

Scholar QV Heat Pumps and Air Conditioners

Models VACA60 & VAHA24-30-36-40-49



Designed, Engineered & Assembled In the USA

Scholar QV Heat Pump

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GENERAL DESCRIPTION

The Scholar QV heat pumps and air conditioners are self-contained HVAC systems designed to provide heating, cooling, and outside fresh air for school classrooms. The units are installed in the classroom against an exterior wall. The vertical configuration minimizes the floor space occupied by the HVAC unit. This unique design makes it ideal for both new schools and for renovation of existing classrooms. Scholar QV VAHA high efficiency models have an EER of 10.0.

A full range of ventilation options – from the GreenWheel® ERV to a mechanical damper - are offered to meet any climate or budget. A wide selection of architectural louvers provides the designer with unlimited styles and configurations to compliment the exterior of the school. (For a complete description of the architectural louvers, please refer to the Marvair brochure entitled, "Architectural Extruded Aluminum Louvers.") Marvair offers a full range of thermostats to meet virtually every requirement. The unit can be controlled by a wall mounted thermostat, an internal thermostat or interfaced with a energy management system.

Scholar QV heat pumps and air conditioners are available with capacities of 2 to 5 tons. Electric resistance or hot water is available as primary heat on the air conditioners and as second stage heat on the heat pump. All sizes are available for operation on 208/230 V, 1Ø or 3Ø and 460 V. electrical supply. All models comply with UL standard 1995, current edition and listed by ETL.



Features and Benefits

Quiet Operation + High Efficiency = Improved Learning & Lower Operating Costs

- 10.0 EER on VAHA Models
- High Efficiency Scroll Compressors
- Double Walled Side Panels & Optional Front Panels
- 1-1/2" Acoustical/Thermal Insulation
- A Sound Deadening Compressor Jacket
- 16 Gauge Steel Side & Front Panels to Absorb Low Frequency Sound
- ¼" Closed Cell Interior Insulation
- Electronically Commutated Indoor Air Movers

Dehumidification

- Factory Assembled with Hot Gas Reheat to Provide Dehumidification of Fresh and Room Air
- Mechanical Cooling and the HGR Coil Operate Together to Control Humidity

GreenWheel® Energy Recovery Ventilator (ERV)

- Removes Both Moisture and Heat from the Incoming Air Stream
- Optimized for Hot Gas Reheat

SCHOLAR QV ADVANTAGES

Since their introduction in 1991, Scholar heat pumps and air conditioners have been the undisputed leaders in interior, self-contained classroom HVAC systems. Students in tens of thousands of classrooms across the USA have benefited from the environment provided by Scholar heat pumps and air conditioners.

The Scholar QV builds on this history with unique design innovations and features.


► Quiet Operation + High Efficiency = Improved Learning and Lower Operating Costs

The Scholar QV units combine quiet operation with high efficiency to create an optimum learning environment and lower operating costs. Many of the components that minimize sound levels also reduce operating costs.



- VAHA models rated at 10 EER
- High efficiency scroll compressors
- Double walled side panels and optional double wall front panels
- 1-1/2" acoustical/thermal insulation
- A sound deadening compressor jacket
- 16 gauge steel side and front panels to absorb low frequency sound (and provide excellent vandal resistance)
- 1/4" closed cell insulation wrapped around the perimeter and interior of the outdoor air box to minimize sound transmission from the unit to the building
- High efficiency electronically commutated indoor air movers

In addition, backward curved motorized impellers are used on all Scholar QV units as the outdoor air movers. The completely integrated, dynamically balance motor and impellor provide for vibration free operation and can be speed controlled. A head pressure controller varies the speed of the impellor based upon ambient conditions. In all except the hottest summer months, the impellor rotates at low speeds. An added benefit of the motorized impellor is the reduction in service and maintenance costs. Years of trouble free operation are assured by having the motor & impellor located in the air stream where the impellor acts as a heat sink.

Note: Features and options that minimize sound levels are designated by this icon: 

► R-410A Refrigerant – The Green Choice

Scholar QV heat pumps and air conditioners utilize R-410A, a non-ozone depleting refrigerant, with a synthetic lubricant. Since R-410A can release heat more efficiently than R-22, compressors with R-410A have less risk of burnout due to over heating. The synthetic lubricant and R-410A mix and circulate more efficiently to lubricate the compressor, reducing wear and extending its life.

► Humidity Control

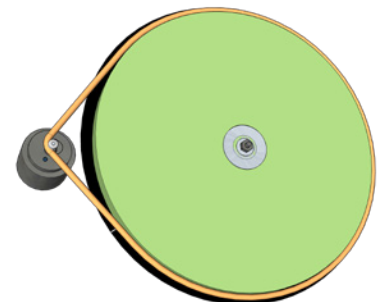
The control of humidity is essential for a positive learning environment. Scholar QV heat pumps and air conditioners actively control humidity with both standard controls and several optional accessories for schools where control of humidity is an everyday concern. Raw outdoor air for ventilation is not brought directly into the classroom. Ventilation air first passes through the indoor coil to temper the air and remove moisture. It then is mixed with classroom air before being introduced into the classroom.

► GreenWheel® Energy Recovery Ventilators (ERV)

The optional GreenWheel® ERV is a total energy wheel, i.e., during the summer it removes both moisture and heat from the incoming air stream. With a outdoor wet bulb of 74°F and a indoor dry bulb of 72°F and 450 cfm of outside air, the GreenWheel ERV will remove 8 pints per hour of moisture from the incoming fresh air stream. See page 4 for a complete description of the performance and operation of the Marvair GreenWheel ERV.

For optimum control of the humidity, the GreenWheel® ERV should be used in conjunction with Hot Gas Reheat. This complete, factory assembled optional coil and

controls economically maintains the temperature and humidity in the classroom. See page 4 for a complete description of the performance and operation of the Hot Gas Reheat Coil.



LOW NOISE AND HIGH EFFICIENCY FEATURES



The Scholar QV was designed from the onset for unsurpassed quiet operation and high efficiency. With the proper installation, sound reduction panel and a freeblow plenum, very low sound levels can be obtained. With ducting, sound levels can be greatly reduced. In addition, many of the same components that enable the Scholar QV to have such quiet operation, contribute to its high efficiency.

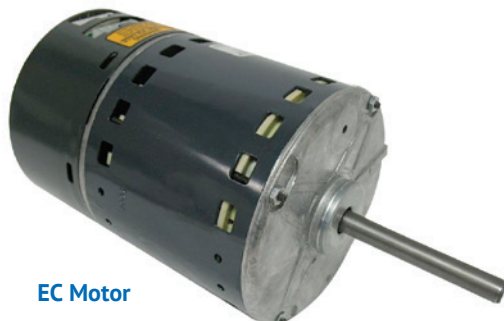
► Rugged Cabinet Construction

The front and side panels of the cabinet are constructed of 16 gauge galvanized steel with a mark and scratch resistant polyester finish. The side panels are of double wall construction. Front panels are also available with double wall construction. Condensate line openings and electrical knockouts are located both in the bottom of the unit and in the lower back panel. The standard color is grey and is complimented by clear, anodized aluminum supply and return grilles. Optional colors are available.

► Electronically Commutated (EC) Indoor Air Mover Motor

Scholar QV air conditioners and heat pumps uses an Electronically Commutated (EC) motor for the indoor air mover and provides a number of advantages over conventional induction motors.

- **Constant Torque** Factory set, but can be adjusted in the field to compensate for high static filters, grilles or duct work. At a given torque setting, the EC motor has a lower drop in air flow with increasing static compared to a conventional PSC motor.
- **Quiet** The three phase brushless DC motor construction results in a very low torque ripple and the rotor construction effectively eliminates noise transmission through the shaft. Unlike a conventional induction motor that repeatedly cycles on & off, the EC motor is always powered, but cycled through an external low control voltage programmed to slowly ramp up to speed, eliminating the abrupt sound at start-up.
- **Ultra-High Efficiency** On constant fan speed, the motor consumes 60-80 watts compared to 400 watts for an induction motor.
- **Reliable** The motor's electronics are mounted on a potted single board design less susceptible to damage from moisture.



EC Motor

► Ease of Installation

Scholar QV heat pumps and air conditioners are installed in the classroom against an exterior wall. The outdoor air box slides into an opening in the exterior wall. The outdoor air box provides for the ingress and egress of the condenser air as well as the intake and exhaust for the ventilation air. The bottom of the outdoor air box is 33" from the base of the unit, enabling it to clear the sills of windows. For existing schools this greatly facilitates installation since expensive structural changes to exterior walls are not required. By having the fresh air intake three feet above grade, stagnant, moisture laden air is not introduced into the classroom.

Scholar QV heat pumps and air conditioners can be installed as a free blow or ducted system. Free blow and ducted plenums are built in various heights to match the color and appearance of Scholar QV units.

Scholar QV units are available with a full range of accessories for customizing the installation including, base stands, decorative trim panels, and outdoor louvers.

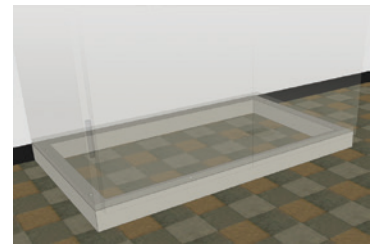
► Service and Maintenance

Ease of service and maintenance is a major benefit of the Scholar QV units. Full access to parts, air filters and controls is from the room side through the front hinged doors.

FIELD INSTALLED ACCESSORIES

► Trim Piece

The trim piece provides a color coordinated panel between the cabinet and the wall. Built in the same color as the cabinet and in various widths. Trim pieces provide a finished appearance and cover any space between the back of the cabinet and the wall.



► Base Stand

A 2" or 4" high base (standard, with other heights available) matches the Scholar QV™ cabinet and raises it off the floor for custodial purposes. The base stand is available in several colors to match the color of the unit.



LOUVER AND COLLAR OPTIONS

See the brochure, *Architectural Extruded Aluminum Louvers*, for complete description of the various styles and configurations of louvers.

► Louver/Collar Assembly

Aluminum louver and collar, preassembled at the factory to cover outside wall opening. The louver with 2" collar assembly is to be used when the louver is flush with the outside wall and is the preferred method of filling and sealing the outside wall. Standard colors are dark bronze or clear anodized. Exterior louver includes 1/2" x 1/2" bird screen. Note: Louvers are available in a variety of styles to meet architectural needs and various colors for aesthetic considerations. Contact your Marvair® representative for custom louvers.

► Louver Collar

Aluminum louver collar to enclose the louver and provide finished appearance over wall opening. Fits flush with outer wall surface. Available in dark bronze or clear anodized. Normally used when wall depth is less than 14" and louver is not flush with the outside wall.

► Louver

Aluminum louver for covering the outside wall opening. Available in dark bronze or clear anodized. Used with collar when louver is not flush with the outside wall. Exterior louver includes 1/2" x 1/2" bird screen.

► 4" Hurricane Louver

Miami-Dade approved, hurricane-resistant aluminum louvers with stationary drainable blades. These louvers are designed to protect the outside opening in building exterior walls from water penetration during high winds and rain.



AIR DISTRIBUTION OPTIONS

► Freeblow Air Distribution

Provided with the freeblow plenum. The front grille has individually adjustable vertical and horizontal louvers that provide a full range of airflow direction. An optional accessory side grille that has the same vertical and horizontal adjustment louvers as the front grille is also available. The side grille can be installed on one or both sides and provides an "air washing" effect to the adjacent wall or window. All grilles have a clear brushed aluminum finish to be used with Scholar QV™ unit's with no heat or electric resistance heat.

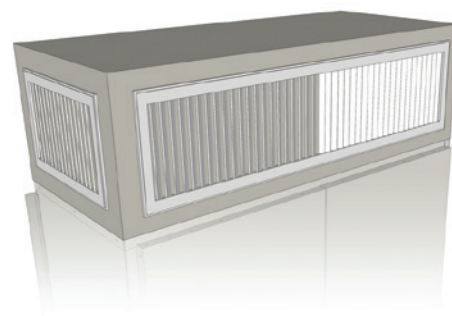
Note: Plenum heights up to 40" are available.

► Ducted Air Distribution

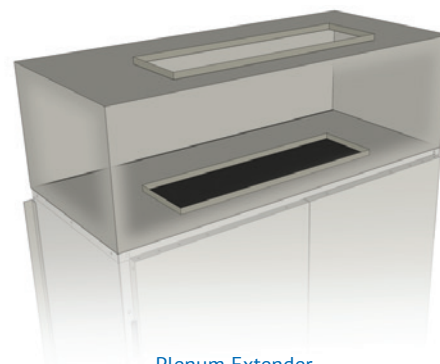
Provided with the ducted plenum. Because of various ceiling heights, the ducted air plenum may be ordered in various heights. The plenum is available in heights up to 40". Duct can be easily installed to the flanged rectangular opening on the top. The table on page 18 shows the relationship between CFM and ESP for various ducted distribution systems. Use with Scholar QV™ units with no heat or electric resistance heat.

► Plenum Extenders

In order to provide a finished appearance, plenum extenders may be ordered. The plenum extender rests on top of the either the free blow or ducted plenum and may be ordered in various heights in 1" increments.



Freeblow Plenum



Plenum Extender



DEHUMIDIFICATION OPTIONS

➤ Reheat Dehumidification

The Scholar QV™ air conditioner or heat pump with hot gas reheat is a complete factory assembled unit designed to provide dehumidification of fresh air and room air. Hot gas reheat can be used with any supplemental heat and the GreenWheel® ERV or motorized damper ventilation options. Hot gas reheat is controlled by an external humidity controller or BAS control. For optimum performance, hot gas reheat should be used in conjunction with the GreenWheel® ERV. When used with the motorized damper, hot gas reheat alone may not maintain satisfactory control of the humidity in the classroom over all outdoor conditions.

Operation - If the humidity rises above the set point on the humidity controller and the temperature in the classroom is satisfied, both mechanical cooling and the HGR coil operate to temper the air and lower the humidity. If the temperature in the classroom rises above (or falls below) the set point of the thermostat and the unit is operating in the dehumidification mode, the call for cooling (or heating) will override the call for dehumidification and the coil is disengaged until the thermostat is satisfied. This assures the environment temperature is maintained as first priority and humidity control is second.

Note: Scholar QV™ units with the hot gas reheat coil require a humidity controller for proper operation. (See Optional Controls.)

HEAT OPTIONS

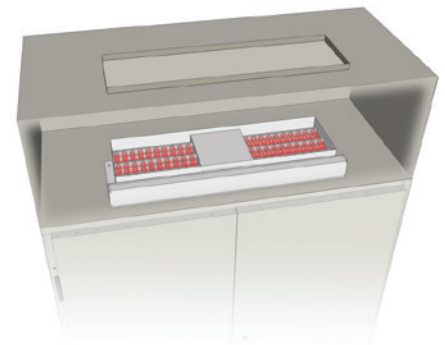
All heat options are available for the Scholar QV™ heat pump or air conditioner. For the heat pump, electric resistance, steam or hot water heat is used to supplement, where required, the heat pump cycle. For the air conditioner, electric resistance, steam or hot water heat can be selected to provide the lowest cost method of heating.

➤ Electric Resistance Heat

Installs above the indoor air blowers. Each Scholar™ QV unit is available with 5, 7.5, 10 or 15 kW of electric heat. Electric heat can be used with the freeblow plenum or with ducted air distribution options.

➤ Hot Water Heat

Installs above the indoor air blowers. Hot water coil capacities for the Scholar QV™ models are shown on page 17. Hot water heat is factory installed in the freeblow or the ducted plenums. Hot water heat is plumbed from the top right side of the plenum. As a standard safety feature, each hot water coil has a protective 24 volt thermostat embedded within it to shut off air flow across the coil if the coil temperature drops to 32°F.



Electric Resistance Heater

CABINET CONSTRUCTION OPTIONS

➤ Sound Reduction Panel



To minimize the sound level in the classroom, an optional sound reduction panel may be utilized. The two part panel provides an additional baffle between the Scholar QV™ air conditioner or heat pump and the classroom. The hinged panels are field installed to the front of the Scholar QV air conditioner or heat pump. Easy and quick access to the return air filter is provided by the hinged panels - removal of the panels are not required for filter access. The sound reduction panel can reduce the sound level up to 2 dbA and can be used with any ventilation or ducting option.

➤ Coastal Installations

For installation in coastal areas where salt corrosion may be a problem, Scholar QV heat pumps and air conditioners may be ordered with a stainless steel drain pan for the indoor coil and a corrosion resistant coating on the outdoor coils.

➤ Tamper Resistant Door Latches

Requires special access tool to open the front doors.



Scholar QV with Sound Reduction Panel

VENTILATION OPTIONS

➤ Configuration “N”: Manual Fresh Air Damper with Pressure Relief Ventilation (Standard)

Manually adjustable to a fixed position up to 40% outside air, with a maximum of 450 cfm. Includes fresh air filter and exhaust air filters, fresh air intake blower, fan speed controller and pressure relief.

➤ Configuration “B”: Motorized Fresh Air Damper with Pressure Relief Ventilation (Optional)

A 24 volt actuated motor allows fresh air to enter, as a function of an external input; e.g., time clock, CO2 sensor, energy management system, or manual switch. Includes fresh air and exhaust air filters, a ventilation intake blower and a fan speed controller for the blower. Pressure relief is standard.

➤ Configuration “J”: Power Vent with Motorized Damper (Optional)

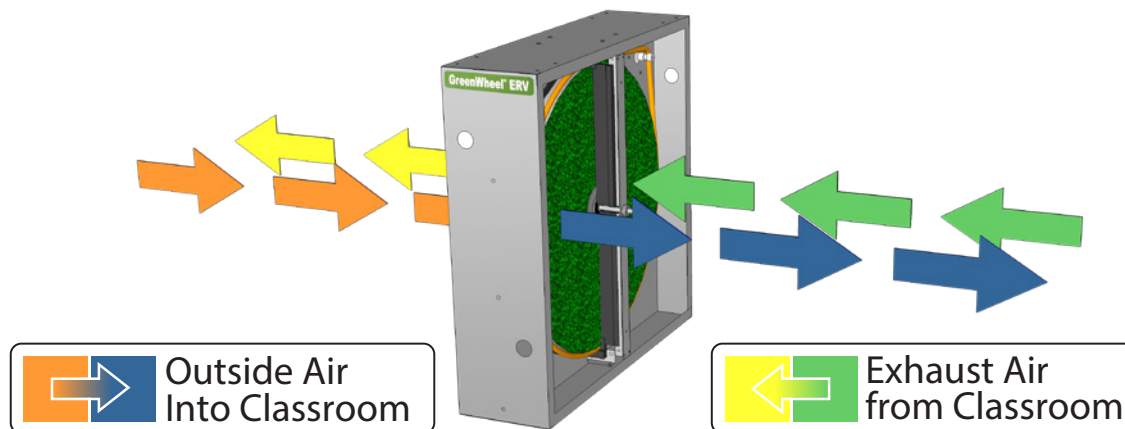
Ventilation Configuration “J”. A 24 volt actuated motor allows fresh air to enter, as a function of an external input; e.g., time clock, CO2 sensor, energy management system, or manual switch. Includes fresh air filter and exhaust air filters, a ventilation intake blower, a fan speed controller for the intake blower, a ventilation exhaust blower and pressure relief. An optional fan speed controller for the exhaust air blower may be ordered. Vents up to 40% of classroom air, with a maximum of 450 cfm, to assure fresh air circulation.

➤ Configuration “H”: GreenWheel® ERV Ventilation (Optional)

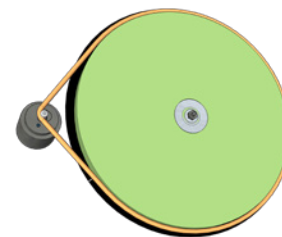
The Marvair® GreenWheel® ERV is a total energy (both sensible and latent) wheel that reduces both construction and operating cost while ventilating the classroom to ASHRAE 62-1999 requirements. The use of the GreenWheel ERV reduces the energy load of the outside air. Exhausting stale, inside air keeps indoor pollutants and harmful gases to a minimum. The Marvair GreenWheel ERV has been tested and certified according to ARI Standard 1060.

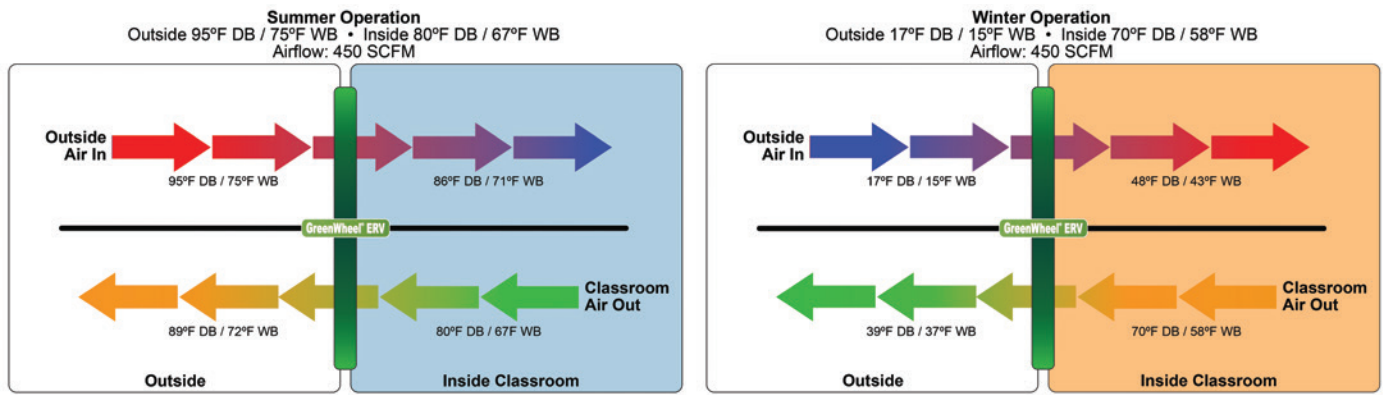
How It Works - During the summer, cool dry air from the classroom is exhausted through the GreenWheel® ERV to the outside. As the air passes through the rotating wheel, the desiccant becomes cooler and drier. Simultaneously, hot humid air is being pulled across the rotating wheel. The cool, dry desiccant absorbs moisture and heat from the incoming air. The cooler, drier air is mixed with the return air from the classroom and distributed throughout the room.

In the winter, warm moist air is exhausted through the GreenWheel ERV to the outside. As the air passes through the rotating wheel, the desiccant becomes warmer and absorbs moisture. Simultaneously, cold dry air is being pulled across the rotating wheel. The cold, dry air absorbs heat and moisture from the desiccant. The warmed air is mixed with the return air from the classroom and distributed throughout the room.



Quality Components - The GreenWheel® ERV cassette consists of the wheel, two blowers and the drive motor and belt. The two blowers simultaneously pull fresh air from outside and exhaust air from the classroom through the rotating wheel. The air streams are separated by an insulated partition so that the incoming fresh air is not mixed with the exhaust air. Two variable speed blowers ensure that up to 450 CFM of outside air can be brought into the room and the indoor air is properly exhausted. Variable speed blowers permit that the desired quantity of outside air is delivered into the room. Optional independent exhaust air blower control allows positive pressurization of the classroom, i.e., more outside air can be introduced through the GreenWheel ERV than is exhausted.





GreenWheel® Energy Recovery Ventilator Performance

SCFM* of Outside Air	Energy Conserved, BTUH					
	95° DB/73° WB Outside • 80° DB/67° WB Inside			95° DB/80° WB Outside • 80° DB/67° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total
225	2,900	1,100	4,000	2,900	6,400	9,300
250	3,100	1,200	4,300	3,100	6,900	10,000
325	3,700	1,400	5,100	3,700	8,100	11,800
400	4,200	1,500	5,700	4,200	9,100	13,300
450	4,500	1,600	6,100	4,500	9,700	14,200

SCFM* of Outside Air	Energy Conserved, BTUH								
	90° DB/74° WB Outside • 75° DB/64° WB Inside			80° DB/70° WB Outside • 75° DB/64° WB Inside			60° DB/54° WB Outside • 70° DB/58° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
225	2800	3600	6400	900	2800	2700	1900	200	2100
250	3000	3800	6800	1000	3000	4000	2000	200	2200
325	3600	4500	8100	1200	3500	4700	2400	200	2600
400	4100	4900	9000	1400	3800	5200	2700	300	3000
450	4300	5200	9500	1400	4000	5400	2900	300	3200

SCFM* of Outside Air	Energy Conserved, BTUH								
	40° DB/36° WB Outside • 70° DB/58° WB Inside			20° DB/18° WB Outside • 70° DB/58° WB Inside			0° DB/7° WB Outside • 70° DB/58° WB Inside		
	Sensible	Latent	Total	Sensible	Latent	Total	Sensible	Latent	Total
225	5600	3300	8900	9300	4900	14200	13000	5700	18700
250	6000	3600	9600	10000	5300	15300	14000	6100	14100
325	7200	4200	11400	12000	6200	18200	16700	7100	23800
400	8100	4600	12700	13500	6800	20300	18900	7900	26800
450	8600	4800	13400	14400	7100	21500	20100	8200	28300

*SCFM = Standard Cubic Feet per Minute
 For performance of the GreenWheel® ERV at conditions other than those shown, please contact your Marvair® representative or the factory.

Ventilation Summary Comparison

Ventilation Package	Description	Pressure Relief	Vent Filters	Vent Fresh Air Mover	Vent Exhaust Air Mover	Standard Controls	Options
N	Manual, fixed position damper. Up to 450 cfm of outside air not to exceed 40% of rated air flow.	Yes	One on incoming air	Yes	No	One fan speed controller for fresh air mover.	None
B	Two position (open & close) motorized damper with a fresh air intake blower. Up to 450 cfm of outside air not to exceed 40% of rated air flow.	Yes	One on incoming air	Yes	No	One fan speed controller that controls the intake air blower.	None
J	PowerVent with two position motorized damper with a fresh air intake blower. 0-450 cfm of outside air not to exceed 40% of rated air flow.	Yes	One on incoming air	Yes	Yes	One fan speed controller that controls both blowers.	Second fan speed controller for the exhaust air.
H	GreenWheel® ERV. 0-450 cfm of outside air	Yes	Two. One on fresh air and 2nd on exhaust air	Yes	Yes	One fan speed controller that controls both blowers.	Second fan speed controller for the exhaust air.

Notes:
 1. The optional fan speed controller for the exhaust air allows independent control of the two ventilation motors to permit positive pressurization of the classroom.
 2. Aluminum side return air grilles for the ventilation air from the classroom maybe ordered on al Scholar III units as factory installed option in lieu of the standard air slots.

OPTIONAL VENTILATION CONTROLS

► Demand Control Ventilation.

A field or factory installed carbon dioxide sensor controls the ventilation damper and only opens the damper when CO2 levels exceed a specified level. Demand control ventilation saves energy and utility costs by ventilating the classroom based upon occupancy. Note: Not available on the manual fresh air damper (“B”) configuration.

► Exhaust Air Controller

The motorized fresh air damper with PowerVent (option J) and GreenWheel® ERV (option H) ventilation options are equipped with an exhaust air fan speed control which controls the ventilation exhaust blower independent of the fresh air intake blower. An optional independent exhaust air blower control allows positive pressurization of the classroom; i.e., more outside air can be introduced through the GreenWheel® ERV than is exhausted.

THERMOSTAT OPTIONS

- **A/C with Heat or 1 Stage Heat HP Thermostat** (p/n 50121)
1 stage heat, 1 stage cool. Non-programmable. Fan switch: Auto & On. Manual changeover system switch: Cool-Off-Heat. Low temperature protection. °F or °C selectable.
- **A/C with Heat or 1 Stage Heat HP Thermostat** (p/n 50123)
1 stage heat, 1 stage cool. 7 day programmable. Fan switch: Auto & On. Auto-changeover. Keypad lockout. Non-volatile program memory. Title 24 compliant - no batteries needed.
- **A/C with Heat or 1 Stage Heat HP Thermostat** (p/n 50186)
1 stage heat, 1 stage cool. Non-programmable. Permanent memory. System switch: Manual or auto changeover. Fan switch: Auto & On. adjustable maximum heat /minimum cool set points. Adjustable temperature differential. Keypad lockout. Status LED's. Field adjustable calibration.
- **Heat Pump Thermostat**..... (p/n 50107)
two stage heat, two stage cool. Seven day programmable. Programmable fan. Auto-On Fan switch. Auto-changeover. Non-volatile program memory. Status LED's.
- **Heat Pump Thermostat**..... (p/n 50252)
Non-programmable thermostat. Two stage heat/Two stage cool. Manual or auto changeover. Fan: Auto & On. Permanent retention of setting on power loss. Field adjustable temperature calibration. Adjustable max. setpoint for heating and min. adjustable setpoints for cooling. Adjustable temperature differential. Keypad lockout. Status LED. °F or °C selectable.
- **Heat Pump Thermostat**..... (p/n 50248)
7 day, 2 occupied & 2 unoccupied periods for each day of the week programmable thermostat. Three stage heat/ Three stage cool. Manual or auto changeover. Fan: Auto & On. Ten year retention of programming settings and 48 hour clock and day settings on power loss. Adjustable max. setpoint for heating and min. adjustable setpoints for cooling. Adjustable temperature differential. Keypad lockout. Status LED. °F or °C selectable. Optional remote sensors for outdoor air, supply air and humidity. Title 24 compliant.
- **Thermostat Guard**..... (p/n 50092)
Clear thermostat guard with key lock and clear plastic cover and base For use with 50121, 50123, 50186, 50107 & 50252 thermostats.
- **Thermostat Guard**..... (p/n 50119)
Clear, thermostat guard with key lock and clear plastic cover for use with 50248 thermostat.
- **MAR7000 Thermostat/Controller**
The MAR7000 thermostat/controller is a stand alone, self-programming HVAC controller designed to optimize performance of Marvair's heat pumps and air conditioners. It can function as an independent controller or used in conjunction with a BACnet network.
- With built-in temperature and humidity sensors, motion sensing and an optional CO2 detection sensor, the MAR7000 can control:
- Single or 2-stage air conditioners or heat pumps with supplemental hot water or electric heat
 - Hot gas dehumidification operation
 - An economizer cycle
 - Marvair's various ventilation options including the Marvair GreenWheel® Energy Recovery Ventilator

The intelligent occupancy anticipation feature of the MAR7000 automatically programs occupied and unoccupied settings for temperature, humidity, and ventilation requirements. The ventilation control can be based on occupancy, demand, time, or a combination of these features. When vacant, the thermostat automatically reduces the run time of the unit and adjusts ventilation to save energy. The intelligent occupancy feature can be turned off, and the MAR7000 can be connected to a BACnet control system for remote control and operation of Marvair heat pumps or air conditioners. The MAR7000 thermostat includes a precise, real time clock with capacitor back up to maintain the program and set points for extended power outages.



Features include:

- User-friendly English-language menus (no obscure numeric codes) on a 64 x128 pixel, dot-matrix LCD display with 5 buttons for data selection and entry,
- Built-in, factory-tested libraries of configurable application control sequences,
- Schedules that can easily be set uniquely by weekdays (Mon.–Fri.), weekend (Sat.–Sun.), entire week (Mon.–Sun.), individual days, and/or holidays,
- Six On/Off and independent heating and cooling set point periods are available per day, and
- Three levels of password-protected access (user/operator/administrator) prevent disruption of operation and configuration

STANDARD CONTROLS

➤ High Pressure and Loss of Charge (HP) or Low Pressure (A/C) Switches

Includes a lockout relay.

➤ PLC Controller

The PLC is a factory installed microprocessor. LED indicator lights show operational status and provide assistance with diagnosis if troubleshooting is ever required. The controller can perform extensive self diagnosis to assess the operational status and indicate a fault when detected.

The controller in the Scholar QV air conditioners and heat pumps improves reliability due to a reduction of components and simplification of control panel wiring and can control a Building Automation System (BAS) and various ventilation operations..

➤ Defrost Control

Based upon time and temperature. The time interval can be adjustable from 30 to 90 minutes in one minute increments. The control system initiates a defrost cycle only if the outdoor coil temperature is 28°F or below. (*Heat pump only.*)

➤ Anti-short Cycle Timer

Prevents the compressor's motor windings and starting controls from destructive overheating. The time interval is adjustable from three to eight minutes.

➤ BAS Control Relay (24V only)

Provides a 24 VAC coil to control operation from a Building Automation System. Note: An additional BAS control relay can be added when 120 or 240 VAC coils are required. See Scholar QV™ Engineering Design Manual for details.

➤ Outdoor Thermostat

Prevents second stage heat (electric or wet heat) from operating above desired outdoor temperature set point and can be set to activate second stage heat while disabling the compressor below desired outdoor temperature. See Scholar QV™ Engineering Design Manual for details. (*Heat pump only.*)

➤ Electric Heat Control

Controls operation of electric heat and allows either simultaneous or non-simultaneous operation of electric heat and the compressor. See Scholar QV™ Engineering Design Manual for details. (*Heat pump only.*)

➤ Ventilation Control

The motorized fresh air damper with PowerVent and GreenWheel® ERV ventilation options are equipped with a Fresh Air Fan Speed Control. The fresh air fan controls both the ventilation intake and exhaust blowers together, automatically balancing the intake exhaust cfm up to 450 cfm.

➤ Indoor Blower Fan Speed Control

Provides adjustable air volume from indoor blower. (Warning: Minimum air flow is required for proper operation.)

OPTIONAL CONTROLS

► Spring Wound Timer

Used to enable operation of air conditioner or heat pump to override building automation system. Field installed.

► Humidity Controller

Wall mounted type humidity controller controls operation of the hot gas reheat coil for dehumidification. Adjustable dehumidification range. Required for Scholar QV™ air conditioners or heat pumps with hot gas reheat.

OTHER OPTIONS

► Display Boards

The sound reduction panel provides an ideal surface for a display board. Two types of boards are available - a magnetic dry erase and a plasticized cork board. These boards are excellent for displaying student artwork or important announcements.



Scholar QV Display Board

► Condensate Pans and Freeze Protection

To prevent freezing of water in the condensate lines and in the drain pans, this kit should be installed in locales subject to freezing temperatures. The kit includes a heater for the outdoor condensate pan.

► Anti-Microbial Light

A germicidal UV light destroys toxic bacteria, viruses and mold on the indoor air coil.

► Cold Plasma Air Purification Device

Installed inside the Scholar QV unit, this device neutralizes odors, kills mold, bacteria and viruses. It also helps to control allergens*, asthma*, smoke and airborne particles.

► MERV 13 Return Air Filters

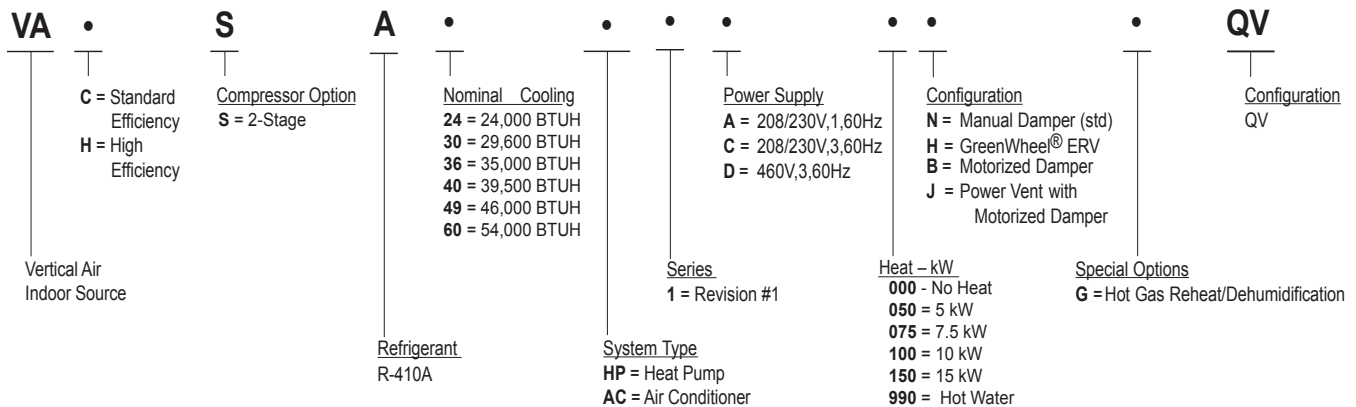
Factory installed two inch (51 cm) MERV 13 filters. Ultra high filtration material that removes most airborne mold, spores and dust. Replaces standard MERV 7 return air filters.

► Protective Coil Coating Packages

The Scholar QV is available with corrosion protection coatings for the condenser and evaporator coils.

*These statements are based on customer testimonials and have not been evaluated by the FDA.

MODEL IDENTIFICATION



Scholar QV VACA/VAHA w/Single Stage Compressor

Certified Efficiency & Capacity Ratings @ ANSI/AHRI Standard 390 - Heat Pumps & Air Conditioners

MODEL NUMBER	VAHA24	VAHA30	VAHA36	VAHA40	VAHA49	VACA60
Cooling (BTUH) ¹	24,000	29,000	35,000	39,000	44,000	54,000
EER ²	10.00	10.00	10.00	10.00	10.00	9.5
Heating (BTUH) ³	22,000	25,600	30,000	35,400	40,000	53,000
COP ⁴	3.00	3.00	3.00	3.00	3.00	3.00
Rated Air Flow (CFM) ⁵	850	1,000	1,200	1,300	1,700	1,850

¹Cooling is rated at 95°F (35°C) outdoor and 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air.
²EER=Energy Efficiency Ratio
³Heating & COP (Heat Pumps only) are rated at 47°F DB/43°WB (8.3°C DB/6.1°C WB) outdoor and 70°F (21.1°C) return air.
⁴COP=Coefficient of Performance (Heat Pumps only)
⁵CFM=Cubic Feet per Minute
Ratings are with no outside air. Performance will be affected by altitude. Ratings are at 230 volts for 208/230 volt units ("A" & "C" models) and 460 volts for "D" models. Operation of units at a different voltage from that of the rating point will affect performance and air flow.

Sensible Total Heat Ratio @ 95°F (35°C) Outside Air DB - VACA/VAHA Heat Pumps & Air Conditioners

MODEL NUMBER	VAHA24	VAHA30	VAHA36	VAHA40	VAHA49	VACA60
Total Capacity	24,000	29,000	35,000	39,000	44,000	54,000
Sensible Heat Ratio	0.71	0.70	0.68	0.69	0.73	0.67
Sensible Capacity	17,125	20,195	23,800	26,730	32,120	36,445
Rated Air Flow (CFM) ¹	850	1,000	1,200	1,300	1,700	1,850

¹CFM=Cubic Feet per Minute
Sensible Heat Ratios based upon ANSI/AHRI std. 390 outdoor conditions of 95°F (35°C) outdoor and 80°F DB/67°F WB (26.5°C DB/19.5°C WB) return air.

Cooling Performance (BTUH) at Various Outdoor Temperatures - VACA/VAHA Heat Pumps & Air Conditioners

MODEL NUMBER	OUTDOOR TEMPERATURE								
	75°F / 24°C	80°F / 26.5°C	85°F / 29°C	90°F / 32°C	95°F / 35°C	100°F / 38°C	105°F / 40.5°C	110°F / 43.3°C	115°F / 46°C
VAHA24HP1*	27,840	26,880	25,920	24,960	24,000	23,040	22,080	21,120	20,640
VAHA30HP1*	33,640	32,480	31,320	30,160	29,000	27,840	26,680	25,520	24,940
VAHA36HP1*	40,600	39,200	37,800	36,400	35,000	33,600	32,200	30,800	30,100
VAHA40HP1*	45,240	43,680	42,120	40,560	39,000	37,440	35,880	34,320	33,540
VAHA49HP1*	52,200	50,400	48,600	46,800	45,000	43,200	41,400	39,600	38,700
VACA60HP1*	62,640	60,480	58,320	56,160	54,000	51,840	49,680	47,520	49,440

*HP1 Model ID applies to VACA Models Only
Based upon ANSI/AHRI std. 390 return air conditions of 80°F DB/67°F WB (26.5°C DB/19.5°C WB). Return air at rated air flow.

Heating Performance (BTUH) at Various Outdoor Temperatures - VACA/VAHA Heat Pumps

MODEL NUMBER	OUTDOOR TEMPERATURE													
	0°F	5°F	10°F	15°F	20°F	25°F	30°F	35°F	40°F	45°F	47°F	50°F	55°F	60°F
	-17.8°C	-15°C	-12.2°C	-9.4°C	-6.7°C	-3.9°C	-1.1°C	1.7°C	4.4°C	7.2°C	8.3°C	10°C	12.8°C	15.6°C
VAHA24HP1*	9,660	11,040	12,420	13,800	15,180	16,560	17,940	19,320	20,700	22,080	23,000	23,460	24,840	26,220
VAHA30HP1*	10,752	12,288	13,824	15,360	16,896	18,432	19,968	21,504	23,040	24,576	25,600	26,112	27,648	29,184
VAHA36HP1*	13,440	15,360	17,280	19,200	21,120	23,040	24,960	26,880	28,800	30,720	32,000	32,640	34,560	36,480
VAHA40HP1*	14,868	16,992	19,116	21,240	23,364	25,488	27,612	29,736	31,860	33,984	35,400	36,108	38,232	40,356
VAHA49HP*	17,640	20,160	22,680	25,200	27,720	30,240	32,760	35,280	37,800	40,320	42,000	42,840	45,360	47,880
VACA60HP1*	22,260	25,440	28,620	31,800	34,980	38,160	41,340	44,520	47,700	50,880	53,000	54,060	57,240	60,420

*HP1 Model ID applies to VACA Models Only
Based upon AHRI 390 Return Air of 70°F (21.1°C) Dry Bulb / 60°F (15.6°C) Wet Bulb

Dehumidification - Model VACA/VAHA

Dehumidification - Scholar QV Model VAHA24 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	25,650	18,336	7,314	800	53.8	6.9	6.6	Cooling
75 / 62.5	50	75	7,314	0	7,314	800	73.7	6.9	6.6	Dehumidification
75 / 65.5	60	75	27,102	16,897	10,205	800	55.5	9.7	9.3	Cooling
75 / 65.5	60	75	10,205	0	10,205	800	74.1	9.7	9.3	Dehumidification
75 / 68	70	75	28,332	14,318	14,014	800	58.5	13.3	12.7	Cooling
75 / 68	70	75	14,014	0	14,014	800	74.4	13.3	12.7	Dehumidification
65 / 63	90	75	25,896	9,581	16,315	800	53.9	15.4	14.8	Cooling
65 / 63	90	75	16,315	0	16,315	800	64.8	15.4	14.8	Dehumidification
80 / 67	50	95	24,000	17,123	6,877	800	60.2	6.5	6.2	Cooling
80 / 67	50	95	6,877	0	6,877	800	78.8	6.5	6.2	Dehumidification

Dehumidification - Scholar QV Model VAHA30 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	31,635	21,934	9,701	1000	54.7	9.2	8.8	Cooling
75 / 62.5	50	75	9,701	0	9,701	1000	73.9	9.2	8.8	Dehumidification
75 / 65.5	60	75	33,426	19,410	14,016	1000	57.1	13.3	12.7	Cooling
75 / 65.5	60	75	14,016	0	14,016	1000	74.3	13.3	12.7	Dehumidification
75 / 68	70	75	34,943	17,262	17,681	1000	59.1	16.7	16.0	Cooling
75 / 68	70	75	17,681	0	17,681	1000	74.5	16.7	16.0	Dehumidification
65 / 63	90	75	33,122	11,803	21,319	1000	54.1	20.2	19.3	Cooling
65 / 63	90	75	21,319	0	21,319	1000	64.8	20.2	19.3	Dehumidification
80 / 67	50	95	29,000	20,414	9,186	1000	61.1	8.7	8.3	Cooling
80 / 67	50	95	9,186	0	9,186	1000	78.8	8.7	8.3	Dehumidification

Dehumidification - Scholar QV Model VAHA36 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	38,475	26,046	12,429	1200	54.9	11.8	11.3	Cooling
75 / 62.5	50	75	12,429	0	12,429	1200	72.7	11.8	11.3	Dehumidification
75 / 65.5	60	75	40,654	23,134	17,520	1200	57.2	16.6	15.9	Cooling
75 / 65.5	60	75	17,520	0	17,520	1200	73.3	16.6	15.9	Dehumidification
75 / 68	70	75	42,498	20,653	21,845	1200	59.1	20.7	19.8	Cooling
75 / 68	70	75	21,845	0	21,845	1200	73.3	20.7	19.8	Dehumidification
65 / 63	90	75	38,844	14,371	24,473	1200	53.9	23.2	22.2	Cooling
65 / 63	90	75	24,473	0	24,473	1200	64.9	23.2	22.2	Dehumidification
80 / 67	50	95	35,000	23,050	11,350	1200	61.4	11.2	10.7	Cooling
80 / 67	50	95	11,832	0	11,832	1200	77.6	11.2	10.7	Dehumidification

Dehumidification - Scholar QV Model VAHA40 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	43,819	29,625	14,194	1300	53.9	13.4	12.9	Cooling
75 / 62.5	50	75	14,194	0	14,194	1300	73.8	13.4	12.9	Dehumidification
75 / 65.5	60	75	46,299	26,347	19,952	1300	56.3	18.9	18.1	Cooling
75 / 65.5	60	75	19,952	0	19,952	1300	74.2	18.9	18.1	Dehumidification
75 / 68	70	75	48,401	23,554	24,847	1300	58.3	23.5	22.5	Cooling
75 / 68	70	75	24,847	0	24,847	1300	74.5	23.5	22.5	Dehumidification
65 / 63	90	75	44,239	16,451	27,788	1300	53.3	26.3	25.2	Cooling
65 / 63	90	75	27,788	0	27,788	1300	64.9	26.3	25.2	Dehumidification
80 / 67	50	95	39,000	27,471	13,529	1300	60.5	12.8	12.3	Cooling
80 / 67	50	95	13,529	0	13,529	1300	78.8	12.8	12.3	Dehumidification

The Dehumidification Operating Mode is with Hot Gas Reheat.

Dehumidification - Model VACA/VAHA (continued)

Dehumidification - Scholar QV Model VAHA49 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	49,697	35,527	14,170	1740	56.1	13.4	12.9	Cooling
75 / 62.5	50	75	14,170	0	14,170	1740	73.6	13.4	12.9	Dehumidification
75 / 65.5	60	75	52,511	31,242	21,269	1740	58.4	20.1	19.3	Cooling
75 / 65.5	60	75	21,269	0	21,269	1740	74.0	20.1	19.3	Dehumidification
75 / 68	70	75	54,894	27,599	27,295	1740	60.3	25.8	24.8	Cooling
75 / 68	70	75	27,295	0	27,295	1740	74.4	25.8	24.8	Dehumidification
65 / 63	90	75	50,174	18,364	31,810	1740	55.2	30.1	28.9	Cooling
65 / 63	90	75	31,810	0	31,810	1740	64.8	30.1	28.9	Dehumidification
80 / 67	50	95	45,000	33,206	13,294	1740	62.4	12.6	12.1	Cooling
80 / 67	50	95	13,294	0	13,294	1740	78.4	12.6	12.1	Dehumidification

Dehumidification - Scholar QV Model VACA60 (G)

Indoor Conditions Air Entering Indoor Coil		Outdoor Ambient	Capacity (Btu/Hr)			Indoor Air Flow	Indoor Supply Air	Moisture Removed (Approximate)		Operating Mode
DB / WB	% RH	DB	Total	Sensible	Latent	CFM	DB	Lbs / Hr	Pints / Hr	
75 / 62.5	50	75	59,850	40,123	19,727	1850	55.0	18.7	17.9	Cooling
75 / 62.5	50	75	19,727	0	19,727	1850	74.9	18.7	17.9	Dehumidification
75 / 65.5	60	75	63,238	35,695	27,543	1850	57.2	26.1	25.0	Cooling
75 / 65.5	60	75	27,543	0	27,543	1850	75.0	26.1	25.0	Dehumidification
75 / 68	70	75	66,105	31,920	34,185	1850	59.1	32.3	31.0	Cooling
75 / 68	70	75	34,185	0	34,185	1850	75.0	32.3	31.0	Dehumidification
65 / 63	90	75	60,424	22,376	38,048	1850	53.8	36.0	34.5	Cooling
65 / 63	90	75	38,048	0	38,048	1850	65.0	36.0	34.5	Dehumidification
80 / 67	50	95	54,000	37,184	18,816	1850	61.4	17.8	17.1	Cooling
80 / 67	50	95	18,816	0	18,816	1850	79.4	17.8	17.1	Dehumidification

The Dehumidification Operating Mode is with Hot Gas Reheat.

ELECTRICAL DATA FOR VACA/VAHA HEAT PUMPS

Electrical Characteristics - VACA/VAHA Heat Pumps Compressor, Fan, Ventilation & Blower Motors

MODEL NUMBER	COMPRESSOR			OTHER MOTORS	OUTDOOR FAN				INDOOR BLOWER (ECM)			VENTILATION GREENWHEEL® ERV		
	VOLTS / HZ / PH	RLA ¹	LRA ²	VOLTS / HZ / PH	QTY	RPM ³	FLA ⁴	HP ⁵	RPM ³	FLA ⁴	HP ⁵	AMPS		
												OAM ⁶	EXM ⁷	WD ⁸
VAHA24HP1A*	208/230-60-1	12.8	64.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30HP1A*	208/230-60-1	14.1	77.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36HP1A*	208/230-60-1	17.9	112.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40HP1A*	208/230-60-1	19.8	109.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49HP1A*	208/230-60-1	21.8	117.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60HP1A*	208/230-60-1	26.2	134.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VAHA24HP1C*	208/230-60-3	8.3	61.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30HP1C*	208/230-60-3	9.0	71.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36HP1C*	208/230-60-3	13.2	88.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40HP1C*	208/230-60-3	13.6	83.1	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49HP1C*	208/230-60-3	13.7	83.1	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60HP1C*	208/230-60-1	15.6	111.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VAHA24HP1D*	460-60-3	5.1	28.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30HP1D*	460-60-3	5.6	38.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36HP1D*	460-60-3	6.0	44.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40HP1D*	460-60-3	6.1	41.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49HP1D*	460-60-3	6.2	41.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60HP1D*	460-60-3	7.7	52.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute ⁴FLA = Full Load Amps
⁵HP = Horsepower ⁶OAM = Outside Air Mover ⁷EXM = Exhaust Air Mover ⁸WD = Wheel Drive Motor
The 460 volt units have a step down transformer for the 230 volt motors.
*HP1 Model ID applies to VACA Models Only

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Heat Pumps with Ventilation Configurations: Manual Damper, up to 15% Outside Air Ventilation Configuration (“N”) Motorized Damper, up to 450 CFM of Outside Air w/Pressure Relief Ventilation Configuration (“B”)

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24HP1A*	208-230/1/60	21.7	30	47.7	50	58.1	60	73.8	80		
VAHA30HP1A*	208-230/1/60	23.3	35	49.3	50	59.7	60	75.4	80		
VAHA36HP1A*	208-230/1/60	28.1	45	54.1	60	64.5	70	80.2	90		
VAHA40HP1A*	208-230/1/60	30.5	50	56.5	60	66.9	70	82.6	90		
VAHA49HP1A*	208-230/1/60	35.5	50	61.5	70	71.9	80	87.6	90		
VACA60HP1A*	208-230/1/60	41.0	60	67.0	70	77.4	80	93.1	100		
VAHA24HP1C*	208-230/3/60	16.1	20	31.1	35	38.6	40	46.2	50	61.2	70
VAHA30HP1C*	208-230/3/60	17.0	25	32.0	35	39.5	40	47.1	50	62.1	70
VAHA36HP1C*	208-230/3/60	22.2	35	37.2	40	44.7	45	52.3	60	67.3	70
VAHA40HP1C*	208-230/3/60	22.7	35	37.7	40	45.2	50	52.8	60	67.8	70
VAHA49HP1C*	208-230/3/60	25.3	35	40.3	45	47.8	50	55.4	60	70.4	80
VACA60HP1C*	208-230/3/60	27.7	40	42.7	45	50.2	60	57.8	60	72.8	80
VAHA24HP1D*	460/3/60	9.2	15	16.7	20	20.5	25	24.2	25	31.7	35
VAHA30HP1D*	460/3/60	9.9	15	17.4	20	21.2	25	24.9	25	32.4	35
VAHA36HP1D*	460/3/60	10.4	15	17.9	20	21.7	25	25.4	30	32.9	35
VAHA40HP1D*	460/3/60	10.5	15	18.0	20	21.8	25	25.5	30	33.0	35
VAHA49HP1D*	460/3/60	11.9	20	19.4	20	23.2	25	26.9	30	34.4	35
VACA60HP1D*	460/3/60	13.7	20	21.2	25	24.7	25	28.7	30	36.2	40

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.
*HP1 Model ID applies to VACA Models Only

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Heat Pumps with Ventilation Configuration (“J”) PowerVent with Motorized Damper, up to 450 CFM of Outside Air w/Pressure Relief

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24HP1A*	208-230/1/60	22.7	35	48.7	50	59.1	60	74.8	80		
VAHA30HP1A*	208-230/1/60	24.3	35	50.3	60	60.7	70	76.4	80		
VAHA36HP1A*	208-230/1/60	29.1	45	55.1	60	65.5	70	81.2	90		
VAHA40HP1A*	208-230/1/60	31.5	50	57.5	60	67.9	70	83.6	90		
VAHA49HP1A*	208-230/1/60	36.5	50	62.5	70	72.9	80	88.6	90		
VACA60HP1A*	208-230/1/60	42.0	60	68.0	70	78.4	80	94.1	100		
VAHA24HP1C*	208-230/3/60	17.1	25	32.1	35	39.6	40	47.2	50	62.2	70
VAHA30HP1C*	208-230/3/60	18.0	25	33.0	35	40.5	45	48.1	50	63.1	70
VAHA36HP1C*	208-230/3/60	23.2	35	38.2	40	45.7	50	53.3	60	68.3	70
VAHA40HP1C*	208-230/3/60	23.7	35	38.7	40	46.2	50	53.8	60	68.8	70
VAHA49HP1C*	208-230/3/60	26.3	35	41.3	45	48.8	50	56.4	60	71.4	80
VACA60HP1C*	208-230/3/60	28.7	40	43.7	45	51.2	60	58.8	60	73.8	80
VAHA24HP1D*	460/3/60	9.7	15	17.2	20	21.0	25	25.2	30	32.2	35
VAHA30HP1D*	460/3/60	10.4	15	17.9	20	21.7	25	25.9	30	32.9	35
VAHA36HP1D*	460/3/60	10.9	15	18.4	20	22.2	25	26.4	30	33.4	35
VAHA40HP1D*	460/3/60	11.0	15	18.5	20	22.3	25	26.5	30	33.5	35
VAHA49HP1D*	460/3/60	12.4	20	19.9	20	23.7	25	27.9	30	34.9	35
VACA60HP1D*	460/3/60	14.2	20	21.7	25	25.2	30	29.7	30	36.7	40

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.
*HP1 Model ID applies to VACA Models Only

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Heat Pumps with Ventilation Configuration (“H”) GreenWheel® ERV

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24HP1A*	208-230/1/60	22.9	35	48.9	50	59.3	60	75.0	80		
VAHA30HP1A*	208-230/1/60	24.5	35	50.5	60	60.9	70	76.6	80		
VAHA36HP1A*	208-230/1/60	29.3	45	55.3	60	65.7	70	81.4	90		
VAHA40HP1A*	208-230/1/60	31.7	50	57.7	60	68.1	70	83.8	90		
VAHA49HP1A*	208-230/1/60	36.7	50	62.7	70	73.1	80	88.8	90		
VACA60HP1A*	208-230/1/60	42.2	60	68.2	70	78.6	80	94.3	100		
VAHA24HP1C*	208-230/3/60	17.3	25	32.3	35	39.8	40	47.4	50	62.4	70
VAHA30HP1C*	208-230/3/60	18.2	25	33.2	35	40.7	45	48.3	50	63.3	70
VAHA36HP1C*	208-230/3/60	23.4	35	38.4	40	45.9	50	53.5	60	68.5	70
VAHA40HP1C*	208-230/3/60	23.9	35	38.9	40	46.4	50	54.0	60	69.0	70
VAHA49HP1C*	208-230/3/60	26.5	35	41.5	45	49.0	50	56.6	60	71.6	80
VACA60HP1C*	208-230/3/60	28.9	40	43.9	45	51.4	60	59.0	60	74.0	80
VAHA24HP1D*	460/3/60	9.8	15	17.3	20	21.1	25	25.3	30	32.3	35
VAHA30HP1D*	460/3/60	10.5	15	18.0	20	21.8	25	26.0	30	33.0	35
VAHA36HP1D*	460/3/60	11.0	15	18.5	20	22.3	25	26.5	30	33.5	35
VAHA40HP1D*	460/3/60	11.1	15	18.6	20	22.4	25	26.6	30	33.6	35
VAHA49HP1D*	460/3/60	12.5	20	20.0	20	23.8	25	28.0	30	35.0	35
VACA60HP1D*	460/3/60	14.3	20	21.8	25	25.3	30	29.8	30	36.8	40

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.
*HP1 Model ID applies to VACA Models Only

Unit Load Amps (Heating) - VACA/VAHA Heat Pumps

ELECTRIC HEAT		HEAT PUMP ¹ (AMPS)			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL MAXIMUM HEATING AMPS ² (ELECTRIC HEAT IS ON A SEPARATE CIRCUIT)											
MODEL NUMBER	VOLTAGE PHASE HERTZ	VENT. CONFIGURATION			HEATING ELEMENT (KW)				VENT. CONFIGURATION B, N				POWERVENT J				GREENWHEEL [®] ERV H			
		B, N	J	H	5	7.5	10	15	HEATING ELEMENT (KW)				HEATING ELEMENT (KW)				HEATING ELEMENT (KW)			
									5	7.5	10	15	5	7.5	10	15	5	7.5	10	15
VAHA24HPA	208-230/1/60	15.4	16.4	16.6	20.8	31.3	41.7		36.2	46.7	57.1		37.2	47.7	58.1		37.4	47.9	58.3	
VAHA30HPA	208-230/1/60	18.3	19.3	19.5	20.8	31.3	41.7		39.1	49.6	60.0		40.1	50.6	61.0		40.3	50.8	61.2	
VAHA36HPA	208-230/1/60	21.8	22.8	23.0	20.8	31.3	41.7		42.6	53.1	63.5		43.6	54.1	64.5		43.8	54.3	64.7	
VAHA40HPA	208-230/1/60	23.3	24.3	24.5	20.8	31.3	41.7		44.1	54.6	65.0		45.1	55.6	66.0		45.3	55.8	66.2	
VAHA49HPA	208-230/1/60	32.0	33.0	33.2	20.8	31.3	41.7		52.8	63.3	73.7		53.8	64.3	74.7		54.0	64.5	74.9	
VACA60HPA	208-230/1/60	36.5	37.5	37.7	20.8	31.3	41.7		57.3	67.8	78.2		58.3	68.8	79.2		58.5	69.0	79.4	
VAHA24HPC	208-230/3/60	12.2	13.2	13.4	12.0	18.0	24.1	36.1	24.2	30.2	36.3	48.3	25.2	31.2	37.3	49.3	25.4	31.4	37.5	49.5
VAHA30HPC	208-230/3/60	13.8	14.8	15.0	12.0	18.0	24.1	36.1	25.8	31.8	37.9	49.9	26.8	32.8	38.9	50.9	27.0	33.0	39.1	51.1
VAHA36HPC	208-230/3/60	16.3	17.3	17.5	12.0	18.0	24.1	36.1	28.3	34.3	40.4	52.4	29.3	35.3	41.4	53.4	29.5	35.5	41.6	53.6
VAHA40HPC	208-230/3/60	19.1	20.1	20.3	12.0	18.0	24.1	36.1	31.1	37.1	43.2	55.2	32.1	38.1	44.2	56.2	32.3	38.3	44.4	56.4
VAHA49HPC	208-230/3/60	24.3	25.3	25.5	12.0	18.0	24.1	36.1	36.3	42.3	48.4	60.4	37.3	43.3	49.4	61.4	37.5	43.5	49.6	61.6
VACA60HPC	208-230/3/60	28.5	29.5	29.7	12.0	18.0	24.1	36.1	40.5	46.5	52.6	64.6	41.5	47.5	53.6	65.6	41.7	47.7	53.8	65.8
VAHA24HPD	460/3/60	6.1	6.6	6.7	6.0	9.0	12.0	18.0	12.1	15.1	18.1	24.1	12.6	15.6	18.6	24.6	12.7	15.7	18.7	24.7
VAHA30HPD	460/3/60	6.9	7.4	7.5	6.0	9.0	12.0	18.0	12.9	15.9	18.9	24.9	13.4	16.4	19.4	25.4	13.5	16.5	19.5	25.5
VAHA36HPD	460/3/60	7.1	7.6	7.7	6.0	9.0	12.0	18.0	13.1	16.1	19.1	25.1	13.6	16.6	19.6	25.6	13.7	16.7	19.7	25.7
VAHA40HPD	460/3/60	9.6	10.1	10.2	6.0	9.0	12.0	18.0	15.6	18.6	21.6	27.6	16.1	19.1	22.1	28.1	16.2	19.2	22.2	28.2
VAHA49HPD	460/3/60	11.9	12.4	12.5	6.0	9.0	12.0	18.0	17.9	20.9	23.9	29.9	18.4	21.4	24.4	30.4	18.5	21.5	24.5	30.5
VACA60HPD	460/3/60	14.5	15.0	15.1	6.0	9.0	12.0	18.0	20.5	23.5	26.5	32.5	21.0	24.0	27.0	33.0	21.1	24.1	27.1	33.1

¹Heat Pump = Total Heat Pump Unit Amps (Electric Heat is not Operating).

²Total Maximum Heating Amps = Total Amps with the Compressor, Motors and Electric Heat Operating at the same time

Heating kW is rated at 240 volts on the 208-230v. (HPA & HPC) models. Derate heater output by 25% for operation at 208 volts. Heating kW is rated at 480 volts on the HPD models. Three phase models contain single phase motor loads. Values shown are maximum phase loads. Loads are not equally balanced on each phase.

Electrical Characteristics - Ventilation Motors

VENTILATION CONFIGURATION	VENTILATION DESIGNATOR	EXHAUST AIR MOTOR				OUTDOOR AIR MOTOR				GREENWHEEL [®] ERV DRIVE MOTOR			
		VOLTS	HZ/PH	FLA ¹	WATTS ²	VOLTS	HZ/PH	FLA ¹	WATTS ²	VOLTS	HZ/PH	FLA ¹	WATTS ²
Manual Damper (Standard)	N	n/a	n/a	n/a	n/a	230	60/1	1.0	127	n/a	n/a	n/a	n/a
Motorized Damper	B	n/a	n/a	n/a	n/a	230	60/1	1.0	127	n/a	n/a	n/a	n/a
PowerVent with Motorized Damper	J	230	60/1	1.0	127	230	60/1	1.0	127	n/a	n/a	n/a	n/a
GreenWheel [®] Energy Recovery Ventilator	H	230	60/1	1.0	127	230	60/1	1.0	127	230	60/1	0.2	7.5

¹FLA = Full Load Amps ²Watts = Power Consumption Hz/Ph = Hertz (Frequency)/Number of Phases

ELECTRICAL DATA FOR VACA/VAHA AIR CONDITIONERS

Electrical Characteristics - VACA/VAHA Air Conditioners Compressor, Fan, Ventilation & Blower Motors -

MODEL NUMBER	COMPRESSOR			OTHER MOTORS	OUTDOOR FAN				INDOOR BLOWER (ECM)			VENTILATION		
	VOLTS / HZ / PH	RLA ¹	LRA ²	VOLTS / HZ / PH	QTY	RPM ³	FLA ⁴	HP ⁵	RPM ³	FLA ⁴	HP ⁵	GREENWHEEL [®] ERV		
												OAM ⁶	EXM ⁷	WD ⁸
VAHA24ACA	208/230-60-1	12.8	64.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30ACA	208/230-60-1	14.1	77.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36ACA	208/230-60-1	17.9	112.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40ACA	208/230-60-1	19.8	109.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49ACA	208/230-60-1	21.8	117.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60ACA	208/230-60-1	26.2	134.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VAHA24ACC	208/230-60-3	8.3	61.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30ACC	208/230-60-3	9.0	71.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36ACC	208/230-60-3	13.2	88.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40ACC	208/230-60-3	13.6	83.1	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49ACC	208/230-60-3	13.7	83.1	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60ACC	208/230-60-1	15.6	111.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VAHA24ACD	460-60-3	5.1	28.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA30ACD	460-60-3	5.6	38.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA36ACD	460-60-3	6.0	44.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA40ACD	460-60-3	6.1	41.0	208/230-60-1	1	1060	1.9	1/3	1500	2.8	1/2	1.0	1.0	0.2
VAHA49ACD	460-60-3	6.2	41.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2
VACA60ACD	460-60-3	7.7	52.0	208/230-60-1	1	1040	2.9	1/2	1500	4.3	3/4	1.0	1.0	0.2

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute ⁴FLA = Full Load Amps
⁵HP = Horsepower ⁶OAM = Outside Air Mover ⁷EXM = Exhaust Air Mover ⁸WD = Wheel Drive Motor
 The 460 volt units have a step down transformer for the 230 volt motors.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Air Conditioners with Ventilation Configurations: Manual Damper, up to 15% Outside Air Ventilation Configuration ("N") Motorized Damper, up to 450 CFM of Outside Air w/Pressure Relief Ventilation Configuration ("B")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24ACA	208-230/1/60	21.7	30	29.8	30	40.2	45	55.9	60		
VAHA30ACA	208-230/1/60	23.3	35	29.8	35	40.2	45	55.9	60		
VAHA36ACA	208-230/1/60	28.1	45	29.8	45	40.2	45	55.9	60		
VAHA40ACA	208-230/1/60	30.5	50	31.3	50	40.2	50	55.9	60		
VAHA49ACA	208-230/1/60	35.5	50	35.5	50	41.7	50	57.4	60		
VACA60ACA	208-230/1/60	41.0	60	41.0	60	41.7	60	57.4	60		
VAHA24ACC	208-230/3/60	16.1	20	18.8	20	26.3	30	33.9	35	48.9	50
VAHA30ACC	208-230/3/60	17.0	25	18.8	25	26.3	30	33.9	35	48.9	50
VAHA36ACC	208-230/3/60	22.2	35	22.2	35	26.3	35	33.9	35	48.9	50
VAHA40ACC	208-230/3/60	22.7	35	22.7	35	26.3	35	33.9	35	48.9	50
VAHA49ACC	208-230/3/60	25.3	35	25.3	35	27.8	35	35.4	40	50.4	60
VACA60ACC	208-230/3/60	27.7	40	27.7	40	27.8	40	35.4	40	50.4	60
VAHA24ACD	460/3/60	9.2	15	9.4	15	13.2	15	16.9	20	24.4	25
VAHA30ACD	460/3/60	9.9	15	9.9	15	13.2	15	16.9	20	24.4	25
VAHA36ACD	460/3/60	10.4	15	10.4	15	13.2	15	16.9	20	24.4	25
VAHA40ACD	460/3/60	10.5	15	10.5	15	13.2	15	16.9	20	24.4	25
VAHA49ACD	460/3/60	11.9	20	11.9	20	14.0	20	17.7	20	25.2	30
VACA60ACD	460/3/60	13.7	20	13.7	20	14.2	20	17.7	20	25.2	30

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
 MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Air Conditioners with Ventilation Configuration (“J”) PowerVent with Motorized Damper, up to 450 CFM of OutsideAir w/Pressure Relief

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24ACA	208-230/1/60	22.7	35	30.8	35	41.2	45	56.9	60		
VAHA30ACA	208-230/1/60	24.3	35	30.8	35	41.2	45	56.9	60		
VAHA36ACA	208-230/1/60	29.1	45	30.8	45	41.2	45	56.9	60		
VAHA40ACA	208-230/1/60	31.5	50	31.5	50	41.2	50	56.9	60		
VAHA49ACA	208-230/1/60	36.5	50	36.5	50	42.7	50	58.4	60		
VACA60ACA	208-230/1/60	42.0	60	42.0	60	42.7	60	58.4	60		
VAHA24ACC	208-230/3/60	17.1	25	19.8	25	27.3	30	34.9	35	49.9	50
VAHA30ACC	208-230/3/60	18.0	25	19.8	25	27.3	30	34.9	35	49.9	50
VAHA36ACC	208-230/3/60	23.2	35	23.2	35	27.3	35	34.9	35	49.9	50
VAHA40ACC	208-230/3/60	23.7	35	23.7	35	27.3	35	34.9	35	49.9	50
VAHA49ACC	208-230/3/60	26.3	35	26.3	35	28.8	35	36.4	40	51.4	60
VACA60ACC	208-230/3/60	28.7	40	28.7	40	28.8	40	36.4	40	51.4	60
VAHA24ACD	460/3/60	9.7	15	9.9	15	13.7	15	17.4	20	24.9	25
VAHA30ACD	460/3/60	10.4	15	10.4	15	13.7	15	17.4	20	24.9	25
VAHA36ACD	460/3/60	10.9	15	10.9	15	13.7	15	17.4	20	24.9	25
VAHA40ACD	460/3/60	11.0	15	11.0	15	13.7	15	17.4	20	24.9	25
VAHA49ACD	460/3/60	12.4	20	12.4	20	14.5	20	18.2	20	25.7	30
VACA60ACD	460/3/60	14.2	20	14.2	20	14.5	20	18.2	20	25.7	30

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VACA/VAHA Air Conditioners with Ventilation Configuration (“H”) GreenWheel® ERV

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTS-Ph-Hz	SPPE ³		SPPE ³		SPPE ³		SPPE ³		SPPE ³	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAHA24ACA	208-230/1/60	22.9	35	31.0	35	41.4	45	57.1	60		
VAHA30ACA	208-230/1/60	24.5	35	31.0	35	41.4	45	57.1	60		
VAHA36ACA	208-230/1/60	29.3	45	31.0	45	41.4	45	57.1	60		
VAHA40ACA	208-230/1/60	31.7	50	31.7	50	41.4	50	57.1	60		
VAHA49ACA	208-230/1/60	36.7	50	36.7	50	42.9	50	58.6	60		
VACA60ACA	208-230/1/60	42.2	60	42.2	60	42.9	60	58.6	60		
VAHA24ACC	208-230/3/60	17.3	25	20.0	25	27.5	30	35.1	40	50.1	60
VAHA30ACC	208-230/3/60	18.2	25	20.0	25	27.5	30	35.1	40	50.1	60
VAHA36ACC	208-230/3/60	23.4	35	23.4	35	27.5	35	35.1	40	50.1	60
VAHA40ACC	208-230/3/60	23.9	35	23.9	35	27.5	35	35.1	40	50.1	60
VAHA49ACC	208-230/3/60	26.5	35	26.5	35	29.0	35	36.2	40	51.6	60
VACA60ACC	208-230/3/60	28.9	40	28.9	40	29.0	40	36.2	40	51.6	60
VAHA24ACD	460/3/60	9.8	15	10.0	15	13.8	15	17.5	20	25.0	25
VAHA30ACD	460/3/60	10.5	15	10.5	15	13.8	15	17.5	20	25.0	25
VAHA36ACD	460/3/60	11.0	15	11.0	15	13.8	15	17.5	20	25.0	25
VAHA40ACD	460/3/60	11.1	15	11.1	15	13.8	15	17.5	20	25.0	25
VAHA49ACD	460/3/60	12.5	20	12.5	20	14.6	20	18.3	20	25.8	30
VACA60ACD	460/3/60	14.3	20	14.3	20	14.6	20	18.3	20	25.8	30

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps) ²MFS = Maximum Fuse or HACR Breaker Size ³SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the 208-230v. (HPA & HPC) models. The 460 volts HPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Unit Load Amps (Heating) - VACA/VAHA Air Conditioners

ELECTRIC HEAT		HEAT PUMP ¹ (AMPS)			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL MAXIMUM HEATING AMPS ² (ELECTRIC HEAT IS ON A SEPARATE CIRCUIT)											
MODEL NUMBER	VOLTAGE PHASE HERTZ	VENT. CONFIGURATION			HEATING ELEMENT (KW)				VENT. CONFIGURATION B, N				POWERVENT J				GREENWHEEL® ERV H			
		B, N	J	H	5	7.5	10	15	HEATING ELEMENT (KW)				HEATING ELEMENT (KW)				HEATING ELEMENT (KW)			
									5	7.5	10	15	5	7.5	10	15	5	7.5	10	15
VAHA24ACA	208-230/1/60	3.8	4.8	5.0	20.8	31.3	41.7		24.6	35.1	45.5		25.6	36.1	46.5		25.8	36.3	46.7	
VAHA30ACA	208-230/1/60	3.8	4.8	5.0	20.8	31.3	41.7		24.6	35.1	45.5		25.6	36.1	46.5		25.8	36.3	46.7	
VAHA36ACA	208-230/1/60	3.8	4.8	5.0	20.8	31.3	41.7		24.6	35.1	45.5		25.6	36.1	46.5		25.8	36.3	46.7	
VAHA40ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7		26.1	36.6	47.0		27.1	37.6	48.0		27.3	37.8	48.2	
VAHA49ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7		26.1	36.6	47.0		27.1	37.6	48.0		27.3	37.8	48.2	
VACA60ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7		26.1	36.6	47.0		27.1	37.6	48.0		27.3	37.8	48.2	
VAHA24ACC	208-230/3/60	3.8	4.8	5.0	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.8	22.8	28.9	40.9	17.0	23.0	29.1	41.1
VAHA30ACC	208-230/3/60	3.8	4.8	5.0	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.8	22.8	28.9	40.9	17.0	23.0	29.1	41.1
VAHA36ACC	208-230/3/60	3.8	4.8	5.0	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.8	22.8	28.9	40.9	17.0	23.0	29.1	41.1
VAHA40ACC	208-230/3/60	5.3	6.3	6.5	12.0	18.0	24.1	36.1	17.3	23.3	29.4	41.4	18.3	24.3	30.4	42.4	18.5	24.5	30.6	42.6
VAHA49ACC	208-230/3/60	5.3	6.3	6.5	12.0	18.0	24.1	36.1	17.3	23.3	29.4	41.4	18.3	24.3	30.4	42.4	18.5	24.5	30.6	42.6
VACA60ACC	208-230/3/60	5.3	6.3	6.5	12.0	18.0	24.1	36.1	17.3	23.3	29.4	41.4	18.3	24.3	30.4	42.4	18.5	24.5	30.6	42.6
VAHA24ACD	460/3/60	6.1	6.6	6.7	6.0	9.0	12.0	18.0	12.1	15.1	18.1	24.1	12.6	15.6	18.6	24.6	12.7	15.7	18.7	24.7
VAHA30ACD	460/3/60	6.9	7.4	7.5	6.0	9.0	12.0	18.0	12.9	15.9	18.9	24.9	13.4	16.4	19.4	25.4	13.5	16.5	19.5	25.5
VAHA36ACD	460/3/60	7.1	7.6	7.7	6.0	9.0	12.0	18.0	13.1	16.1	19.1	25.1	13.6	16.6	19.6	25.6	13.7	16.7	19.7	25.7
VAHA40ACD	460/3/60	9.6	10.1	10.2	6.0	9.0	12.0	18.0	15.6	18.6	21.6	27.6	16.1	19.1	22.1	28.1	16.2	19.2	22.2	28.2
VAHA49ACD	460/3/60	11.9	12.4	12.5	6.0	9.0	12.0	18.0	17.9	20.9	23.9	29.9	18.4	21.4	24.4	30.4	18.5	21.5	24.5	30.5
VACA60ACD	460/3/60	14.5	15.0	15.1	6.0	9.0	12.0	18.0	20.5	23.5	26.5	32.5	21.0	24.0	27.0	33.0	21.1	24.1	27.1	33.1

¹Heat Pump = Total Heat Pump Unit Amps (Electric Heat is not Operating).

²Total Maximum Heating Amps = Total Amps with the Compressor, Motors and Electric Heat Operating at the same time

Heating kW is rated at 240 volts on the 208-230v. (HPA & HPC) models. Derate heater output by 25% for operation at 208 volts. Heating kW is rated at 480 volts on the HPD models. Three phase models contain single phase motor loads. Values shown are maximum phase loads. Loads are not equally balanced on each phase.

Electrical Characteristics - Ventilation Motors

VENTILATION CONFIGURATION	VENTILATION DESIGNATOR	EXHAUST AIR MOTOR (EXM)				OUTDOOR AIR MOTOR				GREENWHEEL®ERV DRIVE MOTOR			
		VOLTS	HZ/PH	FLA ¹	WATTS ²	VOLTS	HZ/PH	FLA ¹	WATTS ²	VOLTS	HZ/PH	FLA ¹	WATTS
Manual Damper (standard)	N	n/a	n/a	n/a	n/a	230	60/1	1.0	127	n/a	n/a	n/a	n/a
Motorized Damper	B	n/a	n/a	n/a	n/a	230	60/1	1.0	127	n/a	n/a	n/a	n/a
PowerVent with Motorized Damper	J	230	60/1	1.0	127	230	60/1	1.0	127	n/a	n/a	n/a	n/a
GreenWheel® Energy Recovery Ventilator	H	230	60/1	1.0	127	230	60/1	1.0	127	230	60/1	0.2	7.5

¹FLA = Full Load Amps ²Watts = Power Consumption Hz/Ph = Hertz (Frequency)/Number of Phases

Electric Heat Table - Heat Pumps & Air Conditioners

OUTPUT	HEATER KW			
	5	7.5	10	15
240 VOLT (BTUH)	16,380	24,500	32,670	49,150
208 VOLT (BTUH)	12,290	18,420	24,570	36,860
480 VOLT (BTUH)	17,070	25,600	34,130	51,200

Electric heaters are field installed.

Air Flow, CFM* - Heat Pumps & Air Conditioners

BASIC MODEL	AIR FLOW CFM					
	ESP (WET COIL)					
	0.10	0.15	0.20	0.30	0.40	0.50
24	920	890	860	800		
30	1150	1100	1075	1000		
36	1380	1340	1290	1200		
40	1380	1340	1290	1200		
49	1840	1780	1740	1600	1490	1400
60	2250	2190	2100	2000	1900	1790

CFM = Cubic Feet per Minute, Indoor Air Flow ESP = External Static Pressure in Inches of Water
 All ratings are at 230v. for 208-230v. units and 460v. for 460v. units. Operation of units at a voltage different from the rating point will affect performance and air flow.

Shipping Weight (pounds)

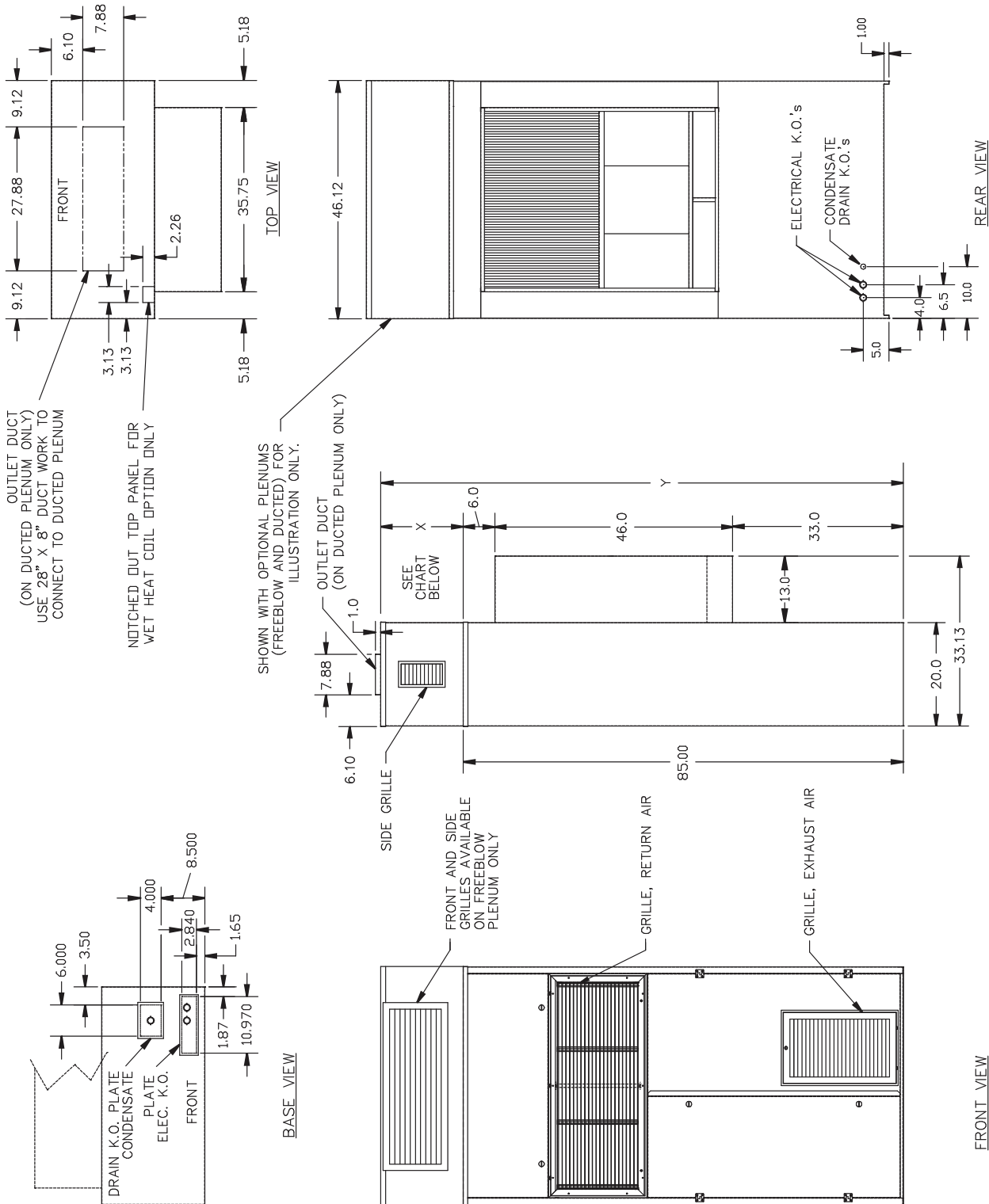
BASIC MODEL	24	30	36	40	49	60
VOLTAGE - 230	450	540	550	565	935	960
VOLTAGE - 460	475	565	575	590	960	985

Air Filter Sizes (inches) - Heat Pumps & Air Conditioners

MODEL	RETURN AIR FILTER*	PART NUMBER	FRESH AIR FILTER	EXHAUST FILTER**
24/30/36/40	2 - 16" x 16" x 1"	81191	11" x 22" x 1"	12" x 20" x 1"
49/60	2 - 20" x 15" x 1"	81159	11" x 22" x 1"	12" x 20" x 1"

*Two (2) return air filters are required for each unit. **With GreenWheel® ventilation system.
 Optional 2" Filter

DIMENSIONAL DATA FOR HEAT PUMPS & AIR CONDITIONERS - VAHA24/30/36/40 (IN INCHES)

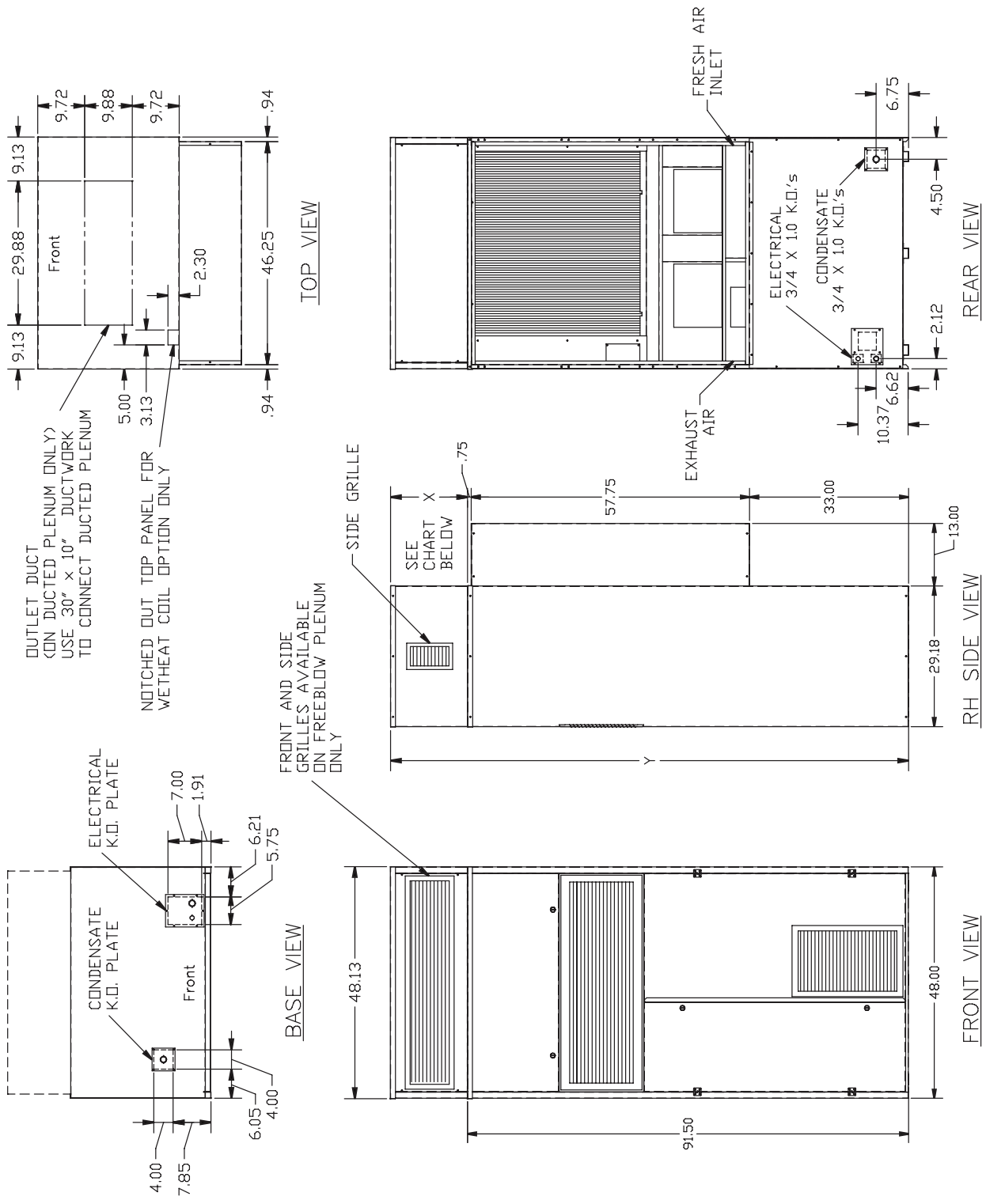


SHIP WEIGHT (POUNDS)

BASIC MODEL	24	30	36	40
VOLTAGE - 230	565	650	650	690
VOLTAGE - 460	585	670	670	720

MINIMUM PLENUM HEIGHT		PLENUM TYPE
DIM 'X'	DIM 'Y'	
16.0	101.0	STANDARD PLENUM, ELEC. OR NO HEAT
18.0	103.0	HOT WATER OR STEAM PLENUM

DIMENSIONAL DATA FOR HEAT PUMPS & AIR CONDITIONERS - VAHA49/VACA60 (IN INCHES)

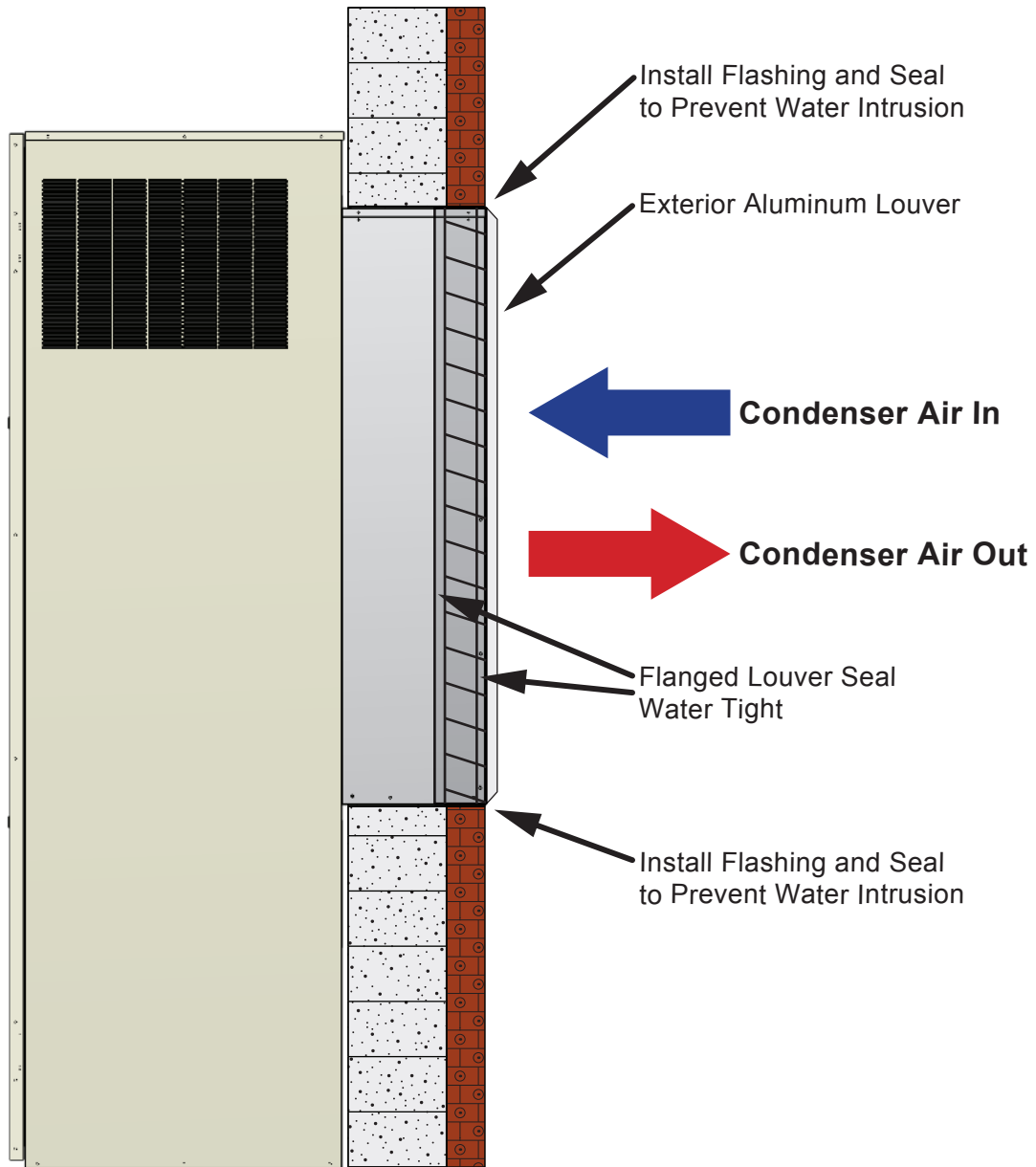


SHIP WEIGHT (POUNDS)

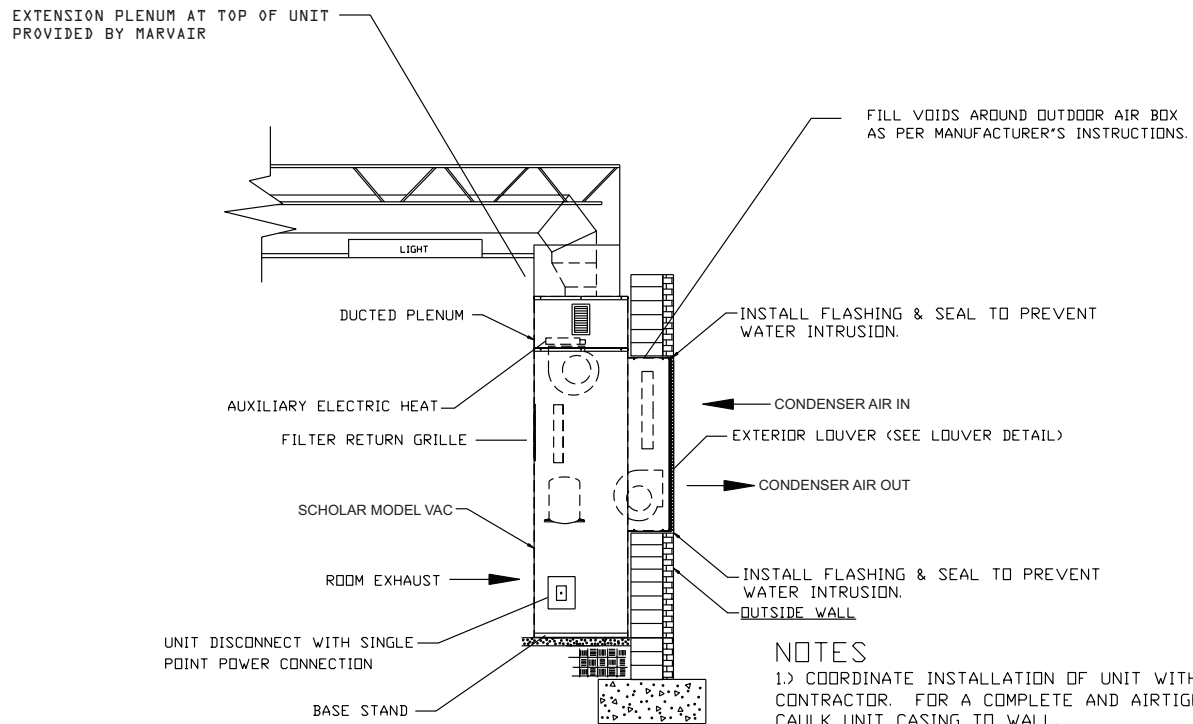
BASIC MODEL	49	60
VOLTAGE - 230	735	780
VOLTAGE - 460	770	815

DIM 'X'	DIM 'Y'	MINIMUM PLENUM HEIGHT	PLENUM TYPE
16.0	107.5	STANDARD PLENUM, ELEC. OR NO HEAT	
18.0	109.5	HOT WATER OR STEAM PLENUM	

WALL MOUNTED LOUVER DETAIL



TYPICAL SCHOLAR QV INSTALLATION DETAIL



NOTES

- 1.) COORDINATE INSTALLATION OF UNIT WITH GENERAL CONTRACTOR. FOR A COMPLETE AND AIRTIGHT INSTALLATION CAULK UNIT CASING TO WALL.
- 2.) DUCT WORK TO BE INSTALLED ACCORDING TO THE CURRENT EDITION OF N.F.P.A. CODES & STANDARDS 90A & 90B.
- 3.) PROVIDE CONNECTION TO 2" DRAIN AT EXTERIOR WALL. COORDINATE LOCATION WITH PLUMBING CONTRACTOR TO PREVENT CONFLICTS.



Please consult the Marvair® website at www.marvair.com for the latest product literature. Detailed dimensional data is available upon request. A complete warranty statement can be found in each product's Installation/Operation Manual, on our website or by contacting Marvair at 229-273-3636. As part of the Marvair continuous improvement program, specifications are subject to change without notice.



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