Carrier

Turn to the experts

Product Data

Aquazone™

Compact Water Source Heat Pumps

$^1/_2$ to 6 Nominal Tons

AQUAZONE™



50PCH, PCV 007-070
Compact Water Source Heat Pumps
with Puron® Refrigerant (R-410A)

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Features/Benefits

Carrier's Aquazone WSHPs are an efficient, compact solution for new construction and retrofit applications

Single-package horizontally and vertically mounted water source heat pumps (WSHPs) with compact cabinet and standard features:

- Compact design allows for replacement of legacy WSHPs from Carrier and other manufacturers.
- Cabinet constructed of heavy gauge galvanized steel to ensure long service life.
- Interior panels feature an acoustical fiberglass lining for quiet operation.
- Large access panels for ease of maintenance and service.
- Suitable for boiler/tower loop applications with standard operating range of 50°F to 100°F entering water temperature.
- Rotary (size 007-018) or scroll (size 024-070) compressors.
- Double isolated compressor mounting for quiet operation
- Non-ozone depleting Puron refrigerant (R-410A)
- Direct drive fan assembly with Permanent Split Capacity (PSC) motor for reliable operation.
- Factory installed unit protection module (UPM) ensures reliable operation and simplifies troubleshooting.
- Manufactured in an ISO 9001 certified facility.

Operating efficiency

Aquazone WSHP units offer cooling EERs (energy efficiency ratios) to 17.7 and heating COPs (coefficients of performance) to 5.1.

All efficiencies stated are in accordance with standard conditions under ISO (International Organization for Standardization) Standard 13256-1:1998 and provide among the highest ratings in the industry.

High quality construction and testing

All units are manufactured to meet extensive quality control standards. An automated control system provides continuous monitoring of each unit and performs quality control checks as equipment progresses through the production process. An automated end of line run test verifies component functionality Units are produced in an ISO 9001 production facility.

Cabinet

Heavy gage galvanized sheet metal cabinet construction designed with large access panels for easy maintenance and service. Cabinet interior surfaces are lined with $^1/_2$ in. thick, $1^1/_2$ lb fiberglass insulation. Sheet metal surfaces are treated for maximum corrosion protection to provide resilience for long term vitality. Compact cabinet dimensions fit tight space limitations in both horizontal and vertical configurations.

Compressor

Compact Aquazone units include a rotary compressor in sizes 007-018 and a scroll compressor in size 024-070 units. Compressors are mounted on a double isolated system (i.e., from the cabinet) that maximizes vibration isolation and minimizes transmission to the unit structure.

Puron® refrigerant (R-410A)

Puron refrigerant (R-410A) is a nonchlorine based environmentally balanced, non-ozone depleting refrigerant. Puron refrigerant characteristics, compared to R-22, have:

- Binary and near azeotropic mixture of 50% R-32 and 50% R-125.
- Higher efficiencies (50 to 60% higher operating pressures).
- Virtually no glide. Unlike other alternative refrigerants, the two components in Puron refrigerant have virtually the same leak rates.

Therefore, refrigerant can be added if necessary.

Permanent split capacitor motors (PSC)

The standard motor for all 50PC model heat pumps is a PSC motor. For all models other than 575-volt units, the supplied motor has 3-speed taps for field adjustability. The 575V motor has a single speed tap.

Hanging brackets

All horizontal units come standard with hanging bracket kits for suspending the unit from field-supplied hanger rods. These kits include heavy duty steel brackets and rubber grommets for sound and vibration isolation from the building structure.

Water connections

All water connections are heavy duty bronze FPT fittings securely fastened to the unit corner post. This allows connecting to a flexible hose kit without the use of a backup wrench making for easier, faster installation.

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Refrigeration/water circuit

All units have a sealed refrigerant circuit including a high-efficiency rotary or scroll compressor. Simplified refrigerant circuits provide easy maintenance, higher accuracy and excellent performance. Also, standard are a reversing valve (4-way valve), water-to-refrigerant coaxial (tube-in-tube) coil, and enhanced aluminum fin/rifled copper tube air-to-refrigerant heat exchanger coil.

AHRI/ISO

Aquazone units have AHRI (Air-Conditioning, Heating, and Refrigeration Institute)/ISO, NRTL (Nationally Recognized Testing Lab), or CSA (Canadian Standards Association) labels and are factory tested under normal operating conditions at nominal water flow rates. Quality assurance is provided via testing report cards shipped with each unit to indicate specific unit performance under cooling and heating modes.

Quiet operation

All 50PC units have a unique floating basepan; the compressor is mounted on a heavy steel plate which rests on a high density rubber pad on the base of the unit. In addition, compressors are mounted on rubber grommets. This double isolation is standard in all 50PC units preventing vibration and noise transmission from the compressor to the unit structure, resulting in exceptionally quiet operation.

Cabinets are fully insulated to reduce noise transmission, low speed blowers are used for quiet operation through reduced outlet air velocities, and air-to-refrigerant coils are designed for lower airflow coil face velocities. A mute package is also available for extremely noise sensitive applications.

Indoor Air Coil

All units come standard with a copper tube, aluminum-fin air coil. These air coils employ lanced fin and rifled tubing for maximum heat transfer. Large face areas result in lower face velocity reducing sound while ensuring high latent heat removal for maximum dehumidification in the cooling mode.

Thermostatic Expansion Valve

All 50PC units are equipped with a thermostatic expansion valve (TXV) metering device to ensure reliable operation across a wide range of entering air and water temperatures.

Design flexibility

Airflow configurations for horizontal units are available in patterns including left or right return or straight through or end discharge. Horizontal units are field convertible between straight through (left or right) discharge and end discharge. Vertical units are available in left or right return with top discharge. Other combinations may be available as a special order. Standard water temperature range between 50 and 100˚F offers maximum design flexibility for boiler/tower applications. Water flow rates as low as 2.5 gpm per ton assist with selection from a various range of circulating pumps. Factory-installed options are offered to meet specific design requirements.

Safe, reliable operation

Standard safety features for the refrigerant circuit include a high-pressure switch, low-pressure sensor to detect refrigerant loss. Equipment safety features include water loop temperature monitoring, voltage protection, water coil freeze protection, and standard electronic condensate overflow shutdown. All safety features are tested and run at the factory to assure proper operation of all components and safety switches.

All components are carefully designed and selected for endurance, durability, and carefree day-to-day operation.

The Aquazone™ unit is shipped to provide internal and external equipment protection. Shipping supports are placed under the blower housing. In addition, horizontal and vertical units are both mounted on oversized pallets with lag bolts for sturdiness and maximum protection during transit.

Ease of installation

The Aquazone unit is packaged for simple low cost handling and requires minimal installation. All units are prewired and factory charged with refrigerant. Horizontal units include factory-installed hanger isolation brackets. Water connections (FPT) and condensate drains (FPT) are anchored securely to the unit cabinet.

Simple maintenance and serviceability

The Aquazone WSHP units are constructed to provide easy maintenance. All units allow easy access to the compressor section from 2 sides with large removable panels. Additional panels allow access to the blower and control box sections.

The blower housing assembly can be serviced without disconnecting ductwork from the dedicated blower access panel. Blower units come with permanently lubricated bearings for worry-free performance. Blower inlet rings allow blower wheel removal without having to remove the housing or ductwork connections.

Electrical disconnection of the blower motor and control box is easily accomplished via quick disconnects on each component.

Easy removal of the control box from the unit provides access to all refrigeration components.

The refrigeration circuit is easily tested and serviced through high and low pressure ports integral to the refrigeration circuit.

Maximum control flexibility

All Aquazone water source heat pumps feature a factory installed and configured unit protection module (UPM), which regulates unit operation, features integrated safeties, and simplifies unit troubleshooting.

The UPM provides control of the unit compressor, reversing valve, fan, safety features, waterside economizer and hot gas reheat control. It also provides troubleshooting fault indication features. Additional features and functions of the UPM include:

Anti-short cycle timer

Provides a minimum off time to prevent the unit from short cycling. The 5-minute timer energizes when the compressor is deenergized, resulting in a 5-minute delay before the unit can be restarted.

Random start relay

Provides a random delay in energizing each different WSHP unit. This option minimizes peak electrical demand during start-up from different operating modes or after building power outages. Each controller has a unique random start delay ranging from 270 to 300 seconds after power is applied to the board.

High and low pressure refrigerant protection

Safeguards against unreliable unit operation and prevents refrigerant from leaking.

Features/Benefits (cont)

Condensate overflow sensor

Sensor is an electronic sensor mounted to the drain pan. When condensate pan liquid reaches an unacceptable level, the unit is automatically deactivated and placed in a lockout condition. The sensor recognizes 30 continuous seconds of overflow as a fault condition.

High and low voltage protection

Provides safety protection from excessive or low voltage conditions.

Automatic intelligent reset

Will automatically restart unit 5 minutes after shutdown if the fault has cleared. Should a fault occur 2-4 times sequentially (field selectable), lockout will occur.

Water coil freeze protection (selectable for water or antifreeze)

Provides a field selectable switch for water and water/glycol solution systems which initiates a fault when temperatures exceed the selected limit for 30 continuous seconds.

Alarm relay setting

Is a selectable 24-v or pilot duty dry contact for activating a remote alarm.

Low pressure bypass timer

The low pressure switch is bypassed for 120 seconds after a call for compressor operation to prevent nuisance low pressure lockouts during cold start-up in the heating mode.

Service Test mode with diagnostic LED (light-emitting diode)

Allows service personnel to check the operation of the WSHP and control system efficiently. Upon entering Test mode, time delays speed up, and the Status LED flashes a code to indicate the last fault experienced. This mode provides easy fault diagnosis; based on the fault code that the status LED flashes. Carrier troubleshooting tables provide easy reference to typical problems.

LED visual output

Indicates high pressure, low pressure, low voltage, high voltage, air/water freeze protection, condensate overflow, and control status via a LED panel.

Lockout reset

Can be accomplished by turning the unit thermostat off and then back on or by shutting off unit power at the circuit breaker. The method of reset is selectable by the DIP switch on the unit control board.

Complete C Control Package

The Complete C control package is the standard control package for all 50PC units and includes the following:

- Unit Protection Module (UPM)
- 50-VA transformer (tapped to 230V for all 208V/230V units).
- Factory labeled terminal strip thermostat input for field provided thermostat or DDC control
- Factory provided wiring diagram affixed to the control enclosure access panel.

Model number nomenclature

50PCH 024 B C C 3 E C C 1

Aquazone™ Compact Water Source Heat Pump with Puron® Refrigerant (R-410A)
50PCH – Horizontal Configuration
50PCV – Vertical Upflow Configuration

Nominal Capacity - Tons

007 – 1/2	**024** – 2	**042** – 3-1/2
009 – 3/4	**030** – 2-1/2	**048** – 4
012 – 1	**036** – 3	**060** – 5
015 – 1-1/4	**041** – 3-1/2	**070** – 6
018 – 1-1/2		

Horizontal Airflow Configuration

	Return	Discharge	Blower Motor
B –	Right	Back	PSC
E –	Left	Right	PSC
N –	Right	Left	Constant Torque ECM
P –	Right	Back	Constant Torque ECM
S –	Left	Back	PSC
W –	Left	Right	Constant Torque ECM
Y –	Left	Back	Constant Torque ECM
Z –	Right	Left	PSC

Vertical Airflow Configuration

J –	Left	Top	Constant Torque ECM
K –	Right	Top	Constant Torque ECM
L –	Left	Top	PSC
R –	Right	Top	PSC

Control
C – Standard C Control Package
D – Deluxe D Control Package
W – WSHP Open DDC Control Package

LEGEND
ECM — Electronically Commutated Motor
PSC — Permanent Split Capacitor

Factory-Installed Options
1 – None
2 – Waterside Economizer
8 – MERV 8 Filter
9 – MERV 13 Filter

Operating Range/Sound Option/Insulation
A – Extended Range (25 to 110 F)
C – Standard Range (50 to 100 F)
D – Extended Range, 1/2-in. Closed Cell Foam
E – Standard Range, 1/2-in. Closed Cell Foam
F – Extended Range, Mute, Closed Cell Foam
J – Extended Range, Mute
N – Standard Range, Mute
P – Standard Range, Mute, Closed Cell Foam

Valve Options
A – 2-Way Solenoid
B – Autoflow Regulator (3 gpm autoflow reg)
C – None
D – 2-Way Solenoid with Autoflow Regulator

Revision Code
D – Revision D
E – Revision E

Voltage
1 – 575-3-60
3 – 208/230-1-60
4 – 265-1-60
5 – 208/230-3-60
6 – 460-3-60
A – 575-3-60 with Disconnect
C – 208/230-1-60 with Disconnect
D – 265-1-60 with Disconnect
E – 208/230-3-60 with Disconnect
F – 460-3-60 with Disconnect

Refrigerant Circuit Options

Option	Non-Coated Air Coil		Coated Air Coil	
	Copper	Cupronickel	Copper	Cupronickel
Standard	C	N	A	J
Hot Gas Reheat	E	P	D	F
Hot Gas Bypass	T	S	U	W
Hot Gas Bypass & Reheat	L	M	R	V

NOTE: Configuration and option availability are subject to change. Please refer to WSHP Builder for availability.

AHRI/ISO capacity ratings

50PC UNITS WITH EXTENDED RANGE AND COPPER COILS

MOTOR OPTION	50PC UNIT SIZE	WATER LOOP HEAT PUMP				GROUND WATER HEAT PUMP				GROUND LOOP HEAT PUMP				CFM	GPM
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 77°F		Heating 32°F			
		Capacity BTU/h	EER BTU/W-h	Capacity BTU/h	COP	Capacity BTU/h	EER BTU/W-h	Capacity BTU/h	COP	Capacity BTU/h	EER BTU/W-h	Capacity BTU/h	COP		
PSC	007	6,100	13.20	7,800	5.10	N/A				6,800	15.10	4,900	3.40	300	2.0
	009 Horizontal	8,200	12.40	9,900	4.70					N/A	N/A	N/A	N/A	330	2.5
	009 Vertical	8,150	12.40	10,700	4.70					8,700	14.40	6,900	3.20	330	2.5
	012	10,900	12.20	13,000	4.30					11,800	14.10	8,700	3.20	375	3.0
	015	14,200	12.80	16,100	4.40					14,200	14.60	11,300	3.30	500	4.0
	018	18,200	14.10	20,200	4.60					19,200	16.15	14,300	3.50	600	5.0
	024	24,300	14.20	27,400	5.00					25,400	16.90	18,100	3.55	800	6.0
	030	28,200	13.40	32,600	4.70					29,500	15.60	21,500	3.40	950	7.0
	036	36,900	14.30	38,800	4.65					38,500	16.65	27,100	3.55	1200	9.0
	041	36,000	14.15	39,100	4.45					37,400	16.20	27,400	3.30	1240	9.0
	042	39,600	13.65	42,800	4.45					41,200	15.90	30,000	3.25	1380	10.0
	048	46,200	13.95	58,600	4.65					48,400	16.35	39,300	3.40	1640	12.0
	060	59,100	13.60	77,800	4.80					61,600	15.80	53,400	3.75	1900	15.0
	070	64,000	13.30	72,800	4.40					66,400	15.00	50,800	3.40	2000	16.0
ECM	015	13,700	13.90	15,500	4.40	N/A				14,400	16.20	10,700	3.30	500	4.0
	018	18,500	14.50	19,900	4.70					19,500	16.95	14,000	3.55	650	5.0
	024	24,700	14.90	27,000	5.10					25,800	17.65	17,700	3.60	850	6.0
	030	28,800	13.50	32,000	4.90					30,100	15.65	20,900	3.55	950	7.0
	036	37,200	14.70	38,400	4.75					38,800	17.10	26,700	3.60	1200	9.0
	041	37,000	14.35	38,200	4.70					38,400	16.45	26,500	3.45	1240	9.0
	042	40,500	14.20	41,800	4.60					42,100	16.60	29,000	3.40	1380	10.0
	048	47,100	14.30	57,800	4.70					49,300	16.70	38,500	3.45	1640	12.0
	060	59,000	14.30	66,400	4.30					61,100	16.40	46,200	3.30	2000	15.0
	070	65,200	14.60	71,800	4.60					67,600	16.60	50,000	3.50	2100	16.0

LEGEND

AHRI — Air-Conditioning, Heating and Refrigeration Institute
COP — Coefficient Performance
EER — Energy Efficiency Ratio
ISO — International Organization for Standardization
NA — Not Applicable

NOTES:

1. Ratings based upon ANSI/AHRI/ASHRAE/ISO 13256-1 with 1-in. disposable filter.
2. For specific configuration ratings, refer to WSHP Builder in Carrier ECAT.
3. Vertical/Horizontal airflow.
4. Ground Loop Heat Pump ratings require an extended range option.
5. Certified in accordance with ANSI/AHRI/ASHRAE/ISO 13256-1.



Physical data

PHYSICAL DATA — 50PCH,PCV (007-070) UNITS

50PCH,PCV UNIT	007	009	012	015	018	024	030
COMPRESSOR (1 each)	Rotary					Scroll	
Maximum Water Working Pressure (psig)	400*						
PSC Fan Motor and Blower							
Fan Motor Type	PSC						
Fan Motor (hp)	1/10			1/6	1/4		
Blower Wheel Size (Dia x W) (in.)	4.5 x 4.5		5.5 x 4.5	9 x 7			
Constant Torque Fan Motor and Blower							
Fan Motor Type	PSC			Constant Torque			
Fan Motor (hp)	1/10			1/3		1/3	
Blower Wheel Size (Dia x W) (in.)	4.5 x 4.5		5.5 x 4.5	9 x 7			
WATER CONNECTION SIZE FPT (in.)	3/4						
Coaxial Coil Volume (gal.)	0.06	Cu: 0.06 Cu/Ni: 0.08	0.08	0.09	0.14	0.24	0.24
Condensate Connection in. FPT	3/4						
VERTICAL CABINET							
Typical Refrigerant Charge (oz)	16	19	21	Cu: 19 CuNi: 19 (captube)/ 17 (TXV)	22	Cu: 35 CuNi: 33	
Air Coil Dimensions (H x W) (in.)	10 x 14			12 X 16.5	16 X 16.5	20 x 16.5	
Std. Filter - 1 in. Throwaway (L x H) (in.)	10 x 16			16 x 20		20 x 20	
Opt. Filter - 2 in. MERV 8 or 13 Throwaway (L x H)	10 x 16			16 x 20		20 x 20	
Weight - Operating (lb)	98	103	105	123	173	177	190
Weight - Shipping (lb)	126	130	132	151	201	205	217
HORIZONTAL CABINET							
Typical Refrigerant Charge (oz)	Cu: 16 CuNi:19		19		22	Cu: 35/CuNi: 33	
Air Coil Dimensions (H x W) (in.)	10 x 14			12 x 16.5	16 x 16.5	16 x 20.5	
Std. Filter - 1 in. Throwaway (L x H) (in.)	10 x 16			16 x 20		16 x 25	
Opt. Filter - 2 in. MERV 8 or 13 Throwaway (L x H) (in.)	10 x 16			16 x 20		16 x 25	
Weight - Operating (lb)	96	100	105	136	174	181	190
Weight - Shipping (lb)	128	132	134	158	208	212	224

50PCH,PCV UNIT	036	041	042	048	060	070
COMPRESSOR (1 each)	Scroll					
Maximum Water Working Pressure (psig)	400*					
PSC Fan Motor and Blower						
Fan Motor Type	PSC					
Fan Motor (hp)	1/2	3/4	1/2	3/4		
Blower Wheel Size (Dia x W) (in.)	9 x 7	10 x 8			10 x 9	11 x 9
Constant Torque Fan Motor and Blower						
Fan Motor Type	Constant Torque					
Fan Motor (hp)	1/2	3/4			1	
Blower Wheel Size (Dia x W) (in.)	9 x 7	10 x 8			11 x 9	
WATER CONNECTION SIZE FPT (in.)	3/4			1		
Coaxial Coil Volume (gal.)	0.27			0.49	0.62	
Condensate Connection in. FPT	3/4					
VERTICAL CABINET						
Typical Refrigerant Charge (oz)	Cu: 44 CuNi: 40	38	Cu: 43 CuNi: 39	52	59	64
Air Coil Dimensions (H x W) (in.)	24 x 20.2	20 x 16	24 x 20.2	24 x 26.75		32 x 26.2
Std. Filter - 1 in. Throwaway (L x H) (in.)	24 x 24	20 x 20	24 x 24	24 x 30		16 x 30 (2)
Opt. Filter - 2 in. MERV 8 or 13 Throwaway (L x H) (in.)	24 x 24	20 x 20	24 x 24	24 x 30		16 x 30 (2)
Weight - Operating (lb)	229	217	239	287	307	336
Weight - Shipping (lb)	255	243	265	312	331	360
HORIZONTAL CABINET						
Typical Refrigerant Charge (oz)	40	N/A	Cu: 43 CuNi: 39	51	70	61
Air Coil Dimensions (H x W) (in.)	18 x 27.5	N/A	18 x 27.5	20 x 32		20 x 42
Std. Filter - 1 in. Throwaway (L x H) (in.)	18 x 30	N/A	18 x 30	20 x 34.5		20 x 24 (2)
Opt. Filter - 2 in. MERV 8 or 13 Throwaway (L x H) (in.)	18 x 30	N/A	18 x 30	20 x 34.5		20 x 24 (2)
Weight - Operating (lb)	226	N/A	231	274	288	316
Weight - Shipping (lb)	270	N/A	264	299	318	365

LEGEND

FPT — Female Pipe Thread
N/A — Not Applicable
PSC — Permanent Split Capacitor

* 300 psig when unit is built with the 2-way solenoid valve option.

NOTE: Refrigerant charges will depend on unit configuration and design revision.

Options and accessories

ITEM	FACTORY-INSTALLED OPTION	FIELD-INSTALLED ACCESSORY
Cupronickel Heat Exchanger	X	
Air Coil Protection	X	
Extended Range Units	X	
Hot Gas Reheat	X	
Hot Gas Bypass	X	
Waterside Economizer	X	
Sound Attenuation Package	X	
Constant Torque ECM	X	
Two-Position Water Valve	X	
Complete C Control Package	X	
Deluxe D Control Package	X	
WSHP Open Multi-Protocol Controller	X	
WSHP Open Equipment Touch™ Device		X
WSHP Open System Touch™ Device		X
WSHP Open ZS Sensor		X
Supply and Return Water Hose Kits		X
Electric Duct Heaters		X
Edge® Pro 7-Day Programmable Thermostat		X

Factory-installed options

Cupronickel heat exchangers

They are available for higher corrosion protection for applications such as open tower, geothermal, etc. Consult the water quality guidelines for proper application and selection of this option.

Air coil protection

This option offers tin electro-plated copper tubing with high-tech polymer coated aluminum fins will protect the air coil from all forms of corrosive elements in the airstream. Air coil protection is recommended for primary residence applications to protect against formicary corrosion.

Extended range units

This option insulates the coaxial coil to prevent condensation, and therefore potential dripping problems, in applications where the entering water temperature is below the normal operating range (less than 50°F). Units are capable of operating at a range of 25 to 110°F. Thermostatic expansion valves (TXVs) come with the optional extended range units and are designed to vary the flow of refrigerant depending on the load. The TXVs provide unit optimization and more stable control over a wider range of operating conditions.

Hot gas reheat (HGRH)

HGRH is an efficient and effective method of providing space humidity control. HGRH allows the unit to dehumidify the space when there is no demand for space cooling without the need for additional energy consuming devices.

The HGRH package is factory installed and includes a HGRH coil (installed behind the indoor air coil, a HGRH control valve, and additional refrigerant piping. The HGRH coil is factory sized to maximize performance.

When the space temperature is satisfied but the space humidity is above the desired set point, a call for dehumidification is initiated and the unit fan, reversing valve, HGRH valve, and compressor are enabled. The fan draws in warm humid air through the indoor air coil where is it cooled and dehumidified. The cool, dehumidified air then passes through the reheat coil where it is heated to a neutral temperature (typically 68°F to 78°F). The neutral, dry air is then delivered to the space and reduces space humidity levels without cooling the space. See WSHP Builder for HGRH performance.

Hot gas bypass

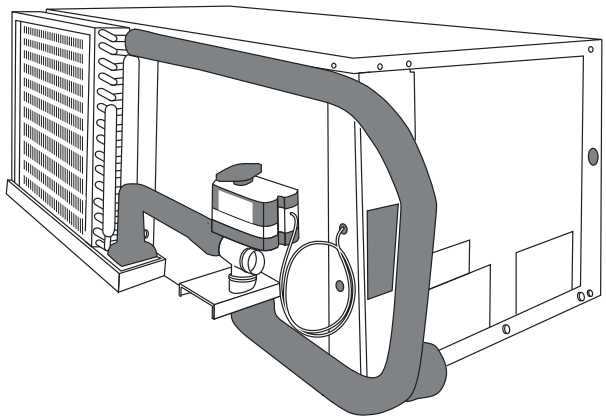
It prevents icing of the air coil when the unit is operating at low cooling load conditions. The hot gas bypass valve located in the compressor discharge line diverts hot gas to the inlet of the air coil. The valve is factory set to open when the evaporating pressure falls to 90 psig and will modulate to prevent the pressure falling any lower. This setting is field adjustable and this set point may be adjusted as required.

Waterside economizer

It is available and allows for free cooling for applications where the water loop temperature is able to reach temperatures between 40 and 65°F. When the loop is cold enough, the waterside economizer acts as a chilled water coil, providing free cooling without the use of the compressor (no mechanical cooling). The water leaving the economizer coil is then directed to the unit coaxial coil, which can allow compressor operation in integrated economizer cooling applications.

The factory-installed waterside economizer coil is mounted external to the air coil as shown below. The waterside economizer is controlled by the factory-supplied and installed aquastat. The aquastat is factory wired to the unit control board, and has a field adjustable range of –30°F to 100°F, with recommended settings of 45°F for cooling. A remote sensing bulb is stored inside the WSHP for shipping and requires field installation.

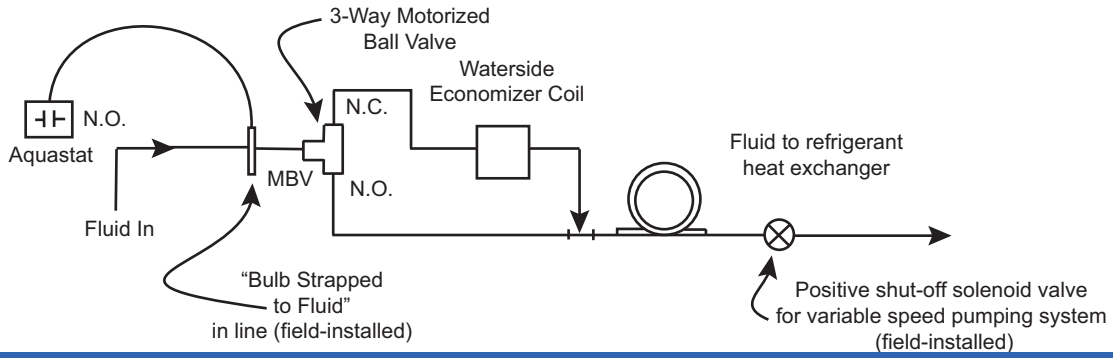
WATERSIDE ECONOMIZER



Water flow through the waterside economizer is controlled by a factory installed and wired 3-way motorized valve. When the waterside economizer is active (based on the aquastat set point), flow is through the waterside economizer coil and then through the coaxial coil. When mechanical cooling is active (when the water loop temperature is outside the aquastat set point), water flow is through the coaxial coil only.

Waterside economizer capacity and performance data can be seen in the WSHP Builder selection software.

WATERSIDE ECONOMIZER APPLICATION



Sound attenuation packages (mute package or closed cell foam)

Available for applications that require especially low noise levels. With the mute package option, a compressor sound blanket is added to reduce compressor sound output. With the closed cell foam option, the entire unit cabinet is lined with high density closed cell foam insulation to reduce the fan and compressor sound output.

Constant torque ECMs

Optional on sizes 015-070 and provide the efficiency and operability of an ECM at a lower cost than a constant airflow ECM. Constant torque ECMs provide 5 available motor speed taps and will maintain a constant motor torque as external static pressure in the system increases. As the system static pressure increases, reduction in fan airflow with a constant torque ECM is minor.

Two-position water valve

Optional on all unit sizes and is a great energy savings option. The valve opens to allow 100% fluid flow through the coaxial heat exchanger only when there is a call for cooling or heating. Closing off fluid flow to the unit when there is no call for cooling or heating reduces system operating costs, when using variable speed pumping, by reducing the speed of the primary loop pumps.

Deluxe D control package

Provides all of the options on the standard Complete C control package in addition to the following:

- Phase Monitor - Prevent motors from running at temperatures above approved ratings, and provides protection against phase loss, phase reversal, and phase imbalance.
- Boilerless Control - For use when the desired means of heating is an electric heater, and no boiler is installed in a water loop system.
- Energy Management Switch - Enables a 24 vac external signal to control the operation of the WSHP.
- Pump-Valve Relay - Provides a signal between an isolation valve and a secondary pump.
- Larger transformer - 75 va transformer.

COMPLETE C AND DELUXE D PACKAGE CAPABILITIES

CAPABILITY	COMPLETE C PACKAGE	DELUXE D PACKAGE
High and Low Refrigerant Pressure Switches	X	X
Fluid Temperature (Freeze) Protection	X	X
Condensate Overflow Protection Sensor	X	X
Air Temperature (Freeze) Protection	X	X
Anti-short Cycle Timer	X	X
Random Start Relay	X	X
Low Pressure Bypass Timer	X	X
Surge Protection	X	X
Intelligent Reset	X	X
Lockout Reset	X	X
Malfunction (Alarm) Output	X	X
Test Service Mode with LED Fault Indication	X	X
Dehumidification Control via Hot Gas Reheat	X	X
Waterside Economizer Control	X	X
Transformer	50 va*	75 va
Field Installed DDC Controller	X	X
Phase Monitor (3-phase Units Only)		X
Boilerless Control		X
Energy Management Switch		X
Pump-Valve Relay		X

* With HGRH (hot gas reheat), waterside economizer or factory-installed DDC (direct digital controls), the WSHP will have a 75 va transformer.

Options and accessories (cont)

WSHP Open controller

Continuously monitors and regulates water source heat pump operation with reliability and precision. This advanced controller features a sophisticated, factory-engineered control program that provides optimum performance and energy efficiency.

The WSHP Open controller is factory installed and programmed to control all factory-installed standard options including hot gas reheat and waterside economizer as well as provide boilerless electric heat control and demand controlled ventilation.

The WSHP Open controller is programmed to communicate with different protocols including BACnet, N2, Modus and LonWorks. While the controller is programmed to operate on Carrier's i-Vu® building automation system (BAS), the WSHP Open can easily be integrated into a third party BAS.

NOTE: A separate LON integration card is required for LonWorks.

Independent three-speed fan control

It provides the most efficient WSHP operation. All WSHP Open controllers come programmed from the factory with 3-speed fan control, with user selectable low, medium and high fan speeds. Using the space temperature input, the WSHP Open controller will automatically operate the fan at the optimal speed to maintain space temperature while providing increased latent heat removal, reduced sound and the lowest fan energy consumption.

Three-speed fan control is available only with constant torque ECM and PSC fan motors.

Intuitive fault detection

Allows prolonged operation of the WSHP. The pre-programmed WSHP Open controller logic monitors and preemptively shuts down a WSHP as an alarming condition approaches instead of causing a hard lockout of the WSHP. This way, the WSHP can automatically restart if the fault condition clears within a set amount of time and a local reset of the WSHP is not required.

Learning adaptive optimal start

It transitions the WSHP from unoccupied set points to occupied set points in the most efficient means possible. Over time, the WSHP will learn and determine the best adjustment rates of the set points to provide the most efficient means of shifting the WSHP to an occupied mode.

Field-installed accessories

WSHP Open Equipment Touch™ and System Touch™

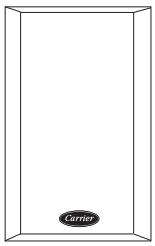
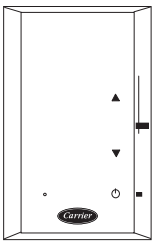
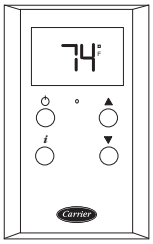
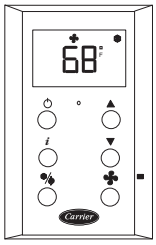
These touchscreen devices have a color LCD display that allows easy connection to the controllers to view or change the controller's property values including set points, schedule equipment, view trends and alarms and more. The Equipment Touch device provides easy connection to one controller while the System Touch device can access up to 60 controllers when wired together as a network. For more details about the Equipment Touch and System Touch devices, see either the Equipment Touch or System Touch Installation and Setup Guide.

WSHP Open

ZS sensors are the preferred method of monitoring space temperature, humidity and CO_2 levels when using the WSHP Open controller.

NOTE: The ZS sensor is required for space temperature with all WSHP Open controllers. Only a ZS sensor can provide the necessary space temperature input for the WSHP Open controller.

ZS SENSOR FEATURES

FEATURES	 ZS STANDARD	 ZS PLUS	 ZS PRO	 ZS PRO-F
Temp, CO_2, Humidity	X	X	X	X
Neutral Color	X	X	X	X
Addressable/Supports Daisy-Chaining	X	X	X	X
Hidden Communication Port	X	X	X	X
Mounts on a Standard 2-in. X 4-in. Electrical Box	X	X	X	X
Occupancy Status Indicator		X	X	X
Push-Button Occupancy Override		X	X	X
Set Point Adjust		X	X	X
Large, Easy-to-Read LCD			X	X
Alarm Indicator			X	X
Fan Speed Control				X
Cooling/Heating/Fan Only - Mode Control				X
F to C Conversion Button				X

ZS SENSOR OPTIONS

OPTIONS	ZS STANDARD	ZS PLUS	ZS PRO	ZS PRO-F
	Part Number			
Temperature Only	ZS2-CAR	ZS2PL-CAR	ZS2P-CAR	ZS2PF-CAR
Temperature with CO_2	ZS2-C-CAR	ZS2PL-C-CAR	ZS2P-C-CAR	ZS2PF-C-CAR
Temperature with Humidity	ZS2-H-CAR	ZS2PL-H-CAR	ZS2P-H-CAR	ZS2PF-H-CAR
Temperature with Humidity and CO_2	ZS2-HC-CAR	ZS2PL-HC-CAR	ZS2P-HC-CAR	ZS2PF-HC-CAR

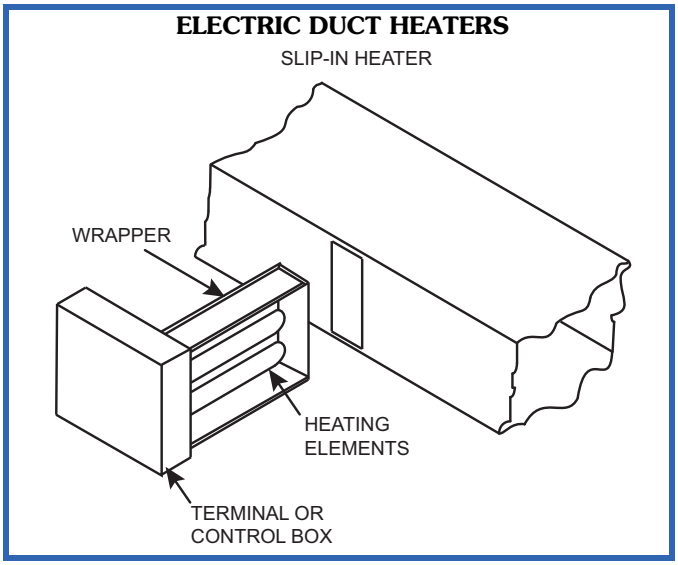
Supply and return water hose kits

Available as accessories. Hose kits are recommended for connection between the unit and the water loop piping. Hose kits are 24 inches in length, flexible stainless steel and have options for manual isolation valves with and without autoflow regulators and Y-strainers.

Electric duct heaters

Available ranging from 5 to 20 kW of electric heat in all available WSHP voltages. These slip-in type heaters provide an extra means of auxiliary heat or reheat control.

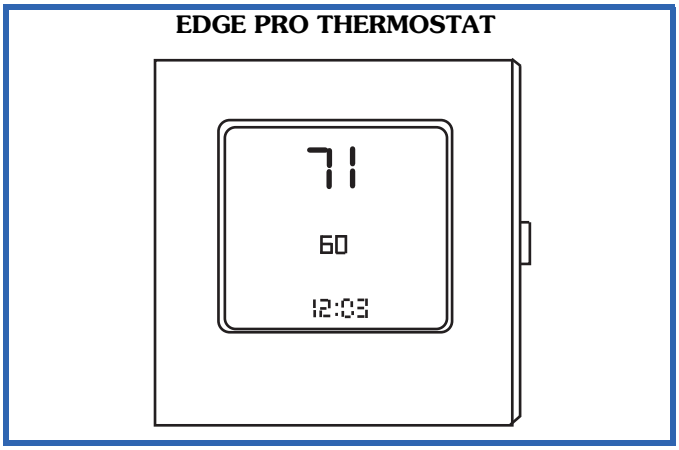
ELECTRIC DUCT HEATERS



Edge® Pro 7-day programmable thermostat

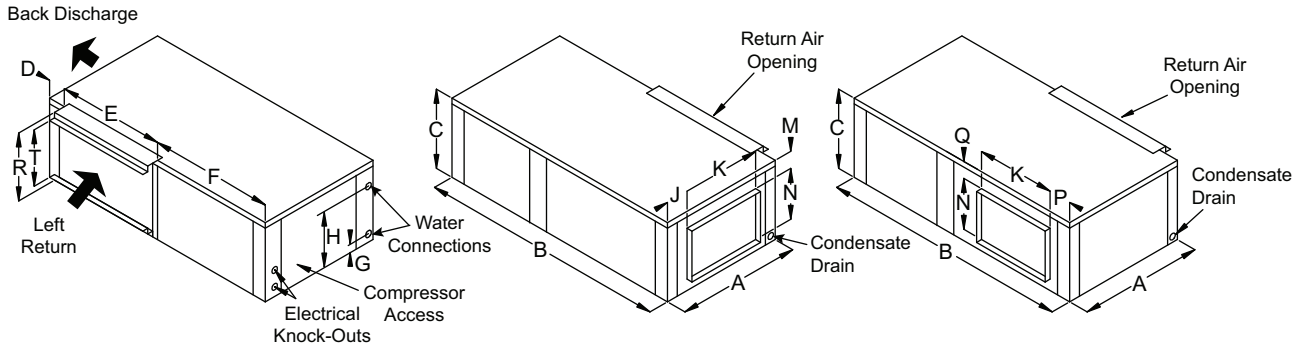
Available for connecting a unit directly to a wall mounted thermostat. The Edge Pro thermostat offers 2-stage heat, 2-stage cool, remote sensor capability, pre-occupancy purge, soft start, manual/auto changeover, 4 settings per day, 24 vac, backlit LCD, keypad lockout, no batteries required, 5-minute compressor protection, never lost memory, 3 security levels, and temperature display in degrees F or C.

EDGE PRO THERMOSTAT



Dimensions

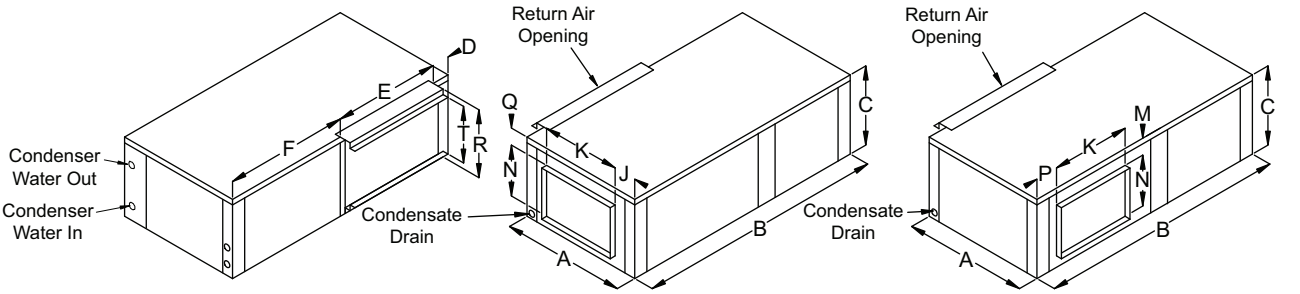
50PCH UNIT



Left Hand Return, Back Discharge

Left Hand Return, Right Discharge

NOTE: Models 048 and 060 Left Hand Return units have condenser water connections on the front right and electrical knockouts on the front left.

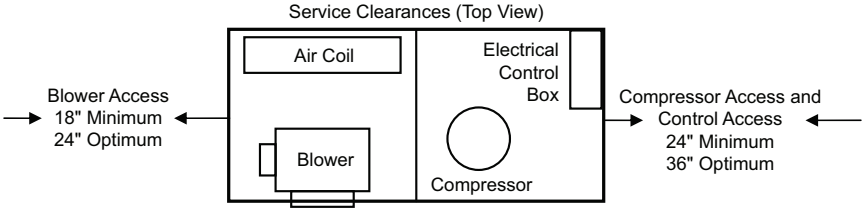


Right Hand Return, Back Discharge

Right Hand Return, Left Discharge

LEGEND

R/A — Return Air



50PCH007-070 UNITS

50PCH UNIT SIZE	A WIDTH*	B DEPTH†	C HEIGHT	D CAB END TO FILTER RACK	E R/A DUCT WIDTH	F CAB FRONT TO FILTER RACK	G WATER INLET	H WATER OUTLET	J SIDE TO DISC. WIDTH	K DISC. WIDTH	M TOP TO DISC.	N DISC. HEIGHT	P END TO DISC.	Q TOP TO DISC.	R FILTER RACK HEIGHT	T R/A DUCT FLANGE HEIGHT	CONDENSER WATER CONNECTIONS FPT	RECOMMENDED REPLACEMENT NOMINAL FILTER SIZE
007	19.0	33.0	11.5	1.5	16.15	15.35	2.38	9.50	5.375	6.30	5.97	4.10	4.875	1.41	11.3	8.6	3/4	10x16x1
009	19.0	33.0	11.5	1.5	16.15	15.35	2.38	9.50	5.375	6.30	5.97	4.10	4.875	1.41	11.3	8.6	3/4	10x16x1
012	19.0	33.0	11.5	1.5	16.15	15.35	2.38	9.50	5.250	6.43	6.31	4.10	4.750	1.14	11.3	8.6	3/4	10x16x1
015	22.0	43.0	17.0	1.5	20.15	21.35	2.86	15.00	8.150	6.43	9.55	4.10	7.650	3.40	16.8	15.0	3/4	16x20x1
015**	22.0	43.0	17.0	1.5	20.15	21.35	2.86	15.00	5.420	9.13	6.11	9.65	4.920	1.23	16.8	15.0	3/4	16x20x1
018	22.0	43.0	17.0	1.5	20.15	21.35	2.86	14.13	5.420	9.13	6.11	9.65	4.920	1.23	16.8	15.0	3/4	16x20x1
024	22.0	43.0	18.0	1.5	25.00	16.50	2.86	14.13	5.420	9.13	6.11	9.65	4.920	1.23	16.8	15.0	3/4	16x25x1
030	22.0	43.0	18.0	1.5	25.00	16.50	2.47	15.00	5.420	9.13	6.11	9.65	4.920	1.23	16.8	15.0	3/4	16x25x1
036	22.0	54.5	19.0	1.5	30.15	22.85	2.86	16.13	6.470	9.13	7.50	10.28	5.970	1.21	18.8	17.0	3/4	18x30x1
042	22.0	54.5	19.0	1.5	30.15	22.85	2.86	16.13	5.270	10.45	6.46	11.30	4.770	1.22	18.8	17.0	3/4	18x30x1
048	25.0	54.5	21.0	1.5	34.60	18.40	2.86	18.52	7.250	10.45	7.46	11.36	6.750	2.16	20.8	19.0	1	20x34.5x1
060	25.0	54.5	21.0	1.5	34.60	18.40	2.86	18.52	6.320	11.76	6.81	12.50	5.820	1.68	20.8	19.0	1	20x34.5x1
070	25.0	65.0	21.0	1.5	48.10	15.40	2.86	18.52	6.320	11.76	6.81	12.50	5.820	1.68	20.8	19.0	1	20x24x1 (2)

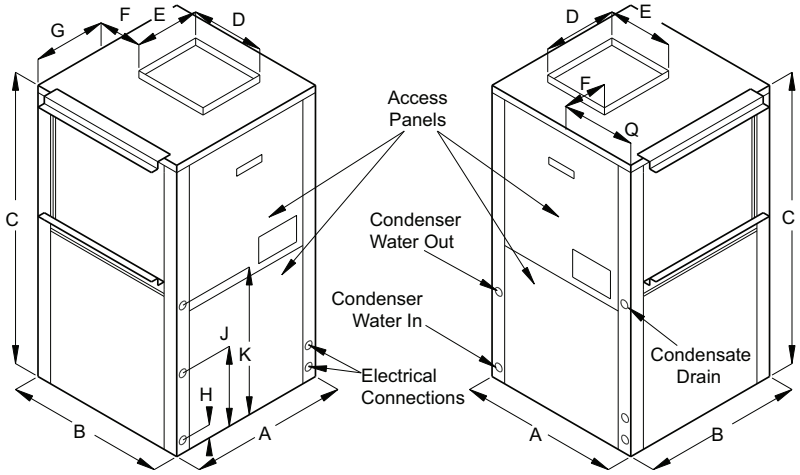
* When waterside economizer is installed, increase width by 7 inches.

† When WSHP Open controller is installed increase depth by 2.6 inches. When waterside economizer is installed, increase depth by 7 inches.

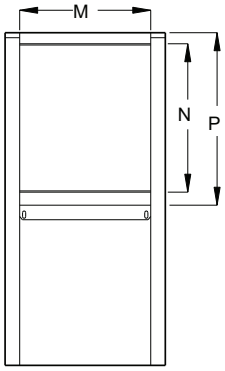
**50PCH015 units built with ECM motor option.

NOTES:
1. All dimensions are within ± 0.125 inch.
2. All condensate drain connections are 3/4 in. FPT.
3. Unit sizes 015-070 can be field converted between end blow and straight through discharge air configurations.
4. Specifications subject to change without notice.
5. The 1-in. filter rack extends 1.23-in. beyond the side of the unit. The 2-in. filter rack extends 2.89-in. beyond the side of the unit. The 2-in. filter rack is 4-sided with a filter access door on one end and can accept either a 1 in. or 2-in. filter. When a waterside economizer is installed the filter rack will be a 2-sided filter rack only.
6. Return and discharge orientations determined when facing panel with water connections.

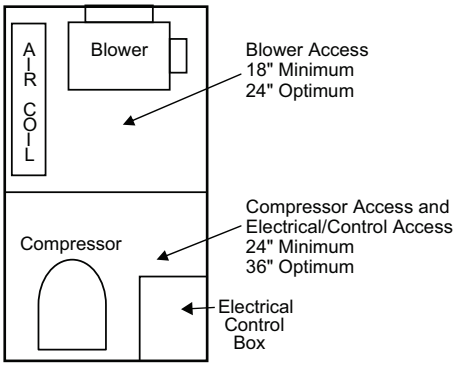
50PCV UNIT



Left Hand Return **Right Hand Return**



Return Air (Filter) View



Front of Unit
Service Clearances

LEGEND
R/A — Return Air

50PCV007-070 UNITS

50PCV UNIT SIZE	A WIDTH*	B DEPTH†	C HEIGHT	D DISC. DEPTH	E DISC. WIDTH	F CABINET EDGE TO DISC.	G LEFT SIDE TO DISC.	H WATER INLET	J WATER OUTLET	K CONDEN-SATE DRAIN	M R/A DUCT WIDTH	N R/A DUCT FLANGE HEIGHT	P FILTER RACK HEIGHT	Q	CONDENSER WATER CONNECTIONS FPT	RECOMMENDED REPLACEMENT NOMINAL FILTER SIZE
007	19.0	19.00	24.25	10.0	8.0	4.5	9.3	2.44	9.68	13.87	16.0	8.0	10.0	5.4	3/4	10x16x1
009	19.0	19.00	24.25	10.0	8.0	4.5	9.3	2.44	9.68	13.87	16.0	8.0	10.0	5.4	3/4	10x16x1
012	19.0	19.00	24.25	10.0	8.0	4.5	9.3	2.44	9.68	13.87	16.0	8.0	10.0	5.4	3/4	10x16x1
015	21.5	21.50	32.25	10.0	8.0	5.8	10.0	2.85	8.45	15.87	20.0	14.0	16.0	3.5	3/4	16x20x1
015**	21.5	21.50	32.25	14.0	14.0	3.1	5.2	2.85	8.45	15.87	20.0	14.0	16.0	5.2	3/4	16x20x1
018	21.5	21.50	32.25	14.0	14.0	3.1	5.2	2.85	8.45	15.87	20.0	14.0	16.0	5.2	3/4	16x20x1
024	21.5	21.50	39.25	14.0	14.0	3.1	5.2	2.80	8.45	18.87	20.0	18.0	20.0	5.2	3/4	20x20x1
030	21.5	21.50	39.25	14.0	14.0	3.1	5.2	2.80	8.45	18.87	20.0	18.0	20.0	5.2	3/4	20x20x1
036	21.5	26.00	43.25	16.0	14.0	4.0	5.0	2.75	10.77	18.87	24.0	22.0	24.0	5.0	3/4	24x24x1
041	21.5	21.50	40.25	16.0	14.0	1.7	4.7	2.80	8.45	18.87	20.0	18.0	20.0	4.7	3/4	20x20x1
042	21.5	26.00	44.25	16.0	14.0	4.0	5.0	2.75	10.77	18.87	24.0	22.0	24.0	5.0	3/4	24x24x1
048	24.0	32.50	45.25	18.0	14.0	7.0	6.2	3.26	13.20	20.87	30.0	22.0	24.0	6.2	1	24x30x1
060	24.0	32.50	45.25	18.0	14.0	7.0	6.2	3.26	13.20	20.87	30.0	22.0	24.0	6.2	1	24x30x1
070	26.0	33.25	58.25	18.0	16.0	7.8	7.2	2.92	13.36	25.87	30.0	30.0	32.0	7.2	1	16x30x1 (2)

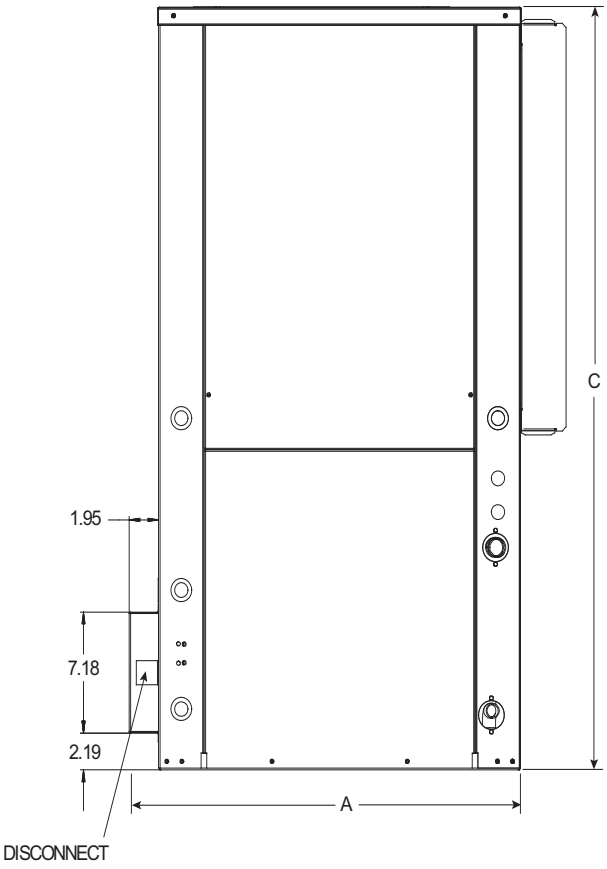
* When waterside economizer is installed, increase width by 7 inches.
† When WSHP Open controller is installed increase depth by 2.6 inches. When waterside economizer is installed, increase depth by 7 inches.
** 50PCV015 units built with ECM Motor Option.

NOTES:
1. All dimensions are within ± 0.125 inch.
2. All condensate drain connections are 3/4 in. FPT.
3. Specifications subject to change without notice.
4. The 1-in. filter rack extends 1.23-in. beyond the side of the unit. The 2-in. filter rack extends 2.89-in. beyond the side of the unit. The 2-in. filter rack is 4 sided with a filter access door on one end and can accept either a 1-in. or 2-in. filter. When a waterside economizer is installed the filter rack will be a 2-sided filter rack only.
5. Return and discharge orientations determined when facing panel with water connections.
6. The local electric codes may require 36 in. or more clearance at the electrical control box.

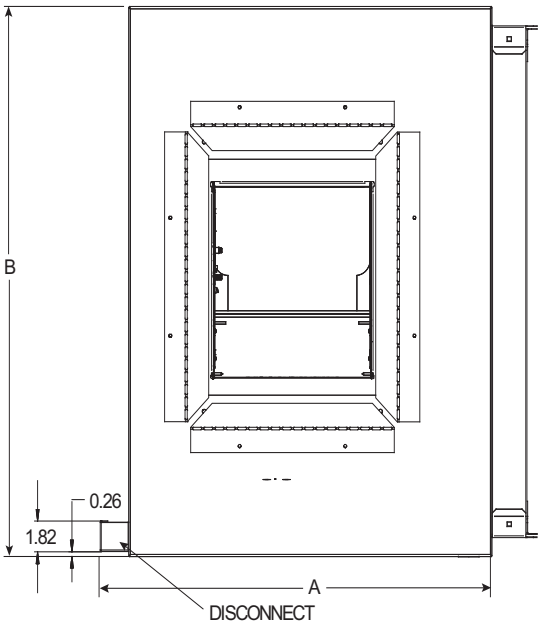
Dimensions (cont)

50PCV WITH FACTORY-INSTALLED DISCONNECT
RIGHT RETURN

FRONT VIEW



TOP VIEW



50PCV007-070 UNITS

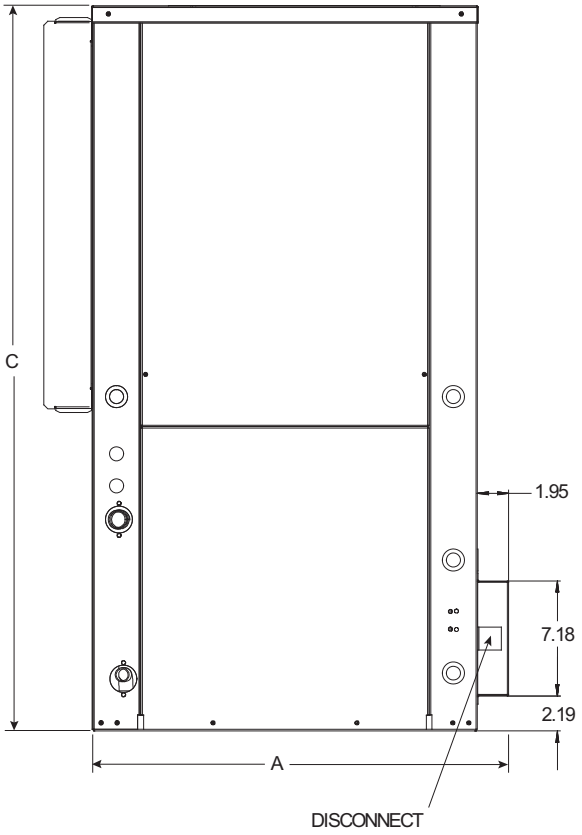
50PCV UNIT SIZE	A	B	C
	Width	Depth*	Height
007	20.95	19.00	24.25
009	20.95	19.00	24.25
012	20.95	19.00	24.25
015	23.45	21.50	32.25
018	23.45	21.50	32.25
024	23.45	21.50	39.25
030	23.45	21.50	39.25
036	23.45	26.00	43.25
041	21.50	21.50	39.25
042	23.45	26.00	43.25
048	25.95	32.50	45.25
060	25.95	32.50	45.25
070	27.95	33.25	58.25

*If WSHP Open Controller is factory-installed, increase depth by 2.6 inches.

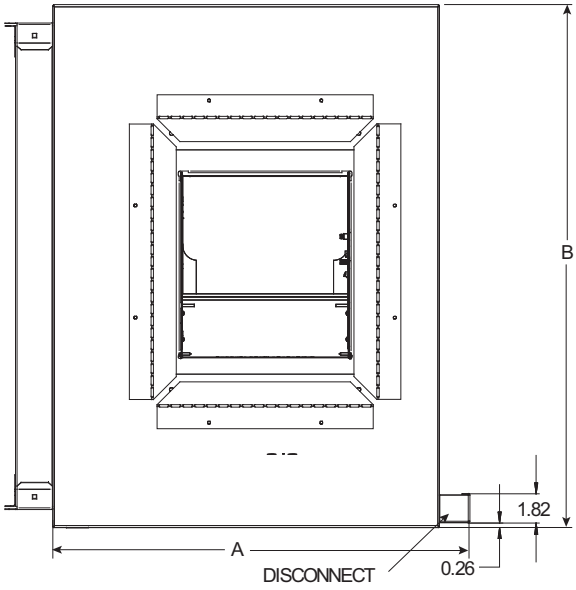
NOTE: Dimensions are shown in inches.

50PCV WITH FACTORY-INSTALLED DISCONNECT
LEFT RETURN

FRONT VIEW



TOP VIEW



50PCV007-070 UNITS

50PCV UNIT SIZE	A	B	C
	Width	Depth*	Height
007	20.95	19.00	24.25
009	20.95	19.00	24.25
012	20.95	19.00	24.25
015	23.45	21.50	32.25
018	23.45	21.50	32.25
024	23.45	21.50	39.25
030	23.45	21.50	39.25
036	23.45	26.00	43.25
041	21.50	21.50	39.25
042	23.45	26.00	43.25
048	25.95	32.50	45.25
060	25.95	32.50	45.25
070	27.95	33.25	58.25

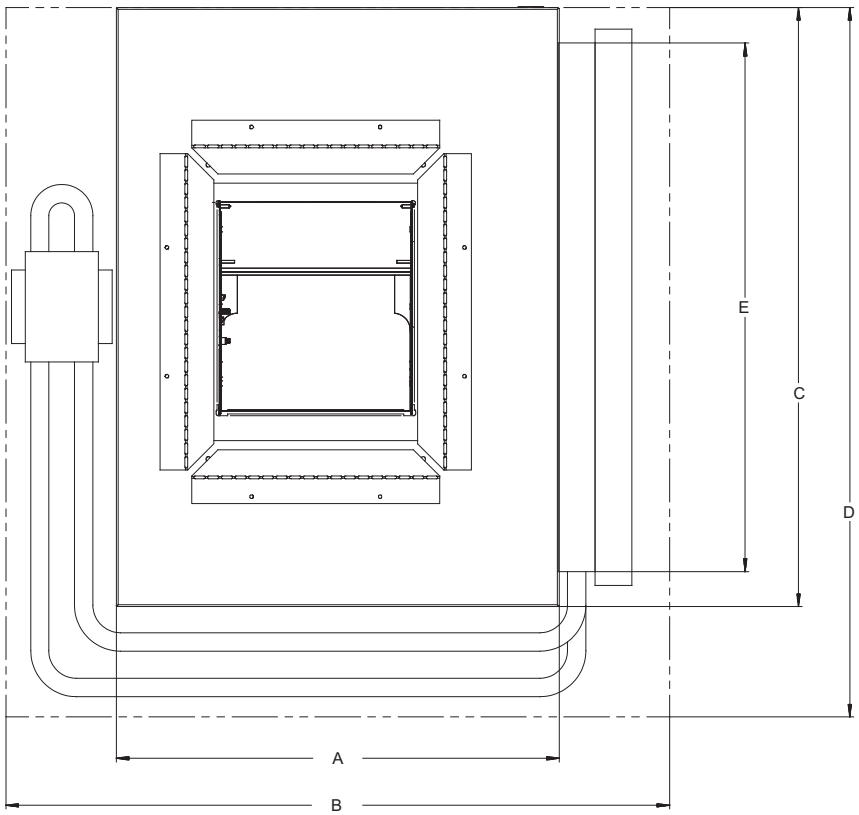
*If WSHP Open Controller is factory-installed, increase depth by 2.6 inches.

NOTE: Dimensions are shown in inches.

Dimensions (cont)

50PCV WITH WATERSIDE ECONOMIZER TOP VIEW; RIGHT RETURN

50PCV WITH WATERSIDE ECONOMIZER
RIGHT RETURN, TOP DISCHARGE



50PCV007-070 UNITS

50PCV UNIT SIZE	A	B	C	D	E	
	WIDTH UNIT	WIDTH ECO OPT	DEPTH UNIT	DEPTH ECO OPT	WIDTH ECO COIL	HEIGHT
007	19.00	31.00	19.00	25.00	14.00	24.25
009	19.00	31.00	19.00	25.00	14.00	24.25
012	21.50	31.00	21.50	25.00	14.00	24.25
015	21.50	33.50	21.50	27.50	16.50	32.25
018	21.50	33.50	21.50	27.50	16.50	32.25
024	21.50	33.50	21.50	27.50	16.50	39.25
030	21.50	33.50	21.50	27.50	16.50	39.25
036	21.50	33.50	26.00	32.00	21.00	43.25
041	21.50	33.50	21.50	27.50	16.50	39.25
042	21.50	33.50	26.00	32.00	16.50	43.25
048	24.00	38.00	32.50	39.50	27.00	45.25
060	24.00	38.00	32.50	39.50	27.00	45.25
070	26.00	40.00	33.25	40.25	27.00	58.25

LEGEND

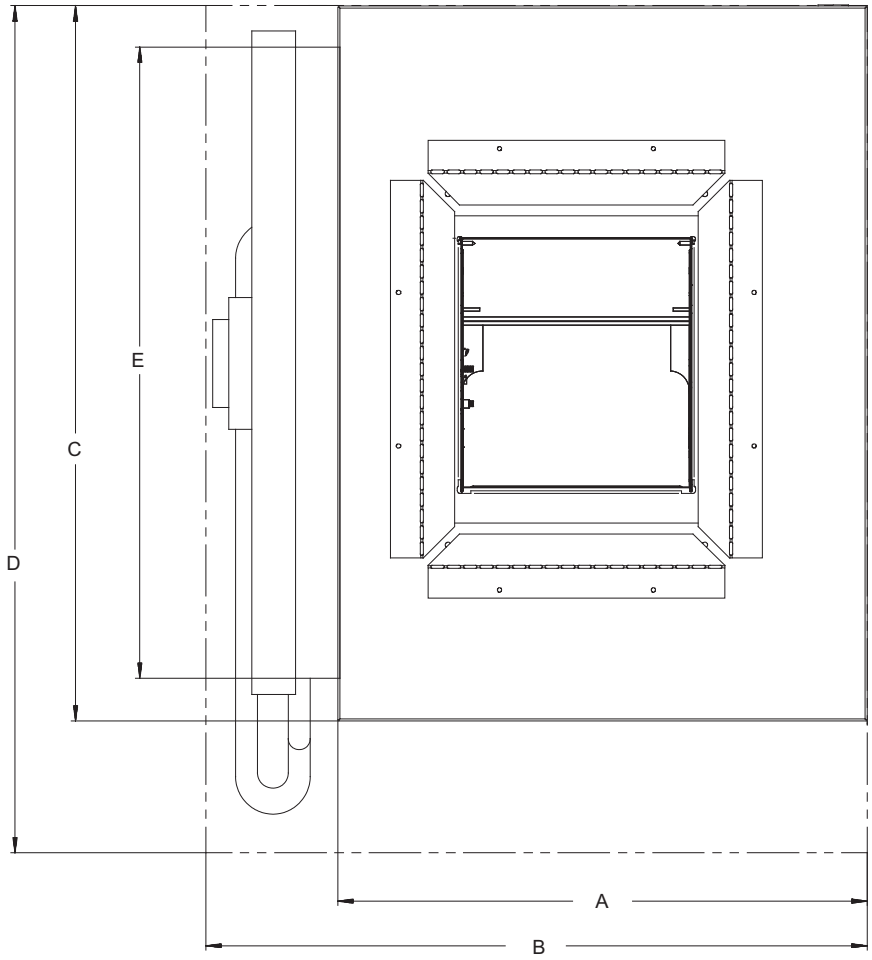
ECO— Economizer
OPT— Option

NOTES:

1. Economizer height is the same as the unit height.
2. Dimensions are in inches.

50PCV WITH WATERSIDE ECONOMIZER
TOP VIEW; LEFT RETURN

50PCV WITH WATERSIDE ECONOMIZER
LEFT RETURN, TOP DISCHARGE



50PCV007-070 UNITS

50PCV UNIT SIZE	A	B	C	D	E	
	WIDTH UNIT	WIDTH ECO OPT	DEPTH UNIT	DEPTH ECO OPT	WIDTH ECO COIL	HEIGHT
007	19.00	25.00	19.00	25.00	14.00	24.25
009	19.00	25.00	19.00	25.00	14.00	24.25
012	21.50	25.00	19.00	25.00	14.00	24.25
015	21.50	27.50	21.50	27.50	16.50	32.25
018	21.50	27.50	21.50	27.50	16.50	32.25
024	21.50	27.50	21.50	27.50	16.50	39.25
030	21.50	27.50	21.50	27.50	16.50	39.25
036	21.50	27.50	26.00	32.00	21.00	43.25
041	21.50	27.50	21.50	27.50	16.50	39.25
042	21.50	27.50	26.00	32.00	16.50	43.25
048	24.00	31.00	32.50	39.50	27.00	45.25
060	24.00	31.00	32.50	39.50	27.00	45.25
070	26.00	33.00	33.25	40.25	27.00	58.25

LEGEND

ECO — Economizer
OPT — Option

NOTES:

1. Economizer height is the same as the unit height.
2. Dimensions are in inches.

Performance data

50PCH007-070 CORNER WEIGHTS (LB)

UNIT SIZE	TOTAL (lb)	LEFT HAND EVAPORATOR				RIGHT HAND EVAPORATOR			
		Left Front*	Right Front*	Left Back	Right Back	Left Front*	Right Front*	Left Back	Right Back
007	98	28	21	25	24	21	28	24	25
009	103	29	23	26	25	23	29	25	26
012	105	29	24	26	26	24	29	26	26
015	127	36	28	34	29	28	36	29	34
018	177	57	36	48	37	36	57	37	48
024	181	58	37	48	38	37	58	38	48
030	194	61	41	52	41	41	61	41	52
036	237	71	49	66	52	49	71	52	66
042	231	70	47	64	50	47	70	50	64
048	268	87	60	62	60	60	87	60	62
060	288	88	65	69	66	65	88	66	69
070	316	98	72	76	70	72	98	70	76

* Front is control box end.

Please see the WSHP Builder for cooling and heating performance data.

ANTIFREEZE CORRECTION TABLE

ANTIFREEZE TYPE	ANTIFREEZE%	COOLING			HEATING		WPD CORRECTION FACTOR
		EWT 90°F			EWT 30°F		
		Total Capacity	Sensible Capacity	kW	Heating Capacity	kW	EWT 30°F
Water	0	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.997	0.997	1.004	0.989	0.997	1.060
	10	0.994	0.994	1.006	0.986	0.995	1.125
	15	0.990	0.990	1.009	0.978	0.988	1.190
	25	0.983	0.983	1.016	0.960	0.979	1.300
	30	0.979	0.979	1.020	0.950	0.974	1.736
	35	0.975	0.974	1.024	0.940	0.969	1.834
Methanol	5	0.997	0.997	1.003	0.990	0.997	1.060
	10	0.996	0.996	1.005	0.979	0.993	1.100
	15	0.994	0.994	1.008	0.970	0.990	1.140
	20	0.992	0.992	1.011	0.961	0.987	1.248
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.160
	10	0.996	0.996	1.004	0.960	0.988	1.230
	15	0.992	0.992	1.006	0.944	0.983	1.280
	25	0.986	0.986	1.009	0.917	0.974	1.400
Ethylene Glycol	5	0.997	0.997	1.003	0.993	0.998	1.060
	10	0.995	0.995	1.004	0.986	0.996	1.120
	15	0.992	0.992	1.005	0.980	0.993	1.190
	25	0.988	0.988	1.009	0.970	0.990	1.330
	30	0.985	0.985	1.012	0.965	0.987	1.400

LEGEND

EWT — Entering Water Temperature
WPD — Water Pressure Differential

Performance data (cont)

50PCH,PCV (007-070) BLOWER PERFORMANCE — STANDARD PSC UNIT

50PCH, PCV	RATED AIRFLOW	FAN SPEED	AIRFLOW (cfm) AT EXTERNAL STATIC PRESSURE (in. wg)											
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
007	300	Low	370	340	295	250	—	—	—	—	—	—	—	—
		Med	390	360	330	300	260	—	—	—	—	—	—	—
		High	410	380	350	315	280	210	—	—	—	—	—	—
009	350	Low	370	340	295	250	—	—	—	—	—	—	—	—
		Med	390	360	330	300	260	—	—	—	—	—	—	—
		High	410	380	350	315	280	210	—	—	—	—	—	—
012	400	Low	300	290	290	300	—	—	—	—	—	—	—	—
		Med	380	380	360	330	290	—	—	—	—	—	—	—
		High	420	400	380	360	340	320	—	—	—	—	—	—
015	500	Low	500	450	400	—	—	—	—	—	—	—	—	—
		Med	560	520	480	430	400	—	—	—	—	—	—	—
		High	700	650	600	550	500	450	400	—	—	—	—	—
018	600	Low	630	590	560	—	—	—	—	—	—	—	—	—
		Med	810	790	760	730	680	590	—	—	—	—	—	—
		High	1010	970	920	870	800	680	530	—	—	—	—	—
024	800	Low	740	730	700	660	610	—	—	—	—	—	—	—
		Med	830	810	770	730	680	620	—	—	—	—	—	—
		High	1000	950	900	830	750	690	630	—	—	—	—	—
030	950	Low	740	730	700	660	610	—	—	—	—	—	—	—
		Med	830	810	770	730	680	620	—	—	—	—	—	—
		High	1000	950	900	830	750	690	630	—	—	—	—	—
036	1200	Low	1290	1250	1200	1150	1080	1000	—	—	—	—	—	—
		Med	1410	1350	1290	1220	1150	1060	900	—	—	—	—	—
		High	1500	1440	1370	1290	1210	1120	1000	900	—	—	—	—
041	1250	Low	950	900	840	780	720	700	—	—	—	—	—	—
		Med	1200	1140	1080	1010	930	870	820	—	—	—	—	—
		High	1490	1400	1320	1240	1160	1080	990	910	—	—	—	—
042	1400	Low	1210	1210	1190	1160	1120	1080	—	—	—	—	—	—
		Med	1460	1450	1430	1390	1330	1250	1160	—	—	—	—	—
		High	1750	1710	1670	1620	1560	1460	1330	1210	1080	—	—	—
048 (208/230V)	1600	Low	1450	1440	1420	1400	1360	1320	—	—	—	—	—	—
		Med	1700	1670	1630	1580	1530	1470	1400	—	—	—	—	—
		High	1930	1870	1810	1740	1670	1600	1520	1430	1340	—	—	—
048 (460V)	1600	Low	1886	1853	1818	1773	1724	1654	1562	1481	1386	1299	883	—
		Med	2029	1993	1946	1897	1837	1763	1662	1564	1460	1360	1254	—
		High	2225	2170	2105	2032	1961	1885	1793	1666	1541	1435	1298	—
060	2000	Low	1560	1550	1540	1530	1505	1475	1440	1400	—	—	—	—
		Med	1890	1880	1870	1860	1825	1790	1730	1670	1590	1500	—	—
		High	2220	2200	2150	2100	2050	2000	1940	1870	1800	1700	1590	—
070	2100	Low	1570	1560	1550	1540	1530	1505	1475	1440	1400	—	—	—
		Med	1900	1890	1880	1870	1860	1825	1790	1730	1670	1590	1500	—
		High	2240	2220	2200	2150	2100	2050	2000	1940	1870	1800	1700	1590

NOTE: 575V models employ 1 speed motor (high only).

50PCH, PCV BLOWER PERFORMANCE — CONSTANT TORQUE MOTOR

50PCH, PCV	RATED AIRFLOW	TAP #	AIRFLOW (cfm) AT EXTERNAL STATIC PRESSURE (in. wg)											
			0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20
015	500	1	480	440	410	370	340	—	—	—	—	—	—	—
		2	530	490	450	420	380	340	—	—	—	—	—	—
		3	600	560	510	470	440	410	370	—	—	—	—	—
		4	650	600	560	520	500	480	440	380	—	—	—	—
		5	710	660	620	580	550	520	490	470	—	—	—	—
018	650	1	630	590	560	530	490	—	—	—	—	—	—	—
		2	720	700	670	630	600	560	—	—	—	—	—	—
		3	790	770	750	710	670	620	560	—	—	—	—	—
		4	910	890	850	810	740	670	590	520	—	—	—	—
		5	1010	970	920	860	810	750	660	530	—	—	—	—
024	850	1	620	600	570	540	490	—	—	—	—	—	—	—
		2	730	710	670	640	610	550	—	—	—	—	—	—
		3	820	790	760	740	710	670	630	—	—	—	—	—
		4	940	910	880	850	800	740	660	—	—	—	—	—
		5	1070	1010	950	900	840	760	670	—	—	—	—	—
030	950	1	620	600	570	540	490	—	—	—	—	—	—	—
		2	730	710	670	640	610	550	—	—	—	—	—	—
		3	820	790	760	740	710	670	630	—	—	—	—	—
		4	940	910	880	850	800	740	660	—	—	—	—	—
		5	1070	1010	950	900	840	760	670	—	—	—	—	—
036	1200	1	1120	1090	1055	1030	1000	—	—	—	—	—	—	—
		2	1260	1230	1200	1170	1140	1080	—	—	—	—	—	—
		3	1330	1290	1250	1210	1170	1100	1030	—	—	—	—	—
		4	1400	1360	1310	1250	1190	1120	1040	960	—	—	—	—
		5	1470	1420	1360	1290	1220	1140	1050	970	890	—	—	—
041	1250	1	840	770	700	620	—	—	—	—	—	—	—	—
		2	1220	1150	1080	1010	950	—	—	—	—	—	—	—
		3	1430	1360	1280	1200	1130	1080	—	—	—	—	—	—
		4	1540	1460	1380	1300	1220	1140	1060	—	—	—	—	—
		5	1620	1550	1470	1370	1260	1180	1090	1000	—	—	—	—
042	1400	1	1270	1250	1230	1210	—	—	—	—	—	—	—	—
		2	1440	1420	1410	1410	1400	1380	1340	—	—	—	—	—
		3	1540	1530	1510	1500	1490	1470	1430	1350	—	—	—	—
		4	1650	1630	1610	1600	1580	1530	1460	1360	1240	—	—	—
		5	1730	1720	1700	1670	1620	1570	1490	1380	1260	1100	—	—
048	1600	1	1390	1370	1350	1320	—	—	—	—	—	—	—	—
		2	1600	1580	1550	1530	1510	—	—	—	—	—	—	—
		3	1730	1700	1670	1650	1630	1600	1580	1540	—	—	—	—
		4	1830	1810	1780	1760	1740	1710	1670	1600	1520	—	—	—
		5	1930	1910	1880	1860	1830	1780	1720	1640	1540	1420	—	—
060	2000	1	1900	1880	1860	1820	—	—	—	—	—	—	—	—
		2	2000	1970	1950	1920	1890	1860	—	—	—	—	—	—
		3	2110	2090	2060	2030	2010	1970	1940	1910	1880	—	—	—
		4	2220	2200	2170	2140	2110	2080	2050	2060	2050	2000	1920	—
		5	2340	2320	2290	2260	2230	2210	2180	2150	2110	2070	2000	1930
070	2100	1	2050	2010	1970	1930	—	—	—	—	—	—	—	—
		2	2150	2120	2080	2030	1990	1960	—	—	—	—	—	—
		3	2270	2230	2200	2160	2120	2080	2040	2010	1980	—	—	—
		4	2390	2350	2320	2280	2250	2200	2160	2130	2100	2070	2030	—
		5	2520	2480	2450	2420	2380	2330	2290	2260	2220	2170	2100	2020

Electrical data

50PCH,PCV (007-070) UNIT WITH STANDARD PSC BLOWER MOTOR ELECTRICAL DATA

50PCH,PCV	RATED VOLTAGE v-ph-Hz	VOLTAGE MIN/MAX	COMPRESSOR			FAN MOTOR FLA	FAN MOTOR HP	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE/ HACR
			QTY	RLA	LRA					
007	208/230-1-60	197/253	1	2.6	17.7	0.96	0.10	3.56	4.2	15
	265-1-60	238/292	1	2.6	13.5	0.96	0.10	3.56	4.2	15
009	208/230-1-60	197/253	1	3.4	22.2	0.96	0.10	4.36	5.2	15
	265-1-60	238/292	1	2.9	18.8	0.85	0.10	3.75	4.5	15
012	208/230-1-60	197/253	1	4.6	28.0	0.96	0.10	5.56	6.7	15
	265-1-60	238/292	1	3.8	22.2	0.85	0.10	4.65	5.6	15
015	208/230-1-60	197/253	1	5.6	29.0	1.10	1.17	6.70	8.1	15
	265-1-60	238/292	1	4.6	20.0	0.90	0.17	5.50	6.7	15
018	208/230-1-60	197/253	1	7.4	33.0	1.80	0.25	9.20	11.1	15
	265-1-60	238/292	1	6.0	28.0	1.60	0.25	7.60	9.1	15
024	208/230-1-60	197/253	1	13.5	58.3	1.80	0.25	15.30	18.7	30
	265-1-60	238/292	1	9.0	54.0	1.60	0.25	10.60	12.9	20
	208/230-3-60	197/253	1	7.1	55.4	1.80	0.25	8.90	10.7	15
	460-3-60	414/506	1	3.5	28.0	0.90	0.25	4.40	5.3	15
030	208/230-1-60	197/253	1	12.8	64.0	1.80	0.25	14.60	17.8	30
	265-1-60	238/292	1	10.9	60.0	1.60	0.25	12.50	15.2	25
	208/230-3-60	197/253	1	8.3	58.0	1.80	0.25	10.10	12.2	20
	460-3-60	414/506	1	5.1	28.0	0.90	0.25	6.00	7.3	15
036	208/230-1-60	197/253	1	15.2	79.0	4.40	0.50	19.60	23.4	35
	208/230-1-60*	197/253	1	15.4	83.9	4.40	0.50	19.80	23.7	35
	265-1-60	238/292	1	11.6	72.0	3.60	0.50	15.20	18.1	40
	208/230-3-60	197/253	1	10.4	73.0	4.40	0.50	14.80	17.4	25
	460-3-60	414/506	1	5.8	38.0	1.80	0.50	7.60	9.1	15
041	208/230-1-60	197/253	1	15.4	83.9	4.40	0.75	19.80	23.7	40
	208/230-3-60	197/253	1	10.4	73.0	4.40	0.75	14.80	17.4	25
	460-3-60	414/506	1	5.8	38.0	2.80	0.75	8.60	10.1	15
042	208/230-1-60	197/253	1	16.2	109.0	4.40	0.50	20.60	24.7	40
	460-3-60	414/506	1	5.6	44.0	1.80	0.50	7.40	8.8	15
048	208/230-1-60	197/253	1	19.6	130.0	4.40	0.75	24.00	28.9	45
	208/230-3-60	197/253	1	13.7	83.1	4.40	0.75	18.10	21.5	35
	460-3-60	414/506	1	6.2	41.0	2.80	0.75	9.00	10.6	15
	575-3-60	517/633	1	4.8	33.0	2.60	0.75	7.40	8.6	15
060	208/230-1-60	197/253	1	26.0	134.0	6.00	0.75	31.80	38.4	60
	208/230-3-60	197/253	1	16.0	110.0	6.00	0.75	21.10	25.0	40
	460-3-60	414/506	1	8.0	52.0	3.00	0.75	10.60	12.6	20
	575-3-60	517/633	1	6.0	38.9	3.00	0.75	8.40	9.9	15
070	208/230-1-60	197/253	1	28.3	178.0	5.50	0.75	33.80	40.9	60
	208/230-3-60	197/253	1	19.2	136.0	5.50	0.75	24.70	29.5	45
	460-3-60	414/506	1	8.7	66.1	2.80	0.75	11.50	13.7	20
	575-3-60	517/633	1	6.9	55.3	2.60	0.75	9.50	11.2	15

LEGEND

FLA — Full Load Amps
HACR — Heating, Air-Conditioning and Refrigeration
LRA — Locked Rotor Amps
RLA — Rated Load Amps

*Data for units produced on or after week 46 of 2019.

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50PCH,PCV UNIT WITH CONSTANT TORQUE ECM BLOWER MOTOR ELECTRICAL DATA

50PCH,PCV	RATED VOLTAGE v-ph-Hz	VOLTAGE MIN/MAX	COMPRESSOR			FAN MOTOR FLA	FAN MOTOR HP	TOTAL UNIT FLA	MIN CIRCUIT AMP	MAX FUSE/ HACR
			QTY	RLA	LRA					
015	208/230-1-60	197/253	1	5.6	29.0	2.8	0.33	8.4	9.8	15
	265-1-60	238/292	1	4.6	20.0	2.6	0.33	7.2	8.4	15
018	208/230-1-60	197/253	1	7.4	33.0	2.8	0.33	10.2	12.1	15
	265-1-60	238/292	1	6.0	28.0	2.6	0.33	8.6	10.1	15
024	208/230-1-60	197/253	1	13.5	58.3	2.8	0.33	16.3	19.7	30
	265-1-60	238/292	1	9.0	54.0	2.6	0.33	11.6	13.9	20
	208/230-3-60	197/253	1	7.1	55.4	2.8	0.33	9.9	11.7	15
	460-3-60	414/506	1	3.5	28.0	2.1	0.50	5.6	6.5	15
030	208/230-1-60	197/253	1	12.8	64.0	2.8	0.33	15.6	18.8	30
	265-1-60	238/292	1	10.9	60.0	2.6	0.33	13.5	16.2	25
	208/230-3-60	197/253	1	8.3	58.0	2.8	0.33	11.1	13.2	20
	460-3-60	414/506	1	5.1	28.0	2.1	0.50	7.2	8.5	15
036	208/230-1-60	197/253	1	16.7	79.0	4.1	0.50	20.8	25.0	40
	208-230/1/60	197/253	1	15.4	83.9	4.1	0.50	19.5	23.4	35
	265-1-60	238/292	1	11.6	72.0	3.6	0.50	15.2	18.1	25
	208/230-3-60	197/253	1	10.4	73.0	4.1	0.50	14.5	17.1	25
	460-3-60	414/506	1	5.8	38.0	2.1	0.50	7.9	9.4	15
041	208/230-1-60	197/253	1	15.4	83.9	6.0	0.75	21.4	25.3	40
	208/230-3-60	197/253	1	10.4	73.0	6.0	0.75	16.4	19.0	30
	460-3-60	414/506	1	5.8	38.0	3.2	0.75	9.0	10.5	15
042	208/230-1-60	197/253	1	16.7	109.0	6.0	0.75	22.7	26.9	40
	208/230-3-60	197/253	1	11.2	84.0	6.0	0.75	17.2	20.0	30
	460-3-60	414/506	1	5.6	44.0	3.2	0.75	8.8	10.2	15
048	208/230-1-60	197/253	1	19.6	130.0	6.0	0.75	25.6	30.5	50
	208/230-3-60	197/253	1	13.7	83.1	6.0	0.75	19.7	23.1	35
	460-3-60	414/506	1	6.2	41.0	3.2	0.75	9.4	11.0	15
060	208/230-1-60	197/253	1	26.3	145.0	7.6	1.00	33.9	40.5	60
	208/230-3-60	197/253	1	15.6	123.0	7.6	1.00	23.2	27.1	40
	460-3-60	414/506	1	7.8	70.0	4.0	1.00	11.8	13.8	20
070	208/230-1-60	197/253	1	28.3	158.0	7.6	1.00	35.9	43.0	70
	208/230-3-60	197/253	1	19.2	155.0	7.6	1.00	26.8	31.6	50
	460-3-60	414/506	1	8.7	75.0	4.0	1.00	12.7	14.9	20

LEGEND

FLA — Full Load Amps
HACR — Heating, Air-Conditioning and Refrigeration
LRA — Locked Rotor Amps
RLA — Rated Load Amps

Application data

Aquazone™ water source heat pumps are available in a flexible, efficient array of models, which can be used in all types of water loop, ground water, and ground loop type systems. Aquazone products provide optimal energy efficient solutions and adapt to the most challenging design requirements.

Water loop system

Water loop (or boiler/tower) system applications typically include a number of units plumbed to a common piping system. For optimal performance, this system should be designed between 2.25 and 3 gpm per ton of cooling capacity. The system is comprised of highly efficient packaged reverse cycle heat pump units interconnected by a water loop. The water circuit serves as both a sink and source for heat absorption and rejection and is designed for entering water temperatures between 50 and 90°F. Within this temperature range units can heat or cool as required from the same water source. Transferring heat from warm to cold spaces in the building, whenever they coexist, conserves energy rather than creating new heat.

Refer to the **Carrier Water Source Heat Pump System Design Guide** for assistance designing water loop systems. The guide includes a practical approach for the most current design recommendations including:

- Product application including horizontal, vertical, console, rooftop and water-to-water applications.
- Ventilation methods and system design including energy recovery.
- Acoustical considerations for different product types.
- Addressing indoor air quality (IAQ) issues such as condensate removal, humidity control.
- Air distribution design including diffuser selection/layout and ductwork design.
- Hydronic system design including pipe sizing/layout and boiler/tower sizing.
- Control configurations such as stand alone, DDC, DCV (demand controlled ventilation), and VVT® (variable volume and temperature) controls.
- Water Source Heat Pump Efficiency/Operational Cost Comparison chart.
- System variations such as a system without a boiler, variable pumping, and VAV (variable air volume) for interior use.

Ground water systems

To utilize Aquazone units in ground water applications, extended range should be specified. This will provide factory-installed insulation on the coaxial coil to prevent condensate from dripping when entering water temperatures are below 50°F. In addition, the copper coaxial coil installed on the Aquazone units may not be suitable for all water conditions. Refer to the Water Conditioning section for proper coaxial coil material selection.

Surface water system

This system is typically located near a lake or pond. In this application, the loop can be submerged in a series of coils beneath the water surface. The number of coils required depends on system load and design. This application requires minimum piping and excavation.

Open loop system

This system is used where ground water is plentiful. In this application, ground water is pumped through supply piping from the well to the building. The water is then pumped back into the ground through a discharge well as it leaves the building. An additional heat exchanger is usually installed between the building water piping system and the ground water piping system. This design limits the amount of piping and excavation required.

Aquazone units are available with an extended range option for open or closed loop systems. To conserve water on this type of system, a slow opening/closing solenoid valve is recommended. Depending on loop water temperatures, a water regulating valve may be needed.

Ground loop systems

There are many commonly specified designs for ground loop applications. Typical designs include vertical and horizontal loops. In some applications, water is piped from the ground or lake directly to the water source heat pump. Piping is limited to the amount of pipe required to get the water from the source to the unit.

NOTE: When utilizing Aquazone water source heat pumps in ground loop systems, refer to design considerations in the ground water system section.

Horizontal ground loop

This system is used when adequate space is available and trenching can be easily accomplished. A series of parallel pipes are laid out in trenches 3 to 6 ft below the ground surface, and then back-filled. Often, multiple pipes are used to maximize the heat transfer capability of each trench. The amount of pipe and the size of the ground loop field are based on ground conditions, heating, and cooling requirements of the application and system design.

Vertical ground loop

This system is used in vertical borehole applications. This design is well suited for retrofit applications when space is limited or where landscaping is already complete and minimum disruption of the site is desired. The vertical ground loop system contains a single loop of pipe inserted into a hole. The hole is back-filled and grouted after the pipe is inserted. The completed loop is concealed below ground. The number of loops required depends on ground conditions, heating and cooling requirements, and the depth of each hole.

Hybrid systems

In some applications, it may be beneficial to incorporate a cooling tower into the ground loop system to reduce the overall cost. A hybrid system discards excess heat into the air and increases the cooling performance of the ground loop.

Condensate drainage

Venting

Properly vent condensate lines to prevent fan pressure from causing water to hang up in the piping. Condensate lines should be pitched to assure full drainage of condensate under all load conditions. Use chemical treatment to remove algae in the condensate pans and drains in geographical areas that are conducive to algae growth.

Trapping

Condensate trapping is a necessity on every water source heat pump unit. A trap is provided to prevent the backflow of moisture from the condensate pan and into the fan intake or downstream into the mechanical system. The water seal or the length of the trap depends on the positive or negative pressure on the drain pan. As a rule of thumb, size the water seal 1 in. for every 1 in. of negative pressure on the unit. The water seal is the distance from the bottom of the unit condensate piping connection to the bottom of

the condensate drain line run-out piping. Therefore, the trap size should be double the water seal dimension.

Horizontal units

Horizontal units should be sloped toward the drain at a $^1/_4$ in. per foot pitch. If it is not possible to meet the pitch requirement, a condensate pump should be designed and installed at the unit to pump condensate to a building drain. Horizontal units are not internally trapped; therefore an external trap is necessary. Each unit must be installed with its own individual trap and means to flush or blow out the condensate drain. It is not acceptable to use a common trap or vent for multiple units. The condensate piping system should not be designed with a pipe size smaller than the drain connection pipe size.

Vertical units

All vertical units require installation of an external trap.

Water conditioning

In some applications, maintaining proper water quality may require higher corrosion protection for the water-to-refrigerant heat exchanger. Water quality varies from location to location and is unique for each job. Water characteristics such as pH value, alkalinity, hardness, and specific conductance are important when considering any WSHP application. Water typically includes impurities and hardness that must be removed. The required treatment will depend on the water quality as well as type of system. Water problems fall into three main categories:

1. Scale formation caused by hard water reduces the heat transfer rate and increases the water pressure drop through the heat exchanger. As water is heated, minerals and salts are precipitated from a solution and deposited on the inside surface of the pipe or tube.
2. Corrosion is caused by absorption of gases from the air coupled with water on exposed metal. Corrosion is also common in salt-water areas.
3. Organic growths such as algae can reduce the heat transfer rate by forming an insulating coating on the inside tube surface. Algae can also promote corrosion by pitting.

NOTE: In most commercial water loop applications, Aquazone WSHP units use copper water-to-refrigerant heat exchanger. Units can and should be equipped with a cupronickel heat exchanger for applications where water is outside the standard contaminant limits for a copper heat exchanger.

Acoustical design

Sound power levels represent the sound as it is produced by the source, the WSHP unit, with no regard to attenuation between the source and the space. Acoustical design goals are necessary to provide criteria for occupied spaces where people can be comfortable and communicate effectively over the background noise of the air-conditioning system and other background noise sources.

Acoustical design goals are desirable sound pressure levels within a given conditioned space and are represented by noise criteria (NC) curves. The NC curve levels represent a peak over a full spectrum of frequencies. A high value in a low frequency band has the same effect on NC level as a lower value in a high frequency band. It is important that sound levels be balanced over the entire spectrum relative to the NC curve. The lower the NC criteria curve, the more stringent the room acoustical design must be to meet the design goals.

It is important to know how to convert NC levels from the unit ratings in terms of sound power (Lw). This conversion depends on the specifics of the acoustical environment of the installation.

The resulting calculations are compared to the NC curve selected for the area to assess the acoustical design.

Some of the factors that affect conversion of sound power to sound pressure and consequent NC level include:

- type of acoustical ceiling
- use of metal or flex duct
- absorption in the occupied space
- location in the occupied space
- open or closed layout plan
- use of open or ducted returns
- orientation of unit to occupant
- use of lined or unlined duct

Hot gas reheat

Hot gas reheat (HGRH) allows a WSHP to dehumidify the space when the space temperature is satisfied but the space humidity is high. High humidity can promote mold and bacteria growth, poor indoor air quality (IAQ), and cause occupant discomfort.

Possible causes of excess humidity could be a byproduct of the unit having to operate under a widely varying load, an oversized unit that is short cycling, a high percentage of unconditioned outside air being introduced into the space, a high latent load in the space or any location where humidity infiltration is a problem.

A properly sized WSHP unit operating in cooling mode will dehumidify the air as it cools. Once the space temperature is satisfied and cooling mode is disabled, the unit no longer dehumidifies. Operating the unit in cooling mode for the sole purpose of dehumidifying will cause the space to become cold and uncomfortable. HGRH allows the unit to continue dehumidifying the space without over cooling the space.

Dehumidification with HGRH requires a control system with dehumidification capabilities, such as a thermostat with dehumidification output, a thermostat with separate humidistat, or a DDC controller with humidity sensor and dehumidification output.

Once the space temperature is satisfied but the space humidity is above the desired set point, the control system sends a dehumidification command (H input) to the WSHP. The WSHP is now in dehumidification mode.

In dehumidification mode, the fan, reversing valve, HGRH valve, and compressor are all enabled. The reversing valve directs cold refrigerant liquid to the indoor air coil and the HGRH valve directs warm refrigerant vapor to the HGRH coil.

As the fan draws warm, humid air into the unit, the air passes through the indoor air cool where it is cooled and dehumidified, due to the cold liquid refrigerant flowing in the coil. The cooled and dehumidified air then passes through the HGRH coil where it is reheated to a neutral temperature (68°F to 78°F typical), due to the warm refrigerant vapor flowing in the coil. The air exits the unit at a neutral temperature and low humidity (dry).

The unit will remain in dehumidification mode until the space humidity is reduced below the set point or there is a call for space cooling, which is prioritized over dehumidification mode.

The moisture removal capacity of a WSHP in a specific application will depend on multiple factors including the WSHP