

### DC Free Air HVAC Unit w/48 VDC Evaporator Fan Motor, 100% Free Cooling and CoolLinks Controller Models MAH1036D-1042D-1048D-1060D & MGH1072D



#### GENERAL DESCRIPTION

Marvair<sup>®</sup> MAH1036D–MAH1060D and MGH1072D DC Free Air exterior wall mount air conditioners are designed to cool telecommunications shelters where the high internal heat load requires year round cooling, even when ambient temperatures are below 60°F (15°C). Marvair DC air conditioners have the necessary controls and components to provide year-round cooling in a wide range of ambient conditions. All models use the non-ozone depleting R-454B refrigerant.

#### ► Ultra High Efficiency

Marvair's most efficient wall mount 48 VDC air conditioners. Rated up to 11.5 EER and available in cooling capacities of 3, 3.5, 4, 5 & 6 tons (36,000 to 72,000 BTUH).

#### ► DC Power Provides Emergency Cooling/Ventilation

Should there be loss of power to the site, the Marvair DC Free Air unit will continue to cool/ventilate the site by utilizing the shelter's DC power to introduce outside air into the shelter for free cooling. The DC Free Air unit will continue to ventilate the site and extend the run time of the equipment until battery power is exhausted or, at the minimum, owner specified pull down of battery drain.

Marvair DC free air units operate on both AC and DC power. The compressor, condenser fan motor and electric heat operate on AC power, but the evaporator motors, the 100% free cooling economizer damper and the internal control board operate on DC power – an inverter is *not* required. Since these key components are all powered by 48 VDC – the same 48 VDC power used by the shelter's radios- they are always operational.

The 48 VDC power supply connects to an internal DC breaker. From this breaker, power is supplied to the DC indoor blower and control board.

#### ► Free Cooling with the Marvair 100% Full Flow Economizer

When the outside air is cool and dry, the economizer damper opens and draws in filtered, outside air to cool the shelter. The Marvair 100% full flow economizer means the same CFM of outside air is brought into the shelter as the rated air flow of the unit. The innovative design of the full flow economizer assembly also allows inside air to exit the building – pressure relief – when the full flow economizer is operating. This design eliminates the need for additional, costly penetrations in the shelter.

Free cooling provides temperature control, energy 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.



MAH1036D



## Features and Benefits

#### CoolLinks Controller

- PLC-Based for Programming Flexibility
- Sequence the Operation of Two Units
- Ensures Maximum Efficiency
- Independent Economizer Control
- SNMP Interface for External Communication

#### Next Generation R-454B Refrigerant

- 78% Lower GWP than R-410A
- 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

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. For energy efficiency and performance, the units are tested and rated in accordance to the ANSI/AHRI (Air-Conditioning Heating and Refrigeration Institute Standard 390-2003 (Single Package Vertical Units). All units meet or exceed the efficiency requirements of ANSI/ASHRAE/IESNA 90.1.2019. Marvair MAH and MGH air conditioners are commercial units and not intended for residential use.

## 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) 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).
  - Factory installed economizer.
- ▶ **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
- ▶ **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.
- ▶ **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.
  - Foiled backed insulation on the indoor air path.
- ▶ **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 rain hood.
  - Built-in mounting flanges facilitate installation and minimize chance of water leaks.
  - Supply and return openings exactly match previous models.
  - Factory installed disconnect on all units.
  - Single Point Power Entry Complies with latest edition of U.L. Standard 60335-2-40.
  - Side access panels for easy access to electrical connections.

## CoolLinks™ PLC Controller

The Siemens PLC-based CoolLinks controller sequences the operation of the two Marvair A/C units to ensure the most energy-efficient conditioning of the shelter space and the most balanced use of the conditioning equipment. The CoolLinks system determines the need to cool or heat the shelter based on an indoor temperature sensor and outside temperature/humidity sensor connected directly to the controller. When cooling or heating is required, the controller selects the unit that was not running in the previous cooling/heating cycle. This lead/lag operation ensures that each unit receives equal runtime and therefore extends the operating life of the units. In the event that one of the units is unavailable, for example, scheduled maintenance, the system will automatically select the active unit. Similarly, if the internal shelter temperature continues to rise/fall, the system will run both units.

For cooling requests, the CoolLinks controller first examines the external shelter conditions to establish whether DC Free Cooling is possible. If acceptable, the 100% full flow economizer damper on the lead unit is opened to 100%. The damper then modulates its position, regulated by the controller, to cool the shelter to the target set point. During extreme cold outdoor temperatures this prevents "shocking" the equipment in the shelter.

For units installed in corrosive environments, e.g., near the ocean, the economizer cooling function can be disabled to prevent the entry of corrosive air into the shelter.

If DC Free Cooling is active on one unit and the internal temperature continues to rise, DC Free Cooling will then be activated on the second unit. Should the temperature continue to rise, the DC Free Cooling will be disabled on both units, both economizer dampers will be closed, and mechanical cooling activated on the lead unit. The control scheme allows the CoolLinks controller to make as efficient use of the external air as possible to minimize HVAC power consumption.

The CoolLinks controller communicates with the Marvair air conditioners over Ethernet. Should communications between the controller and one of the units fail, the unit will continue to run in stand-alone mode and cool to a mixed-air set point of 55°F (12.8°C). Whenever communications are restored, the CoolLinks controller will assume control of the air conditioner. An Ethernet connection is also provided for a SNMP interface through which the Network Operations Center can receive traps (alarms), monitor/change cooling and heating set points, and monitor HVAC unit and system operational parameters.



## AIR CONDITIONER ALARMS AND LOCKOUTS



Each air conditioner is monitored over Ethernet and if a problem is detected, an alarm is generated. The alarm is displayed on the CoolLinks PLC in the shelter **and** sent via SNMP trap to the network operations center.

- **High Pressure Alarm** The refrigerant pressure has exceeded the set point pressure once in a cooling cycle. The air conditioner will continue to operate, but notification is sent that there is a high pressure fault.
- **High Pressure Lockout Alarm** The refrigerant pressure has exceeded the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a high pressure lockout.
- **Low Pressure Alarm** The refrigerant pressure has dropped below the set point pressure once in a cooling cycle. The air conditioner will continue to operate, but notification is sent that there is a low pressure fault.
- **Low Pressure Lockout Alarm** The refrigerant pressure has dropped below the set point pressure twice in a cooling cycle. The air conditioner will shut down and notification will be sent that there is a low pressure lockout.
- **Damper Alarm** If the 100% full flow damper does not open when required, an alarm notification is sent that the damper is not open. The damper is exercised every 24 hours to verify proper operation.
- **Dirty Filter Alarm** A switch monitors the pressure on either side of the filter. If the differential pressure exceeds the set point pressure, an alarm notification is sent that there is not sufficient air flow through the filter.
- **Communications Alarm** A signal is sent if there is a loss of communication between the air conditioner and the CoolLinks controller.
- **Landline Power Alarm** If either air conditioner loses landline power, an alarm notification is sent.

## SHELTER & SYSTEM ALARMS



In addition to the HVAC alarms, the CoolLinks controller also provides Shelter and System alarms. The alarm is displayed on the CoolLinks PLC in the shelter **and** also sent via SNMP trap to the network operations center.

- **First Stage High Temperature Alarm** Inside temperature above 85°F (29.4°C).
- **Second Stage High Temperature Alarm** Inside temperature above 90°F (32.2°C).
- **Low Temperature Alarm** Inside temperature is below 45°F (7.2°C).
- **Smoke Alarm** If the smoke sensor input to the CoolLinks system is active, the Compressor, Heater, and Indoor Blower Motor on both HVAC units will be shut down and the damper will closed completely. This will stop air flow within the shelter.
- **Hydrogen Detector Alarm** If the hydrogen sensor input to the CoolLinks system is active, the damper(s) on units that are not currently in mechanically cooling will be fully opened and the Indoor Blower Motor(s) will be turned on. This will expel noxious gases and introduce outside air into the shelter. If one unit is in mechanical cooling, it will continue to run. The other air conditioner will turn on and operate in the emergency ventilation mode.
- **Generator Operation Alarm** If the generator running input to the CoolLinks system is active, only one HVAC unit will be permitted to run in mechanical cooling. As the generator is typically sized to run only one HVAC unit, this ensures that the generator load is not exceeded.

## 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 DC Free Air Cooling Time - Last Hour
- Unit 1 & Unit 2 DC Free Air Cooling Requests - Last Hour
- Unit 1 & Unit 2 Heating Time - Last Hour
- Unit 1 & Unit 2 Heating Requests - Last Ho

## DRY CONTACT 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.

## GRILLES

### ► For MAH1036D-1042D-1048D-1060D & MGH1072D

Supply Grille:  
30" x 10" (762mm x 254mm)..... P/N 80676

Return Grille:  
30" x 16" (762mm x 406mm)..... P/N 80679

## FACTORY INSTALLED ACCESSORIES

### ► Phase Monitor

Monitors the power supply for 3Ø units and will turn the air conditioner off if power supply is not phased properly.

### ► Compressor Sound Jacket

To reduce sound of compressor.



### ► Right & Left Side Compressor Configuration

The 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 36, the standard location for the compressor is on the right hand side. In the 42-48-60, the standard location for the compressor is on the left hand side. In the 72, the compressor is accessed from the front of the unit and an opposing configuration is not required.

### ► Hard Start Kit

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

## OPTIONS

### ► Desert Duty Package

The Desert Duty package is designed for operation in hot climates including the American southwest and the Middle East in ambient temperatures from -20°F to 131°F (-29°C to 55°C). Standard features of the Desert Duty package include a thermal expansion valve and a sealed condenser fan motor. Low temperature cooling is with the use of outside air via the economizer.

### ► 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. An illuminated LED indicates that the air flow may be obstructed and the filter should be inspected.

### ► Coastal Environment Package

Recommended for units to be installed near an ocean or on seacoast. Includes corrosion resistant fasteners, sealed or partially sealed condenser fan motor, protective coating applied to all exposed internal copper and metal in the in the condenser section and an impregnated polyurethane on the condenser coil and fan blades. See Coastal Environmental Technical Bulletin for more details.

### ► Protective Coil Coatings

Either the condenser or evaporator coil can be coated, however, coating of 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 coil should be coated. Note: Cooling capacity may be reduced by up to 5% on units with coated coils.

### ► Wall Mount Adapter for MAH1036D Air Conditioners

P/N K/03955-XXX - Facilitates replacement of 44-5/8" (1133 mm) wide older AVP36 & AVPA36 air conditioners with the 40" (1,016 mm) wide MAH1036D air conditioners. XXX is color designator. See model ID.

# MODEL IDENTIFICATION

Example	M	A	H	1	0	3	6	D	A	0	5	0	C	R	+	+	+	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	<b>M</b> = Marvail Wall Mount
2	Energy Efficiency Ratio (EER)	<b>A</b> = 11 <b>G</b> = 10
3	Refrigerant Type	<b>H</b> = R-454B
4	Compressor Type/Quantity	<b>1</b> = Single <b>2</b> = 2-Stage/Single
5	Unit Capacity/Nominal Cooling (BTUH)	<b>036</b> = 36,000 <b>060</b> = 60,000
6		<b>042</b> = 42,000 <b>072</b> = 72,000
7		<b>048</b> = 48,000
8	System Type	<b>D</b> = 48VDC Dual Power Supply
9	Power Supply (Volts-Hz-Phase)	<b>A</b> = 208/230-60-1 <b>D</b> = 460-3-60 <b>C</b> = 208/230-60-3
10	Heat Designation @ Rated Voltage	<b>000</b> = No Heat <b>060</b> = 6KW <b>050</b> = 5KW <b>100</b> = 10KW
11	<b>KW</b> = Kilowatt	
12		
13	Ventilation Configuration	<b>A</b> = Solid Front Door <b>C</b> = Economizer <b>\$</b> = Special
14	Dehumidification	<b>R</b> = Electric Reheat <b>T</b> = Electric Reheat w/Humidity Control <b>+</b> = None <b>\$</b> = Special
15	Controls	<b>A</b> = Power Fail Alarm w/Additional Lockouts <b>C</b> = 24V EMS Relay Kit <b>+</b> = None <b>\$</b> = Special
16	Operating Condition	<b>A</b> = Evaporator Freeze Sensor (EFS) <b>C</b> = EFS w/Hot Gas Bypass <b>N</b> = Hard Start <b>P</b> = Hard Start w/Low Ambient & CCH <b>Q</b> = Hard Start w/Low Ambient & Fan Cycle Control (FCC) <b>R</b> = Crank Case Heater (CCH) <b>T</b> = Hard Start w/EFS <b>U</b> = Hard Start w/Hot Gas Bypass <b>V</b> = Hard Start w/Low Ambient & CCH & EFS <b>W</b> = Low Ambient w/CCH <b>X</b> = Hot Gas Bypass <b>Y</b> = Low Ambient w/CCH & FCC <b>Z</b> = Low Ambient w/CCH & EFS <b>1</b> = Low Ambient w/FCC <b>2</b> = Low Ambient w/FCC & EFS <b>3</b> = CCH w/Hot Gas Bypass <b>+</b> = None <b>\$</b> = Special

17	Indoor Air Quality Features	<b>D</b> = Dry Bulb Sensor <b>E</b> = Dry Bulb Sensor w/Dirty Filter <b>G</b> = Dirty Filter Sensor <b>+</b> = None <b>\$</b> = Special
18	Air Flow	<b>1</b> = Top Supply/Center Return <b>\$</b> = Special
19	Compressor Location	<b>D</b> = Left Hand <b>E</b> = Right Hand
20	Filter Option	<b>A</b> = 2" Pleated (MERV 8, AC/HP-C) <b>C</b> = 2" Charcoal <b>D</b> = MERV 11 High Filtration Package <b>E</b> = MERV 13 High Filtration Package <b>F</b> = Filter Access Through Return Air Grille <b>W</b> = Aluminum Washable <b>+</b> = None <b>\$</b> = Special
21	Corrosion Protection	<b>A</b> = Condenser Coil Only <b>C</b> = Evaporator Coil Only <b>D</b> = Both Coils Condenser & Evaporator <b>E</b> = All Coils Cond/Evap/Reheat <b>F</b> = Coat All <b>K</b> = Coastal Package <b>+</b> = None <b>\$</b> = Special
22	Engineering	A1
23	Revision Level	
24	Cabinet Color	<b>1</b> = Marvail Beige (STD) <b>2</b> = Gray (STD) <b>3</b> = Carlsbad Canyon (STD) <b>4</b> = White (STD) <b>5</b> = Stainless Steel Exterior <b>9</b> = Pebble Gray <b>A</b> = Stainless Steel - Unit <b>S</b> = Stainless Steel Exterior <b>\$</b> = Custom Color (Powder Coat)
25	Sound Attenuation	<b>2</b> = Compressor Blanket <b>+</b> = None
26	Security Option	<b>A</b> = Lockable Access Plate/Tamper Proof <b>+</b> = None <b>\$</b> = Special
27	Fastener/Drain Pan Option	<b>A</b> = Stainless Steel Fasteners <b>C</b> = Stainless Steel Drain Pan <b>D</b> = Stainless Steel Fasteners & Drain Pan <b>+</b> = None <b>\$</b> = Special
28	Unused	<b>+</b> = None <b>\$</b> = Special
29	Unused	<b>+</b> = None <b>\$</b> = Special
30	Special Variation	<b>+</b> = None <b>\$</b> = Special Configuration Not Covered by Model Nomenclature

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

# MAH1036D-1060D & MGH1072D Ultra High Efficiency DC Free Air 48 VDC Air Conditioners



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

Model Number	MAH1036D		MAH1042D		MAH1048D		MAH1060D		MGH1072D	
	A	C	A	C	A	C	A	C	A	C
Cooling BTUH <sup>1</sup>	35,600		40,000		47,500		56,000		66,000	70,000
EER <sup>2</sup>	11.00		11.00		11.50		11.00		10.00	10.00
Rated Air Flow (CFM <sup>3</sup> )	1,300		1,500		1,725		1,925		1,925	1,925
ESP <sup>4</sup> @ Rated Conditions	0.15		0.15		0.20		0.20		0.20	0.25

<sup>1</sup>Cooling 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  
<sup>4</sup>ESP=External Static Pressure  
Ratings are with no outside air. Performance will be affected by altitude.  
Ratings are at 230 volts for 208/230 volt units. 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	MAH1036D		MAH1042D		MAH1048D		MAH1060D		MGH1072D	
	A	C	A	C	A	C	A	C	A	C
Total Capacity	35,600		40,000		47,500		56,000		66,000	70,000
Sensible Heat Ratio	0.76		0.73		0.74		0.73		0.73	0.70
Sensible Capacity	27,056		29,200		34,780		40,800		48,180	49,000
Rated Air Flow (CFM <sup>1</sup> )	1,300		1,500		1,725		1,925		1,925	1,925

<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 DB/67° WB (26.5°C DB/19.5°C WB) return air.

## Cooling Performance (BTUH) at Various Outdoor Temperatures

Model Number	Outdoor Temperature											
	75°F	80°F	85°F	90°F	95°F	100°F	105°F	110°F	115°F	120°F	125°F	130°F
	(23.9°C)	(26.7°C)	(29.4°C)	(32.2°C)	(35°C)	(37.8°C)	(40.6°C)	(43.3°C)	(46.1°C)	(48.9°C)	(51.7°C)	(54.4°C)
MAH1036D	41,295	39,870	38,450	37,025	35,600	34,175	32,750	31,320	30,615	29,975	29,335	28,695
MAH1042D	46,400	44,800	43,200	41,600	40,000	38,400	36,800	35,200	34,400	33,680	32,960	32,240
MAH1048D	54,520	52,640	50,760	48,880	47,000	45,120	43,240	41,360	40,420	39,574	38,728	37,882
MAH1060D	67,280	64,960	62,640	60,320	58,000	55,680	53,360	51,040	49,880	48,835	47,790	46,745
MGH1072D, 1ø	76,560	73,920	71,280	68,640	66,000	63,360	60,720	58,080	56,760	52,800	50,160	47,520
MGH1072D, 3ø	81,200	78,400	75,600	72,800	70,000	67,200	64,400	61,600	60,200	56,000	53,200	50,400

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.

## CFM @ External Static Pressure (Wet Coil) (IWG)

Model Number	0.10	0.15	0.20	0.25	0.30	0.40	0.50
MAH1036D	1290	1230	1170	1115	1060	1000	<b>920</b>
MAH1042D	1500	1430	1360	1295	1230	1160	<b>1070</b>
MAH1048D	1900	1850	1800	1700	1600	1500	<b>1350</b>
MAH1060D	1900	1850	1800	1700	1600	1500	<b>1350</b>
MGH1072D	N/A	N/A	2100	1950	1800	1730	<b>1660</b>

Values in bold are the minimum air flow.

Air flow ratings of 208-230 volt units are at 230v. Air flow ratings of 460 volt units are at 460 volts. Operation of units at a voltage different from the rating point will affect air flow. Air flow ratings for 575 volt units are at 575 volts.

## Electrical Characteristics - Compressor, Fan & Blower Motors

BASIC MODEL	COMPRESSOR				OUTDOOR FAN MOTOR	INDOOR BLOWER MOTOR - 48 VDC
	Type	VOLTS-HZ-PH	RLA <sup>1</sup>	LRA <sup>2</sup>	FLA	FLA
MAH1036DA	Scroll	208/230-60-1	14.7	109.0	2.8	4.0
MAH1042DA		208/230-60-1	18.6	123.0	3.5	4.4
MAH1048DA		208/230-60-1	22.4	126.0	2.8	4.4
MAH1060DA		208/230-60-1	23.7	157.0	2.8	4.4
MGH1072DA		208/230-60-1	30.1	170.0	2.9	6.0
MAH1036DC	Scroll	208/230-60-3	12.2	102.8	2.8	4.0
MAH1042DC		208/230-60-3	12.8	102.8	3.5	4.4
MAH1048DC		208/230-60-3	12.8	120.4	2.8	4.4
MAH1060DC		208/230-60-3	16.0	156.4	2.8	4.4
MGH1072DC		208/230-60-3	22.4	166.2	2.9	6.0

<sup>1</sup>RLA=Rated Load Amps <sup>2</sup>LRA=Locked Rotor Amps FLA=Full Load Amps

## Summary Electrical Ratings (Wire and Circuit Breaker Sizing)

ELECTRIC HEAT		000 = None		050 = 5 kw		060 = 6 kw		100 = 10 kW	
BASIC MODEL	VOLTAGE - HZ - PHASE	SPPE <sup>3</sup>		SPPE <sup>3</sup>		SPPE <sup>3</sup>		SPPE <sup>3</sup>	
		MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>	MCA <sup>1</sup>	MFS <sup>2</sup>
MAH1036DA	208/230-60-1	21.2	35	26.0	35			52.1	60
MAH1042DA	208/230-60-1	26.8	45	26.8	45			52.1	60
MAH1048DA	208/230-60-1	30.8	50	30.8	50			52.1	60
MAH1060DA	208/230-60-1	32.4	50	32.4	50			52.1	60
MGH1072DA	208/230-60-1	40.5	70	40.5	70			52.1	70
MAH1036DC	208/230-60-3	18.1	30			18.1	30		
MAH1042DC	208/230-60-3	19.5	30			19.5	30		
MAH1048DC	208/230-60-3	18.8	30			18.8	30		
MAH1060DC	208/230-60-3	22.8	35			22.8	35		
MGH1072DC	208/230-60-3	30.9	50			30.9	50		

<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

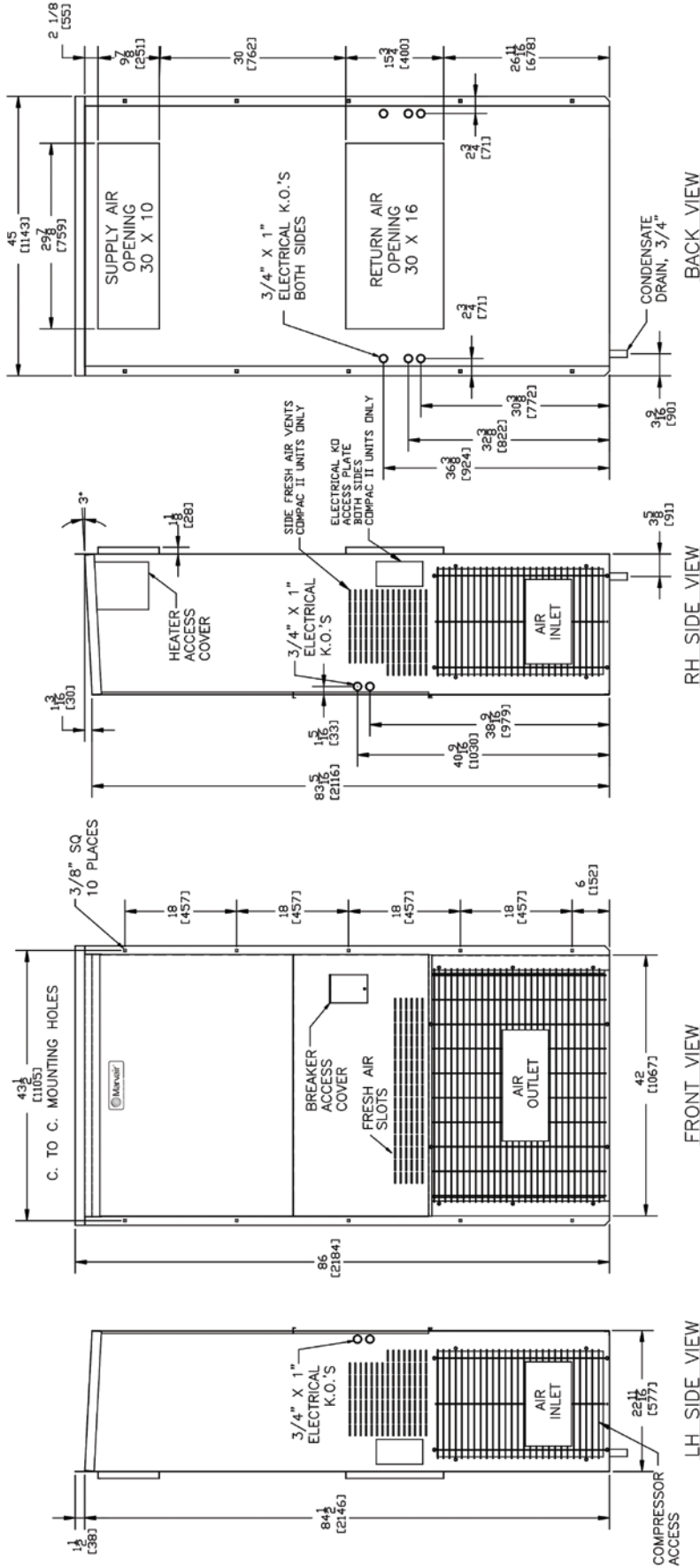
## Unit Load Amps

BASIC MODEL	VOLTAGE - HZ - PHASE	CURRENT AMPS		LOAD OF RESISTIVE HEATING - ELEMENTS ONLY (AMPS) Note: ALL HEATING ELEMENTS ARE ON A SEPARATE CIRCUIT			TOTAL MAXIMUM HEATING AMPS INCLUDES AMPS FROM MOTOR(S) THAT ARE LOCATED ON AN ELECTRICAL CIRCUIT THAT DOES NOT HAVE HEATERS		
		AC <sup>1</sup>	IBM <sup>2</sup>	5 kW	6 kW	10 kW	5 kW	6 kW	10 kW
MAH1036DA	208/230-60-1	21.5	4.0	20.8		41.7	24.8		45.7
MAH1042DA	208/230-60-1	26.5	4.4	20.8		41.7	25.2		46.1
MAH1048DA	208/230-60-1	29.6	4.4	20.8		41.7	25.2		46.1
MAH1060DA	208/230-60-1	30.9	4.4	20.8		41.7	25.2		46.1
MGH1072DA	208/230-60-1	39.0	6.0	20.8		41.7	26.8		47.7
MAH1036DC	208/230-60-3	19.0	4.0		14.4			18.4	
MAH1042DC	208/230-60-3	20.7	4.4		14.4			18.8	
MAH1048DC	208/230-60-3	20.0	4.4		14.4			18.8	
MAH1060DC	208/230-60-3	23.2	4.4		14.4			18.8	
MGH1072DC	208/230-60-3	31.3	6.0		14.4			20.4	

<sup>1</sup>AC = Air Conditioner <sup>2</sup>IBM = Indoor Blower Motor  
Total heating and cooling amps includes all motors.

# DIMENSIONAL DATA - MAH1036D & 1042D

ENGINEERING REVISION "A"



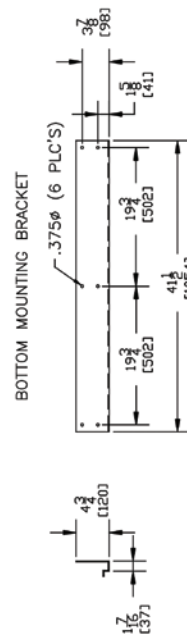
## Shipping Weight (pounds/kilograms)

MAH1036D-1042D		LBS/KGS
With Economizer		590/268

## Filter Size

MAH1036D-1042D	INCHES	MILLIMETERS	PART NUMBER	FILTERS PER UNIT	MERV RATING
RETURN AIR FILTER	36 1/2 x 22 x 2	927 x 559 x 51	80162	1	8 (STD)

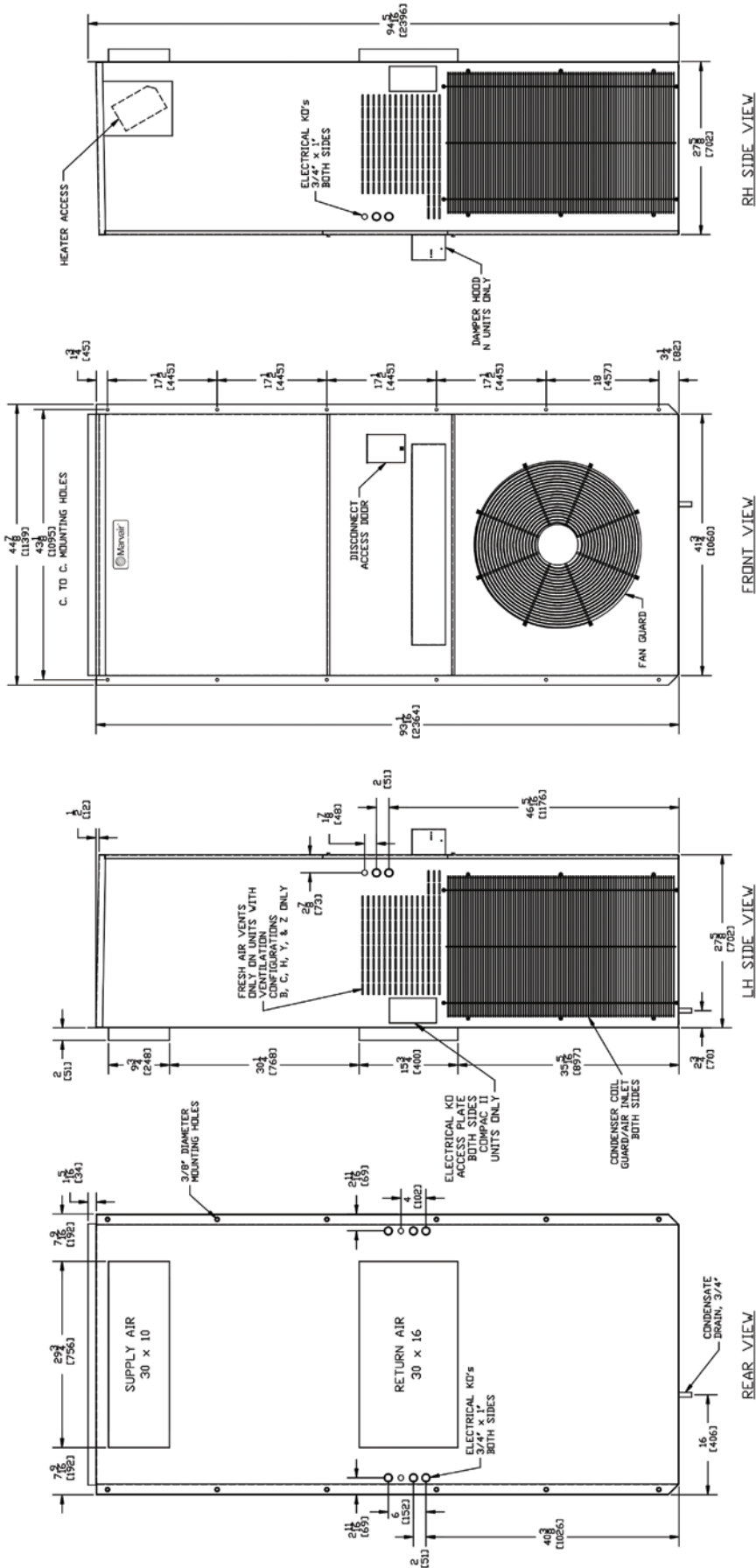
Note: All overall outside dimensions are given with +/- .250" (6mm) tolerance.





# DIMENSIONAL DATA - MAH1048D-1060D & MGH1072D

ENGINEERING REVISION "A"



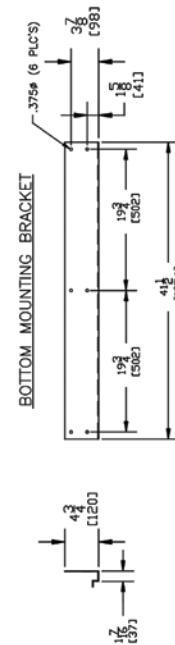
## Shipping Weight (pounds/kilograms)

MAH1048D-1060D & MGH1072D	LBS/KGS
With Economizer	640/291

## Filter Size

MAH1048D-1060D & MGH1072D	INCHES	MILLIMETERS	PART NUMBER	FILTERS PER UNIT	MERV RATING
RETURN AIR FILTER	18 x 24 x 2	457 x 610 x 51	92491	2	8 (STD)

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





*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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