

### Wall Mounted Air Conditioners with Gas Heat Models GAH1024A-1030A-1036A-1042A-1048A-1060A



GAH1036

#### GENERAL DESCRIPTION

The Marvair® GAH series of wall mounted air conditioner with gas heat are designed for use on a variety of applications including modular classrooms, relocatable offices and a multitude a permanent buildings. The GAH series is manufactured in two cabinets with nominal cooling capacities of 2, 2-1/2, 3, 3-1/2, 4 and 5 tons and input heating capacities of 45,000; 67,500; 75,000; 90,000 and 100,000 and 125,000 BTU/hs. Marvair GAH units are available with a number of factory and field installed options and accessories which permit the user to optimize the unit for specific applications.

#### SAFETY LISTED & ENERGY CERTIFIED

All Marvair air conditioners conform to UL/CSA standard 60335-1 and 60335-2-40 and CAN/CSA C22.2, No. 236-11 Ed. 4. The units are listed by ETL and tested to the American National Standard/CSA Standard for Gas Fired Central Furnaces; ANSI Z 21.47 -2006/CSA 2.30-2006. For energy efficiency and performance, the units are tested and rated in accordance to the ANSI/AHRI (Air-Conditioning Heating and Refrigeration Institute) Standard 390 (Single Package Vertical Units). All GAH units meet or exceed the efficiency requirements of ANSI/ASHRAE/IESNA 90.1.2007.

Marvair GAH air conditioners are commercial units and are not intended for use in residential applications.

#### STANDARD FEATURES

##### ► Ease of Installation

- Built-in mounting flanges eliminate need for side brackets
- Sloped top sheds water, minimizes chance of water leaks and eliminates the need for a rainhood
- Top flashing piece and bottom mounting bracket provided on all units
- Electrical knockouts on back and side
- Gas connection on the right side
- Power disconnect

##### ► Economical Gas Heat

- Factory set up for natural gas with easy conversion in field to propane
- Natural gas high altitude pressure switch kit allows operation in sites from 6,000 to 10,000 ft. (1,830 m to 3,050 m)
- Propane high altitude pressure switch kit allows operation in sites from 6,000 to 10,000 ft. (1,830 m to 3,050 m)
- Vertical vent pipe kits



#### Features and Benefits

##### Economical Gas Heat

- Easy to Set Up for Natural Gas or Propane
- High Altitude Pressure Switch Kit Allows Operation from 6,000 to 10,000 ft. (1,830 to 3,050 meters) Using Propane or Natural Gas
- Optional Vertical Vent Pipe Kits

##### Next Generation R-454B Refrigerant

- 78% Lower GWP than R-410A
- Non-Ozone Depleting Refrigerant
- Synthetic Lubricant
- Reduced Compressor Wear

##### Patented Technology

- Tubular Heat Exchanger with Integral Formed Dimple Turbolator
- Clean and Quiet "Inshot" Stainless Steel Gas Burners

##### Ease of Installation and Service

- Easily Accessible Electrical Box and Compressor
- Built-In Mounting Flanges and Internal Disconnect
- Standard Access Valves and Filters, Status LEDs

## STANDARD FEATURES (CONTINUED)

- **Ease of Service**
  - Compressor and electrical box are easily accessible
  - Refrigerant access valves allow quick check of refrigerant pressures
  - Easily accessible filter
  - LED identifies operating status and simplifies service by flashing fault code in heating mode
  - Copper tube, aluminum fin evaporator and condenser coils
- **Protection of Refrigeration System Components**
  - High pressure switch and low pressure sensor with lockout protects refrigerant circuit.
  - Compressor time delay
- **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
- **Low Ambient Operation in Cooling Mode.**
  - Condenser fan cycles allowing cooling to 20°F (-7°C)
- **Patented Tubular Heat Exchanger with Integral Formed Dimple Turbulator**
  - Enhanced heat transfer for optimum efficiency
  - Quiet – eliminates noise caused by expansion and contraction of internal baffles
- **Patented Inshot Gas Burners**
  - Quiet, clean burning gas inshot burners fire in a direct line with the orifice and the tube
  - Unique carryover design (cross lighting from one burner to another) for immediate lighting
  - Stainless steel burner
- **Direct Spark Ignition Control System with LED Flash Fault Indicator**
  - Thirty second purge of heat exchanger prior to ignition
  - Three ignition trials before lockout
  - Sixty second post purge at end of operating cycle prevents nuisance trips of rollout switch
  - One hour automatic reset after lockout – eliminates need to manually recycle on lockout
  - LED identifies operating status and simplifies service by flashing fault code

## OPTIONS FOR OUTSIDE AIR VENTILATION

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

### ➤ **Configuration “C”: Up to 100% Modulating Economizer**

The economizer reduces the cost of air conditioning by using outside air when acceptable to cool the room (Free Cooling). The factory installed Marvair® economizer has integral pressure relief.

**Control Board Logic:** Upon a “Call for Cooling”, the economizer control board calculates whether the HVAC operates in economizer mode or mechanical cooling mode based on outdoor temperature (dry bulb) or temperature/humidity (enthalpy). When outdoor conditions are favorable for economizer cooling, the damper drives open and modulates to maintain a 55°F mixed air temperature through the supply grille. When outdoor conditions are not favorable for economizer cooling, the economizer damper remains closed, and the HVAC unit will operate in mechanical cooling mode.

*Features Designed for Telecommunication applications:*

**Hydrogen Fault Input:** When 24VAC is applied to the H\_FLT input, the economizer board forces the damper to open 100% for emergency ventilation. The compressor does not operate during Hydrogen Fault/Emergency Ventilation. Thermostat must provide the fan “G” signal to HVAC to activate the indoor blower.

**Forced Mechanical Cooling:** When 24VAC is applied to the FC input of the economizer board, the economizer damper is forced closed, and the HVAC will operate in mechanical cooling mode. This is considered as economizer override in the event economizer cooling is not sufficient for the heat load. Thermostat must provide the fan “G” signal to HVAC to activate the indoor blower.

**Economizer Status:** The economizer board has contacts that when used with the Marvair CommStat 4 Telecom HVAC Controller, change state to provide feedback to the CommStat 4 to indicate when the HVAC is in economizer mode versus mechanical cooling mode. This feedback allows the CommStat 4 to initiate the forced cooling feature to override economizer cooling and force mechanical cooling.

When used with minimum position potentiometer (optional), the Marvair® economizer can meet requirements of ASHRAE Std. 62.

### ➤ **Configuration “D”: Two-Position Motorized Fresh Air Damper w/Pressure Relief Ventilation**

**Control Board Logic:** The 92589 control board allows the position of the “D” damper to be set for desired outside air intake from fully closed to fully open. Setting 15 of the control board configuration menu allows the user to set the position from 20 (2VDC / Closed) to 100 (10VDC 100% open). The damper position can be adjusted in 1VDC increments to any position from closed to 100% open as required.

**Operation:** Anytime the indoor blower operates, the damper drives open to the position selected in the control board configuration menu setting 15. When the indoor blower stops operation the motorized damper spring returns to the fully closed position.

**Note:** This circuit does not interrupt the compressor or heater operation.

➤ **Configuration “E”: Two-Position Motorized Fresh Air Damper w/Pressure Relief Ventilation & Independent Control**

*Control Board/Factory Installed Relay Logic:* The 92589 control board allows the position of the “E” damper to be set for desired outside air intake from fully closed to fully open. Setting 15 of the control board configuration menu allows the user to set the position from 20 (2VDC / Closed) to 100 (10VDC 100% open). The damper position can be adjusted in 1VDC increments to any position from closed to 100% open as required.

*Operation:* Upon a “Call for Motorized damper” via a 24V signal from an external user-installed device, the motorized damper opens to the position selected in the control board configuration menu setting 15 and the indoor blower operates. A 24VAC signal {sourced from LVTB 24VAC “R” and supplied through a user-provided Normally Open (NO) contact} activates (opens) the Motorized Damper and connected Relief Damper. When the 24VAC signal is removed, the motorized damper spring returns to the fully closed position and the indoor blower stops operation. The motorized damper Does NOT open when there is a call for the indoor fan (G).

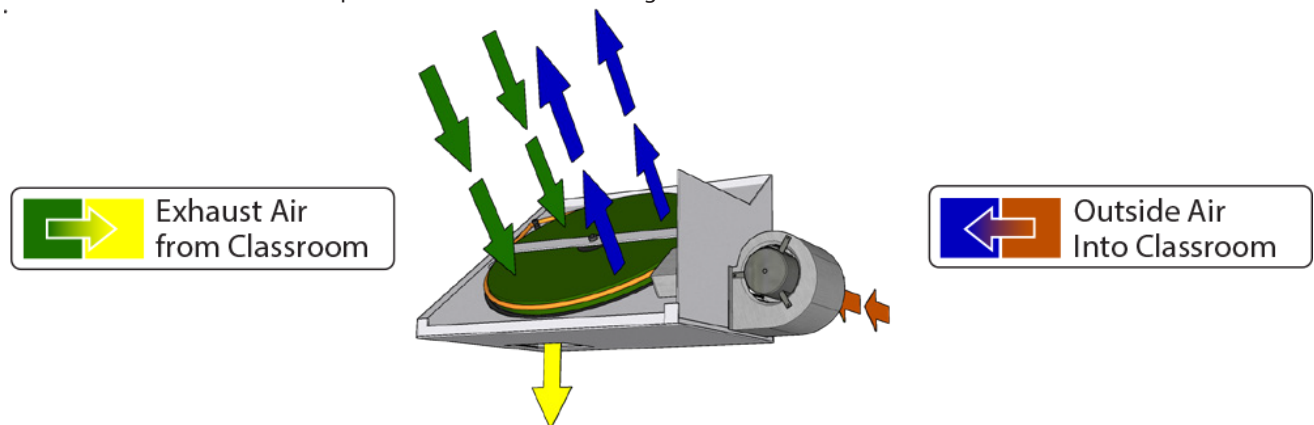
**Note:** This circuit does not interrupt the compressor or heater operation.

➤ **Configuration “H”: GreenWheel® ERV Energy Recovery Ventilator (Optional)**

Allows independent control of the exhaust and intake blowers. When used, the standard speed controller operates the intake blower and the optional second controller, the exhaust blower. Individual blower control allows positive pressurization of a classroom or other space. Field or factory installed.

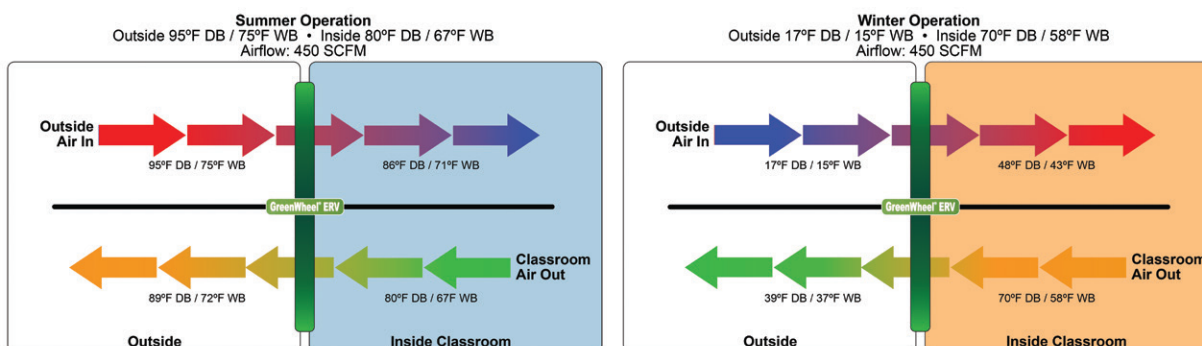
The Marvair GreenWheel® ERV is a total energy (both sensible and latent) wheel that reduces both construction and operating cost while ventilating the classroom to ASHRAE 62-1999 requirements. The use of the GreenWheel ERV reduces the energy load of the outside air. Exhausting stale, inside air keeps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

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



**Quality Components** - The GreenWheel ERV Ventilation package consists of the GreenWheel cassette, an incoming air blower, an exhaust air blower, an air filter for the incoming air and one fan speed controller that controls the speed of both blower motors simultaneously. As an option, a second fan speed controller can be factory installed for independent control of the exhaust air motor and positive pressurization of the classroom or other space. Also, an optional filter on the exhaust air is available on selected models. Please consult your Marvair representative for details. The two blowers simultaneously pull fresh air from outside and exhaust air from the space through the rotating wheel. The air streams are separated by an insulated partition so that the incoming fresh air is not mixed with the exhaust air. Two variable speed blowers ensure that up to 450 CFM of outside air can be brought into the room and the indoor air is properly exhausted. Variable speed blowers permit that the desired quantity of outside air is delivered into the space. Optional independent exhaust air blower control allows positive pressurization of the space, i.e., more outside air can be introduced through the GreenWheel ERV than is exhausted.





## GreenWheel® Energy Recovery Ventilator Performance

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

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

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

\*SCFM = Standard Cubic Feet per Minute

For performance of the GreenWheel® ERV at conditions other than those shown, please contact your Marvair® representative or the factory.

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## OPTIONS

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

### ► Hard Start Kit

Used on single phase equipment to give the compressor higher starting torque under low voltage conditions.

### ► Protective Coating Packages

**Coated Coils:** Either the condenser or evaporator coil can be coated. For harsh conditions, e.g., power plants, paper mills or sites where the unit will be exposed to salt water, the coils should be coated. **Note:** Cooling capacity may be reduced by up to 5% on units with coated coils.

**Coastal Environmental Package:** This package includes:

- Corrosion resistant fasteners,
- Sealed or partially sealed condenser fan motor,
- Insitu coating applied to all exposed internal copper and metal in the condenser section, and
- A protective coating on the condenser coil.

**All Coat Package:** Includes the same features as the Coastal Environmental Package and adds an impregnated polyurethane on the evaporator coil and the Insitu coating on all 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 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.

### ► Natural Gas to Propane Conversion Kit

Marvair GAH air conditioners are factory configured for natural gas. This kit is required for use with propane.

Propane Conversion Kit for GAH with 45,000, 67,500 & 90,000 BTUH Heat Capacity .....01561

### ► 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.

### ► Cabinet Color

Marvair air conditioners are available in six different cabinet colors. The standard colors are Marvair® beige, white, gray and Carlsbad Canyon (brown). The standard cabinet's sides, top and front panels are constructed of 20 gauge painted steel. Contact your Marvair representative for color chips. Custom colors are also available; contact Marvair for details.

Two stainless steel cabinet constructions are available:

**Stainless Steel Exterior (Option "5"):** This option replaces all standard exterior painted surfaces with stainless steel. This option also replaces the standard unpainted compressor base of the unit and exterior cabinet screws with stainless steel. No other standard construction surfaces are stainless steel in this option, unless listed in this description. Back panel is not stainless steel with this option. This option is designed to give a more economical alternative to full stainless steel, and still offer an enhanced level of protection. For further corrosion protection, please see our "A" offering at full stainless on all metal components.

**Stainless Steel Unit (Option "A"):** This option replaces all interior and exterior steel sheet metal parts with stainless steel. All galvanized and painted steel surfaces found in the standard unit are stainless steel with this option. All cabinet screws are stainless steel. No other standard construction surfaces are stainless steel, unless listed in this description. This option is designed to give our most robust protection against steel corrosion.

### ► Extended Warranty

A first-year labor (Silver), and a two-year labor (Gold) are available. See [www.marvair.com](http://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.

### ► Compressor Sound Jacket

To reduce sound of compressor.

### ► Lockable Disconnect Access Cover Plate

The access plate to the service disconnect switch can be equipped with a lockable cover.

### ► Washable Filter

Spun aluminum construction allows cleaning of filters with water.

### ► Compressor Locations

Most GAH air conditioners can be built with the compressor on the opposite side to facilitate service access when two units are installed side by side.

## HOT GAS REHEAT OPERATION

Marvair® units equipped with Hot Gas Reheat (HGR) 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 classroom. Dehumidification is achieved by operating mechanical cooling in conjunction with a hot gas reheat coil. Hot Gas Reheat is only available with units with the "B" or "H" ventilation option.

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

## ACCESSORIES

### ► Grilles for the GAH1024A-1030A-1036A

Supply Grille: 28" x 8" .....P/N 80675  
Return Grille: 28" x 14" .....P/N 80678  
Return Filter Grille:\* 28" x 14" .....P/N 80672

### ► Grilles for the GAH1042A-1048A-1060A

Supply Grille: 30" x 10" .....P/N 80676  
Return Grille: 30" x 16" .....P/N 80679  
Return Filter Grille:\*30" x 16" .....P/N 80673

## ROOM SIZE LIMITATIONS

	GAH1024A	GAH1030A	GAH1036A	GAH1042A	GAH1048A	GAH1060A
<b>Refrigerant Charge (oz.)</b>	100	105	120	125	125	125
<b>Minimum Room Size (ft²)</b>	98.2	103.1	117.8	122.7	122.7	122.7
<b>Minimum Supply Height (ft)</b>	6.9	6.9	6.9	6.9	6.9	6.9

## MODEL IDENTIFICATION

Example	G	A	H	1	0	3	6	A	A	0	9	0	C	G	+	+	+	1	D	A	+	A	1	1	+	+	+	+	+	+
Position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Unit Designation/Family		G = Marvair Wall Mount w/Gas Heat																											
2	Energy Efficiency Ratio (EER)		A = 11																											
3	Refrigerant Type		H = R-454B																											
4	Compressor Type/Quantity		1 = Single																											
5	Unit Capacity/Nominal Cooling (BTUH)		024 = 24,000      042 = 42,000																											
6			030 = 30,000      048 = 48,000																											
7			036 = 36,000      060 = 60,000																											
8	System Type		A = Air Conditioner																											
9	Power Supply (Volts-Hz-Phase)		A = 208/230-60-1 C = 208/230-60-3 D = 460-60-3																											
10	Heat Designation		045 = 45,000 BTUH    090 = 90,000 BTUH																											
11			067 = 67,500 BTUH    100 = 100,000 BTUH																											
12			075 = 75,000 BTUH    125 = 125,000 BTUH																											
13	Ventilation Configuration		C = Economizer D = Motorized Damper w/Pressure Relief E = Motorized Damper w/Pressure Relief & Independent Motorized Damper Control H = GreenWheel																											
14	Dehumidification		G = Hot Gas Reheat H = Hot Gas Reheat w/Humidity Control J = Hot Gas Reheat w/Return Air Limit K = Hot Gas Reheat w/Humidity Control & Return Air Limit M = Modulating Hot Gas Reheat N = Modulating Hot Gas Reheat w/Humidity Control + = None																											
15	Controls		A = Power Fail Alarm w/Additional Lockouts C = 24V EMS Relay Kit + = None																											
16	Operating Condition		A = Evaporator Freeze Sensor (EFS) C = EFS w/Hot Gas Bypass N = Hard Start P = Hard Start w/Low Ambient & CCH Q = Hard Start w/Low Ambient & Fan Cycle Control (FCC) R = Crank Case Heater (CCH) T = Hard Start w/EFS U = Hard Start w/Hot Gas Bypass V = Hard Start w/Low Ambient & CCH & EFS W = Low Ambient w/CCH X = Hot Gas Bypass Y = Low Ambient w/CCH & FCC Z = Low Ambient w/CCH & EFS 1 = Low Ambient w/FCC 2 = Low Ambient w/FCC & EFS 3 = CCH w/Hot Gas Bypass + = None																											
17	Indoor Air Quality Features		D = Dry Bulb Sensor E = Dry Bulb Sensor w/Dirty Filter G = Dirty Filter Sensor + = None																											
18	Air Flow		1 = Top Supply/Center Return (STD)																											
19	Compressor Location		D = Left Hand E = Right Hand																											
20	Filter Option		A = 2" Pleated (MERV 8, AC/HP-C) C = 2" Charcoal D = MERV 11 High Filtration Package E = MERV 13 High Filtration Package F = Filter Access Through Return Air Grille W = Aluminum Washable + = None																											
21	Corrosion Protection		A = Condenser Coil Only C = Evaporator Coil Only D = Both Coils Condenser & Evaporator E = All Coils Cond/Evap/Reheat F = Coat All K = Coastal Package + = None \$ = Special																											
22	Engineering Revision Level		A1 B1																											
24	Cabinet Color		1 = Marvair Beige (STD) 2 = Gray (STD) 3 = Carlsbad Canyon (STD) 4 = White (STD) 5 = Stainless Steel Exterior 9 = Pebble Gray A = Stainless Steel - Unit \$ = Custom Color (Powder Coat)																											
25	Sound Attenuation		2 = Compressor Blanket + = None																											
26	Security Option		A = Lockable Access Plate/Tamper Proof + = None																											
27	Packaging		1 = Crating 2 = Coil Covering 3 = ISPM 15 Compliant + = None																											
28	Fastener/Drain Pan Option		A = Stainless Steel Fasteners C = Stainless Steel Drain Pan D = Stainless Steel Fasteners & Drain Pan + = None																											
29	Unused		+ = None \$ = Special																											
30	Special Variation		+ = None \$ = Special Configuration Not Covered by Model Nomenclature																											

**Note:** Not all options are available with all configurations. Contact your Marvair sales representative for configuration details and feature compatibility.

\*Used when filter is accessed and changed from inside the interior.

## HEATING CAPACITY INPUTS AVAILABLE

MODEL	Available Heating Inputs	MODEL	Available Heating Inputs
<b>GAH1024A</b>	45,000 BTUH; 67,500 BTUH; 90,000 BTUH	<b>GAH1042A</b>	75,000 BTUH; 100,000 BTUH; 125,000 BTUH
<b>GAH1030A</b>	45,000 BTUH; 67,500 BTUH; 90,000 BTUH	<b>GAH1048A</b>	75,000 BTUH; 100,000 BTUH; 125,000 BTUH
<b>GAH1036A</b>	45,000 BTUH; 67,500 BTUH; 90,000 BTUH	<b>GAH1060A</b>	75,000 BTUH; 100,000 BTUH; 125,000 BTUH

## Certified Efficiency and Capacity Ratings at ANSI/AHRI Standard 390

Model Number	GAH1024A	GAH1030A	GAH1036A	GAH1042A	GAH1048A	GAH1060A
Cooling BTUH <sup>1</sup>	24,000	30,000	35,600	42,000	44,000	55,000
EER <sup>2</sup>	11.00	11.00	11.00	11.00	11.00	11.00
Rated Air Flow (CFM <sup>3</sup> )	800	900	1,050	1,550	1,600	1,650

<sup>1</sup>Cooling capacity and efficiency (EER) rated at 95°F (35°C) outdoor and 80°F DB/67° WB (26.5°C DB/19.5°C WB) return air  
<sup>2</sup>EER=Energy Efficiency Ratio    <sup>3</sup>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 @ 95°F (35°C) Outside Air DB

Model Number	GAH1024A			GAH1030A			GAH1036A			GAH1042A			GAH1048A			GAH1060A		
	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D	A	C	D
Total Capacity	24,000			30,000			35,600			42,000			44,000			55,000		
Sensible Heat Ratio	0.69			0.70			0.64			0.76			0.71			0.68		
Sensible Capacity	16,560			21,140			23,045			32,185			31,300			37,595		
Rated Air Flow (CFM <sup>1</sup> )	800			900			1,050			1,550			1,600			1,650		

<sup>1</sup>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 Dry Bulb B/67° Wet Bulb (26.5°C DB/19.5°C WB) return air.

## Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	OUTDOOR AMBIENT DRY BULB TEMPERATURES								
	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
1024A	27,840	26,880	25,920	24,960	24,000	23,040	22,080	21,120	20,640
1030A	34,800	33,600	32,400	31,200	30,000	28,800	27,600	26,400	25,800
1036A	41,295	39,870	38,450	37,025	35,600	32,965	32,750	31,330	30,615
1042A	48,720	47,040	45,360	43,680	42,000	40,320	38,640	36,960	36,120
1048A	51,040	49,280	47,520	45,760	44,000	42,240	40,480	38,720	37,840
1060A	63,800	61,600	59,400	57,200	55,000	52,800	50,600	48,400	47,300
Based upon ANSI/AHRI std. 390 return air conditions of 80°F Dry Bulb/67° Wet Bulb (26.5°C DB/19.5°C WB) at various outdoor temperatures.									

## Heating Efficiency and Capacity Ratings\*

Input	45,000 BTUH	67,500 BTUH	90,000 BTUH	75,000 BTUH	100,000 BTUH	125,000 BTUH
Output	32,000 BTUH	52,000 BTUH	69,000 BTUH	57,000 BTUH	77,000 BTUH	96,000 BTUH
Thermal Heating Efficiency	81.0	81.0	81.0	81.0	81.0	81.0
Temperature Rise Range (°F)	25 to 55	40 to 70	50 to 80	25 to 55	40 to 70	50 to 80
Mid Range Air Flow (CFM)	840	1,000	1,220	1,650	1,70	1,750
Acceptable Air Flow Range (CFM)	650 to 1,050	750 to 1,250	1,000 to 1,500	925 to 1,750	1,060 to 1,750	1,150 to 1,750

\*Heating ratings in accordance with AHRI Efficiency Certification Program. Temperature rise (°F) at .035" Water Gauge External Static Pressure.

## SCFM @ Various External Static Pressures

Model Number	0.10	0.20	0.25	0.30	0.40	0.50
GAH1024A	800	720	680	640		
GAH1030A	940	860	820	780	700	
GAH1036A	1,090	1000	970	925	850	
GAH1042A	1,590	1500	1470	1430	1350	1260
GAH1048A	1,680	1600	1560	1520	1440	1350
GAH1060A	1,730	1650	1600	1570	1480	1400

Operation of units at a voltage different from the rating point will affect air flow.

## Natural Gas Heating Capacity by Altitude (ft.)

NATURAL GAS DERATE CAPACITIES - Btu/Hr											
Rated Input	Altitude (Feet)										
	Sea Level	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
40,500	40,500	39,204	37,908	36,612	35,640	34,992	34,182	33,696	33,048	32,643	32,076
45,000	45,000	43,560	42,120	40,680	39,600	38,880	37,980	37,440	36,720	36,270	35,640
60,750	60,750	58,806	56,862	54,918	53,460	52,488	51,273	50,544	49,572	48,965	48,114
67,500	67,500	65,340	63,180	61,020	59,400	58,320	56,970	56,160	55,080	54,405	53,460
75,000	75,000	72,600	70,200	67,800	66,000	64,800	63,300	62,400	61,200	60,450	59,400
81,000	81,000	78,408	75,816	73,224	71,280	69,984	68,364	67,392	66,096	65,286	64,152
90,000	90,000	87,120	84,240	81,360	79,200	77,760	75,960	74,880	73,440	72,540	71,280
100,000	100,000	96,800	93,600	90,400	88,000	86,400	84,400	83,200	81,600	80,600	79,200
112,500	112,500	108,900	105,300	101,700	99,000	97,200	94,950	93,600	91,800	90,675	89,100
125,000	125,000	121,000	117,000	113,000	110,000	108,000	105,500	104,000	102,000	100,750	99,000

## Propane (LP) Heating Capacity by Altitude (ft.)

PROPANE (LP GAS) DERATE CAPACITIES - Btu/Hr											
Rated Input	Altitude (Feet)										
	Sea Level	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000	10,000
40,500	40,500	39,852	39,528	39,204	38,556	38,232	37,584	36,612	35,640	34,344	32,724
45,000	45,000	44,280	43,920	43,560	42,840	42,480	41,760	40,680	39,600	38,160	36,360
60,750	60,750	59,778	59,292	58,806	57,834	57,348	56,376	54,918	53,460	51,516	49,086
67,500	67,500	66,420	65,880	65,340	64,260	63,720	62,640	61,020	59,400	57,240	54,540
75,000	75,000	73,800	73,200	72,600	71,400	70,800	69,600	67,800	66,000	63,600	60,600
81,000	81,000	79,704	79,056	78,408	77,112	76,464	75,168	73,224	71,280	68,688	65,448
90,000	90,000	88,560	87,840	87,120	85,680	84,960	83,520	81,360	79,200	76,320	72,720
100,000	100,000	98,400	97,600	96,800	95,200	94,400	92,800	90,400	88,000	84,800	80,800
112,500	112,500	110,700	109,800	108,900	107,100	106,200	104,400	101,700	99,000	95,400	90,900
125,000	125,000	123,000	122,000	121,000	119,000	118,000	116,000	113,000	110,000	106,000	101,000

## Orifice and Altitude Selection Tables for Factory Standard Input Models

HMG 22,500 BTUH/ Burner (Used with GAH1024A/1030A/1036A Heat Exchangers)				
Altitude	Orifice- Natural		Orifice- Propane	
	Drill Size	Dia.	Drill Size	Dia.
0-1999 ft	#43	0.089	#54	0.055
2000-2999 ft	2.2	0.0866	1.35	0.531
3000-3999 ft	2.15	0.0846	#55	0.052
4000-4999 ft	2.1	0.0827	1.3	0.0511
5000-5999 ft	#45	0.082	1.25	0.0492
6000-6999 ft	2.05	0.087	1.2	0.0472

HMG 25,000 BTUH/ Burner (Used with GAH1042A, 1048A & 1060A Heat Exchangers)				
Altitude	Orifice- Natural		Orifice- Propane	
	Drill Size	Dia.	Drill Size	Dia.
0-1999 ft	2.30	0.0906	1.5	0.0591
2000-2999 ft	#43	0.0890	#54	0.0550
3000-3999 ft	2.20	0.0866	1.35	0.0531
4000-4999 ft	2.15	0.0846	#55	0.0520
5000-5999 ft	2.10	0.0827	1.30	0.0511
6000-6999 ft	#45	0.0820	1.25	0.0492

Burner Input	Number of Orifices
40,500	2
45,000	2
60,750	3
67,500	3
75,000	3
81,000	4
90,000	4
100,000	4
112,500	5
125,000	5

Orifice Size (mm)	Orifice Diameter	Orifice Size (mm)	Orifice Diameter
2.10	0.0826	2.45	0.0964
2.15	0.0846	2.50	0.0984
2.20	0.0866	2.60	0.1024
2.25	0.0885	2.70	0.1063
2.30	0.0905	2.75	0.1082
2.35	0.0925	2.80	0.1102
2.40	0.0945	2.90	0.1142



## Electrical Characteristics - Compressor, Fan & Blower Motors

Model Number	COMPRESSOR			OUTDOOR FAN MOTOR				INDOOR FAN MOTOR				GREENWHEEL® ERV		
	VOLTS-HZ-PH	RLA <sup>1</sup>	LRA <sup>2</sup>	VOLTS-HZ-PH	RPM <sup>3</sup>	FLA <sup>4</sup>	HP <sup>5</sup>	VOLTS-HZ-PH	RPM <sup>3</sup>	FLA <sup>4</sup>	HP <sup>5</sup>	OAM <sup>6</sup>	EXM <sup>7</sup>	WD <sup>8</sup>
GAH1024AA	208/230-60-1	11.9	67.8	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	2.8	1/3	1.0	1.0	0.2
GAH1030AA	208/230-60-1	13.5	82.5	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1036AA	208/230-60-1	14.7	109.0	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1042AA	208/230-60-1	17.3	123.0	208/230-60-1	1200	5.3	1/2	208/230-60-1	1075	6.0	3/4	1.0	1.0	0.2
GAH1048AA	208/230-60-1	22.4	126.0	208/230-60-1	1200	5.3	1/2	208/230-60-1	1075	6.0	3/4	1.0	1.0	0.2
GAH1060AA	208/230-60-1	23.7	157.0	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1024AC	208/230-60-3	8.3	67.7	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	2.8	1/3	1.0	1.0	0.2
GAH1030AC	208/230-60-3	12.8	97.5	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1036AC	208/230-60-3	12.2	102.8	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1042AC	208/230-60-3	12.8	102.8	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1048AC	208/230-60-3	12.8	120.4	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1060AC	208/230-60-3	16.0	156.4	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1024AD	460-60-3	5.1	38.1	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	2.8	1/3	1.0	1.0	0.2
GAH1030AD	460-60-3	5.1	44.3	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1036AD	460-60-3	5.8	50.0	208/230-60-1	1075	3.5	1/3	208/230-60-1	1050	4.3	1/2	1.0	1.0	0.2
GAH1042AD	460-60-3	5.8	50.0	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1048AD	460-60-3	6.0	49.4	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2
GAH1060AD	460-60-3	7.1	69.0	208/230-60-1	1200	5.3	1/2	208/230-60-1	1050	6.0	3/4	1.0	1.0	0.2

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

## Summary Electrical Ratings (Wire Sizing) - GAH Gas / Electric Air Conditioners

C = Economizer

D = Motorized Damper w/Pressure Relief

E = Motorized Damper w/Pressure Relief & Independent Motorized Damper Control

H = GreenWheel

Model Number	VOLTAGE PHASE	Ventilation Configuration				Gas Heat Capacities (Btu/Hr)					
		C, D, E, F, N		H		045		067		090	
		MCA	MFS	MCA	MFS	INPUT	OUTPUT	INPUT	OUTPUT	INPUT	OUTPUT
GAH1024AA	208-230/1	21.2	30	23.4	35	45,000	32,000	67,500	52,000	90,000	69,000
GAH1030AA	208-230/1	24.7	35	26.9	40	45,000	32,000	67,500	52,000	90,000	69,000
GAH1036AA	208-230/1	26.2	40	28.4	40	45,000	32,000	67,500	52,000	90,000	69,000
GAH1042AA	208-230/1	32.9	50	35.1	50	75,000	57,000	100,000	77,000	125,000	96,000
GAH1048AA	208-230/1	39.3	60	41.5	60	75,000	57,000	100,000	77,000	125,000	96,000
GAH1060AA	208-230/1	40.9	60	43.1	60	75,000	57,000	100,000	77,000	125,000	96,000
GAH1024AC	208-230/3	16.7	20	18.9	25	45,000	32,000	67,500	52,000	90,000	69,000
GAH1030AC	208-230/3	23.8	35	26	35	45,000	32,000	67,500	52,000	90,000	69,000
GAH1036AC	208-230/3	23.1	35	25.3	35	45,000	32,000	67,500	52,000	90,000	69,000
GAH1042AC	208-230/3	27.3	40	29.5	40	75,000	57,000	100,000	77,000	125,000	96,000
GAH1048AC	208-230/3	27.3	40	29.5	40	75,000	57,000	100,000	77,000	125,000	96,000
GAH1060AC	208-230/3	31.3	45	33.5	45	75,000	57,000	100,000	77,000	125,000	96,000
GAH1024AD	460/3	9.5	15	11.7	15	45,000	32,000	67,500	52,000	90,000	69,000
GAH1030AD	460/3	10.3	15	12.5	15	45,000	32,000	67,500	52,000	90,000	69,000
GAH1036AD	460/3	11.2	15	13.4	15	45,000	32,000	67,500	52,000	90,000	69,000
GAH1042AD	460/3	12.9	15	15.1	20	75,000	57,000	100,000	77,000	125,000	96,000
GAH1048AD	460/3	13.2	15	15.4	20	75,000	57,000	100,000	77,000	125,000	96,000
GAH1060AD	460/3	14.5	20	16.7	20	75,000	57,000	100,000	77,000	125,000	96,000

<sup>1</sup>MCA = Minimum Circuit Ampacity (Wiring Size Amps)

<sup>2</sup>MFS = Maximum Fuse or HACR Breaker Size

<sup>3</sup>SPPE = Single Point Power Entry

<sup>4</sup>Top Supply/Center Return

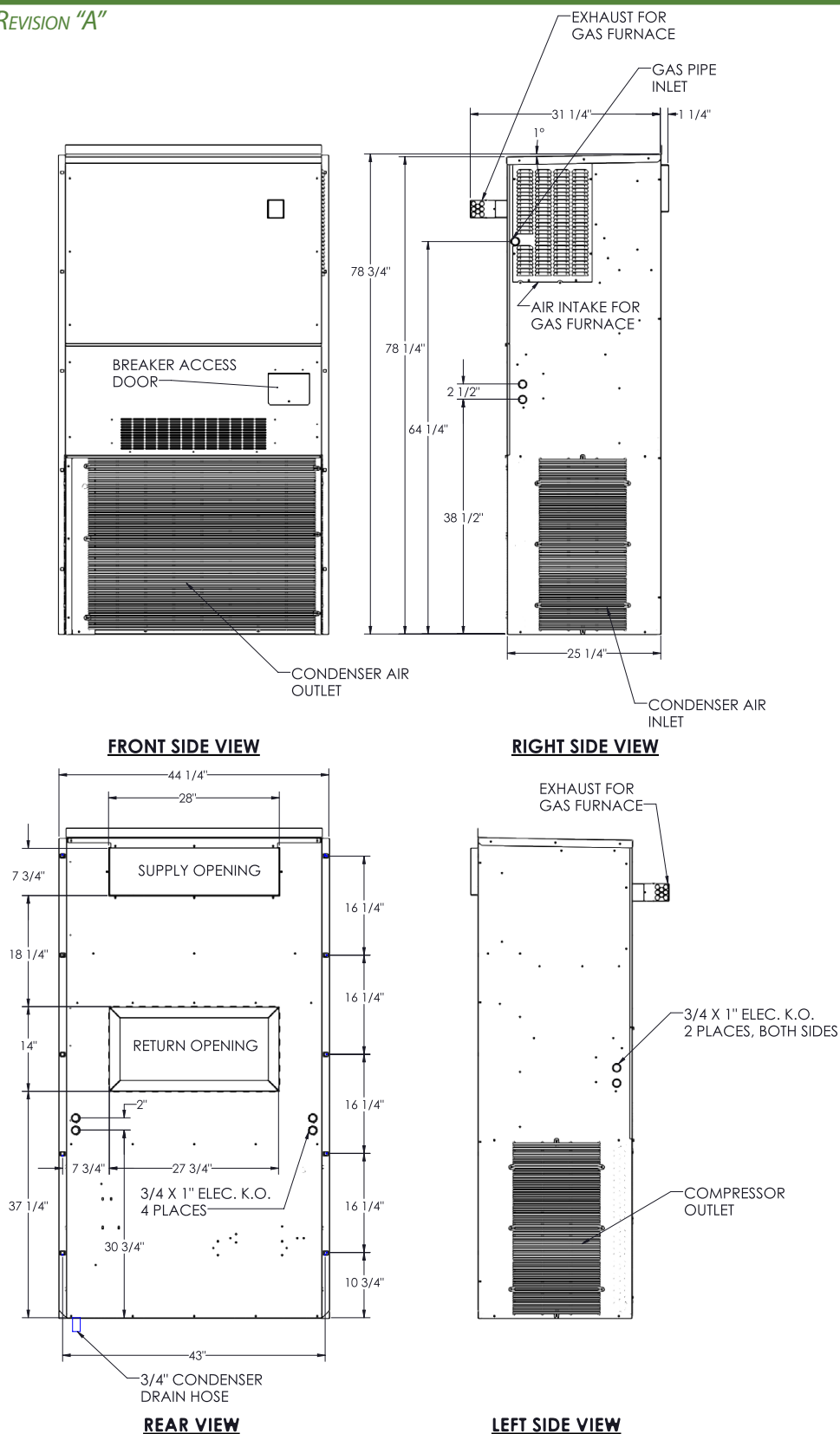
<sup>5</sup>Center Supply/Top Return

MCA & MFS are calculated at 240 volts on the "A" & "C" models. The 480 volts "D" models are calculated at 480 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.

1. MFS (Maximum Fuses Size) value listed is the maximum value as per UL 60335-2-40 calculations for MOCP (branch-circuit conductor sizes in this chart are based on this MOCP). The actual factory installed Overcurrent Protective Device (Circuit Breaker) in the models may be lower than the maximum UL 60335-2-40 allowable MOCP value, but still above the UL 60335-2-40 minimum calculated value or Minimum Circuit Ampacity (MCA) listed.
2. The end user shall size conductors based on the Single Point Power Entry (SPPE) - Minimum Circuit Ampacity. The service circuit breaker shall not be sized less than the minimum circuit ampacity associated to Single Point Power Entry value provided. The service circuit breaker shall also not be sized greater than the Maximum Fuse size associated to the Single Point Power Entry Value Provided.
3. While this electrical data is presented as a guide, it is important to electrically connect properly sized fuses and conductor wires in accordance with the National Electrical Code and all local codes

## DIMENSIONAL DATA (IN INCHES) - GAH1024A/1030A/1036A

ENGINEERING REVISION "A"



### Shipping Weight

BASIC MODEL	GAH1024A	GAH1030A	GAH1036A
SHIP WEIGHT - LBS	335	415	415
SHIP WEIGHT - KG	152	189	189

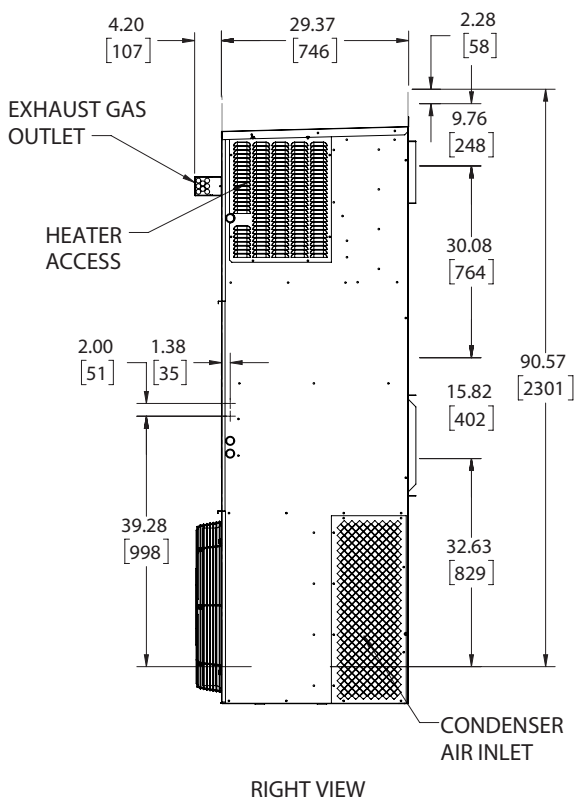
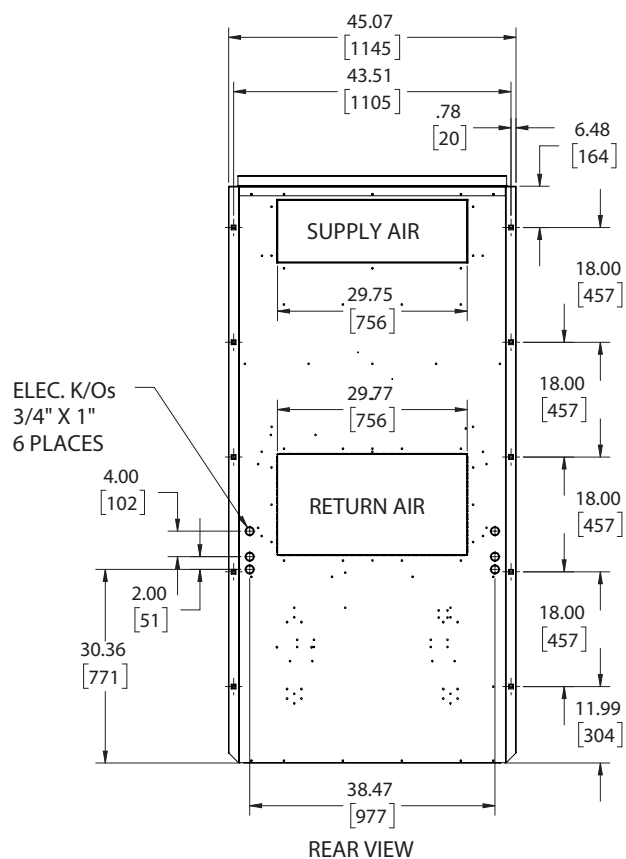
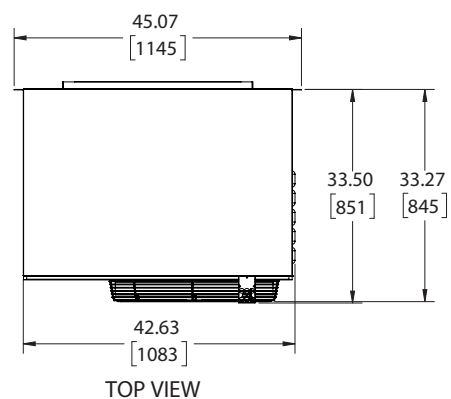
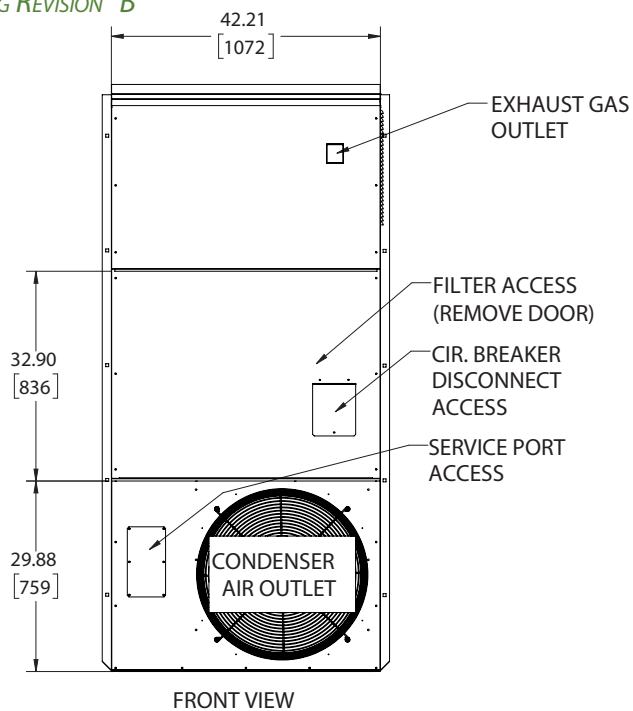
**Note:** All overall outside dimensions are given with +/- .250" (6mm) tolerance.

### Filter Size (inches)

BASIC MODEL	GAH1024A	GAH1030A	GAH1036A
FILTER SIZE - IN	30 x 16 x 2		
FILTER SIZE - MM	762 x 406 x 51		
FILTER PART #	80138		

## DIMENSIONAL DATA (IN INCHES) - GAH1042A/1048A/1060A

ENGINEERING REVISION "B"



### Shipping Weight

BASIC MODEL	GAH1042A	GAH1048A	GAH1060A
SHIP WEIGHT - LBS	555	580	595
SHIP WEIGHT - KG	252	264	270

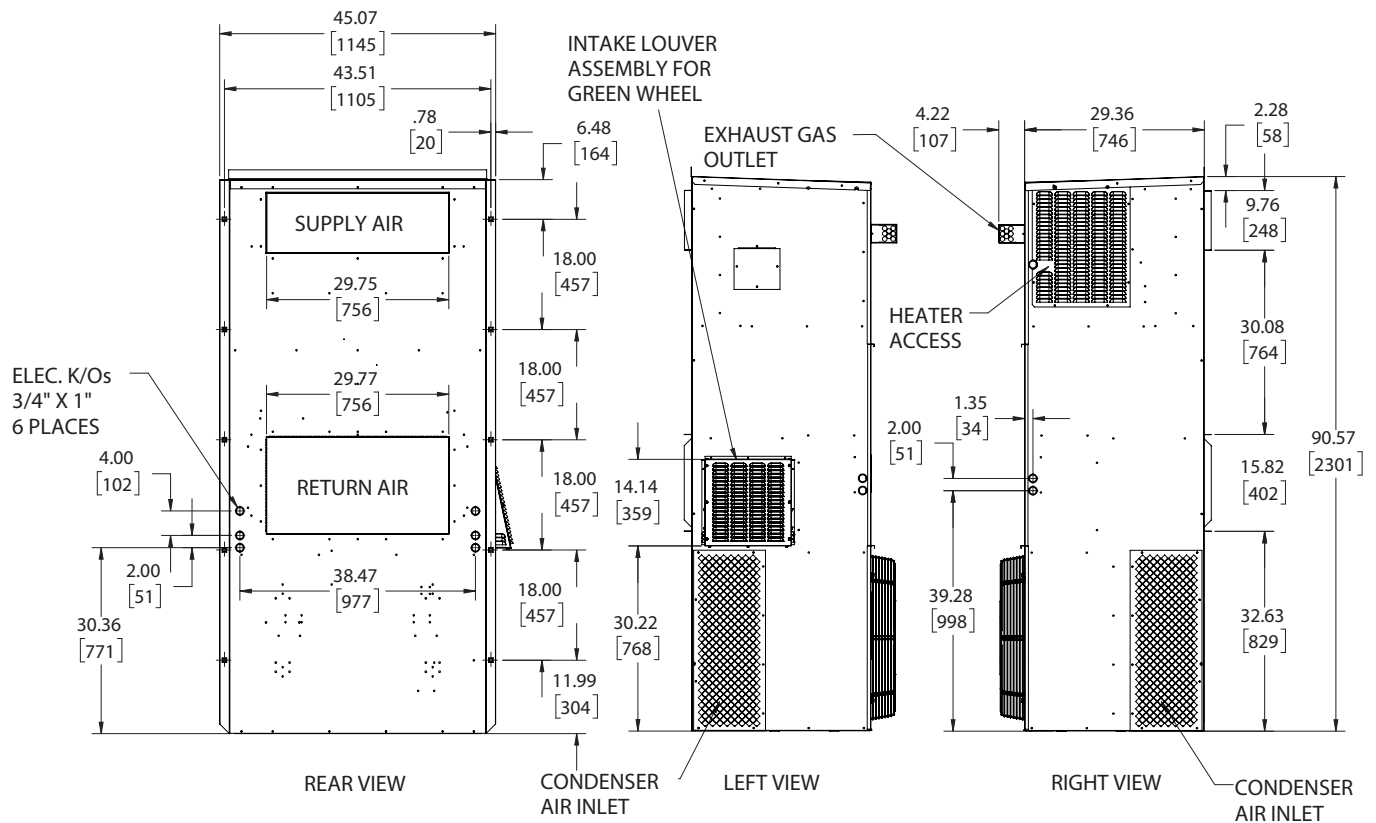
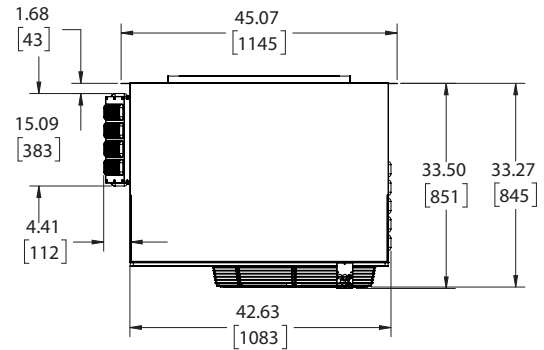
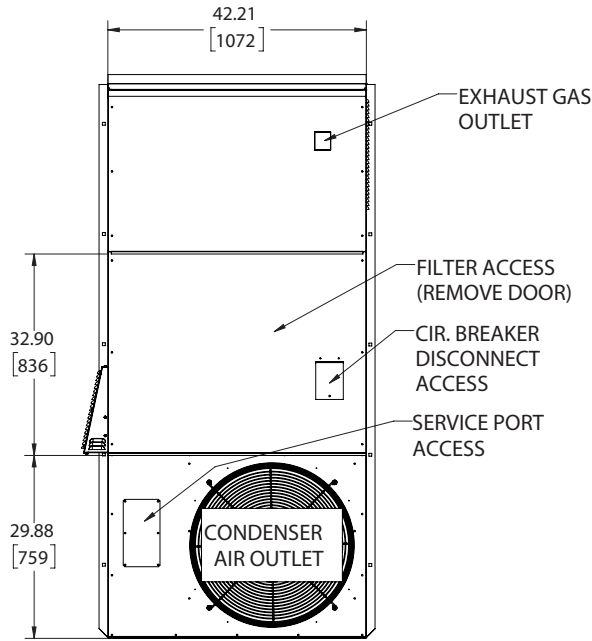
**Note:** All overall outside dimensions are given with +/- .250" (6mm) tolerance.

### Filter Size (inches)

BASIC MODEL	GAH1042A	GAH1048A	GAH1060A
FILTER SIZE - IN	18 x 24 x 1		
FILTER SIZE - MM	457 x 610 x 25		
FILTER PART # (2 FILTERS/UNIT)	81199		

# DIMENSIONAL DATA (IN INCHES) - GAH1042A/1048A/1060A w/GREENWHEEL

ENGINEERING REVISION "B"



## Shipping Weight

BASIC MODEL	GAH1042A	GAH1048A	GAH1060A
SHIP WEIGHT - LBS	555	580	595
SHIP WEIGHT - KG	252	264	270

**Note:** All overall outside dimensions are given with +/- .250" (6mm) tolerance.

## Filter Size (inches)

BASIC MODEL	GAH1042A	GAH1048A	GAH1060A
FILTER SIZE - IN	18 x 24 x 1		
FILTER SIZE - MM	457 x 610 x 25		
FILTER PART # (2 FILTERS/UNIT)	81199		





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



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