

3, 3.5, 4 & 5 Ton Vertical Packaged 10EER Wall Mount Heat Pumps Models AVHA36-42-48-60 (Single Stage Cooling)



General Description

The Marvair® Classic wall mounted heat pumps are the ideal HVAC system for a wide variety of applications. The exterior mounting means that no valuable interior space is required. The Classic heat pumps are packaged units – the refrigerant piping and internal wiring are factory assembled and thoroughly tested. All components are readily accessible for easy service and maintenance. The energy efficient operation keeps operating costs to a minimum and makes the Marvair heat pumps ideal problem solvers for a wide variety of applications, including offices, classrooms and telecommunication shelters.

► Outside Air for Ventilation or Free Cooling

A full range of accessories and options allows the Classic heat pumps to be optimized for each application. For classrooms, a complete range of ventilation options are available to meet the fresh air requirements of the ASHRAE 62 standard, "Ventilation for Acceptable Indoor Air Quality". Where cooling is required during cool or cold weather, e.g., telecommunications shelters, a factory installed economizer should be used. To insure proper operation and optimum performance, all outside air ventilation packages are non-removable, factory installed and factory calibrated.

► Performance:

- Efficiency ratings from 10.0 EER & 3.0 COP
- Sizes range from 3 to 5 tons
- Electric heat available from 5 kW to 10 kW—varies with model
- Designed for ducted and non-ducted applications
- AHRI performance certified, ETL safety approved



AVHA36

Designed,
Engineered
&
Assembled
in the USA



FEATURES AND BENEFITS

- ECM Blower Motors
- R-410A Refrigerant
- All Major Components Can Be Accessed From The Front for Maximum Serviceability
- Single Stage Scroll Compressor
- 1000-Hour Salt Spray, Baked On Polyester Finish
- Low /High Pressure Switches Standard
- Built In Circuit Breakers With Lockable Outside Access Door (Disconnect On 460 Volt Models)
- Barometric Damper with Washable Outside Air Filter Standard
- Phase Monitor Is Standard On All 3-Phase Units

Classic Heat Pump Model Identification

AVH	A ●	HP ● ●	● ●	●	●	A5 ● ● ●
	<u>Nominal Cooling (BTUH)</u> 36 = 36,000 42 = 40,000 48 = 50,000 60 = 59,000	<u>Series</u> <u>Power Supply</u> A = 208/230V, 1Ø, 60Hz C = 208/230V, 3Ø, 60Hz D = 460V, 3Ø, 60Hz	<u>System Type</u> Heat Pump	<u>Electric Heat</u> 000 = No Heat 050 = 5 kW 060 = 6 kW 090 = 9 kW 100 = 10 kW 150 = 15 kW	<u>Ventilation Configuration</u> N = 0-15% fresh air with manual damper, no pressure relief. B = Motorized two position damper (open & closed) capable of 0 to 450 cfm of outside air, includes pressure relief. C = Economizer; capable of 100% of rated cooling capacity using outside air.	<u>Cabinet Color</u> 100 = Marvair Beige 200 = Gray 300 = Brown 400 = White 800 = Mesa Tan
	R410A Refrigerant					<u>Special Option Code</u> R = Electric Reheat U = Scroll Compressor K = Coastal Environment Package
	10 EER High Efficiency Air Source Package					Built in Compliance with UL 1995 4th ed.

Options

➤ Electric Re-Heat

Control provides simultaneous operation of compressor when in cooling mode and the electric elements to provide dehumidification without over cooling the room. The electric element (kW) must be properly sized for each model for proper operation. Factory installed. Available on all Classic™ units. Consult factory for details.

➤ High/Low Pressure Alarm Contacts

The high and low pressure switches are located on the liquid line. They are electrically connected to the control board and will turn the compressor off if the pressure rises or falls from the set point twice within one hour. This protects the compressor if airflow is significantly reduced or lost through the coil performing the condenser function or a loss of refrigerant.



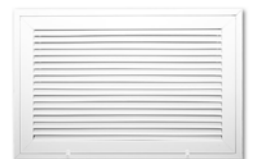
➤ 2" Pleated Filters

Optional 2" (50 mm) pleated filter with a MERV rating of 8 changeable from outside.



➤ Supply and Filter Return Grilles

Double deflection, aluminum supply and return grilles. Exact fit inside grilles for Classic heat pump units.



➤ Protective Coating Packages

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:** the internal sheet metal which is insulated and the internal control box are not coated)

➤ Protective Coil Coatings

The Condenser Coil or the Evaporator Coil or Both can be coated. Coating the Evaporator Coil is 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.

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

Options for Outside Air for Ventilation & Controls

ASHRAE standard 62 requires 30 cfm of outside air per occupant of a classroom. To meet this requirement, Marvair offers seven ventilation packages for every budget and requirement.

➤ **Configuration “N”: Manual Fresh Air Damper (Standard)**

Manual damper capable of up to 15% of rated airflow of outside air; field adjustable, no pressure relief.

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

Manual, two position damper (open and closed) capable of 0 to 450 cfm of outside air; includes pressure relief. A 24-volt actuated motor controls the damper from an external input such as a time clock, CO₂ sensor, energy management system or a manual switch.

➤ **Configuration “C”: Economizer (Optional)**

The economizer reduces the cost of air conditioning by using outside air when acceptable to cool the room. The factory installed Marvair® economizer has integral pressure relief. On a signal from a thermostat that cooling is required, either mechanical cooling with the compressor or free cooling with the economizer is provided. The Marvair economizer is capable of bringing in outside air equal to 100% of the rated cooling capacity of the unit and has built in pressure relief.

An internal enthalpy controller determines whether the outside air is sufficiently cool and dry to be used with cooling. If suitable, the compressor is locked out and the economizer damper opens to bring in outside air. The temperature at which the economizer opens is adjustable from approximately 55°F (13°C) to 73°F (23°C) at 50% RH. If the outside air becomes too hot or humid, the economizer damper closes completely or to a minimum position and mechanical cooling is activated. When used with minimum position potentiometer (optional), the Marvair® economizer can meet requirements of ASHRAE Std. 62.

➤ **4 & 5 Ton Models with 3 Ton Back Plates**

Allows replacement of a 3 ton unit with a 4 or 5 ton unit without modifying existing wall openings. Back plate aligns the existing return and supply vents in the installation with a 4 or 5 ton unit.

➤ **Choice of Cabinet Color: Marvair Beige, White, Gray**

The standard cabinet color is Marvair Beige. White and Gray are available as options.

➤ **Thermostats for Single Stage Heat Pumps (no electric heat)**

Digital, Non-Programmable ThermostatP/N 50121
1 stage heat, 1 stage cool. Fan switch: Auto & On. Manual changeover system switch: Cool-Off-Heat. Low temperature protection. °F or °C selectable. Thirty minute power loss memory retention.

Digital, Seven Day Programmable ThermostatP/N 50123
1 stage heat, 1 stage cool. Fan switch: Auto & On. Auto-changeover. Keypad lockout. Non-volatile program memory. Title 24 compliant.

Digital, Non-Programmable ThermostatP/N 50186
One stage cool/One stage heat. Manual or auto changeover. Fan mode: Auto or On. Permanent retention of settings upon power loss. Field adjustable temperature calibration. Max heat and minimum cool set points. Adjustable temperature differential. Remote sensor capable. Keypad lock out. Status LED. °F or °C selectable.

➤ **Thermostats for Heat Pumps with 2-Stage Heat**

Digital, 7 Day, 5-2 and 5-1-1 Day Programmable ThermostatP/N 50107
Two stage heat/Two stage cool. Manual or auto changeover. Fan: Auto & On. Permanent retention of setting on power loss. Field adjustable temperature calibration. Adjustable max. setpoint for heating and min. adjustable setpoints for cooling. Adjustable temperature differential. Keypad lockout. Status LED. °F or °C selectable. Title 24 compliant.

Digital, 7 Day, 2 Occupied & 2 Unoccupied Periods for Each Day of the Week Programmable ThermostatP/N 50248
Three stage heat/Three stage cool. Manual or auto changeover. Fan: Auto & On. Ten year retention of programming settings and 48 hour clock and day settings on power loss. Adjustable max. setpoint for heating and min. adjustable setpoints for cooling. Adjustable temperature differential. Keypad lockout. Status LED. °F or °C selectable. Optional remote sensors for outdoor air, supply air and humidity. Title 24 compliant.

Digital, Non-Programmable ThermostatP/N 50252
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.

➤ **MAR7000 Thermostat/Controller**

The MAR7000 thermostat/controller is a stand alone, self-programming HVAC controller designed to optimize performance of Marvair's heat pumps and air conditioners. It can function as an independent controller or used in conjunction with a BACnet network.

With built-in temperature and humidity sensors, motion sensing and an optional CO2 detection sensor, the MAR7000 can control:

- Single or 2-stage air conditioners or heat pumps with supplemental electric heat,
- Dehumidification operation,
- An economizer cycle, and
- Marvair's various ventilation options.

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

Features include:

- User-friendly English-language menus (no obscure numeric codes) on a 64 x 128 pixel, dot-matrix LCD display with 5 buttons for data selection and entry,
- Built-in, factory-tested libraries of configurable application control sequences,
- Schedules that can easily be set uniquely by weekdays (Mon.–Fri.), weekend (Sat.–Sun.), entire week (Mon.–Sun.), individual days, and/or holidays,
- Six On/Off and independent heating and cooling set point periods are available per day, and
- Three levels of password-protected access (user/operator/administrator) prevent disruption of operation and configuration



➤ **Thermostat guards**

Clear Thermostat Guard with Keylock & Clear Plastic Cover & Base.....P/N 50092
For use with 50121, 50123, 50186, 50107 and 50252 thermostats.

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

➤ **Humidity controller**

Digital Humidity Controller.....P/N 50254
To be used with units with electric reheat. Programmable dehumidistat, ventilation control. 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.

➤ **Sound Attenuation Modules**

Fits between wall mount units and the wall. Exclusive internal engineering design manages air direction attenuating and reducing the sound level from the unit to the inside space. Actual sound reduction ratios vary with application. Optional for all Classic wall mount heat pumps, and fits many competitors' wall mounts that are 9 EER or less. Order SAM-A-01 for 3 ton or less, SAM-B-01 for 3.5 to 5 ton units.

➤ **Low Ambient Control**

Controls the head pressure in low outdoor temperature conditions. Head pressure is maintained to keep the low pressure high enough to avoid a freeze up on the evaporator coil. Kit includes pressure Switch, crankcase heater and a control board with alarm contact.

Classic AVHA 10EER High Efficiency Heat Pumps Specifications

MODEL	AVHA36HPA	AVHA36HPC	AVHA36HPD	AVHA42HPA	AVHA42HPC	AVHA42HPD	AVHA48HPA	AVHA48HPC	AVHA48HPD	AVHA60HPA	AVHA60HPC	AVHA60HPD
Cooling Capacity	33,000			38,000			44,000			56,000		
EER	10.0			10.0			10.0			10.0		
Heating Capacity	24,400			28,000			40,000			50,00		
COP	3.0											
Volts/Phase/Hertz	208-230/1/60	208-230-3/60	460/3/60	208-230/1/60	208-230-3/60	460/3/60	208-230/1/60	208-230-3/60	460/3/60	208-230/1/60	208-230-3/60	460/3/60
COMPRESSOR DATA												
Type	Scroll											
Rated Load Amps	16.7	10.4	5.7	15.6	13.6	6.1	21.8	13.7	6.2	26.3	15.6	7.7
OUTDOOR FAN DATA												
HP	1/6			1/2								
Full Load Amps	1.2		0.7	2.8		1.4	2.8		1.4	2.8		1.4
Fan Diameter/CFM	22"/2,000			22"/3,000								
BLOWER DATA												
HP	1/3			1/2								
Full Load Amps	1.6		1.3	3.2		2.6	3.2		2.6	3.2		2.6
Rated CFM/ESP	1,250/0.15			1,700/0.20						2,200/0.20		
VENTILATION PKG												
Barometric Damper	Adjustable Barometric Damper											
Barometric Filter	Permanent Washable 7" x 29" x 1/4"											
Max Fresh Air-CFM %	310			425						550		
Return Air Filter	14" or 16" x 30" x 1" Disposable			20" x 30" x 1" Disposable								
WEIGHT												
Shipping/Net	380/360			525/510						530/510		

COOLING PERFORMANCE	AMBIENT TEMPERATURE (°F)			
	95		80	
	Total	Sensible	Total	Sensible
AVHA36	33,000	24,400	35,300	26,100
AVHA42	38,000	28,000	40,000	30,000
AVHA48	44,000	32,700	47,000	35,000
AVHA60	56,000	41,400	59,400	43,900

HEATING PERFORMANCE	AMBIENT TEMPERATURE (°F)	
	47	17
AVHA36	24,400	15,000
AVHA42	28,000	17,000
AVHA48	43,500	27,000
AVHA60	50,000	30,300

HEAT PUMP HEATER MODEL	BTH* OUTPUT	AMPS	SHIP WEIGHT	APPROVED UNIT AND HEATER COMBINATION											
				208/230V, 1ø, 60Hz “A”				208/230V, 3ø, 60Hz “C”				460V, ø, 60Hz “D”			
				AVHA36	AVHA42	AVHA48	AVHA60	AVHA36	AVHA42	AVHA48	AVHA60	AVHA36	AVHA42	AVHA48	AVHA60
ETA1-05-HP	17,000	20.8	15	●	●	●	●								
ETA1-10-HP	34,000	41.6	16	●	●	●	●								
ETA1-15-HP	51,000	62.5	17	●	●	●	●								
ETA3-06	20,000	14.4	15					●	●	●	●				
ETA3-09	31,000	21.7	18					●	●	●	●				
ETA3-15	51,000	36.1	20					●	●	●	●				
ETA4-06	20,000	7.2	15									●	●	●	●
ETA4-09	31,000	10.8	18									●	●	●	●
ETA4-15	51,000	18.0	20									●	●	●	●

Classic AVHA 10EER High Efficiency Heat Pumps Electrical Data

Summary Electrical Ratings (Wire and Circuit Breaker Sizing)

AVHA Heat Pumps with Ventilation Configurations:

Manual Damper, up to 15% Outside Air ("N")

Economizer, up to 100% Outside Air with Pressure Relief ("C")

Motorized Damper, up to 450 CFM of Outside Air with Pressure Relief ("B")

Manual Damper, up to 450 CFM of Outside Air ("Y")

Manual Damper, up to 15% Outside Air with Pressure Relief ("Z")

ELECTRIC HEAT		000 = None		050 = 5 kw		060 = 6 kw		090 = 9 kw		100 = 10 kw		150 = 15 kw	
BASIC MODEL	VOLTAGE PHASE / HZ	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
AVHA36HPA	208/230-1-60	25.0	40	50.0	60					77.0	980	96.8	100
AVHA42HPA	208/230-1-60	27.0	40	52.0	60					79.0	80	98.8	100
AVHA48HPA	208/230-1-60	33.0	50	59.0	60					85.0	90	105.8	110
AVHA60HPA	208/230-1-60	39.0	60	65.0	70					91.0	100	111.8	115
AVHA36HPC	208/230-3-60	16.0	30			34.0	40	43.0	50			61.0	70
AVHA42HPC	208/230-3-60	23.0	35			41.0	50	50.0	60			68.0	70
AVHA48HPC	208/230-3-60	23.0	40			41.0	50	50.2	60			68.0	70
AVHA60HPC	208/230-3-60	26.0	40			44.0	50	53.0	60			71.0	80
AVHA36HPD	460-3-60	9.0	15			18.0	20	23.0	25			32.0	40
AVHA42HPD	460-3-60	11.0	15			20.0	25	25.0	25			34.0	40
AVHA48HPD	460-3-60	12.0	15			21.0	25	25.0	30			35.0	40
AVHA60HPD	460-3-60	14.0	20			23.0	30	27.0	30			37.0	40

¹MCA = Minimum Circuit Ampacity (Wiring Size Amps)

²MFS = Maximum Fuse Size

³SPPE = Single Point Power Entry

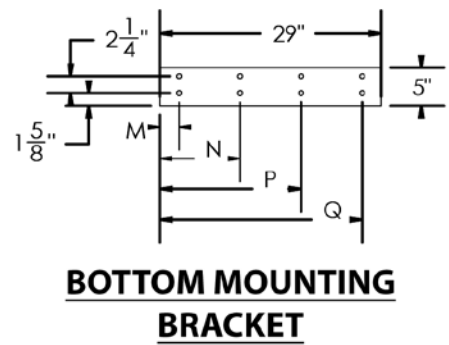
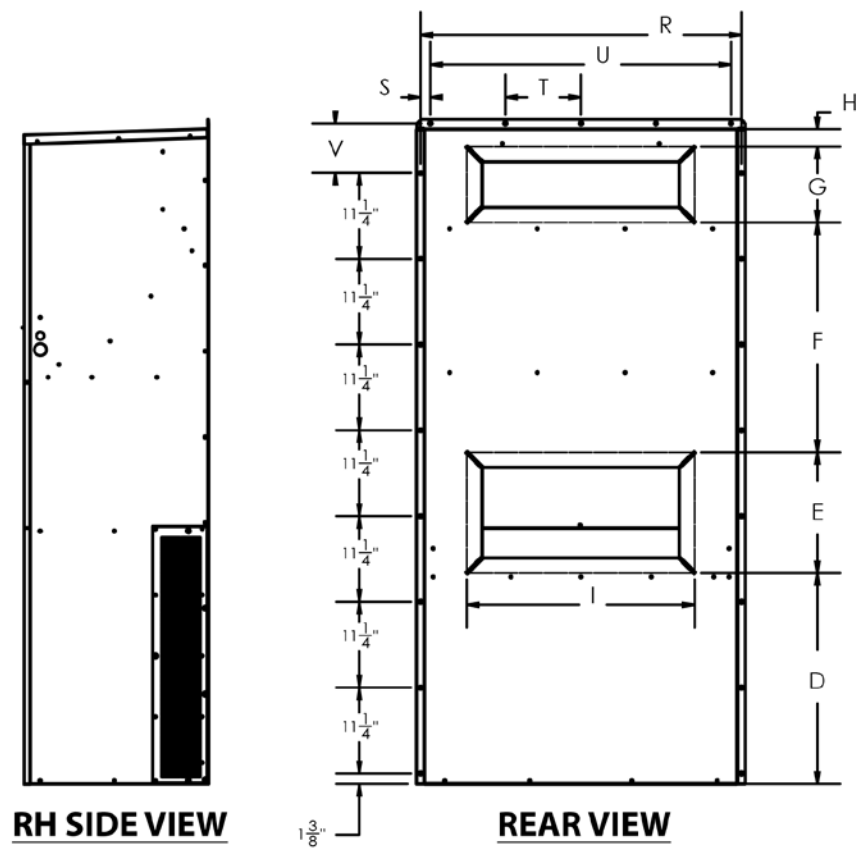
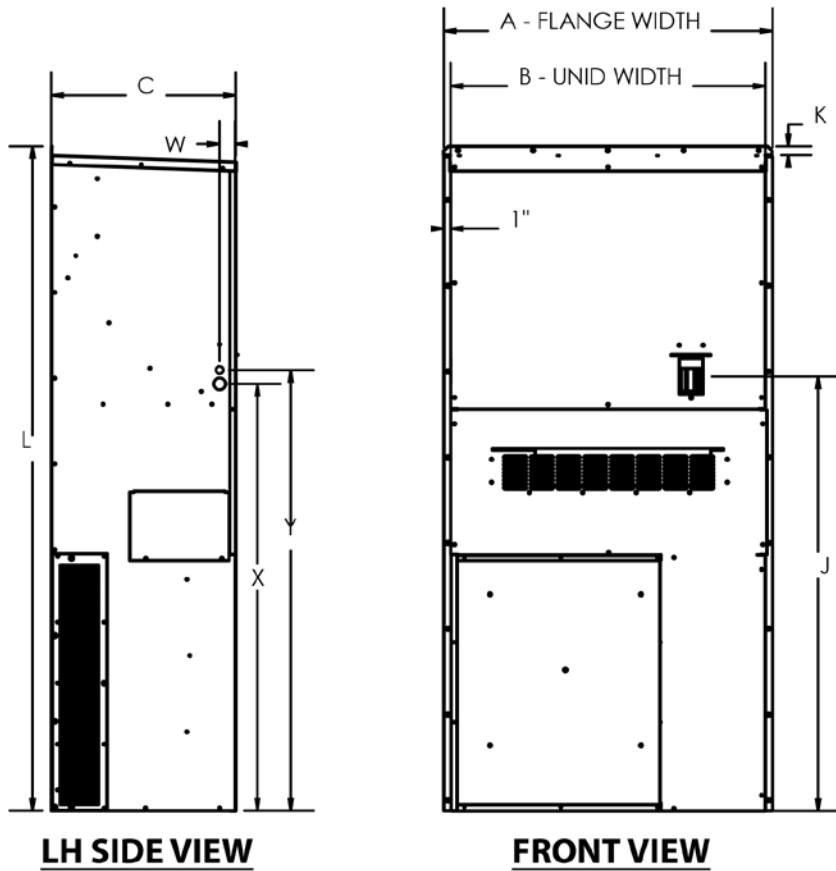
MCA & MFS are calculated at 230 volts on the AVHAxxHPA and AVHAxxHPC models. The 460 volts AVHAxxHPD models are calculated at 460 volts. This chart should only be used as a guideline for estimating conductor size and overcurrent protection. For the requirements of specific units, always refer to the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

Classic AVHA 10EER High Efficiency Heat Pumps

Total Cooling Capacity vs. Ambient Temperature

MODEL	I.D. °F (°C) DB/WB	AMBIENT TEMPERATURE °F (°C)								
		75 (24)	80 (27)	85 (29)	90 (32)	95 (35)	100 (38)	105 (41)	110 (43)	115 (46)
AVHA36	75/62 (24/17)	33,900	33,300	32,600	32,000	31,200	30,500	29,700	28,900	28,100
	80/67 (27/19)	35,700	35,200	34,400	33,800	33,000	32,200	31,400	30,500	29,700
	85/72 (29/22)	37,700	37,100	36,300	35,500	34,800	34,000	33,200		
AVHA42	75/62 (24/17)	41,019	40,293	39,446	38,720	37,752	36,905	35,937	34,969	34,001
	80/67 (27/19)	43,197	42,592	41,624	40,898	39,930	38,962	37,994	36,905	35,937
	85/72 (29/22)	45,617	44,891	43,923	42,955	42,108	41,140	40,172		
AVHA48	75/62 (24/17)	48,100	47,200	46,300	45,400	43,500	42,800	41,500	41,000	40,000
	80/67 (27/19)	50,900	50,000	49,000	48,000	44,000	43,500	42,500	42,000	41,000
	85/72 (29/22)	53,700	52,800	51,800	50,800	49,700	48,600	47,400		
AVHA60	75/62 (24/17)	58,300	57,300	56,100	55,000	53,700	52,400	51,000	49,600	43,900
	80/67 (27/19)	61,600	60,500	59,400	58,200	58,000	55,600	54,200	52,600	46,400
	85/72 (29/22)	65,000	64,000	62,700	61,500	60,200	58,800	57,400		

Dimensional Data



Dimensional Data

Cabinet Dimensions - Inches (MM)		
Model	AVHA36	AVHA42,48,60
A	40 (1,016)	43 (1,092)
B	38 (965)	41 1/8 (1,045)
C	18 3/4 (476)	24 1/8 (613)
D	28 1/2 (724)	27 1/2 (699)
E	14 (356)	16 (406)
F	18 (457)	30 (762)
G	8 (203)	10 (254)
H	1 7/8 (48)	2 1/4 (57)
I	28 (711)	30 (762)
J	50 1/2 (1,283)	57 1/8 (1,451)
K	1 1/8 (29)	1 1/8 (29)
L	71 1/2 (1,816)	87 1/8 (2,213)
M	2 1/2 (64)	2 1/2 (64)
N	10 1/2 (267)	10 1/2 (267)
P	18 1/2 (470)	18 1/2 (470)
Q	26 1/2 (673)	26 1/2 (673)
R	38 7/8 (987)	42 1/8 (1,070)
S	1 1/8 (29)	1 1/4 (32)
T	9 1/8 (232)	9 7/8 (251)
U	36 3/8 (924)	39 3/8 (1,000)
V	2 1/8 (54)	6 1/2 (165)
W	2 (51)	2 (51)
X	48 1/4 (1,226)	56 (1,422)
Y	50 (1,270)	57 7/8 (1,470)



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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