Marvair®
An ACS Brand

PRODUCT DATA SHEET

2 to 6 Ton Vertical Wall Mount Air Conditioners

Models HVEA24-30-36-42-49-60 (Single Stage Compressor) **Models HVESA36-42-49-60 & AVHSA72 (2-Stage Compressor)**

HVEA36AC3A

Designed, Engineered & Assembled In the USA

AHRI CERTIFIED

CE

ETL Intertek

General Description

Used primarily to cool electronic and communication equipment shelters, Marvair® wall mount air conditioners are problem solvers for a wide range of conditions and applications. Due to the high internal heat load, these shelters require cooling even when outside temperatures drop below 60°F (15°C). All Marvair air conditioners have the necessary controls and components for operation during these (less than 60°F [15°C]) temperatures. All models use the non-ozone depleting R-410A refrigerant.

Marvair wall mount air conditioners are available with a factory installed economizer. When ambient conditions are cool and dry, the economizer uses outside air to cool the shelter. The economizer provides temperature control, energy cost savings, and increased reliability by decreasing the operating hours of the compressor and the condenser fan. To insure proper operation and optimum performance, all economizers are non-removable, factory installed and tested. In addition, factory and field installed accessories can be used to meet specific requirements.

➤ High Efficiency Models

HVEA: Marvair's most efficient wall mount air conditioners. Electronically commutated indoor fan motors combined with highly efficient scroll compressors result in Energy Efficiency Ratios (EER's) of up to 11.75.

➤ 2-Stage Compressor Models

HVESA/AVHSA: Models 36-42-49-60-72 have a 2-stage compressor with first stage cooling approximately 65% of the total cooling capacity. The 2-stage compressor provides lower start-up amps which can be critical when operating with a generator. The two stage compressor can also reduce energy costs and is able to more precisely match the cooling capacity of the air conditioner with the heat load in the shelter. *Both non-economizer and economizer-equipped units are available with 2 stage compressors.*

Features and Benefits

Built-In Energy Savings

- *Optional Factory Installed Economizer*
- *Three Model Lines to Meet Any Budget and Efficiency Requirements*
- *Available EER of up to 11.75*
- *Available 2-Stage Compressor on HVESA Models*

R-410A Refrigerant

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

High Efficiency and Reliability

- *High Efficiency Compressor and Lanced Coil Fins*
- *High/Low Pressure Switches with Lockout & Short Cycle Protection*

Ease of Installation and Service

- *Side Access Panels for Power Connections*
- *Built-In Mounting Flanges and Internal Disconnect*
- *Standard Access Valves and Filters, Status LEDs*

Safety Listed and Energy Certified

All Marvair wall mount air conditioners are built to UL standard 1995, 4th edition and CAN/CSA C22.2, No. 236-11 Ed.4. For energy efficiency and performance, the units are tested and rated in accordance to the ANSI/ARI (Air-Conditioning and Refrigeration Institute) Standard 390- 2003 (Single Package Vertical Units). All units meet or exceed the efficiency requirements of ANSI/ASHRAE/IESNA 90.1.2010. Marvair air conditioners are commercial units and are not intended for use in residential applications.

Standard Features

➤ Designed for Operation in Low Ambient Conditions

- Low ambient control cycles condenser fan to maintain proper refrigerant pressures. Allows operation in mechanical cooling (compressor) of our standard air conditioners down to 20°F (-7°C). With the Extreme Duty option, the units will operate down to 0°F (-18°C). Note: low temperature operation is affected by ambient conditions, e.g. wind and humidity.
- Three minute by-pass of the low pressure switch for start-up of compressor when outdoor temperatures are below 55°F (13°C).
- Optional economizer.

➤ High Efficiency

- High efficiency compressor.
- Lanced fins standard on all evaporator and condenser coils.

➤ Built-in Reliability

- High pressure switch and low pressure switch with lockout protects refrigerant circuit.
- Adjustable .03 to ten minute delay on make for short cycle protection.

➤ Designed for Operation on Generator Power

- All Marvair single & three phase air conditioners are designed to operate on Generator Power. See *Summary Electrical Ratings* for your specific model

➤ Remote Alarm Capability

- Dry contacts can be used for remote alarm or notification upon air conditioner lockout.

➤ Ease of Service

- Service access valves are standard.
- Standard 2" (50 mm) pleated filter with a MERV rating of 8 changeable from outside.
- All major components are readily accessible.
- Front Control Panel allows easy access and complies with NEC clearance codes on redundant side-by-side systems.
- LEDs indicate operational status and fault conditions.
- Foil backed insulation on the indoor air path.
- A minimum position potentiometer that can be adjusted to prevent the economizer damper from closing completely. This control ensures that whenever the evaporator fan is operating, fresh air is being introduced into the building.

➤ Rugged Construction

- Copper tube, aluminum fin evaporator & condenser coils.
- Field or factory installed heaters on discharge side of evaporator coil (optional)
- Baked on neutral beige finish over galvanneal steel for maximum cabinet life. (Other finishes are available.)

➤ Ease of Installation

- Sloped top with flashing eliminates need of rainhood.
- Built-in mounting flanges facilitate installation and minimize chance of water leaks.
- Supply and return openings exactly match previous models.
- Factory installed disconnect.
- Single Point Power Entry complies with latest edition of U.L. Standard 1995.
- Side access panels on economizer models for easy access to electrical connections.
- Phase monitor on all 3-Phase units to continuously measures the voltage of each of the three phases. Separate sensing of low/high voltage, voltage imbalance including phase loss and phase reversal.

A Marvair® First – Factory Installed Economizer

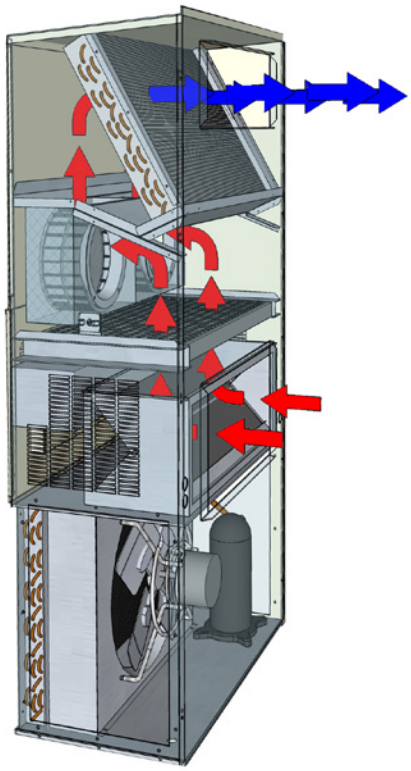
Marvair air conditioners have been the industry standard since their introduction in 1986. Tens of thousands are in operation from the metropolitan areas of North America to the deserts of the Mid-East to the Siberian tundra. Here's how the economizer works:

On a signal from the wall mounted indoor thermostat that cooling is required, either mechanical cooling with the compressor or free cooling with the economizer is provided. A factory installed enthalpy controller determines whether the outside air is sufficiently cool and dry to be used for cooling. If suitable, the compressor is locked out and the economizer damper opens to bring in outside air. Integral pressure relief allows the interior air to exit the shelter, permitting outside air to enter the shelter. The temperature at which the economizer opens is adjustable from 63°F (17°C) at 50% Relative Humidity to 73°F (23°C) at 50% Relative Humidity.

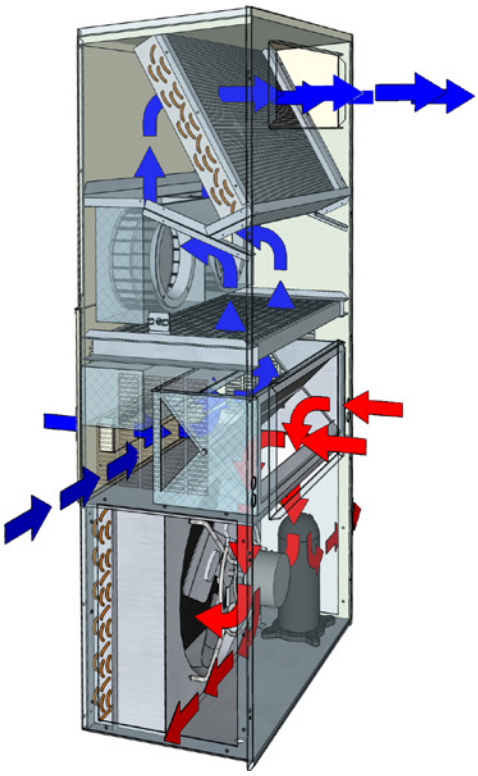
After the enthalpy control has activated and outside air is being brought into the building, the mixed air sensor measures the temperature of the air entering the indoor blower and then modulates the economizer damper to mix the right proportion of cool outside air with warm indoor air to maintain 50-63°F (10 - 17°C) air being delivered to the building. This prevents shocking the electronic components with cold outside air. The compressor is not permitted to operate when the economizer is functioning.

If the outside air becomes too hot or humid, the economizer damper closes completely, or to a field selectable minimum open position, and mechanical cooling is activated.

In all economizer equipped air conditioners, the supply air flow in the economizer mode is the same or greater than the rated air flow. (The rated air flow is the AHRI certified air flow when the unit is in mechanical cooling.) The “full flow” economizer reduces electrical costs by maximizing the use of outside air for cooling.



100% Mechanical Cooling



100% Economizer Cooling

Savings with an Economizer

The following table shows the annual electrical cost of cooling a 10 ft. x 20 ft. x 9 ft. (3m x 6m x 2.7m) shelter in twelve cities in the US. Costs are shown for an air conditioner without an economizer, for an air conditioner with an economizer and the savings. The savings do not include any demand charges. The savings are based on the electrical usage of a five ton air conditioner and an electric rate of $.11 per kilowatt-hour, the approximate average commercial rate in the US.

Hours of Operation	Atlanta, GA	Boston, MA	Chicago, IL	Dallas, TX	Denver, CO	Houston, TX
Annual Compressor & Condenser Motor Run Time without Economizer (Hrs.)	6,176	6,016	6,018	6,282	6,022	6,299
Annual Compressor & Condenser Motor Run Time with Economizer (Hrs.)	3,456	1,947	2,106	4,062	1,930	4,495
Run Time Savings with the Economizer (Hrs.)	2,720	4,069	3,912	2,220	4,092	1,804
Annual Costs Saving ($) of 11.0 EER unit with an Economizer						
Annual Operating Cost 11.0 EER Unit without Economizer ($)	$3,150	$3,068	$3,069	$3,204	$3,072	$3,212
Annual Operating Cost 11.0 EER with Economizer	$2,071	$1,459	$1,525	$2,323	$1,454	$2,496
Annual Savings using 11.0 EER Unit with Economizer	$1,079	$1,609	$1,544	$881	$1,454	$716

Hours of Operation	Los Angeles, CA	Miami, FL	Phoenix, AZ	Pittsburgh, PA	Seattle, WA	St. Louis, MO
Annual Compressor & Condenser Motor Run Time without Economizer (Hrs.)	6,105	6,434	6,473	6,026	5,999	6,120
Annual Compressor & Condenser Motor Run Time with Economizer (Hrs.)	3,121	6,062	4,799	2,172	1,093	2,896
Run Time Savings with the Economizer (Hrs.)	2,984	372	1,674	3,854	4,906	3,224
Annual Costs Saving ($) of 11.0 EER unit with an Economizer						
Annual Operating Cost 11.0 EER Unit without Economizer ($)	$3,114	$3,282	$3,302	$3,073	$3,060	$3,122
Annual Operating Cost 11.0 EER with Economizer	$1,926	$3,133	$2,636	$1,550	$1,114	$1,846
Annual Savings using 11.0 EER Unit with Economizer	$1,188	$148	$666	$1,523	$1,946	$1,275

Shelter Metrics:

- 10’ x 20’ x 9’ building
- Internal heat gain (electronics load): 12,000 watts.
- Building surface area (excluding floor area): 740 ft²
- R-Value of walls and ceiling: R-12
- Internal shelter temperature (Thermostat set point): 75ºF

Air Conditioner Metrics:

- Economizer setting: 63ºF (dry bulb or enthalpy sensor)
- A/C unit capacity: 60,000 BTUH (5 tons) with 1-stage compressor
- Nominal EER (unit efficiency): 11.0
- Cost of power: $.11 per KWH

Controllers and Thermostats

➤ Controllers

CommStat 6 2/4 Telecom HVAC Controller ..... *P/N 70705*
CommStat 6 4/8 Telecom HVAC Controller ..... *P/N S/12087-04*
CommStat 6 6/12 Telecom HVAC Controller ..... *P/N S/12087-06*

The CommStat 6 is an HVAC controller, is available in three configurations, and is designed specifically for controlling up to six redundant air conditioners with two stage compressors in a telecommunications shelter or enclosure. The **CommStat 6 2/4** controls up to two single or 2-stage air conditioners (4 Stages max.), the **CommStat 6 4/8** controls up to four single or 2-stage air conditioners (8 Stages max.) and the **CommStat 6 6/12** controls up to six single or 2-stage air conditioners (12 Stages max.)

In addition to the control of the air conditioners, the CommStat 6 has multiple configurable outputs for remote alarms or notification. The CommStat 6 is factory programmed with standard industry set points, but can be configured on site. Settings are retained indefinitely in the event of a power loss.

CommStat Touch HVAC Controller NEW! ..... P/N K/10439

The CommStat Touch telecom controller with a touch screen interface is designed to allow remote control and monitoring of Marvair air conditioners and heat pumps with single or 2-stage compressors in a shelter or enclosure and is certified by ETL for HVAC UL60950-1 and FCC47CFR compliance. In addition to the control of HVAC equipment, CommStat Touch includes the Marvair RemoteLink IPv4/IPv6 communication module to provide status information, alarm notifications, set point adjustment, and remote HVAC configuration. See the CommStat Touch PDS for more details.

CommStat 4 Telecom HVAC Controller ..... P/N *S/7846*

The CommStat 4 HVAC controller is designed specifically for controlling two redundant air conditioners, heat pumps or air conditioners with 2-stage compressors. The CommStat 4 has seven outputs for remote alarms or notification. Status LED's indicate HEAT, COOL, POWER and the LEAD unit. When a fault is detected, an alarm LED flashes and the LCD screen displays the fault.

The CommStat can be daisy chained with a second CommStat 4 controllers for controlling up to four air conditioners in one shelter. See the CommStat 4 PDS for more details.

CommStat3™ Lead/Lag Microprocessor Controller ..... *P/N S/04581*

Solid state controller designed to operate a fully or partially redundant air conditioning system. Ensures equal wear on both air conditioners while allowing the lag unit to assist upon demand. Lead/ lag changeover is factory set at 7 days, but is field programmable in 1/2 day increments from 1/2 to 7 days. The CommStat 3™ Controller has LED's to indicate status & function, digital display of temperature, a comfort override button for energy savings, five alarm relays, a built in temperature sensor and is fully programmable. See the CommStat 3 PDS for more details.

➤ Thermostats & Thermostat Guards

Note: *All air conditioners with 2-stage compressors (models AVHSA & HVESA) require a 2-stage cooling thermostat.*

Thermostat ..... *P/N 50123*
Digital thermostat. 1-stage heat, 1-stage cooling. 7 day programmable. Fan switch: Auto & On. Auto-change over. Keypad lockout. Non-volatile program memory.

Thermostat ..... *P/N 50107*
Digital thermostat. 2-stage heat, 2-stage cooling. 7 day programmable. Fan switch: Auto & On. Auto-change over. Status LED's. Backlit display. Programmable fan. Non-volatile program memory.

Thermostat Guard ..... *P/N 50092*
Thermostat guard for use with the 50123 and 50107 thermostats.

Digital Humidistat ..... *P/N 50254*
To be used with units with hot gas or electric reheat. Programmable dehumidistat and ventilation controller. Permanent memory retention of set points.Humidity sensor can be field calibrated. High & low dehumidification set points. Outdoor temperature and humidity sensor included. °F or °C selectable.

Operation of 2-Stage Compressor Air Conditioners with a CommStat Touch, CommStat 4™ or CommStat 6 Lead/Lag Thermostat Controller

Marvair's AVHSA and HVESA air conditioners have 2-stage compressors. These units can provide substantial energy savings and better control of temperature and humidity by matching the cooling requirement with the performance of the air conditioner. First stage is typically 65% of the total (2-stage) capacity of the air conditioner. When operated from power supplied by a generator, starting the air conditioner in the first stage means lower start-up amps.

- **CommStat Touch or CommStat™ 4 Controller:** When two, 2-stage air conditioners are controlled by a CommStat 4 lead/lag controller in a redundant application, one of the air conditioners is the lead unit and the second is the lag unit. On a call for cooling, the lead unit starts operation in the first stage (low capacity). If the temperature in the building continues to rise above the set point temperature, the first stage (low capacity) of the lag unit will be initiated. When the temperature in the building drops to the set point, the air conditioners will turn off. On a subsequent call for cooling the process will repeat.

  If the set point temperature is not reached with the first stage capacity operation of both air conditioners, the lead air conditioner will commence operation in second stage (full capacity). If the temperature in the building continues to rise past the setpoint, the lag unit will switch to second stage cooling operation. At that time, both air conditioners are operating in maximum capacity.

- **CommStat™ 6 Controller:** When two, 2-stage air conditioners are controlled by a CommStat 6 lead/lag controller in a redundant application, one of the air conditioners is the lead unit and the second is the lag unit. On a call for cooling, the lead unit starts operation in the first stage (LOW capacity). If the temperature in the building continues to rise above the set point temperature, the second stage (FULL capacity) of the LEAD unit will be initiated. When the temperature in the building drops to the set point, the unit will turn off. On a subsequent call for cooling the process will repeat.

  If the set point temperature is not reached with second stage capacity operation of the LEAD air conditioner, the LAG air conditioner will commence operation in first stage (LOW capacity). If the temperature in the building continues to rise past the setpoint, the lag unit will switch to second stage cooling operation. At that time, both air conditioners are operating in maximum capacity

When the temperature in the building is satisfied with either controller, both units will turn off.

If the units have economizers (ComPac II air conditioners), the enthalpy sensor determines whether to use outside air or use mechanical cooling. When the economizer is used, the compressors do not operate.

Accessories

➤ Supply Grilles

For HVEA24 ..... *P/N 80675*
28" x 8" (711 mm x 203 mm)

For HVEA30, 36, 42, 49, 60 ..... *P/N 80676*
30" x 10" (762 mm x 254 mm)

For HVESA60 Reverse Flow ..... *P/N 93197*
30" x 16" (762 mm x 406 mm)

➤ Return Grilles

For HVEA24 ..... *P/N 80678*
28" x 14" (711 mm x 356 mm)

For AVHSA72 and HVEA30, 36, 42, 49, 60 ..... *P/N 80679*
30" x 16" (762 mm x 406 mm)

For HVESA60 Reverse Flow ..... *P/N 93198*
30" x 10" (762 mm x 254 mm)

➤ Return Filter Grilles

Used when filter must be changed from the interior. Not recommended for ComPac II air conditioners.
Note: Filter used in Return Filter Grille is 1" (25 mm) thick.

For HVEA24 ..... *P/N 80672*
28" x 14" (711 mm x 356 mm)

For AVHSA72 and HVEA30, 36, 42, 49, 60 ..... *P/N 80673*
30" x 16" (762 mm x 406 mm)

Options

Marvair wall mount air conditioners are designed and are built to stringent requirements of the communications/ electronic shelter. Applications occur that have special requirements. Numerous options are available that meet these special needs.

➤ Hard Start Kit

Used on single phase equipment to give the compressor higher starting torque under low voltage conditions. (Field installed only) (Note: Not recommended for use on scroll compressors.)

➤ Dehumidification

Allows the electric heat to operate simultaneously with cooling. See Dehumidification Application Bulletin for details. Note: The electrical characteristics and requirements of air conditioners with the dehumidification option are different from standard air conditioners. Refer to the appropriate Summary Rating Charts for the electrical characteristics of units with Electric Reheat. Units with reheat require a thermostat and a dehumidistat for proper operation.

➤ Protective Coating Packages

Typically, only non-economizer units are used in corrosive environments, but Marvair economizer equipped air conditioners are also available with corrosion protection. Two corrosion protection packages are offered - one for the condenser section (Coastal Environmental Package) and the other for the entire unit (Coat-All Package).

The Coastal Environmental Package includes:

- Corrosion resistant fasteners
- Sealed or partially sealed condenser fan motor
- Protective coating applied to all exposed internal copper and metal in the condenser section
- Protective coating on the condenser coil (Luvata Insitu®) contains ES2 (embedded stainless steel pigment) technology.

The Coat all Package includes all of the above, plus:

- Protective coating on the evaporator coil (Luvata Insitu®) contains ES2 (embedded stainless steel pigment) technology
- Protective coating on exterior and interior components and sheet metal.

  Note 1: The insulated internal sheet metal and the internal control box are not coated.
  Note 2: The corrosion prevention coating can not be applied to stainless steel.

➤ Protective Coil Coatings

The Condenser Coil or the Evaporator Coil or Both can be coated. Coating the Evaporator Coil in not common. For harsh conditions, e.g., power plants, paper mills or sites where the unit will be exposed to salt water, the coils should be protected by a protective coating and the stainless steel cabinet/fastener option should be selected.

Note: Cooling capacity may be reduced by up to 5% on units with coated coils.

➤ Air Conditioner Transition Curb

Non-economizer units only – A sheet metal curb that enables 42/48/60 air conditioner to replace 30/36 units. Curb transitions supply and return openings of the 3-1/2, 4 and 5 ton units to the smaller openings.

➤ Hot Gas By-Pass (Non-Economizer Models)

Used in specialty applications; i.e., Magnetic Resonance Imaging (MRI) buildings, to prevent magnetic voltage disturbance caused by compressor cycling. Hot gas by-pass option packages are available to allow operation to 20°F (-7°C). Please refer to Hot Gas By-pass Application Bulletin for details.

➤ High Filtration

Selected units are built with larger blowers/motors for use with higher efficiency filters with MERV ratings of 11, 13 and 14 when tested to ASHRAE 52.2. Units with economizers have a prefilter on the outside air. Contact your Marvair representative for specific models.

➤ Color

Marvair air conditioners are available in five different cabinet colors -the standard Marvair® beige, white, gray, brown and dark bronze. The standard cabinet's sides, top and front panels are constructed of 20 gauge painted steel. Contact your Marvair representative for color chips. The cabinet can also be constructed of type 316 stainless steel. Two stainless steel cabinet constructions are available- the complete cabinet, including most internal sheet metal or only the exterior sheet metal. Custom colors are also available; contact Marvair for details.

Custom colors available

➤ Extended Warranty
A first-year labor (Silver), and a two-year labor (Gold) are available. See *www.marvair.com* for optional warranty details.

➤ Dirty Filter Indicator
A factory installed option that measures the difference in pressure across the internal filter and illuminates a LED when the pressure exceeds the desired difference.

➤ Thermal Expansion Valve
Available on all Marvair air conditioners. Improves performance in hot ambient temperatures.

➤ Sealed Condenser Fan Motors
Recommended on units to be installed in corrosive sites, e.g., near the ocean and in deserts with blowing sand.

➤ Compressor Sound Jacket
To reduce sound of compressor.

➤ Extreme Duty Package
Allows Marvair® air conditioners to operate in extremely cold and hot ambient conditions. The Extreme Duty Kit is always factory installed and is available on all air conditioners. Units without an economizer will operate from 0°F to 130°F (-18°C to 54°C). Units with an economizer will operate from -40°F to 130°F (-40°C to 54°C).

The Extreme Duty Package includes a thermal expansion valve (TXV), crankcase heater, an auto reset high pressure switch and an outdoor thermostat and fan cycle switch. The fan cycle control is standard on all Marvair air conditioners and operates based upon the liquid line pressure. The outside thermostat opens whenever the outside temperature is below 50°F (10°C) and closes when the outside temperature is 50°F (10°C) or higher. When the temperature is below 50°F (10°C), the fan cycle switch is in the circuit; when temperatures are 50°F (10°C) or higher, the fan cycle switch is not in the circuit. The outdoor thermostat is used with a TXV to prevent excessive cycling or "hunting" of the TXV.

➤ Lockable Disconnect Access Cover Plate
The access plate to the service disconnect switch can be equipped with a lockable cover.

➤ Desert Duty Package
Our standard air conditioners will operate in outside ambient temperatures up to 120°F (48.9°C) The Desert Duty package is a factory installed package of components and cabinet modifications to allow operation in ambient temperatures up 130°F (54°C). Standard features of the Desert Duty package include a thermal expansion valve and a sealed condenser fan motor. To prevent sand and dust infiltration, the electrical control box is sealed. A closed loop design on non-economizer units insures that no outside air is introduced into the shelter. Note: Units with an economizer may be ordered with the Desert Duty Package. If an economizer equipped air conditioner is required with the Desert Duty Package, sand intrusion into the shelter should be considered.

➤ Washable Filter
Spun aluminum construction allows cleaning of filters with water.

➤ Hot Gas Reheat (HGR)
A Hot Gas Reheat coil and controls allow the indoor humidity of the controlled environment to be maintained at or below a certain humidity set point. These units do not have the ability to add humidity to the room. Dehumidification is achieved by operating mechanical cooling in conjunction with a hot gas reheat coil.

➤ Right & Left Side Compressor Location
Marvair air conditioners can be built with the compressor on the opposite side to facilitate service access when two units are installed side by side. In the HVEA/HVSA24,30,36 and 42, the standard location for the compressor is on the right hand side. In the AVHSA72, the compressor is accessed from the front of the unit and an opposing configuration is not required.

➤ Anti-Microbial Light
A germicidal UV light destroys toxic bacteria, viruses and mold on the indoor air coil.

➤ Cold Plasma Air Purification Device
Installed inside the unit, this device neutralizes odors, kills mold, bacteria and viruses. It also helps to control allergens*, asthma*, smoke and airborne particles.
*These statements are based on customer testimonials and have not been evaluated by the FDA.

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

Remote Access Data Points

Through the Ethernet connection, the network operations center can monitor and change various data points in the HVAC system and the shelter.

Data Points which can be monitored **and** changed:

- First Stage Cooling Set Point Temperature
- Second Stage Cooling Set Point Differential Temperature
- First Stage Heating Set Point Temperature
- Second Stage Heating Set Point Differential Temperature

Data points which can only be monitored:

- Inside Temperature - Current
- Outside Temperature - Current
- Outside Humidity - Current
- Dew point - Current
- Inside Temperature - Average Last Hour
- Outside Temperature - Average Last Hour
- Outside Humidity - Average Last Hour
- Dew point - Average Last Hour
- Unit 1 & Unit 2 Mechanical Cooling Time - Last Hour
- Unit 1 & Unit 2 Mechanical Cooling Requests - Last Hour
- Unit 1 & Unit 2 Free Air Cooling Time - Last Hour
- Unit 1 & Unit 2 Free Air Cooling Requests - Last Hour
- Unit 1 & Unit 2 Heating Time - Last Hour
- Unit 1 & Unit 2 Heating Requests - Last Hour

Dry Contacts Alarm Outputs

A dry contact is provided for each HVAC unit to indicate HVAC unit failure to the shelter alarm block. Unit failure is defined as 1) a high pressure lockout or 2) a low pressure lockout or 3) a loss of landline power. This dry contact is a normally open contact.

Control Box

The internal control board in Marvair air conditioners simplifies wiring, consolidates several of the electrical functions onto one device and improves the reliability of the air conditioner. In addition, the control board has LED's that indicate operational status and fault conditions.

➤ LED Indicator Lights

COLOR	TYPE	STATUS	DESCRIPTION
Green	Power	Constant On	24 VAC power has been applied
Red	Status	Constant On	Normal operation
		1 Blink	High pressure switch has opened twice
		2 Blinks	Low pressure switch has opened twice
		3 Blinks	Freeze stat (optional) - indoor coil temperature is below 35°F (1°C)

➤ Modes of Operation

Normal Start-up: On a call for cooling, and the with the high pressure switch closed, the cooling system (compressor, indoor blower motor and outdoor fan motor) will be energized. (Note: See the Delay on Make feature). The cooling system will remain energized during the three minute low pressure switch bypass cycle. If the low pressure is closed, the cooling system will continue to operate after the three-minute bypass. If the low pressure switch is open after the three-minute bypass, the cooling system will be de-energized.

Lockout Mode: If either the high or low pressure switch opens twice on the same call for cooling, the control board enters into and indicates the lockout mode. In the lockout mode, the compressor is turned off, the alarm output is energized and the status LED's will blink to indicate which fault has occurred. If there is a call for air flow, the indoor blower will remain energized. When the lockout condition has cleared, the unit will reset if the demand of the thermostat is removed or when power is reset. The lockout circuit is factory wired for normally open contacts. The user can select either normally closed or normally open remote alarm dry contacts.

Delay on Make: On initial power up or on resumption of power, the air conditioner will wait .03 to 10 minutes from a call for cooling before allowing the contactor to energize.

Model Identification

●●● S A ●● AC 3 ● ●●● ● ● A5 ●●● ●●●

AVH = High Efficiency Wall Mount Air Conditioner[1]
HVE = High Efficiency Wall Mount Air Conditioner[2]

2-Stage Compressor

Refrigerant
A = R410A

Nominal Cooling
24 = 24,000 BTUH
30 = 30,000 BTUH
36 = 36,000 BTUH
42 = 42,000 BTUH
49 = 48,000 BTUH
60 = 60,000 BTUH
72 = 72,000 BTUH

System Type
Air Conditioner

Engineering Revision

Power Supply
A = 208/230V,60Hz,1ø
C = 208/230V,60Hz,3ø
D = 460V,60Hz,3ø (3 wire)
Z = 575V,60Hz,3ø

Electric Heat – kW
000 = No Heat
022 = 2.2 kW
036 = 3.6 kW
040 = 4 kW
050 = 5 kW
060 = 6 kW
080 = 8 kW
090 = 9 kW
100 = 10 kW
120 = 12 kW
150 = 15 kW

Special Option Code
D = Desert Duty
E = Extreme Duty
F = Reverse Air Flow[3]
G = Hot Gas Reheat
O = Opposite side compressor
R = Electric Reheat
U = Scroll Compressor
X = Hot Gas Bypass

Configuration
N = Non-Economizer
C = Economizer-Equipped

A5 = Built in compliance with UL 1995, 4th edition

Brand Designation
Unused = Marvair
EUB = Eubank

Cabinet Color
100 = Beige
200 = Gray
400 = White
500 = Stainless Steel (Exterior Only)
SS-500 = Stainless Steel
700 = Aluminum Stucco

[1]AVHSA72 has a 2-Stage compressor as standard.
[2]All HVES models feature a 2-Stage compressor.
[3]The standard configuration is with the supply (conditioned) air at the top of the unit and the return air below it. In the reverse air flow configuration, the return is at the top and the supply air below it.

Ambient Temperature Operating Ranges

Basic Model	Special Option	AVHSA/HVEA/HVESA
Non-Economizer	Standard Unit (N)	20ºF - 120ºF (-7ºC - 48.9ºC)
	Desert Duty (ND)	20ºF - 130ºF (-7ºC - 54ºC)
	Extreme Duty Kit (NE)	0ºF - 130ºF (-18ºC - 54ºC)
Economizer-Equipped	Standard Unit (C)	-40ºF - 120ºF (-40ºC - 48.9ºC)
	Desert Duty (CD)	-40ºF - 130ºF (-40ºC - 54ºC)
	Extreme Duty Kit (CE)	-40ºF - 130ºF (-40ºC - 54ºC)

EER Comparison by Model

Nominal Cooling Capacity (BTUH)	Basic Model	EER
24,000	HVEA24	11.00
30,000	HVEA30	11.75
36,000	HVEA36	11.00
	HVESA36	11.00
42,000	HVEA42	11.00
	HVESA42	11.00
48,000	HVEA49	11.50
	HVESA49	11.50
60,000	HVEA60	11.00
	HVESA60	11.00
72,000	AVHSA72	11.00

Note: HVESA models have 2-stage compressors.

HVEA High Efficiency Air Conditioners

Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390 for HVEA Air Conditioners with Single Stage Compressor

Model Number	HVEA24			HVEA30				HVEA36				HVEA42				HVEA49				HVEA60			
	AC3A	AC3C	AC3D	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z
Cooling BTUH[1]	23,200			29,000				35,000				40,000				49,000				58,000			
EER[2]	11.00			11.75				11.00				11.00				11.50				11.00			
Rated Air Flow (CFM[3])	800			1,000				1,300				1,400				1,750				1,900			

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

Sensible Total Heat Ratio @ 95ºF (35ºC) Outside Air Dry Bulb - HVEA Air Conditioners with Single Stage Compressor

Model Number	HVEA24			HVEA30				HVEA36				HVEA42				HVEA49				HVEA60			
	AC3A	AC3C	AC3D	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z
Total Capacity	23,200			29,000				35,000				40,000				49,000				58,000			
Sensible Heat Ratio	0.76			0.76				0.76				0.73				0.74				0.73			
Sensible Capacity	17,600			22,020				26,945				29,270				36,175				42,505			
Rated Air Flow (CFM[1])	800			1,000				1,300				1,400				1,750				1,900			

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

Cooling Performance (BTUH) at Various Outdoor Temperatures for HVEA Air Conditioners with Single Stage Compressor

Model Number	Return Air DB/WB °F(°C)	Cooling Capacity BTUH	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	120°F / 48.9°C	125°F / 51.7°C	130°F / 54.4°C
HVEA24	72/61 (22/16)	Total	24,497	23,647	22,821	21,972	21,122	20,272	19,423	18,597	18,172	17,747	17,322	16,898
		Sensible	17,568	17,212	16,869	16,519	16,170	15,824	15,481	15,149	14,979	14,810	14,641	14,473
	76/63 (24/17)	Total	25,464	24,591	23,694	22,821	21,948	21,075	20,202	19,305	18,880	18,455	18,030	17,606
		Sensible	19,030	18,677	18,317	17,968	17,622	17,279	16,937	16,589	16,425	16,261	16,098	15,936
	80/67 (27/19)	Total	27,376	26,432	25,488	24,544	23,600	22,656	21,712	20,768	20,296	19,871	19,446	19,022
		Sensible	18,908	18,552	18,199	17,848	17,500	17,154	16,810	16,469	16,299	16,147	15,995	15,844
	84/71 (29/22)	Total	29,288	28,273	27,282	26,267	25,252	24,237	23,222	22,231	21,712	21,287	20,862	20,438
		Sensible	18,690	18,335	17,991	17,641	17,293	16,949	16,606	16,274	16,102	15,961	15,820	15,680
HVEA30	72/61 (22/16)	Total	30,102	29,058	28,043	26,999	25,955	24,911	23,867	22,852	22,330	21,808	21,286	20,764
		Sensible	22,020	21,585	21,165	20,735	20,309	19,885	19,464	19,057	18,849	18,641	18,434	18,228
	76/63 (24/17)	Total	31,291	30,218	29,116	28,043	26,970	25,897	24,824	23,722	23,200	22,678	22,156	21,634
		Sensible	23,898	23,465	23,024	22,597	22,174	21,752	21,334	20,907	20,706	20,506	20,306	20,107
	80/67 (27/19)	Total	33,640	32,480	31,320	30,160	29,000	27,840	26,680	25,520	24,940	24,418	23,896	23,374
		Sensible	23,745	23,309	22,876	22,447	22,020	21,596	21,175	20,757	20,549	20,363	20,177	19,991
	84/71 (29/22)	Total	35,989	34,742	33,524	32,277	31,030	29,783	28,536	27,318	26,680	26,158	25,636	25,114
		Sensible	23,474	23,039	22,618	22,189	21,764	21,341	20,922	20,515	20,303	20,130	19,958	19,786
HVEA36	72/61 (22/16)	Total	36,953	35,671	34,425	33,144	31,862	30,580	29,299	28,053	27,412	26,771	26,130	25,490
		Sensible	26,946	26,417	25,906	25,384	24,865	24,349	23,837	23,341	23,088	22,835	22,583	22,331
	76/63 (24/17)	Total	38,412	37,095	35,742	34,425	33,108	31,791	30,474	29,121	28,480	27,839	27,198	26,558
		Sensible	29,241	28,716	28,180	27,661	27,145	26,633	26,124	25,604	25,359	25,115	24,872	24,629
	80/67 (27/19)	Total	41,296	39,872	38,448	37,024	35,600	34,176	32,752	31,328	30,616	29,975	29,334	28,694
		Sensible	29,041	28,512	27,986	27,464	26,945	26,430	25,917	25,409	25,155	24,928	24,702	24,476
	84/71 (29/22)	Total	44,180	42,649	41,154	39,623	38,092	36,561	35,030	33,535	32,752	32,111	31,470	30,830
		Sensible	28,695	28,167	27,656	27,135	26,618	26,105	25,594	25,100	24,842	24,631	24,421	24,212
HVEA42	72/61 (22/16)	Total	41,520	40,080	38,680	37,240	35,800	34,360	32,920	31,520	30,800	30,080	29,360	28,640
		Sensible	29,436	28,838	28,260	27,669	27,082	26,498	25,919	25,359	25,072	24,786	24,501	24,218
	76/63 (24/17)	Total	43,160	41,680	40,160	38,680	37,200	35,720	34,240	32,720	32,000	31,280	30,560	29,840
		Sensible	31,858	31,263	30,656	30,069	29,486	28,906	28,330	27,743	27,466	27,190	26,915	26,641
	80/67 (27/19)	Total	46,400	44,800	43,200	41,600	40,000	38,400	36,800	35,200	34,400	33,680	32,960	32,240
		Sensible	31,643	31,044	30,449	29,857	29,270	28,687	28,108	27,533	27,246	26,990	26,734	26,478
	84/71 (29/22)	Total	49,640	47,920	46,240	44,520	42,800	41,080	39,360	37,680	36,800	36,080	35,360	34,640
		Sensible	31,265	30,668	30,088	29,499	28,913	28,332	27,755	27,195	26,904	26,666	26,429	26,192
HVEA49	72/61 (22/16)	Total	50,862	49,098	47,383	45,619	43,855	42,091	40,327	38,612	37,730	36,848	35,966	35,084
		Sensible	36,323	35,592	34,887	34,165	33,448	32,736	32,028	31,344	30,994	30,645	30,297	29,950
	76/63 (24/17)	Total	52,871	51,058	49,196	47,383	45,570	43,757	41,944	40,082	39,200	38,318	37,436	36,554
		Sensible	39,340	38,614	37,873	37,156	36,444	35,737	35,034	34,316	33,978	33,641	33,305	32,970
	80/67 (27/19)	Total	56,840	54,880	52,920	50,960	49,000	47,040	45,080	43,120	42,140	41,258	40,376	39,494
		Sensible	39,071	38,340	37,613	36,892	36,175	35,463	34,756	34,053	33,703	33,390	33,077	32,765
	84/71 (29/22)	Total	60,809	58,702	56,644	54,537	52,430	50,323	48,216	46,158	45,080	44,198	43,316	42,434
		Sensible	38,602	37,873	37,165	36,446	35,732	35,022	34,318	33,634	33,278	32,987	32,697	32,409
HVEA60	72/61 (22/16)	Total	60,204	58,116	56,086	53,998	51,910	49,822	47,734	45,704	44,660	43,616	42,572	41,528
		Sensible	42,765	41,886	41,037	40,170	39,309	38,454	37,605	36,785	36,365	35,947	35,531	35,115
	76/63 (24/17)	Total	62,582	60,436	58,232	56,086	53,940	51,794	49,648	47,444	46,400	45,356	44,312	43,268
		Sensible	46,277	45,403	44,512	43,651	42,795	41,946	41,102	40,242	39,837	39,433	39,030	38,629
	80/67 (27/19)	Total	67,280	64,960	62,640	60,320	58,000	55,680	53,360	51,040	49,880	48,836	47,792	46,748
		Sensible	45,989	45,109	44,234	43,367	42,505	41,650	40,801	39,958	39,538	39,162	38,788	38,414
	84/71 (29/22)	Total	71,978	69,484	67,048	64,554	62,060	59,566	57,072	54,636	53,360	52,316	51,272	50,228
		Sensible	45,465	44,586	43,734	42,869	42,010	41,157	40,311	39,491	39,063	38,715	38,368	38,021

Electrical Characteristics - Compressor, Fan & Blower Motors

BASIC MODEL	COMPRESSOR				OUTDOOR FAN MOTOR				INDOOR FAN MOTOR (ECM)			
	Type	VOLTS-HZ-PH	RLA[1]	LRA[2]	VOLTS-HZ-PH	RPM[3]	FLA[4]	HP[5]	VOLTS-HZ-PH	RPM[3]	FLA[4]	HP[5]
HVEA24AC3A	SCROLL	208/230-60-1	12.8	58.3	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	2.8	1/3
HVEA30AC3A		208/230-60-1	12.8	64.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA36AC3A		208/230-60-1	16.6	79.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA42AC3A		208/230-60-1	17.0	124.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA49AC3A		208/230-60-1	21.8	117.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVEA60AC3A		208/230-60-1	26.4	134.0	208/230-60-1	825	5.3	1/2	208/230-60-1	1050	6.8	3/4
HVEA24AC3C	SCROLL	208/230-60-3	7.7	55.4	208/230-60-1	1200	3.5	1/4	208/230-60-1	1050	2.8	1/3
HVEA30AC3C		208/230-60-3	8.3	58.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA36AC3C		208/230-60-3	10.4	88.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA42AC3C		208/230-60-3	13.6	83.1	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA49AC3C		208/230-60-3	13.7	83.1	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVEA60AC3C		208/230-60-3	15.9	111.0	208/230-60-1	825	5.3	1/2	208/230-60-1	1050	6.8	3/4
HVEA24AC3D	SCROLL	460-60-3	4.0	28.0	208/230-60-1	1200	3.5	1/4	208/230-60-1	1050	2.8	1/3
HVEA30AC3D		460-60-3	5.1	28.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA36AC3D		460-60-3	5.8	38.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA42AC3D		460-60-3	6.1	41.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA49AC3D		460-60-3	6.2	41.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVEA60AC3D		460-60-3	7.7	52.0	208/230-60-1	825	5.3	1/2	208/230-60-1	1050	6.8	3/4
HVEA30AC3Z	SCROLL	575-60-3	3.3	23.7	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA36AC3Z		575-60-3	3.8	36.5	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA42AC3Z		575-60-3	4.2	33.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVEA49AC3Z		575-60-3	4.8	33.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVEA60AC3Z		575-60-3	5.8	39.0	208/230-60-1	825	5.3	1/2	208/230-60-1	1050	6.8	3/4

[1]RLA = Rated Load Amps [2]LRA = Locked Rotor Amps [3]RPM = Revolutions per Minute [4]FLA = Full Load Amps [5]HP = Horsepower
The 460 volt units will have a step down transformer for the 230 volt motors.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - *HVEA Air Conditioners with Single stage Compressors & Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") • Economizer, Outside Air with Pressure Relief ("C")*

ELECTRIC HEAT		000 = None		040 = 4 kw		050 = 5 kw		060 = 6 kw		080 = 8 kw		090 = 9 kw		100 = 10 kw		120 = 12 kw		150 = 15 kw	
BASIC MODEL	VOLTS-HZ-PH	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
HVEA24AC3A	208/230-60-1	22.3	35	23.6	35	28.8	35	34.1	35	44.5	45			54.9	60				
HVEA30AC3A	208/230-60-1	22.8	35	25.1	35	30.3	35	35.6	40	46.0	50			56.4	60	66.8	70	82.4	90
HVEA36AC3A	208/230-60-1	27.6	40	25.1	40	30.3	40	35.6	40	46.0	50			56.4	60	66.8	70	82.4	90
HVEA42AC3A	208/230-60-1	29.1	45			30.3	45							56.4	60	66.8	70	82.4	90
HVEA49AC3A	208/230-60-1	36.6	60			36.6	60							58.9	60	69.3	70	84.9	90
HVEA60AC3A	208/230-60-1	45.1	70			45.1	70							58.9	60	69.3	70	84.9	90
HVEA24AC3C	208/230-60-3	15.9	20					20.8	25			29.9	30			38.9	40		
HVEA30AC3C	208/230-60-3	17.2	25					22.3	25			31.4	35			40.4	45	49.4	50
HVEA36AC3C	208/230-60-3	19.8	30					22.3	30			31.4	35			40.4	45	49.4	50
HVEA42AC3C	208/230-60-3	24.8	35					24.8	35			31.4	35			40.4	45	49.4	50
HVEA49AC3C	208/230-60-3	26.4	40					26.4	40			33.9	40			42.9	45	51.9	60
HVEA60AC3C	208/230-60-3	32.0	45					32.0	45			33.9	45			42.9	45	51.9	60
HVEA24AC3D	460-60-3	8.2	15					10.4	15			14.9	15			19.4	20	24.0	25
HVEA30AC3D	460-60-3	9.8	15					11.2	15			15.7	20			20.2	25	24.7	25
HVEA36AC3D	460-60-3	10.7	15					11.2	15			15.7	20			20.2	25	24.7	25
HVEA42AC3D	460-60-3	11.5	15					11.6	15			15.7	20			20.2	25	24.7	25
HVEA49AC3D	460-60-3	12.4	15					12.4	15			16.9	20			21.4	25	26.0	30
HVEA60AC3D	460-60-3	15.7	20					15.7	20			16.9	20			21.4	25	26.0	30
HVEA30AC3Z	575-60-3	6.8	15					8.9	15			12.5	15			16.2	20	20.5	25
HVEA36AC3Z	575-60-3	7.5	15					8.9	15			12.5	15			16.2	20	20.5	25
HVEA42AC3Z	575-60-3	8.4	15					8.9	15			12.5	15			16.2	20	20.5	25
HVEA49AC3Z	575-60-3	9.7	15					9.9	15			13.5	15			17.2	20	21.5	25
HVEA60AC3Z	575-60-3	12.1	20					9.9	20			13.5	20			17.2	20	21.5	25

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the AC3A & AC3C models. The 460 volts AC3D models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - *HVEA Air Conditioners with Electric Reheat ("R") with Single stage Compressors and Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") • Economizer, Outside Air with Pressure Relief ("C")*

ELECTRIC HEAT		000 = None		040 = 4 kw		050 = 5 kw		060 = 6 kw		080 = 8 kw		090 = 9 kw		100 = 10 kw		120 = 12 kw		150 = 15 kw	
BASIC MODEL	VOLTS-HZ-PH	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
HVEA24AC3A	208/230-60-1	22.3	35	43.1	45	48.3	50	53.6	60					74.4	80				
HVEA30AC3A	208/230-60-1	22.8	35	43.6	45	48.8	50	54.1	60					74.9	80	85.3	90	100.9	110
HVEA36AC3A	208/230-60-1	27.6	40	48.4	50	53.6	60	58.8	60					79.6	80	90.1	100	105.7	110
HVEA42AC3A	208/230-60-1	29.1	45			55.1	60							81.1	90	91.6	100	107.2	110
HVEA49AC3A	208/230-60-1	36.6	60			62.6	70							88.6	90	99.1	100	114.7	120
HVEA60AC3A	208/230-60-1	45.1	70			71.1	80							97.2	100	107.6	110	123.2	130
HVEA24AC3C	208/230-60-3	15.9	20					34.0	35			43.0	45			52.0	60	61.0	70
HVEA30AC3C	208/230-60-3	17.2	25					35.2	40			44.2	45			53.3	60	62.3	70
HVEA36AC3C	208/230-60-3	19.8	30					37.8	40			46.9	50			55.9	60	64.9	70
HVEA42AC3C	208/230-60-3	24.8	35					42.8	45			51.9	60			60.9	70	69.9	70
HVEA49AC3C	208/230-60-3	26.4	40					44.5	45			53.5	60			62.5	70	71.5	80
HVEA60AC3C	208/230-60-3	32.0	45					50.0	60			59.0	60			68.1	70	77.1	80
HVEA24AC3D	460-60-3	8.2	15					17.2	20			21.7	25			26.2	30	30.7	30
HVEA30AC3D	460-60-3	9.8	15					18.8	20			23.3	25			27.8	30	32.3	35
HVEA36AC3D	460-60-3	10.7	15					19.7	20			24.2	25			28.7	30	33.2	35
HVEA42AC3D	460-60-3	11.5	15					20.5	25			25.1	30			29.6	30	34.1	35
HVEA49AC3D	460-60-3	12.4	15					21.4	25			25.9	30			30.4	35	35.0	40
HVEA60AC3D	460-60-3	15.7	20					24.7	25			29.2	30			33.7	35	38.2	40
HVEA30AC3Z	575-60-3	6.8	15					14.1	15			17.7	20			21.3	25	25.6	30
HVEA36AC3Z	575-60-3	7.5	15					14.7	15			18.3	20			21.9	25	26.2	30
HVEA42AC3Z	575-60-3	8.4	15					15.6	20			19.2	20			22.8	25	27.1	30
HVEA49AC3Z	575-60-3	9.7	15					16.9	20			20.5	25			24.2	25	28.5	30
HVEA60AC3Z	575-60-3	12.1	20					19.3	20			22.9	25			26.5	30	30.9	35

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry

MCA & MFS are calculated at 230 volts on the AC3A & AC3C models. The 460 volts AC3D models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Unit Load Amps - *HVEA Air Conditioners with with Single stage Compressors and Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") • Economizer, Outside Air with Pressure Relief ("C")*

BASIC MODEL NUMBER	VOLTS-HZ-PH	CURRENT AMPS		LOAD OF RESISTIVE HEATING - ELEMENTS ONLY (AMPS) *(1) ALL HEATING ELEMENTS ARE ON A SEPARATE CIRCUIT (2) SHADED VALUES (12 & 15 kW) UTILIZE TWO CIRCUITS*								TOTAL MAXIMUM HEATING AMPS *INCLUDES AMPS FROM MOTOR(S) THAT ARE LOCATED ON AN ELECTRICAL CIRCUIT THAT DOES NOT HAVE HEATERS*							
		AC[1]	IBM[2]	04 kW	05 kW	06 kW	08 kW	09 kW	10 kW	12 kW	15 kW	04 Kw	05 Kw	06 Kw	08 Kw	09 Kw	10 Kw	12 Kw	15 Kw
HVEA24AC3A	208/230-60-1	19.1	2.8	16.7	20.8	25.0	33.3		41.7			19.5	23.6	27.8	36.1		44.5		
HVEA30AC3A	208/230-60-1	19.6	4.3	16.7	20.8	25.0	33.3		41.7	50.0	62.5	21.0	25.1	29.3	37.6		46.0	54.3	66.8
HVEA36AC3A	208/230-60-1	23.4	4.3	16.7	20.8	25.0	33.3		41.7	50.0	62.5	21.0	25.1	29.3	37.6		46.0	54.3	66.8
HVEA42AC3A	208/230-60-1	24.8	4.3		20.8				41.7	50.0	62.5		25.1				46.0	54.3	66.8
HVEA49AC3A	208/230-60-1	31.1	6.8		20.8				41.7	50.0	62.5		27.6				48.5	56.8	69.3
HVEA60AC3A	208/230-60-1	38.5	6.8		20.8				41.7	50.0	62.5		27.6				48.5	56.8	69.3
HVEA24AC3C	208/230-60-3	14.0	2.8			14.4		21.7		28.9	36.1			17.2		24.5		31.7	38.9
HVEA30AC3C	208/230-60-3	15.1	4.3			14.4		21.7		28.9	36.1			18.7		26.0		33.2	40.4
HVEA36AC3C	208/230-60-3	17.2	4.3			14.4		21.7		28.9	36.1			18.7		26.0		33.2	40.4
HVEA42AC3C	208/230-60-3	21.4	4.3			14.4		21.7		28.9	36.1			18.7		26.0		33.2	40.4
HVEA49AC3C	208/230-60-3	23.0	6.8			14.4		21.7		28.9	36.1			21.2		28.5		35.7	42.9
HVEA60AC3C	208/230-60-3	28.0	6.8			14.4		21.7		28.9	36.1			21.2		28.5		35.7	42.9
HVEA24AC3D	460-60-3	5.4	1.4			7.2		10.8		14.4	18.0			8.6		12.2		15.8	19.4
HVEA30AC3D	460-60-3	7.3	2.2			7.2		10.8		14.4	18.0			9.4		13.0		16.6	20.2
HVEA36AC3D	460-60-3	8.0	2.2			7.2		10.8		14.4	18.0			9.4		13.0		16.6	20.2
HVEA42AC3D	460-60-3	8.3	2.2			7.2		10.8		14.4	18.0			9.4		13.0		16.6	20.2
HVEA49AC3D	460-60-3	9.6	3.4			7.2		10.8		14.4	18.0			10.6		14.2		17.8	21.4
HVEA60AC3D	460-60-3	11.1	3.4			7.2		10.8		14.4	18.0			10.6		14.2		17.8	21.4
HVEA30AC3Z	575-60-3	5.0	1.7			5.8		8.7		11.5	14.4			7.5		10.4		13.3	16.2
HVEA36AC3Z	575-60-3	5.5	1.7			5.8		8.7		11.5	14.4			7.5		10.4		13.3	16.2
HVEA42AC3Z	575-60-3	5.9	1.7			5.8		8.7		11.5	14.4			7.5		10.4		13.3	16.2
HVEA49AC3Z	575-60-3	7.5	2.7			5.8		8.7		11.5	14.4			8.5		11.4		14.3	17.2
HVEA60AC3Z	575-60-3	8.5	2.7			5.8		8.7		11.5	14.4			8.5		11.4		14.3	17.2

[1]AC = Air Conditioner Unit Amps [2]IBM = Indoor Blower Motor

Heating kW is rated at 240 volts on the AC3A & AC3C models. Derate heater output by 25% for operation at 208 volts. Heating kW is rated at 480 volts on the AC3D models. Total heating and cooling amps includes all motors. Three phase models contain single phase motor loads. Loads are not equally balanced on each phase and values shown are maximum phase loads.

HVESA & AVHSA Air Conditioners with 2-Stage Compressor

Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390 for HVESA & AVHSA Air Conditioners with 2-Stage Compressors

Model Number	HVESA36			HVESA42				HVESA49				HVESA60				AVHSA72		
	AC3A	AC3C	AC3D	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D
Cooling BTUH[1] - 2nd Stage	35,000			39,000				47,000				56,000				67,000		
EER[2] - 2nd Stage	11.00			11.00				11.75				11.00				11.00		
Integrated Part Load Value[3]	16.00			14.10				16.00				14.80				12.90		
Rated Air Flow (CFM[4])	1,300			1,400				1,750				1,900				2,150		

[1]Cooling rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air. [2]EER=Energy Efficiency Ratio
[3]Integrated Part Load Value is an integrated efficiency measure from 1st and 2nd stage capacity modulation. [4]CFM=Cubic Feet per Minute
Ratings are with no outside air. Performance will be affected by altitude.
Ratings are at 230 volts for 208/230 volt units ("A" & "C" models) and 460 volts for "D" models. Operation of units at a different voltage from that of the rating point will affect performance and air flow.

Sensible Total Heat Ratio @ 95ºF (35ºC) Outside Air Dry Bulb - HVESA & AVHSA Air Conditioners with 2-Stage Compressors

Model Number	HVESA36			HVESA42				HVESA49				HVESA60				AVHSA72		
	AC3A	AC3C	AC3D	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D	AC3Z	AC3A	AC3C	AC3D
Total Capacity	35,000			39,000				47,000				56,000				67,000		
Sensible Heat Ratio	0.70			0.71				0.79				0.77				0.68		
Sensible Capacity	24,445			27,590				36,920				43,235				45,560		
Rated Air Flow (CFM[1])	1,300			1,400				1,750				1,900				2,150		

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

Stage 2 Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature						
	75ºF / 24ºC	80ºF / 26.5ºC	85ºF / 29ºC	90ºF / 32ºC	95ºF / 35ºC	100ºF / 38ºC	105ºF / 41ºC
HVESA36AC3	40,600	39,200	37,800	36,400	35,000	33,600	32,200
HVESA42AC3	45,240	43,680	42,120	40,560	39,000	37,440	35,880
HVESA49AC3	54,520	52,640	50,760	48,880	47,000	45,120	43,240
HVESA60AC3	64,960	62,720	60,480	58,240	56,000	53,760	51,520
AVHSA72AC3	78,068	75,376	72,684	69,992	67,000	64,675	61,916

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

Stage 1 Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature						
	75ºF / 24ºC	80ºF / 26.5ºC	85ºF / 29ºC	90ºF / 32ºC	95ºF / 35ºC	100ºF / 38ºC	105ºF / 41ºC
HVESA36AC3	30,856	29,792	28,728	27,664	26,600	25,536	24,472
HVESA42AC3	34,336	33,152	31,968	30,784	29,600	28,416	27,232
HVESA49AC3	44,080	42,560	41,040	39,520	38,000	36,480	34,960
HVESA60AC3	51,040	49,280	47,520	45,760	44,000	42,240	40,480
AVHSA72AC3	60,436	58,352	56,268	54,184	52,100	50,068	47,932

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

HVESA Air Conditioners Cooling Performance (BTUH) at Various Outdoor Temperatures
Stage 2 Cooling Performance (BTUH) at Various Outdoor

Model Number	Return Air DB/WB °F(°C)	Cooling Capacity BTUH	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	120°F / 48.9°C	125°F / 51.7°C	130°F / 54.4°C
HVESA36	72/61 (22/16)	Total	36,330	35,070	33,845	32,585	31,325	30,065	28,805	27,580	26,950	26,320	25,690	25,060
		Sensible	24,758	24,239	23,739	23,227	22,718	22,212	21,709	21,223	20,974	20,726	20,479	20,232
	76/63 (24/17)	Total	37,765	36,470	35,140	33,845	32,550	31,255	29,960	28,630	28,000	27,370	26,740	26,110
		Sensible	26,700	26,185	25,660	25,151	24,646	24,144	23,644	23,135	22,894	22,655	22,416	22,178
	80/67 (27/19)	Total	40,600	39,200	37,800	36,400	35,000	33,600	32,200	30,800	30,100	29,470	28,840	28,210
		Sensible	26,500	25,981	25,466	24,954	24,445	23,940	23,438	22,939	22,690	22,467	22,245	22,024
	84/71 (29/22)	Total	43,435	41,930	40,460	38,955	37,450	35,945	34,440	32,970	32,200	31,570	30,940	30,310
		Sensible	26,156	25,639	25,137	24,627	24,120	23,617	23,117	22,631	22,378	22,172	21,966	21,761
HVESA42	72/61 (22/16)	Total	40,482	39,078	37,713	36,309	34,905	33,501	32,097	30,732	30,030	29,328	28,626	27,924
		Sensible	27,892	27,311	26,749	26,176	25,606	25,039	24,476	23,932	23,653	23,376	23,099	22,823
	76/63 (24/17)	Total	42,081	40,638	39,156	37,713	36,270	34,827	33,384	31,902	31,200	30,498	29,796	29,094
		Sensible	30,108	29,531	28,942	28,372	27,806	27,243	26,684	26,113	25,844	25,576	25,309	25,042
	80/67 (27/19)	Total	45,240	43,680	42,120	40,560	39,000	37,440	35,880	34,320	33,540	32,838	32,136	31,434
		Sensible	29,893	29,311	28,734	28,160	27,590	27,024	26,461	25,902	25,624	25,375	25,126	24,878
	84/71 (29/22)	Total	48,399	46,722	45,084	43,407	41,730	40,053	38,376	36,738	35,880	35,178	34,476	33,774
		Sensible	29,518	28,938	28,376	27,804	27,236	26,672	26,112	25,568	25,285	25,053	24,823	24,593
HVESA49	72/61 (22/16)	Total	48,786	47,094	45,449	43,757	42,065	40,373	38,681	37,036	36,190	35,344	34,498	33,652
		Sensible	36,709	36,014	35,342	34,654	33,971	33,292	32,617	31,965	31,631	31,298	30,966	30,634
	76/63 (24/17)	Total	50,713	48,974	47,188	45,449	43,710	41,971	40,232	38,446	37,600	36,754	35,908	35,062
		Sensible	39,948	39,257	38,552	37,869	37,191	36,516	35,846	35,162	34,839	34,518	34,197	33,877
	80/67 (27/19)	Total	54,520	52,640	50,760	48,880	47,000	45,120	43,240	41,360	40,420	39,574	38,728	37,882
		Sensible	39,678	38,982	38,290	37,603	36,920	36,242	35,568	34,898	34,565	34,265	33,967	33,670
	84/71 (29/22)	Total	58,327	56,306	54,332	52,311	50,290	48,269	46,248	44,274	43,240	42,394	41,548	40,702
		Sensible	39,215	38,522	37,848	37,164	36,483	35,807	35,136	34,484	34,145	33,868	33,591	33,316
HVESA60	72/61 (22/16)	Total	58,128	56,112	54,152	52,136	50,120	48,104	46,088	44,128	43,120	42,112	41,104	40,096
		Sensible	43,132	42,290	41,475	40,644	39,817	38,997	38,181	37,394	36,991	36,589	36,189	35,790
	76/63 (24/17)	Total	60,424	58,352	56,224	54,152	52,080	50,008	47,936	45,808	44,800	43,792	42,784	41,776
		Sensible	46,866	46,028	45,173	44,347	43,526	42,711	41,901	41,075	40,685	40,297	39,910	39,525
	80/67 (27/19)	Total	64,960	62,720	60,480	58,240	56,000	53,760	51,520	49,280	48,160	47,152	46,144	45,136
		Sensible	46,576	45,732	44,894	44,061	43,235	42,414	41,599	40,790	40,387	40,026	39,666	39,307
	84/71 (29/22)	Total	69,496	67,088	64,736	62,328	59,920	57,512	55,104	52,752	51,520	50,512	49,504	48,496
		Sensible	46,058	45,216	44,399	43,569	42,745	41,927	41,115	40,328	39,917	39,583	39,249	38,917

HVESA Air Conditioners Cooling Performance (BTUH) at Various Outdoor Temperatures
Stage 1 Cooling Performance (BTUH) at Various Outdoor

Model Number	Return Air DB/WB °F(°C)	Cooling Capacity BTUH	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	120°F / 48.9°C	125°F / 51.7°C	130°F / 54.4°C
HVESA36	72/61 (22/16)	Total	27,611	26,653	25,722	24,765	23,807	22,849	21,892	20,961	20,482	20,003	19,524	19,046
		Sensible	21,236	20,858	20,492	20,117	19,745	19,373	19,004	18,646	18,463	18,280	18,097	17,915
	76/63 (24/17)	Total	28,701	27,717	26,706	25,722	24,738	23,754	22,770	21,759	21,280	20,801	20,322	19,844
		Sensible	23,163	22,788	22,404	22,032	21,662	21,294	20,927	20,552	20,375	20,199	20,022	19,844
	80/67 (27/19)	Total	30,856	29,792	28,728	27,664	26,600	25,536	24,472	23,408	22,876	22,397	21,918	21,440
		Sensible	22,959	22,582	22,207	21,833	21,461	21,091	20,722	20,356	20,173	20,009	19,845	19,682
	84/71 (29/22)	Total	33,011	31,867	30,750	29,606	28,462	27,318	26,174	25,057	24,472	23,993	23,514	23,036
		Sensible	22,645	22,270	21,905	21,533	21,163	20,794	20,428	20,071	19,885	19,734	19,582	19,431
HVESA42	72/61 (22/16)	Total	30,725	29,659	28,623	27,558	26,492	25,426	24,361	23,325	22,792	22,259	21,726	21,194
		Sensible	23,927	23,505	23,096	22,678	22,261	21,847	21,434	21,034	20,830	20,625	20,422	20,218
	76/63 (24/17)	Total	31,938	30,843	29,718	28,623	27,528	26,433	25,338	24,213	23,680	23,147	22,614	22,082
		Sensible	26,125	25,706	25,277	24,862	24,448	24,037	23,627	23,209	23,011	22,814	22,614	22,082
	80/67 (27/19)	Total	34,336	33,152	31,968	30,784	29,600	28,416	27,232	26,048	25,456	24,923	24,390	23,858
		Sensible	25,906	25,484	25,065	24,647	24,232	23,818	23,407	22,997	22,793	22,610	22,427	22,245
	84/71 (29/22)	Total	36,734	35,461	34,218	32,945	31,672	30,399	29,126	27,883	27,232	26,699	26,166	25,634
		Sensible	25,564	25,144	24,736	24,321	23,907	23,495	23,086	22,688	22,480	22,311	22,142	21,973
HVESA49	72/61 (22/16)	Total	39,444	38,076	36,746	35,378	34,010	32,642	31,274	29,944	29,260	28,576	27,892	27,208
		Sensible	32,922	32,378	31,851	31,312	30,776	30,242	29,710	29,196	28,932	28,576	27,892	27,208
	76/63 (24/17)	Total	41,002	39,596	38,152	36,746	35,340	33,934	32,528	31,084	30,400	29,716	29,032	28,348
		Sensible	36,144	35,603	35,051	34,516	33,983	33,453	32,528	31,084	30,400	29,716	29,032	28,348
	80/67 (27/19)	Total	44,080	42,560	41,040	39,520	38,000	36,480	34,960	33,440	32,680	31,996	31,312	30,628
		Sensible	35,870	35,326	34,786	34,248	33,712	33,180	32,650	32,123	31,860	31,624	31,312	30,628
	84/71 (29/22)	Total	47,158	45,524	43,928	42,294	40,660	39,026	37,392	35,796	34,960	34,276	33,592	32,908
		Sensible	35,439	34,898	34,372	33,836	33,303	32,773	32,246	31,733	31,466	31,248	31,030	30,813
HVESA60	72/61 (22/16)	Total	45,672	44,088	42,548	40,964	39,380	37,796	36,212	34,672	33,880	33,088	32,296	31,504
		Sensible	38,014	37,378	36,762	36,133	35,507	34,884	34,264	33,664	33,357	33,050	32,296	31,504
	76/63 (24/17)	Total	47,476	45,848	44,176	42,548	40,920	39,292	37,664	35,992	35,200	34,408	33,616	32,824
		Sensible	41,721	41,090	40,445	39,820	39,198	38,580	37,664	35,992	35,200	34,408	33,616	32,824
	80/67 (27/19)	Total	51,040	49,280	47,520	45,760	44,000	42,240	40,480	38,720	37,840	37,048	36,256	35,464
		Sensible	41,425	40,789	40,157	39,529	38,904	38,282	37,663	37,048	36,742	36,467	36,193	35,464
	84/71 (29/22)	Total	54,604	52,712	50,864	48,972	47,080	45,188	43,296	41,448	40,480	39,688	38,896	38,104
		Sensible	40,947	40,314	39,699	39,073	38,451	37,832	37,216	36,618	36,306	36,052	35,798	35,544

Electrical Characteristics - Compressor, Fan & Blower Motors - HVESA & AVHSA Air Conditioners with 2-Stage Compressor

BASIC MODEL	Type	COMPRESSOR			OUTDOOR FAN MOTOR				INDOOR FAN MOTOR (ECM[6])			
		VOLTS-HZ-PH	RLA[1]	LRA[2]	VOLTS-HZ-PH	RPM[3]	FLA[4]	HP[5]	VOLTS-HZ-PH	RPM[3]	FLA[4]	HP[5]
HVESA36AC3A	SCROLL	208/230-60-1	15.2	83.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA42AC3A		208/230-60-1	17.9	96.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA49AC3A		208/230-60-1	21.1	104.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVESA60AC3A		208/230-60-1	27.1	152.9	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
AVHSA72AC3A		208/230-60-1	29.7	179.0	208/230-60-1	1200	6.3	3/4	208/230-60-1	1050	6.8	3/4
HVESA36AC3C	SCROLL	208/230-60-3	11.6	73.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA42AC3C		208/230-60-3	14.1	88.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA49AC3C		208/230-60-3	14.0	83.1	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVESA60AC3C		208/230-60-3	16.5	110.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
AVHSA72AC3C		208/230-60-3	17.6	136.0	208/230-60-1	1200	6.3	3/4	208/230-60-1	1050	6.8	3/4
HVESA36AC3D	SCROLL	460-60-3	5.7	38.0	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA42AC3D		460-60-3	6.2	44.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA49AC3D		460-60-3	6.4	41.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVESA60AC3D		460-60-3	7.2	52.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
AVHSA72AC3D		460-60-3	8.5	67.1	208/230-60-1	1200	6.3	3/4	208/230-60-1	1050	6.8	3/4
HVESA36AC3Z	SCROLL	575-60-3	4.0	25.6	208/230-60-1	825	2.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA42AC3Z		575-60-3	5.1	30.0	208/230-60-1	1200	3.5	1/3	208/230-60-1	1050	4.3	1/2
HVESA49AC3Z		575-60-3	4.6	33.0	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4
HVESA60AC3Z		575-60-3	5.5	38.9	208/230-60-1	825	2.5	1/2	208/230-60-1	1050	6.8	3/4

[1]RLA = Rated Load Amps [2]LRA = Locked Rotor Amps [3]RPM = Revolutions per Minute [4]FLA = Full Load Amps [5]HP = Horsepower [6]ECM = Electronically Commutated Motor
The 460 volt units have a step down transformer for the 230 volt motors.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - *HVESA & AVHSA Air Conditioners with 2-Stage Compressor and Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") Economizer, Outside Air with Pressure Relief ("C")*

ELECTRIC HEAT		000 = None		040 = 4 kw		050 = 5 kw		060 = 6 kw		080 = 8 kw		090 = 9 kw		100 = 10 kw		120 = 12 kw		150 = 15 kw	
BASIC MODEL	VOLTS-HZ-PH	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
HVESA36AC3A	208/230-60-1	25.8	40	25.8	40	30.3	40	35.6	40	46.0	50			56.4	60	66.8	70	82.4	90
HVESA42AC3A	208/230-60-1	30.2	45			30.3	45							56.4	60	66.8	70	82.4	90
HVESA49AC3A	208/230-60-1	35.7	60			35.7	60							58.9	60	69.3	70	84.9	90
HVESA60AC3A	208/230-60-1	43.1	70			43.1	70							58.9	60	69.3	70	84.9	90
AVHSA72AC3A	208/230-60-1	50.2	80			50.2	80							58.4	80	68.8	80	84.4	90
HVESA36AC3C	208/230-60-3	21.3	30					22.3	30			31.4	35			40.4	45	49.4	50
HVESA42AC3C	208/230-60-3	25.5	35					25.5	35			31.4	35			40.4	45	49.4	50
HVESA49AC3C	208/230-60-3	26.8	40					26.8	40			33.9	40			42.9	45	51.9	60
HVESA60AC3C	208/230-60-3	29.9	45					29.9	45			33.9	45			42.9	45	51.9	60
AVHSA72AC3C	208/230-60-3	35.1	50					35.1	50			35.1	50			42.9	50	51.9	60
HVESA36AC3D	460-60-3	10.5	15					11.2	15			15.7	20			20.2	25	24.7	25
HVESA42AC3D	460-60-3	11.7	15					11.7	15			15.7	20			20.2	25	24.7	25
HVESA49AC3D	460-60-3	12.7	15					12.7	15			16.9	20			21.4	25	26.0	30
HVESA60AC3D	460-60-3	13.7	20					13.7	20			16.9	20			21.4	25	26.0	30
AVHSA72AC3D	460-60-3	17.2	25					17.2	25			17.2	25			21.4	25	25.9	30
HVESA36AC3Z	575-60-3	7.7	15					8.9	15			12.5	15			16.2	20	20.5	25
HVESA42AC3Z	575-60-3	9.5	15					8.9	15			12.5	15			16.2	20	20.5	25
HVESA49AC3Z	575-60-3	9.5	15					9.9	15			13.5	15			17.2	20	21.5	25
HVESA60AC3Z	575-60-3	10.6	20					9.9	20			13.5	20			17.2	20	21.5	25

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the AC3A & AC3C models. The 460 volts AC3D models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

Summary Electrical Ratings (Wire and Circuit Breaker Sizing) - *HVESA & AVHSA Air Conditioners with Two Stage Compressor, Electric Reheat ("R") and Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") • Economizer, Outside Air with Pressure Relief ("C")*

ELECTRIC HEAT		000 = None		040 = 4 kw		050 = 5 kw		060 = 6 kw		080 = 8 kw		090 = 9 kw		100 = 10 kw		120 = 12 kw		150 = 15 kw	
BASIC MODEL	VOLTS-HZ-PH	SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]		SPPE[3]	
		MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]	MCA[1]	MFS[2]
HVESA36AC3A	208/230-60-1	25.8	40	46.7	50	51.9	60	57.1	60					77.9	80	88.3	100	104.0	110
HVESA42AC3A	208/230-60-1	30.2	45			56.2	60							82.3	90	92.7	100	108.3	110
HVESA49AC3A	208/230-60-1	35.7	60			61.7	70							87.8	90	98.2	100	113.8	120
HVESA60AC3A	208/230-60-1	43.1	70			69.2	80							95.2	100	105.6	110	121.3	130
AVHSA72AC3A	208/230-60-1	50.2	80			76.2	80							102.3	110	112.7	120	128.3	130
HVESA36AC3C	208/230-60-3	21.3	30					39.3	40			48.3	50			57.4	60	66.4	70
HVESA42AC3C	208/230-60-3	25.5	35					43.5	45			52.5	60			61.6	70	70.6	70
HVESA49AC3C	208/230-60-3	26.8	40					44.9	45			53.9	60			62.9	70	71.9	80
HVESA60AC3C	208/230-60-3	29.9	45					48.0	60			57.0	60			66.0	70	75.0	80
AVHSA72AC3C	208/230-60-3	35.1	50					53.1	60			62.2	70			71.2	80	80.2	90
HVESA36AC3D	460-60-3	10.5	15					19.5	20			24.1	25			28.6	30	33.1	35
HVESA42AC3D	460-60-3	11.7	15					20.7	25			25.2	30			29.7	30	34.2	35
HVESA49AC3D	460-60-3	12.7	15					21.7	25			26.2	30			30.7	35	35.2	40
HVESA60AC3D	460-60-3	13.7	20					22.7	25			27.2	30			31.7	35	36.2	40
AVHSA72AC3D	460-60-3	17.2	25					26.2	30			30.7	35			35.2	40	39.7	40
HVESA36AC3Z	575-60-3	7.7	15					14.9	20			18.5	20			22.1	25	26.4	30
HVESA42AC3Z	575-60-3	9.5	15					16.7	20			20.3	25			23.9	25	28.2	30
HVESA49AC3Z	575-60-3	9.5	15					16.7	20			20.3	25			23.9	25	28.2	30
HVESA60AC3Z	575-60-3	10.6	20					17.8	20			21.4	25			25.0	30	29.3	30

[1]MCA = Minimum Circuit Ampacity (Wiring Size Amps) [2]MFS = Maximum Fuse or HACR Breaker Size [3]SPPE = Single Point Power Entry
MCA & MFS are calculated at 230 volts on the AC3A & AC3C models. The 460 volts AC3D models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the data label on the unit.

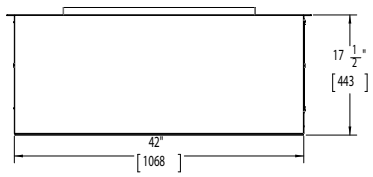
Unit Load Amps - *HVESA & AVHSA Air Conditioners with 2-Stage Compressor and Ventilation Configurations: Manual Damper, up to 15% Outside Air ("N") Economizer,Outside Air with Pressure Relief ("C")*

BASIC MODEL NUMBER	VOLTS-HZ-PH	CURRENT AMPS		LOAD OF RESISTIVE HEATING - ELEMENTS ONLY (AMPS) *(1) ALL HEATING ELEMENTS ARE ON A SEPARATE CIRCUIT (2) SHADED VALUES (12 & 15 kW) UTILIZE TWO CIRCUITS*								TOTAL MAXIMUM HEATING AMPS *INCLUDES AMPS FROM MOTOR(S) THAT ARE LOCATED ON AN ELECTRICAL CIRCUIT THAT DOES NOT HAVE HEATERS*							
		AC[1]	IBM[2]	04 kW	05 kW	06 kW	08 kW	09 kW	10 kW	12 kW	15 kW	04 Kw	05 Kw	06 Kw	08 Kw	09 Kw	10 Kw	12 Kw	15 Kw
HVESA36AC3A	208/230-60-1	22.0	4.3	16.7	20.8	25.0	33.3		41.7	50.0	62.5	21.0	25.1	29.3	37.6		46.0	54.3	66.8
HVESA42AC3A	208/230-60-1	25.7	4.3		20.8				41.7	50.0	62.5		25.1				46.0	54.3	66.8
HVESA49AC3A	208/230-60-1	30.4	6.8		20.8				41.7	50.0	62.5		27.6				48.5	56.8	69.3
HVESA60AC3A	208/230-60-1	36.4	6.8		20.8				41.7	50.0	62.5		27.6				48.5	56.8	69.3
AVHSA72AC3A	208/230-60-1	38.7	6.8		20.8				41.7	50.0	62.5		27.6				48.5	54.3	66.8
HVESA36AC3C	208/230-60-3	18.4	4.3			14.4		21.7		28.9	36.1			18.7		26.0		33.2	40.4
HVESA42AC3C	208/230-60-3	21.9	4.3			14.4		21.7		28.9	36.1			18.7		26.0		33.2	40.4
HVESA49AC3C	208/230-60-3	23.3	6.8			14.4		21.7		28.9	36.1			21.2		28.5		35.7	42.9
HVESA60AC3C	208/230-60-3	25.8	6.8			14.4		21.7		28.9	36.1			21.2		28.5		35.7	42.9
AVHSA72AC3C	208/230-60-3	30.7	6.8			14.4		21.7		28.9	36.1			21.2		28.5		35.7	42.9
HVESA36AC3D	460-60-3	7.9	2.2			7.2		10.8		14.4	18.0			9.4		13.0		16.6	20.2
HVESA42AC3D	460-60-3	8.4	2.2			7.2		10.8		14.4	18.0			9.4		13.0		16.6	20.2
HVESA49AC3D	460-60-3	9.8	3.4			7.2		10.8		14.4	18.0			10.6		14.2		17.8	21.4
HVESA60AC3D	460-60-3	10.6	3.4			7.2		10.8		14.4	18.0			10.6		14.2		17.8	21.4
AVHSA72AC3D	460-60-3	15.5	3.4			7.2		10.8		14.4	18.0			10.4		14.0		17.6	21.2
HVESA36AC3Z	575-60-3	5.8	1.7			5.8		8.7		11.5	14.4			7.5		10.4		13.3	16.2
HVESA42AC3Z	575-60-3	6.9	1.7			5.8		8.7		11.5	14.4			7.5		10.4		13.3	16.2
HVESA49AC3Z	575-60-3	7.5	2.7			5.8		8.7		11.5	14.4			8.5		11.4		14.3	17.2
HVESA60AC3Z	575-60-3	8.4	2.7			5.8		8.7		11.5	14.4			8.5		11.4		14.3	17.2

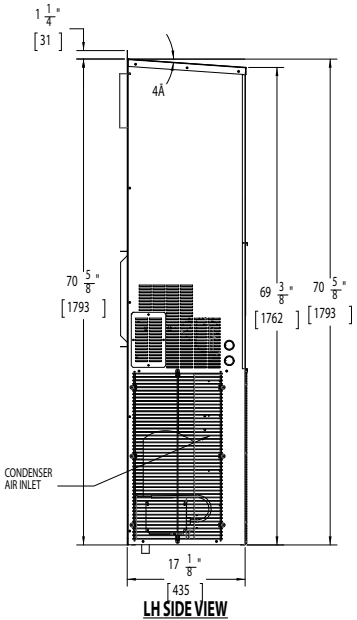
[1]AC = Air Conditioner Unit Amps [2]IBM = Indoor Blower Motor
Heating kW is rated at 240 volts on the AC3A & AC3C models. Derate heater output by 25% for operation at 208 volts. Heating kW is rated at 480 volts on the AC3D models.
Total heating and cooling amps includes all motors. Three phase models contain single phase motor loads. Loads are not equally balanced on each phase and values shown are maximum phase loads.

MODEL	CABINET DESIGNATION			
	A	B	C	D
HVEA24 with and without economizer	✓			
HVEA30/36/42 with and without economizer		✓		
HVESA30/36/42 with and without economizer		✓		
HVEA49/60 with and without economizer			✓	
HVESA49/60 with and without economizer			✓	
AVHSA72 with economizer				✓

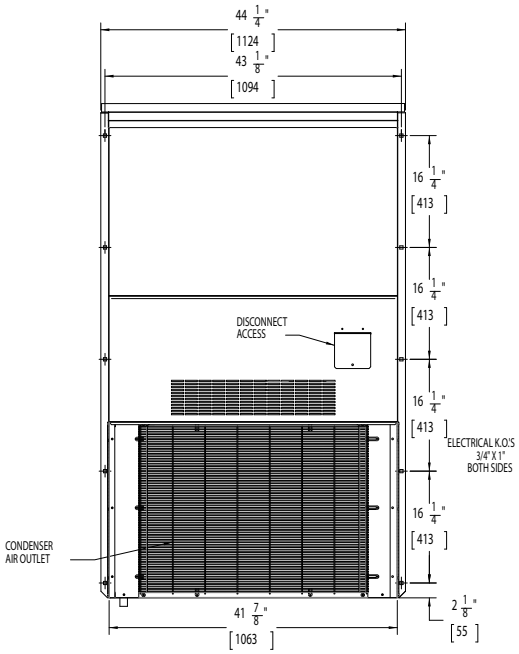
Dimensional Data -Cabinet A



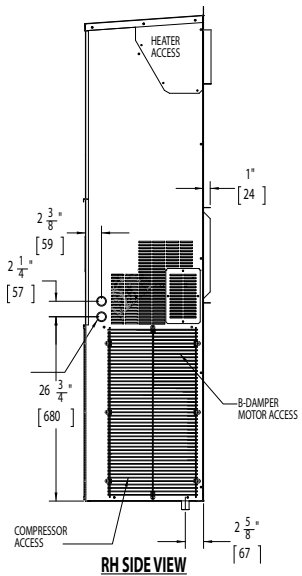
TOP VIEW



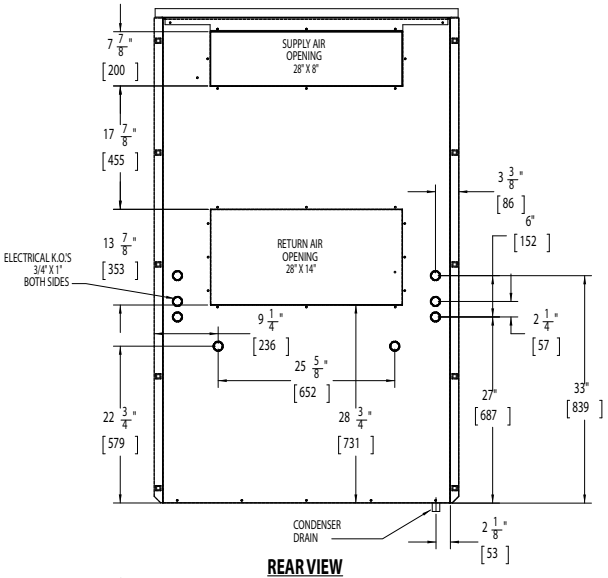
LH SIDE VIEW



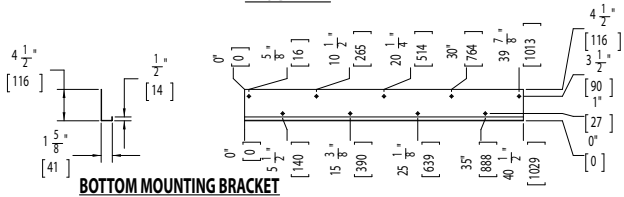
FRONT VIEW



RH SIDE VIEW



REAR VIEW



BOTTOM MOUNTING BRACKET

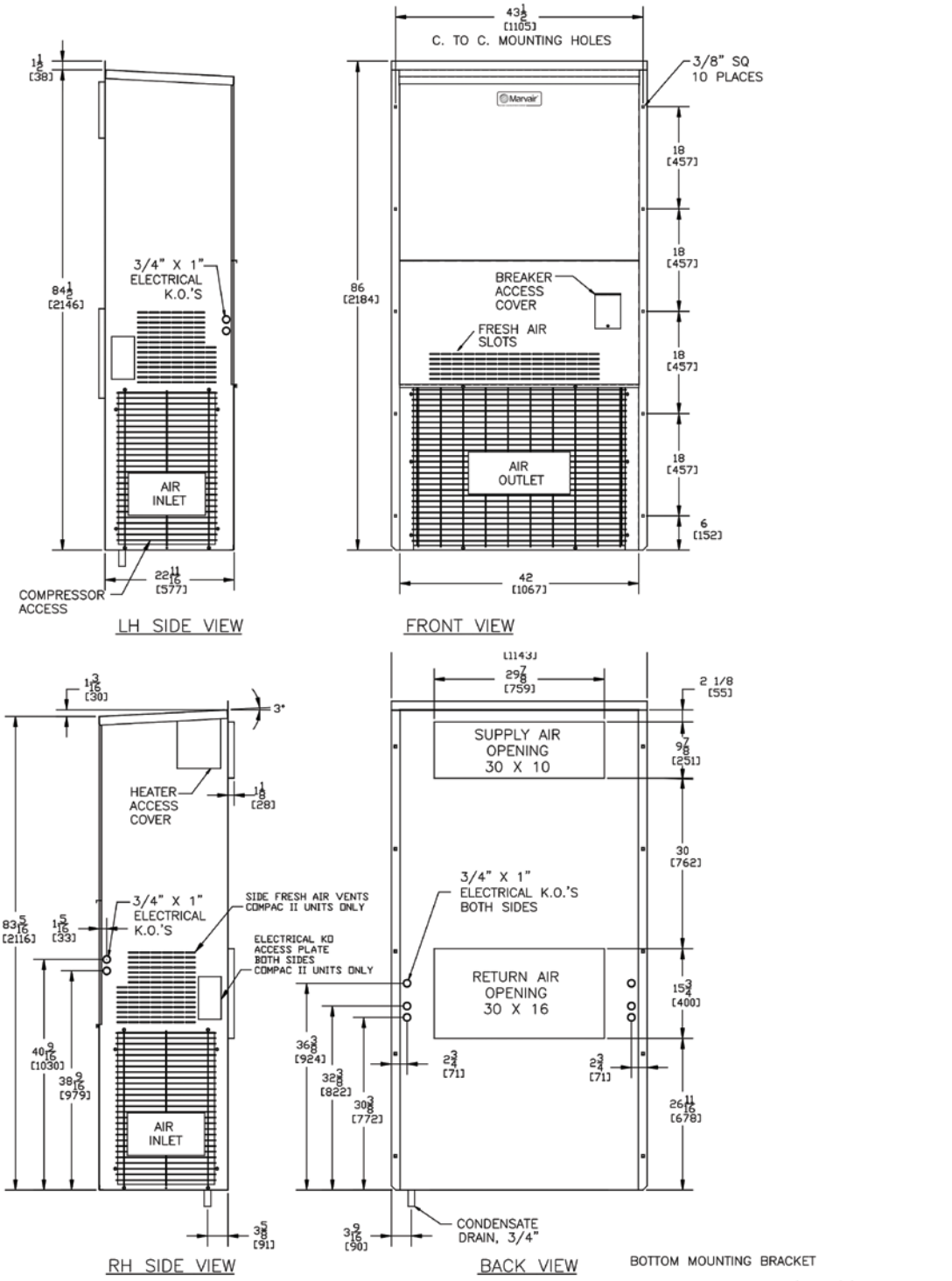
Shipping Weight (pounds/kilograms)

HVEA24	LBS/KGS
Without Economizer	420/191
With Economizer	445/202.5

Filter Size

HVEA24	INCHES	MILLIMETERS	PART NUMBER	FILTERS PER UNIT	MERV RATING
RETURN AIR FILTER	30 x 16 x 1	762 x 406 x 25	80136	1	8

Dimensional Data - Cabinet B



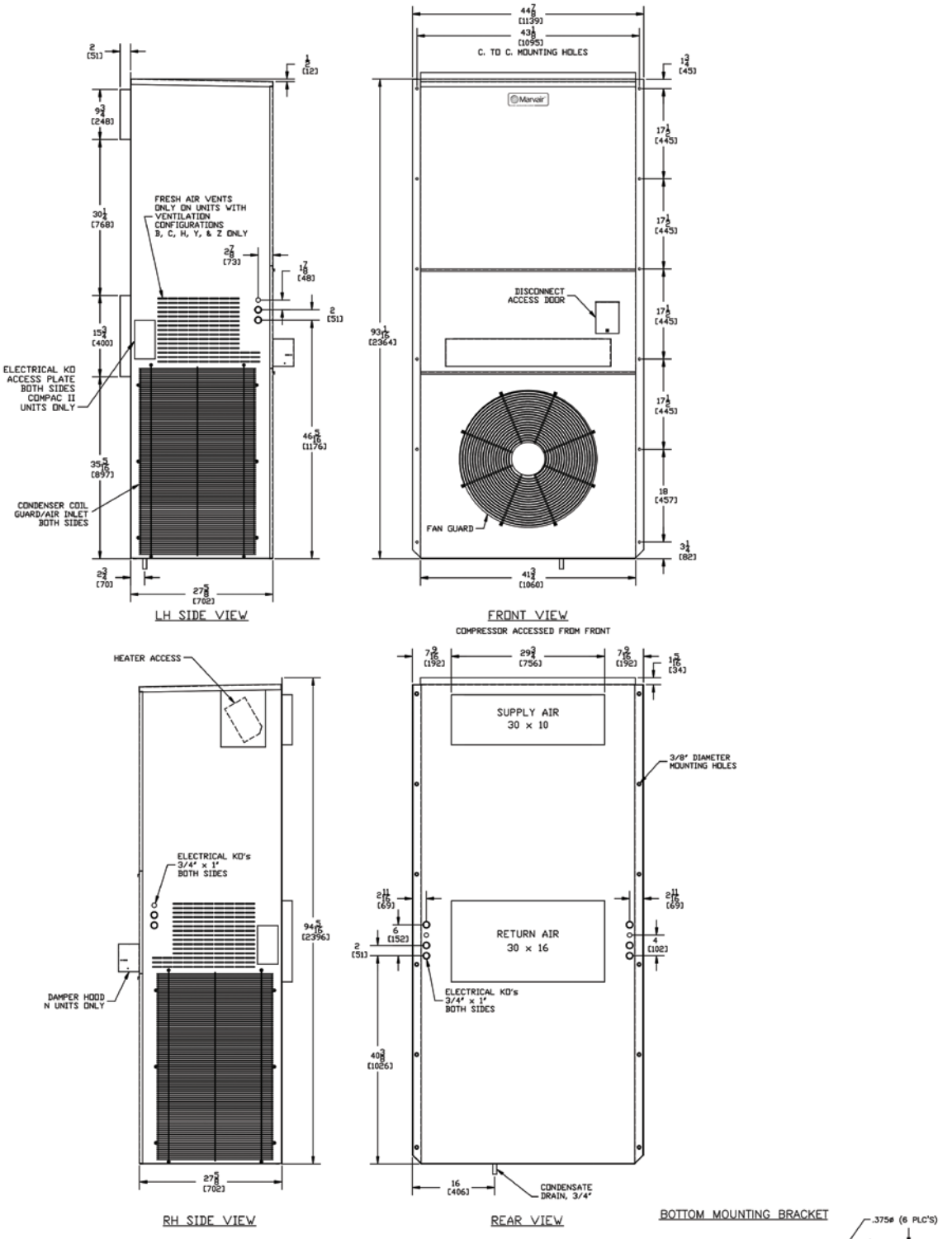
Shipping Weight (pounds/kilograms)

HVEA30/36/42, HVESA30/36/42	LBS/KGS
Without Economizer	540/245.5
With Economizer	565/257

Filter Size

HVEA30/36/42, & HVESA30/36/42	INCHES	MILLIMETERS	PART NUMBER	FILTERS PER UNIT	MERV RATING
RETURN AIR FILTER	36½ x 22 x 2	927 x 559 x 51	80162	1	8

Dimensional Data - Cabinet C



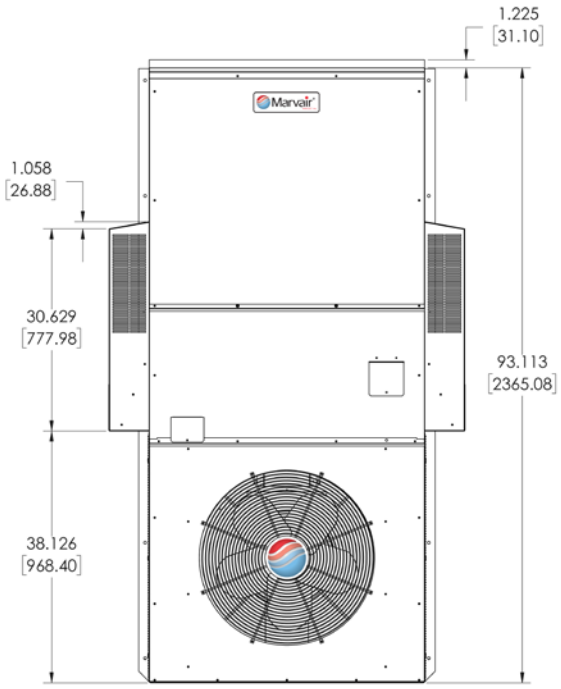
Shipping Weight (pounds/kilograms)

HVEA49/60, HVESA49/60	LBS/KGS
Without Economizer	680/309
With Economizer	705/320.5

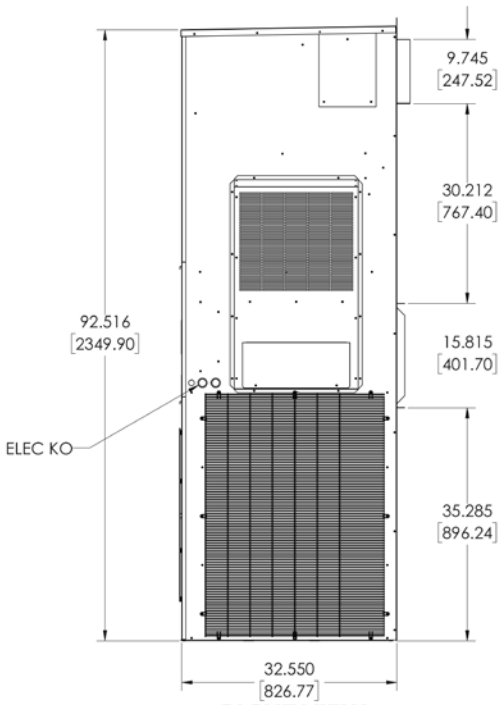
Filter Size

HVEA49/60 & HVESA49/60	INCHES	MILLIMETERS	PART NUMBER	FILTERS PER UNIT	MERV RATING
RETURN AIR FILTER	18 x 24 x 2	457 x 610 x 51	81257	2	8

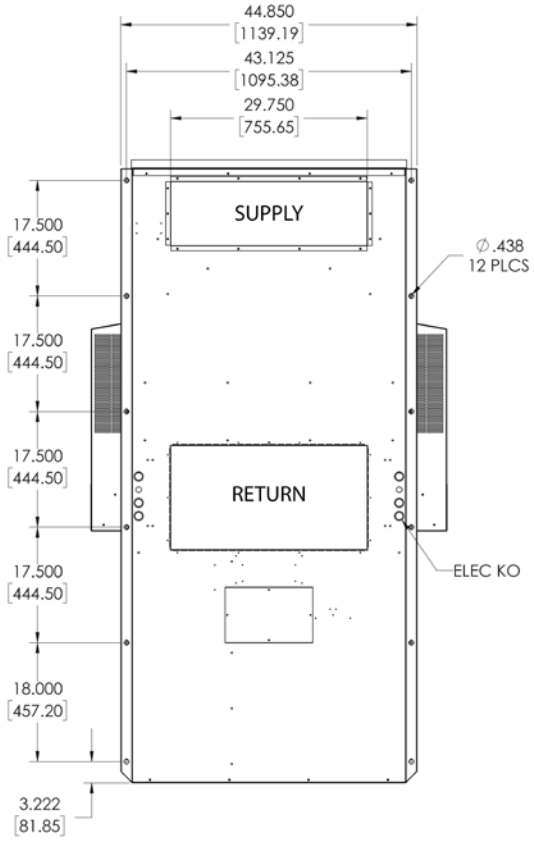
Dimensional Data - Cabinet D



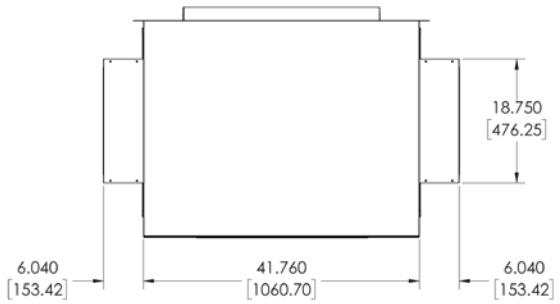
FRONT VIEW



RIGHT VIEW



REAR VIEW



TOP VIEW

Shipping Weight (lbs/kgs)

AVHSA72	LBS/KGS
With Economizer	740/336

Filter Size

AVHSA72	INCHES	MILLIMETERS	PART NUMBER	FILTERS/UNIT	MERV RATING
RETURN AIR FILTER	18 x 30 x 2	457 x 762 x 52	93184	2	8

Notes

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

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Email: marvair@airxcs.com • Internet: www.marvair.com

Designed, Engineered & Assembled In the USA