

## Scholar QV™ Heat Pumps & Air Conditioners 2 to 5 Tons

### Models VACA24-30-36-40-49-60 (1-Stage Compressor) and VACSA36-40-49-60 (2-Stage Compressor)

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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.

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 in cooling capacities from 2 to 5 tons with 1-stage compressor and 3 to 5 tons with the 2-stage compressor. 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, 2nd edition and listed by ETL.

R-410A  
Refrigerant



Scholar QV Heat Pump with  
Free Blow Plenum



## Scholar QV Difference

Since its 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 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.
  - 1-stage or 2-stage 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),
  - ¼" closed cell insulation wrapped around the perimeter and interior of the outdoor air box to minimize sound transmission from the unit to the building, and
  - 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 

- **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. Finally, by selecting a heat pump that uses R-410A, you will avoid the risk associated with purchasing a product that is destined to become obsolete.
- **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.

- **2-Stage Compressor.** The VACSA models of Scholar QV heat pumps and air conditioners are available with 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 16 for performance data on the two stage compressor units. 
- **GreenWheel® 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.

## 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.

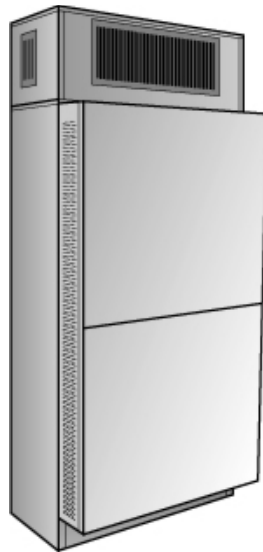
## Rugged Cabinet Construction

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.

## 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.



Freeblow Scholar QV™ A/C with Sound Panels

**Coastal Installations.** For installation in coastal areas where salt corrosion may be a problem, the Scholar QV™ air conditioner or heat pump may be ordered with a stainless steel drain pan for the outdoor coil and a corrosion resistant coating on the coil.

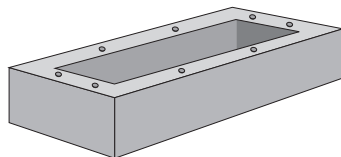
## Service and Maintenance

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 panels.

## 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 4", 5", 6" or 8" high base is the same dimension as the Scholar QV™ cabinet and raises the cabinet off the floor for custodial purposes. The base stand matches the color of the unit.



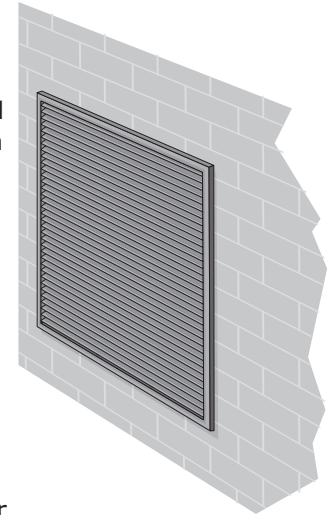
Base Stand

**1Ø or 3Ø Single Point Power Entry.** Dual circuit units connect to a single power entry.

## Exterior Louver and Collar

**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 Louver/Collar louvers.



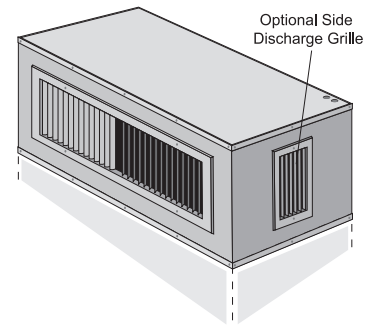
Louver/Collar

**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.

## Air Distribution Options

**Freeblow Air Distribution** is 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 height available up to 40".

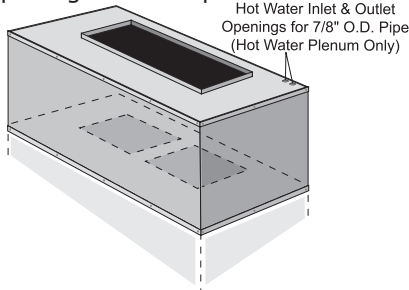


Optional Side Discharge Grille





**Ducted Air Distribution** is 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 23 shows the relationship between CFM and ESP for various ducted distribution systems. Use with Scholar QV™ unit's with no heat or electric resistance heat.



## Dehumidification

**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.)

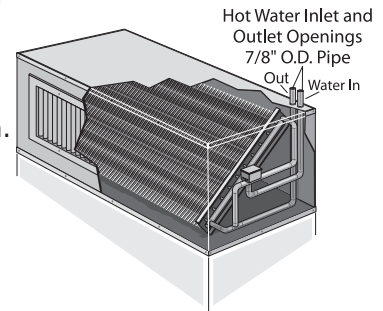
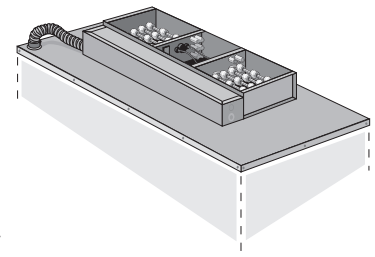
## Electric Resistance and Hot Water Heat

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** is installed 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** is installed above the indoor air blowers. Hot water coil capacities for the Scholar QV™ models are shown on page 6. 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.



## Ventilation Options

### Manual Fresh Air Damper with Pressure Relief (Standard). Ventilation Configuration "N".

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

### Motorized Fresh Air Damper with Pressure Relief (Optional). Ventilation Configuration "B".

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 a ventilation intake blower and a fan speed controller for the blower. Pressure relief is standard.

### 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 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.

### GreenWheel® ERV Ventilation (Optional). Ventilation Configuration "H".

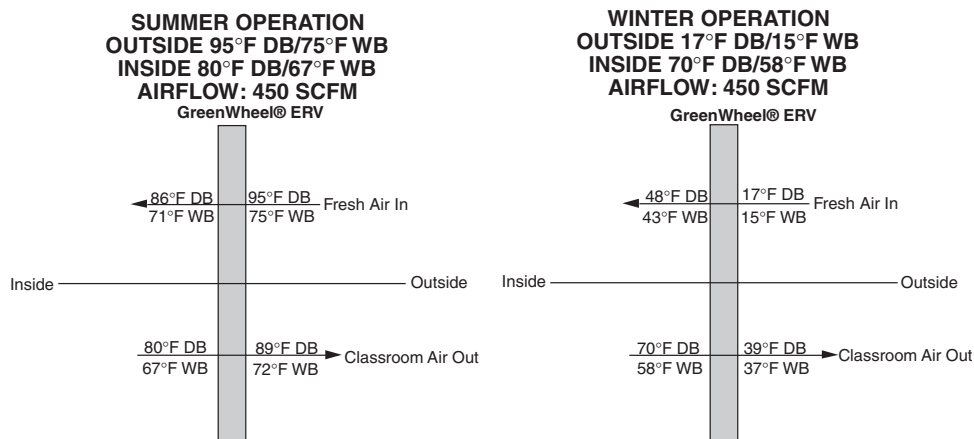
The Marvair® GreenWheel® ERV is a total energy (both sensible and latent) wheel that reduces both construction and operating cost while ventilating the classroom to ASHRAE 62-1999 requirements. The use of the GreenWheel ERV reduces the energy load of the outside air. Exhausting stale, inside air keeps 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	95° DB/73° WB Outside 80° DB/67° WB Inside Energy Conserved, BTUH			95° DB/80° WB Outside 80° DB/67° WB Inside Energy Conserved, BTUH		
	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	90° DB/74° WB Outside 75° DB/64° WB Inside Energy Conserved, BTUH			80° DB/70° WB Outside 75° DB/64° WB Inside Energy Conserved, BTUH			60° DB/54° WB Outside 70° DB/58° WB Inside Energy Conserved, BTUH		
	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	40° DB/36° WB Outside 70° DB/58° WB Inside Energy Conserved, BTUH			20° DB/18° WB Outside 70° DB/58° WB Inside Energy Conserved, BTUH			0° DB/7° WB Outside 70° DB/58° WB Inside Energy Conserved, BTUH		
	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.

## Optional Ventilation Controls

**Demand Control Ventilation.** A field or factory installed carbon dioxide sensor controls the ventilation damper and only opens the damper when CO<sub>2</sub> 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 CO<sub>2</sub> 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 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** with 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 QV™ air conditioner or heat pump 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.

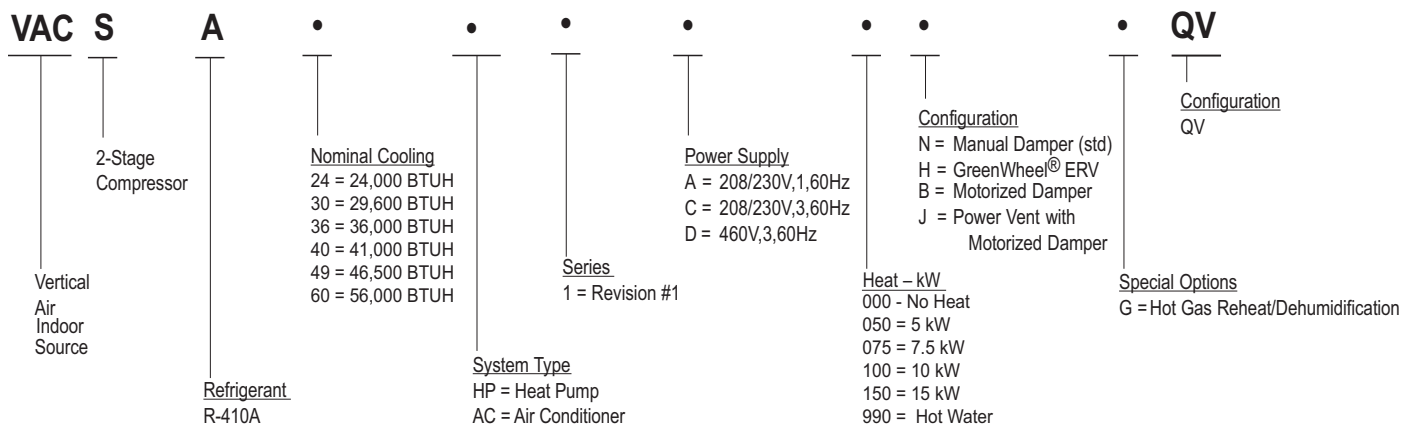
**Defrost Control:** Based upon time and temperature. The time interval can be adjustable from 30 to 90 minutes in one minute increments. The control system initiates a defrost cycle only if the outdoor coil temperature is 28°F or below. (*Heat pump only.*)

**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.*)

## Model Identification



**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

**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.

**Condensate Pan and Freeze Protection.** To prevent freezing of water in the condensate lines and in the drain pan, this kit should be installed in locales subject to freezing temperatures. The kit includes heaters for both the pan and condensate line.

**Anti-microbial light.** A germicidal UV light destroys toxic bacteria, viruses and mold on the indoor air coil. A field or factory installed option.



## Certified Efficiency & Capacity Ratings @ ANSI/AHRI Standard 390 - Heat Pumps & Air Conditioners with Single Stage Compressor

MODEL NUMBER	VACA24	VACA30	VACA36	VACA40	VACA49	VACA60
Cooling (BTUH) <sup>1</sup>	24,000	29,600	35,000	39,500	46,000	54,000
EER <sup>2</sup>	9.40	9.00	9.10	9.00	9.25	9.15
High Temperature Heating <sup>3</sup>	20,600	25,600	30,000	36,600	40,000	51,000
High Temperature COP <sup>4</sup>	3.00	3.00	3.00	3.00	3.00	3.00
Rated Air Flow (CFM) <sup>5</sup>	800	1,000	1,200	1,300	1,750	1,850
ESP <sup>6</sup> @ Rated Conditions	0.10	0.15	0.15	0.15	0.20	0.20

<sup>1</sup>Cooling 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.

<sup>2</sup>EER=Energy Efficiency Ratio

<sup>3</sup>High Temperature Heating & 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.

<sup>4</sup>COP=Coefficient of Performance (Heat Pumps only)

<sup>5</sup>CFM=Cubic Feet per Minute

<sup>6</sup>ESP=External Static Pressure

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 Heat Pumps & Air Conditioners with Single Stage Compressor

MODEL NUMBER	VACA24	VACA30	VACA36	VACA40	VACA49	VACA60
Total Capacity	24,000	29,600	35,000	39,500	46,000	54,000
Sensible Heat Ratio	0.71	0.69	0.68	0.68	0.72	0.67
Sensible Capacity	17,125	20,415	23,800	26,915	33,120	36,445
Rated Air Flow (CFM) <sup>1</sup>	800	1,000	1,200	1,300	1,750	1,850

<sup>1</sup>CFM=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 Heat Pumps & Air Conditioners with Single Stage Compressor

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	
VACA24	27,840	26,880	25,920	24,960	24,000	23,040	22,080	21,120	20,640	
VACA30	34,340	33,150	31,970	30,790	29,600	28,420	27,230	26,050	25,460	
VACA36	40,600	39,200	37,800	36,400	35,000	33,600	32,200	30,800	30,100	
VACA40	45,820	44,240	42,660	41,080	39,500	37,920	36,340	34,760	33,970	
VACA49	53,360	51,520	49,680	47,840	46,000	44,160	42,320	40,480	39,560	
VACA60	62,640	60,480	58,320	56,160	54,000	51,840	49,680	47,520	49,440	

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 Heat Pumps with Single Stage Compressor

MODEL NUMBER		OUTDOOR TEMPERATURE									
		0°F / -17.8°C	10°F / -12.2°C	15°F / -9.4°C	20°F / -6.7°C	30°F / -1.1°C	40°F / 4.4°C	47°F / 8.3°C	50°F / 10°C	60°F / 15.6°C	
VACA24HP1	BTUH	10,080	12,960	14,400	15,840	18,720	21,600	24,000	24,480	27,360	
	COP	1.56	1.91	2.07	2.22	2.52	2.78	3.00	3.03	3.26	
VACA30HP1	BTUH	12,430	15,980	17,760	19,540	23,090	26,640	29,600	30,190	31,970	
	COP	1.56	1.91	2.07	2.23	2.52	2.78	3.00	3.03	3.26	
VACA36HP1	BTUH	14,700	18,900	21,000	23,100	27,300	31,500	35,000	35,700	39,900	
	COP	1.56	1.91	2.07	2.22	2.52	2.78	3.00	3.03	3.26	
VACA40HP1	BTUH	16,950	21,330	23,700	26,070	30,810	35,550	39,500	40,290	45,030	
	COP	1.55	1.91	2.07	2.22	2.52	2.78	3.00	3.03	3.26	
VACA49HP	BTUH	16,800	21,600	24,000	26,400	31,200	36,000	40,000	40,800	45,600	
	COP	1.56	1.91	2.07	2.23	2.52	2.79	3.00	3.03	3.26	
VACA60HP	BTUH	21,420	27,540	30,600	33,660	39,780	45,900	51,000	52,020	58,140	
	COP	1.56	1.91	2.07	2.23	2.52	2.78	3.00	3.03	3.26	

Based upon ANSI/AHRI std. 390 return air of 70°F DB (21.1°C). Return air at rated airflow.



# ELECTRICAL DATA FOR VACA HEAT PUMPS WITH SINGLE STAGE COMPRESSORS

## Electrical Characteristics - Compressor, Fan, Ventilation & Blower Motors - VACA Heat Pumps with Single Stage Compressor

MODEL NUMBER	COMPRESSOR				OUTDOOR FAN MOTOR				INDOOR FAN MOTOR				GREENWHEEL® ERV	
	VOLTS / HZ / PH	RLA <sup>1</sup>	LRA <sup>2</sup>	MCC <sup>3</sup>	VOLTS / HZ / PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS / HZ / PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS	RLA <sup>1</sup>
VACA24HP1A	208/230-60-1	12.8	64.0	20.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30HP1A	208/230-60-1	14.1	77.0	22.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36HP1A	208/230-60-1	17.9	112.0	28.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40HP1A	208/230-60-1	19.8	109.0	31.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49HPA	208/230-60-1	21.8	117.0	34.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60HPA	208/230-60-1	26.2	134.0	41.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA24HP1C	208/230-60-3	8.3	61.0	13.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30HP1C	208/230-60-3	9.0	71.0	14.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36HP1C	208/230-60-3	13.2	88.0	20.6	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40HP1C	208/230-60-3	13.6	83.1	21.2	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49HPC	208/230-60-3	13.7	83.1	21.4	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60HPC	208/230-60-3	15.6	111.0	24.4	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA24HP1D	460-60-3	5.1	28.0	8.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30HP1D	460-60-3	5.6	38.0	8.8	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36HP1D	460-60-3	6.0	44.0	9.3	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40HP1D	460-60-3	6.1	41.0	9.5	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49HPD	460-60-3	6.2	41.0	9.7	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60HPD	460-60-3	7.7	52.0	12.1	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2

<sup>1</sup>RLA = Rated Load Amps      <sup>2</sup>LRA = Locked Rotor Amps      <sup>3</sup>MCC = Maximum Continuous Current      <sup>4</sup>RPM = Revolutions per Minute  
<sup>5</sup>FLA = Full Load Amps      <sup>6</sup>HP = Horsepower  
The 460 volt units have a step down transformer for the 230 volt motors.

## Summary Electrical Ratings (Wire Sizing) - VACA Heat Pumps with Single Stage Compressor Manual Damper with Fresh Air Intake Blower ("N") or Motorized Damper with Fresh Air Intake Blower ("B") Fresh Air Vent Configuration

ELECTRIC HEAT		000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
MODEL NUMBER	VOLTS-Ph-Hz	CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24HP1A	208-230/1/60	21.7	30	47.7	50	n/a	n/a	41.3	45	19.6	20	47.7	50	26.0	30	n/a	n/a	n/a	n/a
VACA30HP1A	208-230/1/60	23.3	35	49.3	50	n/a	n/a	42.9	45	19.6	20	49.3	50	26.0	30	n/a	n/a	n/a	n/a
VACA36HP1A	208-230/1/60	28.1	45	54.1	60	n/a	n/a	47.6	50	19.6	20	54.1	60	26.0	30	n/a	n/a	n/a	n/a
VACA40HP1A	208-230/1/60	30.5	50	56.5	60	n/a	n/a	50.0	60	19.6	20	56.5	60	26.0	30	n/a	n/a	n/a	n/a
VACA49HPA	208-230/1/60	35.5	50	35.5	50	26.0	30	35.5	50	39.1	40	35.5	50	52.1	60	n/a	n/a	n/a	n/a
VACA60HPA	208-230/1/60	41.0	60	41.0	60	26.0	30	41.0	60	39.1	40	41.0	60	52.1	60	n/a	n/a	n/a	n/a
VACA24HP1C	208-230/3/60	16.1	20	31.1	35	n/a	n/a	38.6	40	n/a	n/a	46.2	50	n/a	n/a	38.6	40	22.5	25
VACA30HP1C	208-230/3/60	17.0	25	32.0	35	n/a	n/a	39.5	40	n/a	n/a	47.1	50	n/a	n/a	39.5	40	22.5	25
VACA36HP1C	208-230/3/60	22.2	35	37.2	40	n/a	n/a	44.7	45	n/a	n/a	52.3	60	n/a	n/a	44.7	45	22.5	25
VACA40HP1C	208-230/3/60	22.7	35	37.7	40	n/a	n/a	45.2	50	n/a	n/a	52.8	60	n/a	n/a	45.2	50	22.5	25
VACA49HPC	208-230/3/60	25.3	35	40.3	45	n/a	n/a	47.8	50	n/a	n/a	55.5	60	n/a	n/a	25.3	35	45.1	50
VACA60HPC	208-230/3/60	27.7	40	42.7	45	n/a	n/a	50.2	60	n/a	n/a	27.7	40	30.1	35	27.7	40	45.1	50
VACA24HP1D	460/3/60	9.2	15	16.7	20	n/a	n/a	20.5	25	n/a	n/a	24.2	25	n/a	n/a	31.7	35	n/a	n/a
VACA30HP1D	460/3/60	9.9	15	17.4	20	n/a	n/a	21.1	25	n/a	n/a	24.9	25	n/a	n/a	32.4	35	n/a	n/a
VACA36HP1D	460/3/60	10.4	15	17.9	20	n/a	n/a	21.6	25	n/a	n/a	25.4	30	n/a	n/a	32.9	35	n/a	n/a
VACA40HP1D	460/3/60	10.5	15	18.0	20	n/a	n/a	21.7	25	n/a	n/a	25.5	30	n/a	n/a	33.0	35	n/a	n/a
VACA49HPD	460/3/60	11.9	20	19.4	20	n/a	n/a	23.1	25	n/a	n/a	26.9	30	n/a	n/a	34.4	35	n/a	n/a
VACA60HPD	460/3/60	13.7	20	21.2	25	n/a	n/a	25.0	30	n/a	n/a	28.7	30	n/a	n/a	36.2	40	n/a	n/a

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 for sizing conductors.  
<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)  
<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.  
MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACA Heat Pumps with Single Stage Compressor PowerVent - Ventilation Configuration ("J")

ELECTRIC HEAT		000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
MODEL NUMBER	VOLTAGE-Ph-Hz	CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24HP1A	208-230/1/60	22.7	35	48.4	50	n/a	n/a	42.0	45	19.6	20	48.4	50	26.0	30	n/a	n/a	n/a	n/a
VACA30HP1A	208-230/1/60	24.3	35	50.0	60	n/a	n/a	43.6	45	19.6	20	50.0	60	26.0	30	n/a	n/a	n/a	n/a
VACA36HP1A	208-230/1/60	29.1	45	54.8	60	n/a	n/a	48.3	50	19.6	20	54.8	60	26.0	30	n/a	n/a	n/a	n/a
VACA40HP1A	208-230/1/60	31.5	50	57.2	60	n/a	n/a	50.7	60	19.6	20	57.2	60	26.0	30	n/a	n/a	n/a	n/a
VACA49HPA	208-230/1/60	36.5	50	36.5	50	26.0	30	36.5	50	39.1	40	36.5	50	52.1	60	n/a	n/a	n/a	n/a
VACA60HPA	208-230/1/60	42.0	60	42.0	60	26.0	30	42.0	60	39.1	40	42.0	60	52.1	60	n/a	n/a	n/a	n/a
VACA24HP1C	208-230/3/60	17.1	25	31.8	35	n/a	n/a	39.3	40	n/a	n/a	46.9	50	n/a	n/a	39.3	40	22.5	25
VACA30HP1C	208-230/3/60	18.0	25	32.7	35	n/a	n/a	40.2	45	n/a	n/a	47.8	50	n/a	n/a	40.2	45	22.5	25
VACA36HP1C	208-230/3/60	23.2	35	37.9	40	n/a	n/a	45.4	50	n/a	n/a	53.0	60	n/a	n/a	45.4	50	22.5	25
VACA40HP1C	208-230/3/60	23.7	35	38.4	40	n/a	n/a	45.9	50	n/a	n/a	53.5	60	n/a	n/a	45.9	50	22.5	25
VACA49HPC	208-230/3/60	26.3	35	41.3	45	n/a	n/a	48.8	50	n/a	n/a	56.5	60	n/a	n/a	26.3	35	45.1	50
VACA60HPC	208-230/3/60	28.7	40	43.7	45	n/a	n/a	51.2	60	n/a	n/a	28.7	40	30.1	35	28.7	40	45.1	50
VACA24HP1D	460/3/60	9.7	15	17.2	20	n/a	n/a	21.2	25	n/a	n/a	24.9	25	n/a	n/a	32.4	35	n/a	n/a
VACA30HP1D	460/3/60	10.4	15	17.9	20	n/a	n/a	21.8	25	n/a	n/a	25.6	30	n/a	n/a	32.9	35	n/a	n/a
VACA36HP1D	460/3/60	10.9	15	18.4	20	n/a	n/a	22.3	25	n/a	n/a	26.1	30	n/a	n/a	33.4	35	n/a	n/a
VACA40HP1D	460/3/60	11.0	15	18.5	20	n/a	n/a	22.4	25	n/a	n/a	26.2	30	n/a	n/a	33.5	35	n/a	n/a
VACA49HPD	460/3/60	12.4	20	19.9	20	n/a	n/a	23.6	25	n/a	n/a	27.4	30	n/a	n/a	34.9	35	n/a	n/a
VACA60HPD	460/3/60	14.2	20	21.7	25	n/a	n/a	25.5	30	n/a	n/a	29.2	30	n/a	n/a	36.7	40	n/a	n/a

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACA Heat Pumps with Single Stage Compressor GreenWheel® ERV - Ventilation Configuration ("H")

ELECTRIC HEAT		000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
MODEL NUMBER	VOLTAGE-Ph-Hz	CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24HP1A	208-230/1/60	22.9	35	48.6	50	n/a	n/a	42.2	45	19.6	20	48.6	50	26.0	30	n/a	n/a	n/a	n/a
VACA30HP1A	208-230/1/60	24.5	35	50.2	60	n/a	n/a	43.8	45	19.6	20	50.2	60	26.0	30	n/a	n/a	n/a	n/a
VACA36HP1A	208-230/1/60	29.3	45	55.0	60	n/a	n/a	48.5	50	19.6	20	55.0	60	26.0	30	n/a	n/a	n/a	n/a
VACA40HP1A	208-230/1/60	31.7	50	57.4	60	n/a	n/a	50.9	50	19.6	20	57.4	60	26.0	30	n/a	n/a	n/a	n/a
VACA49HPA	208-230/1/60	36.7	50	36.7	50	26.0	30	36.7	50	39.1	40	36.7	50	52.1	60	n/a	n/a	n/a	n/a
VACA60HPA	208-230/1/60	42.2	60	42.2	60	26.0	30	42.2	60	39.1	40	42.2	60	52.1	60	n/a	n/a	n/a	n/a
VACA24HP1C	208-230/3/60	17.3	25	32.0	35	n/a	n/a	39.5	40	n/a	n/a	47.1	50	n/a	n/a	39.5	40	22.5	25
VACA30HP1C	208-230/3/60	18.2	25	32.9	35	n/a	n/a	40.4	45	n/a	n/a	48.0	50	n/a	n/a	40.4	45	22.5	25
VACA36HP1C	208-230/3/60	23.4	35	38.1	40	n/a	n/a	45.6	50	n/a	n/a	53.2	60	n/a	n/a	45.6	50	22.5	25
VACA40HP1C	208-230/3/60	23.9	35	38.6	40	n/a	n/a	46.1	50	n/a	n/a	53.7	60	n/a	n/a	46.1	50	22.5	25
VACA49HPC	208-230/3/60	26.5	35	41.5	45	n/a	n/a	49.0	50	n/a	n/a	56.7	60	n/a	n/a	26.5	35	45.1	50
VACA60HPC	208-230/3/60	28.9	40	43.9	45	n/a	n/a	51.4	60	n/a	n/a	28.9	40	30.1	35	28.9	40	45.1	50
VACA24HP1D	460/3/60	9.8	15	17.3	20	n/a	n/a	21.3	25	n/a	n/a	25.0	30	n/a	n/a	32.5	35	n/a	n/a
VACA30HP1D	460/3/60	10.5	15	18.0	20	n/a	n/a	21.9	25	n/a	n/a	25.7	30	n/a	n/a	33.0	35	n/a	n/a
VACA36HP1D	460/3/60	11.0	15	18.5	20	n/a	n/a	22.4	25	n/a	n/a	26.2	30	n/a	n/a	33.5	35	n/a	n/a
VACA40HP1D	460/3/60	11.1	15	18.6	20	n/a	n/a	22.5	25	n/a	n/a	26.3	30	n/a	n/a	33.6	35	n/a	n/a
VACA49HPD	460/3/60	12.5	20	20.0	25	n/a	n/a	23.7	25	n/a	n/a	27.5	30	n/a	n/a	35.0	40	n/a	n/a
VACA60HPD	460/3/60	14.3	20	21.8	25	n/a	n/a	25.6	30	n/a	n/a	29.3	30	n/a	n/a	36.8	40	n/a	n/a

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

# Unit Load Amps (Heating) - VACA Heat Pumps with Single Stage Compressor

MODEL NUMBER	VOLTAGE PHASE HERTZ	HEAT PUMP AMPS (MAX)			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL MAXIMUM HEATING AMPS											
		VENT. CONFIGURATION			5 kW	7.5 kW	10 kW	15 kW	VENT. CONFIGURATION B <sup>1</sup> , N <sup>2</sup>				VENT. CONFIGURATION J <sup>3</sup>				VENT. CONFIGURATION H <sup>4</sup>			
		B <sup>1</sup> , N <sup>2</sup>	J <sup>3</sup>	H <sup>4</sup>					5 kW	7.5 Kw	10 Kw	15 Kw	5 kW	7.5 Kw	10 Kw	15 Kw	5 kW	7.5 Kw	10 Kw	15 Kw
VACA24HP1A	208-230/1/60	18.5	19.5	19.7	20.8	31.3	41.7	n/a	39.3	49.8	60.2	n/a	40.3	50.8	61.2	n/a	40.5	51.0	61.4	n/a
VACA30HP1A	208-230/1/60	19.8	20.8	21.0	20.8	31.3	41.7	n/a	40.6	51.1	61.5	n/a	41.6	52.1	62.5	n/a	41.8	52.3	62.7	n/a
VACA36HP1A	208-230/1/60	23.6	24.6	24.8	20.8	31.3	41.7	n/a	44.4	54.9	65.3	n/a	45.4	55.9	66.3	n/a	45.6	56.1	66.5	n/a
VACA40HP1A	208-230/1/60	25.5	26.5	26.7	20.8	31.3	41.7	n/a	46.3	56.8	67.2	n/a	47.3	57.8	68.2	n/a	47.5	58.0	68.4	n/a
VACA49HPA	208-230/1/60	29.9	30.9	31.1	20.8	31.3	41.7	n/a	50.7	61.2	71.6	n/a	51.7	62.2	72.6	n/a	51.9	62.4	72.8	n/a
VACA60HPA	208-230/1/60	34.3	35.3	35.5	20.8	31.3	41.7	n/a	55.1	65.6	76.0	n/a	56.1	66.6	77.0	n/a	56.3	66.8	77.2	n/a
VACA24HP1C	208-230/3/60	14.0	15.0	15.2	12.0	18.0	24.1	36.1	26.0	32.0	38.1	50.1	27.0	33.0	39.1	51.1	27.2	33.2	39.3	51.3
VACA30HP1C	208-230/3/60	14.7	15.7	15.9	12.0	18.0	24.1	36.1	26.7	32.7	38.8	50.8	27.7	33.7	39.8	51.8	27.9	33.9	40.0	52.0
VACA36HP1C	208-230/3/60	18.7	19.7	19.9	12.0	18.0	24.1	36.1	30.7	36.7	42.8	54.8	31.7	37.7	43.8	55.8	31.9	37.9	44.0	56.0
VACA40HP1C	208-230/3/60	19.3	20.3	20.5	12.0	18.0	24.1	36.1	31.3	37.3	43.4	55.4	32.3	38.3	44.4	56.4	32.5	38.5	44.6	56.6
VACA49HPC	208-230/3/60	21.8	22.8	23.0	12.0	18.0	24.1	36.1	33.8	39.8	45.9	57.9	34.8	40.8	46.9	58.9	35.0	41.0	47.1	59.1
VACA60HPC	208-230/3/60	23.7	24.7	24.9	12.0	18.0	24.1	36.1	35.7	41.7	47.8	59.8	36.7	42.7	48.8	60.8	36.9	42.9	49.0	61.0
VACA24HP1D	460/3/60	8.0	8.5	8.6	6.0	9.0	12.0	18.0	14.0	17.0	20.0	26.0	14.5	17.5	20.5	26.5	14.6	17.6	20.6	26.6
VACA30HP1D	460/3/60	8.5	9.0	9.1	6.0	9.0	12.0	18.0	14.5	17.5	20.5	26.5	15.0	18.0	21.0	27.0	15.1	18.1	21.1	27.1
VACA36HP1D	460/3/60	8.9	9.4	9.5	6.0	9.0	12.0	18.0	14.9	17.9	20.9	26.9	15.4	18.4	21.4	27.4	15.5	18.5	21.5	27.5
VACA40HP1D	460/3/60	9.0	9.5	9.6	6.0	9.0	12.0	18.0	15.0	18.0	21.0	27.0	15.5	18.5	21.5	27.5	15.6	18.6	21.6	27.6
VACA49HPD	460/3/60	10.3	10.8	10.9	6.0	9.0	12.0	18.0	16.3	19.3	22.3	28.3	16.8	19.8	22.8	28.8	16.9	19.9	22.9	28.9
VACA60HPD	460/3/60	11.8	12.3	12.4	6.0	9.0	12.0	18.0	17.8	20.8	23.8	29.8	18.3	21.3	24.3	30.3	18.4	21.4	24.4	30.4

<sup>1</sup>Motorized Damper    <sup>2</sup>Manual Fresh Air Damper    <sup>3</sup>PowerVent    <sup>4</sup>GreenWheel®ERV  
 Heating kW is rated at 240 volts on the HPA & HPC models. Derate heater output by 25% for operation at 208 volts. Total heating amps for single phase units with two circuits (#1 and #2) includes both circuits. Heating kW is rated at 480 volts on the HPD models. Three phase models contain single phase motor loads.  
 Total heating and cooling amps includes all motors. 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 <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/ PH	FLA <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/ PH	FLA <sup>1</sup>	WATTS <sup>2</sup>
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
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
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

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

# ELECTRICAL DATA FOR VACA AIR CONDITIONERS WITH SINGLE STAGE COMPRESSORS

## Electrical Characteristics - Compressor, Fan, Ventilation & Blower Motors - VACA Air Conditioners with Single Stage Compressor

MODEL NUMBER	COMPRESSOR				OUTDOOR FAN MOTOR				INDOOR FAN MOTOR				GREENWHEEL® ERV	
	VOLTS-Hz-Pz	RLA <sup>1</sup>	LRA <sup>2</sup>	MCC <sup>3</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS-HZ-PH	RLA <sup>1</sup>
VACA24ACA	208/230-60-1	12.8	64.0	20.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30ACA	208/230-60-1	14.1	77.0	22.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36ACA	208/230-60-1	17.9	112.0	28.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40ACA	208/230-60-1	19.8	109.0	31.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49ACA	208/230-60-1	21.8	117.0	34.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60ACA	208/230-60-1	26.2	134.0	41.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA24ACC	208/230-60-3	8.3	61.0	13.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30ACC	208/230-60-3	9.0	71.0	14.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36ACC	208/230-60-3	13.2	88.0	20.6	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40ACC	208/230-60-3	13.6	83.1	21.2	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49ACC	208/230-60-3	13.7	83.1	21.4	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60ACC	208/230-60-3	15.6	111.0	24.4	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA24ACD	460-60-3	5.1	28.0	8.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA30ACD	460-60-3	5.6	38.0	8.8	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA36ACD	460-60-3	6.0	44.0	9.3	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA40ACD	460-60-3	6.1	41.0	9.5	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACA49ACD	460-60-3	6.2	41.0	9.7	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACA60ACD	460-60-3	7.7	52.0	12.1	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2

<sup>1</sup>RLA = Rated Load Amps      <sup>2</sup>LRA = Locked Rotor Amps      <sup>3</sup>MCC = Maximum Continuous Current      <sup>4</sup>RPM = Revolutions per Minute  
<sup>5</sup>FLA = Full Load Amps      <sup>6</sup>HP = Horsepower  
All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACA Air Conditioners with Single Stage Compressor Manual Damper with Fresh Air Intake Blower ("N") or Motorized Damper w/Fresh Air Intake Blower ("B") Fresh Air Vent Configuration

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTAGE/PHASE	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24ACA	208-230/1	21.7	30	29.8	30	42.9	45	55.9	60	n/a	n/a
VACA30ACA	208-230/1	23.3	35	29.8	35	42.9	45	55.9	60	n/a	n/a
VACA36ACA	208-230/1	28.1	45	29.8	45	42.9	45	55.9	60	n/a	n/a
VACA40ACA	208-230/1	30.5	50	30.5	50	42.9	50	55.9	60	n/a	n/a
VACA49ACA	208-230/1	35.5	50	35.5	50	44.4	50	57.4	60	n/a	n/a
VACA60ACA	208-230/1	41.0	60	41.0	60	44.4	60	57.4	60	n/a	n/a
VACA24ACC	208-230/3	16.1	20	18.8	20	26.3	30	33.9	35	48.9	50
VACA30ACC	208-230/3	17.0	25	18.8	25	26.3	30	33.9	35	48.9	50
VACA36ACC	208-230/3	22.2	35	22.2	35	26.3	35	33.9	35	48.9	50
VACA40ACC	208-230/3	22.7	35	22.7	35	26.3	35	33.9	35	48.9	50
VACA49ACC	208-230/3	25.3	35	25.3	35	28.7	40	35.4	40	50.4	60
VACA60ACC	208-230/3	27.7	40	27.7	40	31.9	45	35.4	45	50.4	60
VACA24ACD	460/3	9.2	15	9.4	15	13.2	15	16.9	20	24.4	25
VACA30ACD	460/3	9.9	15	9.9	15	13.2	15	16.9	20	24.4	25
VACA36ACD	460/3	10.4	15	10.4	15	13.2	15	16.9	20	24.4	25
VACA40ACD	460/3	10.5	15	10.5	15	13.2	15	16.9	20	24.4	25
VACA49ACD	460/3	11.9	20	11.9	20	13.9	20	17.7	20	25.2	30
VACA60ACD	460/3	13.7	20	13.7	20	13.9	20	17.7	20	25.2	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)      <sup>2</sup>MFS = Maximum Fuse Size or HACR Breaker

MCA & MFS are calculated at 240 volts for "A" & "C" models.

MCA & MFS are calculated at 460 volts for all "D" models. All 460 units will have a step down transformer for the 230 volts motors.



## Summary Electrical Ratings (Wire Sizing) - VACA Air Conditioners with Single Stage Compressor PowerVent - Ventilation Configuration ("J")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTAGE/PHASE	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24ACA	208-230/1	22.7	35	30.8	35	43.9	45	56.9	60	n/a	n/a
VACA30ACA	208-230/1	24.3	35	30.8	35	43.9	45	56.9	60	n/a	n/a
VACA36ACA	208-230/1	29.1	45	30.8	45	43.9	45	56.9	60	n/a	n/a
VACA40ACA	208-230/1	31.5	50	31.5	50	43.9	50	56.9	60	n/a	n/a
VACA49ACA	208-230/1	36.5	50	36.5	50	45.4	50	58.4	60	n/a	n/a
VACA60ACA	208-230/1	42.0	60	42.0	60	45.4	60	58.4	60	n/a	n/a
VACA24ACC	208-230/3	17.1	25	19.8	25	27.3	30	34.9	35	49.9	50
VACA30ACC	208-230/3	18.0	25	19.8	25	27.3	30	34.9	35	49.9	50
VACA36ACC	208-230/3	23.2	35	23.2	35	27.3	35	34.9	35	49.9	50
VACA40ACC	208-230/3	23.7	35	23.7	35	27.3	35	34.9	35	49.9	50
VACA49ACC	208-230/3	26.3	35	26.3	35	29.7	40	36.4	40	51.4	60
VACA60ACC	208-230/3	28.7	40	28.7	40	32.9	45	36.4	45	51.4	60
VACA24ACD	460/3	9.7	15	9.7	15	13.7	15	17.4	20	24.9	25
VACA30ACD	460/3	10.4	15	10.4	15	13.7	15	17.4	20	24.9	25
VACA36ACD	460/3	10.9	15	10.9	15	13.7	15	17.4	20	24.9	25
VACA40ACD	460/3	11.0	15	11.0	15	13.7	15	17.4	20	24.9	25
VACA49ACD	460/3	12.4	20	12.4	20	14.4	20	18.2	20	25.7	30
VACA60ACD	460/3	14.2	20	14.2	20	14.4	20	18.2	20	25.7	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)      <sup>2</sup>MFS = Maximum Fuse Size or HACR Breaker

MCA & MFS are calculated at 240 volts for "A" & "C" models.

MCA & MFS are calculated at 460 volts for all "D" models.

All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACA Air Conditioners with Single Stage Compressor GreenWheel® ERV - Ventilation Configuration ("H")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTAGE/PHASE	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACA24ACA	208-230/1	22.9	35	31.0	35	44.1	45	57.1	60	n/a	n/a
VACA30ACA	208-230/1	24.5	35	31.0	35	44.1	45	57.1	60	n/a	n/a
VACA36ACA	208-230/1	29.3	45	31.0	45	44.1	45	57.1	60	n/a	n/a
VACA40ACA	208-230/1	31.7	50	31.7	50	44.1	50	57.1	60	n/a	n/a
VACA49ACA	208-230/1	36.7	50	36.7	50	45.7	50	58.7	60	n/a	n/a
VACA60ACA	208-230/1	42.2	60	42.2	60	45.7	60	58.7	60	n/a	n/a
VACA24ACC	208-230/3	17.3	25	20.0	25	27.5	30	35.1	40	50.1	60
VACA30ACC	208-230/3	18.2	25	20.0	20	27.5	30	35.1	40	50.1	60
VACA36ACC	208-230/3	23.4	35	23.4	35	27.5	35	35.1	40	50.1	60
VACA40ACC	208-230/3	23.9	35	23.9	35	27.5	35	35.1	40	50.1	60
VACA49ACC	208-230/3	26.5	35	26.5	35	29.9	40	36.6	40	51.6	60
VACA60ACC	208-230/3	28.9	40	28.9	40	33.1	45	36.6	45	51.6	60
VACA24ACD	460/3	9.8	15	9.8	15	13.8	15	17.5	20	25.0	30
VACA30ACD	460/3	10.5	15	10.5	15	13.8	15	17.5	20	25.0	30
VACA36ACD	460/3	11.0	15	11.0	15	13.8	15	17.5	20	25.0	30
VACA40ACD	460/3	11.1	15	11.1	15	13.8	15	17.5	20	25.0	30
VACA49ACD	460/3	12.5	20	12.5	20	14.5	20	18.3	20	25.7	30
VACA60ACD	460/3	14.3	20	14.3	20	14.5	20	18.3	20	25.7	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)      <sup>2</sup>MFS = Maximum Fuse Size or HACR Breaker

MCA & MFS are calculated at 240 volts for "A" & "C" models.

MCA & MFS are calculated at 460 volts for all "D" models.

All 460 units will have a step down transformer for the 230 volts motors.

# Unit Load Amps (Heating) - VACA Air Conditioners with Single Stage Compressor

MODEL NUMBER	VOLTAGE PHASE HERTZ	VENTILATION AIR MOVERS, MAX. AMPS			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL MAXIMUM HEATING AMPS											
		VENT. CONFIGURATION			5 kW	7.5 kW	10 kW	15 kW	VENT. CONFIGURATION B <sup>1</sup> , N <sup>2</sup>				VENT. CONFIGURATION J <sup>3</sup>				VENT. CONFIGURATION H <sup>4</sup>			
		B <sup>1</sup> , N <sup>2</sup>	J <sup>3</sup>	H <sup>4</sup>	5 kW	7.5 kW	10 kW	15 kW	5 kW	7.5 kW	10 kW	15 kW	5 kW	7.5 kW	10 kW	15 kW	5 kW	7.5 kW	10 kW	15 kW
VACA24ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACA30ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACA36ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACA40ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACA49ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7	n/a	26.1	36.6	47.0	n/a	27.1	37.6	48.0	n/a	27.3	37.8	48.2	n/a
VACA60ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7	n/a	26.1	36.6	47.0	n/a	27.1	37.6	48.0	n/a	27.3	37.8	48.2	n/a
VACA24ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACA30ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACA36ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACA40ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACA49ACC	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
VACA24ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACA30ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACA36ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACA40ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACA49ACD	460/3/60	2.7	3.2	3.3	6.0	9.0	12.0	18.0	8.7	11.7	14.7	20.7	9.2	12.2	15.2	21.2	9.3	12.3	15.3	21.3
VACA60ACD	460/3/60	2.7	3.2	3.3	6.0	9.0	12.0	18.0	8.7	11.7	14.7	20.7	9.2	12.2	15.2	21.2	9.3	12.3	15.3	21.3

<sup>1</sup>Motorized Damper    <sup>2</sup>Manual Fresh Air Damper    <sup>3</sup>PowerVent    <sup>4</sup>GreenWheel®ERV  
 Heating kW rated at 240v. for "A" & "C" models. Derate heat output by 25% for operation on 208v. Total heating amps for all 1Ø units with 15 kW of heat includes both circuits (#1 & #2).  
 Heater kW rated at 480v. for all "D" models. Note: 3Ø models contain single phase motor loads. Values shown are maximum phase loads. Loads are not equally balanced on each phase.  
 Total heating and cooling amps include motor loads.

## Electrical Characteristics - Ventilation Motors

VENTILATION CONFIGURATION	VENTILATION DESIGNATOR	EXHAUST AIR MOTOR (EXM)				OUTDOOR AIR MOTOR				GREENWHEEL®ERV DRIVE MOTOR			
		VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS
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
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
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

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

## Dehumidification - Model VACA

Dehumidification - Scholar QV Model VACA24 (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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
Dehumidification - Scholar QV Model VACA30 (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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
80 / 67	50	95	29,600	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	Dehumid.
Dehumidification - Scholar QV Model VACA36 (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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
80 / 67	50	95	34,400	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	Dehumid.

## Dehumidification - Model VACA

Dehumidification - Scholar QV Model VACA40 (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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
80 / 67	50	95	41,000	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	Dehumid.

Dehumidification - Scholar QV Model VACA49 (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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
80 / 67	50	95	46,500	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	Dehumid.

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	Dehumid.
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	Dehumid.
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	Dehumid.
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	Dehumid.
80 / 67	50	95	56,000	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	Dehumid.



## Certified Efficiency & Capacity Ratings @ ANSI/AHRI Standard 390 - VACSA Heat Pumps & Air Conditioners with 2-Stage Compressor

MODEL NUMBER	VACSA36	VACSA40	VACSA49	VACSA60
Cooling (BTUH) <sup>1</sup> - 2nd Stage	33,600	38,000	45,500	52,000
EER <sup>2</sup> - 2nd Stage	9.10	9.00	10.15	9.80
Integrated Part Load Value <sup>3</sup>	12.7	11.7	13.6	12.7
High Temperature Heating <sup>4</sup>	32,000	35,600	39,500	49,000
High Temperature COP <sup>5</sup>	3.05	3.00	3.10	3.00
Rated Air Flow (CFM) <sup>6</sup>	1,200	1,300	1,700	1,850
ESP <sup>7</sup> @ Rated Conditions	0.15	0.15	0.20	0.20

<sup>1</sup>Cooling 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.

<sup>2</sup>EER=Energy Efficiency Ratio

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

<sup>4</sup>High Temperature Heating & 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.

<sup>5</sup>COP=Coefficient of Performance (Heat Pumps only)

<sup>6</sup>CFM=Cubic Feet per Minute

<sup>7</sup>ESP=External Static Pressure

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 - VACSA Heat Pumps & Air Conditioners with 2 Stage Compressor

MODEL NUMBER	VACSA36	VACSA40	VACSA49	VACSA60
Total Capacity	33,600	38,000	45,500	52,000
Sensible Heat Ratio	0.74	0.70	0.71	0.68
Sensible Capacity	24,975	26,545	32,230	35,455
Rated Air Flow (CFM) <sup>1</sup>	1,200	1,300	1,700	1,850

<sup>1</sup>CFM=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 - VACSA Heat Pumps & Air Conditioners with 2 Stage Compressor

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	
VACSA36	38,980	37,630	36,290	34,950	33,600	32,260	30,910	29,570	28,900	
VACSA40	44,080	42,560	41,040	39,520	38,000	36,480	34,960	33,440	32,680	
VACSA49	52,780	50,960	49,140	47,320	45,500	43,680	41,860	40,040	39,130	
VACSA60	60,320	58,240	56,160	54,080	52,000	49,920	47,840	45,760	44,720	

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 - VACSA Heat Pumps

MODEL NUMBER		OUTDOOR TEMPERATURE									
		0°F / -17.8°C	10°F / -12.2°C	15°F / -9.4°C	20°F / -6.7°C	30°F / -1.1°C	40°F / 4.4°C	47°F / 8.3°C	50°F / 10°C	60°F / 15.6°C	
VACSA36HP	BTUH	13,400	17,280	19,200	21,120	24,960	28,800	32,000	32,640	36,480	
	COP	1.58	1.94	2.10	2.26	2.56	2.83	3.05	3.08	3.31	
VACSA40HP	BTUH	14,950	19,220	21,360	23,500	27,770	32,040	35,600	36,310	40,580	
	COP	1.56	1.91	2.07	2.23	2.52	2.79	3.00	3.03	3.26	
VACSA49HP	BTUH	16,590	21,330	23,700	26,070	30,810	35,550	39,500	40,290	45,030	
	COP	1.61	1.97	2.14	2.30	2.60	2.88	3.10	3.13	3.36	
VACSA60HP	BTUH	20,580	26,460	29,400	32,340	38,220	44,100	49,000	49,980	55,860	
	COP	1.56	1.91	2.07	2.23	2.52	2.78	3.00	3.03	3.26	

Based upon ANSI/AHRI std. 390 return air of 70°F DB (21.1°C). Return air at rated airflow.

# ELECTRICAL DATA FOR VACSA HEAT PUMPS WITH 2 STAGE COMPRESSORS

## Electrical Characteristics - Compressor, Ventilation, Fan & Blower Motors - VACSA Heat Pumps with 2-Stage Compressor

MODEL NUMBER	COMPRESSOR				OUTDOOR FAN MOTOR				INDOOR FAN MOTOR						GREENWHEEL® ERV	
	VOLTS-HZ-PH	RLA <sup>1</sup>	LRA <sup>2</sup>	MCC <sup>3</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	TYPE	SETTING	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS	RLA <sup>1</sup>
VACSA36HPA	208/230-60-1	16.6	82.0	26.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	70%	2.8	1/2	208/230-60-1	2.2
VACSA40HPA	208/230-60-1	16.6	96.0	26.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	80%	2.8	1/2	208/230-60-1	2.2
VACSA49HPA	208/230-60-1	21.1	96.0	33.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	70%	4.3	3/4	208/230-60-1	2.2
VACSA60HPA	208/230-60-1	25.6	118.0	40.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	75%	4.3	3/4	208/230-60-1	2.2
VACSA36HPC	208/230-60-3	11.1	58.0	17.4	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	70%	2.8	1/2	208/230-60-1	2.2
VACSA40HPC	208/230-60-3	13.4	88.0	21.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	80%	2.8	1/2	208/230-60-1	2.2
VACSA49HPC	208/230-60-3	13.4	88.0	21.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	70%	4.3	3/4	208/230-60-1	2.2
VACSA60HPC	208/230-60-3	17.6	123.0	27.5	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	75%	4.3	3/4	208/230-60-1	2.2
VACSA36HPD	460-60-3	4.5	29.0	7.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	70%	2.8	1/2	208/230-60-1	2.2
VACSA40HPD	460-60-3	6.1	44.0	9.5	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	ECM	80%	2.8	1/2	208/230-60-1	2.2
VACSA49HPD	460-60-3	6.4	41.0	10.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	70%	4.3	3/4	208/230-60-1	2.2
VACSA60HPD	460-60-3	9.0	62.0	14.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	ECM	75%	4.3	3/4	208/230-60-1	2.2

<sup>1</sup>RLA = Rated Load Amps      <sup>2</sup>LRA = Locked Rotor Amps      <sup>3</sup>MCC = Maximum Continuous Current      <sup>4</sup>RPM = Revolutions per Minute  
<sup>5</sup>FLA = Full Load Amps      <sup>6</sup>HP = Horsepower  
The 460 volt units will have a step down transformer for the 230 volt motors.

## Summary Electrical Ratings (Wire Sizing) - VACSA Heat Pumps with 2-Stage Compressor Manual Damper with Fresh Air Intake Blower ("N") or Motorized Damper with Fresh Air Intake Blower ("B") Fresh Air Ventilation Configuration

MODEL MUNBER	ELECTRIC HEAT VOLTAGE Ph-Hz	000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
		CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36HPA	208-230/1/60	26.5	40	52.5	60	n/a	n/a	46.0	50	19.6	20	52.5	60	26.0	30	n/a	n/a	n/a	n/a
VACSA40HPA	208-230/1/60	26.5	40	52.5	60	n/a	n/a	46.0	50	19.6	20	52.5	60	26.0	30	n/a	n/a	n/a	n/a
VACSA49HPA	208-230/1/60	34.6	50	34.6	50	26.0	30	34.6	50	39.1	40	34.6	50	52.1	60	n/a	n/a	n/a	n/a
VACSA60HPA	208-230/1/60	40.2	60	40.2	60	26.0	30	40.2	60	39.1	40	40.2	60	52.1	60	n/a	n/a	n/a	n/a
VACSA36HPC	208-230/3/60	19.6	30	34.6	35	n/a	n/a	42.1	45	n/a	n/a	49.7	50	n/a	n/a	42.1	45	22.5	25
VACSA40HPC	208-230/3/60	22.5	35	37.5	40	n/a	n/a	45.0	50	n/a	n/a	52.6	60	n/a	n/a	45.0	50	22.5	25
VACSA49HPC	208-230/3/60	25.0	35	40.0	45	n/a	n/a	47.5	50	n/a	n/a	55.1	60	n/a	n/a	25.0	35	45.1	50
VACSA60HPC	208-230/3/60	30.2	45	45.2	50	n/a	n/a	52.7	60	n/a	n/a	30.2	45	30.1	35	30.2	45	45.1	50
VACSA36HPD	460/3/60	8.2	15	16.0	20	n/a	n/a	19.7	20	n/a	n/a	23.5	25	n/a	n/a	31.0	35	n/a	n/a
VACSA40HPD	460/3/60	10.2	15	18.0	20	n/a	n/a	21.7	25	n/a	n/a	25.5	30	n/a	n/a	33.0	35	n/a	n/a
VACSA49HPD	460/3/60	12.1	20	19.6	20	n/a	n/a	23.4	25	n/a	n/a	27.5	30	n/a	n/a	34.6	35	n/a	n/a
VACSA60HPD	460/3/60	16.1	25	23.6	25	n/a	n/a	27.4	30	n/a	n/a	31.1	35	n/a	n/a	38.6	40	n/a	n/a

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACSA Heat Pumps with 2- Stage Compressor PowerVent - Ventilation Configuration ("J")

ELECTRIC HEAT		000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
MODEL NUMBER	VOLTAGE Ph-Hz	CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36HPA	208-230/1/60	27.5	40	53.5	60	n/a	n/a	47.0	60	19.6	20	53.5	60	26.0	30	n/a	n/a	n/a	n/a
VACSA40HPA	208-230/1/60	27.5	40	53.5	60	n/a	n/a	47.0	60	19.6	20	53.5	60	26.0	30	n/a	n/a	n/a	n/a
VACSA49HPA	208-230/1/60	35.6	50	35.6	50	26.0	30	35.6	50	39.1	40	35.6	50	52.1	60	n/a	n/a	n/a	n/a
VACSA60HPA	208-230/1/60	41.2	60	41.2	60	26.0	30	41.2	60	39.1	40	41.2	60	52.1	60	n/a	n/a	n/a	n/a
VACSA36HPC	208-230/3/60	20.6	30	35.6	40	n/a	n/a	43.1	45	n/a	n/a	50.7	60	n/a	n/a	43.1	45	22.5	25
VACSA40HPC	208-230/3/60	23.5	35	38.5	40	n/a	n/a	46.0	50	n/a	n/a	53.6	60	n/a	n/a	46.0	50	22.5	25
VACSA49HPC	208-230/3/60	26.0	35	41.0	45	n/a	n/a	48.5	50	n/a	n/a	56.1	60	n/a	n/a	26.0	35	45.1	50
VACSA60HPC	208-230/3/60	31.2	45	46.2	50	n/a	n/a	53.7	60	n/a	n/a	31.2	45	30.1	35	31.2	45	45.1	50
VACSA36HPD	460/3/60	8.7	15	16.5	20	n/a	n/a	20.2	20	n/a	n/a	24.0	25	n/a	n/a	31.5	35	n/a	n/a
VACSA40HPD	460/3/60	10.7	15	18.5	20	n/a	n/a	22.2	25	n/a	n/a	26.0	30	n/a	n/a	33.5	35	n/a	n/a
VACSA49HPD	460/3/60	12.6	20	20.1	25	n/a	n/a	23.9	25	n/a	n/a	28.0	30	n/a	n/a	35.1	40	n/a	n/a
VACSA60HPD	460/3/60	16.6	25	24.1	25	n/a	n/a	27.9	30	n/a	n/a	31.6	35	n/a	n/a	39.1	40	n/a	n/a

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACSA Heat Pumps with 2- Stage Compressor GreenWheel® ERV - Ventilation Configuration ("H")

ELECTRIC HEAT		000 = None		050 = 5 kw				075 = 7.5 kw				100 = 10 kw				150 = 15 kw			
MODEL NUMBER	VOLTAGE Ph-Hz	CKT #1		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2		CKT #1		CKT #2	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36HPA	208-230/1/60	27.7	40	53.7	60	n/a	n/a	47.2	60	19.6	20	53.7	60	26.0	30	n/a	n/a	n/a	n/a
VACSA40HPA	208-230/1/60	27.7	40	53.7	60	n/a	n/a	47.2	60	19.6	20	53.7	60	26.0	30	n/a	n/a	n/a	n/a
VACSA49HPA	208-230/1/60	35.8	50	35.8	50	26.0	30	35.8	50	39.1	40	35.8	50	52.1	60	n/a	n/a	n/a	n/a
VACSA60HPA	208-230/1/60	41.4	60	41.4	60	26.0	30	41.4	60	39.1	40	41.4	60	52.1	60	n/a	n/a	n/a	n/a
VACSA36HPC	208-230/3/60	20.8	30	35.8	40	n/a	n/a	43.3	45	n/a	n/a	50.9	60	n/a	n/a	43.3	45	22.5	25
VACSA40HPC	208-230/3/60	23.7	35	38.7	40	n/a	n/a	46.2	50	n/a	n/a	53.8	60	n/a	n/a	46.2	50	22.5	25
VACSA49HPC	208-230/3/60	26.2	35	41.2	45	n/a	n/a	48.7	50	n/a	n/a	56.3	60	n/a	n/a	26.2	35	45.1	50
VACSA60HPC	208-230/3/60	31.4	45	46.4	50	n/a	n/a	53.9	60	n/a	n/a	31.4	45	30.1	35	31.4	45	45.1	50
VACSA36HPD	460/3/60	8.8	15	16.6	20	n/a	n/a	20.3	25	n/a	n/a	24.1	25	n/a	n/a	31.6	35	n/a	n/a
VACSA40HPD	460/3/60	10.8	15	18.6	20	n/a	n/a	22.3	25	n/a	n/a	26.1	30	n/a	n/a	33.6	35	n/a	n/a
VACSA49HPD	460/3/60	12.7	20	20.2	25	n/a	n/a	24.0	25	n/a	n/a	28.1	30	n/a	n/a	35.2	40	n/a	n/a
VACSA60HPD	460/3/60	16.7	25	24.2	25	n/a	n/a	28.0	30	n/a	n/a	31.7	35	n/a	n/a	39.2	40	n/a	n/a

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

# Unit Load Amps (Heating) - VACSA Heat Pumps with 2-Stage Compressor

MODEL NUMBER	VOLTAGE PHASE HERTZ	MAXIMUM HEAT PUMP AMPS			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL MAXIMUM HEATING AMPS											
		VENT. CONFIGURATION			5 kW	7.5 kW	10 kW	15 kW	B1 & N2				PowerVent "J"				GreenWheel® "H"			
		B <sup>1</sup>	N <sup>2</sup>	J <sup>3</sup>					H <sup>4</sup>	5 kW	7.5 Kw	10 Kw	15 Kw	5 kW	7.5 Kw	10 Kw	15 Kw	5 kW	7.5 Kw	10 Kw
VACSA36HPA	208-230/1/60	22.3	23.3	23.5	20.8	31.3	41.7	n/a	43.1	53.6	64.0	n/a	44.1	54.6	65.0	n/a	44.3	54.8	65.2	n/a
VACSA40HPA	208-230/1/60	22.3	23.3	23.5	20.8	31.3	41.7	n/a	43.1	53.6	64.0	n/a	44.1	54.6	65.0	n/a	44.3	54.8	65.2	n/a
VACSA49HPA	208-230/1/60	29.3	30.3	30.5	20.8	31.3	41.7	n/a	50.1	60.6	71.0	n/a	51.1	61.6	72.0	n/a	51.3	61.8	72.2	n/a
VACSA60HPA	208-230/1/60	33.8	34.8	35.0	20.8	31.3	41.7	n/a	54.6	65.1	75.5	n/a	55.6	66.1	76.5	n/a	55.8	66.3	76.7	n/a
VACSA36HPC	208-230/3/60	16.8	17.8	18.0	12.0	18.0	24.1	36.1	28.8	34.8	40.9	52.9	29.8	35.8	41.9	53.9	30.0	36.0	42.1	54.1
VACSA40HPC	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
VACSA49HPC	208-230/3/60	21.6	22.6	22.8	12.0	18.0	24.1	36.1	33.6	39.6	45.7	57.7	34.6	40.6	46.7	58.7	34.8	40.8	46.9	58.9
VACSA60HPC	208-230/3/60	25.8	26.8	27.0	12.0	18.0	24.1	36.1	37.8	43.8	49.9	61.9	38.8	44.8	50.9	62.9	39.0	45.0	51.1	63.1
VACSA36HPD	460/3/60	7.4	7.9	8.0	6.0	9.0	12.0	18.0	13.4	16.4	19.4	25.4	13.9	16.9	19.9	25.9	14.0	17.0	20.0	26.0
VACSA40HPD	460/3/60	9.0	9.5	9.6	6.0	9.0	12.0	18.0	15.0	18.0	21.0	27.0	15.5	18.5	21.5	27.5	15.6	18.6	21.6	27.6
VACSA49HPD	460/3/60	8.6	9.1	9.2	6.0	9.0	12.0	18.0	14.6	17.6	20.6	26.6	15.1	18.1	21.1	27.1	15.2	18.2	21.2	27.2
VACSA60HPD	460/3/60	11.8	12.3	12.4	6.0	9.0	12.0	18.0	17.8	20.8	23.8	29.8	18.3	21.3	24.3	30.3	18.4	21.4	24.4	30.4

<sup>1</sup>Motorized Damper    <sup>2</sup>Manual Fresh Air Damper    <sup>3</sup>PowerVent    <sup>4</sup>GreenWheel®ERV  
 Heating kW is rated at 240 volts on the HPA & HPC models. Derate heater output by 25% for operation at 208 volts. Total heating amps for single phase units with two circuits (#1 and #2) includes both circuits. Heating kW is rated at 480 volts on the HPD models. Three phase models contain single phase motor loads.  
 Total heating and cooling amps includes all motors. 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 <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS
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
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
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

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

# ELECTRICAL DATA FOR VACSA AIR CONDITIONERS WITH 2 STAGE COMPRESSORS

## Electrical Characteristics - Compressor, Fan, Ventilation & Blower Motors - VACSA Air Conditioners with 2-Stage Compressor

MODEL NUMBER	COMPRESSOR			OUTDOOR FAN MOTOR				INDOOR FAN MOTOR				GREENWHEEL® ERV		
	VOLTS-HZ-PH	RLA <sup>1</sup>	LRA <sup>2</sup>	MCC <sup>3</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS-HZ-PH	RPM <sup>4</sup>	FLA <sup>5</sup>	HP <sup>6</sup>	VOLTS-HZ-PH	RLA <sup>1</sup>
VACSA36ACA	208/230-60-1	16.6	82.0	26.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA40ACA	208/230-60-1	16.6	96.0	26.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA49ACA	208/230-60-1	21.1	96.0	33.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACSA60ACA	208/230-60-1	25.6	118.0	40.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACSA36ACC	208/230-60-3	11.1	58.0	17.4	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA40ACC	208/230-60-3	13.4	88.0	21.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA49ACC	208/230-60-3	13.4	88.0	21.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACSA60ACC	208/230-60-3	17.6	123.0	27.5	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACSA36ACD	460-60-3	4.5	29.0	7.0	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA40ACD	460-60-3	6.1	44.0	9.5	208/230-60-1	1060	1.9	1/3	208/230-60-1	1500	2.8	1/2	208/230-60-1	2.2
VACSA49ACD	460-60-3	6.4	41.0	10.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2
VACSA60ACD	460-60-3	9.0	62.0	14.0	208/230-60-1	1040	2.9	1/2	208/230-60-1	1500	4.3	3/4	208/230-60-1	2.2

<sup>1</sup>RLA = Rated Load Amps    <sup>2</sup>LRA = Locked Rotor Amps    <sup>3</sup>MCC = Maximum Continuous Current    <sup>4</sup>RPM = Revolutions per Minute  
<sup>5</sup>FLA = Full Load Amps    <sup>6</sup>HP = Horsepower  
 The 460 volt units will have a step down transformer for the 230 volt motors.



## Summary Electrical Ratings (Wire Sizing) - VACSA Air Conditioners with 2-Stage Compressor Manual Damper with Fresh Air Intake Blower ("N") or Motorized Damper with Fresh Air Intake Blower ("B") Fresh Air Ventilation Configuration

ELECTRIC HEAT		000 = None		050 = 5 kW		075 = 7.5 kW		10 = 10 kW		15 = 15 kW	
MODEL NUMBER	VOLTAGE PHASE	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36ACA	208-230/1	26.5	40	29.8	40	42.9	45	55.9	60	n/a	n/a
VACSA40ACA	208-230/1	26.5	40	29.8	40	42.9	45	55.9	60	n/a	n/a
VACSA49ACA	208-230/1	34.6	50	35.5	50	44.4	50	57.4	60	n/a	n/a
VACSA60ACA	208-230/1	40.2	60	41.0	60	44.4	60	57.4	60	n/a	n/a
VACSA36ACC	208-230/3	19.6	30	19.6	30	26.3	30	33.9	35	48.9	50
VACSA40ACC	208-230/3	22.5	35	22.5	35	26.3	35	33.9	35	48.9	50
VACSA49ACC	208-230/3	25.0	35	25.3	35	28.7	40	35.4	40	50.4	60
VACSA60ACC	208-230/3	30.2	45	27.7	40	31.9	45	35.4	45	50.4	60
VACSA36ACD	460/3	8.5	15	9.4	15	13.2	15	16.9	20	24.4	25
VACSA40ACD	460/3	10.5	15	10.5	15	13.2	15	16.9	20	24.4	25
VACSA49ACD	460/3	12.1	15	12.1	15	13.9	20	17.7	20	25.2	30
VACSA60ACD	460/3	15.4	20	15.4	20	13.9	20	17.7	20	25.2	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

## Summary Electrical Ratings (Wire Sizing) - VACSA Air Conditioners with 2- Stage Compressor PowerVent - Ventilation Configuration ("J")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUMBER	VOLTAGE PHASE	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36ACA	208-230/1/60	27.5	40	30.8	40	43.9	45	56.9	60	n/a	n/a
VACSA40ACA	208-230/1/60	27.5	40	30.8	40	43.9	45	56.9	60	n/a	n/a
VACSA49ACA	208-230/1/60	35.6	50	35.6	50	45.4	50	58.4	60	n/a	n/a
VACSA60ACA	208-230/1/60	41.2	60	41.2	60	45.4	60	58.4	60	n/a	n/a
VACSA36ACC	208-230/3/60	20.6	30	20.6	30	27.3	30	34.9	35	49.9	50
VACSA40ACC	208-230/3/60	23.5	35	23.5	35	27.3	35	34.9	35	49.9	50
VACSA49ACC	208-230/3/60	26.0	35	26.3	35	29.7	40	36.4	40	51.4	60
VACSA60ACC	208-230/3/60	31.2	45	28.7	40	32.9	45	36.4	45	51.4	60
VACSA36ACD	460/3/60	9.0	15	9.9	15	13.7	15	17.4	20	24.9	25
VACSA40ACD	460/3/60	11.0	15	11.0	15	13.7	15	17.4	20	24.9	25
VACSA49ACD	460/3/60	13.1	15	13.1	15	14.4	20	18.2	20	25.7	30
VACSA60ACD	460/3/60	16.4	25	16.4	25	14.4	25	18.2	25	25.7	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

# Summary Electrical Ratings (Wire Sizing) - VACSA Air Conditioners with 2- Stage Compressor GreenWheel® ERV - Ventilation Configuration ("H")

ELECTRIC HEAT		000 = None		050 = 5 kw		075 = 7.5 kw		100 = 10 kw		150 = 15 kw	
MODEL NUM-BER	VOLTS-HZ-PH	CKT #1		CKT #1		CKT #1		CKT #1		CKT #1	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
VACSA36ACA	208-230/1/60	27.7	40	31.0	40	44.0	45	57.1	60	n/a	n/a
VACSA40ACA	208-230/1/60	27.7	40	31.0	40	44.0	45	57.1	60	n/a	n/a
VACSA49ACA	208-230/1/60	35.8	50	35.8	50	45.7	50	58.7	60	n/a	n/a
VACSA60ACA	208-230/1/60	41.4	60	41.4	60	45.7	60	58.7	60	n/a	n/a
VACSA36ACC	208-230/3/60	20.8	25	20.8	25	27.5	30	35.1	40	50.1	60
VACSA40ACC	208-230/3/60	23.7	30	23.7	30	27.5	30	35.1	40	50.1	60
VACSA49ACC	208-230/3/60	26.2	35	26.5	35	29.9	40	36.6	40	51.6	60
VACSA60ACC	208-230/3/60	31.4	45	28.9	40	33.1	45	36.6	45	51.6	60
VACSA36ACD	460/3/60	9.1	15	10.0	15	13.8	15	17.5	20	25.0	30
VACSA40ACD	460/3/60	11.1	15	11.1	15	13.8	15	17.5	20	25.0	30
VACSA49ACD	460/3/60	13.2	15	13.2	15	14.5	20	18.3	20	25.7	30
VACSA60ACD	460/3/60	16.5	25	16.5	25	14.5	25	18.3	25	25.7	30

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 for sizing conductors.

<sup>1</sup>MCA = Maximum Continuous Current (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse Size MCA & MFS are calculated at 230 volts for HPA & HPC models.

MCA & MFS are calculated at 460 volts for all HPD models. All 460 units will have a step down transformer for the 230 volts motors.

# Unit Load Amps (Heating) - VACSA Air Conditioners with 2-Stage Compressor

MODEL NUMBER	VOLTAGE PHASE HERTZ	VENTILATION AIR MOVERS, MAX AMPS			LOAD OF RESISTIVE HEATING ELEMENTS ONLY (AMPS)				TOTAL HEATING AMPS (MAX)											
		VENT. CONFIGURATION			5 kW	7.5 kW	10 kW	15 kW	VENT. CONFIGURATION B <sup>1</sup> , N <sup>2</sup>				VENT. CONFIGURATION J <sup>3</sup>				VENT. CONFIGURATION H <sup>4</sup>			
		B <sup>1</sup> , N <sup>2</sup>	J <sup>3</sup>	H <sup>4</sup>					5 kW	7.5 kW	10 kW	15 kW	5 kW	7.5 kW	10 kW	15 kW	5 kW	7.5 kW	10 kW	15 kW
VACSA36ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACSA40ACA	208-230/1/60	3.8	3.5	3.7	20.8	31.3	41.7	n/a	23.3	33.8	44.2	n/a	24.3	34.8	45.2	n/a	24.5	35.0	45.4	n/a
VACSA49ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7	n/a	26.1	36.6	47.0	n/a	27.1	37.6	48.0	n/a	27.3	37.8	48.2	n/a
VACSA60ACA	208-230/1/60	5.3	6.3	6.5	20.8	31.3	41.7	n/a	26.1	36.6	47.0	n/a	27.1	37.6	48.0	n/a	27.3	37.8	48.2	n/a
VACSA36ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACSA40ACC	208-230/3/60	3.8	3.5	3.7	12.0	18.0	24.1	36.1	14.5	20.5	26.6	38.6	15.5	21.5	27.6	39.6	15.7	21.7	27.8	39.8
VACSA49ACC	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
VACSA60ACC	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
VACSA36ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACSA40ACD	460/3/60	1.9	1.8	1.9	6.0	9.0	12.0	18.0	7.3	10.3	13.3	19.3	7.8	10.8	13.8	19.8	7.9	10.9	13.9	19.9
VACSA49ACD	460/3/60	2.7	3.2	3.3	6.0	9.0	12.0	18.0	8.7	11.7	14.7	20.7	9.2	12.2	15.2	21.2	9.3	12.3	15.3	21.3
VACSA60ACD	460/3/60	2.7	3.2	3.3	6.0	9.0	12.0	18.0	8.7	11.7	14.7	20.7	9.2	12.2	15.2	21.2	9.3	12.3	15.3	21.3

<sup>1</sup>Motorized Damper    <sup>2</sup>Manual Fresh Air Damper    <sup>3</sup>PowerVent    <sup>4</sup>GreenWheel®ERV

Heating kW is rated at 240 volts on the HPA & HPC models. Derate heater output by 25% for operation at 208 volts. Total heating amps for single phase units with two circuits (#1 and #2) includes both circuits. Heating kW is rated at 480 volts on the HPD models. Three phase models contain single phase motor loads.

Total heating and cooling amps includes all motors. 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 <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS <sup>2</sup>	VOLTS	HZ/PH	FLA <sup>1</sup>	WATTS
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
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
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

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

## Dehumidification - Model VACSA

Dehumidification - Scholar QV Model VACSA36 (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	36,979	27,054	9,925	1200	54.2	9.4	9.0	Cooling
75 / 62.5	50	75	9,925	0	9,925	1200	72.6	9.4	9.0	Dehumid.
75 / 65.5	60	75	39,072	23,752	15,320	1200	56.7	14.5	13.9	Cooling
75 / 65.5	60	75	15,320	0	15,320	1200	73.2	14.5	13.9	Dehumid.
75 / 68	70	75	40,846	20,948	19,898	1200	58.9	18.8	18.1	Cooling
75 / 68	70	75	19,898	0	19,898	1200	73.2	18.8	18.1	Dehumid.
65 / 63	90	75	37,333	13,759	23,574	1200	54.4	22.3	21.4	Cooling
65 / 63	90	75	23,574	0	23,574	1200	64.8	22.3	21.4	Dehumid.
80 / 67	50	95	34,600	25,339	9,261	1200	60.5	8.8	8.4	Cooling
80 / 67	50	95	9,261	0	9,261	1200	77.5	8.8	8.4	Dehumid.
Dehumidification - Scholar QV Model VACSA40 (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	41,147	28,665	12,482	1300	54.6	11.8	11.3	Cooling
75 / 62.5	50	75	12,482	0	12,482	1300	73.8	11.8	11.3	Dehumid.
75 / 65.5	60	75	43,477	25,376	18,101	1300	57.0	17.1	16.4	Cooling
75 / 65.5	60	75	18,101	0	18,101	1300	74.2	17.1	16.4	Dehumid.
75 / 68	70	75	45,450	22,548	22,902	1300	59.0	21.7	20.8	Cooling
75 / 68	70	75	22,902	0	22,902	1300	74.5	21.7	20.8	Dehumid.
65 / 63	90	75	41,542	15,349	26,193	1300	54.1	24.8	23.8	Cooling
65 / 63	90	75	26,193	0	26,193	1300	64.9	24.8	23.8	Dehumid.
80 / 67	50	95	38,500	26,728	11,772	1300	61.0	11.1	10.7	Cooling
80 / 67	50	95	11,772	0	11,772	1300	78.8	11.1	10.7	Dehumid.
Dehumidification - Scholar QV Model VACSA49 (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	48,621	34,864	13,757	1740	56.5	13.0	12.5	Cooling
75 / 62.5	50	75	13,757	0	13,757	1740	73.6	13.0	12.5	Dehumid.
75 / 65.5	60	75	51,381	30,633	20,748	1740	58.7	19.6	18.8	Cooling
75 / 65.5	60	75	20,748	0	20,748	1740	74.0	19.6	18.8	Dehumid.
75 / 68	70	75	53,713	27,039	26,674	1740	60.6	25.2	24.2	Cooling
75 / 68	70	75	26,674	0	26,674	1740	74.4	25.2	24.2	Dehumid.
65 / 63	90	75	49,095	17,937	31,158	1740	55.5	29.5	28.3	Cooling
65 / 63	90	75	31,158	0	31,158	1740	64.9	29.5	28.3	Dehumid.
80 / 67	50	95	45,500	32,600	12,900	1740	62.7	12.2	11.7	Cooling
80 / 67	50	95	12,900	0	12,900	1740	78.4	12.2	11.7	Dehumid.
Dehumidification - Scholar QV Model VACSA60 (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	57,713	38,998	18,715	1850	55.5	17.7	17.0	Cooling
75 / 62.5	50	75	18,715	0	18,715	1850	74.9	17.7	17.0	Dehumid.
75 / 65.5	60	75	60,980	34,626	26,354	1850	57.7	24.9	23.9	Cooling
75 / 65.5	60	75	26,354	0	26,354	1850	75.0	24.9	23.9	Dehumid.
75 / 68	70	75	63,747	30,903	32,844	1850	59.6	31.1	29.8	Cooling
75 / 68	70	75	32,844	0	32,844	1850	75.0	31.1	29.8	Dehumid.
65 / 63	90	75	58,266	21,004	37,262	1850	54.5	35.3	33.8	Cooling
65 / 63	90	75	37,262	0	37,262	1850	65.0	35.3	33.8	Dehumid.
80 / 67	50	95	54,000	36,187	17,813	1850	61.9	16.9	16.2	Cooling
80 / 67	50	95	17,813	0	17,813	1850	79.4	16.9	16.2	Dehumid.

# Hot Water Output - Heat Pumps & Air Conditioners

Entering Air Temperature 70°F DB, 60°F WB		Scholar QV HOT WATER PERFORMANCE 180 °F Entering Water Temperature Water Flow (GPM)									
		2	4	6	8	10	12	14	16	18	20
Indoor Air Flow	(CFM)	800									
Total Capacity	(Btu/Hr)	39,756	48,737	52,668	54,894	56,334	57,346	58,099	58,681	59,146	59,526
Leaving Air - DB	(°F)	115.3	125.5	130.0	132.5	134.2	135.3	136.2	136.8	137.4	137.8
Leaving Air - WB	(°F)	73.7	76.3	77.3	77.9	78.3	78.6	78.8	79.0	79.1	79.2
Leaving Fluid Temp.	(°F)	139.4	155.1	162.0	165.9	168.5	170.2	171.5	172.5	173.3	173.9
Fluid Delta T	(°F)	40.6	24.9	18.0	14.1	11.5	9.8	8.5	7.5	6.7	6.1
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.6
Indoor Air Flow	(CFM)	900									
Total Capacity	(Btu/Hr)	41,723	51,875	56,409	59,001	60,688	61,878	62,765	63,453	64,002	64,453
Leaving Air - DB	(°F)	112.2	122.5	127.1	129.7	131.4	132.6	133.5	134.2	134.8	135.3
Leaving Air - WB	(°F)	72.9	75.5	76.7	77.3	77.7	78.0	78.2	78.3	78.5	78.6
Leaving Fluid Temp.	(°F)	137.4	153.5	160.8	164.9	167.6	169.4	170.8	171.9	172.7	173.4
Fluid Delta T	(°F)	42.6	26.5	19.2	15.1	12.4	10.6	9.2	8.1	7.3	6.6
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.6
Indoor Air Flow	(CFM)	1,000									
Total Capacity	(Btu/Hr)	43,458	54,716	59,848	62,805	64,740	66,109	67,132	67,926	68,563	69,084
Leaving Air - DB	(°F)	109.6	119.9	124.5	127.2	129.0	130.2	131.2	131.9	132.5	132.9
Leaving Air - WB	(°F)	72.2	74.9	76.0	76.7	77.1	77.4	77.6	77.8	77.9	78.0
Leaving Fluid Temp.	(°F)	135.6	152.0	159.6	163.9	166.7	168.7	170.2	171.3	172.2	172.9
Fluid Delta T	(°F)	44.4	28.0	20.4	16.1	13.3	11.3	9.8	8.7	7.8	7.1
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.6
Indoor Air Flow	(CFM)	1,100									
Total Capacity	(Btu/Hr)	44,981	57,276	62,984	66,297	68,475	70,022	71,180	72,081	72,804	73,397
Leaving Air - DB	(°F)	107.3	117.4	122.2	124.9	126.7	128.0	129.0	129.7	130.3	130.8
Leaving Air - WB	(°F)	71.6	74.2	75.4	76.1	76.6	76.9	77.1	77.3	77.4	77.5
Leaving Fluid Temp.	(°F)	134.1	150.7	158.5	163.0	166.0	168.0	169.6	170.8	171.7	172.5
Fluid Delta T	(°F)	45.9	29.3	21.5	17.0	14.0	12.0	10.4	9.2	8.3	7.5
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.6
Indoor Air Flow	(CFM)	1,200									
Total Capacity	(Btu/Hr)	46,332	59,599	65,861	69,520	71,937	73,659	74,951	75,958	76,766	77,431
Leaving Air - DB	(°F)	105.2	115.3	120.0	122.8	124.6	125.9	126.9	127.7	128.3	128.8
Leaving Air - WB	(°F)	71.0	73.7	74.9	75.6	76.0	76.4	76.6	76.8	76.9	77.1
Leaving Fluid Temp.	(°F)	132.7	149.5	157.5	162.2	165.3	167.4	169.0	170.3	171.3	172.1
Fluid Delta T	(°F)	47.3	30.5	22.5	17.8	14.7	12.6	11.0	9.7	8.7	7.9
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.6
Indoor Air Flow	(CFM)	1,400									
Total Capacity	(Btu/Hr)	48,854	63,712	71,027	75,361	78,245	80,311	81,868	83,085	84,065	84,871
Leaving Air - DB	(°F)	101.7	111.5	116.2	119.0	120.9	122.3	123.3	124.1	124.7	125.2
Leaving Air - WB	(°F)	70.0	72.7	73.9	74.7	75.1	75.5	75.7	75.9	76.1	76.2
Leaving Fluid Temp.	(°F)	130.4	147.4	155.8	160.7	164.0	166.3	168.0	169.4	170.4	171.3
Fluid Delta T	(°F)	49.6	32.6	24.2	19.3	16.0	13.7	12.0	10.6	9.6	8.7
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	1,500									
Total Capacity	(Btu/Hr)	49,680	65,580	73,401	78,069	81,186	83,423	85,113	86,436	87,502	88,380
Leaving Air - DB	(°F)	100.2	109.8	114.6	117.4	119.3	120.7	121.7	122.5	123.2	123.7
Leaving Air - WB	(°F)	69.6	72.3	73.5	74.2	74.7	75.1	75.3	75.5	75.7	75.8
Leaving Fluid Temp.	(°F)	129.3	146.5	155.0	160.0	163.4	165.8	167.5	168.9	170.0	170.9
Fluid Delta T	(°F)	50.7	33.5	25.0	20.0	16.6	14.2	12.5	11.1	10.0	9.1
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	1,600									
Total Capacity	(Btu/Hr)	50,613	67,308	75,616	80,608	83,950	86,357	88,176	89,603	90,754	91,704
Leaving Air - DB	(°F)	98.8	108.3	113.1	115.9	117.8	119.2	120.2	121.0	121.7	122.2
Leaving Air - WB	(°F)	69.2	71.8	73.1	73.8	74.3	74.7	74.9	75.2	75.3	75.5
Leaving Fluid Temp.	(°F)	128.4	145.6	154.2	159.4	162.8	165.3	167.1	168.5	169.7	170.6
Fluid Delta T	(°F)	51.6	34.4	25.8	20.6	17.2	14.7	12.9	11.5	10.3	9.4
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	1,700									
Total Capacity	(Btu/Hr)	51,490	68,955	77,744	83,058	86,627	89,203	91,153	92,685	93,922	94,943
Leaving Air - DB	(°F)	97.6	107.0	111.7	114.5	116.4	117.8	118.9	119.7	120.3	120.9
Leaving Air - WB	(°F)	68.8	71.5	72.7	73.5	74.0	74.3	74.6	74.8	75.0	75.1
Leaving Fluid Temp.	(°F)	127.5	144.8	153.5	158.7	162.3	164.8	166.7	168.1	169.3	170.3
Fluid Delta T	(°F)	52.5	35.2	26.5	21.3	17.7	15.2	13.3	11.9	10.7	9.7
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	1,800									
Total Capacity	(Btu/Hr)	52,296	70,491	79,743	85,369	89,160	91,901	93,981	95,617	96,938	98,030
Leaving Air - DB	(°F)	96.5	105.7	110.4	113.2	115.1	116.5	117.6	118.4	119.1	119.6
Leaving Air - WB	(°F)	68.5	71.1	72.4	73.1	73.6	74.0	74.3	74.5	74.7	74.8
Leaving Fluid Temp.	(°F)	126.7	144.0	152.8	158.2	161.7	164.3	166.2	167.8	169.0	170.0
Fluid Delta T	(°F)	53.3	36.0	27.2	21.8	18.3	15.7	13.8	12.2	11.0	10.0
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	1,900									
Total Capacity	(Btu/Hr)	53,046	71,939	81,640	87,571	91,582	94,487	96,695	98,433	98,839	101,001
Leaving Air - DB	(°F)	95.4	104.5	109.2	112.0	113.9	115.3	116.4	117.2	117.9	118.4
Leaving Air - WB	(°F)	68.2	70.8	72.1	72.8	73.3	73.7	74.0	74.2	74.4	74.5
Leaving Fluid Temp.	(°F)	125.9	143.3	152.2	157.6	161.2	163.9	165.8	167.4	168.6	169.6
Fluid Delta T	(°F)	54.1	36.7	27.8	22.4	18.8	16.1	14.2	12.6	11.4	10.4
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7
Indoor Air Flow	(CFM)	2,000									
Total Capacity	(Btu/Hr)	53,746	73,308	83,446	89,675	93,902	96,969	99,303	101,143	102,632	103,865
Leaving Air - DB	(°F)	94.5	103.4	108.0	110.9	112.8	114.2	115.2	116.1	116.8	117.3
Leaving Air - WB	(°F)	67.9	70.5	71.8	72.5	73.0	73.4	73.7	73.9	74.1	74.2
Leaving Fluid Temp.	(°F)	125.2	142.6	151.6	157.1	160.8	163.4	165.5	167.0	168.3	169.4
Fluid Delta T	(°F)	54.8	37.4	28.4	22.9	19.2	16.6	14.5	13.0	11.7	10.6
Water Press. Drop	(Ft - H2O)	0.2	0.6	1.4	2.4	3.8	5.4	7.3	9.5	11.9	14.7

## 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

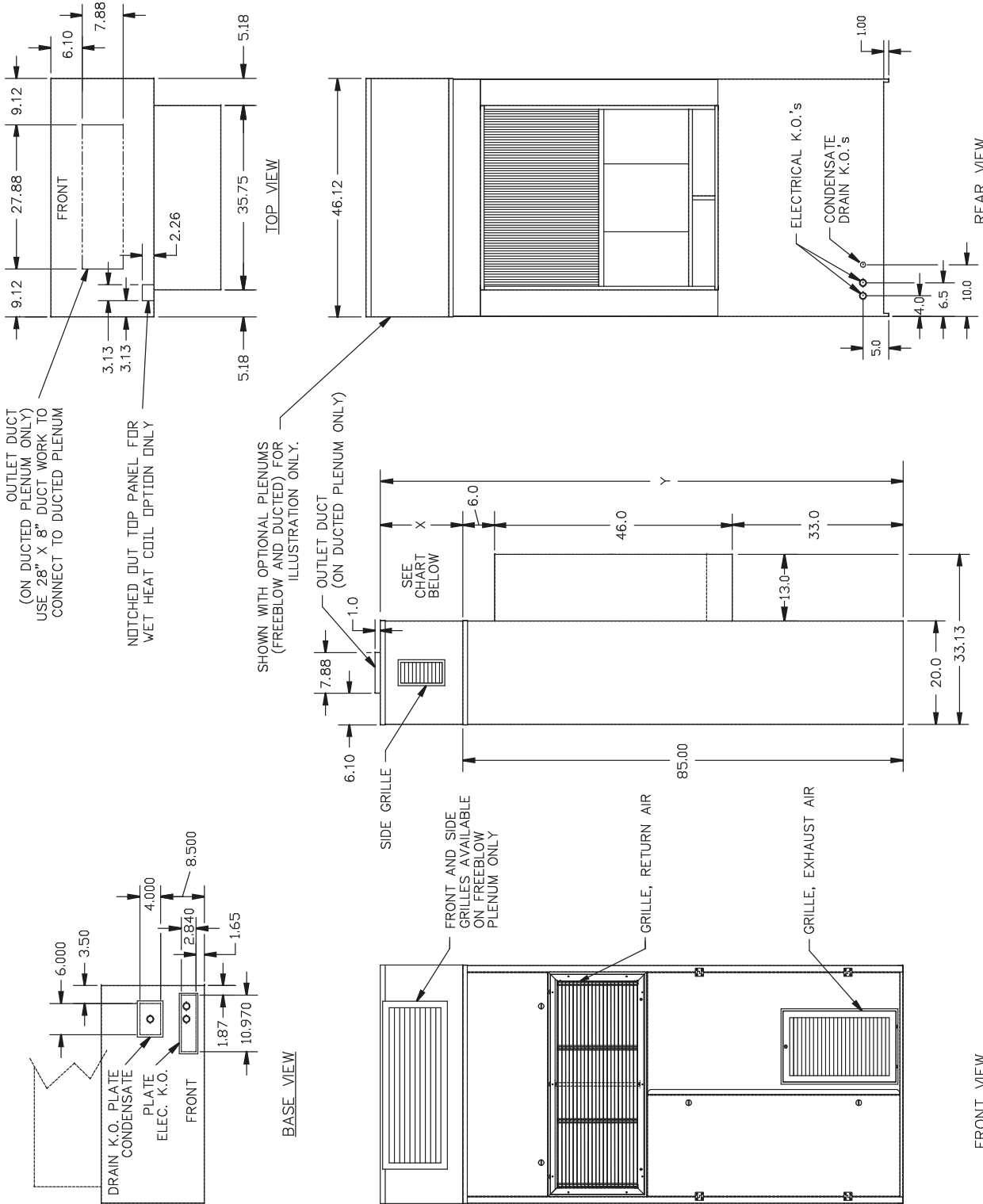
## Air Filter Sizes (inches) - Heat Pumps & Air Conditioners

MODEL	RETURN AIR FILTER*	FRESH AIR FILTER	EXHAUST FILTER**
24/30/36/40	2 - 16" x 16" x 1"	11" x 22" x 1"	12" x 20" x 1"
49/60	2 - 20" x 15" x 1"	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 - VAC24/30/36/40 (in inches)

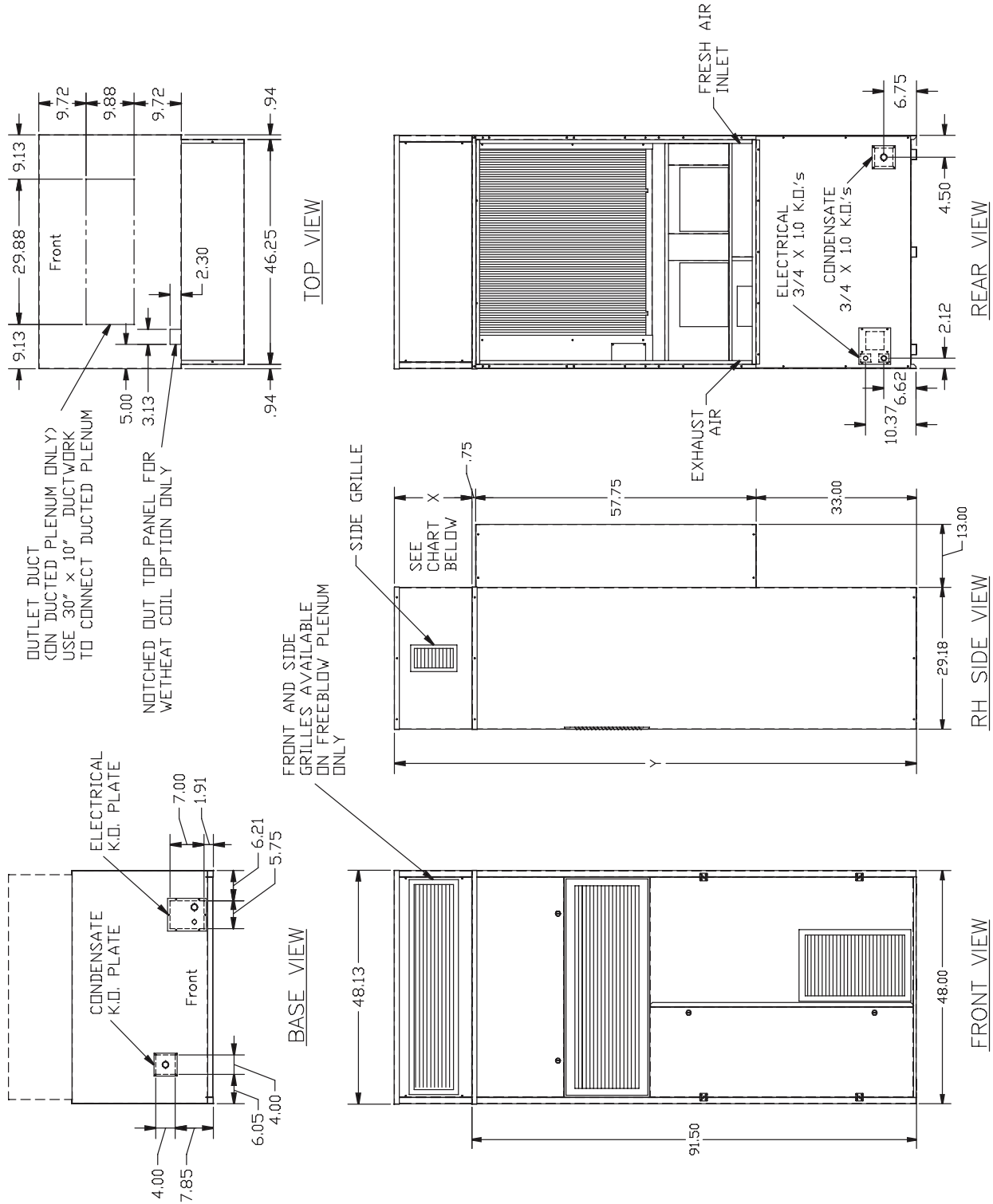


## SHIP WEIGHT (POUNDS)

BASIC MODEL	24	30	36	40
VOLTAGE - 230	450	540	550	565
VOLTAGE - 460	475	565	575	590

DIM. 'X'	MINIMUM PLENUM HEIGHT	
	DIM. 'Y'	PLENUM TYPE
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 - VAC49/60 (in inches)



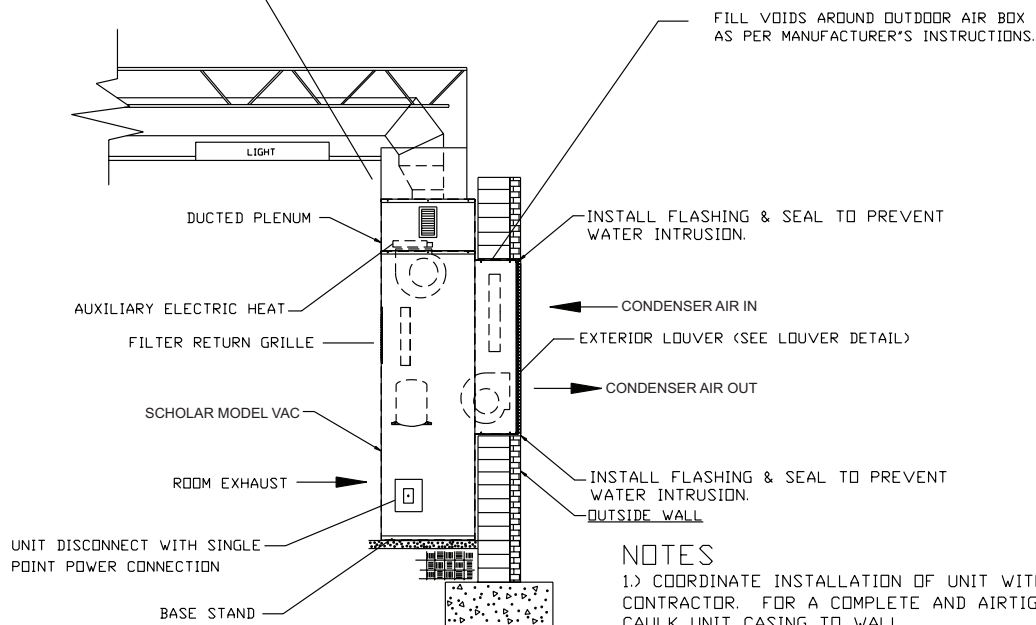
**SHIP WEIGHT (POUNDS)**

BASIC MODEL	49	60
VOLTAGE - 230	935	960
VOLTAGE - 460	960	985

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

## Typical Installation Detail

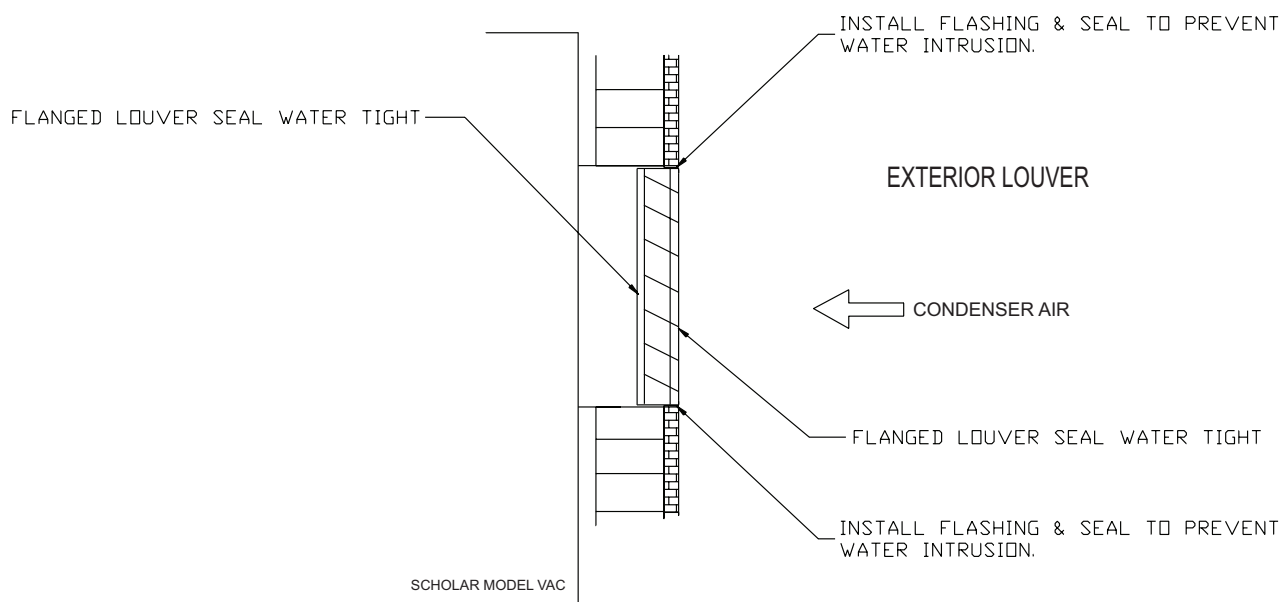
CLOSURE PANEL AT TOP OF UNIT FURNISHED BY UNIT MANUFACTURER.



### 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.

## TYPICAL SCHOLAR QV™ HEAT PUMP AND AIR CONDITIONER WALL DETAILS



## WALL MOUNTED LOUVER DETAIL

## Notes



## Notes

*Please consult the Marvair® website at [www.marvair.com](http://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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