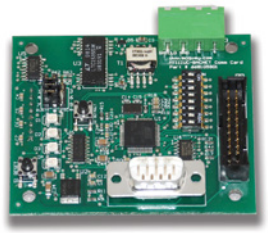
Daikin water source heat pumps are available with a BACnet MS/TP communication module that is designed to communicate over a BACnet MS/TP communications network to a building automation system (BAS). It can be factory or field-installed.

For installation details of the field-installed kit, "MicroTech III Water Source Heat Pump LonWorks Communication Module", refer to IM 928.

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



The MicroTech III SmartSource unit controller with communication module includes a factory installed leaving water temperature sensor, field installed discharge air and return air temperature sensor. A Daikin wall-mounted temperature sensor may be used in place of the factory provided return air temperature sensor.

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

Daikin offers 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 2: 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.

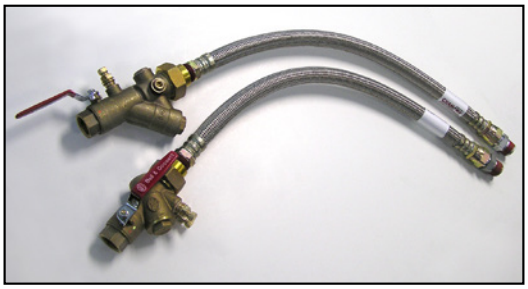
Standard supply and return fire-rated hoses have either a thermoplastic rubber or synthetic polymer core with a braided covering of stainless steel. Fittings are either plated steel or brass.

Table 3: 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"

Supply and Return Hose Kits

Figure 3: 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.

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 4: Shutoff ball valve with memory stop

Wall-Mounted Thermostats for MicroTech III Unit Controller – Standalone Operation

Programmable Touch Screen for Smart Dehumidification or Waterside Economizer Control

Note: *Refer to IOM 1178-x Install & Opertation Manual for details*

With advanced capabilities to control Smart Dehumidification or the Waterside Economizer, the Programmable Touch Screen thermostat offers precise temperature and humidity sensing and control. When combined with a multiple-stage heat pump and electric heat control this thermostat provides the ultimate in thermostatic control with a +/- 1°F accuracy. It's large, 12-square-inch blue backlight display is easy to see and easy to program in low light conditions. Enhanced Smart Dehumidification fan speed control combined with compressor control allows for maximum dehumidification capability. An exclusive Cool Saving feature saves energy during peak cooling demand periods. Remote indoor or outdoor temperature sensing is also available with the accessory remote sensors.

Remote Sensors for the Programmable Touch Screen

Outdoor Sensor

Indoor Sensor

Remote indoor temperature sensor provides the ability to measure room temperature remote from the thermostat location. The remote outdoor temperature sensor provides the ability to display the outdoor temperature at the thermostat.

Programmable and Non-Programmable Thermostats, 2 Stage Heat/2 Stage Cool

Note: *Refer to 910121748 and 910121746 Install Manuals for details*

Programmable

Non-Programmable

For 2-stage heating, 2-stage cooling, both the Programmable and Non-Programmable thermostats provide simple control capabilities. With alarm fault clearing, a timed override button and unit status LED, these thermostats provide an easy interface to the MicroTech III unit controls for both automatic and manual changeover capabilities. Each can be connected to the accessory remote temperature sensor.

Remote Room Sensor used with the Programmable and Non-Programmable Thermostats

The remote indoor temperature sensor provides the ability to measure room temperature remotely, from the thermostat location.

Room Temperature Sensors for MicroTech III Unit Controller – Building Automated System (BAS) Operation

A MicroTech III Water Source Heat Pump Room Temperature Sensor is required when connecting a Compact GCV unit to a Building Automation System (BAS) using either the LONWORKS or BACnet Communication Module. All MicroTech III water source heat pump room temperature sensors provide electronic sensing of the room temperature for single or multiple-stage cooling and heating control, unit status annunciation, timed tenant override, and fault clearing capabilities.

Digitally Adjustable Display Sensor

Note: *Refer to IM 1171-x for details*

The display sensor is used in conjunction with MicroTech III equipped units. This digitally adjustable sensor displays room temperature, room humidity, fan speed (AUTO/ON), system mode (HEAT/COOL/AUTO/OFF/DHUM), ALARM, Override and occupancy.

De-humidification output contact has an adjustable setpoint and configurable deadband.

This output operates automatically using the RH setpoint and deadband in the system “AUTO” mode or in the “DHUM” mode.

Digitally Adjustable Display Sensor

Note: *Refer to IM 1237 for details*

The display sensor is used in conjunction with MicroTech III equipped units. The sensor has a digital display for temperature, occupancy, alarm, setpoint and status indication. Controls include four buttons for setpoint, occupied/unoccupied request, and override reset.

Basic Room Sensor With Cool to Warm

Note: *Refer to IM 1238 for details*

The basic room sensor with adjustment (cool to warm) is used in conjunction with MicroTech III equipped units. The sensor has an output for temperature, and LED status indication and includes an override reset button.

Basic Room Sensor

Note: *Refer to IM 1238 for details*

The basic room sensor is used in con junction with MicroTech III equipped units. The sensor has an output for temperature, and LED status indication and includes an override reset button.

Adjustable Cool/Warm Sensor with Occupancy Switch

The Adjustable Cool/Warm Sensor with Occupancy Switch can be used for 2-stage heating, 2-stage cooling. Unit status is provided through a flashing LED located on the sensor while timed tenant override and fault reset are provided through the override button.

Changing the system mode, fan mode and occupancy is easily accomplished through the slider switches.

Adjustable 55° to 95°F or +/-3°F Sensors

Adjustable 55º to 95ºF Sensor

+/-3°F Sensor

The adjustable 55° to 95°F or +/-3°F sensors can be used for 2-stage heating, 2-stage cooling. Unit status is provided through a flashing LED located on the sensor while timed tenant override and fault reset are provided through the override button. Changing the system or fan mode is easily accomplished through the slider switches.

Basic Sensor

The basic sensor provides simple room temperature sensing for 2-stage heating, 2-stage cooling applications. Unit status is provided through a flashing LED located on the sensor while timed tenant override and fault reset are provided through the override button.

⚠ CAUTION

When an optional wall-mounted room temperature sensor is connected to the unit controller, the Return Air Temperature (RAT) sensor MUST NOT be installed. A wall-mounted room temperature sensor and the return air temperature sensor must not be connected simultaneously or the unit will not operate properly.

Table 4: Thermostats & remote room sensors for standalone operation

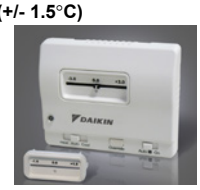
Thermostats & Remote Sensors Used with Compact GCV Units –Standalone Operation		**Thermostats**			**Remote Room Sensor**		
		Programmable Touch-screen	**Non-Programmable**	**Programmable**		**Remote Room Sensor**	**Outdoor Air Sensor**
					Used with Thermostats 668811201, 668811301, 910121746 & 910121748	Used with Thermostat 910121750	Used with Thermostat 910121750
		Part No. 910121750	**Part No.** 910121746	**Part No.** 910121748	**Part No.** 667720401	**Part No.** 910129095	**Part No.** 910129096
Feature							
Display	Room Temperature & Setpoint	●	●	●			
	Room Humidity & Setpoint	●					
Changeover	Manual	●	●	●			
	Automatic	●	●	●			
Stages	Heating	4	2	2			
	Cooling	3	2	2			
Operating Modes	System	Cool-Off-Heat-Emergency-Auto	Cool-Off-Heat-Auto	Cool-Off-Heat-Auto			
	Fan	On-Auto	On-Auto	On-Auto			
Annunciation	Status LED 5VDC		●	●			
	Alarm Fault LED 24 VAC	●	●	●			
	Service & Alarm Display LCD	●					
Reset	Alarm	●	●	●			
	Override	●	●	●			
Remote Sensors	Indoor	●	●	●			
	Outdoor	●					
Application							
Dehumidification	Smart Dehumidification	●✓					
	Simplified	●					
	Humidistat Controlled	●					
	Dehumidification Only	●					
Electric Heat	Boilerless	●	●	●			
	Supplemental	●	●	●			
	Primary	●	●	●			
	Emergency	●	●	●			
Waterside Economizer	–	●✓					
Hydronic Heat	–	●	●	●			

●✓ *= Used with either Smart Dehumidification or Waterside Economizer*

Table 5: Room temperature sensors for BAS operation

Sensors used with Compact GCV Units – Building Automated System (BAS) Operation		Room Temperature Sensors			
		Digitally Adjustable	**Digitally Adjustable Display Sensor**	**Basic Room Sensor With Cool to Warm Adjust**	**Basic Room Sensor**
		With Temperature & Humidity Display for Smart Dehumidification or Waterside Economizer Operation	With Temperature Display, Indicates, ALARM, Override and Occupancy.	Senses Temperature, With Temperature Adjust Cool to Warm, LED Status Indication, Override Reset Button	Senses Temperature, LED Status Indication, Override Reset Button
		Part No. 910121754	**Part No.** 910152147	**Part No.** 910171464	**Part No.** 910152149
Feature					
Setpoint Adjustment		Digitally Adjustable	Digitally Adjustable	Cool to Warm	None
Display	Room Temperature & Setpoint	●	●		
	Room Humidity & Setpoint	●			
Stages	Heating	4	4	4	4
	Cooling	3	3	3	3
Operating Modes	System	Heat-Cool-Auto-Off-Dehum			
	Fan	Auto-On			
	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		●			
Electric Heat	Boilerless	●	●	●	●
	Supplemental	●	●	●	●
	Primary	●	●	●	●
Waterside Economizer	–	●	●	●	●
Hydronic Heat	–	●	●	●	●

Table 6: Room temperature sensors for BAS operation

Sensors used with Compact GCV Units – Building Automated System (BAS) Operation		Room Temperature Sensors			
		Adjustable Cool/Warm with Occupancy Switch	**Adjustable 55˚F to 95˚F**	**Adjustable +/- 3ºF (+/- 1.5˚C)** 	**Basic Sensor**
		Part No. 910121753	**Part No.** 669529101	**Part No.** 669529201	**Part No.** 669529001
Feature					
Setpoint Adjustment		Cool to Warm	55ºF to 95ºF (13º to 35ºC)	-3º to +3ºF (-1.5º to +1.5ºC	None
Display	Room Temperature & Setpoint				
	Room Humidity & Setpoint				
Stages	Heating	4	4	4	4
	Cooling	3	3	3	3
Operating Modes	System	Cool-Auto-Heat	Cool-Auto-Heat	Cool-Auto-Heat	
	Fan	Auto-On	Auto-On	Auto-On	
	Occupancy	Occ-Unoc-Off			
Annunciation	Status LED	●	●	●	●
	LCD Alarm Display				
Reset	Alarm	●	●	●	●
	Setback Override	●	●	●	●
Application					
Dehumidification					
Waterside Economizer	–	●	●	●	●
Electric Heat	Boilerless	●	●	●	●
	Supplemental	●	●	●	●
	Primary	●	●	●	●
Hydronic Heat	–	●	●	●	●

Standard Unit Typical Installation

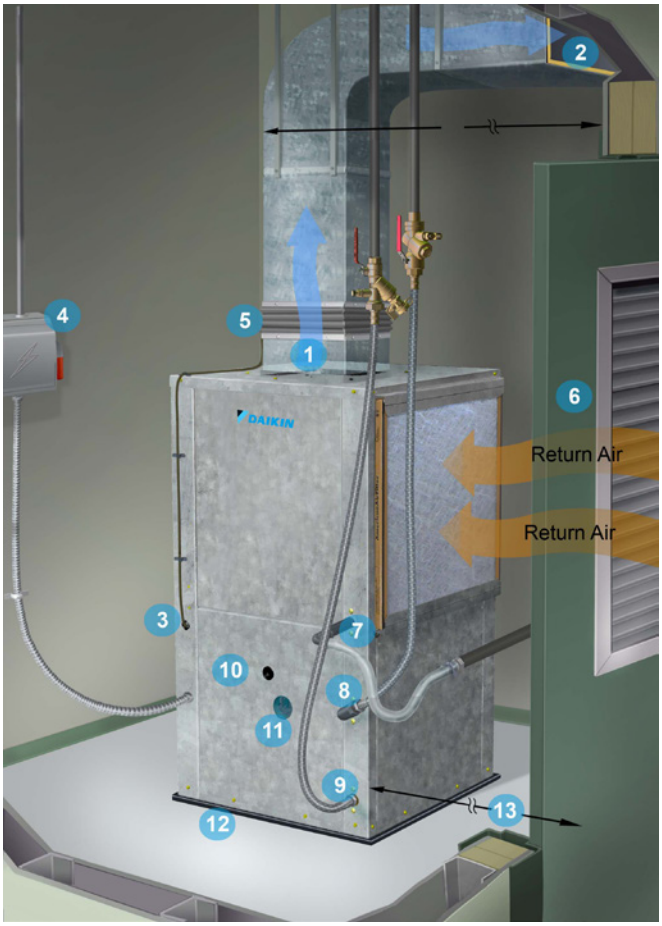
Installation & Location

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-degrees to the door and the major access panels facing the door as shown in Figure 5. Alternatively, the unit can have a ducted return air with the opening facing the door and the major access panels facing 90-degrees to the door.

Locate a vertical unit to allow for easy removal of the filter and access panels. Allow a minimum of 24" (610 mm) clearance on the front 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.

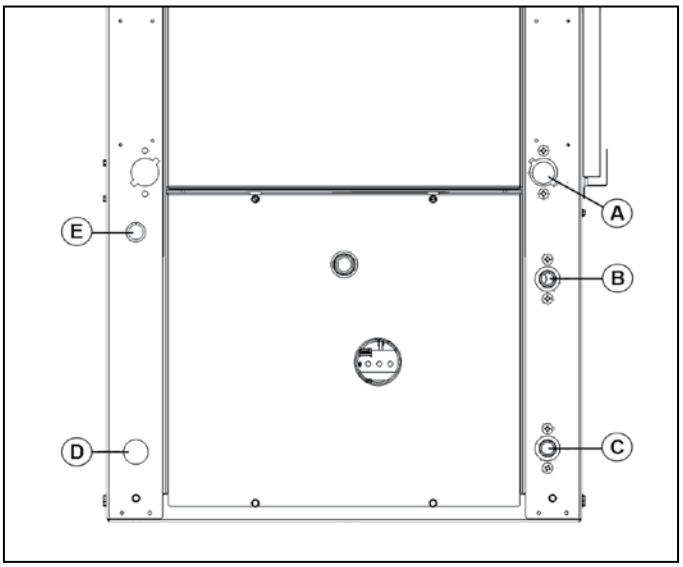
To reduce noise emissions, install a field-provided isolator pad beneath the entire base of the vertical unit. The pad should be equal to the overall foot-print size of the unit to provide sound dampening of the unit while in operation.

Figure 5: 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 with trap
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 sight glass to view 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 6: Vertical unit wiring & piping locations



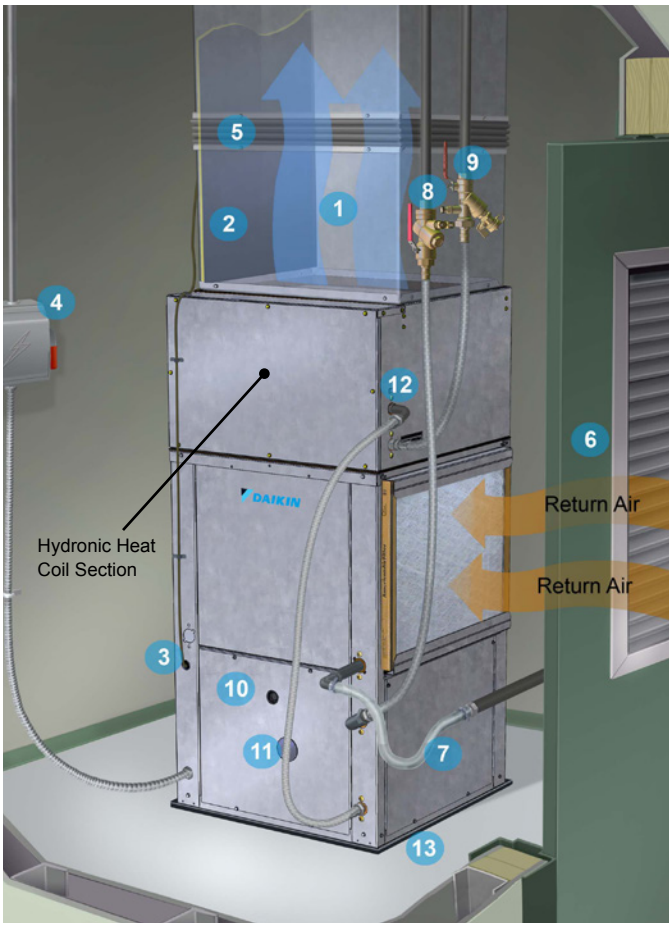
A- Condensate (right-hand unit shown)
B- Water return
C- Water supply
D- Line voltage unit power (right-hand unit shown)
E- Low voltage control Wiring (electric entrance)

Unit With Hydronic Heat Coil Typical Installation

Installation & Location

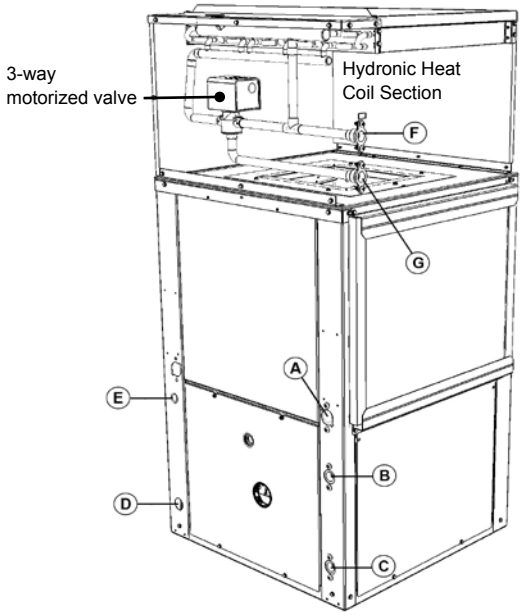
When installing the Compact unit with a hydronic heat section, the same location criteria described for the standard unit application apply. Although hydronic unit piping requires single inlet, outlet and a "jumper" connection as shown in Figure 7

Figure 7: Typical closet installation - with hydronic heat, 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 with trap
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 to hydronic section supply
10. Access to unit control box
11. LED annunciator lights sight glass to view unit operation status and faults
12. Flexible, braided, stainless steel jumper from the hydronic return connection to the unit supply connection
13. Full vibration isolation pad between unit and floor

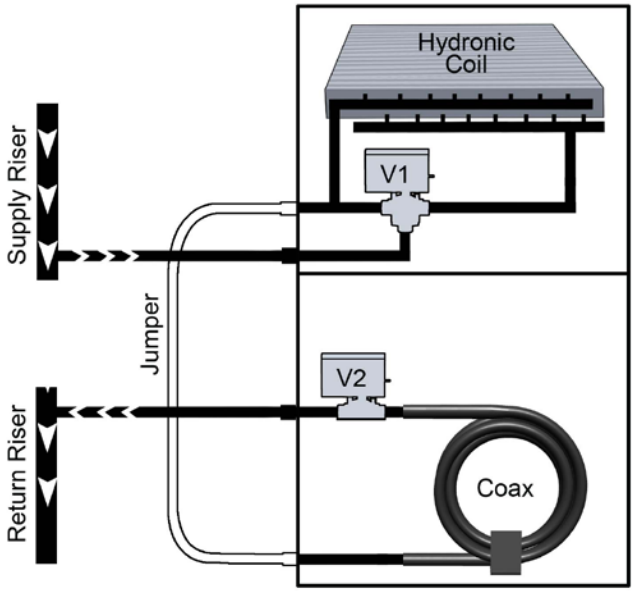
Figure 8: Hydronic heat unit wiring & piping locations



A- Condensate (right-hand shown)
B- Water return
C- Water supply
D- Line voltage - unit power
E- Low voltage - control
F- Hydronic water return
G- Hydronic water supply

Note: *Figure 8 and Figure 9 show a slab type hydronic coil, as on sizes 007 through 019. Unit sizes 024 through 070 hydronic coil is an "A" configuration type.*

Figure 9: Piping schematic



Note: *Two valves allow for cooling and heating, V1, 3-way motorized valve (factory installed) and V2 (factory or field-installed option) 2-way motorized valve (no water flow through the unit when there is no call for heating or cooling).*

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-degree elbow without vanes, and a trunk duct teeing into a branch circuit with discharge diffusers as illustrated in Figure 11.

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.

Figure 10: Typical installation using ducted return

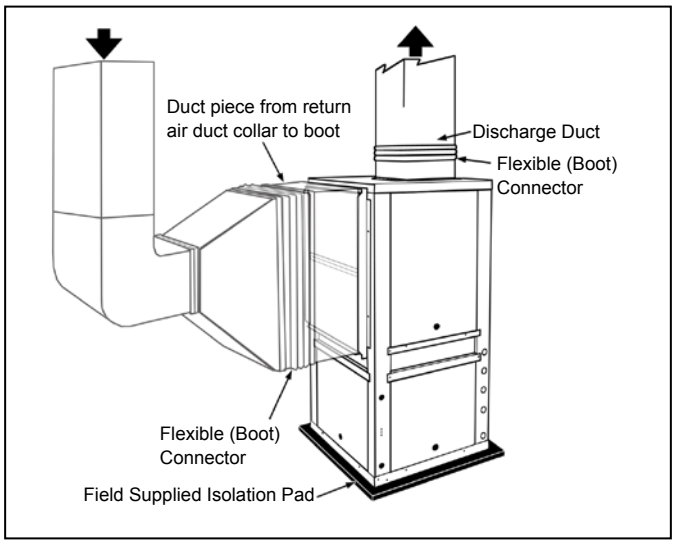
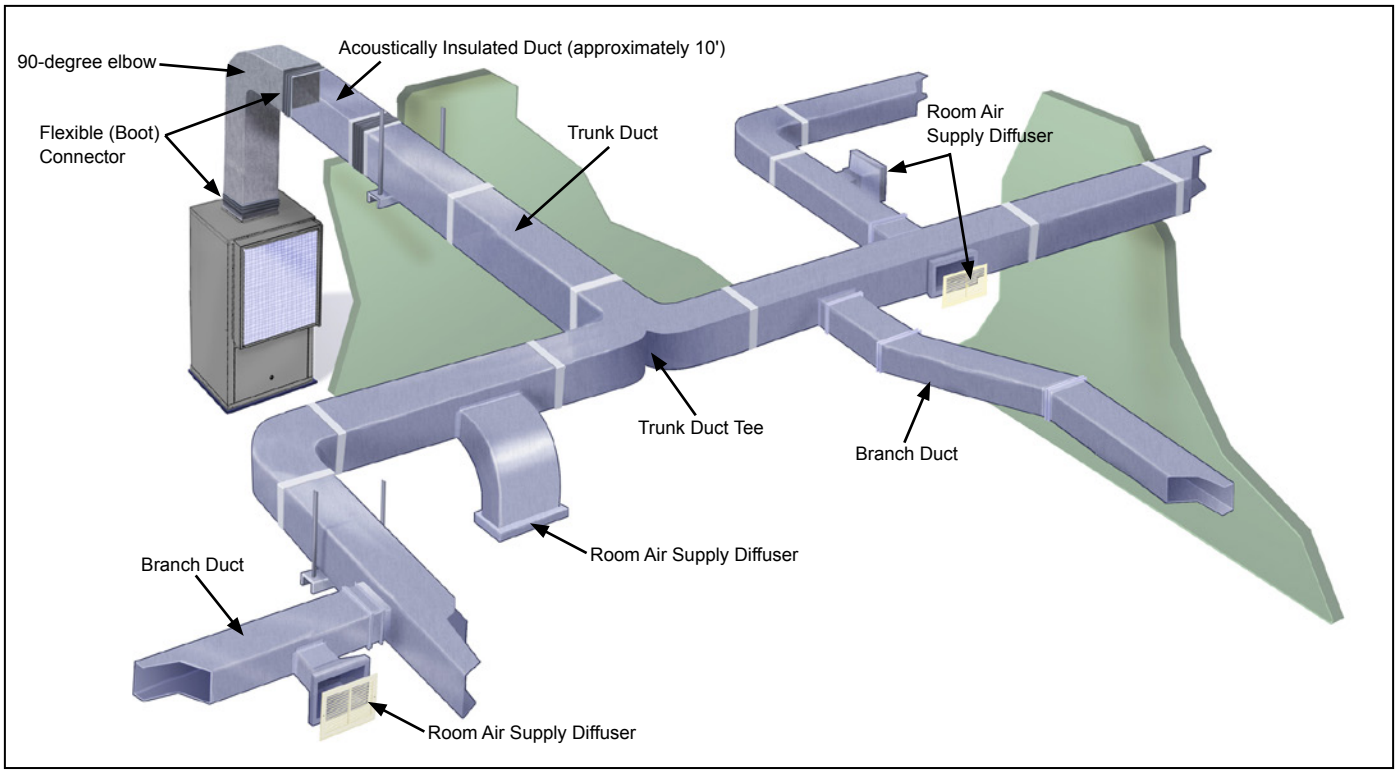


Figure 11: Vertical unit duct example



Piping

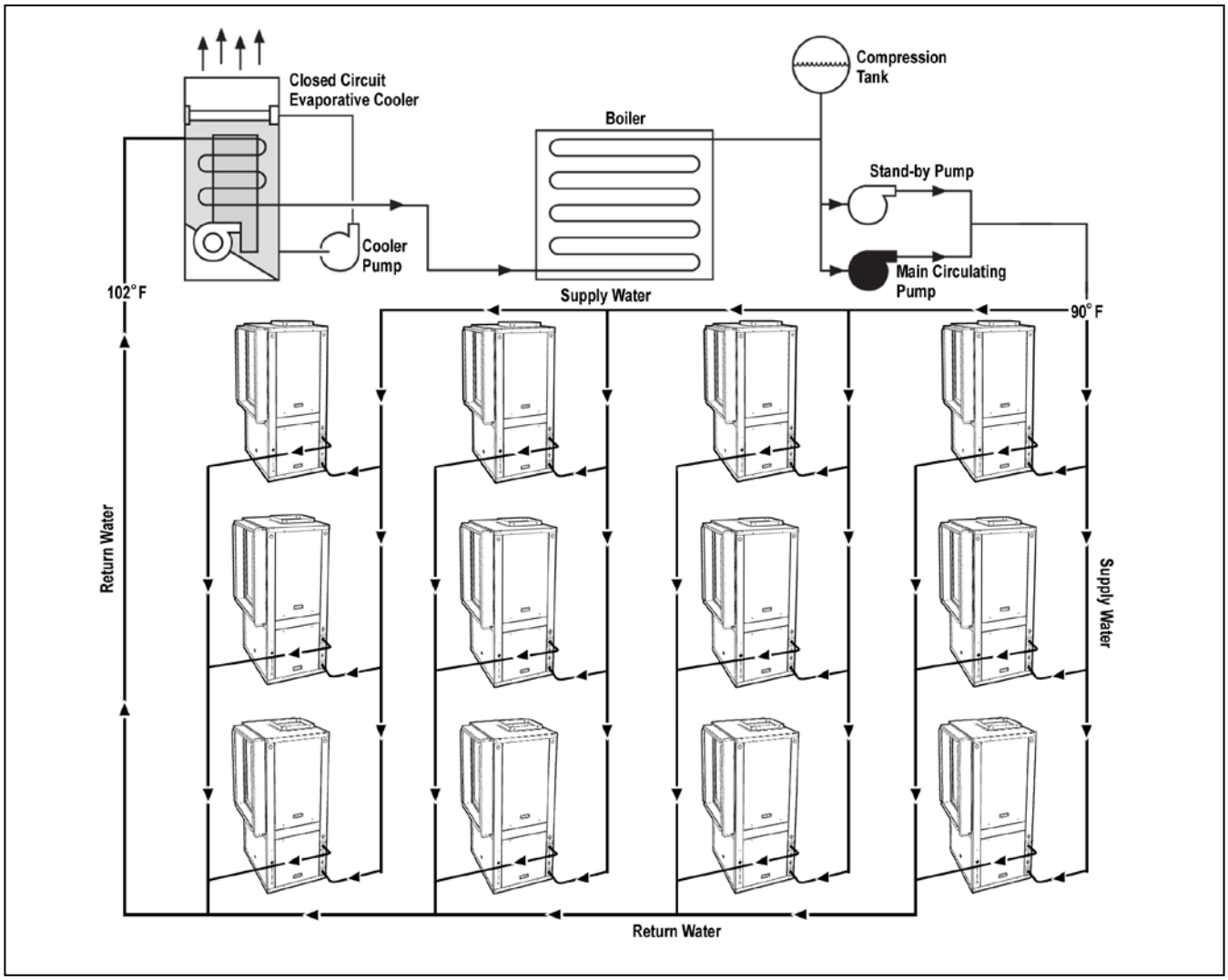
The water source heat pump unit is typically connected to the supply / return piping using a “reverse return” piping system which includes a flow control device so that flow requirements are met for each zone. A short, high pressure “flexible hose” is used to connect the unit to the building’s hard piping 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. For these reasons Daikin Applied does not recommend the use of PVC/CPVC water piping.

Figure 12: 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 7 is a list of water characteristics, the potential impurities and their results and the recommended treatment.

Avoiding Potential Problems

As shown in Table 7, 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 7: Water impurities, result & recommended water system application

Impurity	Copper Coils	Curpro-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			
C_{O2}	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 present, 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 have a 3/4-inch FPT condensate drain connection, flush to the unit. The field installed condensate piping must include a trap after the connection and 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.

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.

Operating Limits

Table 8: Air limits in °F (°C)

Air Limits	Standard Range Units		Geothermal Range 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)

Table 9: Fluid limits

Fluid Limits	Standard Range Units		Geothermal Range Units	
	Cooling	Heating	Cooling	Heating
Minimum Entering Fluid	55°F (13°C)[3]	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	110°F (43°C)	90°F (32°C)	110°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 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.

3 Unit with waterside economizer option can operate in economizer cooling mode down to 40°F (4°C).

Fan Performance for Standard PSC Motor – 208V Operation

Table 10: PSC motor CFM values

Unit Size	Setting	Rated Airflow	External Static Pressure (in-H2O) [Dry Coil and STD Filter) (inches of water column)													
			.05	.10	.20	.30	.40	.45	.50	.60	.70	.80	.90	1.0	1.1	1.2
007	High	250	394	388	374	350	313	291	266	215						
	Medium		331	329	321	302	267	244	220							
	Low		289	287	281	264	231	209	186							
009	High	300	432	424	407	385	351	330	305	246						
	Medium		358	352	342	323	290	269	245							
	Low		317	312	300	278	245	224								
012	High	400	432	424	407	385	351	330	305							
	Medium		358	352	342	323	290									
	Low		317	312	300											
015	High	500	732	736	709	667	625	605	583	521	400					
	Medium		705	673	638	612	573	544	507	413						
	Low		611	599	575	543	498	468	433							
019	High	600	732	736	709	667	625	605	583	521						
	Medium		705	673	638	612	573	544	507							
	Low		611	599	575	543	498	468	433							
024	High	800	931	940	945	934	906	887	863	802	726	632				
	Medium		789	797	802	796	777	763	747	704	650	584				
	Low		695	706	717	714	696	682	664	618						
030	High	1000	1289	1270	1211	1147	1093	1069	1045	984	872					
	Medium		1194	1185	1140	1086	1037	1014	991	932	826					
	Low		1089	1079	1049	1016	980	960	936	869	755					
036	High	1200	1369	1359	1331	1292	1240	1209	1173	1088	980	843				
	Medium		1224	1221	1210	1187	1151	1126	1097	1023	924					
	Low		1078	1083	1084	1073	1049	1031	1009	949	859					
042	High	1400	1698	1695	1688	1679	1663	1652	1639	1602	1553	1490	1414	1327	1230	1126
	Medium		1422	1421	1420	1419	1417	1414	1410	1396	1371	1331	1272	1187	1071	
	Low		1179	1191	1205	1211	1213	1212	1209	1201	1185	1154	1103	1021		
048	High	1600	1698	1695	1688	1679	1663	1652	1639	1602	1553	1490	1414	1327	1230	1126
	Medium		1422	1421	1420	1419	1417	1414	1410	1396	1371	1331	1272	1187		
	Low		1179	1191	1205	1211	1213	1212	1209	1201	1185	1154				
060	High	2000	2265	2267	2252	2214	2156	2122	2084	2000	1909	1815	1721	1632	1551	1482
	Medium		1962	1964	1957	1937	1905	1886	1864	1816	1761	1703	1642	1581	1521	1464
	Low		1703	1702	1697	1687	1673	1664	1654	1629	1597	1559	1512	1458		
070	High	2300	2265	2267	2252	2214	2156	2122	2084	2000	1909	1815	1721			
	Medium		1962	1964	1957	1937	1905	1886	1864	1816	1761	1703				
	Low		1703	1702	1697	1687										

Notes: *1. Speed adjustment is done at terminal strip on the motor. Refer to unit schematic.*
2. Gray tinted areas, outside recommended operating range.
3. Refer to schematic supplied with the unit for wiring as supplied by the factory. Wire colors BK = hi, BL = med & RD = low.

Fan Performance For Optional Constant Torque Motor (Sizes 007–012)

Table 11: Constant torque motor CFM values

Unit Size	Setting	Function	External Static Pressure (in-H2O) [Dry Coil and STD Filter) (inches of water column)													
			0	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
007	Setting 4	Stage 2	350	333	322	310	297	283	269	254	239	224				
	Setting 3		316	302	292	280	266	250	234	218						
	Setting 2		277	268	258	246	231	215								
	Setting 1		237	232	223	211										
	Setting 4	Stage 1	316	302	292	280	266	250	234	218						
	Setting 3		277	268	258	246	231	215								
	Setting 2		237	232	223	211										
	Setting 1		237	232	223	211										
	A	Fan Only, Hydronic Heat and WSE	316	302	292	280	266	250	234	218	202	186	170	156	144	134
	B		277	268	258	246	231	215	198	180	163	147	132	119	109	102
	C		237	232	223	211	196	179	162	144	126	110	96	85	77	74
	D*		173	173	166	155	141	126	109	92	76	62	50			
009	Setting 4	Stage 2	398	377	367	356	344	333	321	308	295	282	268	253	238	222
	Setting 3		367	348	337	326	313	300	287	272	258	243	229	214		
	Setting 2		331	316	305	293	279	264	249	233	217					
	Setting 1		292	281	271	259	244	228	212							
	Setting 4	Stage 1	367	348	337	326	313	300	287	272	258	243	229	214		
	Setting 3		331	316	305	293	279	264	249	233	217					
	Setting 2		292	281	271	259	244	228	212							
	Setting 1		292	281	271	259	244	228	212							
	A	Fan Only, Hydronic Heat and WSE	367	348	337	326	313	300	287	272	258	243	229	214	199	184
	B		331	316	305	293	279	264	249	233	217	202	186	172	159	147
	C		292	281	271	259	244	228	212	194	177	161	146	133	122	113
	D*		229	225	216	204	189	173	155	137	120	104	90	79	72	69
012	Setting 4	Stage 2	475	460	452	442	432	421	410	399	389	378	369	360	353	347
	Setting 3		455	435	426	416	406	396	386	375	364	353	342	331	319	307
	Setting 2		430	409	398	388	378	367	356	345	334	322	309	296	281	
	Setting 1		402	381	370	359	348	337	325	313	300	286				
	Setting 4	Stage 1	455	435	426	416	406	396	386	375	364	353	342	331	319	307
	Setting 3		430	409	398	388	378	367	356	345	334	322	309	296	281	
	Setting 2		402	381	370	359	348	337	325	313	300	286				
	Setting 1		402	381	370	359	348	337	325	313	300	286				
	A	Fan Only, Hydronic Heat and WSE	455	435	426	416	406	396	386	375	364	353	342	331	319	307
	B		430	409	398	388	378	367	356	345	334	322	309	296	281	266
	C		402	381	370	359	348	337	325	313	300	286	273	258	243	227
	D*		354	337	326	314	301	288	273	259	244	229	214	199	185	171

Notes: *1. Gray tinted areas, outside recommended operating range.*
2. Units are shipped at setting 3 (standard). Speed adjustment is done by 4-position switch in the control box.
3. 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 stage 2 fan performance.
** Exception - WSE operates at row "C" airflows.*

Note: *See Figure 13 on page 29 for jumper configuration location.*

Fan Performance For Optional Constant Torque EC Motor (Sizes 015–070)

Table 12: Constant torque EC motor CFM values

Unit Size	Setting	Rated Airflow	External Static Pressure (in-H2O) [Dry Coil and STD Filter) (inches of water column)											
			.05	.10	.20	.30	.40	.45	.50	.60	.70	.80	.90	1.0
015	Setting 5 (High)	500	770	757	725	694	668	657	644	606	531	383		
	Setting 4 (High)		645	633	602	567	533	516	499	459	402			
	Setting 3 (Standard)		598	585	548	505	463	444	425	389				
	Setting 2 (Medium)		554	542	510	470	428	406	385					
	Setting 1 (Low)		530	513	473	428	384	363						
019	Setting 5 (High)	600	800	787	760	730	698	681	663	627	591	557	528	508
	Setting 4 (High)		749	737	709	676	643	625	607	569	526	474		
	Setting 3 (Standard)		700	686	653	619	585	568	551	507	442			
	Setting 2 (Medium)		662	646	616	583	544	522	497	446				
	Setting 1 (Low)		613	589	555	520	475	449	421					
024	Setting 5 (High)	800	1208	1201	1170	1130	1090	1068	1044	978	867	676		
	Setting 4 (High)		940	930	903	873	847	836	824	798	755	675		
	Setting 3 (Standard)		902	891	864	836	811	800	789	764	724	654		
	Setting 2 (Medium)		868	860	825	787	760	751	745	731	691	588		
	Setting 1 (Low)		832	823	786	746	715	705	697	680	644			
030	Setting 5 (High)	1000	1182	1164	1137	1113	1078	1054	1024	946	842	716		
	Setting 4 (High)		1139	1121	1095	1073	1047	1029	1006	939	836			
	Setting 3 (Standard)		1084	1075	1050	1025	1001	986	969	914	814			
	Setting 2 (Medium)		1038	1028	1003	978	955	943	929	884	797			
	Setting 1 (Low)		998	984	956	930	905	893	880	844	787			
036	Setting 5 (High)	1200	1493	1485	1445	1390	1332	1302	1270	1197	1091	921		
	Setting 4 (High)		1413	1404	1377	1340	1296	1270	1241	1168	1068	927		
	Setting 3 (Standard)		1332	1322	1299	1274	1247	1230	1210	1153	1061	916		
	Setting 2 (Medium)		1263	1252	1223	1195	1172	1161	1148	1112	1043	912		
	Setting 1 (Low)		1215	1203	1176	1149	1127	1117	1105	1072	1011	897		
042	Setting 5 (High)	1400	1585	1572	1541	1507	1476	1461	1446	1417	1385	1343	1285	1200
	Setting 4 (High)		1560	1548	1517	1484	1451	1436	1421	1391	1360	1320	1265	1184
	Setting 3 (Standard)		1533	1520	1490	1458	1427	1412	1398	1368	1337	1297	1244	1168
	Setting 2 (Medium)		1467	1453	1423	1392	1361	1346	1331	1301	1270	1234	1192	1137
	Setting 1 (Low)		1409	1395	1366	1335	1304	1289	1273	1240	1206	1170	1133	1094
048	Setting 5 (High)	1600	1789	1781	1758	1730	1704	1692	1682	1664	1647	1625	1588	1524
	Setting 4 (High)		1730	1719	1696	1672	1650	1639	1628	1608	1586	1561	1529	1487
	Setting 3 (Standard)		1699	1694	1673	1645	1614	1599	1585	1560	1537	1515	1490	1455
	Setting 2 (Medium)		1637	1625	1604	1586	1568	1559	1548	1526	1501	1474	1447	1423
	Setting 1 (Low)		1610	1600	1578	1556	1533	1522	1510	1487	1462	1437	1411	1383
060	Setting 5 (High)	2000	2329	2313	2274	2234	2197	2180	2165	2136	2105	2062	1994	1884
	Setting 4 (High)		2252	2235	2195	2153	2115	2097	2081	2050	2018	1975	1911	1809
	Setting 3 (Standard)		2179	2162	2123	2083	2045	2028	2012	1981	1948	1904	1838	1734
	Setting 2 (Medium)		2102	2084	2047	2011	1977	1960	1944	1910	1871	1825	1766	1686
	Setting 1 (Low)		2014	1995	1959	1925	1891	1873	1854	1814	1769	1720	1668	1612
070	Setting 5 (High)	2300	2432	2413	2370	2325	2282	2262	2244	2210	2180	2147	2108	2053
	Setting 4 (High)		2407	2388	2346	2301	2259	2239	2221	2187	2156	2124	2087	2037
	Setting 3 (Standard)		2381	2361	2318	2276	2237	2219	2202	2170	2138	2105	2065	2013
	Setting 2 (Medium)		2348	2327	2285	2244	2205	2187	2169	2135	2102	2068	2029	1980
	Setting 1 (Low)		2303	2281	2240	2200	2163	2145	2127	2092	2057	2021	1981	1937

Notes: *1. Gray tinted areas, outside recommended operating range.*
2. Units are shipped at setting 3 (standard), setting 5 (high) for unit size 070. Speed adjustment is done at motor terminal strip
3. Motor speed adjustments can be made by moving wire to appropriate motor tap 1-5.

Fan Performance For Optional Constant CFM EC Motor (Sizes 015–070)

Table 13: Single stage units with constant CFM 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	Dehumid-ification	Electric Heat	Setting	Fan Only	Hydronic Heat	Water-side Econo-mizer
015	4 (High)	0.7	500	560	500	560	470	560	A	500	500	500
	3 (Standard)		440	500	440	500	400	560	B	440	440	440
	2 (Medium)		375	440	375	440	375	560	C	375	375	375
	1 (Low)		375	375	375	375	375	560	D	280	280	375
019	4 (High)	0.7	600	675	600	675	560	675	A	600	600	600
	3 (Standard)		525	600	525	600	490	675	B	525	525	525
	2 (Medium)		450	525	450	525	450	675	C	450	450	450
	1 (Low)		450	450	450	450	450	675	D	340	340	450
024	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
030	4 (High)	0.7	1000	1125	1000	1125	940	1125	A	1000	1000	1000
	3 (Standard)		875	1000	875	1000	820	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	570	570	750
036	4 (High)	0.7	1200	1350	1200	1350	1130	1350	A	1200	1200	1200
	3 (Standard)		1050	1200	1050	1200	975	1350	B	1050	1050	1050
	2 (Medium)		900	1050	900	1050	900	1350	C	900	900	900
	1 (Low)		900	900	900	900	900	1350	D	680	680	900
042	4 (High)	0.7	1400	1575	1400	1575	1310	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	790	790	1050
048	4 (High)	0.7	1640	1850	1640	1850	1530	1850	A	1640	1640	1640
	3 (Standard)		1425	1640	1425	1640	1320	1850	B	1425	1425	1425
	2 (Medium)		1220	1425	1220	1425	1220	1850	C	1220	1220	1220
	1 (Low)		1220	1220	1220	1220	1220	1850	D	900	900	1220
060	4 (High)	0.7	2000	2250	2000	2250	1890	2250	A	2000	2000	2000
	3 (Standard)		1750	2000	1750	2000	1640	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	1140	1140	1500
070	4 (High)	0.7	2050	2300	2050	2300	1920	2400	A	2050	2050	2050
	3 (Standard)		1790	2050	1790	2050	1670	2400	B	1790	1790	1790
	2 (Medium)		1540	1790	1540	1790	1540	2400	C	1540	1540	1540
	1 (Low)		1540	1540	1540	1540	1540	2400	D	1160	1160	1540

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.*

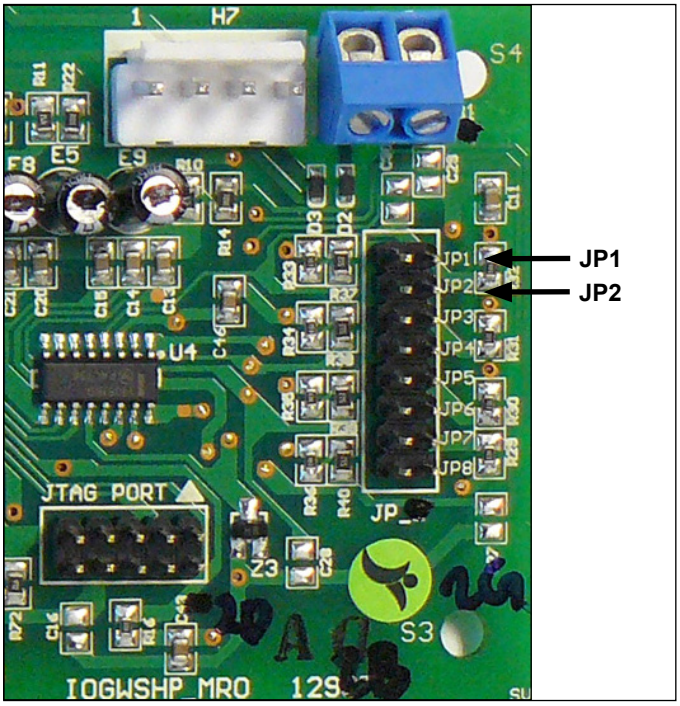
[2] *Applications up to 1.0" ESP (in. wg.) are possible. However, increased fan noise should be anticipated and appropriate noise attenuation should be considered.*

Table 14: I/O expansion module jumper configuration

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

Note: *Refer to Figure 13 for jumper configuration location.*

Figure 13: JP1 & JP2 location on the I/O expansion module



Fan Performance For Optional Constant CFM EC Motor (Sizes 015–070)

Table 15: Fan settings and performance

Unit Size	Setting	Fan Only	Hydronic Heat	Waterside Economizer
015	A	500	500	500
	B	440	440	440
	C	375	375	375
	D	280	280	375
019	A	600	600	600
	B	525	525	525
	C	450	450	450
	D	340	340	450
024	A	800	800	800
	B	700	700	700
	C	600	600	600
	D	450	450	600
030	A	1000	1000	1000
	B	875	875	875
	C	750	750	750
	D	560	560	750
036	A	1250	1250	1250
	B	1090	1090	1090
	C	940	940	940
	D	700	700	940
042	A	1400	1400	1400
	B	1225	1225	1225
	C	1050	1050	1050
	D	785	785	785
048	A	1600	1600	1600
	B	1400	1400	1400
	C	1200	1200	1200
	D	900	900	1200
060	A	2000	2000	2000
	B	1750	1750	1750
	C	1500	1500	1500
	D	1120	1120	1500
070	A	2160	2160	2160
	B	1920	1920	1920
	C	1710	1710	1710
	D	1330	1330	1710

Unit With Standard PSC Motor

Table 16: Unit with standard PSC motor

Unit Size	Power	Compressor		Fan Motor FLA	Total Unit FLA	Minimum Voltage	Minimum Circuit Amps	Maximum Fuse or HACR Breaker Size
	Voltage/Hz/Phase	RLA	LRA					
007	115/60/1	5.0	36.2	1.2	6.2	104	7.5	15
	208-230/60/1	2.5	17.7	0.7	3.2	197	3.8	15
	265/60/1	2.1	13.5	0.4	2.5	240	3.0	15
009	115/60/1	7.0	45.6	1.2	8.2	104	10.0	15
	208-230/60/1	3.4	22.2	0.7	4.1	197	4.9	15
	265/60/1	2.9	18.8	0.4	3.3	240	4.0	15
012	115/60/1	9.6	58.4	1.2	10.8	104	13.2	20
	208-230/60/1	4.6	27.9	0.7	5.3	197	6.4	15
	265/60/1	3.8	22.2	0.6	4.4	240	5.4	15
015	115/60/1	10.5	54.5	1.0	11.5	104	14.1	20
	208-230/60/1	5.1	29.5	1.0	6.1	197	7.4	15
	265/60/1	4.3	23.5	1.0	5.3	240	6.4	15
019	208-230/60/1	6.2	31.5	1.0	7.2	197	8.8	15
	265/60/1	5.3	28.0	1.0	6.3	240	7.6	15
024	208-230/60/1	13.5	58.3	1.3	14.8	197	18.2	30
	265/60/1	9.0	54.0	1.0	10.0	240	12.3	20
	208-230/60/3	7.1	55.4	1.3	8.4	197	10.2	15
	460/60/3	3.5	28.0	0.6	4.1	416	5.0	15
030	208-230/60/1	12.8	64.0	2.7	15.5	197	18.7	30
	265/60/1	10.9	60.0	2.0	12.9	240	15.6	25
	208-230/60/3	8.3	58.0	2.7	11.0	197	13.1	20
	460/60/3	5.1	28.0	1.0	6.1	416	7.4	15
036	208-230/60/1	16.7	79.0	3.1	19.8	197	24.0	40
	265/60/1	13.5	72.0	1.9	15.4	240	18.8	30
	208-230/60/3	10.4	73.0	3.1	13.5	197	16.1	25
	460/60/3	5.8	38.0	1.4	7.2	416	8.7	15
042	208-230/60/1	17.9	112.0	3.3	21.2	197	25.7	40
	208-230/60/3	13.2	88.0	3.3	16.5	197	19.8	30
	460/60/3	6.0	44.0	1.8	7.8	416	9.3	15
048	208-230/60/1	21.8	117.0	3.3	25.1	197	30.6	50
	208-230/60/3	13.7	83.1	3.3	17.0	197	20.4	30
	460/60/3	6.2	41.0	1.8	8.0	416	9.6	15
	575/60/3	4.8	33.0	1.2	6.0	520	7.2	15
060	208-230/60/1	26.3	134.0	5.5	31.8	197	38.4	60
	208-230/60/3	15.6	110.0	5.5	21.1	197	25.0	40
	460/60/3	7.8	52.0	2.4	10.2	416	12.2	15
	575/60/3	5.8	38.9	1.7	7.5	520	9.0	15
070	208-230/60/1	30.8	178.0	5.5	36.3	197	44.0	70
	208-230/60/3	19.6	136.0	5.5	25.1	197	30.0	40
	460/60/3	8.2	66.1	2.4	10.6	416	12.7	20
	575/60/3	6.6	55.3	1.7	8.3	520	10.0	15

Unit With Optional EC Constant Torque Motor

Table 17: Unit with optional EC constant torque motor

Unit Size	Power	Compressor		Fan Motor FLA	Total Unit FLA	Minimum Voltage	Minimum Circuit Amps	Maximum Fuse or HACR Breaker Size
	Voltage/Hz/Phase	RLA	LRA					
007	115/60/1	5.0	36.2	1.8	6.8	104	8.0	15
	208-230/60/1	2.5	17.7	0.9	3.4	197	4.1	15
	265/60/1	2.1	13.5	0.8	2.9	240	3.4	15
009	115/60/1	7.0	45.6	1.8	8.8	104	10.5	15
	208-230/60/1	3.4	22.2	0.9	4.3	197	5.2	15
	265/60/1	2.9	18.8	0.8	3.7	240	4.4	15
012	115/60/1	9.6	58.4	1.8	11.4	104	13.8	20
	208-230/60/1	4.6	27.9	0.9	5.5	197	6.7	15
	265/60/1	3.8	22.2	0.8	4.6	240	5.5	15
015	115/60/1	10.5	54.5	4.8	15.3	104	17.9	25
	208-230/60/1	5.1	29.5	2.9	8.0	197	9.3	15
	265/60/1	4.3	23.5	2.6	6.9	240	8.0	15
019	208-230/60/1	6.2	31.5	2.9	9.1	197	10.7	15
	265/60/1	5.3	28.0	2.6	7.9	240	9.2	15
024	208-230/60/1	13.5	58.3	2.9	16.4	197	19.8	30
	265/60/1	9.0	54.0	2.6	11.6	240	13.9	20
	208-230/60/3	7.1	55.4	2.9	10.0	197	11.8	15
	460/60/3	3.5	28.0	2.1	5.6	416	6.5	15
030	208-230/60/1	12.8	64.0	2.9	15.7	197	18.9	30
	265/60/1	10.9	60.0	2.6	13.5	240	16.2	25
	208-230/60/3	8.3	58.0	2.9	11.2	197	13.3	20
	460/60/3	5.1	28.0	2.1	7.2	416	8.5	15
036	208-230/60/1	16.7	79.0	4.1	20.8	197	25.0	40
	265/60/1	13.5	72.0	3.6	17.1	240	20.5	30
	208-230/60/3	10.4	73.0	4.1	14.5	197	17.1	25
	460/60/3	5.8	38.0	2.1	7.9	416	9.4	15
042	208-230/60/1	17.9	112.0	4.1	22.0	197	26.5	40
	208-230/60/3	13.2	88.0	4.1	17.3	197	20.6	30
	460/60/3	6.0	44.0	2.1	8.1	416	9.6	15
048	208-230/60/1	21.8	117.0	6.0	27.8	197	33.3	50
	208-230/60/3	13.7	83.1	6.0	19.7	197	23.1	35
	460/60/3	6.2	41.0	3.2	9.4	416	11.0	15
060	208-230/60/1	26.3	134.0	7.6	33.9	197	40.5	60
	208-230/60/3	15.6	110.0	7.6	23.2	197	27.1	40
	460/60/3	7.8	52.0	4.0	11.8	416	13.8	20
070	208-230/60/1	30.8	178.0	7.6	38.4	197	46.1	70
	208-230/60/3	19.6	136.0	7.6	27.2	197	32.1	50
	460/60/3	8.2	66.1	4.0	12.2	416	14.3	20

Unit With Optional EC Constant CFM Motor

Table 18: Unit with optional EC constant CFM motor

Unit Size	Power	Compressor		Fan Motor FLA	Total Unit FLA	Minimum Voltage	Minimum Circuit Amps	Maximum Fuse or HACR Breaker Size
	Voltage/Hz/Phase	RLA	LRA					
015	115/60/1	10.5	54.5	5.0	15.5	104	18.1	25
	208-230/60/1	5.1	29.5	3.0	8.1	197	9.4	15
	265/60/1	4.3	23.5	2.6	6.9	240	8.0	15
019	208-230/60/1	6.2	31.5	3.0	9.2	197	10.8	15
	265/60/1	5.3	28.0	2.6	7.9	240	9.2	15
024	208-230/60/1	13.5	58.3	3.0	16.5	197	19.9	30
	265/60/1	9.0	54.0	2.6	11.6	240	13.9	20
	208-230/60/3	7.1	55.4	3.0	10.1	197	11.9	15
	*460/60/3	3.5	28.0	2.6	6.1	416	7.0	15
030	208-230/60/1	12.8	64.0	3.0	15.8	197	19.0	30
	265/60/1	10.9	60.0	2.6	13.5	240	16.2	25
	208-230/60/3	8.3	58.0	3.0	11.3	197	13.4	20
	*460/60/3	5.1	28.0	2.6	7.7	416	9.0	15
036	208-230/60/1	16.7	79.0	5.0	21.7	197	25.9	40
	265/60/1	13.5	72.0	4.1	17.6	240	21.0	30
	208-230/60/3	10.4	73.0	5.0	15.4	197	18.0	25
	*460/60/3	5.8	38.0	4.1	9.9	416	11.4	15
042	208-230/60/1	17.9	112.0	7.3	25.2	197	29.7	45
	208-230/60/3	13.2	88.0	7.3	20.5	197	23.8	35
	*460/60/3	6.0	44.0	5.5	11.5	416	13.0	15
048	208-230/60/1	21.8	117.0	7.3	29.1	197	34.6	50
	208-230/60/3	13.7	83.1	7.3	21.0	197	24.4	35
	*460/60/3	6.2	41.0	5.5	11.7	416	13.3	15
060	208-230/60/1	26.3	134.0	9.4	35.7	197	42.3	60
	208-230/60/3	15.6	110.0	9.4	25.0	197	28.9	40
	*460/60/3	7.8	52.0	6.9	14.7	416	16.7	20
070	208-230/60/1	30.8	178.0	9.4	40.2	197	47.9	70
	208-230/60/3	19.6	136.0	9.4	29.0	197	33.9	50
	*460/60/3	8.2	66.1	6.9	15.1	416	17.2	25

Notes: **All 460/60/3 units require 4-wire power which includes a neutral wire providing 265 volts to the fan motor.*

GCV Units

Table 19: Unit sizes 007 through 030

Description	Unit Size						
	007	009	012	015	019	024	030
Compressor Type	Rotary					Scroll	
Refrigeration Charge (Oz.)	19		18	28	29	32	39
Fan Wheel (D x W)	6" x 8"			9" x 7"			
PSC Fan Motor HP	1/10			1/6		1/4	1/3
EC Constant Torque Motor HP	1/10			1/3		1/3	
EC Constant CFM Motor HP	N/A			1/3		1/3 (1/2 for 460V)	
Water Connection Size (FPT)	1/2"					3/4"	
Coax Volume (Gal. @ 70ºF)	0.07		0.09	0.11	0.12		0.22
Condensate Connection Size (FPT)	3/4						
Air Coil Face Area (Sq. Ft.)	1.17			1.83		2.29	
Filter Size (inches)	12" x 16" x 1"			16" x 20" x 1"		20" x 20" x 1"	
Operating Weight (Lbs.)	99	99	105	142	146	169	174
Shipping Weight (Lbs.)	127	127	133	170	174	197	202
Overall Cabinet Dimensions (W x D x H)	19 x 19 x 24			21.5 x 21.5 x 32		21.5 x 21.5 x 39	
Packaging + Pallet Weight (Lbs.)	28.47						
Waterside Economizer Section (Lbs.)	28			37		53	
Waterside Economizer Coil Volume (Gal.)	0.3	0.3	0.3	0.4	0.4	0.6	0.6
Hydronic Heat Section (Lbs.)	27			36		50	
Hydronic Heat Coil Volume (Gal.)	0.3			0.5		0.6	
Hot Gas Reheat (HGRH) (Lbs.)	N/A			10		12	

Table 20: Unit sizes 036 through 070

Description	Unit Size				
	036	042	048	060	070
Compressor Type	Scroll				
Refrigeration Charge (Oz.)	47.5	52	70	74	76
Fan Wheel (D x W)	9" x 7"	10" x 8"		11" x 10"	
PSC Fan Motor HP	1/3	1/2		3/4	
EC Constant Torque Motor HP	1/2		3/4	1	
EC Constant CFM Motor HP	1/2	3/4		1	
Water Connection Size (FPT)	3/4"		1"		
Coax Volume (Gal. @ 70ºF)	0.35	0.43	0.48	0.64	
Condensate Connection Size (FPT)	3/4				
Air Coil Face Area (Sq. Ft.)	3.42		4.06		6.06
Filter Size (inches)	24" x 24" x 1"		24" x 30" x 1"		16" x 30" x 1" (Qty 2)
Operating Weight	193	205	272	288	317
Shipping Weight	221	233	307	323	352
Overall Cabinet Dimensions (W x D x H)	21.5 x 26 x 44		24 x 32.5 x 46		26 x 33.25 x 54.125
Packaging + Pallet Weight (Lbs.)	28.47		34.7		
Waterside Economizer Section (Lbs.)	56		58		60
Waterside Economizer Coil Volume (Gal.)	0.9	0.9	1.0	1.0	1.6
Hydronic Heat Section (Lbs.)	57		68		79
Hydronic Heat Coil Volume (Gal.)	0.9		1.0		1.6
Hot Gas Reheat (HGRH) (Lbs.)	14		16		18

Standard Model GCV Unit Dimensions – Right-Hand

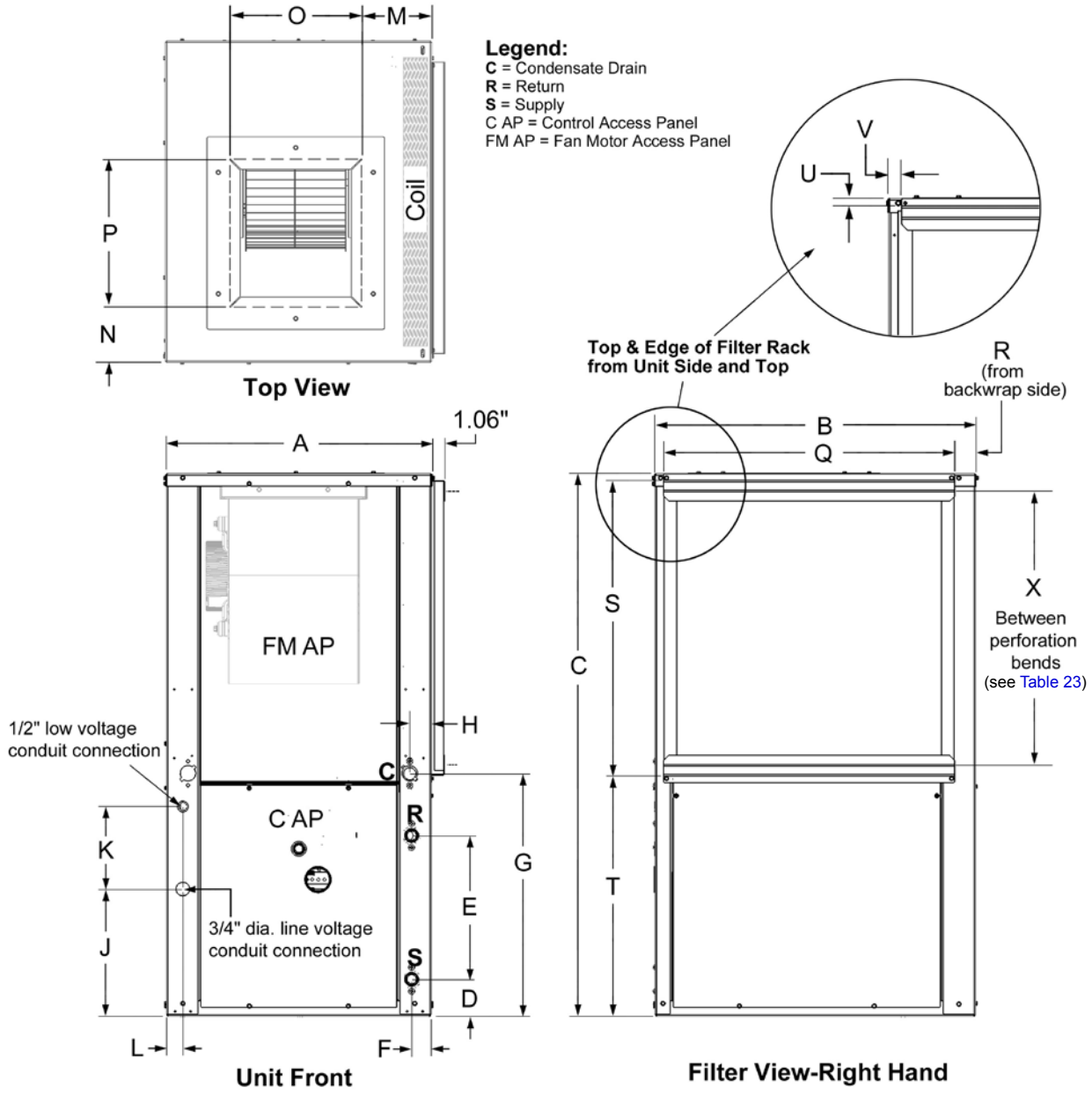


Table 21: Standard model GCV unit dimensions - right-hand

Unit Size	Overall Cabinet Dimensions in inches			Pipe Connections				3/4" FPT Condensate Drain		Electrical Entry Locations		
	A = Width	B = Depth	C = Height	Connection Size (FPT)	D	E	F	G	H	J	K	L
007, 009, 012	19.00	19.00	24.00	1/2"	2.67	6.31	1.61	12.00	1.73	2.51	6.81	1.25
015, 019	21.50	21.50	32.00	1/2"	3.30	7.62	1.57	15.71	1.73	6.26	6.75	1.31
024, 030	21.50	21.50	39.00	3/4"	3.26	7.98*	1.57	18.95	1.73	9.57	6.75	1.31
036	21.50	26.00	44.00	3/4"	3.00	11.66	1.57	19.71	1.73	10.32	6.75	1.31
042	21.50	26.00	44.00	3/4"	3.00	11.66	1.57	19.71	1.73	10.32	6.75	1.31
048	24.00	32.50	46.00	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31
060	24.00	32.50	46.00	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31
070	26.00	33.25	54.13	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31

Note: *All dimensions within ± 0.10 inches.*

** Unit size 030 ordered with an optional factory-installed 2-way motorized valve, dimension "E" = 4.68"*

Table 22: Standard model GCV unit dimensions - right-hand

Unit Size	*Discharge Opening - in inches				Standard Filter Rails Location - in inches				Offset from top & left edge	
	M	N	O	P	Q	R	S	T	U	V
007, 009, 012	11.63	4.87	4.84	9.30	16.50	1.75	12.78	11.22	0.58	0.78
015, 019	7.21	3.84	9.19	10.33	19.13	1.46	16.78	15.22	0.58	0.95
024, 030	7.21	3.84	9.19	10.33	19.13	1.46	20.54	18.46	0.58	0.95
036	6.40	3.84	9.19	10.33	23.57	1.73	24.35	19.65	0.58	0.74
042	5.84	4.94	10.31	11.33	23.57	1.73	24.35	19.65	0.58	0.74
048	8.03	6.25	10.31	11.33	30.12	1.49	24.34	21.66	0.58	0.92
060	5.62	9.6	13.55	12.98	30.12	1.49	24.34	21.66	0.58	0.92
070	7.49	9.98	13.55	12.98	30.56	1.98	32.84	21.29	0.58	0.74

Notes: ** Discharge opening dimensions are with the flanges bent up along the perforations at 90 degrees. Dimensions within ± 0.10 inches (2.5 mm).*

Table 23: Filter rack dimensions for Figure 14

Unit Size	Optional Filter Rack Flange Opening Dimensions in inches		Standard Unit Filter Rails Between 90-Degree Perforation bends	Optional Filter Rack Outside Dimensions in inches	
	W (width)	X (height)	X (height)	Y (width)	Z (height)
007, 009, 012	15.38	10.26	10.44	17.23	11.94
015, 019	18.01	14.26	14.44	19.85	15.94
024, 030	18.03	18.01	18.19	19.88	19.69
036	22.45	21.82	22.00	24.30	23.50
042	22.45	21.82	22.00	24.30	23.50
048	28.02	20.69	22.13	31.00	23.50
060	28.02	20.69	22.13	31.00	24.34
070	29.45	30.32	*30.50	31.29	32.00

Notes: *Filter rack flange dimensions are to the outside edge of the flange.*

** Unit size 070 uses two (2) filters where dimension "X" (height) = the overall outside edge dimension.*

Figure 14: Optional filter rack dimensions - right-hand

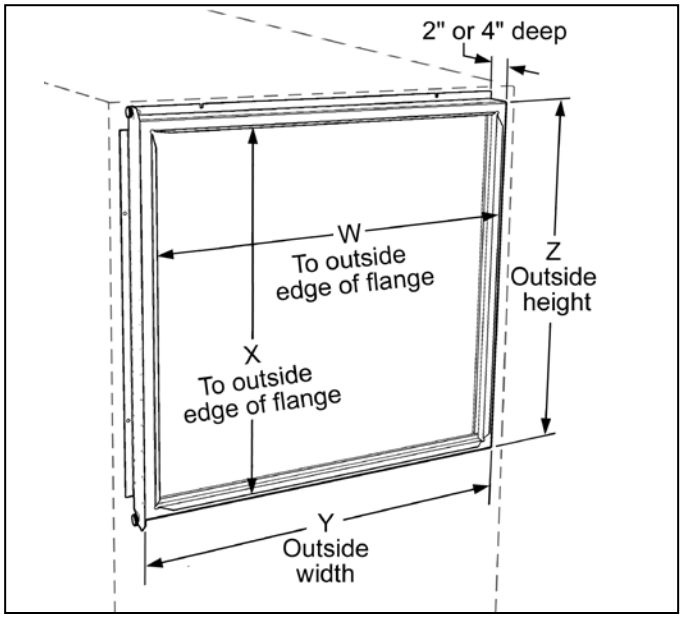
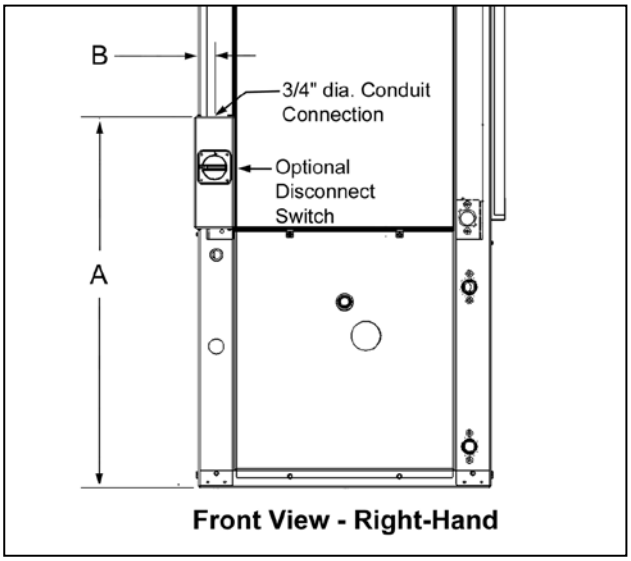


Figure 15: Optional disconnect switch location dimensions



Unit Size	A	B
007, 009, 012	19-3/8"	1"
015, 019	23-1/8"	1-1/8"
024, 030	18-1/4"	
036, 042	26-3/8"	
048, 060, 070	29-1/8"	

Standard Model GCV Unit Dimensions – Left-Hand

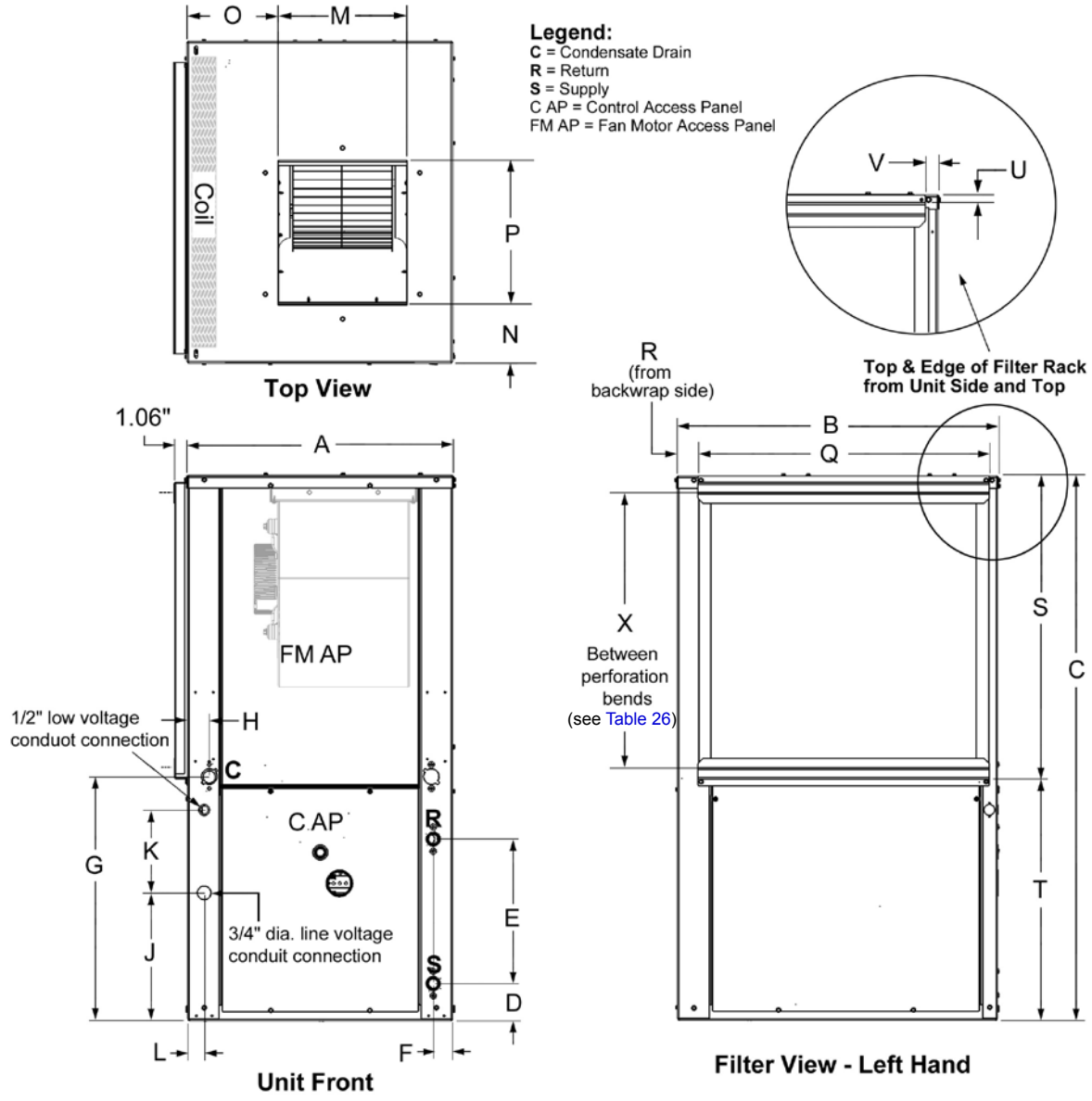


Table 24: Standard model GCV unit dimensions - left-hand

Unit Size	Overall Cabinet Dimensions in inches			Pipe Connections				3/4" FPT Condensate Drain		Electrical Entry Locations		
	A = Width	B = Depth	C = Height	Connection Size (FPT)	D	E	F	G	H	J	K	L
007, 009, 012	19.00	19.00	24.00	1/2"	2.67	6.31	1.61	12.00	1.73	2.51	6.81	1.25
015, 019	21.50	21.50	32.00	1/2"	3.30	7.62	1.57	15.71	1.73	6.26	6.75	1.31
024, 030	21.50	21.50	39.00	3/4"	3.26	7.98*	1.57	18.95	1.73	9.57	6.75	1.31
036	21.50	26.00	44.00	3/4"	3.00	11.66	1.57	19.71	1.73	10.32	6.75	1.31
042	21.50	26.00	44.00	3/4"	3.00	11.66	1.57	19.71	1.73	10.32	6.75	1.31
048	24.00	32.50	46.00	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31
060	24.00	32.50	46.00	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31
070	26.00	33.25	54.13	1"	4.38	11.84	1.57	21.75	1.73	12.32	6.75	1.31

Note: *All dimensions within ± 0.10 inches.*

** Unit size 030 ordered with an optional factory-installed 2-way motorized valve, dimension "E" = 4.68"*

Table 25: Standard model GCV unit dimensions - left-hand

Unit Size	*Discharge Opening - in inches				Standard Filter Rails Location - in inches				Offset from top & right edge	
	M	N	O	P	Q	R	S	T	U	V
007, 009, 012	6.07	4.87	4.84	9.30	16.5	1.75	12.78	11.22	0.58	0.78
015, 019	7.95	3.84	9.19	10.33	19.13	1.46	16.78	15.22	0.58	0.95
024, 030	7.95	3.84	9.19	10.33	19.13	1.46	16.78	15.22	0.58	0.95
036	8.20	3.84	9.19	10.33	23.57	1.73	24.35	19.65	0.58	0.74
042	7.45	4.94	10.31	11.33	23.57	1.73	24.35	19.65	0.58	0.74
048	9.08	6.25	10.31	11.33	30.12	1.49	24.34	21.66	0.58	0.92
060	5.74	9.60	13.55	12.98	30.12	1.49	24.34	21.66	0.58	0.92
070	9.24	9.98	13.55	12.98	30.56	1.98	32.84	21.29	0.58	0.74

Notes: ** Discharge opening dimensions are with the flanges bent up along the perforations at 90 degrees. Dimensions within ± 0.10 inches (2.5 mm).*

Table 26: Filter rack dimensions for Figure 16

Unit Size	Optional Filter Rack Flange Opening Dimensions in inches		Standard Unit Filter Rails Between 90-Degree Perforation bends	Optional Filter Rack Outside Dimensions in inches	
	W (width)	X (height)	X (height)	Y (width)	Z (height)
007, 009, 012	15.38	10.26	10.44	17.23	11.94
015, 019	18.01	14.26	14.44	19.85	15.94
024, 030	18.03	18.01	18.19	19.88	19.69
036	22.45	21.82	22.00	24.30	23.50
042	22.45	21.82	22.00	24.30	23.50
048	28.02	20.69	22.13	31.00	23.50
060	28.02	20.69	22.13	31.00	24.34
070	29.45	30.32	*30.50	31.29	32.00

Notes: *Filter rack flange dimensions are to the outside edge of the flange.*

** Unit size 070 uses two (2) filters where dimension "X" (height) = the overall outside edge dimension.*

Figure 16: Optional filter rack dimensions - left-hand

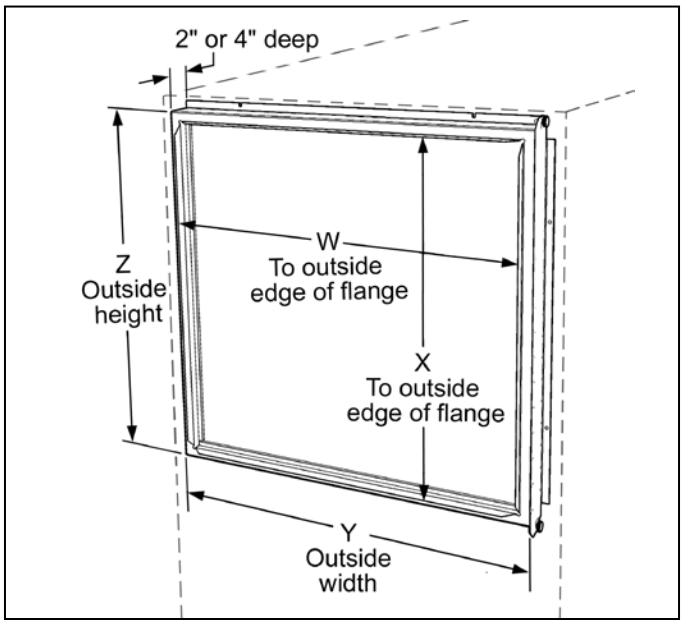
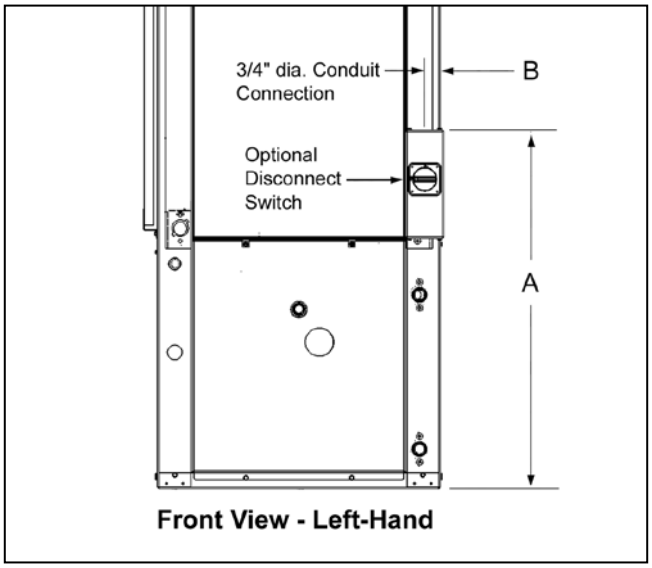


Figure 17: Optional disconnect switch location dimensions



Unit Size	A	B
007, 009, 012	19-3/8"	1"
015, 019	23-1/8"	1-1/8"
024, 030	18-1/4"	
036, 042	26-3/8"	
048, 060, 070	29-1/8"	

Model GCV Unit With Waterside Economizer Dimensions

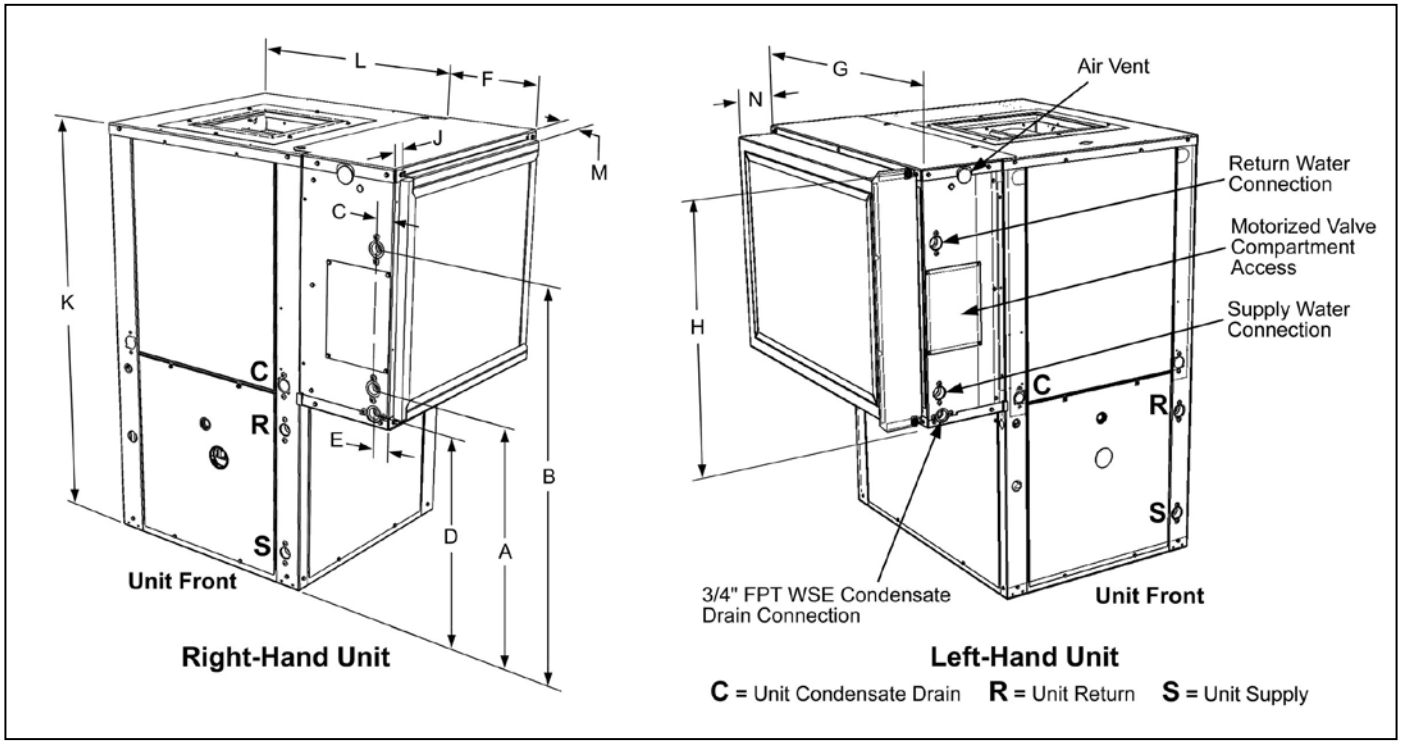


Table 27: Model GCV unit with waterside economizer - dimensions

Unit Size	Supply & Return Connections				3/4" FPT Condensate Drain		Waterside Economizer Overall Cabinet Section			J	K	L	Standard 1" Deep-Filter Rack	Optional Filter Racks	
	Connection Size (FPT)	A	B	C	D	E	F	G	H				M	N Optional 2" Deep	N Optional 4" Deep
007, 009, 012	1/2"	13.26	21.46	1.65	11.68	1.65	9.00	19.00	13.42	1.28	24.00	19.00	1.00	2.125	4.125
015, 019	3/4"	17.50	29.46	1.65	17.51	1.65	9.00	21.50	17.42	1.28	32.00	21.50			
024, 030	3/4"	20.86	32.50	1.53	18.74	1.40	9.00	21.50	21.42	0.91	39.00	21.50			
036, 042	3/4"	25.87	37.50	1.40	19.68	1.40	9.00	26.00	25.42	1.20	44.00	21.50			
048, 060	1"	24.00	38.88	1.40	21.68	1.65	9.00	32.50	25.42	1.20	46.00	24.00			
070	1"	27.85	45.87	1.40	21.80	1.65	9.00	33.25	33.42	1.36	54.13	26.00			

Note: *All dimensions within ± 0.10 inches (2.5 mm.*

General

Units shall be supplied completely factory assembled, piped, internally wired, fully charged with R-410A, vertical unit and capable of operating over an entering water temperature range from 55°F to 110°F on water loop (boiler/tower) models, and 20° to 110°F on ground loop (geothermal) models. All equipment must be rated and certified in accordance with AHRI/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 US and CAN/CSA-C22.2 NO. 236 for Canada. Each unit shall be ETL and ETLC Listed. Each unit shall be run tested at the factory. The installing contractor shall be responsible for furnishing and installing Water Source Heat Pumps as indicated on the plans and per installation instructions.

All water loop (boiler/tower) units shall include a:

- Low refrigerant suction line temperature safety device (freeze protection)

All ground loop (geothermal) units shall have:

- Insulated water-to-refrigerant heat exchanger
- Insulated water and refrigerant piping, designed to prevent sweating
- Low refrigerant suction line temperature safety device (freeze protection)

Electrical

A “swing out” removable 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 nameplated 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 or sensor. 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 sensor to indicate a “fault” condition from the activation of any one of the safety devices.

Casing and Cabinet

Unit cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal. Interior surfaces shall be lined with ½-inch, 1½ lb. dual density coated fiberglass insulation. All insulation shall have 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.

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.

Three access panels, two 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 shall have a ¾" fold-out discharge duct collar for connection of supply air ductwork.

Unit Insulation Option

- Indoor Air Quality (IAQ) closed cell foam on entire unit; replaces standard fiberglass

Sound Attenuation Options

- **Sound Blanket**
  - For additional sound attenuation on unit sizes 024 - 070, a compressor blanket constructed from high performance Duracoustic sound material with superior sound absorption and deadening properties shall be provided. The sound rated material has a density of 1.5 lb./ft^3 and is made from a loaded vinyl reinforced barrier and is embedded with 0.5" urethane foam
- **Sound Package**
  - 1-inch dual layer insulation on entire unit (Unit Sizes 007 - 019)
  - 1-inch dual layer insulation in air handling section (Unit Sizes 024 - 070), 1/2-inch dual-density fiberglass insulation in the compressor section and compressor sound blanket (Unit Sizes 024 - 070).

Filter Rack and Filters

Units shall have factory-installed, one inch thick filter rails on the top and bottom for filter support with 1" inch thick disposable standard filter(s) and ¾" inch fold-out duct collar for connection of return air ductwork.

Filter Options

- **Factory-installed 2-inch thick MERV 8 filter**
  - Factory-installed in a low leakage 2-inch, 4-sided combination filter rack with ¾" return air duct collar and removable, tool-less access door with thumb screws. Gasketing shall provide a leakage rate of less than 4 CFM per square foot of filter area at .5" ESP.

- **Factory-installed 4-inch thick MERV 13 filter**
  - Factory-installed in a low leakage 4-inch, 4-sided combination filter rack with ¾" return air duct collar and removable, tool-less access door with thumb screws.

Supply and return, condenser water connections

Shall be FPT fittings, brazed copper water tubes and securely flush mounted to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench.

Drain Pan

Unit shall utilize a corrosion resistant, stainless steel, insulated drain pan. Drain pan connection shall be ¾" FPT flush threaded fitting. The drain pan shall be designed to ensure no pooling of condensate water per ASHRAE 62.2.

Refrigerant Circuit

Units shall have a R-410A sealed refrigerant circuit, which includes a rotary or scroll compressor, thermostatic expansion valve, an aluminum lanced-fin and rifled copper tube refrigerant-to-air heat exchanger, reversing valve, and coaxial, tube-in-tube, refrigerant-to-water heat exchanger. The airside coil shall be rated at 600 psig working pressure. The coaxial coil shall be made of a copper inner tube and a painted steel outer tube and be rated at 500 psig working pressure on the waterside and 600 psig working pressure on the refrigerant side. The compressor shall have thermal overload protection.

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 to minimize vibration transfer.

Safety controls shall include a minimum of 3 safety devices; high refrigerant pressure switch, low refrigerant pressure switch and a low refrigerant suction temperature sensor. The low refrigerant suction temperature sensor shall provide freeze protection for the water coil and the air coil. Refrigerant gauge access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent the compressor from operating via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the unit disconnect switch.

- **Cupro-Nickel coil option:** The coaxial coil shall be made of cupro-nickel inner tube and a painted steel outer tube.
- **Coated air coil option:** Unit shall have epoxy coated air coil to meet ASTM Std B-117, 1,000-hour salt spray test.

Fan and Motor Assembly

Unit shall have a direct drive centrifugal fan motor assembly. The fan housing shall have a removable orifice ring to facilitate fan motor and fan wheel removal. Unit sizes 015 thru 048 shall have a slide-out fan assembly to facilitate fan motor removal The fan motor shall be 3-speed, permanently lubricated, PSC type, with internal thermal overload protection.

Optional Fan Motors

- **Constant Torque motor (sizes 007-012)**
  - The fan motor shall be permanently lubricated, constant torque electronically commutated for improved operation. Field adjustable CFM settings shall be accomplished from a 4-position switch in the control box.
- **Constant Torque motor (sizes 015-070)**
  - The fan motor shall be permanently lubricated, constant torque electronically commutated for improved operation. These motors shall feature 5 pre-programmed torque settings that can be changed in the field to match design airflow requirements. Units with 460/60/3 power do not require the 4th wire neutral.
- **Constant CFM motor (unit sizes 015-070)**
  - The fan motor shall be permanently lubricated, variable speed, constant CFM, electronically commutated for improved operation. Field adjustable CFM settings shall be accomplished from a 4-position switch in the control box. The constant CFM EC motor shall have the ability to reduce the CFM as the space temperature approaches the thermostat setpoint for improved dehumidification. Units with 460/60/3 power require the 4th wire neutral.

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. 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. A corrosion resistant epoxy coated hot gas reheat coil shall be available as an option.

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 cabinet shall be fabricated from heavy gauge G-60 galvanized sheet metal with the top and bottom interior surfaces lined with with a minimumm 3/8-inch thick closed-cell non-fibrous IAQ insulation and 1/8-inch thick closed-cell non fibrous insulation on the interior side walls. 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. For corrosive environment applications, a corrosion resistant epoxy 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. Economizer operation shall be permitted when entering fluid temperature is below the adjustable range from 50°F to 70°F. Default setting is 55°F. Economizer operation shall be initiated from a multi-stage remote thermostat or sensor. Economizer operation will be permitted with entering fluid temperature down to 35°F.

Hydronic Heat Option

A factory mounted and wired hydronic coil shall consist of a heating coil located in a plenum on top of the unit, 2-position 3-way diverting valve, a manual air vent, and an entering fluid sensor. The standard control sequence is provided where a call for heating will divert the warm water to the hydronic coil to satisfy the heating demand. The unit shall have an alternate hydronic coil control sequence where compressor heating is enabled when the entering water is below 90°F or hydronic heat is enabled above 90°F.

Microprocessor-Based 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 high refrigerant pressure switch.
12. Suspended compressor operation upon activation of the low refrigerant pressure switch.
13. Suspended compressor operation upon activation of the low refrigerant suction temperature switch.
14. Cooling operation activated for 60 seconds upon activation of the low suction temperature sensor – defrost cycle.
15. Method of defeating compressor, reversing valve and fan time delays for fast service diagnostics.
16. Remote Alarm reset - Provides ability to remotely reset the unit upon a fault condition.
17. Intelligent Reset attempts to clear faults the first two times they occur within a 24-hour period and locks-out compressor operation upon the third fault.
18. Control shall be configurable to accommodate thermostat or sensor based control.
19. Unit mounted LED annunciators aid in diagnosing unit operation by indicating the water source heat pump operating mode and alarm conditions.
20. Freeze fault protection (option): Unit shall be equipped with an additional sensor located on the leaving water piping to be used to help protect the unit from excessively low water coil and air coil temperatures.
21. Electric heat control output (option): Unit shall be equipped with a 24-volt control signal to activate a field-installed electric heater.

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 SmartSource Control with 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 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

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 operation of each MicroTech III Water Source Heat Pump.

Non-Fused 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 handle all the voltages available for the unit.

75VA Transformer

A factory-installed 75VA tranformer replaces the standard 50VA transformer for added electrical capacity.

Warranty

Standard Warranty

- The standard unit warranty covers all parts for a period of 1 year after start-up, or 18 months after shipment; whichever occurs first.

Optional Warranty

- An optional 1 or 4-year extended compressor warranty covers the compressor from the date at which the unit ships from the factory.
- An optional 1 or 4-year extended refrigeration circuit warranty covers the entire refrigeration circuit and related components.
- An optional 1 or 4-year extended complete unit warranty covers the entire unit and related components.

Field Installed Accessories

Wall-Mounted Thermostats:

- Programmable Touch Screen Thermostat with optional humidity sensing
  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

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. For details on hose kits refer to catalog 1196-x.

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

Motorized Valve and Ball Valve Kits

- 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 1-inch disposable filters shall be available as direct replacement to factory-installed filters.

Daikin Applied Training and Development

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

Warranty

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

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