

Scholar III Heat Pumps & Air Conditioners: Models VAISA24-30-36-40-48 – 2 to 4 Ton Cooling Capacity with 2-Stage Compressors



Scholar III without Free Blow Plenum

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GENERAL DESCRIPTION

The Scholar III 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.

A full range of ventilation options – from two energy recovery ventilators, the GreenWheel[®] ERV or the GreenCube[®] 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 III heat pumps and air conditioners are available in cooling capacities from 2 to 4 tons with a 2-stage compressor (cooling only) as standard. 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, 4th edition and CAN/CSA C22.2, No. 236-11 and listed by ETL.



Features and Benefits

Ease of Installation

- Installed inside classroom
- Outdoor air box provides condenser airflow
- Air box height clears window sills
- Can be installed as free blow or ducted
- Air box easily removes to fit unit through 3' door

R-410A Refrigerant

- Efficient Heat Release
- Non-Ozone Depleting Refrigerant
- Synthetic Lubricant
- Reduced Compressor Wear

Rugged Cabinet Construction

- Cabinet constructed of 16 gauge galvanized steel
- Hinged doors with tamper resistant locks
- PVC outdoor drain resists corrosion

GreenWheel[®] and GreenCube[®] Energy Recovery Ventilators (ERV)

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

SCHOLAR III ADVANTAGES

Since their introduction in 1991, Scholar heat pumps and air conditioners have been the undisputed leader 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 III builds on this history with unique design innovations and features.

► Quiet Operation for a Better Learning Environment

The Scholar III minimizes sound levels in the classroom; in many non-ducted applications sound levels of 45 dbA and less can be expected. A high efficiency axial fan moves air silently through the condenser coils. Specially designed interior panels convert sound to heat energy, resulting in the sound being absorbed. A low vibration, scroll compressor insures quiet operation as well as energy efficiency. The indoor air mover utilizes a revolutionary electronically commutated motor (ECM). This motor consumes a minimum of power with whisper quiet operation. Throughout this Data Sheet features, options and components that minimize sound levels are designated by the “Quiet Zone” logo.

► High efficiency means lower operating costs

The latest in scroll compressor technology with ultra high efficiency indoor and outdoor air movers, generous lanced fin with rifled tube evaporator and condenser coils combine for Integrated Part Load Values (IPLV's) of up to 14.5.

► Humidity Control

The control of humidity is essential for a positive learning environment. Scholar III 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. The electronically commutated motor optimizes moisture removal by automatically controlling the air flow across the indoor coil. Unconditioned 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.

► Scroll Compressor and R-410A Refrigerant

The heart of every air conditioner or heat pump is the compressor and the Scholar III utilizes a scroll compressor specifically designed to use R-410A refrigerant. The heavy duty scroll compressor is quieter and operates with less damaging vibration than older compressors that operate on R-22. Since R-410A can absorb and release heat more efficiently than R-22, compressors with R-410A run cooler than R-22 systems, reducing the risk of burnout due to overheating.

► 2-Stage Compressor

The VAISA models of Scholar III heat pumps and air conditioners have, as standard, a two stage compressor with a first stage capacity of 65% of the total capacity. The two stage compressor provides better comfort and improved energy efficiency compared to many older, single stage compressors. See page 4 for a complete description of the operation and performance of the two stage compressor units.

► GreenWheel® and GreenCube® Energy Recovery Ventilators (ERV)

The optional GreenWheel® ERV and GreenCube® ERV's are total energy recovery ventilators, removing both moisture and heat from the incoming air stream. With an outdoor wet bulb of 74°F and an indoor dry bulb of 72°F and 450 cfm of outside air, the ERV's will remove 8 pints per hour of moisture from the incoming fresh air stream.

For optimum control of the humidity, the GreenWheel and GreenCube® ERV's should be used 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.



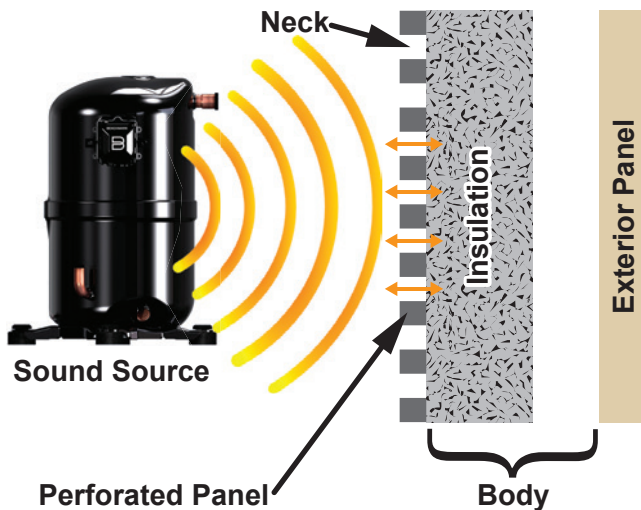
LOW NOISE AND HIGH EFFICIENCY FEATURES



The Scholar III was designed from the onset for unsurpassed quiet operation and high efficiency. With the proper installation, sound levels of 45 dBA or less with a freeblow plenum can be obtained. With duct, sound levels can be greatly reduced. In addition, many of the same components that enable the Scholar III to have such quiet operation, contribute to its high efficiency.

► Cabinet Construction

All exterior cabinet panels are double wall construction with a perforated interior panel and the finished exterior panel. Between the two sheet metal panels is a 1¼" thick, acoustical and thermal insulation. The perforation pattern and the insulation are designed to optimize the reduction of sound. The absorption mechanism of these panels is a combination of the perforated panels and insulation acting together as an array of Helmholtz Resonators. The columns of air in each perforation correspond to the "neck" of the Resonator and the layer of air at the back side of the panel including insulation correspond to the "body" of the Resonator. As sound passes through a perforation, it causes the air of the "neck" to vibrate. When the vibrations meet the resistance of the panel material surrounding the perforation or the resistance of the insulation attached to the back of the perforated panel, the resistance causes the sound to convert to heat energy, the heat is absorbed by the insulation & sound levels are reduced.



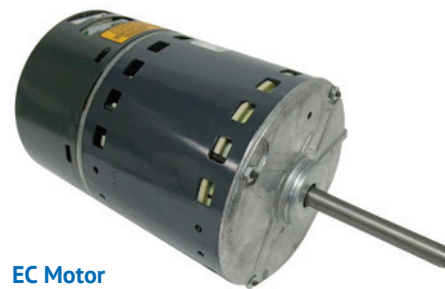
► Electronically Commutated (EC) Indoor Air Mover Motor

Scholar III heat pumps and air conditioners use 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.

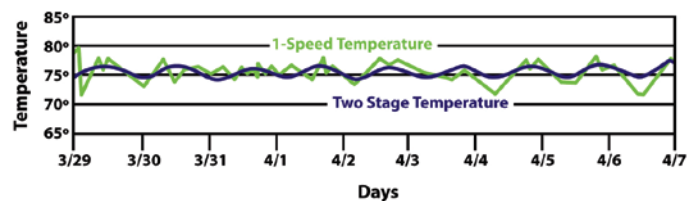


EC Motor

► 2-Stage Compressor

A two stage compressor offers better comfort and improved overall energy efficiency. The second stage is only functional in the cooling mode. Heating and dehumidification are single stage.

- **Better Comfort.** The two stage compressor is able to maintain more precise temperature and relative humidity levels. During mild days, the first stage can satisfy the load, minimizing temperature fluctuations providing steady, even comfort.
- **Energy Efficiency.** The Scholar III heat pump with the two stage high efficiency compressor can provide significant energy savings compared to older, less efficient systems.



- **Hot Gas Reheat** for humidity control. The outside air requirements of classrooms require a special emphasis on control of humidity. The Scholar III with hot gas reheat and the two speed compressor provide a comprehensive, yet affordable solution. It is a complete factory assembled unit designed to provide dehumidification of fresh air and room air. See page 5 for a complete description of Hot Gas Reheat for dehumidification.

EASE OF INSTALLATION

Scholar III 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 III 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 III units.

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

The outdoor air box is designed to be quickly removed and reinstalled in the field. With the box removed, Scholar III heat pumps and air conditioners will slide comfortably through a three foot wide door.

SERVICE AND MAINTENANCE

All service and maintenance is performed from the front or side of the unit – no need to slide the unit away from the wall. The heavy duty hinged front panels open 180° to facilitate access to parts, air filters and controls. Both the indoor and outdoor coils are easily accessible for cleaning.

RUGGED CABINET CONSTRUCTION

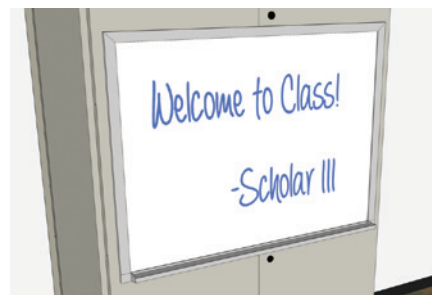
The exterior cabinet is constructed of 16 gage galvanized steel with a mark and scratch resistant polyester finish. Grey is the standard cabinet color, but other colors are available.

The hinged doors permit easy access to the filters and components for service and maintenance. Tamper resistant locks which require a special tool may be ordered as an option.

The drain pans under each indoor coil are sloped to ensure the water drains completely.

Outdoor drain pan constructed of .156" rigid PVC will not corrode.

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 III 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.

► Dry Erase Board

Magnetic dry erase board provides an excellent surface for displaying student art or important announcements.



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, pre-assembled 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 louvers that provide a full range of airflow direction. Two side supply grilles with vertical louvers enhance the air flow in the classroom. All grilles have a clear brushed aluminum finish to be used with Scholar III units with no heat or electric resistance heat. The plenum is 12-1/2" high.

► Supply Grilles

The frame and blades are 6063 extruded aluminum alloy with a 2000-R1 satin anodized finish. To eliminate corrosion and vibration, the frame is separated from the blade with injection molded bushings. All blades are air foil in design, individually adjustable and spaced 3/4" on center. A specially engineered channel on the outside of the frame holds an extruded flexible vinyl bulb gasket that produces a positive air seal at the mounting surface.

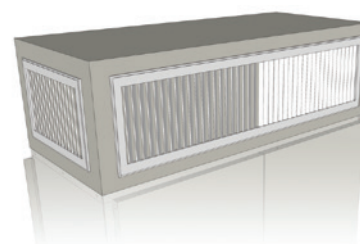
► Ducted Air Distribution



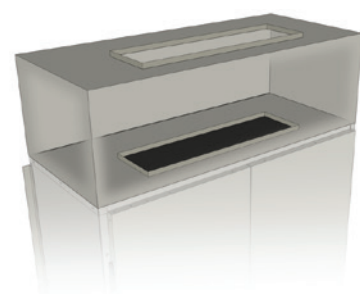
Provided with the ducted plenum. The plenum is 12-1/2" high. Duct can be easily installed to the flanged rectangular opening on the top. The tables on page 12 and 17 show the cfm for the various units.

► 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

Scholar III heat pumps and air conditioners with hot gas reheat are complete factory assembled units designed to provide dehumidification of fresh air and room air. Hot gas reheat can be used with the single stage or two stage compressor and with any supplemental heat and the GreenWheel® ERV, the GreenCube® 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 or the GreenCube® 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.

As an option to the standard HGR control, a modulating valve, a PC board and temperature sensor can be used. The modulating valve maintains a constant discharge temperature during reheat operation. This temperature can be adjusted after installation.

Operation - If the humidity rises above the set point on the dehumidistat 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 III™ units with the hot gas reheat coil require a dehumidistat for proper operation. (See Optional Controls.)

HEAT OPTIONS

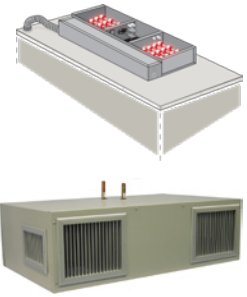
All heat options are available for the Scholar III heat pumps and air conditioners. Electric resistance or hot water heat is used as heat on air conditioners and to supplement, where required, the heat pump cycle.

➤ Electric Resistance Heat

Installs above the indoor air blowers. Each Scholar III 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

Installed above the indoor air blowers. Hot water coil capacities for the Scholar III™ models are shown on page 24. 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. The hot water plenum is 12-1/2" high.



CABINET CONSTRUCTION OPTIONS

➤ Coastal Installations

For installation in coastal areas where salt corrosion may be a problem, the Scholar III 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.

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.

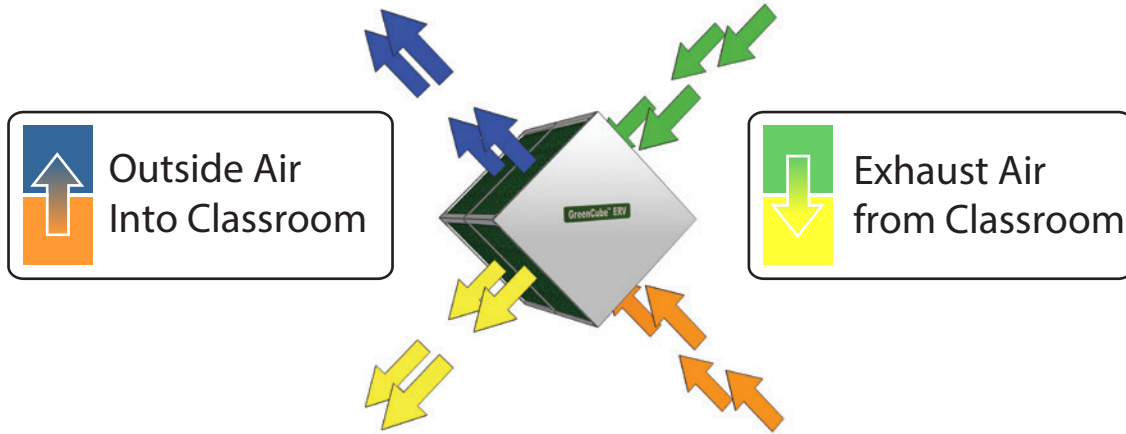
➤ Configuration "J": Power Vent with Motorized Damper (Optional)

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 “Q”: GreenCube® ERV Ventilation (Optional)**

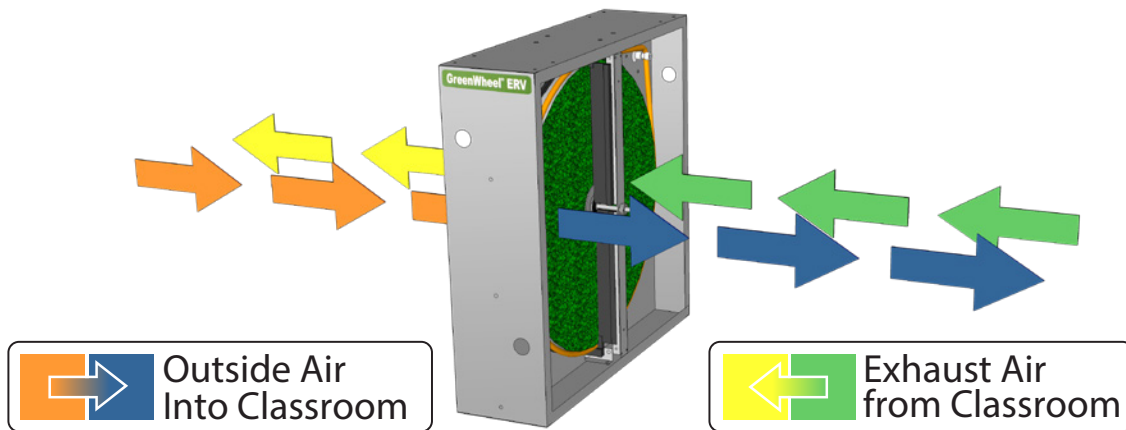
The Marvair GreenCube ERV is an enthalpy plate heat exchanger that transfers both sensible and latent energies between outgoing and incoming air streams in a cross flow arrangement. Except for two air movers, it has no moving parts. The media is impregnated with a RC134 polymeric desiccant that exchanges water by direct vapor transfer using molecular transport without the need of condensation. The GreenCube® ERV will operate at temperatures as low as 10°F without a defrost mechanism. In addition, the desiccant is a bactericide. Two MERV 6 type filters are used on both sides of the enthalpy core. The fresh air and exhaust motors have independent speed controllers to permit each of the motors to be regulated independently.



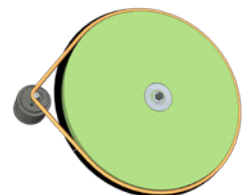
► **Configuration “H”: GreenWheel® ERV Ventilation (Optional)**

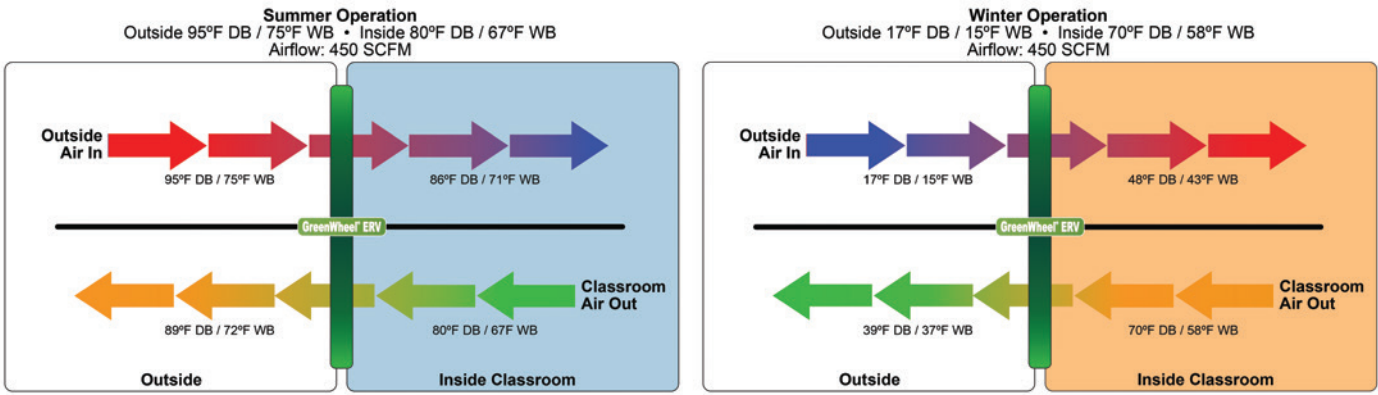
The Marvair® GreenWheel® ERV is a total energy (both sensible and latent) wheel that reduces both construction and operating cost while ventilating the classroom. The use of the GreenWheel ERV reduces the energy load of the outside air. Exhausting stale, inside air keeps indoor pollutants and harmful gases to a minimum.

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.



► **Fresh Air Backdraft Damper (standard on all Ventilation Configurations)**

A factory installed flapper type damper that prevents outside air from entering the Scholar III unit when the intake (fresh air) blower is not operating. The damper opens whenever the ventilation fan is on and automatically shuts when the ventilation fan turns off.

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.
Q	GreenCube ERV	Yes	Two. One on fresh air and 2nd on exhaust air	Yes	Yes	Independent speed controllers	None
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 may be ordered on all Scholar III units as factory installed option in lieu of the standard air slots.

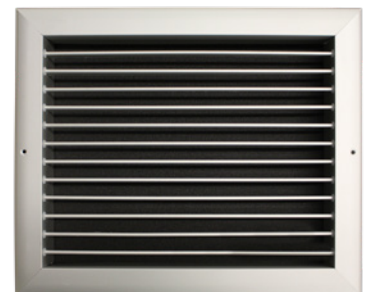
OPTIONAL VENTILATION CONTROLS AND GRILLES

► **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.

► **Ventilation Exhaust Air Controller**

As standard, the motorized fresh air damper with PowerVent (option J) and GreenWheel® ERV (option H) ventilation options are equipped with a single controller which controls both the exhaust air and the fresh air blowers. The optional exhaust air blower controller allows positive pressurization of the classroom; i.e., more outside air can be introduced through the GreenWheel® ERV than is exhausted.



Aluminum Grille

► **Side Return Air Grilles**

Aluminum grille replaces stamped slots on left and right side of the unit.

► **GreenWheel® and GreenCube® ERV Exhaust Air Grille**

Aluminum grille replaces slots in cabinet.

THERMOSTAT/CONTROLLERS

► **Digital A/C Thermostat**

Digital, Seven Day Programmable ThermostatP/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.

► **Digital Heat Pump Thermostat**

Digital, 7 Day, 5-2 and 5-1-1 Day Programmable Thermostat P/N 50107
 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. Title 24 compliant.

Digital, 7 Day, 2 Occupied & 2 Unoccupied Periods for Each Day of the Week Programmable Thermostat.....P/N 50248
 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.

Internal Electronic Programmable Heat Pump ThermostatP/N S/02792
 (factory installed) with automatic changeover, has two stages of heating and one stage of cooling and a fan switch. System mode switch has OFF, COOL, AUTO, HEAT, and EM.HT. settings. Fan mode switch has OFF and AUTO settings. This thermostat may be used with systems that have no heat, electric resistance, a hot water coil or a steam coil.

► **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, and
- 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 x 128 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

► **Thermostat Guards**

Clear Thermostat Guard with Keylock & Clear Plastic Cover & Base.....P/N 50092
 For use with 50123 and 50107 thermostats.

Clear Thermostat Guard with Keylock & Clear Plastic Cover & Base.....P/N 50119
 For use with 50248 thermostat.

SCHOLAR III 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 can be programmed remotely or with a removable program storage device. Pertinent statistical data regarding the history of the refrigerant system is also stored.

The controller in the Scholar III™ heat pumps and air conditioners 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.

➤ **EMS Control Relay (24V only)**

Provides a 24 VAC coil to control operation from a Building Automation System.

Note: An additional EMS control relay can be added when 120 or 240 VAC coils are required.

➤ **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. (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 (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 Controller**

Allows field calibration of the indoor blower to minimize sound levels for specific installations.

OPTIONAL CONTROLS

➤ **Dehumidistat**

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

➤ **Condensate Float Switch**

Factory installed in the outdoor drain pan and will turn the unit off if the pan is not draining properly.

➤ **Phase Monitor**

Monitors 3ø power supply and will not allow the unit to operate if the power supply is not properly phased. Not required on 1ø units.

➤ **Factory Installation of EMS Control Hardware**

Installation of customer supplied EMS control hardware in the unit at the factory. Note: programming of the controller is the responsibility of the customer.

OTHER OPTIONS

➤ **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 III 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 III 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.



Cold Plasma Air Purifier

MODEL IDENTIFICATION

VAI Vertical Air Indoor Source	S 2-Stage Compressor	A Refrigerant R-410A	•• Nominal Cooling 24 = 24,000 BTUH 30 = 29,000 BTUH 36 = 35,000 BTUH 40 = 40,500 BTUH 48 = 48,000 BTUH	•• System Type HP = Heat Pump AC = Air Conditioner	• Power Supply A = 208/230V, 1,60Hz C = 208/230V, 3,60Hz D = 460V, 3,60Hz	••• Heat - kW 000 = No Heat 050 = 5 kW 075 = 7.5 kW 100 = 10 kW 150 = 15 kW 099 = 99 (Hot Water)	• Configuration N = Manual Damper (std) H = GreenWheel® ERV Q = GreenCube® ERV B = Motorized Damper J = Power Vent with Motorized Damper	III Configuration III = Scholar III	••• Cabinet Color 100 = Beige 200 = Gray	Special Options G = Hot Gas Reheat/Dehumidification
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SCHOLAR III VAISA HEAT PUMPS WITH 2-STAGE COMPRESSOR



Certified Efficiency and Capacity Ratings at ANSI/ARI Standard 390

Model Number	VAISA30			VAISA36			VAISA40			VAISA48		
	HPA	HPC	HPD	HPA	HPC	HPD	HPA	HPC	HPD	HPA	HPC	HPD
Cooling BTUH ¹ - 2nd Stage	29,000			34,000			41,000			46,000		
EER ² - 2nd Stage	11.00			11.00			11.00			11.00		
Integrated Part Load Value ³	14.5			14.5			14.0			14.3		
High Temperature Heating ⁴	28,000			34,000			37,000			39,000		
High Temperature COP ⁵	3.30			3.30			3.30			3.30		
Rated Air Flow (CFM ⁶)	1,050			1,200			1,300			1,550		

¹Cooling rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air.

²EER=Energy Efficiency Ratio

³Integrated Part Load Value is an integrated efficiency measure from 1st and 2nd stage capacity modulation.

⁴High Temperature Heating & 5COP is rated at 47°F DB/43°WB (8.3°C DB/6.1°C WB) outdoor and 70°F (21.1°C) return air.

⁵COP=Coefficient of Performance ⁶CFM=Cubic Feet per Minute

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

Model Number	VAISA30			VAISA36			VAISA40			VAISA48		
	HPA	HPC	HPD	HPA	HPC	HPD	HPA	HPC	HPD	HPA	HPC	HPD
Total Capacity	29,000			34,000			41,000			46,000		
Sensible Heat Ratio	0.75			0.75			0.74			0.74		
Sensible Capacity	21,630			25,455			30,500			34,080		
Rated Air Flow (CFM ¹)	1,050			1,200			1,300			1,550		

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

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	
VAISA30HP1	33,640	32,480	31,320	30,160	29,000	27,840	26,680	25,520	24,940	
VAISA36HP1	39,440	38,080	36,720	35,360	34,000	32,640	31,280	29,920	29,240	
VAISA40HP1	47,560	45,920	44,280	42,640	41,000	39,360	37,720	36,080	35,260	
VAISA48HP1	53,360	51,520	49,680	47,840	46,000	44,160	42,320	40,480	39,560	

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

Model Number	Outdoor Temperature													
	0°F / -17.8°C	5°F / -15°C	10°F / -12.2°C	15°F / -9.4°C	20°F / -6.7°C	25°F / -3.9°C	30°F / -1.1°C	35°F / 1.7°C	40°F / 4.4°C	45°F / 7.2°C	47°F / 8.3°C	50°F / 10°C	55°F / 12.8°C	60°F / 15.6°C
VAISA30HP1	11,760	13,440	15,120	16,800	18,480	20,160	21,840	23,520	25,200	26,880	28,000	28,560	30,240	31,920
VAISA36HP1	14,280	16,320	18,360	20,400	22,440	24,480	26,520	28,560	30,600	32,640	34,000	34,680	36,720	38,760
VAISA40HP1	15,540	17,760	19,980	22,200	24,420	26,640	28,860	31,080	33,300	35,520	37,000	37,740	39,960	42,180
VAISA48HP1	16,380	18,720	21,060	23,400	25,740	28,080	30,420	32,760	35,100	37,440	39,000	39,780	42,120	44,460

Based upon AHRI 390 Return Air of 70°F (21.1°C) Dry Bulb / 60°F (15.6°C) Wet Bulb.

Dehumidification Charts

Full Capacity Dehumidification - Scholar III Model VAISA30 with Hot Gas Reheat

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	30,994	23,698	7,296	1,050	51.7	6.9	6.6	Cooling
75 / 62.5	50	75	7,296	0	7,296	1,050	73.6	6.9	6.6	Dehumid.
75 / 65.5	60	75	32,748	20,687	12,061	1,050	54.8	11.4	10.9	Cooling
75 / 65.5	60	75	12,061	0	12,061	1,050	74.0	11.4	10.9	Dehumid.
75 / 68	70	75	34,235	18,134	16,101	1,050	57.4	15.2	14.6	Cooling
75 / 68	70	75	16,101	0	16,101	1,050	74.2	15.2	14.6	Dehumid.
65 / 63	90	75	31,291	13,485	17,806	1,050	52.3	16.8	16.1	Cooling
65 / 63	90	75	17,806	0	17,806	1,050	64.8	16.8	16.1	Dehumid.
80 / 67	50	95	29,000	21,632	7,368	1,050	57.9	6.3	6.0	Cooling
80 / 67	50	95	7,368	0	7,368	1,050	78.5	6.3	6.0	Dehumid.

Full Capacity Dehumidification - Scholar III Model VAISA36 with Hot Gas Reheat

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	37,406	26,904	10,502	1200	51.6	9.9	9.5	Cooling
75 / 62.5	50	75	10,502	0	10,502	1200	72.4	9.9	9.5	Dehumid.
75 / 65.5	60	75	39,524	23,680	15,844	1200	54.7	15.0	14.3	Cooling
75 / 65.5	60	75	15,844	0	15,844	1200	73.0	15.0	14.3	Dehumid.
75 / 68	70	75	41,318	20,411	20,907	1200	57.3	19.7	18.9	Cooling
75 / 68	70	75	20,907	0	20,907	1200	73.0	19.7	18.9	Dehumid.
65 / 63	90	75	37,765	16,028	21,737	1200	57.2	20.5	19.7	Cooling
65 / 63	90	75	21,737	0	21,737	1200	64.6	20.5	19.7	Dehumid.
80 / 67	50	95	35,000	25,148	9,852	1200	57.9	9.3	8.9	Cooling
80 / 67	50	95	9,852	0	9,852	1200	77.3	9.3	8.9	Dehumid.

Full Capacity Dehumidification - Scholar III Model VAISA40 with Hot Gas Reheat

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	32,539	11,280	1300	50.7	10.7	10.2	Cooling
75 / 62.5	50	75	11,280	0	11,280	1300	73.4	10.7	10.2	Dehumid.
75 / 65.5	60	75	46,299	28,561	17,738	1300	53.8	16.8	16.1	Cooling
75 / 65.5	60	75	17,738	0	17,738	1300	73.8	16.8	16.1	Dehumid.
75 / 68	70	75	48,400	25,186	23,214	1300	56.5	22.0	21.1	Cooling
75 / 68	70	75	23,214	0	23,214	1300	74.1	22.0	21.1	Dehumid.
65 / 63	90	75	44,239	19,025	25,214	1300	51.3	23.8	22.9	Cooling
65 / 63	90	75	25,214	0	25,214	1300	67.8	23.8	22.9	Dehumid.
80 / 67	50	95	41,000	30,501	10,499	1300	57.1	9.9	9.5	Cooling
80 / 67	50	95	10,499	0	10,499	1300	78.4	9.9	9.5	Dehumid.

Full Capacity Dehumidification - Scholar III Model VAISA48 with Hot Gas Reheat

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	52,369	37,675	14,694	1550	50.7	13.9	13.3	Cooling
75 / 62.5	50	75	14,694	0	14,694	1550	73.3	13.9	13.3	Dehumid.
75 / 65.5	60	75	55,333	33,215	22,118	1550	53.7	20.9	20.0	Cooling
75 / 65.5	60	75	22,118	0	22,118	1550	73.5	20.9	20.0	Dehumid.
75 / 68	70	75	57,845	29,424	28,421	1550	56.3	26.8	25.7	Cooling
75 / 68	70	75	28,421	0	28,421	1550	73.9	26.8	25.7	Dehumid.
65 / 63	90	75	52,871	25,548	27,323	1550	51.2	25.8	24.7	Cooling
65 / 63	90	75	27,323	0	27,323	1550	66.5	25.8	24.7	Dehumid.
80 / 67	50	95	49,000	35,191	13,809	1550	56.9	13.0	12.5	Cooling
80 / 67	50	95	13,809	0	13,809	1550	77.9	13.0	12.5	Dehumid.

The Dehumidification Operating Mode is with Hot Gas Reheat.

Electrical Characteristics - Compressor, Fan, Ventilation & Blower Motors - VAISA Heat Pumps

Model Number	COMPRESSOR			OTHER MOTORS	OUTDOOR FAN				INDOOR BLOWER (ECM)			ENERGY RECOVERY VENTILATORS				
	VOLTS / HZ / PH	RLA ¹	LRA ²	VOLTS / HZ / PH	QTY	RPM ³	FLA ⁴	HP ⁵	RPM ³	FLA ⁴	HP ⁵	GREENWHEEL®			GREENCUBE™	
												AMPS			AMPS	
												OAM ⁶	EXM ⁷	WD ⁸	OAM ⁶	EXM ⁷
VAISA30HP1A	208/230-60-1	13.1	73.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36HP1A	208/230-60-1	15.2	83.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40HP1A	208/230-60-1	17.9	96.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48HP1A	208/230-60-1	21.1	104.0	208/230-60-1	2	1500	2.8	1/2	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA30HP1C	208/230-60-3	8.6	58.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36HP1C	208/230-60-3	11.6	73.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40HP1C	208/230-60-3	14.1	88.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48HP1C	208/230-60-3	14.0	83.1	208/230-60-1	2	1500	2.8	1/2	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA30HP1D	460-60-3	4.3	28.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36HP1D	460-60-3	5.7	38.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40HP1D	460-60-3	6.2	44.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48HP1D	460-60-3	6.4	41.0	208/230-60-1	2	1500	2.8	1/2	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute ⁴FLA = Full Load Amps
⁵HP = Horsepower ⁶OAM - Outside Air Motor ⁷EXM-Exhaust Air Motor 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) - VAISA Heat Pumps with Ventilation Configurations - Manual Damper, up to 15% Outside Air ("N") Motorized Damper, up to 450 CFM of Outside Air with Pressure Relief ("B")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA30HP1A	208/230-1-60	21.6	30	47.6	50	58.0	60	73.7	80		
VAISA36HP1A	208/230-1-60	24.2	35	50.2	60	60.6	70	76.3	80		
VAISA40HP1A	208/230-1-60	29.1	45	55.1	60	65.5	70	81.2	90		
VAISA48HP1A	208/230-1-60	37.3	50	63.3	70	73.7	80	89.4	90		
VAISA30HP1C	208/230-3-60	16.0	20	31.0	35	38.5	40	46.1	50	61.1	70
VAISA36HP1C	208/230-3-60	19.7	30	34.7	35	42.2	45	49.8	50	64.8	70
VAISA40HP1C	208/230-3-60	24.3	35	39.3	40	46.8	50	54.4	60	69.4	70
VAISA48HP1C	208/230-3-60	28.4	40	43.4	45	50.9	60	58.5	60	73.5	80
VAISA30HP1D	460-3-60	8.0	15	15.5	20	19.3	20	23.0	25	30.5	35
VAISA36HP1D	460-3-60	9.7	15	17.2	20	21.0	25	24.7	25	32.2	35
VAISA40HP1D	460-3-60	11.1	15	18.6	20	22.4	25	26.1	30	33.6	35
VAISA48HP1D	460-3-60	13.5	15	21.0	25	24.8	25	28.5	30	36.0	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.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) – VAISA Heat Pumps with Ventilation Configuration - PowerVent with Motorized Damper & up to 450 CFM of Outside Air with Pressure Relief (“J”)

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA30HP1A	208/230-1-60	22.0	35	48.0	50	58.4	60	74.1	80		
VAISA36HP1A	208/230-1-60	24.6	40	50.6	60	61.0	70	76.7	80		
VAISA40HP1A	208/230-1-60	29.5	45	55.5	60	65.9	70	81.6	90		
VAISA48HP1A	208/230-1-60	37.7	50	63.7	70	74.1	80	89.8	90		
VAISA30HP1C	208/230-3-60	16.4	25	31.4	35	38.9	40	46.5	50	61.5	70
VAISA36HP1C	208/230-3-60	20.1	30	35.1	40	42.6	45	50.2	60	65.2	70
VAISA40HP1C	208/230-3-60	24.7	35	39.7	40	47.2	50	54.8	60	69.8	70
VAISA48HP1C	208/230-3-60	28.8	40	43.8	45	51.3	60	58.9	60	73.9	80
VAISA30HP1D	460-3-60	8.2	15	15.7	20	19.5	20	23.2	25	30.7	35
VAISA36HP1D	460-3-60	9.9	15	17.4	20	21.2	25	24.9	25	32.4	35
VAISA40HP1D	460-3-60	11.3	15	18.8	20	22.6	25	26.3	30	33.8	35
VAISA48HP1D	460-3-60	13.7	20	21.2	25	25.0	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.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) – VAISA Heat Pumps with Ventilation Configuration - GreenWheel® Energy Recovery Ventilator (“H”)

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA30HP1A	208/230-1-60	22.2	35	48.2	50	58.6	60	74.3	80		
VAISA36HP1A	208/230-1-60	24.8	40	50.8	60	61.2	70	76.9	80		
VAISA40HP1A	208/230-1-60	29.7	45	55.7	60	66.1	70	81.8	90		
VAISA48HP1A	208/230-1-60	37.9	50	63.9	70	74.3	80	90.0	90		
VAISA30HP1C	208/230-3-60	16.6	25	31.6	35	39.1	40	46.7	50	61.7	70
VAISA36HP1C	208/230-3-60	20.3	30	35.3	40	42.8	45	50.4	60	65.4	70
VAISA40HP1C	208/230-3-60	24.9	35	39.9	40	47.4	50	55.0	60	70.0	70
VAISA48HP1C	208/230-3-60	29.0	40	44.0	45	51.5	60	59.1	60	74.1	80
VAISA30HP1D	460-3-60	8.3	15	15.8	20	19.6	20	23.3	25	30.8	35
VAISA36HP1D	460-3-60	10.0	15	17.5	20	21.3	25	25.0	25	32.5	35
VAISA40HP1D	460-3-60	11.4	15	18.9	20	22.7	25	26.4	30	33.9	35
VAISA48HP1D	460-3-60	13.8	20	21.3	25	25.1	30	28.8	30	36.3	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.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) – VAISA Heat Pumps with Ventilation Configuration - GreenCube® Energy Recovery Ventilator (“Q”)

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA30HP1A	208/230-1-60	24.2	35	50.2	60	60.6	70	76.3	80		
VAISA36HP1A	208/230-1-60	26.8	40	52.8	60	63.2	70	78.9	80		
VAISA40HP1A	208/230-1-60	31.7	45	57.7	60	68.1	70	83.8	90		
VAISA48HP1A	208/230-1-60	39.9	50	65.9	70	76.3	80	92.0	100		
VAISA30HP1C	208/230-3-60	18.6	25	33.6	35	41.1	45	48.7	50	63.7	70
VAISA36HP1C	208/230-3-60	22.3	30	37.3	40	44.8	45	52.4	60	67.4	70
VAISA40HP1C	208/230-3-60	26.9	40	41.9	45	49.4	50	57.0	60	72.0	80
VAISA48HP1C	208/230-3-60	31.0	45	46.0	45	53.5	60	61.1	70	76.1	80
VAISA30HP1D	460-3-60	9.3	15	16.8	20	20.6	25	24.3	25	31.8	35
VAISA36HP1D	460-3-60	11.0	15	18.5	20	22.3	25	26.0	30	33.5	35
VAISA40HP1D	460-3-60	12.4	15	19.9	20	23.7	25	27.4	30	34.9	35
VAISA48HP1D	460-3-60	14.8	20	22.3	25	26.1	30	29.8	30	37.3	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.

Unit Load Amps (Heating) - VAISA 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)															
Basic Model	Voltage Ph-Hz	Config. B & N	Power Vent J	Green Wheel H	Green Cube Q	Heating Element (kW)				Config. (B) & (N)				Power Vent (J)				GreenWheel® ERV (H)				GreenCube™ ERV (Q)			
						Heating Element (kW)				Heating Element (kW)				Heating Element (kW)				Heating Element (kW)				Heating Element (kW)			
						5	7.5	10	15	5	7.5	10	15	5	7.5	10	15	5	7.5	10	15	5	7.5	10	15
VAISA30HP1A	208-230/1/60	18.3	18.7	18.9	20.9	20.8	31.3	41.7		39.1	49.6	60.0		39.5	50.0	60.4		39.7	50.2	60.6		41.7	52.2	62.6	
VAISA36HP1A	208-230/1/60	21.8	22.2	22.4	24.4	20.8	31.3	41.7		42.6	53.1	63.5		43.0	53.5	63.9		43.2	53.7	64.1		45.2	55.7	66.1	
VAISA40HP1A	208-230/1/60	23.3	23.7	23.9	25.9	20.8	31.3	41.7		44.1	54.6	65.0		44.5	55.0	65.4		44.7	55.2	65.6		46.7	57.2	67.6	
VAISA48HP1A	208-230/1/60	32.0	32.4	32.6	34.6	20.8	31.3	41.7		52.8	63.3	73.7		53.2	63.7	74.1		53.4	63.9	74.3		55.4	65.9	76.3	
VAISA30HP1C	208-230/3/60	13.8	14.2	14.4	16.4	12.0	18.0	24.1	36.1	25.8	31.8	37.9	49.9	26.2	32.2	38.3	50.3	26.4	32.4	38.5	50.5	28.4	34.4	40.5	52.5
VAISA36HP1C	208-230/3/60	16.3	16.7	16.9	18.9	12.0	18.0	24.1	36.1	28.3	34.3	40.4	52.4	28.7	34.7	40.8	52.8	28.9	34.9	41.0	53.0	30.9	36.9	43.0	55.0
VAISA40HP1C	208-230/3/60	19.1	19.5	19.7	21.7	12.0	18.0	24.1	36.1	31.1	37.1	43.2	55.2	31.5	37.5	43.6	55.6	31.7	37.7	43.8	55.8	33.7	39.7	45.8	57.8
VAISA48HP1C	208-230/3/60	24.3	24.7	24.9	26.9	12.0	18.0	24.1	36.1	36.3	42.3	48.4	60.4	36.7	42.7	48.8	60.8	36.9	42.9	49.0	61.0	38.9	44.9	51.0	63.0
VAISA30HP1D	460/3/60	6.9	7.1	7.2	8.2	6.0	9.0	12.0	18.0	12.9	15.9	18.9	24.9	13.1	16.1	19.1	25.1	13.2	16.2	19.2	25.2	14.2	17.2	20.2	26.2
VAISA36HP1D	460/3/60	7.1	7.3	7.4	8.4	6.0	9.0	12.0	18.0	13.1	16.1	19.1	25.1	13.3	16.3	19.3	25.3	13.4	16.4	19.4	25.4	14.4	17.4	20.4	26.4
VAISA40HP1D	460/3/60	9.6	9.8	9.9	10.9	6.0	9.0	12.0	18.0	15.6	18.6	21.6	27.6	15.8	18.8	21.8	27.8	15.9	18.9	21.9	27.9	16.9	19.9	22.9	28.9
VAISA48HP1D	460/3/60	11.9	12.1	12.2	13.2	6.0	9.0	12.0	18.0	17.9	20.9	23.9	29.9	18.1	21.1	24.1	30.1	18.2	21.2	24.2	30.2	19.2	22.2	25.2	31.2

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 (OAM)				Wheel Drive Motor			
		Volts	Hz/Ph	FLA ¹	HP	Volts	Hz/Ph	FLA	HP	Volts	Hz/Ph	FLA	HP
Motorized Damper	B					230	60/1	1.0	0.17				
Manual Damper (Standard)	N					230	60/1	1.0	0.17				
PowerVent with Motorized Damper	J	230	60/1	0.4	0.12	230	60/1	1.0	0.17				
GreenWheel® ERV	H	230	60/1	0.4	0.12	230	60/1	1.0	0.17	230	60/1	0.2	0.01
GreenCube™ ERV	Q	230	60/1	0.4	0.12	230	60/1	3.2	1/2				

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

SCHOLAR III VAISA AIR CONDITIONERS WITH 2-STAGE COMPRESSOR



Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390

Model Number	VAISA24			VAISA30			VAISA36			VAISA40			VAISA48		
	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD
Cooling BTUH ¹ - 2nd Stage	23,000			29,000			34,000			41,000			46,000		
EER ² - 2nd Stage	11.00			11.00			11.00			11.00			11.00		
Integrated Part Load Value ³	14.5			14.5			14.5			14.0			14.3		
Rated Air Flow (CFM ⁴)	860			1,050			1,200			1,300			1,550		

¹Cooling rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air. ²EER=Energy Efficiency Ratio
³Integrated Part Load Value is an integrated efficiency measure from 1st and 2nd stage capacity modulation. ⁴CFM=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

Model Number	VAISA24			VAISA30			VAISA36			VAISA40			VAISA48		
	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD	ACA	ACC	ACD
Total Capacity	23,000			29,000			34,000			41,000			46,000		
Sensible Heat Ratio	0.75			0.75			0.76			0.74			0.74		
Sensible Capacity	17,250			21,630			25,820			30,500			34,080		
Rated Air Flow (CFM ¹)	860			1,050			1,200			1,300			1,550		

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

Stage 2 Cooling Performance (BTUH) at Various Outdoor Temperatures

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	
VAISA24AC	26,680	25,760	24,840	23,920	23,000	22,080	21,160	20,040	19,780	
VAISA30AC	33,640	32,480	31,320	30,160	29,000	27,840	26,680	25,520	24,940	
VAISA36AC	39,440	38,080	36,720	35,360	34,000	32,640	31,280	29,920	29,240	
VAISA40AC1	47,560	45,920	44,280	42,640	41,000	39,360	37,720	36,080	35,260	
VAISA48AC1	53,360	51,520	49,680	47,840	46,000	44,160	42,320	40,480	39,560	

Based upon ANSI/AHRI std. 390 return air conditions of 80°F DB/67° WB (26.5°C DB/19.5°C WB) at various outdoor temperatures.

Electrical Characteristics - Compressor, Fan, Ventilation & Blower Motor

BASIC MODEL	COMPRESSOR			OTHER MOTORS	OUTDOOR FAN				INDOOR BLOWER (ECM ⁹)			ENERGY RECOVERY VENTILATORS				
	VOLTS / HZ / PH	RLA ¹	LRA ²	VOLTS / HZ / PH	QTY	RPM ³	FLA ⁴	HP ⁵	RPM ³	FLA ⁴	HP ⁵	GREENWHEEL [®]			GREENCUBE [™]	
												AMPS			AMPS	
													OAM ⁶	EXM ⁷	WD ⁸	OAM ⁶
VAISA24ACA	208/230-60-1	11.7	58.3	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA30ACA	208/230-60-1	13.1	73.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36ACA	208/230-60-1	15.2	83.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40AC1A	208/230-60-1	17.9	96.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48AC1A	208/230-60-1	21.1	104.0	208/230-60-1	1	1500	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA24ACC	208/230-60-3	6.5	55.4	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA30ACC	208/230-60-3	8.6	58.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36ACC	208/230-60-3	11.6	73.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40AC1C	208/230-60-3	14.1	88.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48AC1C	208/230-60-3	14.0	83.1	208/230-60-1	1	1500	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA24ACD	460-60-3	3.5	28.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA30ACD	460-60-3	4.3	28.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA36ACD	460-60-3	5.7	38.0	208/230-60-1	1	1030	1.4	1/3	1500	2.8	1/2	1.0	0.4	0.2	3.2	0.4
VAISA40AC1D	460-60-3	6.2	44.0	208/230-60-1	1	1030	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4
VAISA48AC1D	460-60-3	6.4	41.0	208/230-60-1	1	1500	1.4	1/3	1500	4.3	3/4	1.0	0.4	0.2	3.2	0.4

¹RLA = Rated Load Amps ²LRA = Locked Rotor Amps ³RPM = Revolutions per Minute ⁴FLA = Full Load Amps ⁵HP = Horsepower
⁶OAM = Outdoor Air Ventilation Motor ⁷EXM = Ventilation Exhaust Air Motor ⁸WD = Wheel Drive Motor ⁹ECM = Electronically Commutated Motor
The 460 volt units have a step down transformer for the 230 volt motors.

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

BASIC MODEL	ELECTRIC HEAT	VOLTAGE Ph-Hz	000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
			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
VAISA24ACA		208-230/1/60	19.8	30	29.8	30	40.2	45	55.9	60		
VAISA30ACA		208-230/1/60	21.6	30	29.8	30	40.2	45	55.9	60		
VAISA36ACA		208-230/1/60	24.2	35	29.8	35	40.2	45	55.9	60		
VAISA40AC1A		208-230/1/60	29.1	45	31.3	45	41.7	45	57.4	60		
VAISA48AC1A		208-230/1/60	33.1	50	33.1	50	41.7	50	57.4	60		
VAISA24ACC		208-230/3/60	13.3	15	18.8	20	26.3	30	33.9	35	48.9	50
VAISA30ACC		208-230/3/60	16.0	20	18.8	20	26.3	30	33.9	35	48.9	50
VAISA36ACC		208-230/3/60	19.7	30	19.7	30	26.3	30	33.9	35	48.9	50
VAISA40AC1C		208-230/3/60	24.3	35	24.3	35	27.8	35	35.4	40	50.4	60
VAISA48AC1C		208-230/3/60	24.2	35	24.2	35	27.8	35	35.4	40	50.4	60
VAISA24ACD		460/3/60	7.0	15	9.4	15	13.2	15	16.9	20	24.4	25
VAISA30ACD		460/3/60	8.0	15	9.4	15	13.2	15	16.9	20	24.4	25
VAISA36ACD		460/3/60	9.7	15	9.7	15	13.2	15	16.9	20	24.4	25
VAISA40AC1D		460/3/60	11.1	15	11.1	15	14.0	15	17.7	20	25.2	30
VAISA48AC1D		460/3/60	11.4	15	11.4	15	14.0	15	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) - VAISA Air Conditioners with Ventilation Configuration - PowerVent with Motorized Damper & Pressure Relief, up to 450 CFM Outside Air w/Pressure Relief ("J")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA24ACA	208-230/1/60	20.8	30	30.8	35	41.2	45	56.9	60		
VAISA30ACA	208-230/1/60	22.6	35	30.8	35	41.2	45	56.9	60		
VAISA36ACA	208-230/1/60	25.2	35	30.8	35	41.2	45	56.9	60		
VAISA40AC1A	208-230/1/60	30.1	45	32.3	45	42.7	45	58.4	60		
VAISA48AC1A	208-230/1/60	34.1	50	34.1	50	42.7	50	58.4	60		
VAISA24ACC	208-230/3/60	14.3	20	19.8	20	27.3	30	34.9	35	49.9	50
VAISA30ACC	208-230/3/60	17.0	20	19.8	20	27.3	30	34.9	35	49.9	50
VAISA36ACC	208-230/3/60	20.7	30	20.7	30	27.3	30	34.9	35	49.9	50
VAISA40AC1C	208-230/3/60	25.3	35	25.3	35	28.8	35	36.4	40	51.4	60
VAISA48AC1C	208-230/3/60	25.3	35	25.3	35	28.8	35	36.4	40	51.4	60
VAISA24ACD	460/3/60	7.5	15	9.9	15	13.7	15	17.4	20	24.9	25
VAISA30ACD	460/3/60	8.5	15	9.9	15	13.7	15	17.4	20	24.9	25
VAISA36ACD	460/3/60	10.2	15	10.2	15	13.7	15	17.4	20	24.9	25
VAISA40AC1D	460/3/60	11.6	15	11.6	15	14.5	15	18.2	20	25.7	30
VAISA48AC1D	460/3/60	11.9	15	11.9	15	14.5	15	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) - VAISA Air Conditioners with Ventilation Configuration - GreenWheel® Energy Recovery Ventilator ("H")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE 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
VAISA24ACA	208-230/1/60	20.4	30	31.0	35	41.4	45	57.1	60		
VAISA30ACA	208-230/1/60	22.2	35	31.0	35	41.4	45	57.1	60		
VAISA36ACA	208-230/1/60	24.8	40	31.0	40	41.4	45	57.1	60		
VAISA40AC1A	208-230/1/60	29.7	45	32.5	45	42.9	45	58.6	60		
VAISA48AC1A	208-230/1/60	33.7	50	33.7	50	42.9	50	58.6	60		
VAISA24ACC	208-230/3/60	13.9	20	20.0	20	27.5	30	35.1	40	50.1	60
VAISA30ACC	208-230/3/60	16.6	25	20.0	25	27.5	30	35.1	40	50.1	60
VAISA36ACC	208-230/3/60	20.3	30	20.3	30	27.5	30	35.1	40	50.1	60
VAISA40AC1C	208-230/3/60	24.9	35	24.9	35	29.0	35	36.8	40	51.6	60
VAISA48AC1C	208-230/3/60	24.9	35	24.9	35	29.0	35	36.8	40	51.6	60
VAISA24ACD	460/3/60	7.3	15	10.0	15	13.8	15	17.5	20	25.0	25
VAISA30ACD	460/3/60	8.3	15	10.0	15	13.8	15	17.5	20	25.0	25
VAISA36ACD	460/3/60	10.0	15	10.0	15	13.8	15	17.5	20	25.0	25
VAISA40AC1D	460/3/60	11.4	15	11.4	15	14.6	15	18.3	20	25.8	30
VAISA48AC1D	460/3/60	11.7	15	11.7	15	14.6	15	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.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - VAISA Air Conditioners with Ventilation Configuration - GreenCube® Energy Recovery Ventilator ("Q")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE Ph-Hz	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²	MCA ¹	MFS ²
VAISA24ACA	208-230/1/60	23.0	30	33.0	35	43.4	45	59.1	60		
VAISA30ACA	208-230/1/60	24.8	35	33.0	35	43.4	45	59.1	60		
VAISA36ACA	208-230/1/60	27.4	40	33.0	40	43.4	45	59.1	60		
VAISA40AC1A	208-230/1/60	32.3	45	34.5	45	44.9	45	60.6	70		
VAISA48AC1A	208-230/1/60	36.3	50	36.3	50	44.9	50	60.6	70		
VAISA24ACC	208-230/3/60	16.5	20	22.0	25	29.5	30	37.1	40	52.1	60
VAISA30ACC	208-230/3/60	19.2	25	22.0	25	29.5	30	37.1	40	52.1	60
VAISA36ACC	208-230/3/60	22.9	30	22.9	30	29.5	30	37.1	40	52.1	60
VAISA40AC1C	208-230/3/60	27.5	40	27.5	40	31.0	40	38.8	40	53.6	60
VAISA48AC1C	208-230/3/60	27.5	40	27.5	40	31.0	40	38.8	40	53.6	60
VAISA24ACD	460/3/60	8.6	15	11.0	15	14.8	15	18.5	20	26.0	30
VAISA30ACD	460/3/60	9.6	15	11.0	15	14.8	15	18.5	20	26.0	30
VAISA36ACD	460/3/60	11.3	15	11.3	15	14.8	15	18.5	20	26.0	30
VAISA40AC1D	460/3/60	12.7	15	12.7	15	15.6	20	19.3	20	26.8	30
VAISA48AC1D	460/3/60	13.0	15	13.0	15	15.6	20	19.3	20	26.8	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) - VAISA Air Conditioners

Electric Heat		Air Mover ¹ (Amps)				Load of Resistive Heating Elements Only (Amps)				Total Maximum Heating Amps ² (Electric Heat is on a Separate Circuit)															
Basic Model	Voltage Ph-Hz	Config. B & N	Power Vent J	Green Wheel H	Green Cube Q	Heating Element (kW)				Heating Element (kW)				Heating Element (kW)				Heating Element (kW)							
						5	7.5	10	15	5	7.5	10	15	5	7.5	10	15	5	7.5	10	15				
						VAISA24ACA	208-230/1/60	3.8	4.2	4.4	6.4	20.8	31.3	41.7		24.6	35.1	45.5		25.0	35.5	45.9		25.2	35.7
VAISA30ACA	208-230/1/60	3.8	4.2	4.4	6.4	20.8	31.3	41.7		24.6	35.1	45.5		25.0	35.5	45.9		25.2	35.7	46.1		27.2	37.7	48.1	
VAISA36ACA	208-230/1/60	3.8	4.2	4.4	6.4	20.8	31.3	41.7		24.6	35.1	45.5		25.0	35.5	45.9		25.2	35.7	46.1		27.2	37.7	48.1	
VAISA40AC1A	208-230/1/60	5.3	5.7	5.9	7.9	20.8	31.3	41.7		26.1	36.6	47.0		26.5	37.0	47.4		26.7	37.2	47.6		28.7	39.2	49.6	
VAISA48AC1A	208-230/1/60	5.3	5.7	5.9	7.9	20.8	31.3	41.7		26.1	36.6	47.0		26.5	37.0	47.4		26.7	37.2	47.6		28.7	39.2	49.6	
VAISA24ACC	208-230/3/60	3.8	4.2	4.4	6.4	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.2	22.2	28.3	40.3	16.4	22.4	28.5	40.5	18.4	24.4	30.5	42.5
VAISA30ACC	208-230/3/60	3.8	4.2	4.4	6.4	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.2	22.2	28.3	40.3	16.4	22.4	28.5	40.5	18.4	24.4	30.5	42.5
VAISA36ACC	208-230/3/60	3.8	4.2	4.4	6.4	12.0	18.0	24.1	36.1	15.8	21.8	27.9	39.9	16.2	22.2	28.3	40.3	16.4	22.4	28.5	40.5	18.4	24.4	30.5	42.5
VAISA40ACC	208-230/3/60	5.3	5.7	5.9	7.9	12.0	18.0	24.1	36.1	17.3	23.3	29.4	41.4	17.7	23.7	29.8	41.8	17.9	23.9	30.0	42.0	19.9	25.9	32.0	44.0
VAISA48ACC	208-230/3/60	5.3	5.7	5.9	7.9	12.0	18.0	24.1	36.1	17.3	23.3	29.4	41.4	17.7	23.7	29.8	41.8	17.9	23.9	30.0	42.0	19.9	25.9	32.0	44.0
VAISA24ACD	460/3/60	6.1	6.3	6.4	7.4	6.0	9.0	12.0	18.0	12.1	15.1	18.1	24.1	12.3	15.3	18.3	24.3	12.4	15.4	18.4	24.4	13.4	16.4	19.4	25.4
VAISA30ACD	460/3/60	6.9	7.1	7.2	8.2	6.0	9.0	12.0	18.0	12.9	15.9	18.9	24.9	13.1	16.1	19.1	25.1	13.2	16.2	19.2	25.2	14.2	17.2	20.2	26.2
VAISA36ACD	460/3/60	7.1	7.3	7.4	8.4	6.0	9.0	12.0	18.0	13.1	16.1	19.1	25.1	13.3	16.3	19.3	25.3	13.4	16.4	19.4	25.4	14.4	17.4	20.4	26.4
VAISA40ACD	460/3/60	9.6	9.8	9.9	10.9	6.0	9.0	12.0	18.0	15.6	18.6	21.6	27.6	15.8	18.8	21.8	27.8	15.9	18.9	21.9	27.9	16.9	19.9	22.9	28.9
VAISA48ACD	460/3/60	11.9	12.1	12.2	13.2	6.0	9.0	12.0	18.0	17.9	20.9	23.9	29.9	18.1	21.1	24.1	30.1	18.2	21.2	24.2	30.2	19.2	22.2	25.2	31.2

¹Air Mover(s) = Indoor Blower and Ventilation Air Mover(s) Amps. Compressor is not Operating.
²Total Maximum Heating Amps = Total Amps with the Indoor Motor, Ventilation 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 (OAM)				Wheel Drive Motor			
		Volts	Hz/Ph	FLA ¹	HP	Volts	Hz/Ph	FLA	HP	Volts	Hz/Ph	FLA	HP
Motorized Damper	B	n/a	n/a	n/a	n/a	230	60/1	1.0	0.17	n/a	n/a	n/a	n/a
Manual Damper (Standard)	N	n/a	n/a	n/a	n/a	230	60/1	1.0	0.17	n/a	n/a	n/a	n/a
PowerVent with Motorized Damper	J	230	60/1	0.4	0.12	230	60/1	1.0	0.17	n/a	n/a	n/a	n/a
GreenWheel® ERV	H	230	60/1	0.4	0.12	230	60/1	1.0	0.17	230	60/1	0.2	0.01
GreenCube® ERV	Q	230	60/1	0.4	0.12	230	60/1	3.2	1/2	n/a	n/a	n/a	n/a

¹FLA = Full Load Amps 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.

Hot Water Output - Heat Pumps & Air Conditioners

Model	Entering Air Temperature 70°F DB, 60°F WB		HOT WATER HEAT 180°F Entering Water Temperature - Water Flow (GPM)									
			2	4	6	8	10	12	14	16	18	20
VAISA24 (A/C ONLY)	Indoor Air Flow	(CFM)	800									
	Total Capacity	(Btu/Hr)	44,359	56,790	62,475	65,757	67,900	69,412	70,539	71,413	72,111	72,683
	Leaving Air - DB	(°F)	120.5	134.6	141.1	144.8	147.3	149.0	150.3	151.3	152.0	152.7
	Leaving Air - WB	(°F)	75.1	78.6	80.0	80.9	81.4	81.8	82.1	82.3	82.4	82.6
	Leaving Fluid Temp.	(°F)	134.4	150.8	158.6	163.1	166.1	168.1	169.7	170.8	171.8	172.5
	Fluid Delta T	(°F)	45.6	29.2	21.4	16.9	13.9	11.9	10.3	9.2	8.2	7.5
	Water Press. Drop	(Ft - H ₂ O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VAISA30	Indoor Air Flow	(CFM)	1,000									
	Total Capacity	(Btu/Hr)	47,529	62,536	69,762	74,030	76,863	78,887	80,408	81,595	82,549	83,333
	Leaving Air - DB	(°F)	113.3	126.9	133.5	137.4	140.0	141.8	143.2	144.3	145.1	145.8
	Leaving Air - WB	(°F)	73.2	76.7	78.3	79.2	79.8	80.2	80.5	80.8	80.9	81.1
	Leaving Fluid Temp.	(°F)	131.2	147.9	156.1	161.0	164.2	166.5	168.2	169.5	170.6	171.4
	Fluid Delta T	(°F)	48.8	32.1	23.9	19.0	15.8	13.5	11.8	10.5	9.4	8.6
	Water Press. Drop	(Ft - H ₂ O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VAISA36	Indoor Air Flow	(CFM)	1,200									
	Total Capacity	(Btu/Hr)	49,916	67,067	75,662	80,826	84,297	86,800	88,693	90,179	91,378	92,367
	Leaving Air - DB	(°F)	107.9	120.9	127.4	131.3	133.9	135.8	137.3	138.4	139.3	140.1
	Leaving Air - WB	(°F)	71.8	75.2	76.8	77.8	78.4	78.8	79.2	79.4	79.6	79.8
	Leaving Fluid Temp.	(°F)	128.7	145.6	154.1	159.2	162.7	165.1	167.0	168.4	169.6	170.5
	Fluid Delta T	(°F)	51.3	34.4	25.9	20.8	17.3	14.9	13.0	11.6	10.4	9.5
	Water Press. Drop	(Ft - H ₂ O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VAISA40	Indoor Air Flow	(CFM)	1,300									
	Total Capacity	(Btu/Hr)	50,903	69,001	78,218	83,797	87,569	90,297	92,368	93,977	95,313	96,401
	Leaving Air - DB	(°F)	105.6	118.3	124.8	128.7	131.3	133.2	134.7	135.8	136.7	142.8
	Leaving Air - WB	(°F)	71.2	74.5	76.2	77.1	77.8	78.2	78.6	78.8	79.1	80.4
	Leaving Fluid Temp.	(°F)	127.7	144.6	153.2	158.5	162.0	164.5	166.4	167.9	169.1	171.0
	Fluid Delta T	(°F)	52.3	35.4	26.8	21.5	18.0	15.5	13.6	12.1	10.9	9.0
	Water Press. Drop	(Ft - H ₂ O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4
VAISA48	Indoor Air Flow	(CFM)	1,500									
	Total Capacity	(Btu/Hr)	52,575	72,363	82,703	89,070	93,405	96,561	98,969	100,870	102,412	103,688
	Leaving Air - DB	(°F)	101.9	113.9	120.2	124.0	126.7	128.6	130.1	131.2	132.1	132.9
	Leaving Air - WB	(°F)	70.1	73.4	75.0	76.0	76.7	77.1	77.5	77.8	78.0	78.2
	Leaving Fluid Temp.	(°F)	126.0	142.8	151.7	157.1	160.8	163.5	165.5	167.1	168.3	169.4
	Fluid Delta T	(°F)	54.0	37.2	28.3	22.9	19.2	16.5	14.5	12.9	11.7	10.6
	Water Press. Drop	(Ft - H ₂ O)	0.2	0.6	1.3	1.7	3.7	5.3	7.2	9.3	11.7	14.4

Shipping Weight (pounds)

BASIC MODEL	24 (A/C)	30	36	40	48
VOLTAGE - 230	1020	1020	1020	1030	1045
VOLTAGE - 460	1045	1045	1045	1055	1070

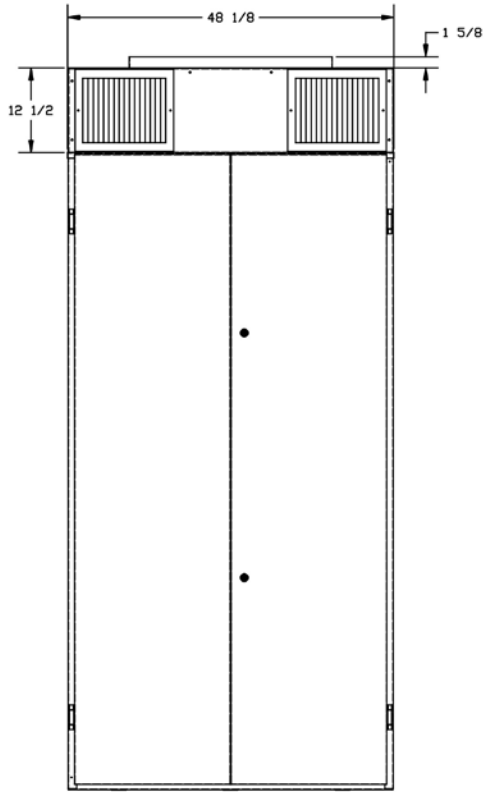
Air Filters

	Qty per unit	Size	Type	MERV ¹ Rating
Return Air Filter	2	46" x 24" x 2"	Pleated, disposable	7 ²
Fresh Air Ventilation Filter	1	12" x 20" x 1"	Fiberglass, disposable	N/A
Exhaust Air Ventilation Filter	1	12" x 20" x 1"	Fiberglass, disposable	N/A

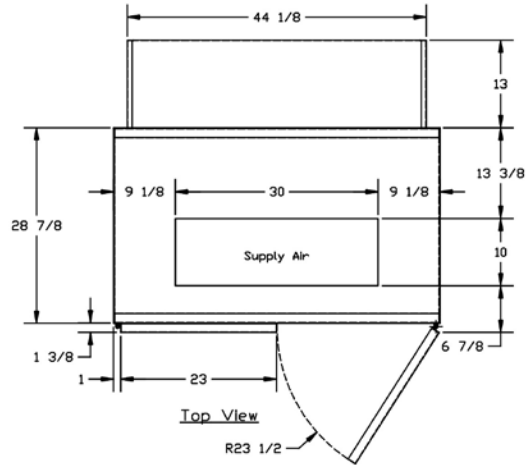
¹MERV = Minimum Efficiency Reporting Value

²Standard return air filter has MERV rating of 7. Optional filters are available with MERV ratings of 8 and 13.

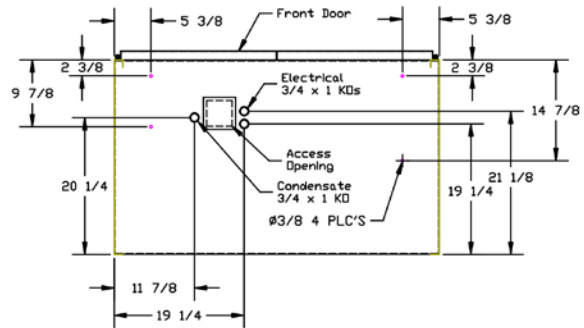
DIMENSIONAL DATA FOR VAISA24-48 - AXIAL FAN (IN INCHES)



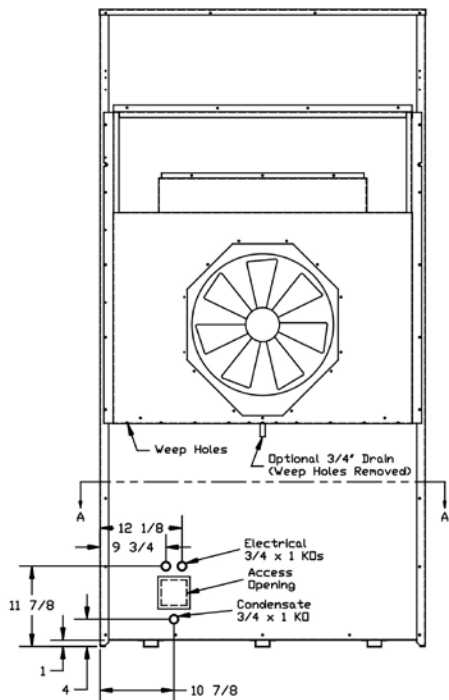
Front View



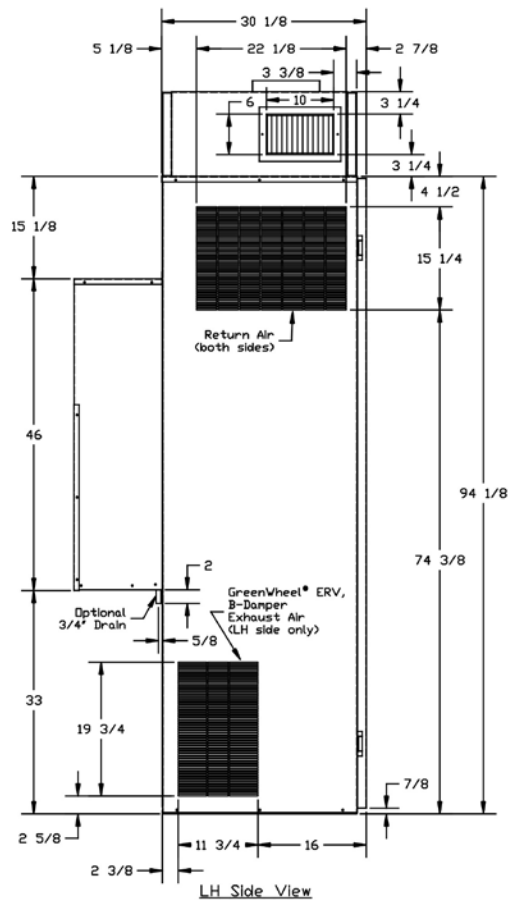
Top View



Section A-A

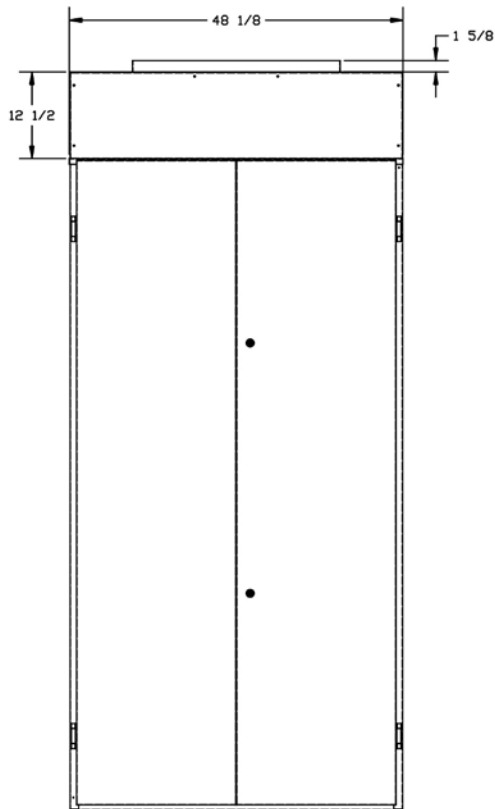


Rear View

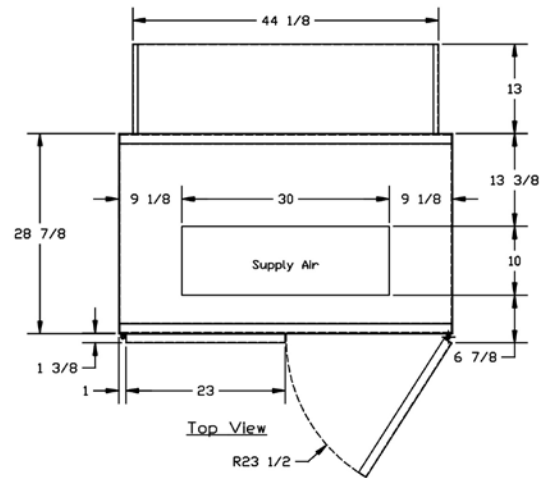


LH Side View

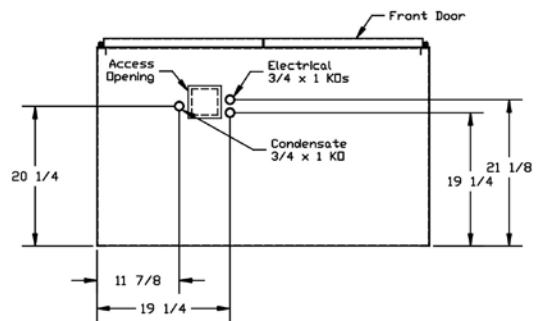
DIMENSIONAL DATA FOR VAISA24-48 - BLOWER (IN INCHES)



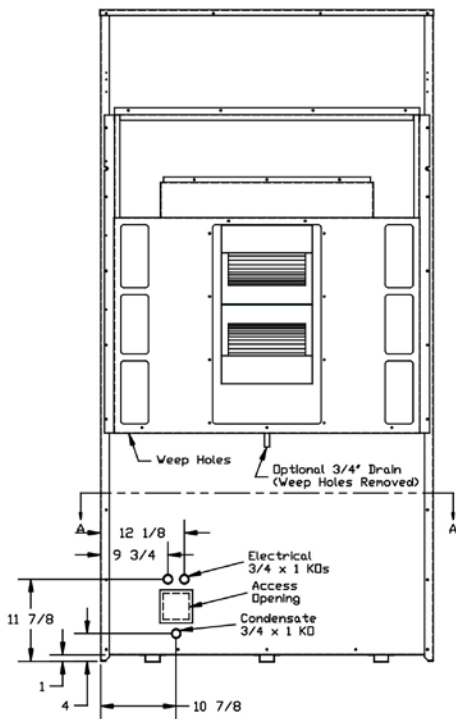
Front View



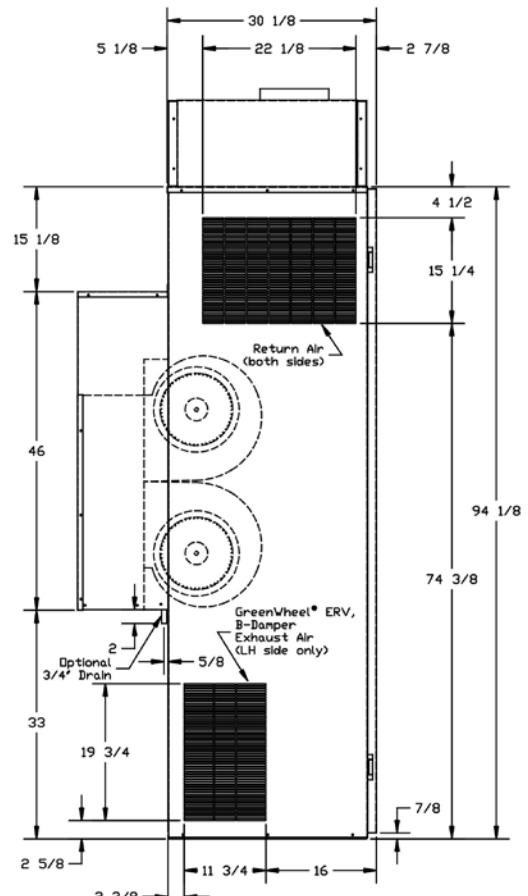
Top View



Section A-A

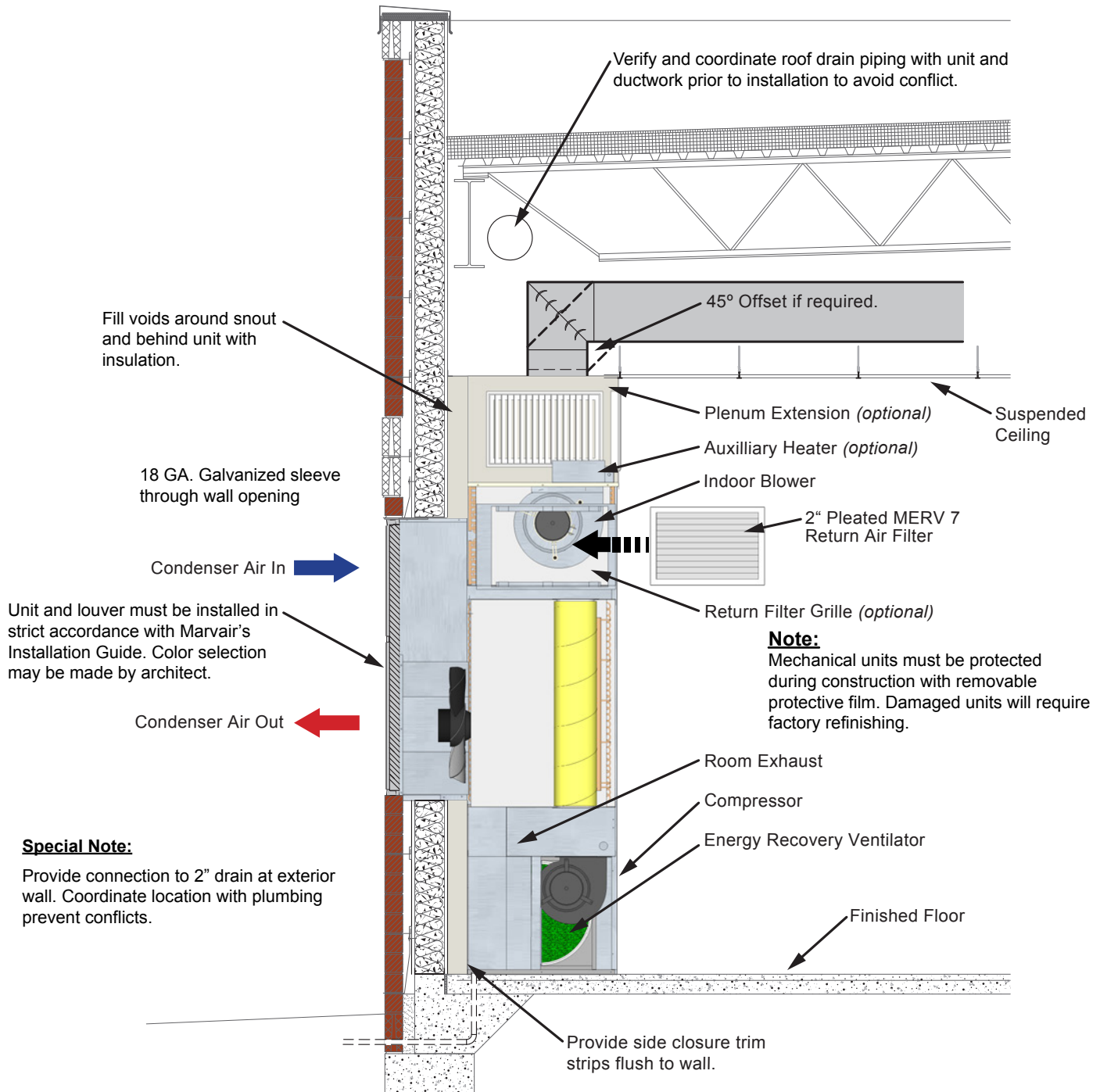


Rear View



LH Side View

TYPICAL INSTALLATION DETAIL



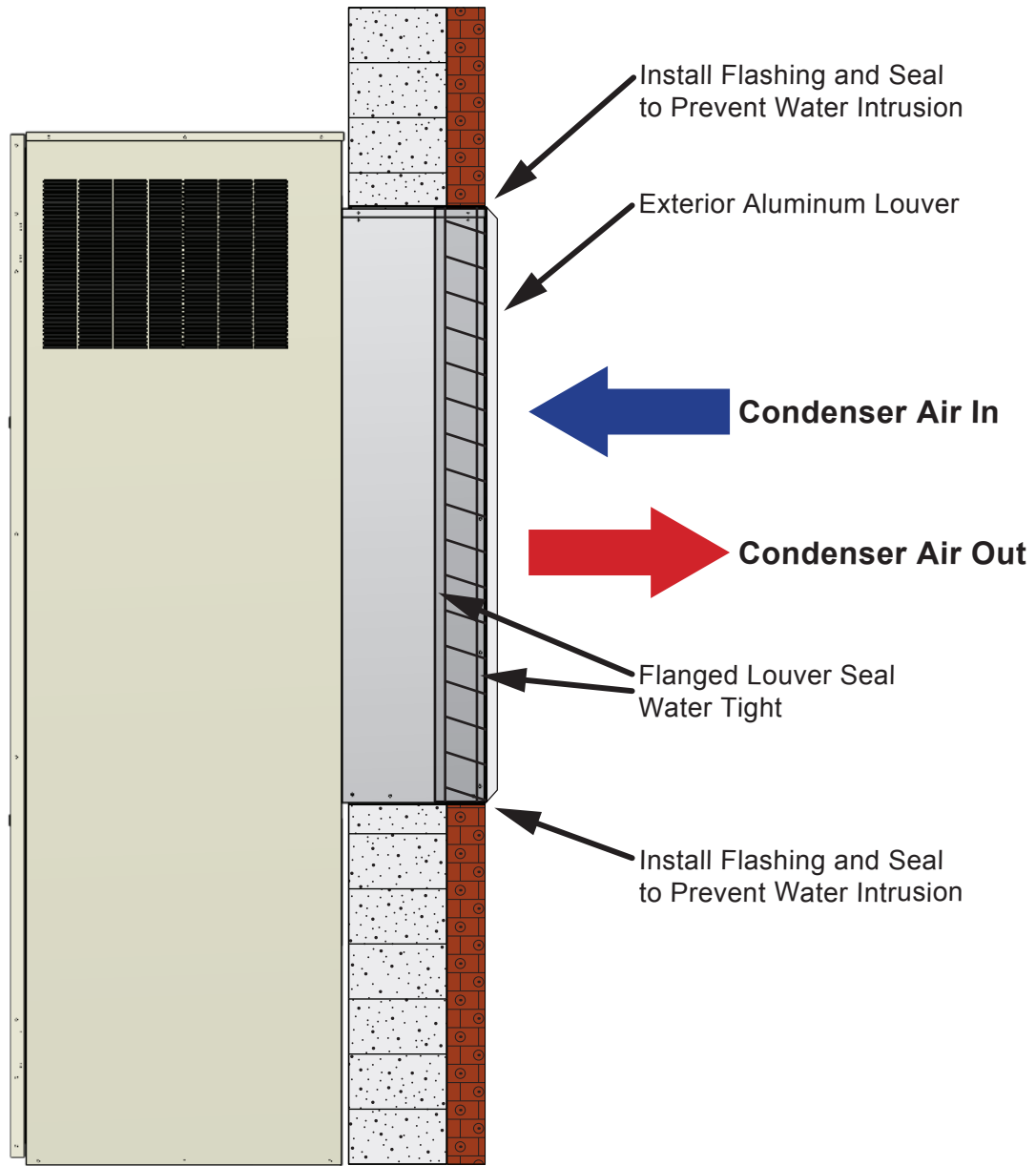
Special Note:

Provide connection to 2" drain at exterior wall. Coordinate location with plumbing prevent conflicts.

Note:

1. Coordinate installation of unit with general contractor for a complete and airtight installation. Caulk unit casing to wall.
2. Installation of the louver must be performed by the mechanical contractor and caulked by the general contractor
3. Provide blank off panel on rear of louver to seal off unused portion of louver.

WALL MOUNTED LOUVER DETAIL



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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