



Product Data

Aquazone™ Indoor Packaged Water Source Heat Pump Units

1/2 to 6 Nominal Tons



50WC Vertical and Horizontal Compact
Water Source Heat Pump Units with
PuronAdvance® Refrigerant (R-454B)
Sizes 007-070

Carrier's Aquazone™ indoor packaged water source heat pump (WSHP) is an efficient, compact solution great for both new construction and retrofit applications.

The Carrier AquaZone 50WC water source heat pumps utilize Puron Advance® low GWP refrigerant (R-454B), with a GWP of 465, ensuring compliance with U.S. EPA (Environmental Protection Agency) and other regulatory agency limits of 700, offer:

- A compact, cost optimized design in both a vertical and horizontal packaged configuration.
- Enhanced serviceability features, a wide variety of factory-installed options, and flexible configurations suitable for boiler tower, geothermal, and hybrid water loop systems.
- Optional integrated Carrier TruVu™ controls allowing for advanced equipment control and monitoring and seamless integration to the i-Vu® building automation system.

Cabinet construction and insulation

Heavy gauge 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 or closed cell foam 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.

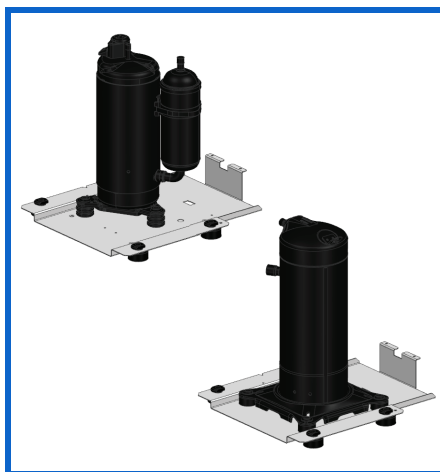
Cabinets are fully insulated to reduce noise transmission, low speed blowers

are used for quiet operation through reduced outlet air velocities, and air to refrigerant coils are designed for lower airflow coil face velocities.

Compressor

Compact Aquazone units include a rotary compressor in sizes 007-030 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

All 50WC 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 50WC units preventing vibration and noise transmission from the compressor to the unit structure, resulting in exceptionally quiet operation.



Refrigerant circuit

All units contain sealed refrigerant (R-454B) circuit including features like:

- Thermal expansion valve — 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.
- Reversing Valve (4-way valve) — Units are equipped with a refrigerant reversing valve. This valve's operation is specifically controlled to switch modes, ensuring heightened reliability in functionality.
- Pressure ports — All units are provided with high and low pressure ports integral to the refrigeration circuit for ease service.
- Filter dryer — Standard on units with scroll compressor 2 tons and up, the refrigerant circuit filter dryer enhances system performance by efficiently filtering and removing contaminants for improved longevity and efficiency.

Refrigerant to air heat exchanger

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 cooling mode. Additional air coil coating protection option is available for units.

Refrigerant to water heat exchanger

50WC units are offered with a Copper coaxial (tube-in-tube) refrigerant to water heat exchanger. Optional Cupronickel coaxial heat exchanger is available for higher corrosion protection. Additionally, heat exchanger is insulated to prevent condensation, and therefore potential dripping problems, in applications where the entering water temperature is less than 50°F.



Table of contents

| | Page |
|--------------------------------------|------|
| Overview | 2 |
| Features/Benefits | 5 |
| Model Number Nomenclature | 7 |
| AHRI Ratings and Capacities. | 8 |
| Physical Data | 9 |
| Options and Accessories | 11 |
| Dimensions | 21 |
| Performance Data | 28 |
| Electrical Data | 35 |
| Application Data | 40 |
| Selection Procedure | 47 |
| Guide Specifications | 50 |

Blower motor and housing

All units come equipped with a direct drive blower and motor assembly, which includes large blower wheels that enable the unit to operate at lower speeds, resulting in quieter operation. These units offer three optional motor choices: Permanent split capacitor (PSC), Constant Torque ECM, Constant Airflow ECM.

To minimize noise and vibration transmission to the unit and airstream, the motors are mounted on the fan housing using rubber grommets. The standard configuration includes a 1-inch supply air duct-flange connection, facilitating easy duct installation on the unit.

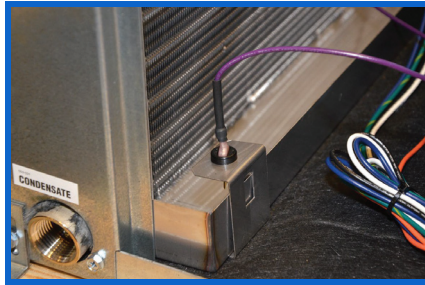
Stainless steel drain pan with condensate switch

Protection against corrosion is a feature in the 50WC series. A stainless steel drain pan is designed to last the lifetime of the unit and resist corrosion and cracking that may occur with steel or plastic materials.

Condensate overflow sensor

Factory-installed 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.



Unit controls

All Carrier WSHPs are equipped with a 24V low voltage control circuit. Units are selectable to be provided with no controls for control via a field installed thermostat or third party DDC or to be provided with a factory installed Carrier i-Vu TruVu DDC for advanced equipment control and monitoring. Regardless of the selection all units will be equipped with a unit protection module, which regulates unit operation, features integrated safeties, and simplifies unit troubleshooting.

Electrical protection

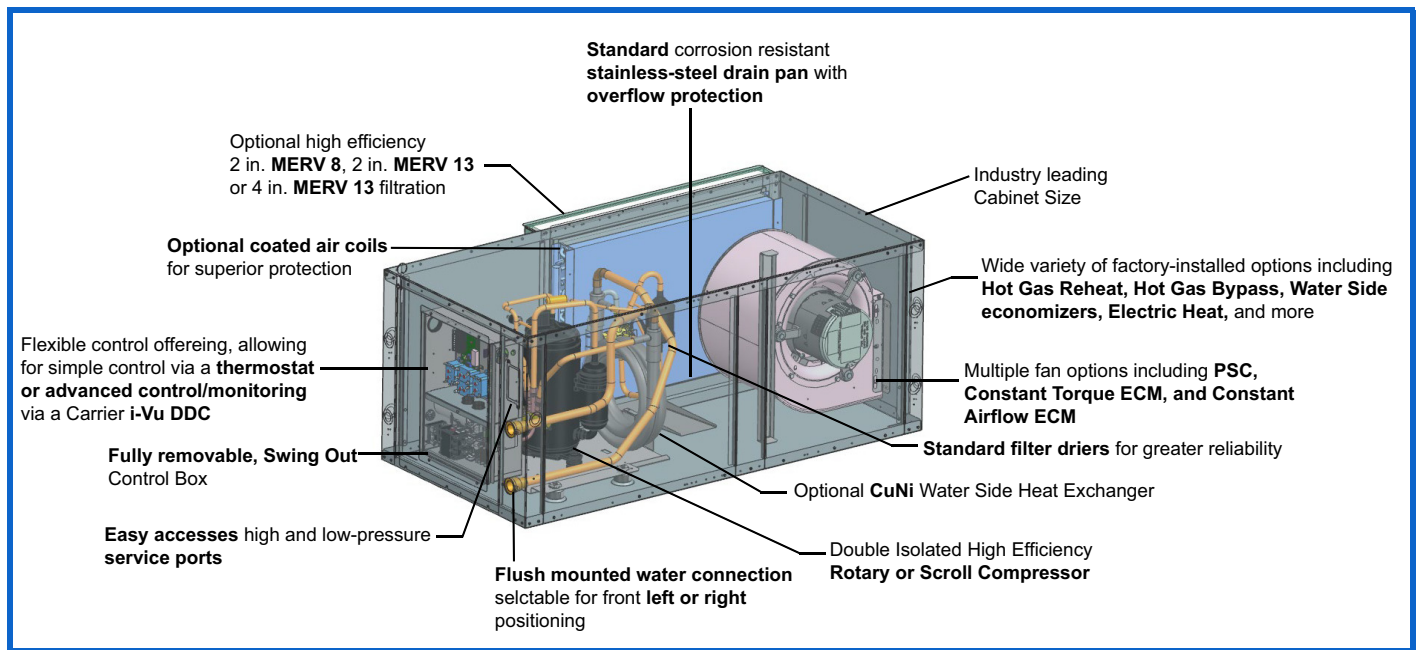
Units are offered with standard 5kA SCCR (Short-Circuit Current Rating) or optional for enhanced protection with a 65kA SCCR. Optional factory-installed disconnects are available for units with 5kA SCCR.

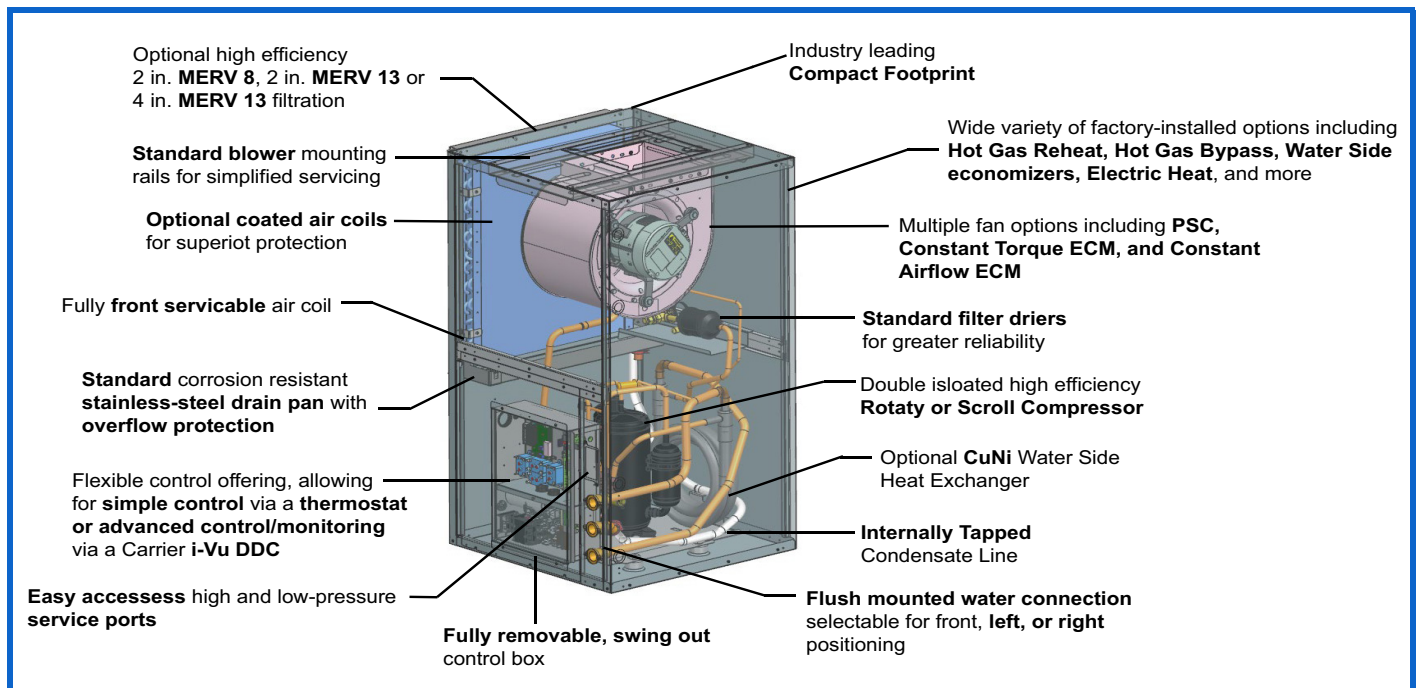
Hanging brackets

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.

Operating efficiencies

All efficiencies stated are in accordance with the latest edition of ISO/AHRI/ASHRAE/ISO 13256-1 and provide competitive high ratings (cooling EERs (energy efficiency ratios) and heating COPs (coefficients of performance) in the industry. All 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.





Safe, reliable operation

Equipment standard safety features include high and low refrigerant pressure protection, voltage protection, air and water coil freeze protection, condensate overflow shut-down, and optional refrigerant leak detector. 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.

Quiet operation

In addition to standard cabinet and component insulation, such as rubber pads and grommets aimed at minimizing noise and vibration transmission, we provide sound attenuation packages tailored for applications demanding exceptionally low noise levels. This option encompasses closed-cell foam and a compressor blanket. Additionally, automatic 3-speed fan control logic is accessible through TruVu DDC, enabling the unit to operate at its lowest speed when necessary, thus further enhancing noise reduction capabilities.

Simple maintenance and serviceability

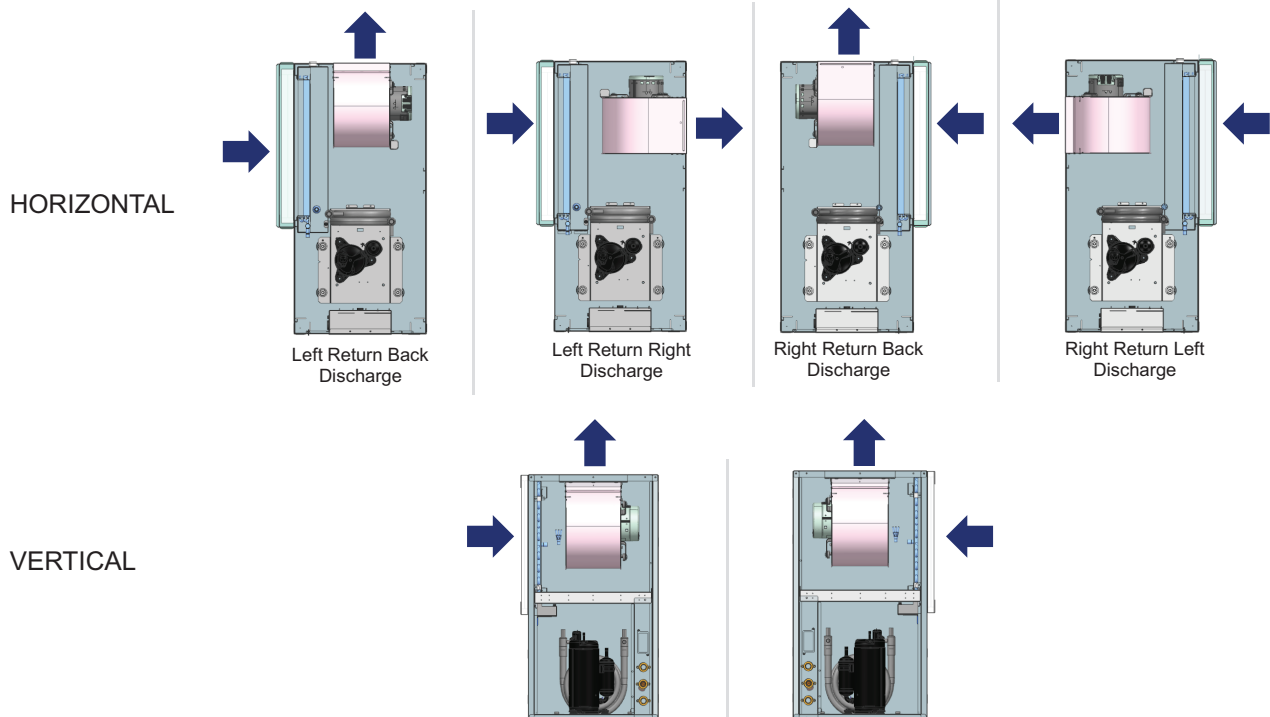
The Aquazone WSHP units are constructed to provide easy maintenance. All units allow easy access to the compressor section from 2 sides with large removable panels. Additional panels allow access to the blower and control box sections. The blower housing assembly can be serviced without disconnecting 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.

Ease of installation

The Aquazone unit is packaged for simple low cost handling and requires minimal installation. All units are pre-wired 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.

Airflow Configuration — Horizontal and Vertical Units

Airflow configurations for horizontal units are available in patterns including left or right return with 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.

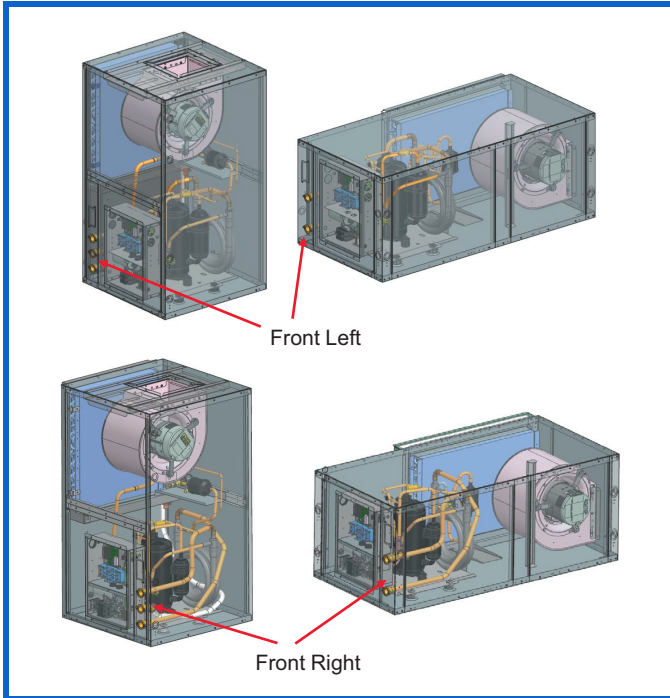


Features/Benefits (cont)



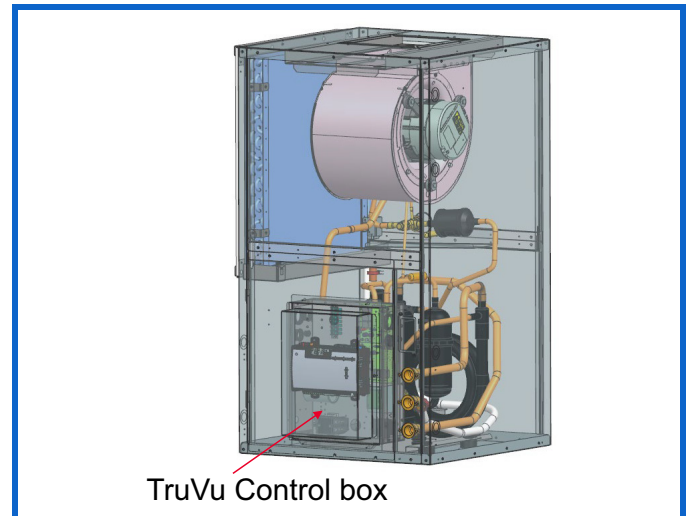
Water connections

All units are offered with choice of water connection side for flexible 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.



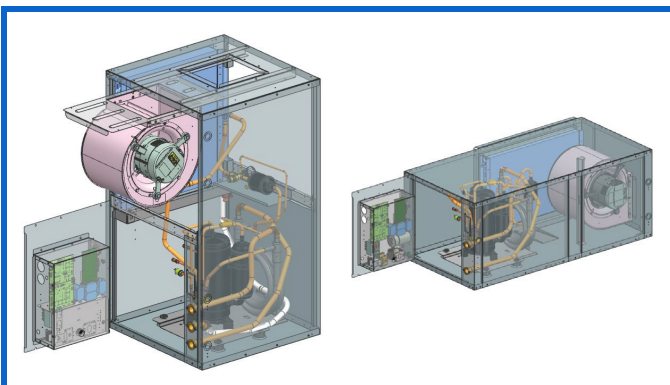
TruVu DDC control box

For added controller protection, an additional enclosure box is included and factory installed with the selected TruVu DDC control option. This feature increases the unit's depth by 3 inches.



Swing out control box and slide out motor

Designed for optimal convenience, this unit combines a user-friendly control box that effortlessly swings out for easy access, along with a motor that smoothly slides out for simplified maintenance.



Model number nomenclature



| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 5 | 0 | W | C | A | 0 | 2 | 4 | A | A | A | 1 | A | A | - | A |

Model Series (1-2)
50 = Packaged WSHP Unit

Tier (3-4)
WC = 1-Stage (Compact)

Cabinet Configuration (5)

| Orientation | Filter Access | Water Connection | |
|-------------|----------------------|------------------|-------------|
| | | Front Left | Front Right |
| Horizontal | Side Filter Access | A | B |
| | Bottom Filter Access | C | D |
| Vertical | Side Filter Access | E | F |

Nominal Capacity MBH (Tons) (6-8)

007 = 7 (1/2) Tons
009 = 9 (3/4) Tons
012 = 12 (1) Tons
015 = 15 (1-1/4) Tons
018 = 18 (1-1/2) Tons
024 = 24 (2) Tons
030 = 30 (2-1/2) Tons
036 = 36 (3) Tons
042 = 42 (3-1/2) Tons
048 = 48 (4) Tons
060 = 60 (5) Tons
070 = 70 (6) Tons

Airflow Configuration (9)

| Orientation | Return | Discharge | Motor | | |
|-------------|--------|-----------|-------|--------|--------|
| | | | PSC | CT ECM | CA ECM |
| Horizontal | Right | Back | A | G | N |
| | Right | Left | B | H | P |
| | Left | Back | C | J | Q |
| | Left | Right | D | K | R |
| Vertical | Right | Top | E | L | S |
| | Left | Top | F | M | T |

Controls — Option/Transformer (10)

A = UPM/50VA
B = UPM/75VA
C = UPM + BE/50VA^a
D = UPM + BE/75VA^a
E = UPM + TV DDC/100VA
G = UPM + SR/50VA
H = UPM + SR/75VA
J = UPM + PR/50VA
K = UPM + PR/75VA
L = UPM + EMS/50VA
M = UPM + EMS/75VA
N = UPM + BE + PR/50VA^a
P = UPM + BE + PR/75VA^a
Q = UPM + BE + SR/50VA^a
R = UPM + BE + SR/75VA^a

S = UPM + BE + SR + PR/50VA^a
T = UPM + BE + SR + PR/50VA^a
U = UPM + SR + PR/50VA
V = UPM + SR + PR/75VA
W = UPM + EMS + SR/50VA
X = UPM + EMS + SR/75VA
Z = UPM + EMS + SR/75VA
1 = UPM + EMS + SR+PR/50VA
2 = UPM + EMS + SR+PR/75VA
3 = UPM + EMS + BE/50VA^a
4 = UPM + EMS + BE/75VA^a
5 = UPM + EMS + BE + SR/50VA^a
6 = UPM + EMS + BE + SR/75VA^a
7 = UPM + EMS + BE + PR/50VA^a
8 = UPM + EMS + BE + PR/75VA^a

LEGEND

| | |
|---|---|
| BE — Boilerless Electric Heat | PR — Pump Relay |
| CA ECM — Constant Airflow ECM | PSC — Permanent Split Capacitor |
| CB — Compressor Blanket | REG — Auto Flow Regulator |
| CCF — Closed Cell Foam Insulation | SR — Compressor Status Relay |
| CO — Cooling Only | Std — Standard |
| CT ECM — Constant Torque ECM | TV DDC — TruVu Direct Digital Controller |
| DP — Differential Pressure Flow Switch | ULL — Ultra Low Leak Cabinet |
| ECM — Electronically Commutated Motor | UPM — Unit Protection Module |
| EMS — Energy Management Switch | VLV — 2-Way Solenoid Valve |
| HGBP — Hot Gas Bypass | WSE — Water Side Economizer |
| HGRH — Hot Gas Reheat | WSHP — Water Source Heat Pump |

Design Revision (16)

A = Initial Release

Miscellaneous Options (15)

— = NONE
A = Waterside Economizer (WSE)^a
B = A2L Leak Detection (LD)
C = WSE + LD^a

Hydronic Options (14)

| Option | Water Coil | |
|--------------------------|------------|--------------|
| | Copper | Cupro-Nickel |
| None | A | J |
| 2-Way Valve (VLV) | B | K |
| Auto-flow Reg. (REG) | C | L |
| Flow Proving Switch (DP) | D | M |
| VLV + REG | E | N |
| VLV + DP | F | P |
| VLV + REG + DP | G | Q |
| REG + DP | H | R |

Sound, and IAQ Options (13)

A = NONE (Std Insulation)
B = Closed cell foam insulation (CCF)
D = Ultra-Low-Leak Cabinet (ULL) + 2 in. MERV8, CCF^b
F = 2 in. MERV8 Filter, Std Insulation
G = 2 in. MERV8 Filter, CCF
H = 2 in. MERV13 Filter, Std Insulation
J = 2 in. MERV13 Filter, CCF
K = 4 in. MERV13 Filter, Std Insulation
L = 4 in. MERV13 Filter, CCF
M = ULL + 2 in. MERV13, CCF^b
P = ULL + 4 in. MERV13, CCF^b
U = Compressor Blanket (CB), Std Insulation
V = Compressor Blanket (CB), CCF
W = CB + 2 in. MERV8, Std Insulation
X = CB + 2 in. MERV8, CCF
Y = CB + 2 in. MERV13, Std Insulation
Z = CB + 2 in. MERV13, CCF
1 = CB + 2 in. MERV13, Std Insulation
2 = CB + 2 in. MERV13, CCF
3 = ULL + CB + 2 in. MERV8, CCF^b
4 = ULL + CB + 2 in. MERV13, CCF^b
5 = ULL + CB + 4 in. MERV13, CCF^b

Electrical Options (12)

1 = 575/3/60
3 = 208-230/1/60
4 = 265/1/60
5 = 208-230/3/60
6 = 460/3/60
B = 208-230/1/60 w/ Disc.
C = 265/1/60 w/ Disc.
D = 208-230/3/60 w/ Disc.
E = 460/3/60 w/ Disc.
F = 575/3/60 w/ Disc.
G = 208-230/1/60, 10kA SCCR
J = 265/1/60, 10kA SCCR
K = 208-230/1/60, 5kW E-heat
L = 208-230/1/60, 7.5kW E-heat
M = 208-230/1/60, 10kW E-heat

Refrigerant Circuit Options (11)

| Option | Non-Coated Air Coil | Coated Air Coil |
|------------------------------------|---------------------|-----------------|
| None | A | B |
| Hot Gas Reheat (HGRH) ^a | C | D |
| Cooling Only (CO) | E | F |
| Hot Gas Bypass (HGBP) | G | H |
| HGRH + HGBP ^a | N | P |

NOTE(S):

- Option Card board is provided with selection of HGRH/WSE/BE options and without TruVu DDC.
- ULL represents < 2% air leakage option.

50WC Series Water Source Heat Pump Ratings^{a,b,c}

| SERIES | MOTOR OPTION | MODEL NUMBER | WATER LOOP HEAT PUMP | | | | GROUND LOOP HEAT PUMP | | | | GROUND WATER HEAT PUMP | | | | CFM | GPM |
|--------|--------------|--------------|----------------------|-------------|----------------|--------|-----------------------|-------------|----------------|--------|------------------------|-------------|----------------|-------|-------|-------|
| | | | Cooling 86°F | | Heating 68°F | | Cooling 77°F | | Heating 32°F | | Cooling 59°F | | Heating 50°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 | | |
| 50WC | PSC | 007 | 6,100 | 13.20 | 8,900 | 4.60 | 6,350 | 14.80 | 5,600 | 3.30 | 6,750 | 14.80 | 7,100 | 4.20 | 300 | 2.00 |
| | PSC | 009 | 8,200 | 12.40 | 10500 | 4.60 | 8,450 | 14.50 | 6700 | 3.20 | 9100 | 15.30 | 8400 | 4.00 | 300 | 2.25 |
| | PSC | 012 | 10,900 | 12.20 | 14,000 | 4.50 | 11,350 | 14.50 | 9,000 | 3.20 | 12,100 | 14.80 | 11,200 | 4.00 | 400 | 3.00 |
| | PSC | 015 | 14,200 | 12.80 | 17,000 | 4.70 | 14,800 | 14.80 | 11,000 | 3.50 | 15,750 | 15.30 | 13,600 | 4.30 | 500 | 3.50 |
| | PSC | 018 | 18,000 | 13.80 | 22,000 | 4.60 | 18,350 | 14.60 | 14,000 | 3.60 | 20,000 | 16.30 | 17,600 | 4.50 | 600 | 4.50 |
| | PSC | 024 | 24,200 | 14.00 | 28,300 | 4.70 | 24,550 | 14.70 | 18,500 | 3.60 | 26,850 | 16.50 | 22,650 | 4.40 | 800 | 6.00 |
| | PSC | 030 | 27,700 | 13.90 | 34,600 | 4.50 | 28,000 | 14.80 | 23,000 | 3.50 | 30,750 | 15.70 | 27,700 | 4.20 | 950 | 7.50 |
| | PSC | 036 | 37,700 | 13.60 | 40,000 | 4.60 | 37,700 | 14.80 | 27,000 | 3.50 | 41,850 | 16.90 | 32,000 | 4.10 | 1200 | 9.00 |
| | PSC | 042VT | 39,300 | 14.10 | 47,400 | 4.60 | 40,100 | 14.70 | 31,000 | 3.50 | 43,600 | 15.50 | 37,900 | 4.30 | 1400 | 10.50 |
| | PSC | 042HZ | 39,300 | 14.00 | 47,400 | 4.60 | 40,100 | 14.70 | 31,000 | 3.50 | 43,600 | 16.20 | 37,900 | 4.30 | 1400 | 10.50 |
| | PSC | 048 | 46,900 | 14.00 | 54,000 | 4.70 | 47,400 | 14.90 | 36,500 | 3.60 | 52,050 | 16.40 | 43,200 | 4.30 | 1600 | 12.00 |
| | PSC | 060 | 59,500 | 13.60 | 74,000 | 4.60 | 60,400 | 14.60 | 48,500 | 3.50 | 66,050 | 15.80 | 59,200 | 4.30 | 1900 | 15.00 |
| PSC | 070 | 64,000 | 13.30 | 73,500 | 4.50 | 65,000 | 14.50 | 50,000 | 3.50 | 71,050 | 15.10 | 58,800 | 4.10 | 2030 | 16.00 | |
| 50WC | ECM | 007 | 6,200 | 13.50 | 8,800 | 4.60 | 6,450 | 14.90 | 5,500 | 3.30 | 6,900 | 14.90 | 7,000 | 4.20 | 300 | 2.00 |
| | ECM | 009 | 8,300 | 12.60 | 10,400 | 4.60 | 8,550 | 14.70 | 6,700 | 3.20 | 9200 | 15.50 | 8400 | 4.00 | 350 | 2.25 |
| | ECM | 012 | 11,000 | 12.50 | 13,900 | 4.60 | 11,400 | 14.80 | 8,900 | 3.30 | 12,150 | 15.10 | 11,100 | 4.10 | 400 | 3.00 |
| | ECM | 015VT | 14,400 | 13.70 | 16,700 | 4.80 | 15,000 | 15.60 | 10,700 | 3.70 | 16,000 | 16.10 | 13,250 | 4.60 | 550 | 4.00 |
| | ECM | 015HZ | 14,400 | 13.70 | 16,700 | 4.80 | 15,000 | 15.60 | 10,700 | 3.70 | 16,000 | 16.10 | 13,250 | 4.60 | 500 | 4.00 |
| | ECM | 018 | 18,200 | 14.50 | 21,800 | 4.70 | 18,500 | 15.30 | 13,800 | 3.70 | 20,150 | 17.10 | 17,350 | 4.70 | 600 | 5.00 |
| | ECM | 024 | 24,500 | 14.80 | 28,000 | 4.70 | 24,850 | 15.40 | 18,200 | 3.70 | 27,200 | 17.20 | 22,250 | 4.50 | 800 | 6.00 |
| | ECM | 030 | 28,000 | 14.50 | 34,000 | 4.70 | 28,300 | 15.20 | 22,600 | 3.70 | 31,100 | 16.10 | 27,200 | 4.50 | 950 | 7.00 |
| | ECM | 036 | 37,900 | 13.90 | 39,800 | 4.60 | 37,900 | 14.90 | 26,800 | 3.60 | 42,050 | 17.00 | 31,750 | 4.30 | 1,200 | 9.00 |
| | ECM | 042 | 40,100 | 15.60 | 46,500 | 4.90 | 40,900 | 16.20 | 30,100 | 3.80 | 44,500 | 17.10 | 36,800 | 4.60 | 1,400 | 10.00 |
| | ECM | 048 | 47,400 | 14.70 | 53,300 | 4.70 | 47,900 | 15.30 | 35,800 | 3.70 | 44,100 | 16.60 | 37,200 | 4.40 | 1,600 | 12.00 |
| | ECM | 060 | 59,900 | 14.00 | 73,300 | 4.70 | 60,800 | 15.00 | 47,800 | 3.70 | 52,400 | 16.90 | 42,600 | 4.50 | 2,000 | 15.00 |
| ECM | 070 | 64,900 | 14.20 | 72,600 | 4.70 | 65,900 | 15.60 | 49,100 | 3.70 | 66,950 | 17.00 | 58,150 | 4.50 | 2,100 | 16.00 | |

NOTE(S):

- Ratings based upon AHRI/ANSI 13256-1 with 1 in. disposable MERV 5 filter.
- ECM motor option = Constant Airflow (CA), and Constant Torque (CT) motors.
- These ratings are for Vertical and Horizontal airflow.

LEGEND

| | |
|---------------|---|
| AHRI | — Air-Conditioning, Heating and Refrigeration Institute |
| BTU/hr | — British Thermal Units per Hour |
| CA | — Constant Airflow |
| cfm | — Cubic Feet Per Minute |
| COP | — Coefficient Performance |
| CT | — Constant Torque |
| ECM | — Electronically Commutated Motor |
| EER | — Energy Efficiency Ratio |
| GPM | — Gallons Per Minute |
| HZ | — Horizontal |
| PSC | — Permanent Split Capacitor |
| VT | — Vertical |

Physical Data — 50WC (007-024) Units

| UNIT SIZE | 007 | 009 | 012 | 015 | 018 | 024 |
|---|---------|---------|---------|---------|---------|--|
| Compressor Type (Qty 1) | Rotary | Rotary | Rotary | Rotary | Rotary | Scroll (208-230V 3 Phase, 460V) Rotary (208-230V 1 Phase, 265V) |
| Max Water Working Pressure (psig/kPa) | 400 | 400 | 400 | 400 | 400 | 400 |
| FAN MOTOR AND BLOWER | | | | | | |
| PSC Fan Motor (HP) | 0.1 | 0.1 | 0.1 | 1/6 | 1/6 | 0.25 |
| Constant Torque Fan Motor (HP) | 0.25 | 0.25 | 0.25 | 0.33 | 0.33 | 0.33 (Vertical 208/230V, 265V) 0.5 (Vertical 460V; Horizontal) |
| Constant Airflow Fan Motor (HP) | — | — | — | — | 0.33 | 0.33 (Vertical) 0.5 (Horizontal) |
| Blower Wheel Size (Dia. x W) | 5.5x4.5 | 5.5x4.5 | 5.5x4.5 | 9x7 | 9x7 | 9x7 |
| WATER CONNECTION SIZE (FPT) (in.) | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| Coaxial Coil Volume (gal) | 0.07 | 0.07 | 0.07 | 0.07 | 0.10 | 0.18 |
| ECONOMIZER OPTION WATER CONNECTION SIZE (FPT) (in.) | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 |
| VERTICAL CABINET | | | | | | |
| Refrigeration Charge (oz) | 17 | 20 | 19 | 19 | 23 | 30 Scroll (208-230V 3 Phase, 460V) 29 Rotary (208-230V 1 Phase, 265V) |
| Air Coil Dimensions (H x W) | 10x14 | 10x14 | 10x14 | 15x16.5 | 15x16.5 | 20x16.5 |
| Standard Filter - 1" MERV 5 Throwaway (L x H) | 12x16 | 12x16 | 12x16 | 17x19 | 17x19 | 18x22 |
| Optional Filter - 2" MERV 8 or 13 (L x H) | 12x16 | 12x16 | 12x16 | 17x19 | 17x19 | 18x22 |
| Optional Filter - 4" MERV 13 (L x H) | 12x16 | 12x16 | 12x16 | 17x19 | 17x19 | 18x22 |
| Weight - Operating (lb) | 106 | 112 | 117 | 146 | 170 | 191 |
| Weight - Shipping (lb) | 134 | 139 | 144 | 174 | 195 | 218 |
| HORIZONTAL CABINET | | | | | | |
| Refrigeration Charge (oz) | 18 | 20 | 17 | 21 | 24 | 28 Scroll (208-230V 3 Phase, 460V) 30 Rotary (208-230V 1 Phase, 265V) |
| Air Coil Dimensions (H x W) | 10x14 | 10x14 | 10x14 | 14x20 | 14x20 | 15x22 |
| Standard Filter - 1" Throwaway (L x H) | 10x16 | 10x16 | 10x16 | 16x24 | 16x24 | 17x25 |
| Optional Filter - 2" MERV 8 or 13 (L x H) | 10x16 | 10x16 | 10x16 | 16x24 | 16x24 | 17x25 |
| Optional Filter - 4" MERV 13 (L x H) | 10x16 | 10x16 | 10x16 | 16x24 | 16x24 | 17x25 |
| Weight - Operating (lb) | 98 | 106 | 114 | 147 | 155 | 183 |
| Weight - Shipping (lb) | 130 | 135 | 143 | 169 | 189 | 214 |

LEGEND

FPT — Female Pipe Thread
PSC — Permanent Split Capacitor

Physical Data — 50WC (030-070) Units

| UNIT SIZE | 030 | 036 | 042 | 048 | 060 | 070 |
|--|--|---|---------|--------|--------|-----------|
| Compressor Type (Qty 1) | Scroll (208-230V 3 Phase, 460V) Rotary (208-230V 1 Phase, 265V) | Scroll | Scroll | Scroll | Scroll | Scroll |
| Max Water Working Pressure (PSIG/kPa) | 400 | 400 | 400 | 400 | 400 | 400 |
| FAN MOTOR AND BLOWER | | | | | | |
| PSC Fan Motor (HP) | 0.25 (Vertical) 0.5 (Horizontal) | 0.75 (Vertical 208/230V, 460V) 0.5 (Vertical 265V; Horizontal) | 0.75 | 0.75 | 0.75 | 0.75 |
| Constant Torque Fan Motor (HP) | 0.33 (Vertical 208/230V, 265V) 0.5 (Vertical 460V; Horizontal) | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 |
| Constant Airflow Fan Motor (HP) | 0.33 (Vertical) 0.5 (Horizontal) | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 |
| Blower Wheel Size (Dia. x W) | 9x7 | 10x8 | 10x8 | 10x8 | 11x9 | 11x9 |
| WATER CONNECTION SIZE (FPT) (in.) | 0.75 | 0.75 | 0.75 | 1 | 1 | 1 |
| Coaxial Coil Volume (gal) | 0.32 | 0.32 | 0.32 | 0.37 | 0.49 | 0.49 |
| ECONOMIZER OPTION WATER CONNECTION SIZE (FPT) (in.) | 0.75 | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 |
| VERTICAL CABINET | | | | | | |
| Refrigeration Charge (oz) | 28 Scroll (208-230V 3 Phase, 460V) 35 Rotary (208-230V 1 Phase, 265V) | 34 | 38 | 44 | 48 | 57 |
| Air Coil Dimensions (H x W) | 20x16.5 | 24x16.5 | 28x21 | 28x21 | 28x21 | 40x27 |
| Standard Filter - 1" MERV 5 Throwaway (L x H) | 18x22 | 19x27 | 24x30 | 24x30 | 24x30 | 20x27 (2) |
| Optional Filter - 2" MERV 8 or 13 (L x H) | 18x22 | 19x27 | 24x30 | 24x30 | 24x30 | 20x27 (2) |
| Optional Filter - 4" MERV 13 (L x H) | 18x22 | 19x27 | 24x30 | 24x30 | 24x30 | 20x27 (2) |
| Weight - Operating (lb) | 191 | 215 | 228 | 228 | 275 | 338 |
| Weight - Shipping (lb) | 218 | 241 | 254 | 253 | 299 | 362 |
| HORIZONTAL CABINET | | | | | | |
| Refrigeration Charge (oz) | 31 Scroll (208-230V 3 Phase, 460V) 37 Rotary (208-230V 1 Phase, 265V) | 32 | 37 | 51 | 50 | 55 |
| Air Coil Dimensions (H x W) | 15x22 | 16x27.5 | 16x27.5 | 18x31 | 18x31 | 18x42 |
| Standard Filter - 1" Throwaway (L x H) | 17x25 | 18x30 | 18x30 | 20x34 | 20x34 | 20x22 (2) |
| Optional Filter - 2" MERV 8 or 13 (L x H) | 17x25 | 18x30 | 18x30 | 20x34 | 20x34 | 20x22 (2) |
| Optional Filter - 4" MERV 13 (L x H) | 17x25 | 18x30 | 18x30 | 20x34 | 20x34 | 20x22 (2) |
| Weight - Operating (lb) | 187 | 205 | 213 | 267 | 285 | 296 |
| Weight - Shipping (lb) | 221 | 250 | 247 | 292 | 315 | 345 |

LEGEND

FPT — Female Pipe Thread
PSC — Permanent Split Capacitor

| ITEM | FACTORY-INSTALLED OPTION | FIELD-INSTALLED ACCESSORY |
|---|--------------------------|---------------------------|
| Coated Air Coil | X | |
| Cupronickel Water Heat Exchanger | X | |
| Permanent Split Capacitor (PSC) | X | |
| Constant Torque ECM (CT ECM) | X | |
| Constant Airflow ECM (CA ECM) | X | |
| Hot Gas Reheat (HGRH) | X | |
| Hot Gas Bypass (HGBP) | X | |
| Water Side Economizer (WSE) | X | |
| Cooling Only (CO) | X | |
| Disconnect Switch | X | |
| Electric Heater | X | X |
| Air filter (MERV5, MERV8, MERV13) | X | |
| Closed Cell Foam (CCF) | X | |
| Compressor Blanket (CB) | X | |
| Ultra Low Leak Cabinet (ULL) | X | |
| A2L Leak Detection (LD) | X | |
| Two-Position Motorized Isolation Valve (2-Way Solenoid Valve) | X | X |
| Autoflow Regulator | X | |
| Differential Pressure Switch / Flow Proving Switch | X | |
| Supply and Return Water Hose Kits | | X |
| Ball Valves | | X |
| Y-Strainers | | X |
| Thermostat | | X |
| Non-Communicating Sensors | | X |
| TruVu DDC Controller | X | |
| User Interfaces | | X |
| ZS Sensors | | X |

Factory-Installed Options

Coated air coil

Additional Air Coil Protection option is available for units. 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 required for primary residence applications to protect against formicary corrosion. Protected coils exceed 1000 hours of ASTM B117 salt spray testing.

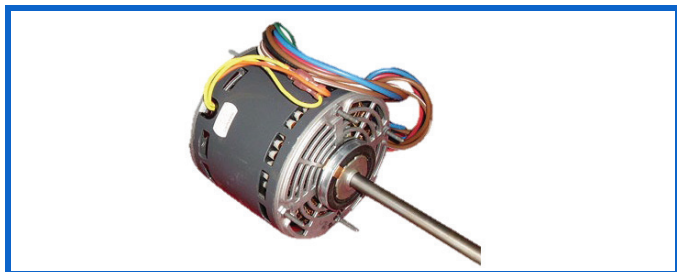
Cupronickel water heat exchanger

Option is 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.

Fan motor options

Permanent Split Capacitor

Permanent split capacitor (PSC) motors are available as a standard option for all unit sizes. The provided motor features three-speed taps that can be adjusted in the field. With the exception of the 575-volt motor, it has a single speed tap.



Constant Torque ECM

Constant Torque ECMs (CT ECM) are available as a standard option across all unit sizes. Constant torque ECMs have 3 available speed taps for unit sizes from 007 to 012, and 5 speed taps for unit sizes from 015-060 and it will maintain a constant motor torque as external static pressure in the system increases.

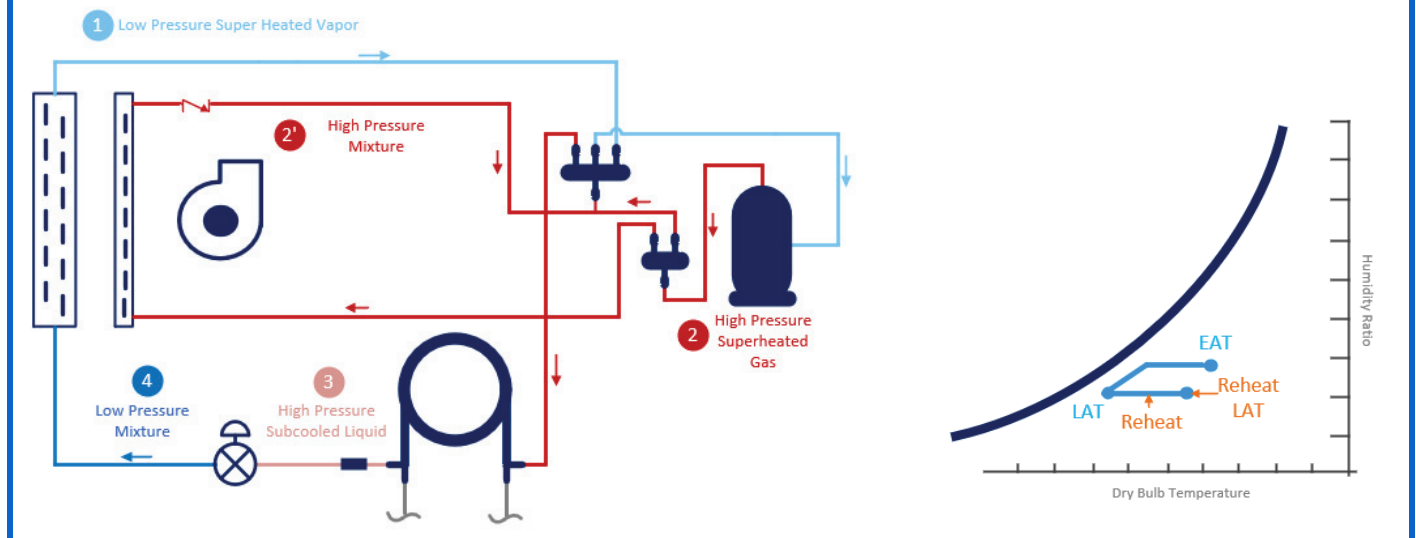


Constant Airflow ECM

Constant Airflow ECMs (CA ECM) are available as a standard option for units from 015 size to 070. It will maintain constant unit airflow as the static pressure in the system increases. Constant airflow ECMs provide 3 available speed settings.



Hot Gas Reheat (HGRH)



Hot Gas Reheat (HGRH)

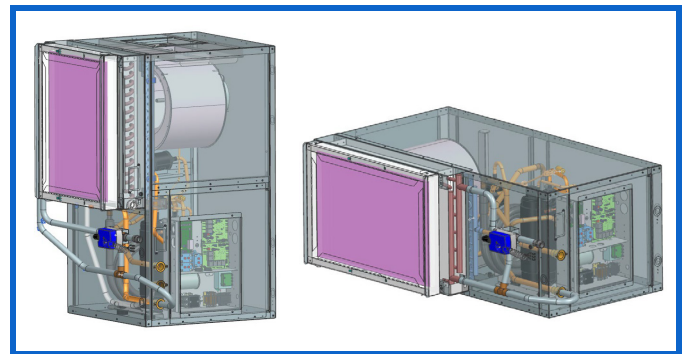
HGRH is an efficient and effective method of providing space humidity control. HGRH allows the unit to dehumidify the space when there is no demand for space cooling without the need for additional energy consuming devices.

The HGRH package is factory installed and includes a HGRH coil (installed behind the indoor air coil, a on/off 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 it is cooled and dehumidified. The cool, dehumidified air then passes through the reheat coil where it is heated to a neutral temperature (typically 68 to 78°F). The neutral, dry air is then delivered to the space and reduces space humidity levels without cooling the space. See NG ECAT unit report for HGRH performance. This option requires a thermostat with dehumidification output, humidistat, or DDC controller with space relative humidity sensor and binary/digital output.

Water Side Economizer

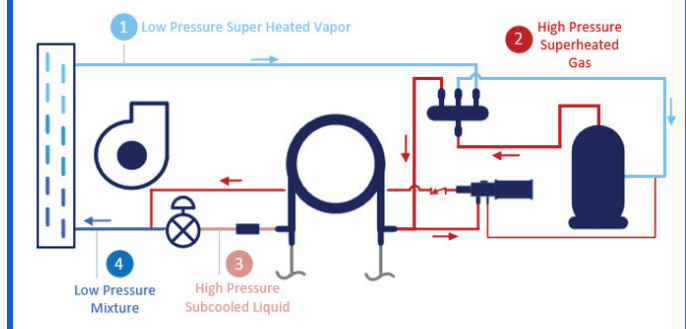
A water side economizer (WSE) is available as a factory installed option and allows for free cooling for applications where the water loop temperature is able to reach temperatures between 40 and 65°F. When the loop is cold enough, the waterside economizer acts as a chilled water coil, providing free cooling limiting fully or partially the usage of the compressor (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 and piped as shown below.



Hot Gas Bypass (HGBP)

HGBP helps to reduce unit cycling and 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 105 psig and will modulate to prevent the pressure falling any lower. This setting is field adjustable (95-115 psig), and this set point may be adjusted as required.

Hot Gas Bypass (HGBP)



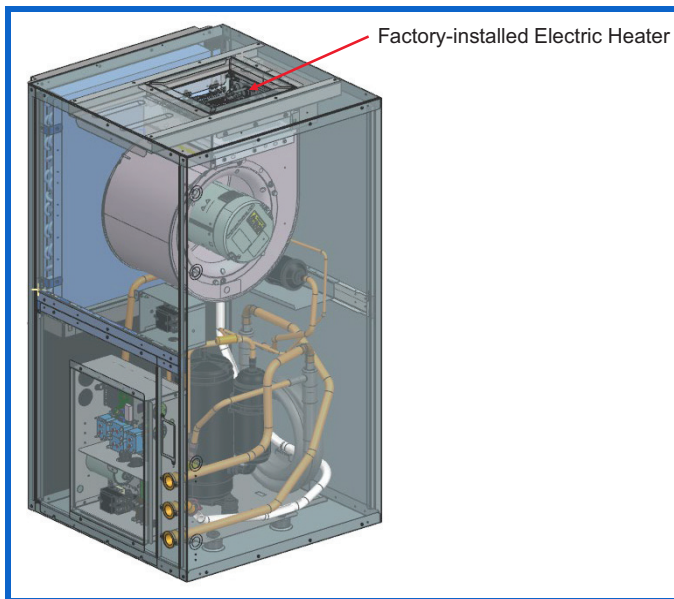
Options and accessories (cont)

Cooling Only

Optional Cooling only (CO) modification is available for all sizes. The Cooling Only option excludes the reversing valve from refrigerant circuit. This modification provides efficient cooling in environments where heating is not a primary need.

Electric Heater

Single stage electric heater is a factory-installed option on vertical units with top discharge and with ECM motors. Electric heaters are available in 5, 7.5, 10 kW on units with 208/230V-1Ph power. Electric heaters shall be factory wired and installed internal to the unit on the fan discharge. The output provided on the controller shall be able to control single stage electric heat.



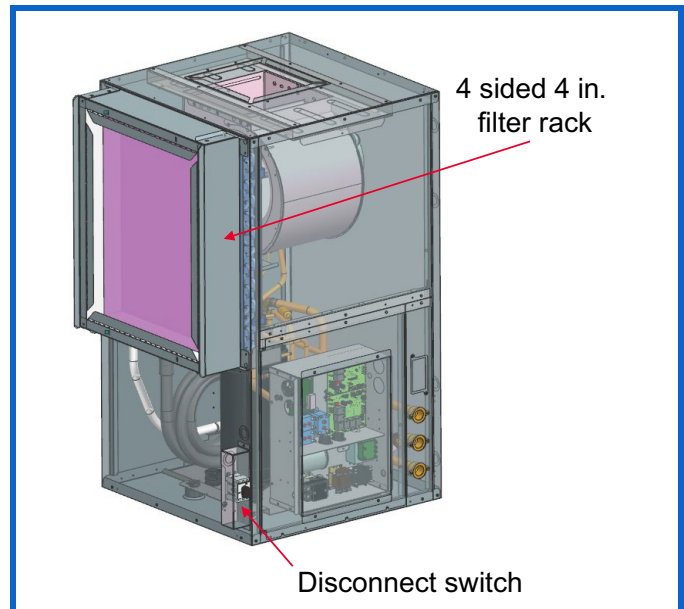
Disconnect Switch

Optional unit mounted non-fused disconnect switch is available for units. Conveniently positioned on the corner post of the unit. This switch allows for easy power interruption during field service.

IEQ Options

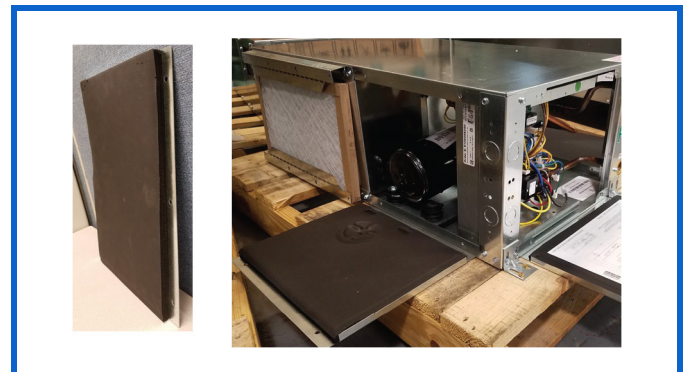
Air Filters

Every unit is equipped with a default 2 in. 2 sided filter rack and 2 in. MERV 5 filter suitable for free return applications. Alternatively, there are optional 4 sided 2 in. or 4 in. MERV8 or MERV13 filters for ducted returns. MERV 13 is available for the purpose of obtaining LEED certification points and achieving higher efficiency filtration standards.



Closed Cell Foam Insulation

1/2 in thick Closed cell foam (CCF) insulation to help aid indoor air quality (IAQ) and to further attenuate low frequency noise from the compressor compartment. The closed-cell foam insulation option is available in all unit sizes.



Compressor Blanket

Compressor blanket (CB) is installed on all units with Scroll compressors (not available for units with rotary compressors).



Ultra Low Leak Cabinet

Ultra low leak cabinet (ULL) feature offers enhanced cabinet construction with a leakage rate of less than 2% (includes closed cell foam insulation).

A2L leak Detection

Industry safety standard UL 60335-2-40 requires systems charged with over 64 ounces of R-454B to include an integrated A2L Leak Detection system to ensure safety in the event of a refrigerant leak. If a refrigerant leak occurs the A2L leak detection system activates, shutting down compressor operation and running the blower motor to disperse any leaked refrigerant. Although all 50WC units have a refrigerant charge below 64 ounces the A2L leak detection feature is optional to meet more stringent local codes or customer requirements.

Hydronic Options

Two-Position Motorized Isolation Valve (2-Way Solenoid Valve)

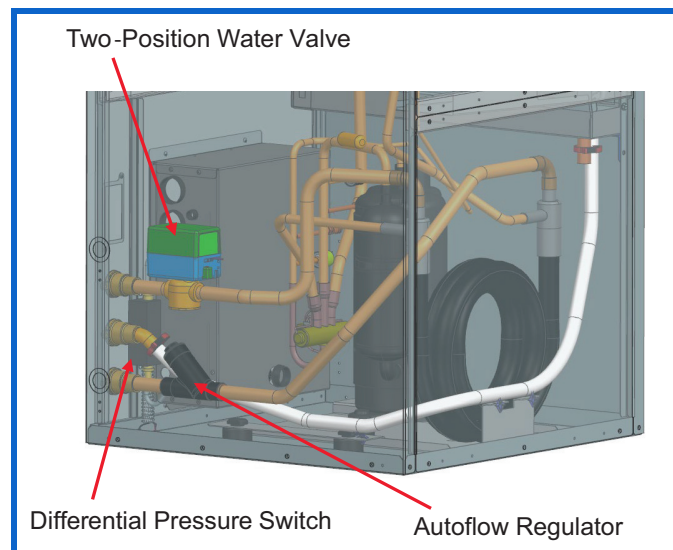
Optional factory installed 2-way solenoid valve is available on all unit sizes and it is a great energy savings option. The valve opens to allow 100% fluid flow through the coaxial heat exchanger only when there is a call for cooling or heating. Closing off fluid flow to the unit when there is no call for cooling or heating reduces system operating costs, when using variable speed pump.

Autoflow Regulator

Factory installed pressure independent auto-flow regulator ensures a constant water flow rate to the unit, it comes with internal cartridge which is set to fixed 3 gpm/ton flowrate. The system installation is much easier with auto-flow regulators compared to manually balanced systems, and the “fluctuation” seen in manually balanced systems is no longer an issue.

Differential Pressure Switch / Flow Proving Switch

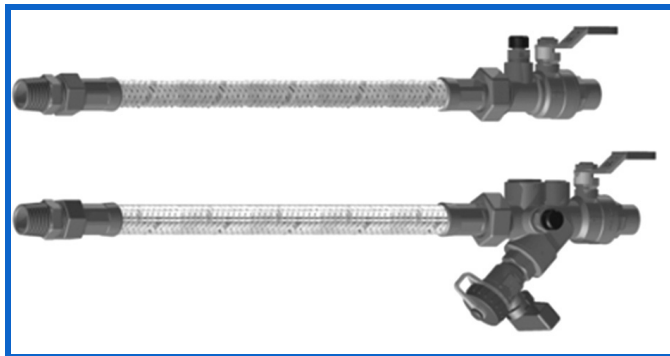
The differential pressure switch, also known as a flow proving switch, is a crucial device for verifying fluid flow in systems. By detecting pressure differences, it ensures accurate flow confirmation, enhancing overall system performance and efficiency across a range of applications.



Field-Installed Options

Supply and Return Water Hose Kits

Hose kits are recommended for connection between the unit and the water loop piping. Hose kits are available in 24 or 36 inches in length. All hose kits come with flexible stainless steel hoses and have options for manual isolation valves with and without autoflow regulators and Y-strainer.

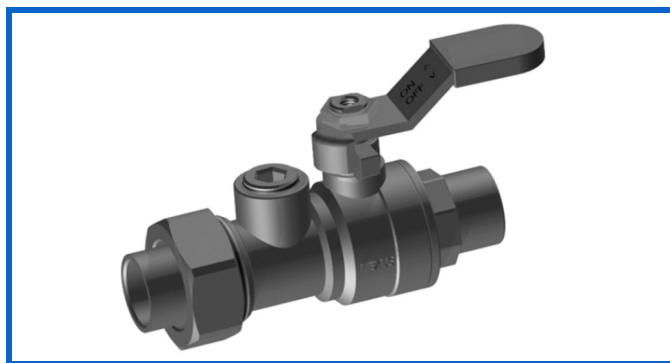


Autoflow Regulator

Field installed pressure independent Autoflow Regulator (automatic balancing valve) is a part of the hose kit and is available with wide range of set flow rate internal cartridges. Factory installed auto-flow regulator ensures a constant water flow rate to the unit. The system installation is much easier with autoflow regulators compared to manually balanced systems, and the “fluctuation” seen in manually balanced systems is no longer an issue.

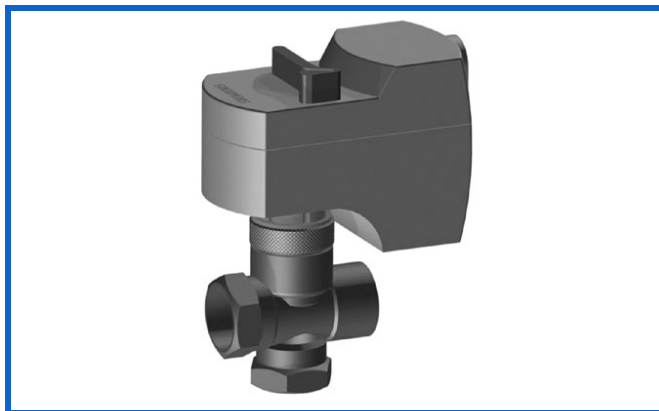
Ball Valves

Carrier's ball valves can be field installed between supply and return lines and the WSHP. These valves provide manual stoppage of water flow during maintenance or when service is needed.



Two-Position Motorized Isolation Valve (2-Way Solenoid Valve)

Carrier's motorized water valves are normally closed, 2-position water valves field installed on the WSHP return line. The valve opens to allow 100% of the fluid flow through the WSHP when compressor energized and closes to shut off flow to the WSHP when compressor is deenergized. Closing off fluid flow to the unit when there is no call for cooling or heating reduces system operating costs, when using variable speed pump.



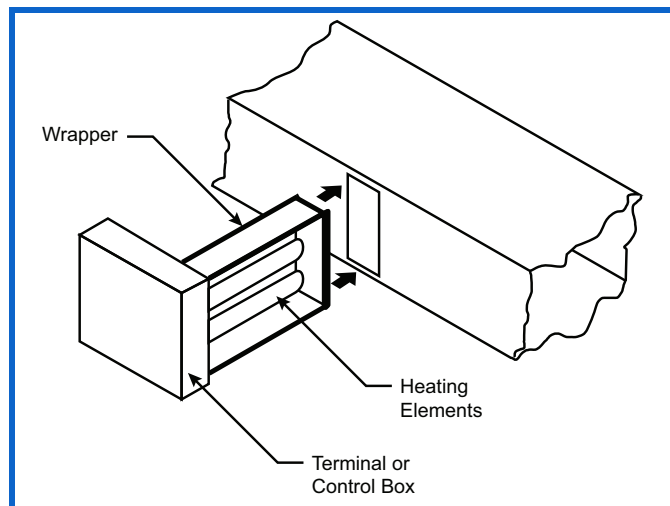
Y-Strainers

Carrier's strainers are field installed on the supply line of the WSHP. These strainers are a combination strainer and ball valve and equipped with a union end, blow down port, and two accessory ports. The strainers provide a 20-mesh removable filter screen.



Slip-In Electric Heater

Field installed duct slip-in electric heaters provide an economical heating source that can be easily integrated into an existing HVAC (Heating, Ventilation and Air-Conditioning) system and new installations. These heaters provide space heating, primary heating, auxiliary heating, and reheating in a wide variety of configurations. The design of the heaters allows for free flow air.



Controls Options

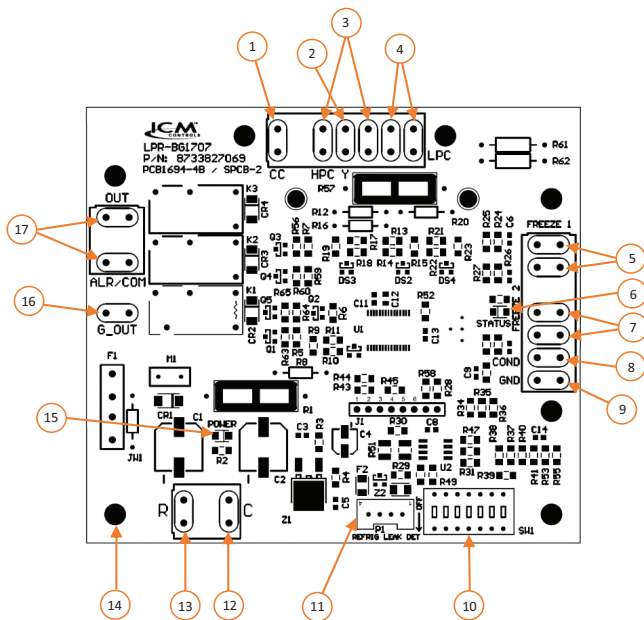
Unit Protection Module (UPM)

All Carrier WSHP units feature an advanced UPM which implements all the critical equipment safeties and allows for continuous safe and reliable operation. It's located in the control box.

Features of the unit protection module include:

- **Hi and Low Refrigerant Pressure Protection:** The unit is equipped with high and low-pressure switches set to disable operation at pressures above 600 psig or below 40 psig.
- **Low Pressure Bypass Timer:** This bypass helps to eliminate nuisance trips by keeping the compressor on for 120s upon the LPS opening. If the LPS is still open after 2 minutes the unit is shut down and put into soft lockout.
- **Air and Water Coil Freeze Protection:** Both the cooling and heating refrigerant liquid line temperatures are monitored to prevent freeze up of both the water and air coil. The freeze limit by default is set to 25°F and is configurable via a dip switch on the UPM to 15°F for applications utilizing antifreeze.
- **High Condensate Level Shutdown:** All units are equipped with a condensate overflow sensor in the drain pan set to disable operation in the event of an overflow condition.
- **Anti-Short Cycle Time Delay:** A 5-minute delay on break timer to prevent compressor short cycling.
- **Random Start Time Delay:** Each controller has a unique random start delay ranging from 270 to 300 seconds on initial power up to reduce the chance of multiple units simultaneously starting at the same time after powering up or after a power interruption, thus avoiding creating large inrush current.
- **Brownout/Surge Protection:** The UPM board will disable the compressor if the incoming low voltage power falls below 18 VAC.
- **Intelligent Alarm Reset:** Upon fault, a 5-minute break is initiated, and the unit will automatically restart after this time period has expired.
- **Hard Lockout Reset:** A hard lockout can be reset by turning the unit thermostat off and then back on when the RESET DIP switch is set to "Y" or by shutting off unit power at the circuit breaker when the RESET DIP switch is set to "R".
- **Alarm Output:** The alarm output is normally open (NO) dry contact. The output is configurable via a dip switch on the UPM to be constant, as a general alarm, or pulsed, to be interpreted for the specific alarm by a remote device.
- **Refrigerant Leak Detection:** On units equipped with an A2L refrigerant leak detection sensor the controller will take mitigation action in the event of a leak. The leak detection sensor is standard option and included with the unit when required by the product safety standard UL60335-2-40. The leak detection sensor is optional feature in cases where it is required by safety standards other than UL60335-2-40 standard with more stringent requirements.
- **Test Mode:** the UPM features a test mode for ease of service which shortens the anti-short cycle and random start delays and requires manual reset for both soft and hard lockouts.

UPM Control Board











- 1 — Compressor Contact Output
- 2 — Compressor Y1 Call
- 3 — High Pressure Switch
- 4 — Low Pressure Switch
- 5 — Water Coil Freeze 1
- 6 — LED Status Diagnostic
- 7 — Air Coil Freeze 2
- 8 — Condensate Overflow
- 9 — Ground
- 10 — UPM Settings Dip Switch
- 11 — A2L Sensor
- 12 — 24 vac Power Common
- 13 — 24 vac Power Input
- 14 — UPM Standoff
- 15 — Power LED
- 16 — Fan
- 17 — Dry Contact

Thermostat Control

The Carrier 50WC series water source heat pumps utilizes 24V non-communicating controls and are suitable for control via most 24V non-communicating single stage heat pump thermostats. Carrier has several 24V non communicating thermostats that are well suited for pairing with water source heat pumps. See "Thermostats" on page 17. for a summary of the available carrier thermostats and the general functionality/capability of each.

Thermostats

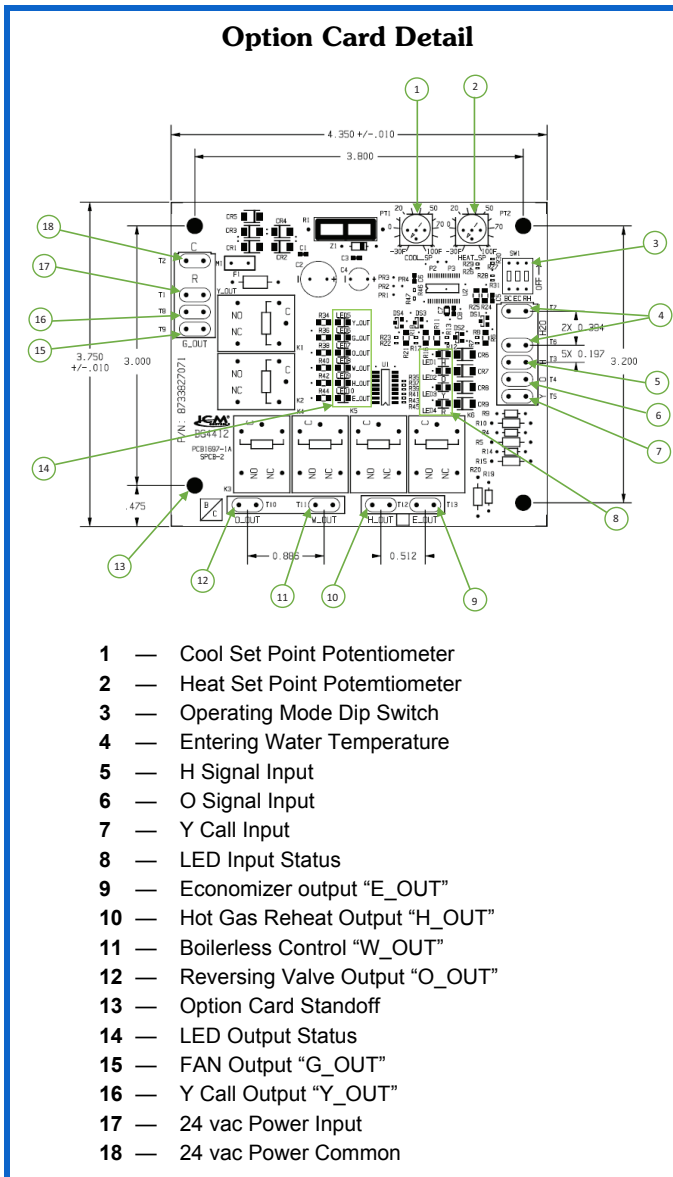
| | | | | | | | | |
|----------------------------------|--|---|---|---|--|---|---|---|
| |  |  |  |  |  |  |  |  |
| TYPE | NON-COMMUNICATING THERMOSTATS | | BACNET THERMOSTAT WITH WI-FI | | | | BACNET THERMOSTAT | |
| Feature | Comfort Pro Programmable Thermostat | Edge Pro Programmable Thermostat | Connect 43FX Thermostat | Connect BACnet Wi-Fi Thermostat | Non-branded 43FX Thermostat | Non-branded BACnet Wi-Fi Thermostat | Comfortvu BACnet Standard Thermostat | Comfortvu BACnet Plus Thermostat |
| | 33CSCPACHP-01 | 33CS2PP2S-03 / 33CS2PPRH-03 | 33CONNECTSTAT43FX | 33ConnectStat43 | 33WIFISTAT43FX | 33WIFISTAT43 | TB-24-C / TB24-HM-C | TBPL-24-H-C |
| Power | 24 VAC | 24 VAC | 24 VAC | 24 VAC | 24 VAC | 24 VAC | 24 VAC | 24 VAC |
| Power Requirements | 3 VA | 3 VA | 6 VA | 6 VA | 6 VA | 6 VA | 4VA unit, 76 VA full load | 4VA unit, 76 VA full load |
| Interface | Backlit Display | Backlit Display | 4.3" LCD TouchScreen | 4.3" LCD Color Touchscreen | 4.3" LCD TouchScreen | 4.3" LCD Color Touchscreen | LCD Pushbutton | LCD Touchscreen |
| Onboard Sensors | Temperature | Temperature & Humidity (optional) | Temperature & Humidity | Temperature & Humidity | Temperature & Humidity | Temperature & Humidity | Temperature & Humidity | Temperature & Humidity |
| Scheduling | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Occupancy (motion) | - | - | - | - | - | - | ✓ | ✓ |
| Compressor Stages | 1-2 | 1-2 | 1-3 | 1-3 | 1-3 | 1-3 | 1-2 | 1-2 |
| Axillary Heat Stages | 1 | 1 | 1-2 | 1-2 | 1-2 | 1-2 | 1-3 | 1-3 |
| Fan Control | 1-speed | 1-speed | 1-speed | 1-speed | 1-speed | 1-speed | 1-3-speed | 1-3-speed |
| Dehumidification Output for HGRH | - | ✓ | ✓ | ✓ | ✓ | ✓ | - | ✓ |
| Humidification Output | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Remote Sensors | OAT / RRS / SAT / RAT | OAT / RRS | RH + OAT / RRS / SAT | OAT / RRS / SAT | RH + OAT / RRS / SAT | OAT / RRS / SAT | ECON / RRS / DEICE | ECON / RRS / DEICE |
| Dry Contact | - | Dehum or Economizer | OCC / ECFL / FLTR | OCC / ECFL | OCC / ECFL / FLTR | OCC / ECFL | Window / Door / KeyTag | Window / Door / KeyTag |
| BACnet MS/TP | - | - | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Wi-Fi | - | - | ✓ | ✓ | ✓ | ✓ | - | - |
| Accessories | OAT Sensor: 33ZCSENOAT Remote Temperature w/ averaging: 33ZCT55SPT Remote Supply/Return Temp Sensing: 33ZCSENSAT | | | | | | | |

Control Options to Supplement Thermostat

50WC units have a number of control options available to supplement the control of a thermostat allowing for control of various auxiliary components that thermostats are not typically capable of controlling. These options include:

Option Card

Units ordered with the water side economizer or hot gas reheat factory installed options and no factory-installed DDC controller will include the UPM expander as standard. The card supplements the primary thermostat control by controlling auxiliary devices that a thermostat is not typically capable of controlling.



The card has three primary functions:

- **"Boilerless" Electric Heat Control:** Boilerless heat control is a means to control an auxiliary electric heater on units that are connected to a water loop without a reliable heat injection source. The card features a potentiometer to configure a water loop heat setpoint (HEAT_SP). When the water loop drops below this setpoint and there is a call for heating the compressor will be disabled and the card generates a 24V output to enable the electric heater. Units equipped with the boilerless electric heat option include an entering water temperature sensor.
- **On/Off Hot Gas Reheat Control:** Hot gas reheat control is an active means of dehumidification control. HGRH is enabled when the space temperature is satisfied but the space humidity is above the desired setpoint. The expansion card energizes the fan, reversing valve, HGRH valve and compressor.
- **Water Side Economizer Control:** Water side economizer control allows for cooling directly with the source water when the source water temperature is below a

configurable setpoint. The expansion card features a potentiometer to configure a water loop cool setpoint (COOL_SP). When the water loop drops below this setpoint and there is a call for cooling the WSE diverting valve will divert water through the water side economizer coil. If a cooling call remains for a period of > 10 min the compressor will be enabled to assist the WSE in meeting the cooling demand.

Energy Management Switch (EMS) Relay

An optional relay providing a normally open set of contacts for remotely enabling and disabling the unit via an external 24VAC signal.

Pump Relay

An optional relay providing a signal to energize a pump when the compressor is command to run.

Compressor Status Relay

Optional relay providing compressor status via a normally open set of dry contacts.

Carrier i-Vu WSHP TruVu DDC

Carrier's WSHP TruVu controller is an integrated component of a Carrier water source heat pump. The WSHP TruVu 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. It also features plug and play connectivity to the Carrier i-Vu Building Automation System. For added flexibility, the controller is capable of stand-alone operation, or it can be integrated with any other building automation system utilizing BACnet IP.



Application Features

- Provides space temperature control with up to 2 stages of mechanical cooling and heating.
- Integrated 2-position or modulating waterside economizer control for optimized mechanical cooling (ASHRAE 90.1).
- Controls modulating or 2-position outside air damper to meet ASHRAE 62 ventilation requirements.
- Automatic 3 speed fan control for efficient WSHP operation. Using the space temperature input, the TruVu controller 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 (exception units with 575-v PSC motor, only 1 speed is available).

Options and accessories (cont)



- **Auxiliary Heat** — Provides control over auxiliary heating, allowing for the management of a 2-position or modulating water/steam valve, or a two-stage electric heater. The auxiliary heat functionality can be configured in two modes: Boilerless (alternative) or Auxiliary Heat (supplemental), providing flexibility and adaptability to different system designs.
- **Dehumidification** — Provides occupied and unoccupied dehumidification, allowing configure setpoints for both occupancy types. The controller offers the choice of cycling on/off HGRH control or modulating control with Modulating HGRH for precise dehumidification.
- **Equipment Performance Monitoring/Statuses** — Compressor Status, Fan Status, Water flow switch, Secondary Condensate Overflow, EWT, LWT, SAT, RAT.
- **Scheduling** — Adaptable scheduling for occupied and unoccupied periods with ability for internal/local occupancy configuration or remote occupancy configuration via external dry contact, local user interfaces, i-Vu network, or BAS network. Additionally, flexible intermittent fan operation is available during both occupied and unoccupied periods for energy savings.
- **Learning adaptive optimal start.** 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.
- **Space temperature input via communicating ZS sensor, or non-communication zone sensor (10K thermistor), or over the network.**
- **Shutdown Inputs** — Fire/Smoke Detector Shutdown and Network Shutdown to safely shutdown the unit in a controlled fashion with ability to monitor the unit.
- **Alarm Status** — Alarms status is accessible through equipment user interfaces or network. (see TruVu Alarm Table).

Hardware Features

- USB port for service/commissioning/troubleshooting, hard-wired via Laptop/smartphone/TruVu ET Display, or wireless service connections via USB-WiFi kit
- Dual 10/100 Mbps, BACnet IP and IP addressing.
- Supports home run, daisy chain and ring IP network topologies.
- Capacitor-backed real-time clock keeps time in the event of power failure or network interruption for at least three days.
- LED indicators for power, status of network and controller, and 1 programmable LED indicator.
- Supports Rnet devices like ZS sensors, Equipment touch, and TruVu ET Display.
- Supports Act Net devices (Smart actuators)

System Features

- Integrated Carrier waterside linkage algorithm for plug-and-play integration with the Carrier WSHP System
- Fully plug-and-play with the Carrier i-Vu Building Automation System
- Supports demand limiting for maximum energy savings
- Compatible with i-Vu Tenant Billing for tracking tenant's after-hours energy usage

- Built-in network diagnostic capture functionality for troubleshooting
- Network statistics that can be viewed numerically or as trend graphs

TruVu Alarms

| ALARM | DESCRIPTION |
|--|--|
| Fire/Smoke Detector Alarm | Immediate shutdown of equipment (fan, compressor, aux heat, and damper) after alarm is generated. |
| Space Temperature Alarms | Generates an alarm whenever the space temperature exceeds configurable alarm set points for occupied and unoccupied periods. |
| Source Water Temperature Alarm | Four configurable alarm limits for leaving condenser water temperature. |
| Supply Air Temperature Alarm | Two configurable alarm limits for supply air temperature. |
| High Condensate/Overflow Alarm | Disables the compressor and fan outputs when alarm is generated. |
| Fan Status Alarm | Monitors the fan output and alarm is generated after 30 seconds and no fan status (all speeds). |
| Compressor Status Alarm | Monitors the compressor output and alarm is generated after 6 minutes of energizing compressor and no status. |
| Filter Status Alarm | Generates an alarm after the number of fan run hours exceeds a configurable filter alarm timer limit. |
| Indoor Air Quality Alarm | Generates an alarm during occupied periods whenever the CO ₂ sensor value exceeds the user adjustable limit. |
| Relative Humidity Alarm | Generates an alarm whenever the space relative humidity exceeds configurable alarm set point. |
| Source Water Linkage Failure Alarm | Generates an alarm after linkage fail with Water loop controller for > 6 min. |
| Airside Linkage Failure Alarm | Generates an alarm once linkage fails for > 6 min. |
| OAT Sensor Alarm | Generates an alarm if the value of OAT fails to be updated through the network. |
| SPT(space temperature) Sensor Alarm | Generates an alarm if the SPT sensor fails to communicate with the control for > 5 minutes. |
| ZS Sensor Alarm | Generates an alarm if the ZS sensor fail to communicate with the control for > 5 minutes. |
| Return Air Temperature Alarm | Configurable alarm limits for return air temperature. |
| Entering Water Temperature Alarm | Configurable alarm limits for entering condenser water temperature. |
| Water Side Delta T Alarm | Configurable alarm limits for waterside delta T. |
| Air Side Delta T Alarm | Configurable alarm limits for airside delta T. |
| Low Water Flow Alarm | Monitors the differential pressure switch, generates alarm if unit has no flow. |
| UPM Alarm - Hard Lockout Status | Generates alarm if Hard lockout conditions occurred on UPM board. Soft lockout alarm history can be viewed. |
| Source Water Valve Alarm | Monitors communicating source water valve (ACT net), alarm is generated if valve fails to communicate. |

Field-Installed TruVu DDC Accessories

ZS sensors

ZS sensors are the preferred method of monitoring space temperature, humidity and CO₂ levels when using the TruVu controller.

TruVu DDC Accessories

| | ZS Standard | ZS Plus | ZS Pro | ZS Pro-M | ZS Pro-F |
|--|--------------------|-----------------|----------------|-------------------|-----------------|
| Model Number | ZS-CAR | ZSPL-CAR | ZSP-CAR | ZS P-M-CAR | ZSPF-CAR |
| Temp CO₂ Humidity Options | X | X | X | X | X |
| VOC Options | X | X | X | | X |
| Neutral Color | X | X | X | X | X |
| Motion-Sensing Option | | | | X | |
| Addressable / Supports Daisy-Chain | X | X | X | X | X |
| Hidden Communication Port | X | X | X | X | X |
| Mounts on a Standard 2 x 4 in. Electrical Box | X | X | X | X | X |
| Occupancy Status Indicator | | X | X | X | X |
| Push Button Occupancy Override | | X | X | X | X |
| Setpoint Adjust | | X | X | X | X |
| Large Easy-to-Read LCD | | | X | X | X |
| Alarm Indicator | | | X | X | X |
| Fan Speed Control | | | | | X |
| Cooling/Heating/Fan Only - Mode Control | | | | | X |
| °F to °C Conversion Button | | | | | X |

User Interfaces

Interfaces are used for start up, commissioning, access information, read sensor values, set or adjust setpoints and schedules, view trends, and monitor alarms.

TruVu ET Display

Carrier's TruVu equipment touch (ET) displays are an integrated component of the i-Vu building automation system. They feature illuminated color pixel touchscreens in two different sizes and connect to a single i-Vu controller. Designed for panel or wall mounting, they provide building occupants, facility managers, and technicians a powerful user interface for managing HVAC equipment in a building. It can view or change its property values, schedule equipment, view trends and alarms, and more, without having to access the system's server. For more details about the TruVu equipment touch devices, see either the TruVu ET Display Installation and Setup Guide.



Field Assistant

Field Assistant is a standalone tool you can install on computer or laptop to access a single TruVu™ controller, several controllers, or a network of i-Vu TruVu controllers (up to 750 controllers). It can communicate with the devices using USB port on the TruVu controller or over an IP network. For more details about the Field Assistant tool, see Field assistant tool Help manual.

Field Provided Non-Communicating Sensors

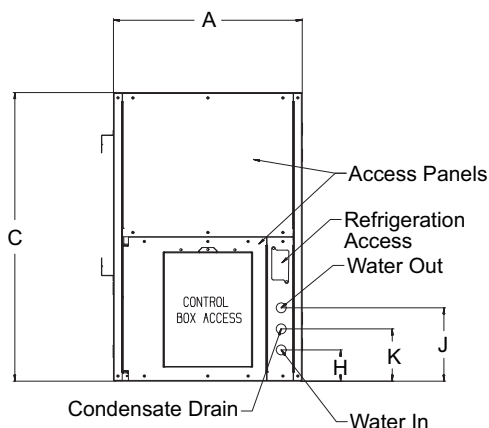
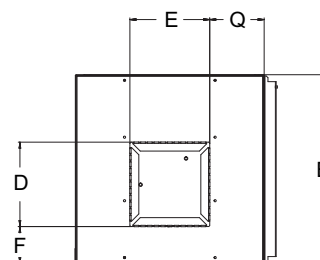
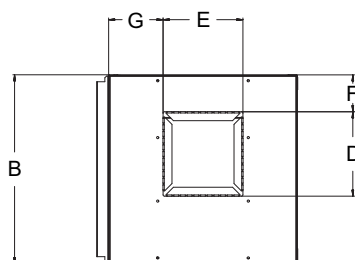
In addition to supplement thermostat or DDC controller, a variety of non-communicating sensors are available to fulfill specific requirements of your application.

Non-Communicating Sensors

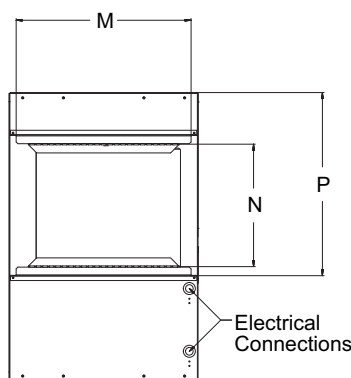
| PART NUMBER | DESCRIPTION |
|-------------------------|---|
| 33ZCSENSRH-02 | Space wall mounted relative humidity sensor |
| 33ZCSPTCO2-01 | CO ₂ /space temp. sensor without LCD display and no override |
| 33ZCT55CO2-02 | Space temp and CO ₂ room sensor with override |
| 33ZCSPTCO2LCD-01 | CO ₂ /space temp. sensor with LCD display and no override |
| 33ZCT55CO2-02 | Space temp. and CO ₂ room sensor with override |
| 33ZCT56CO2-02 | Space temp. and CO ₂ room sensor with override and set point adjustment |
| 33ZCT55SPT | Space Temperature Sensor with override |
| 33ZCT56SPT | Space temperature sensor with override and set point adjustment |
| 33ZCT59SPT | Space temperature sensor with override and set point adjustment and digital display |

NOTE: Check capability/inputs of the controlling device (thermostat or DDC controller) to accept non-communicating sensor.

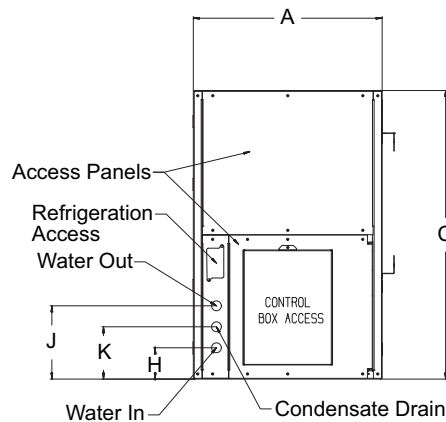
50WC Vertical Units



**Left Hand Return
Right Water**



Return Air (Filter) View



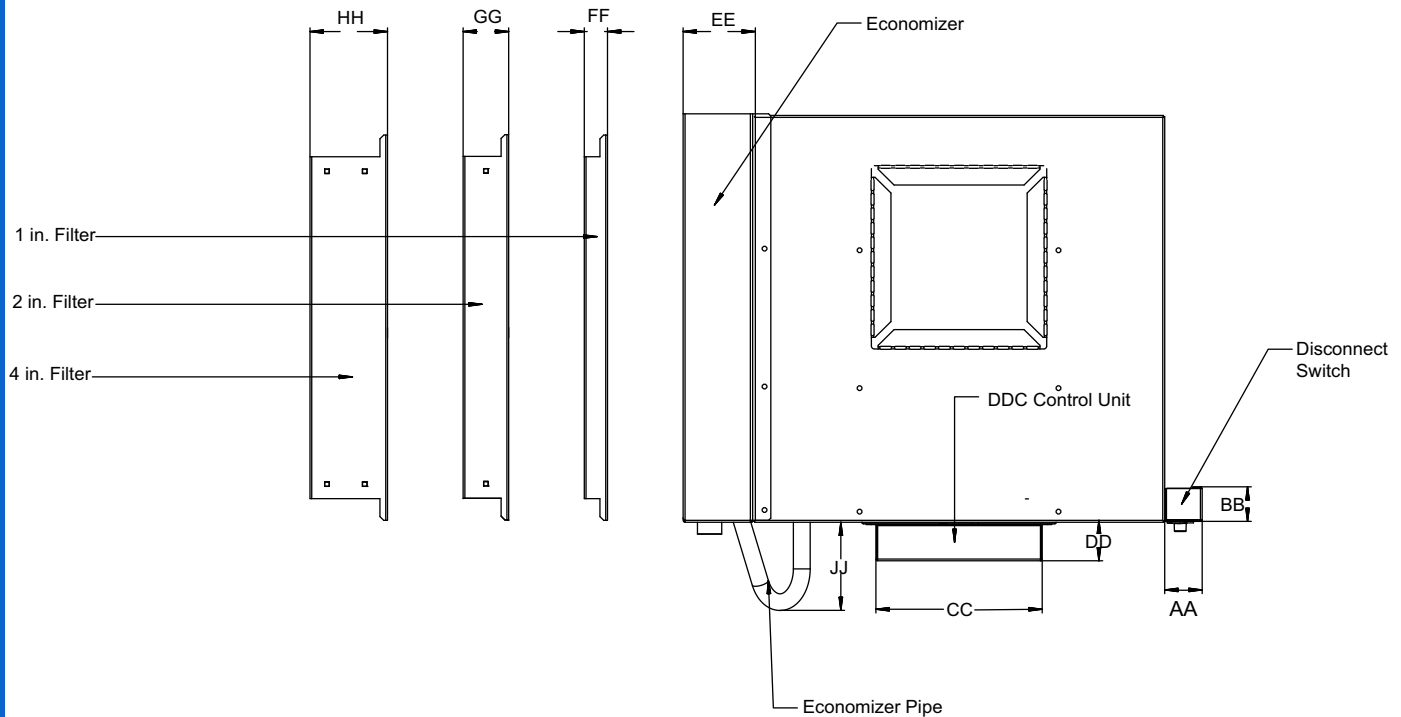
**Right Hand Return
Left Water**

| 50WC UNIT SIZE <small>a,b,c,d</small> | VERTICAL DIMENSIONS (in.) ^{e,f,g} | | | | | | | | | | | | | | | | | |
|--|--|------|------|-----------|-------|--|---|--|-------|--------|---------------------|-------------------|---------------------------|--|---|---|--|---|
| | W | D | H | DISCHARGE | | CABINET EDGE TO DISCHARGE (LEFT HAND RETURN) | CABINET EDGE TO DISCHARGE (RIGHT HAND RETURN) | CABINET EDGE TO DISCHARGE (LEFT HAND RETURN) | WATER | | CONDENSATE DRAIN | R/A DUCT WIDTH | R/A DUCT FLANGE HEIGHT | FILTER RACK HEIGHT ^{h,i,j} | CABINET EDGE TO DISCHARGE (RIGHT HAND RETURN) | CONDENSER WATER CONNECTIONS (in.) | RECOMMENDED REPLACEMENT NOM. FILTER (qty) | CONDENSER DRAIN CONNECTIONS (in.) |
| | | | | DEPTH | WIDTH | | | | INLET | OUTLET | | | | | | | | |
| | | | | D | E | F | F | G | H | J | K | M | N | P | Q | | | |
| 007 | 19.0 | 19.0 | 23.0 | 4.00 | 6.50 | 6.50 | 2.64 | 5.50 | 3.50 | 8.5 | 6.00 | 14.75 | 10.00 | 12.00 | 5.50 | 3/4 FPT | 12x16 | 3/4 FPT |
| 009 | 19.0 | 19.0 | 23.0 | 4.00 | 6.50 | 6.50 | 2.64 | 5.50 | 3.50 | 8.5 | 6.00 | 14.75 | 10.00 | 12.00 | 5.50 | 3/4 FPT | 12x16 | 3/4 FPT |
| 012 | 19.0 | 19.0 | 23.0 | 4.00 | 6.50 | 6.50 | 2.64 | 5.50 | 3.50 | 8.5 | 6.00 | 14.75 | 10.00 | 12.00 | 5.50 | 3/4 FPT | 12x16 | 3/4 FPT |
| 015 | 21.5 | 21.5 | 33.0 | 9.75 | 9.00 | 4.25 | 4.25 | 6.25 | 3.00 | 8.5 | 6.00 | 17.50 | 15.25 | 17.25 | 6.25 | 3/4 FPT | 17x19 | 3/4 FPT |
| 018 | 21.5 | 21.5 | 33.0 | 9.75 | 9.00 | 4.25 | 4.25 | 6.25 | 3.00 | 8.5 | 6.00 | 17.50 | 15.25 | 17.25 | 6.25 | 3/4 FPT | 17x19 | 3/4 FPT |
| 024 | 21.5 | 21.5 | 39.0 | 9.75 | 9.00 | 4.25 | 4.25 | 6.25 | 3.25 | 8.5 | 5.75 | 18.00 | 20.00 | 22.25 | 6.25 | 3/4 FPT | 28x22 | 3/4 FPT |
| 030 | 21.5 | 21.5 | 39.0 | 9.75 | 9.00 | 4.25 | 4.25 | 6.25 | 3.25 | 8.5 | 5.75 | 18.00 | 20.00 | 22.25 | 6.25 | 3/4 FPT | 28x22 | 3/4 FPT |
| 036 | 21.5 | 21.5 | 39.0 | 11.50 | 10.50 | 2.25 | 2.25 | 6.50 | 3.25 | 8.5 | 5.75 | 18.25 | 25.00 | 27.00 | 6.50 | 3/4 FPT | 19x27 | 3/4 FPT |
| 042 | 21.5 | 26.0 | 44.0 | 11.25 | 10.50 | 5.75 | 5.75 | 5.50 | 3.25 | 8.5 | 5.75 | 24.00 | 28.25 | 30.75 | 5.50 | 3/4 FPT | 24x30 | 3/4 FPT |
| 048 | 24.0 | 26.0 | 44.0 | 11.25 | 10.50 | 5.00 | 5.00 | 6.75 | 3.00 | 8.5 | 5.75 | 24.00 | 28.25 | 30.00 | 6.75 | 1 FPT | 24x30 | 3/4 FPT |
| 060 | 24.0 | 26.0 | 44.0 | 12.50 | 11.75 | 4.25 | 4.25 | 6.25 | 3.25 | 8.0 | 5.75 | 24.00 | 28.25 | 30.00 | 6.00 | 1 FPT | 24x30 | 3/4 FPT |
| 070 | 24.0 | 33.0 | 58.0 | 12.50 | 11.75 | 9.00 | 9.00 | 6.25 | 3.00 | 8.5 | 5.75 | 24.25 | 38.25 | 32.00 | 6.00 | 1 FPT | 20x27 (2) | 3/4 FPT |

NOTE(S):

- Front of the unit is determined by the location of the control box panel.
- When DDC controller is installed, control box panel extends 3.0 in. beyond the front of the unit.
- When disconnect switch is installed, increase width by 2.0 in. beyond side of unit.
- The local electric codes may require 36 in. or more clearance at the electrical control box.
- Specifications subject to change without notice.
- Overall unit dimensions do not include filter rack or duct flanges.
- All dimensions within ± 0.125 in. Dimensions in inches.
- The 1 in. filter rack extends 1.25 in. beyond the side of the unit (not including flange).
- The 2 in. filter rack extends 3.0 in. beyond the side of the unit (not including flange). This filter rack is 4 sided with a filter access door on both ends (front/back) and can accept either a 1 in. or 2 in. filter.
- The 4 in. filter rack extends 4.75 in. beyond the side of the unit (not including flange). This filter rack is 4 sided with a filter access door on both ends (front/back) and can accept either a 2 in. or 4 in. filter.

50WC Vertical Units — FIOP



| 50WC Unit Size ^{a,b,c,d,e} | DISCONNECT SWITCH | | DDC | | ECONOMIZER | | FILTER RACKS | | |
|--|-------------------|-------|-------------|--------------|------------|-----------------|-------------------|-------------------|-------------------|
| | AA | BB | CC | DD | EE | JJ | FF | GG | HH |
| | Width | Depth | Panel Width | Panel Height | Economizer | Economizer pipe | 1 in. Filter Rack | 2 in. Filter Rack | 4 in. Filter Rack |
| 007 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 009 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 012 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 015 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 018 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 024 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 030 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 036 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 042 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 048 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 060 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 070 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |

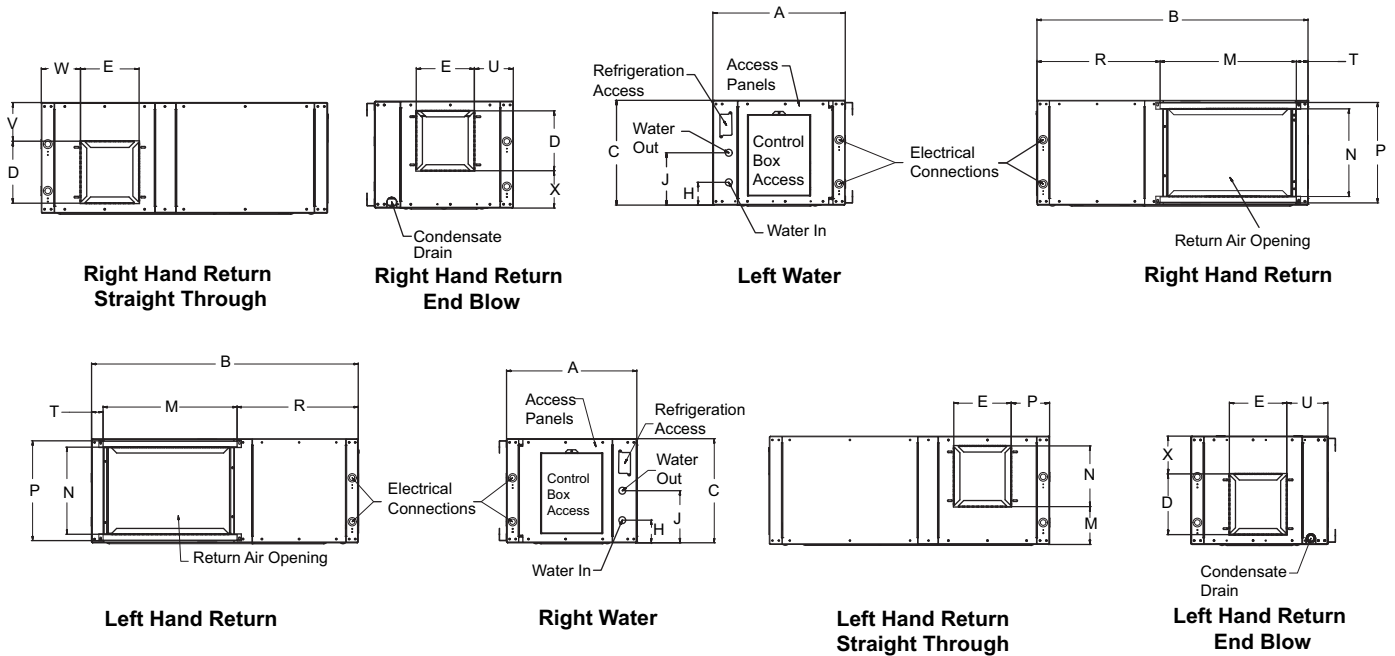
NOTE(S):

- Specifications subject to change without notice.
- All dimensions within ± 0.25 in. Dimensions in inches.
- Filter rack dimensions does not include 1 in. duct flange.
- 2 in. filter rack can accept either a 1 in or 2 in. filter.
- 4 in. filter rack can accept either a 2 in. or 4 in. filter.

LEGEND

DDC — Direct Digital Controller

50WC Horizontal Units

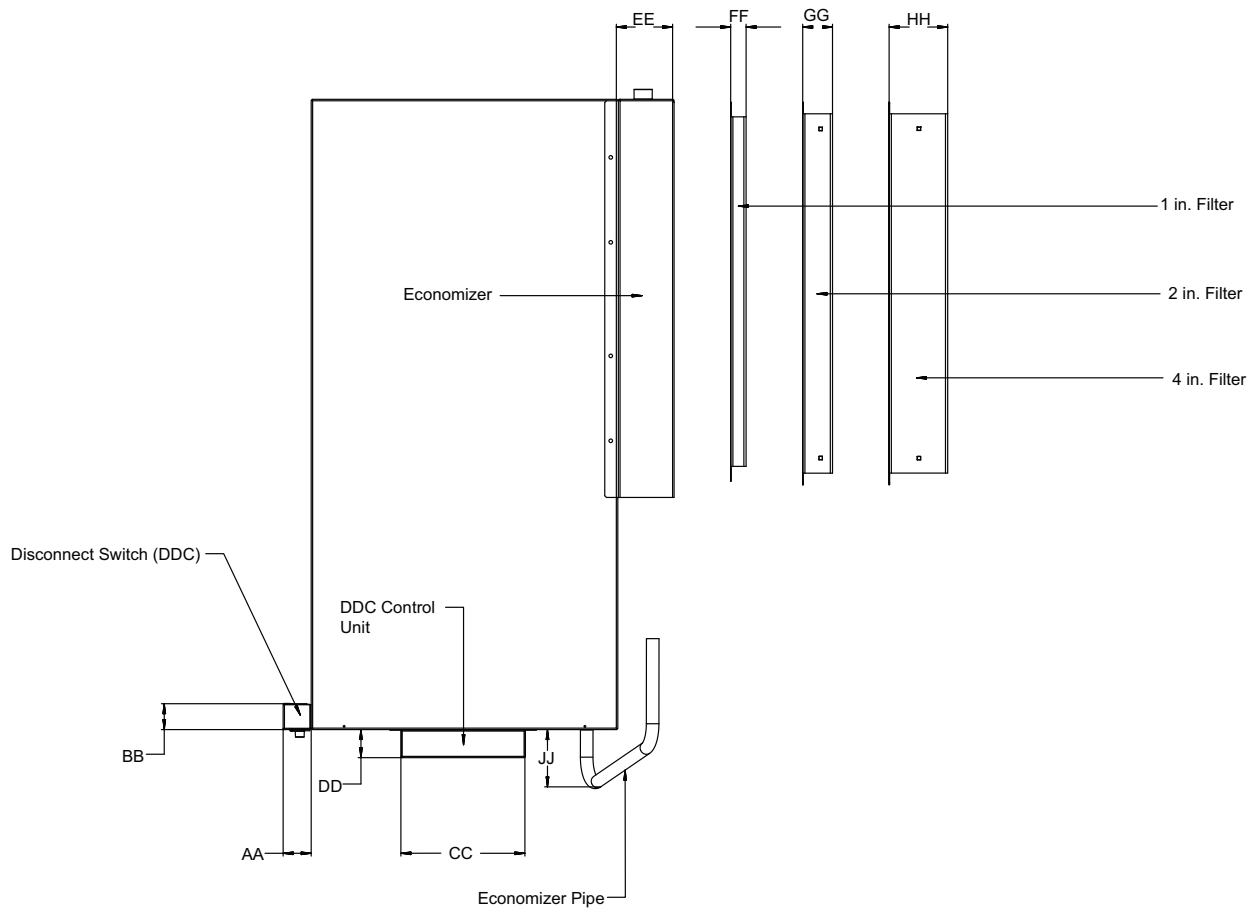


| 50WC UNIT SIZE <small>a,b,c,d</small> | HORIZONTAL DIMENSIONS (in.) ^{e,f,g} | | | | | | | | | | | | | | | | | | | |
|--|--|------|------|-----------|-------|-------|--------|-------------------|---------------------------|--|---------------------------------|-------------------------------|---|--|---------------------------------|--------------------------------|---------------------------------|--------------------------------------|---|--------------------------------------|
| | W | D | H | DISCHARGE | | WATER | | R/A DUCT WIDTH | R/A DUCT FLANGE HEIGHT | FILTER RACK HEIGHT ^{h,i,j} | CABINET FRONT TO FILTER RACK | CABINET END TO FILTER RACK | SIDE TO DISCHARGE (END) (LEFT HAND RETURN) | SIDE TO DISCHARGE (END) (RIGHT HAND RETURN) | TOP TO DISCHARGE (FLE & FRS) | END TO DISCHARGE (STRAIGHT) | TOP TO DISCHARGE (FRE & FLS) | CONDENSER WATER CONNECTIONS (in.) | RECOMMENDED REPLACEMENT NOM. FILTER (qty) | CONDENSER DRAIN CONNECTIONS (in.) |
| | | | | HEIGHT | WIDTH | INLET | OUTLET | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| A | B | C | D | E | H | J | M | N | P | R | T | U | U | V | W | X | | | | |
| 007 | 19.0 | 33.0 | 11.5 | 4.00 | 6.50 | 3.75 | 9.00 | 16.00 | 8.50 | 11.00 | 16.00 | 1.00 | 7.75 | 4.75 | 5.87 | 5.50 | 1.75 | 3/4 FPT | 10x16 | 3/4 FPT |
| 009 | 19.0 | 33.0 | 11.5 | 4.00 | 6.50 | 3.75 | 9.00 | 16.00 | 8.50 | 11.00 | 16.00 | 1.00 | 7.75 | 4.75 | 5.87 | 5.50 | 1.75 | 3/4 FPT | 10x16 | 3/4 FPT |
| 012 | 19.0 | 33.0 | 11.5 | 4.00 | 6.50 | 3.75 | 9.00 | 16.00 | 8.50 | 11.00 | 16.00 | 1.00 | 7.75 | 4.75 | 5.87 | 5.50 | 1.75 | 3/4 FPT | 10x16 | 3/4 FPT |
| 015 | 21.5 | 44.0 | 17.0 | 9.75 | 9.25 | 3.25 | 8.50 | 23.25 | 14.0 | 16.00 | 18.50 | 0.10 | 6.00 | 6.00 | 5.75 | 6.00 | 1.50 | 3/4 FPT | 16x24 | 3/4 FPT |
| 018 | 21.5 | 44.0 | 17.0 | 9.75 | 9.25 | 3.25 | 8.50 | 23.25 | 14.0 | 16.00 | 18.50 | 0.10 | 6.00 | 6.00 | 5.75 | 6.00 | 1.50 | 3/4 FPT | 16x24 | 3/4 FPT |
| 024 | 21.5 | 44.0 | 18.0 | 9.75 | 9.25 | 3.25 | 8.50 | 24.25 | 15.25 | 17.00 | 17.25 | 0.10 | 6.00 | 6.00 | 6.75 | 6.50 | 1.50 | 3/4 FPT | 17x25 | 3/4 FPT |
| 030 | 21.5 | 44.0 | 18.0 | 9.75 | 9.25 | 3.25 | 8.50 | 24.25 | 15.25 | 17.00 | 17.25 | 0.10 | 6.00 | 6.00 | 6.75 | 6.50 | 1.50 | 3/4 FPT | 17x25 | 3/4 FPT |
| 036 | 21.5 | 47.0 | 19.0 | 11.25 | 10.50 | 3.25 | 8.50 | 29.25 | 16.00 | 18.25 | 14.50 | 1.00 | 5.50 | 5.50 | 6.00 | 6.00 | 1.75 | 3/4 FPT | 18x30 | 3/4 FPT |
| 042 | 21.5 | 47.0 | 19.0 | 11.25 | 10.50 | 3.25 | 8.50 | 29.25 | 16.00 | 18.25 | 14.50 | 1.00 | 5.50 | 5.50 | 6.00 | 5.50 | 1.75 | 3/4 FPT | 18x30 | 3/4 FPT |
| 048 | 24.0 | 54.0 | 21.0 | 11.25 | 10.50 | 3.25 | 8.00 | 33.25 | 18.00 | 20.00 | 18.00 | 1.00 | 5.00 | 5.00 | 8.00 | 5.25 | 1.75 | 1 FPT | 20x34 | 3/4 FPT |
| 060 | 24.0 | 54.0 | 21.0 | 12.50 | 11.75 | 3.25 | 8.00 | 33.25 | 18.00 | 20.00 | 18.00 | 1.00 | 5.00 | 5.00 | 6.75 | 5.00 | 1.75 | 1 FPT | 20x34 | 3/4 FPT |
| 070 | 24.0 | 62.0 | 21.0 | 12.50 | 11.75 | 3.25 | 8.50 | 43.50 | 18.00 | 20.00 | 15.00 | 1.00 | 5.50 | 5.50 | 6.75 | 5.50 | 1.75 | 1 FPT | 20x22 (Qty 2) | 3/4 FPT |

NOTE(S):

- Front of the unit is determined by the location of the control box panel.
- When DDC controller is installed, control box panel extends 3.0 in. beyond the front of the unit.
- When disconnect switch is installed, increase width by 2.0 in. beyond side of unit.
- The local electric codes may require 36 in. or more clearance at the electrical control box.
- Specifications subject to change without notice.
- Overall unit dimensions do not include filter rack or duct flanges.
- All dimensions within ± 0.125 in. Dimensions in inches.
- The 1 in. filter rack extends 1.25 in. beyond the side of the unit (not including flange).
- The 2 in. filter rack extends 3.0 in. beyond the side of the unit (not including flange). This filter rack is 4 sided with a filter access door on both ends (front/back) and can accept either a 1 in. or 2 in. filter.
- The 4 in. filter rack extends 4.75 in. beyond the side of the unit (not including flange). This filter rack is 4 sided with a filter access door on both ends (front/back) and can accept either a 2 in. or 4 in. filter.

50WC Horizontal Units — FIOP



| 50WC Unit Size ^{a,b,c,d,e} | DISCONNECT SWITCH | | DDC | | ECONOMIZER | | FILTER RACKS | | |
|--|-------------------|-------|-------------|--------------|------------|-----------------|-------------------|-------------------|-------------------|
| | AA | BB | CC | DD | EE | JJ | FF | GG | HH |
| | Width | Depth | Panel Width | Panel Height | Economizer | Economizer pipe | 1 in. Filter Rack | 2 in. Filter Rack | 4 in. Filter Rack |
| 007 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 009 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 012 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 015 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 018 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 024 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 030 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 036 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 042 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 048 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 060 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |
| 070 | 2.00 | 2.00 | 9.00 | 3.00 | 4.00 | 4.25 | 1.25 | 3.00 | 4.75 |

NOTE(S):

- Specifications subject to change without notice.
- All dimensions within ± 0.25 in. Dimensions in inches.
- Filter rack dimensions does not include 1 in. duct flange.
- 2 in. filter rack can accept either a 1 in or 2 in. filter.
- 4 in. filter rack can accept either a 2 in. or 4 in. filter.

LEGEND

DDC — Direct Digital Controller

50WC Horizontal Unit Corner Weights

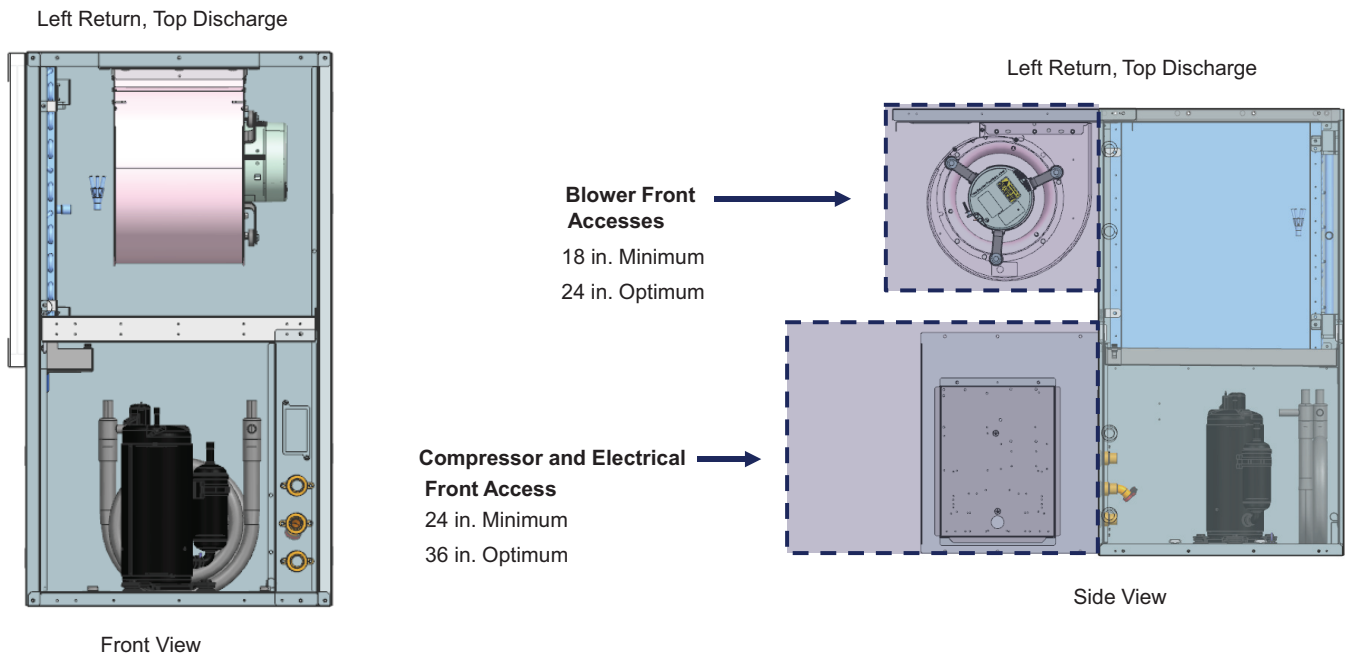
| 50WC UNIT SIZE | UNITS | TOTAL WEIGHT | LEFT HAND EVAPORATOR | | | | RIGHT HAND EVAPORATOR | | | |
|----------------------|-------|-----------------|-------------------------|--------------------------|-----------|------------|-------------------------|--------------------------|-----------|------------|
| | | | Left Front ^a | Right Front ^a | Left Back | Right Back | Left Front ^a | Right Front ^a | Left Back | Right Back |
| 007 | lb | 98.0 | 30.8 | 21.0 | 20.0 | 26.2 | 21.0 | 30.8 | 26.2 | 20.0 |
| | kg | 44.5 | 14.0 | 9.5 | 9.1 | 11.9 | 9.5 | 14.0 | 11.9 | 9.1 |
| 009 | lb | 106.0 | 32.8 | 23.0 | 22.0 | 28.2 | 23.0 | 32.8 | 28.2 | 22.0 |
| | kg | 48.1 | 14.9 | 10.4 | 10.0 | 12.8 | 10.4 | 14.9 | 12.8 | 10.0 |
| 012 | lb | 114.0 | 34.8 | 25.0 | 24.0 | 30.2 | 25.0 | 34.8 | 30.2 | 24.0 |
| | kg | 51.7 | 15.8 | 11.3 | 10.9 | 13.7 | 11.3 | 15.8 | 13.7 | 10.9 |
| 015 | lb | 146.8 | 40.2 | 38.6 | 31.4 | 36.6 | 38.6 | 40.2 | 36.6 | 31.4 |
| | kg | 66.6 | 18.2 | 17.5 | 14.2 | 16.6 | 17.5 | 18.2 | 16.6 | 14.2 |
| 018 | lb | 154.8 | 42.2 | 40.6 | 33.4 | 38.6 | 40.6 | 42.2 | 38.6 | 33.4 |
| | kg | 70.2 | 19.1 | 18.4 | 15.1 | 17.5 | 18.4 | 19.1 | 17.5 | 15.1 |
| 024 | lb | 183.2 | 45.8 | 58.2 | 42.2 | 37.0 | 58.2 | 45.8 | 37.0 | 42.2 |
| | kg | 83.1 | 20.8 | 26.4 | 19.1 | 16.8 | 26.4 | 20.8 | 16.8 | 19.1 |
| 030 | lb | 187.4 | 58.2 | 50.2 | 36.8 | 42.2 | 50.2 | 58.2 | 42.2 | 36.8 |
| | kg | 85.0 | 26.4 | 22.8 | 16.7 | 19.1 | 22.8 | 26.4 | 19.1 | 16.7 |
| 036 | lb | 205.2 | 61.6 | 46.6 | 40.6 | 56.4 | 46.6 | 61.6 | 56.4 | 40.6 |
| | kg | 93.1 | 27.9 | 21.1 | 18.4 | 25.6 | 21.1 | 27.9 | 25.6 | 18.4 |
| 042 | lb | 213.2 | 63.6 | 48.6 | 42.6 | 58.4 | 48.6 | 63.6 | 58.4 | 42.6 |
| | kg | 96.7 | 28.8 | 22.0 | 19.3 | 26.5 | 22.0 | 28.8 | 26.5 | 19.3 |
| 048 | lb | 266.6 | 77.0 | 74.4 | 52.6 | 62.6 | 74.4 | 77.0 | 62.6 | 52.6 |
| | kg | 120.9 | 34.9 | 33.7 | 23.9 | 28.4 | 33.7 | 34.9 | 28.4 | 23.9 |
| 060 | lb | 285.2 | 77.2 | 82.2 | 73.4 | 52.4 | 82.2 | 77.2 | 52.4 | 73.4 |
| | kg | 129.4 | 35.0 | 37.3 | 33.3 | 23.8 | 37.3 | 35.0 | 23.8 | 33.3 |
| 070 | lb | 296.2 | 85.0 | 90.6 | 60.2 | 60.4 | 90.6 | 85.0 | 60.4 | 60.2 |
| | kg | 134.4 | 38.6 | 41.1 | 27.3 | 27.4 | 41.1 | 38.6 | 27.4 | 27.3 |

NOTE(S):

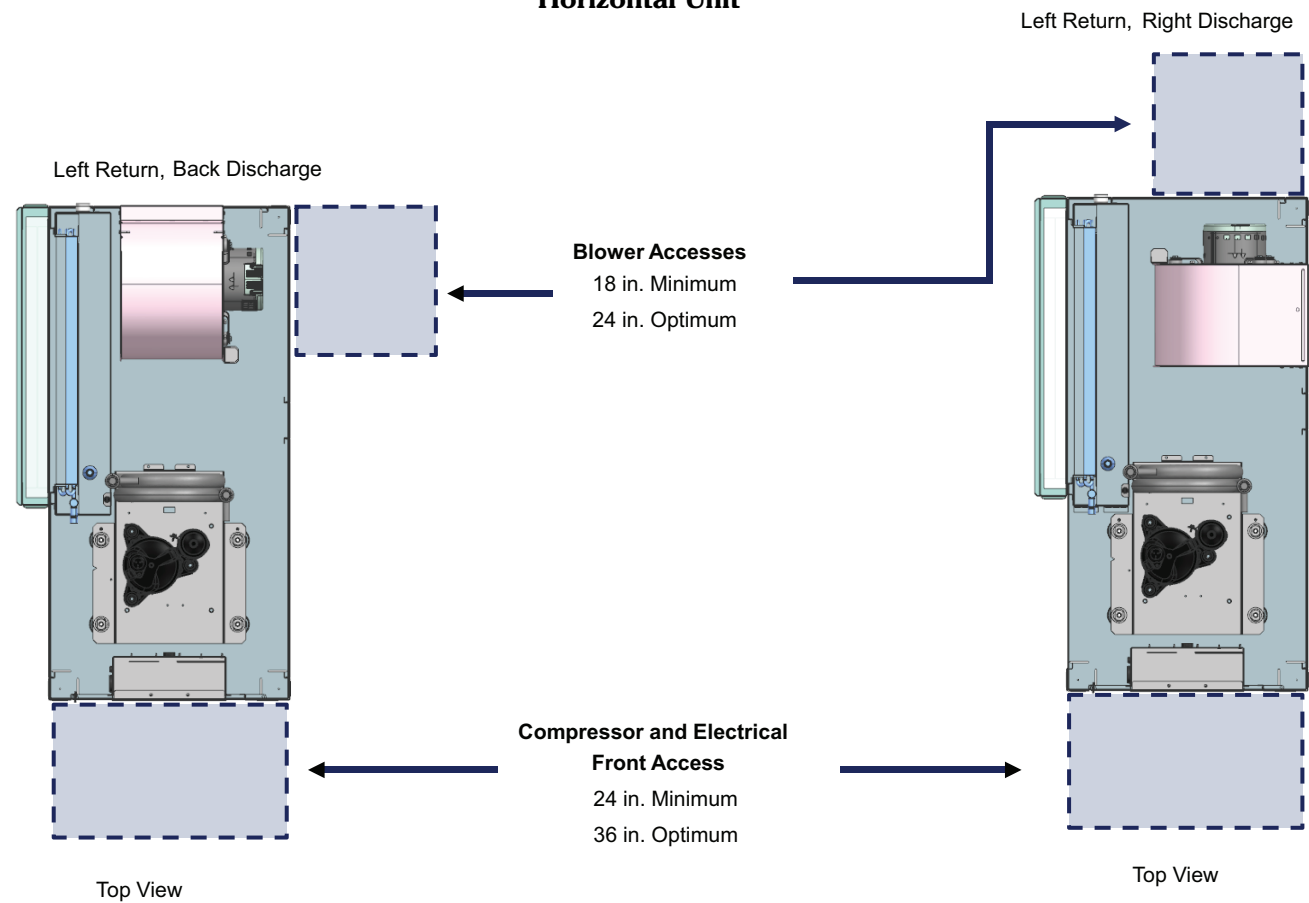
a. Front is the control box end.

50WC Service Clearance

Vertical Unit

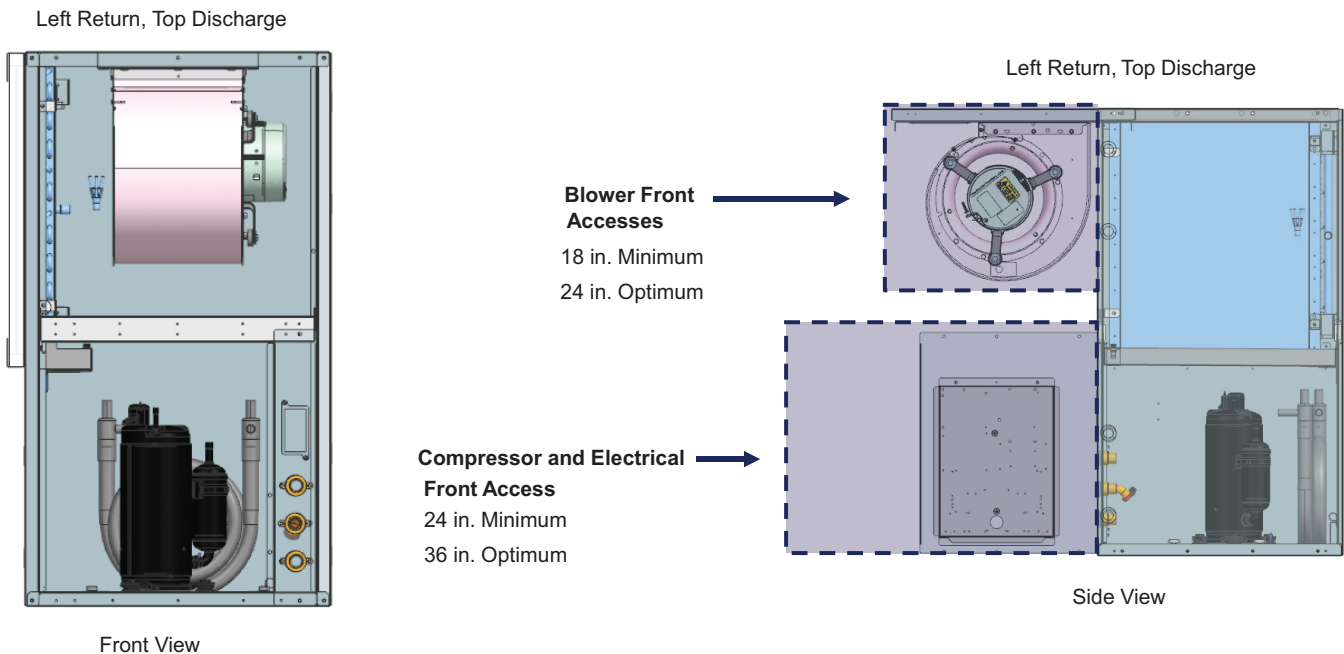


Horizontal Unit

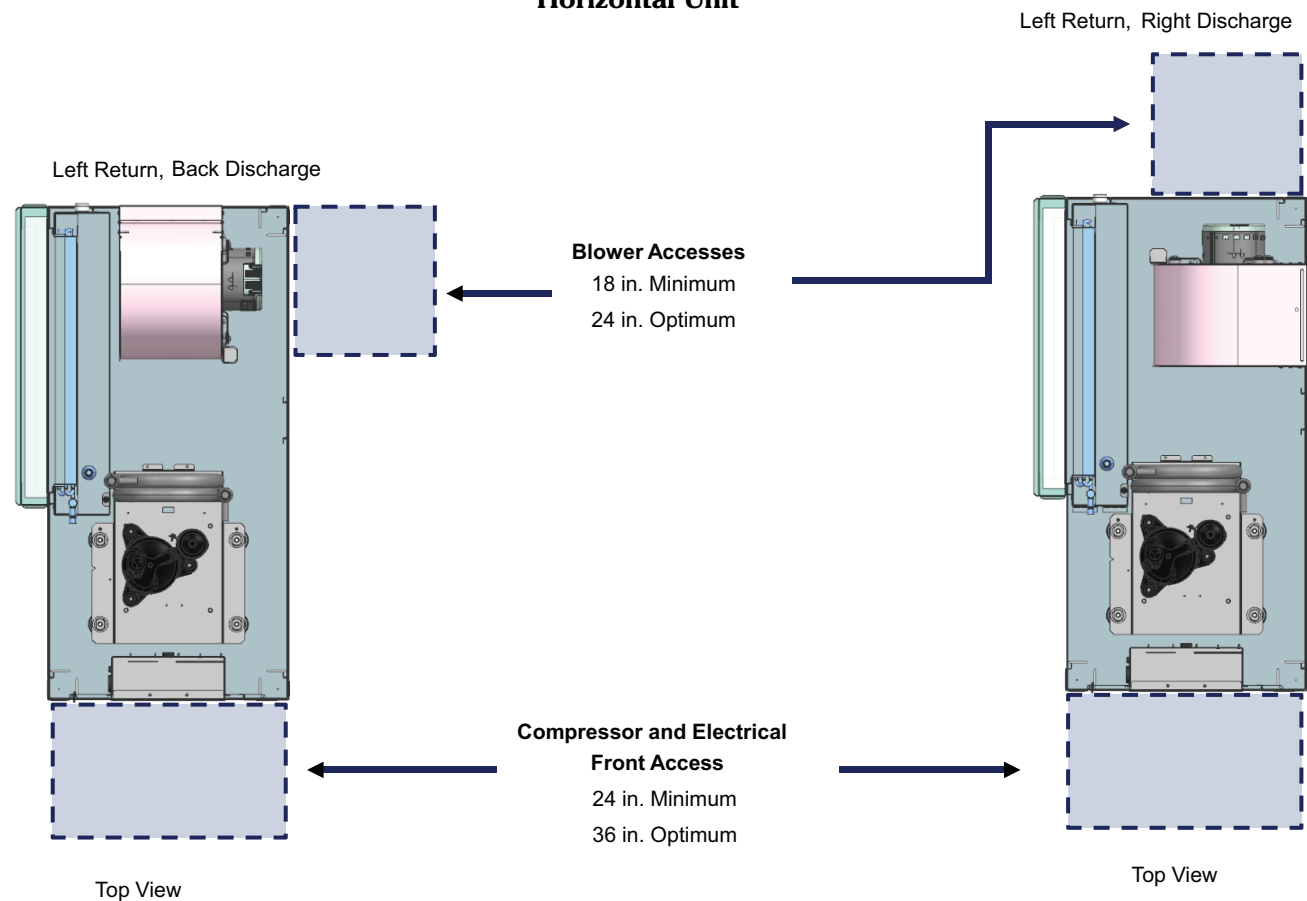


50WC Service Clearance

Vertical Unit



Horizontal Unit



50WC Series WSHP Operating Limits ^a

| Fluid Type | Limit | Cooling | Heating |
|------------|--|---|---------|
| Air | Minimum Ambient (F) | 50 | 40 |
| | Maximum Ambient (F) | 100 | 85 |
| | Rated Ambient (F) | 80 | 68 |
| | Minimum Entering (F db/wb) | 65/57 | 45 |
| | Maximum Entering (F db/wb) | 95/85 | 80 |
| | Rated Entering (F) | 80/67 | 68/57 |
| Liquid | Minimum Entering (F) | 45 | 20 |
| | Max Entering (F) | 110 | 80 |
| | Rated Entering (F) | Water Loop | 86 |
| | | Ground Loop | 77 |
| | | Ground Water | 59 |
| | Anti-Freeze Requirement (LWT / EWT F) | <40 / <50 | |
| | Maximum operating water pressure (PSI/kPa) | 400 psi/2,758 kPa (Standard unit) 300 psi/2,068 kPa (with factory installed 2-way valve option) | |
| | Minimum operating Flow Rate (GPM/Ton) | 1.5 | |

NOTE(S):

a. Units with water side economizer options can operate with EWT <45°F, the LWT from WSE should be within the stated above conditions.

LEGEND

db — Dry Bulb
EWT — Entering Water Temperature
GPM — Gallons Per Minute
LWT — Leaving Water Temperature
wb — Wet Bulb
WSE — Water Side Economizer
WSHP — Water Source Heat Pump

50WC Vertical Units (PSC Motor Performance)^{a,b}

| MODEL | FAN SPEED | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC007 | Low | | 289 | 267 | 244 | 213 | — | — | — | — | — | — | — | — |
| | Med | X | 335 | 309 | 283 | 251 | 215 | — | — | — | — | — | — | — |
| | Hi | | 347 | 320 | 294 | 262 | 225 | 185 | — | — | — | — | — | — |
| 50WC009 | Low | | 294 | 281 | 267 | 248 | — | — | — | — | — | — | — | — |
| | Med | X | 379 | 360 | 340 | 316 | 289 | — | — | — | — | — | — | — |
| | Hi | | 414 | 391 | 369 | 343 | 314 | 284 | — | — | — | — | — | — |
| 50WC012 | Low | | 294 | 281 | 267 | 248 | — | — | — | — | — | — | — | — |
| | Med | | 379 | 360 | 340 | 316 | 289 | — | — | — | — | — | — | — |
| | Hi | X | 414 | 391 | 369 | 343 | 314 | 284 | — | — | — | — | — | — |
| 50WC015 | Low | | 542 | 519 | 469 | 437 | 415 | 375 | — | — | — | — | — | — |
| | Med | | 621 | 598 | 546 | 497 | 452 | 424 | 360 | — | — | — | — | — |
| | Hi | X | 814 | 774 | 733 | 602 | 545 | 500 | 449 | 366 | — | — | — | — |
| 50WC018 | Low | | 542 | 519 | 469 | 437 | 415 | 375 | — | — | — | — | — | — |
| | Med | | 621 | 598 | 546 | 497 | 452 | 424 | 360 | — | — | — | — | — |
| | Hi | X | 814 | 774 | 733 | 602 | 545 | 500 | 449 | 366 | — | — | — | — |
| 50WC024 | Low | | 730 | 723 | 703 | 679 | 637 | 544 | 493 | — | — | — | — | — |
| | Med | | 821 | 808 | 787 | 757 | 720 | 667 | 535 | 479 | — | — | — | — |
| | Hi | X | 1019 | 972 | 943 | 890 | 840 | 779 | 696 | 535 | 473 | — | — | — |
| 50WC030 | Low | | 730 | 723 | 703 | 679 | 637 | 544 | 493 | 412 | — | — | — | — |
| | Med | | 821 | 808 | 787 | 757 | 720 | 667 | 535 | 479 | — | — | — | — |
| | Hi | X | 1019 | 972 | 943 | 890 | 840 | 779 | 696 | 535 | 473 | — | — | — |
| 50WC036 208/230/ 460V | Low | | 1178 | 1139 | 1097 | 1052 | 998 | 935 | 863 | — | — | — | — | — |
| | Med | | 1250 | 1204 | 1158 | 1108 | 1052 | 987 | 912 | 826 | — | — | — | — |
| | Hi | X | 1289 | 1240 | 1194 | 1142 | 1082 | 1017 | 945 | 857 | — | — | — | — |
| 50WC036 265V | Low | | 1022 | 1013 | 988 | 953 | 884 | 805 | 750 | 684 | — | — | — | — |
| | Med | | 1221 | 1193 | 1156 | 1118 | 1059 | 964 | 837 | 772 | — | — | — | — |
| | Hi | X | 1353 | 1304 | 1261 | 1206 | 1147 | 1062 | 887 | 808 | — | — | — | — |
| 50WC042 | Low | | 963 | 999 | 1016 | 1013 | 996 | 995 | 860 | — | — | — | — | — |
| | Med | | 1237 | 1243 | 1263 | 1260 | 1243 | 1215 | 1103 | — | — | — | — | — |
| | Hi | X | 1561 | 1559 | 1547 | 1520 | 1480 | 1426 | 1357 | 1165 | — | — | — | — |
| 50WC048 | Low | | 1424 | 1422 | 1410 | 1393 | 1364 | 1327 | 1273 | 1210 | 1124 | — | — | — |
| | Med | | 1677 | 1662 | 1633 | 1590 | 1538 | 1481 | 1407 | 1324 | 1229 | — | — | — |
| | Hi | X | 1953 | 1896 | 1847 | 1778 | 1704 | 1609 | 1515 | 1422 | 1319 | 1167 | — | — |
| 50WC060 | Low | | 1646 | 1636 | 1627 | 1592 | 1573 | 1540 | 1505 | 1462 | 1415 | 1397 | — | — |
| | Med | | 1832 | 1819 | 1806 | 1793 | 1746 | 1711 | 1659 | 1619 | 1553 | 1501 | 1417 | — |
| | Hi | X | 2081 | 2076 | 2029 | 2008 | 1976 | 1934 | 1876 | 1812 | 1740 | 1659 | 1575 | — |
| 50WC070 | Low | | 1593 | 1586 | 1587 | 1576 | 1572 | 1561 | 1563 | 1550 | 1534 | 1504 | 1456 | 1411 |
| | Med | | 1776 | 1777 | 1774 | 1778 | 1776 | 1756 | 1749 | 1733 | 1728 | 1684 | 1659 | 1606 |
| | Hi | X | 2028 | 2033 | 2029 | 2029 | 2030 | 2029 | 2024 | 1991 | 1969 | 1943 | 1906 | 1852 |

NOTE(S):

a. 575-v models employ 1-speed motors (high only).

b. cfm airflow is based on wet coil and 1 in. disposable MERV 5 filter.

Performance data (cont)

50WC Horizontal Units (PSC Motor Performance)^{a,b}

| MODEL | FAN SPEED | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC007 | Low | | 296 | 285 | 271 | 254 | 235 | — | — | — | — | — | — | — |
| | Med | X | 410 | 391 | 373 | 349 | 321 | — | — | — | — | — | — | — |
| | Hi | | 465 | 442 | 420 | 393 | 360 | — | — | — | — | — | — | — |
| 50WC009 | Low | | 296 | 281 | 266 | 244 | — | — | — | — | — | — | — | — |
| | Med | X | 393 | 373 | 347 | 323 | 293 | 255 | 223 | — | — | — | — | — |
| | Hi | | 424 | 401 | 373 | 345 | 314 | 279 | 238 | 196 | — | — | — | — |
| 50WC012 | Low | | 296 | 281 | 266 | 244 | — | — | — | — | — | — | — | — |
| | Med | | 393 | 373 | 347 | 323 | 293 | 255 | 223 | — | — | — | — | — |
| | Hi | X | 424 | 401 | 373 | 345 | 314 | 279 | 238 | 196 | — | — | — | — |
| 50WC015 | Low | | 542 | 519 | 469 | 437 | 415 | 375 | — | — | — | — | — | — |
| | Med | | 621 | 598 | 546 | 497 | 452 | 424 | 360 | — | — | — | — | — |
| | Hi | X | 814 | 774 | 733 | 602 | 545 | 500 | 449 | 366 | — | — | — | — |
| 50WC018 | Low | | 542 | 519 | 469 | 437 | 415 | 375 | — | — | — | — | — | — |
| | Med | | 621 | 598 | 546 | 497 | 452 | 424 | 360 | — | — | — | — | — |
| | Hi | X | 814 | 774 | 733 | 602 | 545 | 500 | 449 | 366 | — | — | — | — |
| 50WC024 | Low | | 1010 | 965 | 923 | 878 | 811 | 625 | — | — | — | — | — | — |
| | Med | | 1079 | 1016 | 967 | 912 | 851 | 721 | 568 | — | — | — | — | — |
| | Hi | X | 1118 | 1060 | 1000 | 949 | 888 | 795 | 586 | 561 | — | — | — | — |
| 50WC030 | Low | | 1010 | 965 | 923 | 878 | 811 | 625 | — | — | — | — | — | — |
| | Med | X | 1079 | 1016 | 967 | 912 | 851 | 721 | 568 | — | — | — | — | — |
| | Hi | | 1118 | 1060 | 1000 | 949 | 888 | 795 | 586 | 561 | — | — | — | — |
| 50WC036 | Low | | 1027 | 1029 | 1024 | 1010 | 930 | 922 | 912 | 857 | 786 | 689 | — | — |
| | Med | | 1282 | 1272 | 1245 | 1217 | 1168 | 1026 | 1001 | 971 | 904 | 796 | — | — |
| | Hi | X | 1535 | 1497 | 1444 | 1384 | 1315 | 1250 | 1034 | 1026 | 979 | 887 | — | — |
| 50WC042 | Low | | 1279 | 1248 | 1212 | 1161 | 1087 | 992 | 853 | 801 | 744 | 675 | — | — |
| | Med | | 1465 | 1414 | 1365 | 1301 | 1240 | 1097 | 917 | 846 | 774 | 702 | — | — |
| | Hi | X | 1569 | 1509 | 1418 | 1358 | 1298 | 1189 | 995 | 869 | 816 | 741 | — | — |
| 50WC048 | Low | | 1399 | 1388 | 1377 | 1359 | 1327 | 1284 | 1245 | 1173 | 1106 | 883 | — | — |
| | Med | | 1651 | 1605 | 1562 | 1525 | 1481 | 1420 | 1362 | 1293 | 1209 | 1101 | — | — |
| | Hi | X | 1816 | 1764 | 1712 | 1660 | 1590 | 1519 | 1446 | 1367 | 1284 | 1198 | — | — |
| 50WC060 | Low | | 1639 | 1620 | 1597 | 1565 | 1529 | 1482 | 1424 | 1358 | 1276 | 1194 | 1100 | 994 |
| | Med | | 1812 | 1789 | 1737 | 1698 | 1653 | 1600 | 1539 | 1472 | 1388 | 1287 | 1187 | 1076 |
| | Hi | X | 2022 | 1976 | 1937 | 1887 | 1833 | 1771 | 1704 | 1628 | 1543 | 1443 | 1309 | 1193 |
| 50WC070 | Low | | 1636 | 1626 | 1611 | 1607 | 1591 | 1571 | 1540 | 1506 | — | — | — | — |
| | Med | | 1822 | 1822 | 1814 | 1793 | 1777 | 1756 | 1724 | 1675 | 1626 | 1562 | — | — |
| | Hi | X | 2092 | 2082 | 2068 | 2045 | 2020 | 1968 | 1932 | 1878 | 1815 | 1730 | 1640 | 1525 |

NOTE(S):

a. 575-v models employ 1-speed motors (high only).

b. airflow is based on wet coil and 1 in. disposable MERV 5 filter.

50WC Vertical Units (Constant Torque Motor Performance)^{a,b}

| MODEL | TAP # | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC007 | Low | X | 335 | 322 | 309 | 298 | — | — | — | — | — | — | — | — |
| | Medium | | 413 | 403 | 392 | 375 | 351 | — | — | — | — | — | — | — |
| | High | | 456 | 436 | 415 | 393 | 368 | 345 | — | — | — | — | — | — |
| 50WC009 | Low | | 335 | 322 | 309 | 298 | — | — | — | — | — | — | — | — |
| | Medium | X | 413 | 403 | 392 | 375 | 351 | — | — | — | — | — | — | — |
| | High | | 456 | 436 | 415 | 393 | 368 | 345 | — | — | — | — | — | — |
| 50WC012 | Low | | 335 | 322 | 309 | 298 | — | — | — | — | — | — | — | — |
| | Medium | | 413 | 403 | 392 | 375 | 351 | — | — | — | — | — | — | — |
| | High | X | 456 | 436 | 415 | 393 | 368 | 345 | — | — | — | — | — | — |
| 50WC015 | 1 | | 577 | 540 | 494 | 458 | 436 | 408 | 372 | 351 | — | — | — | — |
| | 2 | X | 647 | 621 | 564 | 537 | 504 | 468 | 440 | 398 | — | — | — | — |
| | 3 | | 829 | 799 | 777 | 739 | 619 | 572 | 527 | 417 | 295 | — | — | — |
| | 4 | | 947 | 895 | 838 | 782 | 646 | 594 | 528 | 436 | 316 | — | — | — |
| | 5 | | 945 | 907 | 860 | 799 | 694 | 605 | 532 | 469 | — | — | — | — |
| 50WC018 | 1 | | 577 | 540 | 494 | 458 | 436 | 408 | 372 | — | — | — | — | — |
| | 2 | | 647 | 621 | 564 | 537 | 504 | 468 | 440 | 398 | — | — | — | — |
| | 3 | X | 829 | 799 | 777 | 739 | 619 | 572 | 527 | 417 | — | — | — | — |
| | 4 | | 947 | 895 | 838 | 782 | 646 | 594 | 528 | 436 | — | — | — | — |
| | 5 | | 945 | 907 | 860 | 799 | 694 | 605 | 532 | 469 | — | — | — | — |
| 50WC024 | 1 | | 600 | 578 | 538 | 498 | 448 | 418 | — | — | — | — | — | — |
| | 2 | | 669 | 649 | 616 | 588 | 528 | 487 | 467 | 423 | — | — | — | — |
| | 3 | | 861 | 833 | 812 | 787 | 757 | 732 | 645 | 562 | — | — | — | — |
| | 4 | X | 1034 | 1005 | 967 | 923 | 867 | 803 | 726 | 583 | — | — | — | — |
| | 5 | | 1071 | 1027 | 988 | 939 | 888 | 827 | 738 | 590 | — | — | — | — |
| 50WC030 | 1 | | 600 | 578 | 538 | 498 | 448 | 418 | — | — | — | — | — | — |
| | 2 | | 669 | 649 | 616 | 588 | 528 | 487 | 467 | 423 | — | — | — | — |
| | 3 | | 861 | 833 | 812 | 787 | 757 | 732 | 645 | 562 | — | — | — | — |
| | 4 | | 1034 | 1005 | 967 | 923 | 867 | 803 | 726 | 583 | — | — | — | — |
| | 5 | X | 1071 | 1027 | 988 | 939 | 888 | 827 | 738 | 590 | — | — | — | — |
| 50WC036 | 1 | | 885 | 864 | 832 | 808 | — | — | — | — | — | — | — | — |
| | 2 | | 1028 | 999 | 978 | 951 | 940 | 908 | 872 | — | — | — | — | — |
| | 3 | | 1199 | 1175 | 1152 | 1114 | 1063 | 1005 | 929 | 811 | — | — | — | — |
| | 4 | | 1270 | 1227 | 1177 | 1127 | 1075 | 996 | 928 | 804 | — | — | — | — |
| | 5 | X | 1288 | 1246 | 1188 | 1136 | 1072 | 1008 | 927 | 809 | — | — | — | — |
| 50WC042 | 1 | | 1202 | 1175 | 1150 | 1128 | 1108 | 1080 | 1021 | 971 | 935 | 903 | — | — |
| | 2 | | 1295 | 1269 | 1244 | 1230 | 1203 | 1183 | 1154 | 1093 | 1025 | 940 | — | — |
| | 3 | | 1399 | 1377 | 1352 | 1333 | 1302 | 1284 | 1260 | 1236 | 1051 | 963 | — | — |
| | 4 | X | 1500 | 1475 | 1452 | 1425 | 1400 | 1377 | 1364 | 1321 | 1251 | 966 | — | — |
| | 5 | | 1607 | 1580 | 1558 | 1532 | 1509 | 1492 | 1420 | 1351 | 1264 | 977 | — | — |
| 50WC048 | 1 | | 1412 | 1383 | 1359 | 1331 | — | — | — | — | — | — | — | — |
| | 2 | | 1606 | 1579 | 1556 | 1529 | 1501 | 1471 | 1421 | — | — | — | — | — |
| | 3 | X | 1728 | 1701 | 1675 | 1651 | 1622 | 1588 | 1472 | — | — | — | — | — |
| | 4 | | 1827 | 1801 | 1780 | 1751 | 1680 | 1593 | 1468 | — | — | — | — | — |
| | 5 | | 1897 | 1873 | 1848 | 1797 | 1722 | 1628 | 1482 | 1376 | — | — | — | — |
| 50WC060 | 1 | | 1899 | 1873 | 1847 | 1822 | 1780 | 1760 | — | — | — | — | — | — |
| | 2 | | 2032 | 2004 | 1970 | 1942 | 1903 | 1876 | — | — | — | — | — | — |
| | 3 | X | 2152 | 2116 | 2091 | 2057 | 2015 | 1984 | 1953 | 1927 | 1888 | — | — | — |
| | 4 | | 2252 | 2224 | 2194 | 2165 | 2132 | 2099 | 2066 | 2021 | 1948 | 1866 | — | — |
| | 5 | | 2380 | 2355 | 2332 | 2292 | 2256 | 2219 | 2161 | 2096 | 2017 | 1925 | 1832 | 1723 |
| 50WC070 | 1 | | 2055 | 2027 | 1991 | 1965 | 1939 | 1911 | 1874 | 1845 | 1816 | 1779 | — | — |
| | 2 | | 2149 | 2122 | 2096 | 2060 | 2034 | 2008 | 1979 | 1945 | 1916 | 1887 | — | — |
| | 3 | X | 2225 | 2198 | 2172 | 2140 | 2111 | 2087 | 2057 | 2029 | 1995 | 1968 | — | — |
| | 4 | | 2388 | 2361 | 2330 | 2300 | 2272 | 2246 | 2220 | 2190 | 2155 | 2124 | 2094 | 2062 |
| | 5 | | 2436 | 2408 | 2380 | 2351 | 2322 | 2294 | 2267 | 2240 | 2210 | 2179 | 2145 | 2111 |

NOTE(S):

a. cfm airflow is based on wet coil and 1 in. disposable MERV 5 filter.

b. Off delay = 30 seconds = After receiving an off command motor will continue running for 30 seconds.

50WC Horizontal Units (Constant Torque Motor Performance)^{a,b}

| MODEL | TAP # | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC007 | Low | X | 342 | 331 | 317 | 305 | 293 | 281 | 264 | — | — | — | — | — |
| | Medium | | 426 | 414 | 402 | 381 | 356 | 329 | 300 | 267 | — | — | — | — |
| | High | | 467 | 446 | 429 | 405 | 381 | 353 | 320 | 282 | — | — | — | — |
| 50WC009 | Low | | 342 | 331 | 317 | 305 | 293 | 281 | 264 | — | — | — | — | — |
| | Medium | X | 426 | 414 | 402 | 381 | 356 | 329 | 300 | 267 | — | — | — | — |
| | High | | 467 | 446 | 429 | 405 | 381 | 353 | 320 | 282 | — | — | — | — |
| 50WC012 | Low | | 342 | 331 | 317 | 305 | 293 | 281 | 264 | — | — | — | — | — |
| | Medium | | 426 | 414 | 402 | 381 | 356 | 329 | 300 | 267 | — | — | — | — |
| | High | X | 467 | 446 | 429 | 405 | 381 | 353 | 320 | 282 | — | — | — | — |
| 50WC015 | 1 | | 505 | 434 | 392 | 368 | 327 | — | — | — | — | — | — | — |
| | 2 | | 538 | 491 | 440 | 424 | 384 | 338 | — | — | — | — | — | — |
| | 3 | X | 669 | 636 | 597 | 533 | 499 | 485 | 447 | — | — | — | — | — |
| | 4 | | 762 | 733 | 704 | 658 | 605 | 569 | 538 | 488 | — | — | — | — |
| | 5 | | 861 | 838 | 823 | 800 | 771 | 641 | 569 | 511 | — | — | — | — |
| 50WC018 | 1 | | 505 | 434 | 392 | 368 | 327 | — | — | — | — | — | — | — |
| | 2 | | 538 | 491 | 440 | 424 | 384 | 338 | — | — | — | — | — | — |
| | 3 | X | 669 | 636 | 597 | 533 | 499 | 485 | 447 | — | — | — | — | — |
| | 4 | | 762 | 733 | 704 | 658 | 605 | 569 | 538 | 488 | — | — | — | — |
| | 5 | | 861 | 838 | 823 | 800 | 771 | 641 | 569 | 511 | — | — | — | — |
| 50WC024 | 1 | | 723 | 684 | 651 | 613 | 539 | 475 | — | — | — | — | — | — |
| | 2 | | 772 | 734 | 704 | 644 | 564 | 514 | — | — | — | — | — | — |
| | 3 | | 928 | 899 | 837 | 814 | 783 | 728 | 508 | — | — | — | — | — |
| | 4 | X | 1012 | 984 | 960 | 925 | 881 | 817 | 557 | — | — | — | — | — |
| | 5 | | 1083 | 1060 | 1032 | 925 | 867 | 769 | 503 | — | — | — | — | — |
| 50WC030 | 1 | | 723 | 684 | 651 | 613 | 539 | 475 | — | — | — | — | — | — |
| | 2 | | 772 | 734 | 704 | 644 | 564 | 514 | — | — | — | — | — | — |
| | 3 | | 928 | 899 | 837 | 814 | 783 | 728 | 508 | — | — | — | — | — |
| | 4 | X | 1012 | 984 | 960 | 925 | 881 | 817 | 557 | — | — | — | — | — |
| | 5 | | 1083 | 1060 | 1032 | 925 | 867 | 769 | 503 | — | — | — | — | — |
| 50WC036 | 1 | | 1205 | 1178 | 1158 | 1130 | 1104 | 1075 | 1050 | 1020 | 998 | 967 | 877 | — |
| | 2 | | 1290 | 1268 | 1243 | 1218 | 1198 | 1169 | 1141 | 1115 | 1087 | 1013 | 918 | — |
| | 3 | X | 1398 | 1376 | 1348 | 1329 | 1301 | 1283 | 1256 | 1222 | 1146 | 1045 | 921 | — |
| | 4 | | 1503 | 1481 | 1451 | 1434 | 1412 | 1378 | 1320 | 1250 | 1149 | 1043 | 926 | — |
| | 5 | | 1752 | 1696 | 1645 | 1585 | 1529 | 1451 | 1376 | 1294 | 1198 | 1087 | 946 | 815 |
| 50WC042 | 1 | | 1205 | 1178 | 1158 | 1130 | 1104 | 1075 | 1050 | 1020 | 998 | 967 | 877 | — |
| | 2 | | 1290 | 1268 | 1243 | 1218 | 1198 | 1169 | 1141 | 1115 | 1087 | 1013 | 918 | — |
| | 3 | | 1398 | 1376 | 1348 | 1329 | 1301 | 1283 | 1256 | 1222 | 1146 | 1045 | 921 | — |
| | 4 | X | 1503 | 1481 | 1451 | 1434 | 1412 | 1378 | 1320 | 1250 | 1149 | 1043 | 926 | — |
| | 5 | | 1752 | 1696 | 1645 | 1585 | 1529 | 1451 | 1376 | 1294 | 1198 | 1087 | 946 | 815 |
| 50WC048 | 1 | | 1424 | 1400 | 1374 | 1351 | 1329 | 1308 | 1285 | 1262 | 1241 | 1209 | — | — |
| | 2 | | 1636 | 1615 | 1595 | 1571 | 1551 | 1526 | 1502 | 1455 | 1381 | 1304 | — | — |
| | 3 | X | 1700 | 1677 | 1655 | 1637 | 1611 | 1581 | 1526 | 1463 | 1385 | 1293 | — | — |
| | 4 | | 1798 | 1776 | 1754 | 1730 | 1689 | 1630 | 1560 | 1489 | 1412 | 1317 | — | — |
| | 5 | | 1889 | 1865 | 1827 | 1777 | 1718 | 1652 | 1579 | 1499 | 1412 | 1328 | — | — |
| 50WC060 | 1 | | 1851 | 1818 | 1792 | 1758 | 1729 | 1698 | 1660 | 1627 | 1588 | 1539 | — | — |
| | 2 | | 1945 | 1911 | 1886 | 1852 | 1823 | 1793 | 1757 | 1720 | 1659 | 1579 | — | — |
| | 3 | X | 2026 | 1994 | 1965 | 1938 | 1901 | 1874 | 1825 | 1760 | 1683 | 1593 | 1487 | 1370 |
| | 4 | | 2081 | 2055 | 2021 | 1993 | 1949 | 1903 | 1840 | 1775 | 1695 | 1594 | 1486 | 1370 |
| | 5 | | 2239 | 2201 | 2151 | 2086 | 2028 | 1977 | 1903 | 1822 | 1737 | 1650 | 1529 | 1397 |
| 50WC070 | 1 | | 2020 | 1988 | 1958 | 1932 | 1895 | 1866 | 1836 | 1801 | — | — | — | — |
| | 2 | | 2114 | 2081 | 2056 | 2027 | 1993 | 1966 | 1936 | 1896 | 1863 | — | — | — |
| | 3 | X | 2198 | 2173 | 2146 | 2113 | 2085 | 2050 | 2018 | 1981 | 1948 | 1907 | — | — |
| | 4 | | 2334 | 2303 | 2272 | 2245 | 2215 | 2181 | 2148 | 2103 | 2046 | 1972 | 1886 | — |
| | 5 | | 2385 | 2355 | 2328 | 2295 | 2263 | 2231 | 2192 | 2141 | 2075 | 1994 | 1908 | 1812 |

NOTE(S):

a. cfm airflow is based on wet coil and 1 in. disposable MERV 5 filter.

b. Off delay = 30 seconds = After receiving an off command motor will continue running for 30 seconds.

50WC Vertical Units (Constant Airflow Motor Performance)^{a,b,c}

| MODEL | FAN SPEED | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC015 | D - Low | — | 460 | 460 | 460 | 460 | 460 | 460 | 460 | 440 | 410 | 390 | — | — |
| | D - Normal | X | 550 | 550 | 550 | 550 | 550 | 550 | 550 | 550 | 550 | 550 | — | — |
| | D - Hi | — | 610 | 620 | 640 | 640 | 640 | 640 | 640 | 640 | 620 | 590 | — | — |
| 50WC018 | A - Low | — | 510 | 510 | 510 | 510 | 510 | 510 | 510 | 500 | 480 | 460 | — | — |
| | A - Normal | X | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 580 | 540 | 500 | — | — |
| | A - Hi | — | 685 | 685 | 685 | 685 | 685 | 685 | 640 | 600 | 560 | 520 | — | — |
| 50WC024 | A - Low | — | 680 | 680 | 680 | 680 | 680 | 680 | 680 | 680 | 650 | 620 | — | — |
| | A - Normal | X | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 780 | 740 | 680 | — | — |
| | A - Hi | — | 900 | 900 | 900 | 900 | 900 | 900 | 900 | 870 | 840 | 710 | — | — |
| 50WC030 | C - Low | — | 810 | 830 | 830 | 830 | 830 | 830 | 830 | 830 | — | — | — | — |
| | C - Normal | X | 930 | 950 | 950 | 950 | 950 | 950 | 950 | 900 | — | — | — | — |
| | C - Hi | — | 1040 | 1040 | 1040 | 1040 | 1040 | 1020 | 980 | 940 | — | — | — | — |
| 50WC036 | A - Low | — | 1020 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1020 | 1000 | — | — |
| | A - Normal | X | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1160 | 1140 | 1060 | — | — |
| | A - Hi | — | 1160 | 1200 | 1280 | 1300 | 1300 | 1340 | 1380 | 1380 | 1380 | 1380 | — | — |
| 50WC042 | A - Low | — | 1180 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | — | — |
| | A - Normal | X | 1340 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | — | — |
| | A - Hi | — | 1520 | 1530 | 1550 | 1550 | 1550 | 1550 | 1550 | 1550 | 1550 | 1580 | — | — |
| 50WC048 | B - Low | — | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | — | — |
| | B - Normal | X | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | — | — |
| | B - Hi | — | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 | 1780 | 1800 | 1800 | 1800 | — | — |
| 50WC060 | C - Low | — | 1700 | 1725 | 1725 | 1725 | 1725 | 1725 | 1725 | 1725 | 1725 | 1700 | — | — |
| | C - Normal | X | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 |
| | C - Hi | — | 2260 | 2260 | 2260 | 2260 | 2260 | 2260 | 2260 | 2260 | 2200 | 2160 | 2120 | 2080 |
| 50WC070 | A - Low | — | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| | A - Normal | X | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| | A - Hi | — | 2375 | 2375 | 2375 | 2375 | 2375 | 2375 | 2375 | 2375 | 2375 | 2375 | 2300 | 2270 |

NOTE(S):

- a. During fan only operation air flow is 70% of tabulated value.
- b. When passive dehumidification mode is enabled, air flow is 85% of tabulated value.
- c. cfm airflow is based on wet coil and 1 in. disposable MERV 5 filter.

50WC Horizontal Units (Constant Airflow Motor Performance)^{a,b,c}

| MODEL | FAN SPEED | DEFAULT FACTORY MOTOR SETTING | 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 |
| 50WC015 | A - Low | — | 440 | 440 | 440 | 440 | 440 | 440 | 440 | 440 | 430 | 420 | — | — |
| | A - Normal | X | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 490 | 480 | — | — |
| | A - High | — | 590 | 590 | 590 | 590 | 590 | 590 | 590 | 590 | 590 | 575 | — | — |
| 50WC018 | D - Low | — | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | — | — |
| | D - Normal | X | 580 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 590 | 580 | — | — |
| | D - High | — | 660 | 680 | 700 | 700 | 700 | 700 | 700 | 680 | 650 | 620 | — | — |
| 50WC024 | B - Low | — | 620 | 650 | 650 | 650 | 650 | 650 | 650 | 640 | 630 | 600 | — | — |
| | B - Normal | X | 750 | 780 | 800 | 800 | 800 | 800 | 800 | 780 | 700 | 650 | — | — |
| | B - High | — | 880 | 900 | 900 | 900 | 900 | 900 | 900 | 880 | 800 | 700 | — | — |
| 50WC030 | A - Low | — | 780 | 800 | 800 | 800 | 800 | 800 | 800 | 800 | 700 | 650 | — | — |
| | A - Normal | X | 920 | 950 | 950 | 950 | 950 | 950 | 950 | 900 | 750 | 700 | — | — |
| | A - High | — | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1000 | 950 | 900 | — | — |
| 50WC036 | A - Low | — | 960 | 980 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | — |
| | A - Normal | X | 1150 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | — |
| | A - High | — | 1310 | 1340 | 1340 | 1340 | 1340 | 1340 | 1340 | 1340 | 1340 | 1340 | 1340 | — |
| 50WC042 | B - Low | — | 1120 | 1160 | 1160 | 1160 | 1160 | 1160 | 1160 | 1160 | 1160 | 1160 | 1160 | — |
| | B - Normal | X | 1340 | 1350 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1380 | — |
| | B - High | — | 1530 | 1550 | 1550 | 1550 | 1550 | 1550 | 1550 | 1550 | 1550 | 1530 | 1480 | — |
| 50WC048 | A - Low | — | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | 1350 | — | — |
| | A - Normal | X | 1560 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | 1600 | — | — |
| | A - High | — | 1790 | 1820 | 1820 | 1820 | 1820 | 1820 | 1820 | 1820 | 1820 | 1760 | — | — |
| 50WC060 | A - Low | — | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 | 1620 | 1610 | 1600 |
| | A - Normal | X | 1900 | 1940 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 1970 | 1900 | 1900 |
| | A - High | — | 2150 | 2150 | 2150 | 2150 | 2150 | 2150 | 2150 | 2150 | 2100 | 2050 | 2000 | 1950 |
| 50WC070 | A - Low | — | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| | A - Normal | X | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 |
| | A - High | — | 2380 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2400 | 2300 | 2250 | 2200 | 2150 |

NOTE(S):

- a. During fan only operation air flow is 70% of tabulated value.
- b. When passive dehumidification mode is enabled, air flow is 85% of tabulated value.
- c. cfm airflow is based on wet coil and 1 in. disposable MERV 5 filter.

50WC without Electric Heat — PSC (Standard) Blower Motor Heat Electrical Data

| 50WC UNIT SIZE | CONFIGURATION | V/Ph/Hz | VOLTAGE MIN/MAX | COMPRESSOR | | | BLOWER MOTOR | | TOTAL UNIT FLA | MCA | MOCP |
|----------------------|---------------------|--------------|--------------------|------------|------|-------|--------------|------|-------------------|------|------|
| | | | | QTY | RLA | LRA | FLA | HP | | | |
| 50WC007 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 3.2 | 15.0 | 1.12 | 0.10 | 4.3 | 5.1 | 15 |
| | | 265/1/60 | 238/292 | 1 | 2.2 | 12.0 | 1.99 | 0.10 | 4.2 | 4.8 | 15 |
| 50WC009 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 3.1 | 20.0 | 1.12 | 0.10 | 4.3 | 5.0 | 15 |
| | | 265/1/60 | 238/292 | 1 | 2.7 | 18.0 | 1.99 | 0.10 | 4.7 | 5.4 | 15 |
| 50WC012 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 4.6 | 27.0 | 1.12 | 0.10 | 5.7 | 6.9 | 15 |
| | | 265/1/60 | 238/292 | 1 | 3.5 | 23.0 | 1.99 | 0.10 | 5.5 | 6.4 | 15 |
| 50WC015 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.7 | 34.5 | 1.10 | 0.17 | 6.8 | 8.2 | 15 |
| | | 265/1/60 | 238/292 | 1 | 4.7 | 28.0 | 0.85 | 0.17 | 5.6 | 6.7 | 15 |
| 50WC018 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.3 | 39 | 1.10 | 0.17 | 6.4 | 7.8 | 15 |
| | | 265/1/60 | 238/292 | 1 | 7.6 | 31 | 0.85 | 0.17 | 8.5 | 10.4 | 15 |
| 50WC024 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 7.2 | 58 | 1.8 | 0.25 | 9.0 | 10.8 | 15 |
| | | 265/1/60 | 238/292 | 1 | 7.6 | 36 | 1.6 | 0.25 | 9.2 | 11.1 | 15 |
| | | 208-230/3/60 | 197/253 | 1 | 7.7 | 59.9 | 1.8 | 0.25 | 9.5 | 11.4 | 15 |
| | | 460/3/60 | 414/506 | 1 | 3.8 | 32.4 | 0.9 | 0.25 | 4.7 | 5.7 | 15 |
| 50WC030 | Vertical | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 1.8 | 0.25 | 13.7 | 16.7 | 25 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 4.4 | 0.50 | 16.3 | 19.3 | 30 |
| | Vertical | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 1.6 | 0.25 | 12.5 | 15.2 | 25 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 3.3 | 0.50 | 14.2 | 16.9 | 25 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 1.8 | 0.25 | 10.1 | 12.2 | 20 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 4.4 | 0.50 | 12.7 | 14.8 | 20 |
| | Vertical | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 0.9 | 0.25 | 5.4 | 6.5 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 1.8 | 0.50 | 6.3 | 7.4 | 15 |
| 50WC036 | Vertical | 208-230/1/60 | 197/253 | 1 | 16.7 | 93.5 | 4.4 | 0.75 | 21.1 | 25.2 | 40 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 16.7 | 93.5 | 4.4 | 0.50 | 21.1 | 25.2 | 40 |
| | Vertical | 265/1/60 | 238/292 | 1 | 13.5 | 90.8 | 3.3 | 0.50 | 16.8 | 20.1 | 30 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 13.5 | 90.8 | 3.3 | 0.50 | 16.8 | 20.1 | 30 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 12.2 | 97.5 | 4.4 | 0.75 | 16.6 | 19.6 | 30 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 12.2 | 97.5 | 4.4 | 0.50 | 16.6 | 19.6 | 30 |
| | Vertical | 460/3/60 | 414/506 | 1 | 5.8 | 44.3 | 2.8 | 0.75 | 8.6 | 10.0 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 5.8 | 44.3 | 1.8 | 0.50 | 7.6 | 9.0 | 15 |
| 50WC042 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 14.7 | 109 | 4.4 | 0.75 | 19.1 | 22.8 | 35 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 102.8 | 4.4 | 0.75 | 16.6 | 19.6 | 30 |
| | | 460/3/60 | 414/506 | 1 | 5.8 | 48.5 | 2.8 | 0.75 | 8.6 | 10.0 | 15 |
| 50WC048 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 17.3 | 126 | 4.4 | 0.75 | 21.7 | 26.0 | 40 |
| | | 208-230/3/60 | 238/292 | 1 | 12.2 | 120.4 | 4.4 | 0.75 | 16.6 | 19.6 | 30 |
| | | 460/3/60 | 197/253 | 1 | 6.4 | 48.5 | 2.8 | 0.75 | 9.2 | 10.8 | 15 |
| | | 575/3/60 | 518/632 | 1 | 5.1 | 41 | 2.6 | 0.75 | 7.7 | 9.0 | 15 |
| 50WC060 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 25.6 | 155 | 5.5 | 0.75 | 31.1 | 37.6 | 60 |
| | | 208-230/3/60 | 238/292 | 1 | 18.6 | 155 | 5.5 | 0.75 | 24.1 | 28.7 | 45 |
| | | 460/3/60 | 197/253 | 1 | 8.3 | 58.1 | 2.8 | 0.75 | 11.1 | 13.1 | 20 |
| | | 575/3/60 | 518/632 | 1 | 7.7 | 47.8 | 2.6 | 0.75 | 10.3 | 12.2 | 15 |
| 50WC070 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 27.6 | 170 | 5.5 | 0.75 | 33.1 | 40.0 | 60 |
| | | 208-230/3/60 | 238/292 | 1 | 19.2 | 156.5 | 5.5 | 0.75 | 24.7 | 29.5 | 45 |
| | | 460/3/60 | 197/253 | 1 | 9.0 | 74.8 | 2.8 | 0.75 | 11.8 | 14.0 | 20 |
| | | 575/3/60 | 518/632 | 1 | 7.7 | 47.8 | 2.6 | 0.75 | 10.3 | 12.2 | 15 |

LEGEND

FLA — Full Load Amps
LRA — Locked Rotor Amp
RLA — Rated Load Amps
MCA — Minimum Circuit Amp
MOCP — Maximum Overcurrent Protection

50WC without Electric Heat — Constant Torque ECM Blower Motor Electrical Data

| 50WC UNIT SIZE | CONFIGURATION | V/Ph/Hz | VOLTAGE MIN/MAX | COMPRESSOR | | | BLOWER MOTOR | | TOTAL UNIT FLA | MCA | MOCP |
|----------------------|---------------------|--------------|--------------------|------------|------|-------|--------------|------|-------------------|------|------|
| | | | | QTY | RLA | LRA | FLA | HP | | | |
| 50WC007 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 3.2 | 15.0 | 2.3 | 0.25 | 5.5 | 6.3 | 15 |
| | | 265/1/60 | 238/292 | 1 | 2.2 | 12 | 2.3 | 0.25 | 4.5 | 5.1 | 15 |
| 50WC009 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 3.1 | 20.0 | 2.3 | 0.25 | 5.4 | 6.2 | 15 |
| | | 265/1/60 | 238/292 | 1 | 2.7 | 18.0 | 2.3 | 0.25 | 5.0 | 5.7 | 15 |
| 50WC012 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 4.6 | 27.0 | 2.3 | 0.25 | 6.9 | 8.1 | 15 |
| | | 265/1/60 | 238/292 | 1 | 3.5 | 23 | 2.3 | 0.25 | 5.8 | 6.7 | 15 |
| 50WC015 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.7 | 34.5 | 2.8 | 0.33 | 8.5 | 9.9 | 15 |
| | | 265/1/60 | 238/292 | 1 | 4.7 | 28 | 2.6 | 0.33 | 7.3 | 8.5 | 15 |
| 50WC018 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.3 | 39 | 2.8 | 0.33 | 8.1 | 9.5 | 15 |
| | | 265/1/60 | 238/292 | 1 | 7.6 | 31 | 2.6 | 0.33 | 10.2 | 12.1 | 15 |
| 50WC024 | Vertical | 208-230/1/60 | 197/253 | 1 | 7.2 | 58 | 2.8 | 0.33 | 10.0 | 11.8 | 15 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 7.2 | 58 | 4.1 | 0.50 | 11.3 | 13.1 | 20 |
| | Vertical | 265/1/60 | 238/292 | 1 | 7.6 | 36 | 2.6 | 0.33 | 10.2 | 12.1 | 15 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 7.6 | 36 | 3.6 | 0.50 | 11.2 | 13.1 | 20 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 7.7 | 59.9 | 2.8 | 0.33 | 10.5 | 12.4 | 20 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 7.7 | 59.9 | 4.1 | 0.50 | 11.8 | 13.7 | 20 |
| | Vertical | 460/3/60 | 414/506 | 1 | 3.8 | 32.4 | 2.1 | 0.50 | 5.9 | 6.9 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 3.8 | 32.4 | 2.1 | 0.50 | 5.9 | 6.9 | 15 |
| 50WC030 | Vertical | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 2.8 | 0.33 | 14.7 | 17.7 | 25 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 4.1 | 0.50 | 16.0 | 19.0 | 30 |
| | Vertical | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 2.6 | 0.30 | 13.5 | 16.2 | 25 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 3.6 | 0.50 | 14.5 | 17.2 | 25 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 2.8 | 0.33 | 11.1 | 13.2 | 20 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 4.1 | 0.50 | 12.4 | 14.5 | 20 |
| | Vertical | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 2.1 | 0.50 | 6.6 | 7.7 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 2.1 | 0.50 | 6.6 | 7.7 | 15 |
| 50WC036 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 16.7 | 93.5 | 6.0 | 0.75 | 22.7 | 26.8 | 40 |
| | | 265/1/60 | 238/292 | 1 | 13.5 | 90.8 | 4.9 | 0.75 | 18.4 | 21.7 | 35 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 97.5 | 6.0 | 0.75 | 18.2 | 21.2 | 30 |
| | | 460/3/60 | 414/506 | 1 | 5.8 | 44.3 | 3.2 | 0.75 | 9.0 | 10.4 | 15 |
| 50WC042 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 14.7 | 109 | 6.0 | 0.75 | 20.7 | 24.4 | 35 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 102.8 | 6.0 | 0.75 | 18.2 | 21.2 | 30 |
| | | 460/3/60 | 414/506 | 1 | 5.8 | 48.5 | 3.2 | 0.75 | 9.0 | 10.4 | 15 |
| 50WC048 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 17.3 | 126 | 6.0 | 0.75 | 23.3 | 27.6 | 40 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 120.4 | 6.0 | 0.75 | 18.2 | 21.2 | 30 |
| | | 460/3/60 | 414/506 | 1 | 6.4 | 48.5 | 3.2 | 0.75 | 9.6 | 11.2 | 15 |
| 50WC060 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 25.6 | 155 | 7.6 | 1.00 | 33.2 | 39.7 | 60 |
| | | 208-230/3/60 | 197/253 | 1 | 18.6 | 155 | 7.6 | 1.00 | 26.2 | 30.8 | 45 |
| | | 460/3/60 | 414/506 | 1 | 8.3 | 58.1 | 4.0 | 1.00 | 12.3 | 14.3 | 20 |
| 50WC070 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 27.6 | 170 | 7.6 | 1.00 | 35.2 | 42.1 | 60 |
| | | 208-230/3/60 | 197/253 | 1 | 19.2 | 156.5 | 7.6 | 1.00 | 26.8 | 31.6 | 50 |
| | | 460/3/60 | 414/506 | 1 | 9.0 | 74.8 | 4.0 | 1.00 | 13.0 | 15.2 | 20 |

LEGEND

HP — Horsepower
FLA — Full Load Amps
LRA — Locked Rotor Amp
RLA — Rated Load Amps
MCA — Minimum Circuit Amp
MOCP — Maximum Overcurrent Protection

50WC without Electric Heat — Constant Airflow ECM Blower Motor Electrical Data

| 50WC UNIT SIZE | CONFIGURATION | V/Ph/Hz | VOLTAGE MIN/MAX | COMPRESSOR | | | BLOWER MOTOR | | TOTAL UNIT FLA | MCA | MOCP |
|----------------------|---------------------|--------------|--------------------|------------|------|-------|--------------|------|-------------------|------|------|
| | | | | QTY | RLA | LRA | FLA | HP | | | |
| 50WC015 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.7 | 34.5 | 4.4 | 0.33 | 10.1 | 11.5 | 15 |
| | | 265/1/60 | 238/292 | 1 | 4.7 | 28 | 4.7 | 0.33 | 9.4 | 10.6 | 15 |
| 50WC018 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 5.3 | 39 | 4.4 | 0.33 | 9.7 | 11.1 | 15 |
| | | 265/1/60 | 238/292 | 1 | 7.6 | 31 | 4.7 | 0.33 | 12.3 | 14.2 | 20 |
| 50WC024 | Vertical | 208-230/1/60 | 197/253 | 1 | 7.2 | 58 | 4.4 | 0.33 | 11.6 | 13.4 | 20 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 7.2 | 58 | 5.0 | 0.50 | 12.2 | 14.0 | 20 |
| | Vertical | 265/1/60 | 238/292 | 1 | 7.6 | 36 | 4.7 | 0.33 | 12.3 | 14.2 | 20 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 7.6 | 36 | 5.0 | 0.50 | 12.6 | 14.5 | 20 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 7.7 | 59.9 | 4.4 | 0.33 | 12.1 | 14.0 | 20 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 7.7 | 59.9 | 5.0 | 0.50 | 12.7 | 14.6 | 20 |
| | Vertical | 460/3/60 | 414/506 | 1 | 3.8 | 32.4 | 4.7 | 0.33 | 8.5 | 9.5 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 3.8 | 32.4 | 5.0 | 0.50 | 8.8 | 9.8 | 15 |
| 50WC030 | Vertical | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 4.4 | 0.33 | 16.3 | 19.3 | 30 |
| | Horizontal | 208-230/1/60 | 197/253 | 1 | 11.9 | 58 | 5.0 | 0.50 | 16.9 | 19.9 | 30 |
| | Vertical | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 4.7 | 0.33 | 15.6 | 18.3 | 25 |
| | Horizontal | 265/1/60 | 238/292 | 1 | 10.9 | 71.7 | 5.0 | 0.50 | 15.9 | 18.6 | 25 |
| | Vertical | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 4.4 | 0.33 | 12.7 | 14.8 | 20 |
| | Horizontal | 208-230/3/60 | 197/253 | 1 | 8.3 | 67.7 | 5.0 | 0.50 | 13.3 | 15.4 | 20 |
| | Vertical | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 4.7 | 0.33 | 9.2 | 10.3 | 15 |
| | Horizontal | 460/3/60 | 414/506 | 1 | 4.5 | 38.1 | 5.0 | 0.50 | 9.5 | 10.6 | 15 |
| 50WC036 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 16.7 | 93.5 | 8.4 | 0.75 | 25.1 | 29.2 | 45 |
| | | 265/1/60 | 238/292 | 1 | 13.5 | 90.8 | 7.5 | 0.75 | 21.0 | 24.3 | 35 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 97.5 | 8.4 | 0.75 | 20.6 | 23.6 | 35 |
| | | 460/3/60 | 414/506 | 1 | 5.8 | 44.3 | 7.5 | 0.75 | 13.3 | 14.7 | 20 |
| 50WC042 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 14.7 | 109 | 8.4 | 0.75 | 23.1 | 26.8 | 40 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 102.8 | 8.4 | 0.75 | 20.6 | 23.6 | 35 |
| | | 460/3/60 | 414/506 | 1 | 5.8 | 48.5 | 7.5 | 0.75 | 13.3 | 14.7 | 20 |
| 50WC048 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 17.3 | 126 | 8.4 | 0.75 | 25.7 | 30.0 | 45 |
| | | 208-230/3/60 | 197/253 | 1 | 12.2 | 120.4 | 8.4 | 0.75 | 20.6 | 23.6 | 35 |
| | | 460/3/60 | 414/506 | 1 | 6.4 | 48.5 | 7.5 | 0.75 | 13.9 | 15.5 | 20 |
| 50WC060 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 25.6 | 155 | 9.1 | 1.00 | 34.7 | 41.2 | 60 |
| | | 208-230/3/60 | 197/253 | 1 | 18.6 | 155 | 9.1 | 1.00 | 27.7 | 32.3 | 50 |
| | | 460/3/60 | 414/506 | 1 | 8.3 | 58.1 | 9.1 | 1.00 | 17.4 | 19.4 | 25 |
| 50WC070 | Vertical/Horizontal | 208-230/1/60 | 197/253 | 1 | 27.6 | 170 | 9.1 | 1.00 | 36.7 | 43.6 | 70 |
| | | 208-230/3/60 | 197/253 | 1 | 19.2 | 156.5 | 9.1 | 1.00 | 28.3 | 33.1 | 50 |
| | | 460/3/60 | 414/506 | 1 | 9.0 | 74.8 | 9.1 | 1.00 | 18.1 | 20.3 | 25 |

LEGEND

HP — Horsepower
FLA — Full Load Amps
LRA — Locked Rotor Amp
RLA — Rated Load Amps
MCA — Minimum Circuit Amp
MOCP — Maximum Overcurrent Protection

50WC with 5 kW Electric Heat — Constant Torque ECM Blower Motor Electrical Data (208/230-1-60 Only)

| UNIT SIZE | CONFIGURATION | 5 kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 3.6k | 4.8k | 17.3 | 20.0 | 25.2 | 28.5 | 20 | 25 |
| | Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 26.8 | 30.1 | 25 | 25 |
| 030 | Vertical | 3.6k | 4.8k | 17.3 | 20.0 | 25.2 | 28.5 | 25 | 25 |
| | Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 26.8 | 30.1 | 30 | 30 |
| 036 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 29.2 | 32.5 | 40 | 40 |
| 042 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 29.2 | 32.5 | 35 | 35 |
| 048 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 29.2 | 32.5 | 40 | 40 |
| 060 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 39.7 | 39.7 | 60 | 60 |
| 070 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 42.1 | 42.1 | 60 | 60 |

50WC with 7.5 kW Electric Heat — Constant Torque ECM Blower Motor Electrical Data (208/230-1-60 Only)

| UNIT SIZE | CONFIGURATION | 7.5 kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 5.4k | 7.2k | 26.0 | 30.0 | 36.0 | 41.0 | 30 | 35 |
| | Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 37.6 | 42.6 | 35 | 35 |
| 030 | Vertical | 5.4k | 7.2k | 26.0 | 30.0 | 36.0 | 41.0 | 30 | 35 |
| | Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 37.6 | 42.6 | 35 | 35 |
| 036 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 40.0 | 45.0 | 40 | 40 |
| 042 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 40.0 | 45.0 | 35 | 40 |
| 048 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 40.0 | 45.0 | 40 | 40 |
| 060 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 42.0 | 47.0 | 60 | 60 |
| 070 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 42.1 | 47.0 | 60 | 60 |

50WC with 10 kW Electric Heat — Constant Torque ECM Blower Motor Electrical Data (208/230-1-60 Only)

| UNIT SIZE | CONFIGURATION | 10 kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 7.2k | 9.6k | 34.7 | 40.0 | 50.8 | 57.5 | 45 | 50 |
| | Horizontal | | | | | | | | |
| 030 | Vertical | | | | | | | | |
| | Horizontal | | | | | | | | |
| 036 | Vertical/Horizontal | | | | | | | | |
| 042 | Vertical/Horizontal | | | | | | | | |
| 048 | Vertical/Horizontal | | | | | | | | |
| 060 | Vertical/Horizontal | | | | | | | | |
| 070 | Vertical/Horizontal | | | | | | | | |

50WC with 5 kW Electric Heat — Constant Airflow ECM Blower Motor Electrical Data (208/230-1-60 Only)

| UNIT SIZE | CONFIGURATION | 5kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 3.6k | 4.8k | 17.3 | 20.0 | 27.2 | 30.5 | 25 | 25 |
| | Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 27.9 | 31.3 | 25 | 30 |
| 030 | Vertical | 3.6k | 4.8k | 17.3 | 20.0 | 27.2 | 30.5 | 30 | 30 |
| | Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 27.9 | 31.3 | 30 | 30 |
| 036 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 32.2 | 35.5 | 45 | 45 |
| 042 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 32.2 | 35.5 | 40 | 40 |
| 048 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 32.2 | 35.5 | 45 | 45 |
| 060 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 41.2 | 41.2 | 60 | 60 |
| 070 | Vertical/Horizontal | 3.6k | 4.8k | 17.3 | 20.0 | 43.6 | 43.6 | 70 | 70 |

50WC with 7.5 kW Electric Heat — Constant Airflow ECM Blower Motor Electrical Data (208/230-1-60 Only)

| UNIT SIZE | CONFIGURATION | 7.5 kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 5.4k | 7.2k | 26.0 | 30.0 | 38.0 | 43.0 | 35 | 35 |
| | Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 38.8 | 43.8 | 35 | 40 |
| 030 | Vertical | 5.4k | 7.2k | 26.0 | 30.0 | 38.0 | 43.0 | 35 | 35 |
| | Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 38.8 | 43.8 | 35 | 40 |
| 036 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 43.0 | 48.0 | 45 | 45 |
| 042 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 43.0 | 48.0 | 40 | 45 |
| 048 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 43.0 | 48.0 | 45 | 45 |
| 060 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 43.9 | 48.9 | 60 | 60 |
| 070 | Vertical/Horizontal | 5.4k | 7.2k | 26.0 | 30.0 | 43.9 | 48.9 | 70 | 70 |

50WC with 10 kW Electric Heat — Constant Airflow ECM Blower Motor Electrical Data (208/230-1-60 Only)

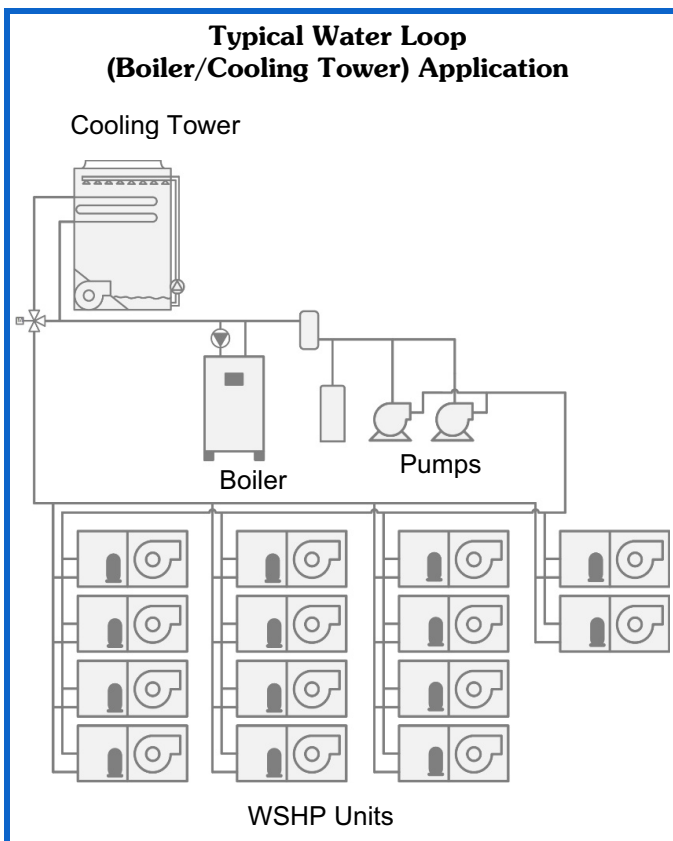
| UNIT SIZE | CONFIGURATION | 10 kW EH | | | | | | | |
|-----------|---------------------|----------------|------|------|------|------------------------|------|------|------|
| | | HEATER ELEMENT | | | | UNIT DATA PLATE VALUES | | | |
| | | WATTS | | AMPS | | MCA | | MOP | |
| | | 208V | 240V | 208V | 240V | 208V | 240V | 208V | 240V |
| 024 | Vertical | 7.2k | 9.6k | 34.7 | 40.0 | 53.8 | 60.5 | 50 | 50 |
| | Horizontal | | | | | | | | |
| 030 | Vertical | | | | | | | | |
| | Horizontal | | | | | | | | |
| 036 | Vertical/Horizontal | | | | | | | | |
| 042 | Vertical/Horizontal | | | | | | | | |
| 048 | Vertical/Horizontal | | | | | | | | |
| 060 | Vertical/Horizontal | | | | | | | | |
| 070 | Vertical/Horizontal | | | | | | | | |

Aquazone™ water source heat pumps are available in a flexible, efficient array of models and sizes, which can be used for extensive variety of commercial building types that has several temperature control zones, some of which need to be heated while others need to be cooled. The WSHP system is an especially good choice for potential energy savings from heat-recovery capabilities to efficiently transfer heat between areas.

The design of WSHP units is adaptable, making them suitable for various water loop, ground water, and ground loop systems. Aquazone products provide optimal energy efficient solutions and adapt to the most challenging design requirements.

Water Loop System

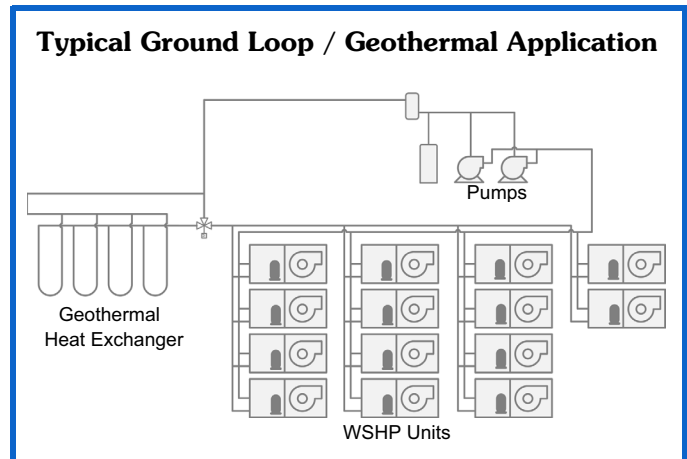
Water loop (or boiler/tower) system applications typically include a number of units plumbed to a common piping system. For optimal performance, this system should be designed between 1.5 and 4 gpm per ton of cooling capacity. The system is comprised of highly efficient packaged reverse cycle heat pump 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 80°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.



Ground Loop Systems

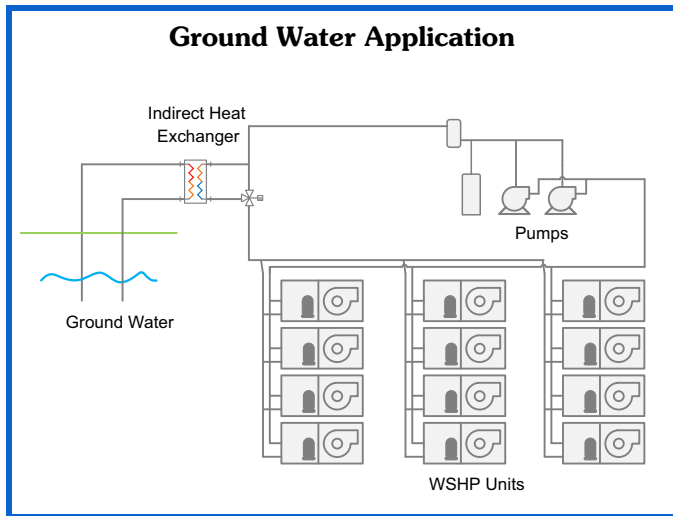
The benefit of ground source applications lies in utilizing the earth's stable temperatures to maintain appropriate water loop temperatures. There are many commonly specified designs for ground loop applications. Typical designs include vertical and horizontal loops:

- **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.



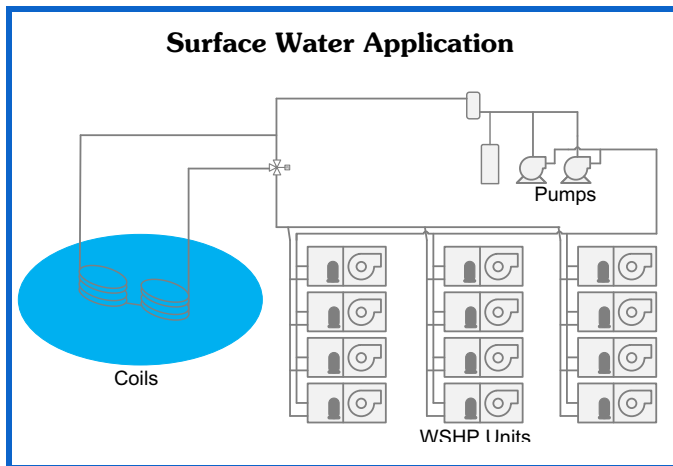
Ground Water systems

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 to isolate WSHP units from contamination. This design limits the amount of piping and excavation required. Aquazone units come with an extended range coil (20-110°F) 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.



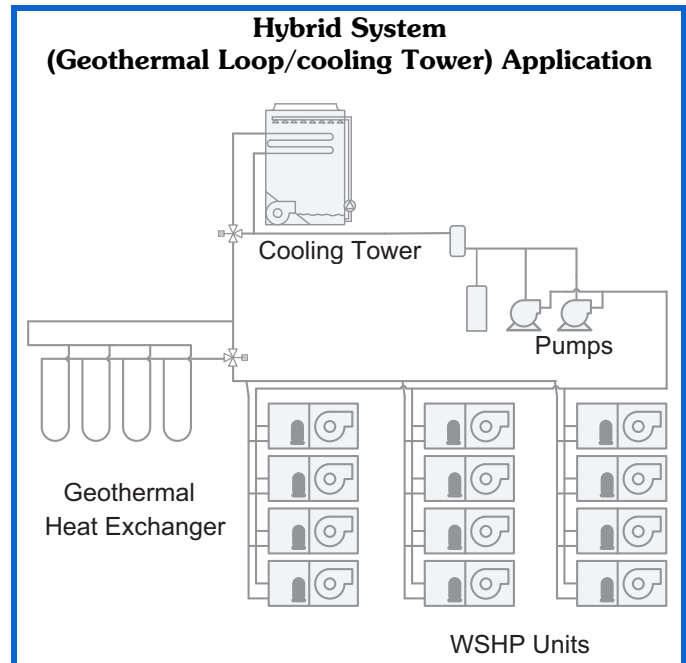
Surface water system

This system is typically located near a lake, pond, well, or other water sources to maintain closed loop water temperatures. 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.



Hybrid Systems

In some applications, it may be beneficial to incorporate a cooling tower or boiler 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.



Freeze Protection

Applications where systems are exposed to outdoor temperatures below freezing (32°F) or leaving water temperatures drop below 40°F must be protected from freezing. The most common method of protecting water systems from freezing is adding glycol concentrations into the water. Design care should be used when selecting both the type and concentrations of glycol used due to the following:

- Equipment and performance may suffer with high concentrations of glycol and other antifreeze solutions.
- Loss of piping pressure may increase greatly, resulting in higher pumping costs.
- Higher viscosity of the mixture may cause excess corrosion and wear on the entire system.
- Acidity of the water may be greatly increased, promoting corrosion.
- Glycol promotes galvanic corrosion in systems of dissimilar metals. The result is corrosion of one metal by the other, causing leaks.

Water Quality

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:

- 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.

Application data (cont)



- Corrosion is caused by absorption of gases from the air coupled with water on exposed metal. Corrosion is also common in salt-water areas.
- 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, Aqua-zone 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.

Water Quality Guidelines

| CONDITION | HX MATERIAL ^a | CLOSED RECIRCULATING ^b | OPEN LOOP AND RECIRCULATING WELL ^c | | |
|---|---|--|--|-------------|--------------|
| Scaling Potential — Primary Measurement Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below. | | | | | |
| pH/Calcium Hardness Method | All | N/A | pH < 7.5 and Ca Hardness, <100 ppm | | |
| Index Limits for Probable Scaling Situations (Operation outside these limits is not recommended.) | | | | | |
| Scaling indexes should be calculated at 150°F for direct use and at 90°F for indirect HX use. A monitoring plan should be implemented. | | | | | |
| Ryznar Stability Index | All | N/A | 6.0 to 7.5 If >7.5 minimize steel pipe use. | | |
| Langelier Saturation Index | All | N/A | -0.5 to +0.5 If <=0.5 minimize steel pipe use. Based upon 150°F direct well, 85°F indirect well HX. | | |
| Iron Fouling | | | | | |
| Iron Fe ²⁺ (Ferrous) (Bacterial Iron Potential) | All | N/A | <0.2 ppm (Ferrous) If Fe ²⁺ (ferrous) >0.2 ppm with pH 6 to 8, O ₂ <5 ppm, check for iron bacteria. | | |
| Iron Fouling | All | N/A | <0.5 ppm of Oxygen Above this level deposition will occur. | | |
| Corrosion Prevention ^d | | | | | |
| pH | All | 6 - 8.5 Monitor/treat as needed. | 6 to 8.5 Minimize steel pipe below 7 and no open tanks with pH <8. | | |
| Hydrogen Sulfide (H ₂ S) | All | N/A | <0.5 ppm At H ₂ S>0.2 ppm, avoid use of copper and cupronickel piping or HXs. Rotten egg smell appears at 0.5 ppm level. Copper alloy (bronze or brass) cast components are acceptable to <0.5 ppm. | | |
| Ammonia Ion as Hydroxide, Chloride, Nitrate and Sulfate Compounds | All | N/A | <0.5 ppm | | |
| Maximum Chloride Levels | Copper Cupronickel 304 SS 316 SS Titanium | N/A | Maximum allowable at maximum water temperature. | | |
| | | | 50°F (10°C) | 75°F (24°C) | 100°F (38°C) |
| | | | <20 ppm | NR | NR |
| | | | <150 ppm | NR | NR |
| | | | <400 ppm | <250 ppm | <150 ppm |
| | | | <1000 ppm | <550 ppm | <375 ppm |
| >1000 ppm | >550 ppm | >375 ppm | | | |
| Erosion and Clogging | | | | | |
| Particulate Size and Erosion | All | <10 ppm of particles and a maximum velocity of 6 fps. Filtered for maximum 800 micron size. | <10 ppm (<1 ppm “sandfree” for reinjection) of particles and a maximum velocity of 6 fps. Filtered for maximum 800 micron size. Any particulate that is not removed can potentially clog components. | | |
| Brackish | All | N/A | Use cupronickel heat exchanger when concentrations of calcium or sodium chloride are greater than 125 ppm are present. (Seawater is approximately 25,000 ppm.) | | |

NOTE(S):

- Heat exchanger materials considered are copper, cupronickel, 304 SS (stainless steel), 316 SS, titanium.
- Closed recirculating system is identified by a closed pressurized piping system.
- Recirculating open wells should observe the open recirculating design considerations.
- If the concentration of these corrosives exceeds the maximum allowable level, then the potential for serious corrosion problems exists.
Sulfides in the water quickly oxidize when exposed to air, requiring that no agitation occur as the sample is taken. Unless tested immediately at the site, the sample will require stabilization with a few drops of one Molar zinc acetate solution, allowing accurate sulfide determination up to 24 hours after sampling. A low pH and high alkalinity cause system problems, even when both values are within ranges shown. The term pH refers to the acidity, basicity, or neutrality of the water supply. Below 7.0, the water is considered to be acidic. Above 7.0, water is considered to be basic. Neutral water registers a pH of 7.0.
To convert ppm to grains per gallon, divide by 17. Hardness in mg/l is equivalent to ppm.

LEGEND

- HX** — Heat Exchanger
N/A — Design Limits Not Applicable Considering Recirculating Potable Water
NR — Application Not Recommended
SS — Stainless Steel

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

50WC Vertical configuration units are internally trapped from the factory.

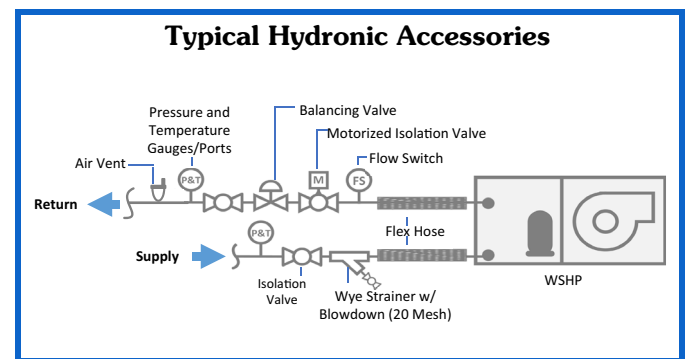
Water piping connections

The most basic type of hose kits are used to connect the fixed building water supply and return piping system to the water inlets and outlets of the unit. Flexible hoses not only simplify the connection but also play a role in minimizing vibration between the unit and the rigid central piping system. For ease of implementation, typical hose kits can include most of hydronic devices like: isolation valves, y-strainer filter, balancing valve, pressure/temperature ports.

Flow balancing

Water source heat pumps are designed and selected to provide a specific amount of cooling and heating capacity at specific operating conditions. While all HVAC equipment is designed around specific return and supply air conditions, WSHPs differentiate themselves by also requiring specific water loop conditions. As a result, it is extremely important that these water loop conditions remain as constant as possible during operation of the WSHP to ensure that both cooling and heating demands are met. One major component of these water loop conditions is the water loop flow rate, often referenced as the GPM or gallons per minute. One method of controlling the GPM is by manually balancing each WSHP, however this is often very time consuming (each WSHP requires manual balancing), and the flow rate through a manually balanced valve tends

to fluctuate over time, often requiring frequent re-balancing. A better method to ensure a constant water loop flow rate at each WSHP is to use an automatic flow control device, or an auto-flow regulator. An auto-flow regulator is a pressure independent automatic flow limiting valve, with the main component being an internal flow cartridge that is factory set to a specific flow rate, or GPM. Auto-flow regulators are utilized at each WSHP (each WSHP will have its own auto-flow regulator) and the auto-flow regulator will maintain the designed GPM over a wide water loop pressure differential. Thus, as the water loop pressure changes (which can be common in systems as different WSHPs on the same water loop are turning on/off and their isolation valves open/close as a result), the water loop flow rate to each WSHP remains constant. Additionally, the system installation is much easier with autoflow regulators compared to manually balanced systems, and the "fluctuation" seen in manually balanced systems is no longer an issue.



Acoustical Considerations

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:

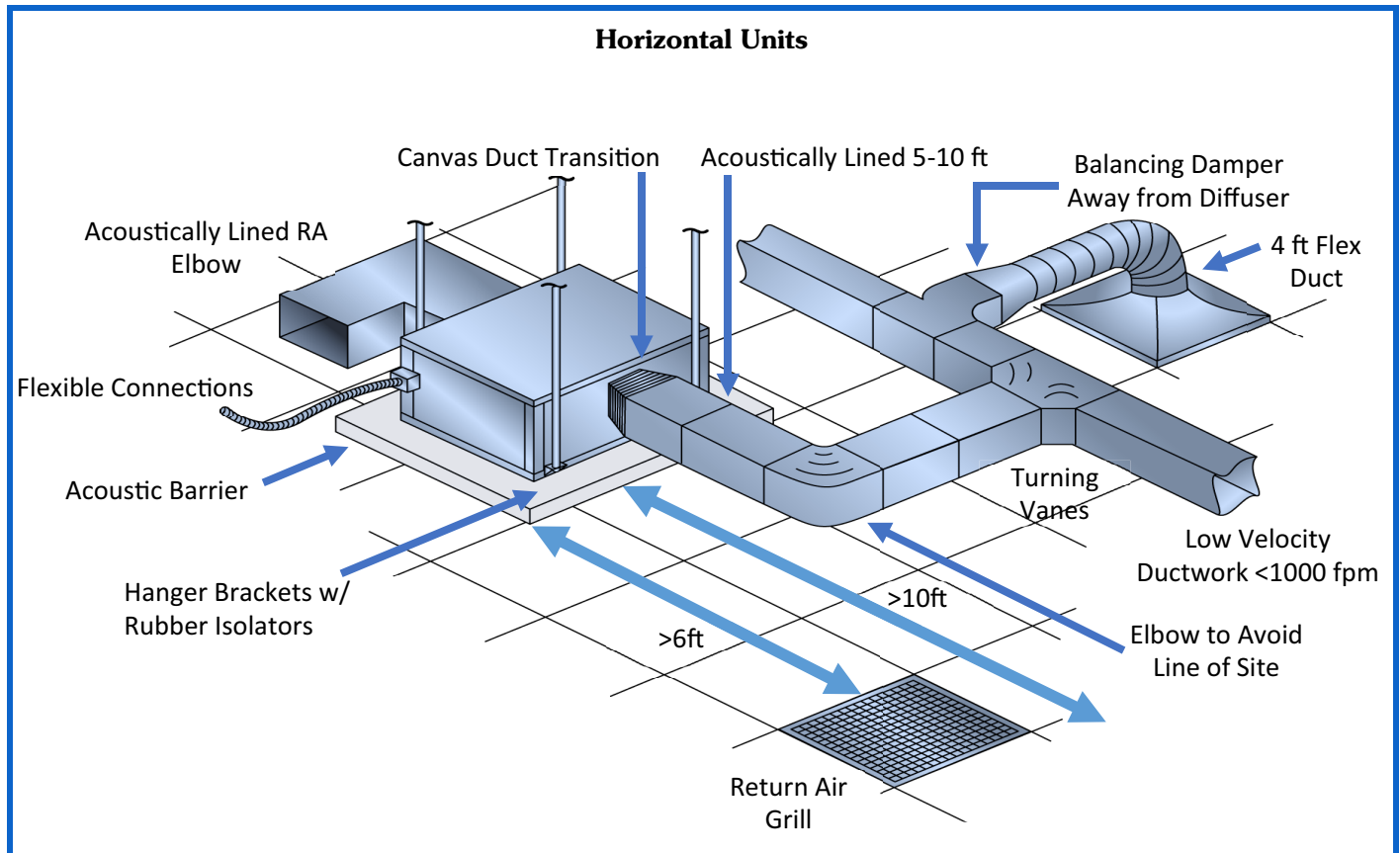
- type of acoustical ceiling
- use of metal or flex duct
- absorption in the occupied space
- location in the occupied space
- open or closed layout plan
- use of open or ducted returns

- orientation of unit to occupant
- use of lined or unlined duct

Horizontal units

General recommendations:

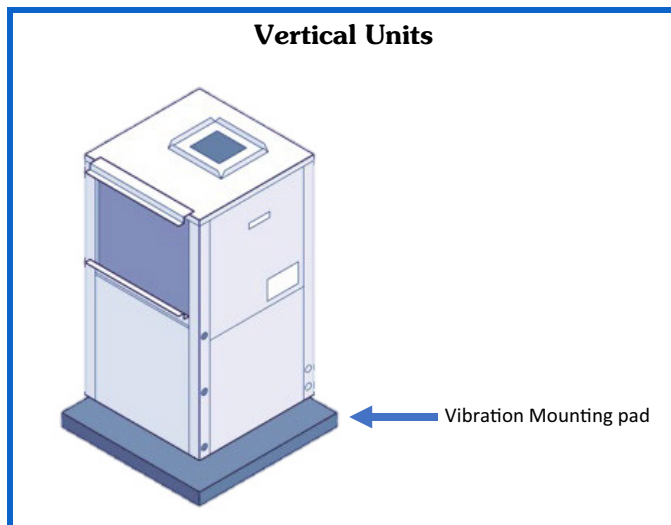
- Maximize the height of the unit above the ceiling.
- Make sure the WSHP unit is located at least 6 feet away from any ceiling return grille to prevent line-of-sight casing noise to reach the space below.
- Suspend the WSHP unit from the ceiling with hangers that utilize spring or neoprene type isolators to reduce vibration transmission.
- Utilize flexible – not rigid – electrical connections to the WSHP unit.
- Utilize flexible loop water and condensate piping connections to the WSHP unit.
- Use a canvas duct connector to connect the WSHP discharge to the downstream duct system. This reduces vibration-induced noise.
- Provide acoustic interior lining for the first 20 feet of discharge duct, or until the first elbow is reached. The elbow prevents line-of-site sound transmission in the discharge duct.
- Provide “turning” vanes in ductwork elbows and tees to reduce air turbulence.
- Size the sheet metal supply duct with velocities no greater than 1000 fpm.
- Make ductwork as stiff as possible.
- Use round duct whenever possible – it is less noisy.
- Allow at least 3 equivalent duct diameters of straight duct upstream and downstream of the unit before allowing any fittings, transitions, etc.
- Seal all penetrations around duct entering the space.
- Provide a four-foot runout duct made of flexible material to connect a diffuser to the supply trunk duct. The flex duct provides an “attenuating end-effect” and reduces duct transmitted sound before it reaches the space. Typically a 6db sound reduction can be accomplished with the use of flex duct.
- Locate the runout duct balancing damper as far away from the outlet diffuser as possible. Locating the balancing damper at the trunk duct exit is best.
- If return air is drawn through a ceiling plenum, provide an acoustically lined return duct elbow or “L” shaped boot at the WSHP to eliminate line-of-site noise into the ceiling cavity and possible through ceiling return air grilles. Face the elbow or boot away from the nearest adjacent WSHP unit to prevent additive noise.
- Do not hang the suspended ceiling from the ductwork.



Vertical units

All the suggestions made for horizontal units equally apply for vertical units. However, due to the fact that vertical units tend to be installed in small equipment rooms or closets, a few more suggestions apply.

- Mount the unit on a pad made of high-density sound absorbing material such as rubber or cork. Extend the pad beyond the WSHP unit footprint by at least 6 inches in each direction.
- Since the units return air flows through a grille mounted in a closet door, provide a sound barrier or some other modification of the closet to prevent line-of-site noise into the space.
- Follow good duct design practice in sizing and locating the connection of the WSHP discharge to the supply duct system. Use an elbow with turning vanes and bent in the direction of the fan rotation to minimize turbulence. Make any duct transitions as smooth and as gradual as possible to again minimize turbulence and loss of fan static pressure.



Console Units

With console units, the fan and compressor are located within the space, and only the unit casing design attenuates the transmission of these sound sources into the space. The designer should carefully review the manufacturer's acoustical data when selecting console units and use lower fan speeds to minimize space noise. After analysis, it may be best to eliminate the use of console units, and use horizontal or vertical type units instead.

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 coil 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 sizing, the nominal latent capacity, the application airflow, the application temperatures and humidity, and the application fluid flow and fluid temperature. WSHP Builder can be utilized to simulate the performance of WSHP units with HGRH under the desired application conditions and will specify the unit leaving air dry bulb temperature and wet bulb temperature, which can be used to determine the leaving air relative and absolute humidity levels. The target leaving air dry bulb temperature for unit with HGRH in dehumidification mode is between 68°F and 78°F. The target leaving air wet bulb temperature should result in a relative humidity is between 40 and 60%, based on the dry bulb temperature. If the relative humidity is too high, reduce the fan speed or increase the unit size until the desired conditions are met. Alternate methods of dehumidification with WSHPs include fan speed control and condenser water reheat. Fan speed control is one of the simplest and most efficient methods of dehumidification, but only provides dehumidification when the unit is in cooling mode. Condenser water reheat can be an effective method of dehumidification in boiler/tower applications, but is not very efficient. Condenser water reheat requires hot loop temperatures (which reduces cooling efficiency) to achieve a neutral discharge air temperature and requires an extra pump which adds to the unit power consumption. Condenser water reheat coils often have a higher airside pressure drop than HGRH coils, which results in higher fan energy consumption.

Waterside Economizer

When considering providing Waterside Economizer with units, several key factors come into play to ensure optimal performance and efficiency. The geographical and climatic conditions of the installation site play a pivotal role, as Waterside Economizers are particularly effective in North/Mild climates and geothermal or hybrid systems where low loop temperatures (40 to 60°F) can be sustained during low ambient conditions. The suitability of the

Application data (cont)



system is heightened in cooling-dominant buildings with a constant cooling demand, maximizing energy savings. It is crucial to weigh the benefits of cooling savings from free cooling against any potential impacts on the airside and waterside pressure drops, as well as heating impact on units. Additionally, compliance with energy codes should

guide the selection of the Waterside Economizer to align with regulatory standards and promote sustainable practices. These considerations collectively contribute to the successful application suitable for the Waterside Economizer, unlocking significant energy savings while advancing environmental sustainability goals.

Selection procedure



The electronic catalog (eCAT) selection tool is a web-based selection program recommend for all WSHP equipment selections. The tool provides guided configuration of WSHP units, all associated performance data, and comprehensive and professional equipment reports/submittals.

Selection Inputs

The following is a list of the primary information needed to select a water source heat pump unit.

Electrical

WSHP units are available in a variety of electrical configurations. The Voltage / Phase/ Hertz requirements for the project will need to be defined for the WSHP unit.

System Parameters

Entering Water Temperature (EWT)

The design entering water temperature will typically be the same for all units within the same source water loop meaning there will be a single set of design cooling and heating source water loop setpoints.

Fluid Type

The fluid type needs to be defined for the source water loop. This will typically be 100% water or a percentage of antifreeze concentration.

Altitude

When the altitude is defined the program will automatically apply any derates to the unit capacity associated with the varying air conditions.

System Parameters Screen

System Parameters

| | | | | |
|-------------------------|------|----|---------------------|------------------|
| Altitude | 0 | ft | Fluid Type | Propylene Glycol |
| Cooling Ent. Water Temp | 86.0 | F | Fluid Concentration | 10 |
| Heating Ent. Water Temp | 68.0 | F | | % |

Design Parameters

Entering Air Temperature (EAT)

The design entering air temperature for both heating and cooling is required. For cooling this will be both a wet bulb and dry bulb temperature and for heating this will be dry bulb only. If outdoor air is being mixed in with the return air of the unit, the EAT will need to be the mixed air condition.

Airflow Rate

Typically, a single airflow rate will be defined for both heating and cooling operation. In general, these units are constant air volume units meaning they are not varying the airflow as a means of capacity or supply air temperature

control. Airflow rates are often selected to maintain around 400 CFM/nominal cooling ton.

External Static Pressure

The external static pressure at the design airflow rate is required. ECAT will automatically factor in the airside pressure drop of optional airside components when evaluating fan performance.

Water Flow Rate

Water flow rate will vary among each unit in a system and is typically selected to maintain a target temperature difference or gpm/nominal ton for either cooling or heating operation.

Design Parameters Screen

Design Parameters

| | | | | | | |
|--------------------------------|---------------------|-----------|---|--------------------|-----|---------|
| Motor Type | Constant Torque ECM | Fan Speed | AUTO | | | |
| External Static | 0.500 | in wg | Airflow Rate | 1000 | CFM | |
| Cooling Ent. Air DB Temp | 75.0 | F | <input type="radio"/> Flow Rate | flow Rate | gpm | |
| Cooling Ent. Air WB Temp | 63.0 | F | <input checked="" type="radio"/> Flow Rate/Nominal Capacity | flow Rate/capacity | 2.8 | gpm/ton |
| Cooling Ent. Relative Humidity | 51.57 | % | Heating Ent. Air DB Temp | 68.0 | F | |

Capacity Requirements

Heating and Cooling Loads

Although both heating and cooling loads need to be considered when selecting WSHP units, they are often chosen based on cooling capacity, given that heating output is generally higher.

Unit Configuration

WSHP units are highly configurable with a wide variety of factory installed options and air/water flow configurations. The ECAT selection program will present the available options and configurations available to the particular unit of selection.

Accessories/Warranties/Start-Up

The electronic catalog (eCAT) selection tool integrates a range of field-installed accessories to meet the specific needs of each project. The selection of accessories includes hose kits, isolation/balancing valves, strainers, electric duct heaters, sensors, and thermostats. Beyond the unit's configuration and accessories, the selection process extends to warranty choices and equipment start-up options. This ensures a comprehensive and tailored approach to WSHP systems, allowing for customization based on the unique requirements of each project.

Capacity Requirements Screen

Capacity Requirements

☒ Total Cooling

Total Cooling

26.0

MBH

☒ Sensible Cooling Capacity

Capacity

19.0

MBH

☒ Total Heating

Total Heating

30.0

MBH

Tolerance

10

%

Selection Outputs / Reports

Performance Report

Upon completing the selection process, the eCAT tool delivers a concise performance report. This report encompasses key unit parameters such as size, model number, and system conditions. Additionally, it includes crucial electrical data and unit performance metrics based on the specified conditions. The report goes a step further by

incorporating the unit's fan curve, offering a visual representation of its airflow characteristics. This concise performance report ensures that users have a clear and easily digestible overview of the chosen WSHP unit, facilitating informed decision-making and streamlined documentation for project evaluation.

Performance Report

Performance Report

☒ Performance Summary

☒ Show Pricing in Reports

Submittal report

Within the project overview section of the eCAT, users have the option to generate a tailored submittal report.

This customizable report features selectable sections to include essential project documentation.

Summittal Report

Selection Summary

Quote selections

Batch Upgrade

CSO Export

+ New selection

| <input type="checkbox"/> | Selection Name | Model | Chiller Arrangement | Capacity | Quantity | Date Modified | Actions |
|--------------------------|----------------|------------------|---------------------|--------------|----------|---------------------|---|
| <input type="checkbox"/> | 50HQP | 50HQP096JCC6B1AB | N/A | 096 (8 tons) | 1 | 19/10/2023 02:28 PM | <div><div>✓</div><div></div><div></div><div></div><div></div></div> |

Prev

1

Next

Items per page: 100

Selection procedure (cont)



Selectable Sections

- Cover Sheet — Includes Project name, Tag name and report's generated Date.
- Unit Report — Offers detailed insights into the selected water source heat pump (WSHP), including size, model number, unit size, overall dimensions, weight, electrical data, selected options and accessories and warranty information.
- Certified Drawings — Provides detailed dimensional information about the unit.
- Detailed Performance Report — Offers a comprehensive overview of the WSHP's electrical and performance data, along with its fan curve.
- Guide Specifications — Outlines key installed options and unit's details.
- Acoustical Report — Provides rated sound data of the unit.

Packaged Water Source Heat Pumps

Engineering Guide Specifications

Size Range: **1/2 to 6 Nominal Tons**

Carrier Model Number: **50WC**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Install water source heat pumps, as indicated on the plans with capacities and characteristics as listed in the schedule and the specifications that follow. Units shall be horizontal or vertical configurations. All equipment shall be rated and certified in accordance with ANSI/AHRI/ASHRAE/ISO (American National Standard Institute/Air-Conditioning, Heating and Refrigeration Institute/American Society of Heating, Refrigerating, and Air-Conditioning Engineers/International Organization for Standardization) 13256-1. All equipment shall be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL-60335-2-40 for the United States and CSA C22.2 No. 60335-2-40 for Canada, by Intertek Testing Laboratories (ETL). The units shall have AHRI/ISO and ETL-US-C labels.
- B. Units shall be supplied completely factory built and capable of operation with an entering water temperature range from 20 to 110°F. Quality control system shall automatically perform via computer: triple leak check, pressure tests, evacuation and accurately charging of system, detailed heating and cooling mode tests, and quality cross checking all operational and test conditions to pass/fail criteria.
- C. Units shall be individually packaged on wooden skids with protective corner posts and plastic stretch wrapping for maximum protection.

1.02 QUALITY ASSURANCE

- A. All equipment listed in this section must be rated in accordance with ANSI/AHRI/ASHRAE/ISO 13256-1 performance standard, latest edition. The applicable units shall have an AHRI/ISO label. Standard cabinet panel insulation shall meet NFPA (National Fire Protection Association) 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21 and shall meet zero level bacteria growth per ASTM (American Society for Testing and Materials) G22.
- B. All units shall be factory tested in all operating modes and safety switch operation shall be verified.
- C. Serial numbers will be recorded by the factory and furnished to the contractor for ease of unit warranty status.

1.03 WARRANTY:

The manufacturer shall warranty the unit's parts for a period of 12 months from start-up or 18 months from ship-ping (whichever occurs first). The manufacturer shall warranty the compressor (parts only) for a period of up to 5 years from shipping.

[Optional] Units shall have the option for an extended warranty.

Part 2 — Product

2.01 EQUIPMENT

- A. General: Units shall be completely assembled, piped, internally wired, and fully charged at the factory.
- B. Basic Construction:
 1. The cabinet shall be fabricated from heavy gage galvanized steel for superior corrosion protection. All interior surfaces shall be lined with 1/2-in. thick, multi-density, coated, fiberglass insulation. Insulation must be non-combustible, non-hygroscopic and anti-fungal. Insulation must meet NFPA 90A and 90B for fire protection as well as Fire Hazard classification 25/50 (per ASTM E84 and UL 723 and CAN/ULC S102-M88), ASTM C1071, erosion requirements of UL181 and be certified to meet GREENGUARD indoor air quality standards for low emitting products. One blower access panel and two compressor compartment access panels shall be removable with supply and return air ductwork in place.
 2. [Optional] Closed cell foam (CCF): CCF shall be installed on interior surfaces of water source heat pump and shall meet the density and compression requirements of ASTM D 1056, the water absorption requirements of ASTM D-1667 and the tensile and elongation requirements of ASTM D-412. Closed cell foam shall meet the flammability requirements of FMVSS302, UL94 and ASTM E84.
 3. Units shall have the following airflow arrangements available. The contractor shall be responsible for all extra costs incurred as a result of the unavailability of these airflow arrangements.
 - a. Horizontal units: Left Return/Right Discharge, Left Return/Back Discharge, Right Return/Left Discharge, Right Return/Back Discharge. Horizontal units shall have a fully field convertible discharge from back to side or side to back. The discharge conversion shall require no additional components.
 - b. Vertical units: Left Return/Top Discharge, Right Return/Top Discharge
 4. All units shall have a stainless-steel drain pan as standard to comply with this project's IAQ (indoor air quality) requirements. Painted steel or plastic is not acceptable. Drain pan must include a condensate overflow safety switch that will shut the unit down in an overflow event.
 5. Unit shall have a floating compressor or pan consisting of a 1/2-in. thick high density elastomeric pad between the compressor base plate and the unit base pan to prevent transmission of vibration to the structure.

6. Units shall have a 1-in., two-sided filter rack with 1-in. thick throwaway type fiberglass filter as standard.
7. [Optional] MERV 8 Filters: Units shall have a gasketed 2-in., four-sided filter rack with a pleated MERV 8 filter. The filter rack shall incorporate a 1-in. duct flange.
8. [Optional] MERV 13 Filters: Units shall have a gasketed 2-in or 4-in, four-sided filter rack with a pleated MERV 13 filter. The filter rack shall incorporate a 1-in duct flange.
9. Cabinets shall have separate holes and knock-outs for entrance of line voltage and low voltage control wiring. Supply and return water connections shall be brass female pipe thread (FPT) fittings and mounted flush to cabinet exterior. Connections that require a backup wrench or that extrude past the unit corner post are not acceptable. Condensate connection will be stainless steel female pipe thread fittings. Plastic is not acceptable.
[Optional] Selectable Water Connections: Units shall be selectable for either front left or front right water connections.
10. Hanging brackets shall be provided for horizontal units and supplied with rubber grommets for field installation.
11. [Optional] Ultra Low Leakage Construction: Unit construction shall allow for cabinet air leakage less than 2% of the nominal unit airflow rate.
12. [Optional] Compressor blanket shall be installed in the unit for additional sound attenuation.
13. [Optional] 208/230-1 phase factory-installed UL listed single stage electric heater shall be available for the units. Available only on vertical units with top discharge and ECM motors.

C. Fan and Motor Assembly:

1. The fan shall be direct-drive centrifugal forward curved type with a dynamically balanced wheel. The housing and wheel shall be designed for quiet low velocity operation. The blower housing shall feature a removable inlet ring to facilitate removal and servicing of the fan motor. The fan motor shall have 3 speed settings (208V, 230V, 265V, or 460V) or 1 speed setting (575V), permanently lubricated, PSC (permanent split capacitor) type with thermal overload protection.
2. [Optional] Units shall have an optional constant torque electronically commutated motor for premium fan efficiency. These motors shall feature 3 (unit sizes 007-012) or 5 (unit sizes 015-070) pre-programmed torque settings that can be changed in the field to match design requirements. 460 v-3 ph-60 Hz units with these motors must be able to operate without the need for a neutral wire for the motor.
3. [Optional] Units 15,000 Btu/Hr to 70,000 Btu/Hr shall have an optional Constant Airflow ECM (Electronically Commutated Motor) for premium fan efficiency and constant air delivery over a wide range of external static pressures. These motors shall be field adjustable for $\pm 15\%$ of nominal design airflow. These motors shall provide feedback to the unit control box to verify motor operating mode and delivered CFM.
4. Blowers shall have inlet rings to allow removal of wheel and motor from one side without removing housing.
5. Units supplied without permanently lubricated motors must provide external oilers for easy service.
6. The fan and motor assembly must be capable of overcoming the external static pressures as shown on the schedule.
7. The airflow/static pressure rating of the unit shall be based on a wet coil and a standard clean filter in place.

D. Refrigerant Components:

1. Units shall use R-454B refrigerant. All units shall have a factory sealed and fully charged refrigerant circuit.
2. Hermetic Compressor:
Hermetic rotary or scroll compressors shall be specifically designed for R-454B refrigerant and shall be internally sprung, externally isolated and with thermal overload protection.
3. Refrigerant metering shall be accomplished with a thermostatic expansion valve. Units with only capillary tubes are not acceptable.
4. The finned tube heat exchanger shall be constructed of lanced aluminum fins not exceeding sixteen fins per inch bonded to rifled copper tubes in a staggered pattern and will have a 600 psig working refrigerant pressure. The heat exchanger shall have aluminum end sheets.
5. [Optional] The finned tube heat exchanger shall have an optional protective coil coating. This corrosion protection shall consist of tin-plated copper tubing with coated aluminum fins that must pass 1,000 hours of ASTM B117 salt fog testing. Painted, dipped or e-coated heat exchangers are not acceptable.
6. Reversing Valve: Reversing valves shall be four-way solenoid activated refrigerant valves that will fail in the heating operation should the solenoid fail to function. Reversing valves that fail to the cooling operation shall not be allowed.
7. Coaxial (tube in tube) refrigerant-to-water heat exchanger. Refrigerant-to-water heat exchangers shall be of copper inner water tube and steel outer refrigerant tube design rated to withstand

- 600 psig working refrigerant pressure and 400 psig working water pressure. Shell and tube style refrigerant to water heat exchangers shall be treated as pressure vessels and shall require refrigerant pressure relief valves piped to the exterior of the building. The contractor supplying the water source heat pumps with shell and tube heat exchangers shall be responsible for any additional installation costs. Brazed plate water-to-refrigerant heat exchangers shall require additional centrifugal separators added to the supply water piping at each unit. Each separator shall have an automated clean out valve piped to a waste line. The contractor supplying water source heat pumps with brazed plate heat exchangers shall be responsible for any additional costs.
8. [Optional] Cupronickel coaxial water-to-refrigerant heat exchangers shall be provided, with cupronickel inner water tube construction.
 9. [Optional] Hot Gas Reheat (HGRH): Units with a capacity above 12,000 Btuh shall be equipped with optional hot gas reheat coil. On/Off HGRH shall be controlled by a thermostat with dehumidification output, humidistat, or DDC control connected to the unit H terminal and shall start the unit in the reheat mode should the humidity be above the set point once the space temperature is satisfied. Cooling or heating requirements shall take precedent over HGRH.
 10. [Optional] Hot Gas Bypass: Units shall be supplied with an ETL listed modulating hot gas bypass valve with factory supplied and installed controls to prevent air coils from frost development by taking hot gas and bypassing the water coil and expansion device and reintroducing the hot gas into the refrigeration line prior to the air coil. The hot gas bypass valve shall maintain a minimum refrigerant suction pressure to allow for a light load cooling module or a low entering air temperature cooling mode. The HGBP valve shall be factory set for opening pressure to 105 psig, this set point can be adjusted (95 to 115 psig) in the field.
 11. [Optional] A2L refrigerant Leak detection shall be available for units where the refrigerant leak detection system is required by local codes.
 12. Safety controls shall include both a high pressure and low-pressure switch. Temperature sensors shall not replace these safety switches.
 13. Refrigerant pressure test ports shall be factory installed on high- and low-pressure refrigerant lines to facilitate field service. Unit shall be equipped with a dedicated accesses panel for the test ports not requiring removal of the primary cabinet panels to access the test ports.
 14. Activation of any safety device shall prevent compressor operation via a lockout circuit. The lockout circuit shall be reset at the thermostat

or at the contractor supplied disconnect switch. Units which may be reset at the disconnect switch only shall not be acceptable.

E. Hydronic Factory Installed Options

1. [Optional] Waterside Economizer: Waterside economizer shall be completely installed at the factory, with an additional condensate drain pan, motorized 3-way valve, and all internal electric controls. Waterside economizer assembly shall be rated at minimum 450 psig and UL (Underwriters Laboratories) listed for applications with the heat pump. This option is externally mounted outside the unit.
2. [Optional] Units shall have a 2-way electrically operated shut-off (solenoid) valve with end switch mounted internally in the unit cabinet. The two-way motorized solenoid valve is rated for a 300 psig working pressure. The valve shall be factory wired to open with compressor operation.
3. [Optional] Units shall have an optional water flow regulating valve set to 3 gallons per minute of water flow per nominal ton of refrigeration capacity.
4. [Optional] Flow proving switch (differential pressure switch) shall energize relay and disable unit operation when no water flow to the unit.

F. Controls and Safeties:

1. Electrical:
 - a. Controls and safety devices will be factory wired and mounted within the unit. Controls shall include fan relay, compressor contactor, 24-v transformer, reversing valve coil, and Unit Protection Module (UPM). The standard transformer shall be rated for a minimum 50 VA for sizes 007-042, or 75 VA for sizes 048-070, or 100 VA for units with TruVu™ controller. All units shall be name plated for use with time-delay fuses or HACR circuit breakers. Unit controls shall be 24-v and provide heating or cooling as required by the remote thermostat/sensor.
 - b. All units shall have a factory installed and labeled terminal strip input for field provided thermostat or DDC controller.
 - c. Units shall include a factory provided wiring diagram on the inside of the control access panel.
 - d. Control box shall be mounted on a hinge and capable of swinging out and full removal.
 - e. All units shall have a Unit Protection Module (UPM) printed circuit board which implements following equipment safeties:
 - 1) Anti-short cycle time delay (5-minute delay on break).
 - 2) Random start time delay on initial power.

- 3) Brownout / surge / power interruption protection.
- 4) 120 second low pressure switch bypass timer.
- 5) High refrigerant pressure shutdown.
- 6) Low refrigerant pressure shutdown.
- 7) Water coil freeze protection shutdown.
- 8) Air coil freeze protection shutdown.
- 9) High condensate level shutdown.
- 10) 24 vac alarm output for remote fault indication.
- 11) Refrigerant leak shutdown.
- 12) Intelligent alarm reset

The UPM shall automatically reset after a safety shutdown. Restart the unit if the cause of the shutdown no longer exists (except for low temperature and high condensate level shutdowns). Should a fault re-occur within 60 minutes after reset, then a "hard" lockout will occur. A light-emitting diode (LED) shall annunciate the following alarms: brownout, high refrigerant pressure, low refrigerant pressure, low water temperature and a high level of condensate in the drain pan, refrigerant leak fault. The LED will display each fault condition as soon as the fault occurs. If a hard lockout occurs, then the fault LED will display the type of fault until the unit is reset.

The UPM shall feature the following field configurable adjustments:

- A) Lock out reset on thermostat interruption or power reset.
 - B) Two or four restart attempts before a hard lockout.
 - C) Test mode (reduces all time delays to 5 seconds for diagnostic work).
 - D) Air/water coil freeze limit trip.
- f. [Optional] Units shall have all the features above (UPM) and additionally TruVu DDC controller shall have an advanced controls logic and include following features:
- 1) Three-speed fan control. Controller shall automatically, based upon space temperature input, operate the fan at the lowest of 3 selectable speeds to achieve space temperature set point. (Exception 575V units with PSC motor)
 - 2) Two-position OA (outdoor air) damper
 - 3) Modulating OA damper with DCV (demand controlled ventilation)
 - 4) Hot gas reheat solenoid valve
 - 5) Two-position water economizer control
 - 6) Modulating water economizer control

- 7) Two stage electric auxiliary heat control
- 8) Scheduling
- 9) Adaptive optimal start
- 10) Equipment performance monitoring
- 11) Alarm status

TruVu controller must be capable of communicating over BACnet IP, supporting direct connection or daisy chain topologies using BACnet/IP for seamless integration into building automation systems, and shall have the ability to be viewed in the TruVu Equipment Touch (ET), or field assistant user interface.

- g. [Optional] A larger transformer rated for at least 75 VA shall be available for all unit sizes and have a push button reset circuit breaker on the secondary power. Units with factory installed HGRH or WSE shall be provided with minimum 75 VA transformer.
- h. [Optional] A larger transformer rated for at least 100 VA shall be available for units with factory-installed TruVu controller and have a push button reset circuit breaker on the secondary power.
- i. [Optional] Non-fused electrical disconnect shall be installed on the unit.
- j. [Optional] Units shall have a short circuit current rating (SCCR) of no less than 65kA.
- k. [Optional] Boilerless control shall activate an electric heater and disable compressor when water temperature drop below set point.
- l. [Optional] Energy management switch to enable remote operation of WSHP (water source heat pump).
- m. [Optional] Pump-valve relay to enable a pump/valve operation when calling for compressor operation.
- n. [Optional] Compressor status relay shall be provided to monitor a status of the compressor via normally open set of dry contact.

G. Accessories:

1. Hydronic accessories:
 - a. Hose Kits

All units shall be connected to main water supply and return headers with hoses. The hoses shall be 2 or 3 feet long, braided stainless steel rated to 400 psig at 265°F. Hoses may contain optional ball valves with P/T ports, Y strainers with blow down valves and/or auto flow regulators as specified in the schedule.

- b. Two-position motorized isolation valve (2-way solenoid valve)
- Two-position motorized isolation valve (2-way solenoid valve) with end switch is available for field installation. The two-way

motorized solenoid valve is rated for a 125 psig working pressure. The valve shall be field wired to open with compressor operation.

c. Ball Valves (Brass Body)

Valves shall be available for shutoff and balancing water flow. Available with memory, memory stop, and pressure temperature ports. (600WOG at 325°F)

d. Y Strainers (Bronze Body)

Strainers are “Y” type configuration with a brass cap. Strainer screen shall be made of stainless steel. (600WOG at 325°F)

2. Controls accessories:

a. Carrier commercial thermostat controls are available as follows:

1) Edge® Pro 7-day programmable thermostat offers 2-stage heat, 2-stage cool, remote contact input, 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.

2) Comfort Pro Programmable Thermostat, 2-stage Heat /2-stage Cool G/E, plus 1-stage auxiliary or emergency heat HP&WSHP, or 2- stage cool/heat only, Touch n Go™ prog. (OCC/UNOCC/LIMIT), Passcode protection, remote sensor capability with override, random start, Manual/Auto-Changeover, Outdoor/supply/return temp, hospitality mode, option battery powered.

3) Carrier Connect™ Wi-Fi 7-day programmable/non-prog; 4.3 in. touch screen, web enabled (portal), smartphone app, 1-2 stage heat/1-3 stage cool, G/E, HP (with 2-stage aux heat), remote sensor capability, manual/auto-changeover, humidify/dehumidify/Humidi-MiZer™

4) Non-Branded Wi-Fi 7-day programmable/non-prog; 4.3 in. touch screen, web enabled (portal), smartphone app, 1-2 stage heat/1-3 stage cool, G/E, HP (with up to 2-stage aux heat), remote sensor capability, manual/auto-changeover, humidify/dehumidify/Humidi-MiZer™

5) ComfortVu BACnet Thermostat, 24 VAC Thermostat, offers a large backlit LCD display and intuitive push-button controls for easy operation, BACnet MS/TP port, 2 universal inputs, 2 universal outputs, and 4 relay outputs, it allows control over up to 3

stages of heating and 2 stages of cooling, along with up to 3 fan speeds.

b. ZS sensors for TruVu DDC (direct digital controls) control option. Sensors are available as follows, and all sensors below offer monitoring of space temperature only, or space temperature and CO₂, or space temperature and humidity, or space temperature and CO₂ and humidity.

1) ZS Standard sensor with a communication port.

2) ZS Plus sensor with communication port, occupancy status indicator, local occupancy override and set point adjustment.

3) ZS Pro sensor with communication port, occupancy status indicator, local occupancy override, set point adjustment, LCD (liquid crystal diode) display, alarm indicator and fan speed control.

4) ZS Pro-F sensor with communication port, occupancy status indicator, local occupancy override, set point adjustment, LCD display, alarm indicator, fan speed control, cooling/heating/fan only mode control and F to C conversion.

5) TruVu Equipment Touch (ET) for unit start-up and commissioning shall be available in 7 and 10 in. touch screen sizes for panel or wall mounting. All point objects will have the ability to be viewed in the Tru Vu ET user interface.

3. Electric Duct Heaters:

a. Duct heater shall be slip-in type and shall be UL approved for zero clearance to combustible surfaces. The heater shall bear a UL/CSA label. Control panel and element housing shall be constructed of heavy gage galvanized steel. All heating elements shall be made of nickel/chromium resistance wire with ends terminated by means of staking and heliarc welding to machine screws. Heating element support structure shall consist of galvanized steel wire formed and constructed to support ceramic bushings through which the heating element passes. Control cabinet shall be constructed of heavy gage galvanized steel with multiple knock-outs for field wiring. Control cabinet shall have a solid cover also of heavy gage galvanized steel and held in place with hinges and tool-release latches.

b. Duct heater shall be supplied with primary over temperature protection by built in disc type automatic reset thermal cutouts and secondary over temperature protection by built in disc type manually resettable thermal cutouts. These devices must function independently of one another and are not

Guide specifications (cont)

acceptable if series connected in the control circuit wiring. A disconnecting magnetic control circuit is required. All duct heaters will require either a fan interlock circuit or an airflow switch.

- c. Over-current protection by means of factory-installed fusing within the control cabinet shall be provided for heaters rated at more than 48 amps. Heating elements shall be subdivided and fused accordingly.
- d. All wiring, component sizing, component spacing and protective devices within the control cabinet shall be factory installed and comply with UL standards. All heaters shall

function properly with a 60 Hz power supply.

- e. A wiring diagram depicting layout and connections of electrical components within the control cabinet shall be affixed to the inside of the control cabinet cover.
- f. A rating plate label shall be affixed to the exterior of the control cabinet cover which states model number, serial number, volts, amps, phase, frequency, control volts, volt-amps and minimum airflow requirements.

