Multiple Circuit Horizontal and Vertical Water Source Heat Pumps

Product Catalog

Sizes: 084 to 144 – Horizontal
Sizes: 084 to 288 – Vertical
Model: M Vintage

Table of Contents

Nomenclature

F	084	H	H	M
Voltage	**Size (BTUH Cooling)**	**Unit Type**	**Temperature Range**	**Vintage**
F = 208-230/3/60	084 = 84,000	H = Horizontal	H = Standard Range	
G = 460/3/60	096 = 96,000	V = Vertical	L = Low Temperature	
J = 380-415/3/50	120 = 120,000			
K = 575/3/60	144 = 144,000			
F = 208-230/3/60	168 = 168,000			
	192 = 192,000			
	240 = 240,000			
	288 = 288,000			

General Description – Twin Circuit Horizontal

M-vintage, twin circuit horizontal water source heat pumps are ceiling-hung in hallways and other corridors, away from the occupied space for reduced sound and to allow easier service access. Twin circuit units provide the opportunity to serve larger spaces with a single unit. Mammoth offers some of the most compact horizontal water source heat pump units in the industry with critical components located to provide easy maintenance and service in a horizontal application.

Basic Features:

- Four units from 6 to 12 tons
- R-410A refrigerant
- EER ratios up to 15.0 and COP ratings to 4.8
- Standard or geothermal operation
- Fully run-tested with water in both heating and cooling modes
- UL and ETL listed
- Efficient, quiet scroll compressors on all units
- Optional digital scroll lead compressor provides superior part load operation (down to 10% load) and avoids the need for hot gas bypass
- ETL listed and AHRI/ISO 13256-1 certified for capacity and efficiency
- Factory-installed variable frequency drive (VFD) is standard for all unit sizes
- FANWALL TECHNOLOGY® allows higher static pressure operation required for MERV 13 filtration, providing an opportunity to earn a point toward LEED® certification
- Available with left or right hand water connections to match application requirements
- Insulated cabinet with removable access panels for easy service
- Standard HP-5 microprocessor-based control system including condensate overflow protection
- Optional EPiC™ DDC controls provide for optimum performance using the control scheme or building management system and protocol of your choice

General Description –Twin and Quad Circuit Vertical

M-vintage, twin circuit vertical water source heat pumps are floor-mounted in closets or small mechanical rooms near the occupied space. Twin circuit units offer the opportunity to serve larger spaces with a single unit. Mammoth offers some of the most quiet water source heat pump units in the industry, allowing units to be located near the occupied space with minimal acoustic impact.

Basic Features:

- Eight unit sizes from 7 to 24 tons
- R-410A refrigerant
- EER ratios up to 15.0 and COP ratings to 4.8
- Standard or geothermal operation
- Fully run-tested with water in both heating and cooling modes
- Scroll compressors on all units
- Optional digital scroll lead compressor provides superior part load operation (to 10% load) and avoids the need for hot gas bypass
- Factory-installed variable frequency drive (VFD) is standard for all unit sizes
- Choice of top or rear fan discharge arrangement
- Available with left or right hand water connections to match application requirements
- ETL listed and AHRI/ISO 13256-1 certified for capacity and efficiency
- FANWALL TECHNOLOGY® allows higher static pressure operation required for MERV 13 filtration, providing an opportunity to earn a point toward LEED® certification
- Insulated cabinet with removable access panels for easy service
- Standard HP-5 microprocessor-based control system including condensate overflow protection
- Optional EPiC™ DDC controls provide for optimum performance using the control scheme or building management system and protocol of your choice

Benefits – Horizontal and Vertical

High Efficiency

Components are selected for high efficiency, up to 15.0 EER and 4.8 COP, to conserve energy and reduce operating costs. Units can help a project obtain LEED® certification.

Application Flexibility

Boiler/tower or geothermal selections provide design flexibility to meet project performance criteria and budget requirements. Multiple discharge arrangements and a wide variety of factory-installed options allow units to be configured to meet design and project requirements. Cooling-only units expand the range of possible applications.

R-410A Refrigerant

Mammoth units incorporate R-410A refrigerant that has no ozone depletion potential or phase-out date. This minimizes the impact on our environment and protects against refrigerant availability over the life of the units.

Easy Maintenance

Horizontal units have multiple access panels to allow easy access to the compressor, fan and control box. Each side of the vertical unit has access panels to the compressor, fan and control box. The back of the unit has access panels to the compressor and fan. The front of the unit, under the coil, has removable panels for additional access.

Each refrigerant circuit has high and low side access valves for easy servicing. Factory-installed filter racks that accommodate return air ducts provide easy access for routine filter replacement.

Controls Flexibility

Units come standard with an HP-5 controller to provide independent, standalone control of all unit functions. An optional factory-installed EPiC DDC system provides or communication with common building automation systems such as BACnet®, LonTalk® and Modbus®.

Durable and Reliable Operation

Mammoth units are engineered for long-life and reliable operation. Components are selected for durability and long life. Multiple refrigerant circuits provide standby operation. Optional cupro-nickel inner tubes of the heat exchanger provide additional protection in applications using well water and city water. Ease of service encourages routine maintenance for peak operation.

Unit Construction and Components

Cabinet

Cabinet casing is constructed of G-60 galvanized steel. Internal metal parts are also fabricated from galvanized steel. Cabinet insulation is ¾ inch, 1 ½ pound density, skin-coated fiberglass. Multiple access panels for the compressor, fan and control box sections allow service to all major components.

Horizontal units have two air coils in the front of the unit. The compressor section is separated from the fan section by an insulated divider panel. There are multiple access panels for the control box, fan and compressor sections. The hanging rail runs along the bottom of the unit.

Vertical units are arranged with the vertical air coil in the front of the unit and the compressor section below. Each side of the unit has multiple access panels to the control box, fan, and compressor. The back of the unit has access panels to the fan and compressor sections. The front of the unit under the coil has removable panels for additional access

Unit sizes 084 through 144 are packaged units. Unit sizes 168 through 288 consist of two sections that ship separately. Dual-section units have a single power source and adjoining power wiring for the adjacent unit, as well as two sets of water connections, condensate connections and thermostat connections.

Each unit includes 1 inch throwaway filters in a factory-mounted filter bracket designed to accommodate a return air duct connection. The filter can be removed horizontally.

Units incorporate 1-¼ inch female NPT copper water connection fittings outside the cabinet for supply water connections using flexible hose or rigid piping. All units must be externally trapped. A 1-¼" O.D. copper condensate connection is located outside the cabinet, adjacent to the water connections.

Refrigeration System

The refrigeration system for each circuit consists of a scroll compressor, coaxial water to refrigerant heat exchanger, airside coil thermal expansion valve, access valves, reversing valve and safety control. Optional digital scroll lead compressor can be provided for superior part load operation (to 10% load) and avoids the need for hot gas bypass.

Unit sizes 084 through 144 (horizontal and vertical) have two independent circuits and unit sizes 168 through 288 (vertical only) have four independent circuits. Compressors are mounted on neoprene isolators and heavy gauge mounting rails for minimum noise transmission and quiet operation. Each refrigerant circuit has high side and low side access valves for servicing.

The water to refrigerant coaxial coil consists of a copper inner tube and a steel outer tube. It is rated for 650psig on the refrigerant side and 400 psig on the water side. Large tube diameters prevent clogging unlike brazed plate-type heat exchangers which require mesh strainers. The air coil is a copper tube, aluminum finned type selected for high efficiency.

The reversing valve is energized in the cooling mode and is fail-safe to the heating mode. Safety controls include a high and low refrigerant pressure switch (loss of charge protection) for each refrigerant circuit. A lockout relay prevents the compressor from operating if any safety switch trips.

Fan Section

The fan section consists of the plug fan, motors, VFD and discharge outlet. Airside components are separated from the compressor section to limit noise transmission from the compressor. Units incorporate FANWALL TECHNOLOGY® to allow for higher static operation to accommodate MERV 13 filtration. This feature is unique to Mammoth water source heat pumps and can help earn a LEED point.

Motors are premium efficiency, totally-enclosed with sealed and locked bearings and a NEMA rated frame designed for quiet operation. Motors are designed for use with the VFD and include bearing protection rings to reduce bearing frosting, pitting and failure caused by VFD induced voltages on the motor shaft.

Horizontal units can be configured for straight-through discharge as standard with an optional side discharge. Vertical units can be configured for top discharge as standard with an optional rear discharge.

Controls

HP-5 Controller

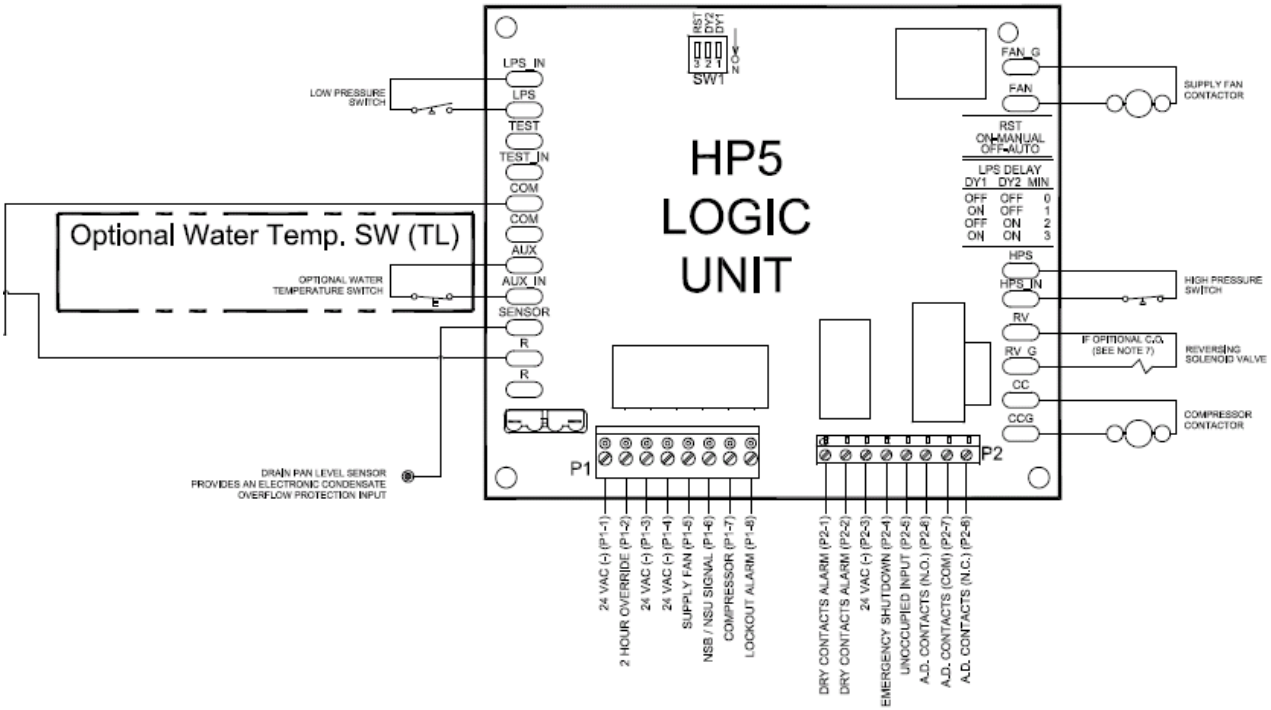
The standard HP-5 microprocessor board provides complete control of the unit compressors, reversing valves, fan, safety features and troubleshooting fault indicators.

EPiC™ DDC Controller

The optional factory-integrated EPiC DDC controller provides control flexibility that can be easily customized to meet any sequence of operation. It is fully capable of operating in a 100% stand-alone mode or can connect to a Building Automation System (BAS) using any of today's four leading protocols: BACnet, Modbus, N2, and LonTalk. The base controller provides ample input/output capacity, plus support for an expander board if additional I/O capacity is required.

The controller provides these key features:

- I/O point count: 6 digital outputs, 12 universal inputs, and 6 analog outputs. I/O points can be increased by use of an optional I/O Flex Expander.
- Optional built-in protocol support: BACnet (ARCNET, MS/TP, and PTP modes), Modbus (RTU and ASCII modes supported), N2, or LonTalk.
- Powerful, high-speed 16-bit microprocessor with 1 MB Flash memory and 1 MB of battery-backed RAM
- Built-in support through a Rnet port for control's custom configurable keypad/display unit, BACview6 (4-line by 40 character per line display); for intelligent sensors.
- For variable air volume (VAV), constant volume (CAV), and make-up air (MAU) applications. Used with applications having options requiring a greater number of outputs and inputs.
- As additional options are added an I/O 8160 expander will be needed.



Example of I/O's

INPUTS				
Point	**Description**			
UD #1	**+Pulse**	BMS Supply Air, Duct Static Reset or Room Air Temperature Setpoint		
UD #2		Room Air Temperature		
UD #3	**RTD/Therm/Dry**	System Switch	Emergency Shut Down	Remote Start
UD #4	**Contact, 0-10VDC,**	High Static	Low Static	VFD in Bypass
UD #5	**0-20MA**	Economizer Lockout	Cooling Lockout	Heating Lockout
UD #6		Supply Fan Status	Compressor Fault	Condensate Overflow
UD #7		Duct Static Pressure or Airflow Switch		
UD #8		Filter Static Pressure or Dirty Filter Switch #1		
UD #9		Outside Air Temperature (AiSE Only)		
UD #10		Condenser Water Temperature		
UD #11		Entering Air Temperature or Return Air Temperature (AiSE)		
UD #12		Supply Air Temperature		
OUTPUTS				
Point	**Description**			
UO #1	**4-20mA, 0-10Vdc**	Spare		
UO #2		Heating Source Control Signal		
UO #3	**0-10 Vdc**	Economizer Valve (WiSE)/Damper Control Signal (AiSE)		
UO #4		WiSE Bypass Valve Signal		
UO #5		Spare		
UO#6		Supply Fan VFD Control Signal		
DO #1	**120 VAC**	Start Supply Fan		
DO #2	**FORM C**	Start Condenser Pump or Switch Reversing Valve		
DO #3		Field-Lin (MWU or Open Min OA)		
DO #4		Common Alarm		
DO #5		Compressor Call #2		
DO #6		Compressor Call #1		

Options

Code	Description
Base Model Options	
A1-M	Base model CAV, scroll compressors, HP5 board, space temp control / requires thermostat
A2-M	Base model VAV, scroll compressors, MDDC 6126 discharge air control
A3-M	Base model VAV, scroll compressors, MDDC 6126 discharge air control, digital compressor w/suction pressure demand limit lead circuit
A4-M	Base model with VAV, scroll compressors, MDDC 6126 w/expander bd. discharge air control, digital compressor w/suction pressure demand limit lead circuit, Hot gas re-heat, dehumidification control,
Sound options	
B1-M	QB sound package
B2-M	QB sound package / SB sound blanket on compressors
B3-M	QB sound package / SB sound blanket on compressors / FI foil backed insulation
Refrigeration Options	
CO	Cooling only
HO	Heating only
SL	Insulated suction lines
CN	Cupro-nickel coaxial coil
Chassis Options	
RH	Righ hand electrical and water connections
D1	SP / Stainless steel drain pan
SL	Insulated suction lines
TL	Low temperature package / includes SL & WT options
WE	Waterside economizer / check with factory / may require field piping
ED	End discharge
HW	Hot water pre-heat coil only / control valve by "others"
LF	Evaporator low temp frost protection
Filter Options	
FF	Four inch filters
2F	2" filter guides with 2" filters
E1	DF / Dirty filter switch
FS	Source side coaxial flow switch
MDCC Protocol Options	
Protocol 1	BACnet MSTP 9600 or 38.4 or 76.6 Baud rate
Protocol 2	BACnet ethernet 10 base T (additional hardware required)
Protocol 3	BACnet IP (additional hardware required)
Protocol 4	ModBus / RTU or ASCII / non-sequential numbers
Protocol 5	ModBus / RTU or ASCII / with sequential register numbers
Protocol 6	Johnson N2... 9600 Baud
Protocol 7	Serial LonTalk communication / includes SLTA for each unit
Protocol 8	If protocol 2 or 3 is selected, extra hardware is required / this option must be selected
Protocol 9	If protocol 7 is selected, extra hardware is required / this option must be selected
MDDC KP	Mammoth DDC keypad / required 1 minimum per job W/MDDC control

Engineering Specification

General: Furnish and install water source heat pumps as indicated on the plans as listed in the unit schedule. All units must be factory run tested of the completed unit with full water flow. All equipment must be safety agency listed with ETL and shall be certified for capacity and efficiency in accordance with AHRI standard 13256-1.

Unit Construction: The cabinet walls, access doors, roof and floor shall be constructed of 18 gauge interior panels with ¾"-inch 1 1/2 lb. density fiberglass as the interior core. All openings through the casing shall be grommeted.

All units shall include dual sloped stainless steel drain pans. All units shall be externally trapped. Units shall be capable of being provided with a top or same side as return discharge opening.

Filters shall be side loaded from the same side as the electrical access door. A 2-inch MERV 7 pleated media panel filter is standard. Options include a 2-inch or 4-inch pleated filter with a MERV 13 rating.

Fan Section: The fan section shall consist of the fan, motor, and discharge outlet. Airside components shall be separated from the compressor section to limit noise transmission from the compressor.

Units shall include direct drive, dynamically balanced, airfoil-shaped blade plug fans. Motors are premium efficiency totally enclosed with sealed and locked bearings and TEAO rated frame designed for quiet operation. Motors are designed for use with VFD's and include bearing protection rings to reduce bearing frosting, pitting and failure caused by VFD induced voltages on the motor shaft.

Standard vertical models shall be provided with supply air discharge from the top of the unit. Horizontal models shall be of straight through design or optional end discharge.

Refrigeration System: Each unit shall have two separate circuits complete with scroll compressor, coaxial water to refrigerant coil, airside direct expansion coil, reversing valve, thermal expansion valve with external equalizer line and is serviceable and adjustable while the unit is in operation.

Units shall be designed for use of R-410A refrigerant. The reversing valve is energized in the cooling mode and is fail-safe to the heating mode. Each circuit is equipped with low and high pressure refrigerant manual reset safety controls, Schrader valves on both the high and low pressure sides and liquid line filter drier. Each refrigerant circuit shall ship fully charged and ready for operation, requiring only connections of water and electrical services. Refrigerant systems shall offer an optional 5-year non-prorated warranty.

Compressors shall be scroll type with thermal overload protection and isolated from unit with neoprene isolators as recommended by the compressor manufacturer. Optional digital scroll compressor on the lead refrigeration circuit shall be capable of modulation from 10 – 100% of its capacity. Compressors shall be mounted in an isolated service compartment that can be accessed without affecting unit operation.

Refrigerant side is rated for 650 PSI. Waterside is rated for 300 PSI. Field piping connections shall be MPT connections and shall be made to each heat exchanger at the top of the unit and incorporate isolation valves and manual drain valves as standard equipment.

Direct expansion airside coils shall be constructed of half-inch rifled copper tubes with lanced aluminum fins mechanically bonded to the tubes and galvanized steel end casings. Coils shall have interlaced circuitry and shall be 3 to 4 rows. Coils shall be factory tested with air at 450 psi under water and shall be rated for 250 psi working pressure.

Economizer coil shall have a minimum of four (4) rows in depth, half-inch diameter tubing, 8 FPI. The coil shall be located upstream from the direct expansion airside coil and shall be factory mounted. The coil shall have factory-installed drain and vent connections extended to permit draining into a watertight condensate pan. The coil shall be factory tested with air at 450 psi under water and shall be rated for 250 psi working pressure. The coil shall have a single or double actuator valve dependant on the size of

the unit. The coil leaving fluid side shall be factory piped to the water-cooled condenser inlet such that the only field piping required shall be from the water supply main to the three-way diverting valve inlet, and from the water-cooled condenser discharge to the water return main.

Hot water coil shall be one row in depth, half-inch diameter tubing, 8 FPI. The coil shall be located upstream from the direct expansion airside coil and shall be factory mounted into the self-contained packaged water-cooled air conditioning unit. The coil shall have factory-installed drain and vent connections extended to permit draining into a watertight condensate pan. The coil shall be factory tested with air at 450 psi under water and shall be rated for 250 psi working pressure.

Steam coil shall be one row in depth, 5/8" diameter tubing, 10 FPI. The coil shall be located upstream from the direct expansion coil and shall be factory mounted into the self-contained packaged water-cooled air conditioning unit. The coil shall have factory installed drain and vent connections extended to permit draining into a watertight condensate pan. The coil shall be factory tested with air at 450 psi under water and shall be rated for 250 psi working pressure.

Refrigerant re-heat coil shall be one row in depth, half-inch diameter tubing, 8 FPI. The coil shall be located downstream from the direct expansion airside coil and shall be factory mounted into the self-contained packaged water-cooled air conditioning unit.

Temperature Control System: Unit shall be equipped with a controller capable of operating in a 100% standalone mode. Optional DDC controller shall be the I/O Flex 6126 and be fully capable of operating in a 100% stand-alone control mode or shall be able to connect to a Building Automation System (BAS) using any of today's four leading protocols: BACnet, Modbus, N2, or Lontalk. Minimum open protocol points**:** Operation mode, supply air temperature, entering air temperature, supply air temperature set point, duct static, and duct static set point. The system shall be prewired in such a manner that remote start-stop can be accomplished through the BMS System via contact closure.

Electrical: Units shall be complete with an ETL listed electrical control panel, which includes contactors, motor protectors, relays, and transformers. A non-fused disconnect shall be located on the control panel for connecting building power to the unit. All branch circuits shall be individually protected and shall include a low-voltage control circuit transformer. Motors and compressors shall be protected on all phases. Units shall be provided with optional phase and brown out protection that shuts down all motors in the unit if the electrical phases are more that 10% out of balance on voltage, the voltage is more that 10% under design voltage or on phase reversal.

Application and Design Considerations

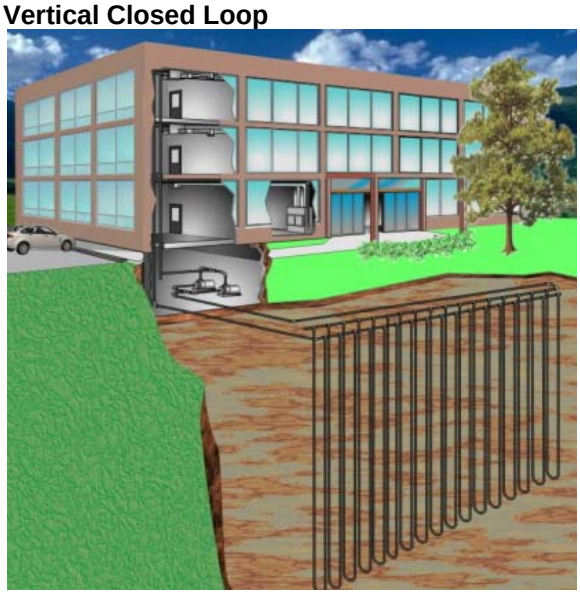
Boiler/Tower

Also called a standard, conventional or water loop system, a boiler/tower system uses a two pipe water circulating system to add, remove, or transfer rejected heat to other units throughout the building. The system is not geothermal – it typically uses a natural gas or electric boiler located in a mechanical equipment room to provide heat. A cooling tower is used to dissipate waste heat. This system is typically the lowest cost of the loop options. (ARI 320 / ISO 13256-1)

Horizontal Closed Loop

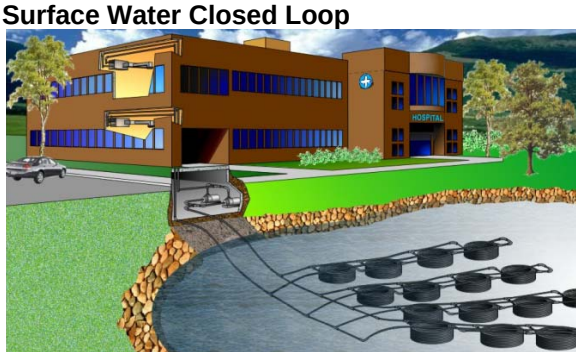
Horizontal loop geothermal systems use a series of parallel loops are installed in trenches approximately 5 feet below the ground. The piping may be installed using a “four-pipe” or “six-pipe” design. This system is well suited for applications where physical space is available – between 1,500 and 2,000 square feet/ton of cooling is required – or where bore drilling is prohibitive. (ARI 330 / ISO 13256-1)

Vertical Closed Loop



Vertical loop geothermal systems are ideal for projects with minimum available space. Vertical bore holes are drilled150 to 400 feet deep depending on building design considerations. A plastic polyethylene supply/return pipe is inserted into the holes and wells are connected in a parallel reverse return arrangement to allow water to circulate evenly throughout the bore field. Loop temperatures range from 37°F to 95°F. (ARI 330 / ISO 13256-1)

Surface Water Closed Loop



Surface water closed loop geothermal systems use a loop that is directly installed in a lake or pond near the building, making it an extremely efficient and cost effective. Bundled polyethylene coils are used in a reverse return design. Care must be taken to ensure the body of water will meet building loads. Debris problems from flooding or the need for public access may limit the use of this application. (ARI 330 / ISO 13256-1)

Open Loop Well Water

Open loop systems use ground water to remove or add heat to the water loop and are typically used in regions where ground water is plentiful. Water is typically extracted and discharged back to the aquifer. The major benefit is the constant well water temperature, approximately 50°F, which provides very efficient operation at a relatively low installed cost. An intermediate heat exchanger is added in many cases to isolate the loop serving the units from the well water to reduce maintenance costs. This system usually has supply wells and return wells. Some states have requirements on the depths of return wells that must be approved by the U.S. Environmental Protection Agency. Water should be tested and strainers are typically required as poor water quality can increase heat exchanger scaling and suspended solids can lead to heat exchanger erosion. (ARI 325 / ISO 13256-1)

Horizontal Unit Design Considerations

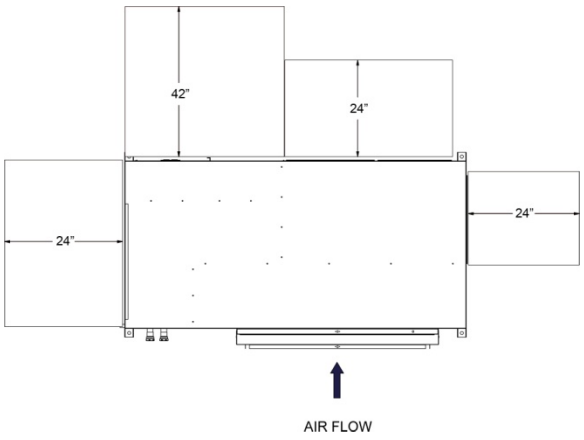
Unit Location and Installation: Units should be positioned to provide enough clearance to perform routine maintenance or service. Units should be located for ease of filter and access panel removal. Allow the minimum clearances on each side of the unit for routine maintenance and service. Leave sufficient space on one side of the filter rack to allow filter removal.

Each horizontal unit is suspended from the ceiling by four threaded rods (provided by others) fastened to the unit by a factory provided mounting bracket and rubber isolator. The unit should be located below building structural members to assure it is securely mounted in a level position.

Do not locate units above noise-sensitive areas such as offices, meeting rooms, classrooms and other spaces. If possible, avoid locations above areas where there is considerable traffic as service time may be limited during occupied hours. Placing units above hallways is a typical location in schools to avoid potential noise problems with supply and return air ducted to adjacent classrooms. Such locations may limit service time during school hours.

Clearance Requirements: The diagram below shows minimum suggested clearances. Any additional clearances would be beneficial, but not always necessary. Units need to be accessed from three sides; two panels for the blower, two electrical access doors and one for the compressor compartment. The requirements on any specific unit may increase or be reduced depending on several factors such as maintenance requirements and mechanical or electrical installation codes. Horizontal unit filters are removed from the bottom with an option for side removal. If return air is not ducted, enough clearance will be required to provide for adequate airflow.

Horizontal unit clearances



Piping: The unit is usually attached to the supply/return piping using a “reverse return” arrangement. This includes a flow control device to assure proper water flow for each zone. A flexible high-pressure hose should be used to connect the system piping to the unit to simplify installation and provide sound attenuation. One end of the hose has a swivel fitting for removal of the unit for servicing. The

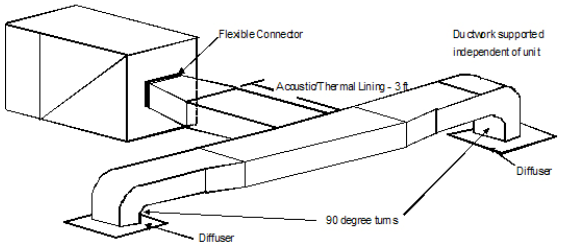
system piping design should include supply and return shutoff valves to facilitate the removal of one unit for servicing or replacement while the system continues to operate. The return valve may be used for water flow balancing. It will typically have a memory to allow it to adjust to the proper position for the required flow upon reopening. Fixed flow valves can be used to replace the memory-type valve. Providing pressure and temperature ports allows measurement of these values during operation.

Condensate Drain Piping: Condensate piping can be PVC, steel or copper. PVC typically eliminates the need to insulate the pipe to prevent sweating. A 1-¼ inch O.D. factory supplied copper condensate connection is located outside the cabinet, allowing connection of the condensate hose. The condensate piping must be externally trapped. Piping must be pitched ¼ inch per foot away from the unit. Provide a vent after the trap to allow condensate to drain away from the unit. The vent also provides a clean out should the trap become obstructed. Refer to local codes for the correct condensate piping to drains.

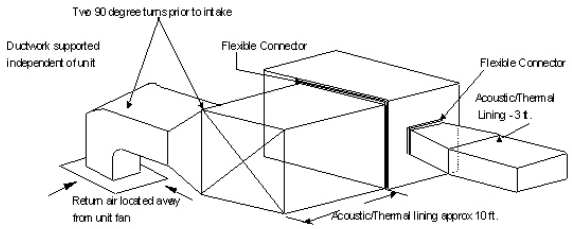
Ductwork and Sound Attenuation: Ceiling mounted heat pumps virtually always have discharge ductwork attached to the unit. A collar is provided on the discharge to facilitate attachment of the ductwork. Good design practice requires a flexible connector between the collar and transition to the main duct system. This connector attenuates sound from the unit; especially fan sound levels, and simplifies unit removal. The filter section is supplied with a bracket to accommodate return ductwork. A flexible connector should also be used to connect the unit to the return ducting to attenuate unit sound levels and allow ease of unit removal. Ducted returns are typically used on acoustically sensitive applications. Return ducting should be located at least 12 inches away from the coil to assure even distribution of return air across the coil. For applications that are especially acoustically sensitive, consider an acoustic kit that includes additional unit lining and dampening material beneath the entire unit.

Ductwork should be lined with an acoustic/ thermal insulation a minimum of ½ inch. For sensitive installations, use 1-inch insulation a minimum of five to 10 feet prior to each diffuser. Changes in duct direction such as tees, elbows, and internal devices such as dampers that create airflow turbulence can increase acoustic problems. Minimize these items where possible. Placing a straight run of duct about the width between fittings will decrease turbulence and associated noise. Diffusers located in the bottom of a trunk duct pose acoustical problems. Volume control dampers should be placed well upstream of any air outlets. .

ASHRAE and SMACNA Suggested Supply Air Ducting



ASHRAE and SMACNA Suggested Return Air Ducting



Applications that have a single duct discharge, such as hotels, should limit the velocity to a maximum of 600 fpm. These applications have a short run of discharge duct that must be fully lined with an elbow without turning vanes. Return air grilles should be located low on the sidewall and route up to the ceiling plenum. An attenuator placed at the return opening will provide added acoustical protection.

Vertical Unit Design Considerations

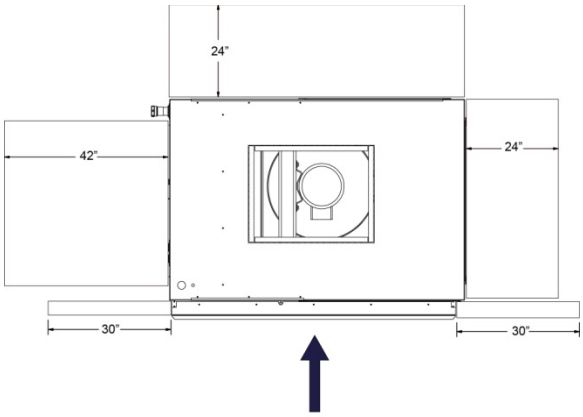
Unit Location and Installation: Units are intended for installation in a small mechanical room or closet. The unit design minimizes sound levels to allow installation adjacent to occupied spaces. The unit is typically placed in a corner of the mechanical room or closet. The return is non-ducted and located ninety degrees to the closet door with access panels facing the door as shown in the drawings below. For application flexibility, Mammoth provides arrangements with the electrical panel, low and control voltage

connections located on either side of the when facing the return air connection.

Locate units for ease of filter and access panel removal. The closet door should extend past the end of the unit to allow for easy filter removal. A field supplied line voltage disconnect is required for branch circuit protection.

Service Clearances: The diagram below shows minimum suggested clearances. Any additional clearances would be beneficial, but not always necessary. Units need to be accessed from three sides: two panels for the blower, two electrical access doors and one for the compressor compartment. The requirements on any specific unit may increase or be reduced depending on several factors such as maintenance requirements and mechanical or electrical installation codes. Vertical unit filters slide out of the left or right side (quad-circuit units must be removed from each side). If return air is not ducted, enough clearance will be required to provide for adequate airflow.

Vertical unit clearances



Piping: The supply and return water connections are located just above the filter to minimize the required size of the space required for units. A high pressure, flexible hose is available to connect the unit to the system hard piping to dampen the unit operating sound level. One end of the hose has a swivel fitting to allow easy removal of the unit. A deluxe hose kit is available to eliminate the need for final water balance. Provide supply and return shutoff valves to allow removal of a single unit without the need to shut down the entire system. Pressure/temperature ports should be provided to allow service personnel to monitor water flow and unit operating pressures.

Condensate Drain Piping: Condensate piping can be PVC, steel or copper. PVC typically eliminates the need to insulate the pipe to prevent sweating. A 1-¼ inch O.D. factory supplied copper condensate connection is located outside the cabinet, allowing connection of the condensate hose. The condensate piping must be externally trapped. Piping must be pitched ¼ inch per foot away from the unit. Provide a vent after the trap to allow condensate to drain away from the unit. The vent also provides a clean out should the trap become obstructed. Refer to local codes for the correct condensate piping to drains.

Ductwork and Sound Attenuation: Ductwork should conform to industry standards as listed in the ASHRAE Systems Guide.

Discharge ductwork should include a non-insulated transition from the unit connection to a flexible connector at the full duct size, a short run of duct and an elbow internally lined with insulation but without turning vanes. The main duct tees into branch circuits with discharge diffusers.

Return air is typically brought in through a grille in the closet door. The door should be located ninety degrees from the unit return to eliminate any “line of sight”. Return air can be brought in through the grille and ducted to the unit with internally lined acoustic insulation to a flexible connector at the unit. Sound attenuation is particularly critical at the unit return.

Return ducting is facilitated through use of a filter rack that is designed to accept return air ducting. Return ducting will likely increase the required width of the closet.

Nominal Capacity – Horizontal Units*

Cooling only and ISO 13256-1 Water Loop (Boiler/Tower Systems)

Size	CFM	GPM	Model HHM						
			Cooling				Heating		
			Q_t	Q_s	kW	EER	Q_t	kW	COP
84	2800	22.0	83,800	69,000	5.7	14.8	96,200	5.8	4.8
96	3200	26.0	96,800	78,800	6.5	15.0	113,100	7.0	4.7
120	4000	32.0	124,400	99,900	8.5	14.6	141,600	9.2	4.5
144	4400	35.0	139,800	111,300	9.8	14.3	158,200	10.5	4.4

Notes:
Shaded are indicates cooling only and water loop units. Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) entering air temperature and 86°F (30°C) entering water temperature. Heating capacity is based on 68°F (20°C) entering air temperature and 68°F (20°C) entering water temperature. GPM = Gallons Per Minute, EDB = Entering Dry Bulb (ºF), EWB = Entering Wet Bulb (ºF), EWT = Entering Water Temperature (ºF), Q_t = Capacity Total (BTUH), Q_s = Capacity Sensible (BTUH), EER = Energy Efficiency Ratio, COP = Coefficient of Performance

ISO 13256-1 Ground Loop (Geothermal)

Size	CFM	GPM	Model HHM						
			Cooling				Heating		
			Q_t	Q_s	kW	EER	Q_t	kW	COP
84	2800	22.0	83,800	69,000	5.7	14.8	96,200	5.8	4.8
96	3200	26.0	96,800	78,800	6.5	15.0	113,100	7.0	4.7
120	4000	32.0	124,400	99,900	8.5	14.6	141,600	9.2	4.5
144	4400	35.0	139,800	111,300	9.8	14.3	158,200	10.5	4.4

Notes:
Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) entering air temperature and 77°F (25°C) entering water temperature. Heating capacity is based on 68°F (20°C) entering air temperature and 32°F (0°C) entering water temperature. GPM = Gallons Per Minute, EDB = Entering Dry Bulb (ºF), EWB = Entering Wet Bulb (ºF), EWT = Entering Water Temperature (ºF), Q_t = Capacity Total (BTUH), Q_s = Capacity Sensible (BTUH), EER = Energy Efficiency Ratio, COP = Coefficient of Performance

*** Please refer to Mammoth's WSHP selection software for accurate performance at the precise entering conditions of your project. The capacity data above is provided using minimum and maximum entering water temperatures as an example only**.

Nominal Capacity – Vertical Units*

Cooling only and ISO 13256-1 Water Loop (Boiler/Tower Systems)

Size	CFM	GPM	Model VHM						
			Cooling				Heating		
084	2800	22	83,900	69,000	5.7	14.8	96,200	5.8	4.8
096	3200	26	96,800	78,800	6.5	15.0	113,100	7.0	4.7
120	4000	32	124,900	100,200	8.5	14.7	141,600	9.2	4.5
144	4400	35	138,800	110,300	9.8	14.2	157,400	10.7	4.3
168	5600	44	167,800	138,000	11.4	14.8	192,300	11.6	4.8
192	6400	52	193,500	157,500	12.9	15.0	226,200	14.1	4.7
240	8000	64	249,900	200,300	17.0	14.7	283,300	18.5	4.5
288	8800	70	277,600	220,600	19.6	14.2	314,900	21.4	4.3

Notes:
Shaded are indicates cooling only and water loop units. Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) entering air temperature and 86°F (30°C) entering water temperature. Heating capacity is based on 68°F (20°C) entering air temperature and 68°F (20°C) entering water temperature. GPM = Gallons Per Minute, EDB = Entering Dry Bulb (ºF), EWB = Entering Wet Bulb (ºF), EWT = Entering Water Temperature (ºF), Q_t = Capacity Total (BTUH), Q_s = Capacity Sensible (BTUH), EER = Energy Efficiency Ratio, COP = Coefficient of Performance

ISO 13256-1 Ground Loop (Geothermal)

Size	CFM	GPM	Model VLM						
			Cooling				Heating		
084	2800	22	82,900	66,900	5.70	14.5	55,800	5.28	3.1
096	3200	26	95,700	76,800	6.49	14.7	65,600	6.39	3.0
120	4000	32	123,500	97,600	8.55	14.4	82,100	8.39	2.9
144	4400	35	137,200	108,000	9.83	14.0	91,300	9.71	2.8
168	5600	44	165,800	133,800	11.42	14.5	111,500	10.56	3.1
192	6400	52	191,300	153,600	12.99	14.7	131,200	12.80	3.0
240	8000	64	247,000	195,300	17.09	14.4	164,300	16.78	2.9
288	8800	70	274,400	215,900	19.66	14.0	182,600	19.42	2.8

Notes:
Cooling capacity is based on 80.6°F db, 66.2°F wb (27/19°C) entering air temperature and 77°F (25°C) entering water temperature. Heating capacity is based on 68°F (20°C) entering air temperature and 32°F (0°C) entering water temperature. GPM = Gallons Per Minute, EDB = Entering Dry Bulb (ºF), EWB = Entering Wet Bulb (ºF), EWT = Entering Water Temperature (ºF), Q_t = Capacity Total (BTUH), Q_s = Capacity Sensible (BTUH), EER = Energy Efficiency Ratio, COP = Coefficient of Performance

*** Please refer to Mammoth's WSHP selection software for accurate performance at the precise entering conditions of your project. The capacity data above is provided using minimum and maximum entering water temperatures as an example only**.

Application Limits

Application Limits – Water Temperature (°F)

	Standard Range		Low Temperature Geothermal	
	COOLING	HEATING	COOLING	HEATING
MINIMUM WATER TEMPERATURE	50^0F	50^0F	30^0F	25^0F
MAXIMUM WATER TEMPERATURE	100^0F	90^0F	110^0F	90^0F

Application Limits – Air Temperature (°F)

	Standard Range		Low Temperature Geothermal	
	COOLING	HEATING	COOLING	HEATING
MINIMUM AMBIENT AIR TEMPERATURE	50^0F	50^0F	50^0F	50^0F
MAXIMUM AMBIENT AIR TEMPERATURE	110^0F	110^0F	110^0F	110^0F
MINIMUM ENTERING AIR TEMPERATURE	65^0F	60^0F	65^0F	60^0F
MAXIMUM ENTERING AIR TEMPERATURE	100^0F	90^0F	100^0F	90^0F

Submittal Data – Horizontal Sizes 084 to 144, Right Hand

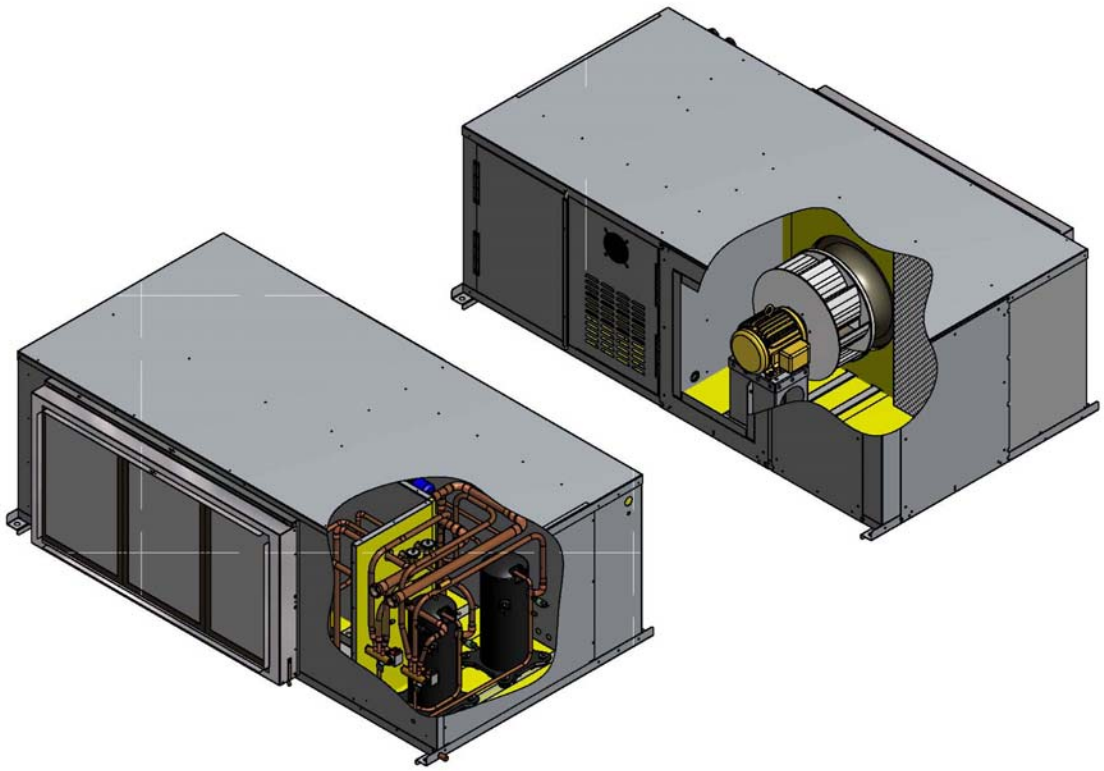
Mammoth WATER SOURCE HEAT PUMP	HORIZONTAL M VINTAGE TWIN CIRCUIT	SUBMITTAL PACKAGE 084H_144H_M_RH RIGHT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

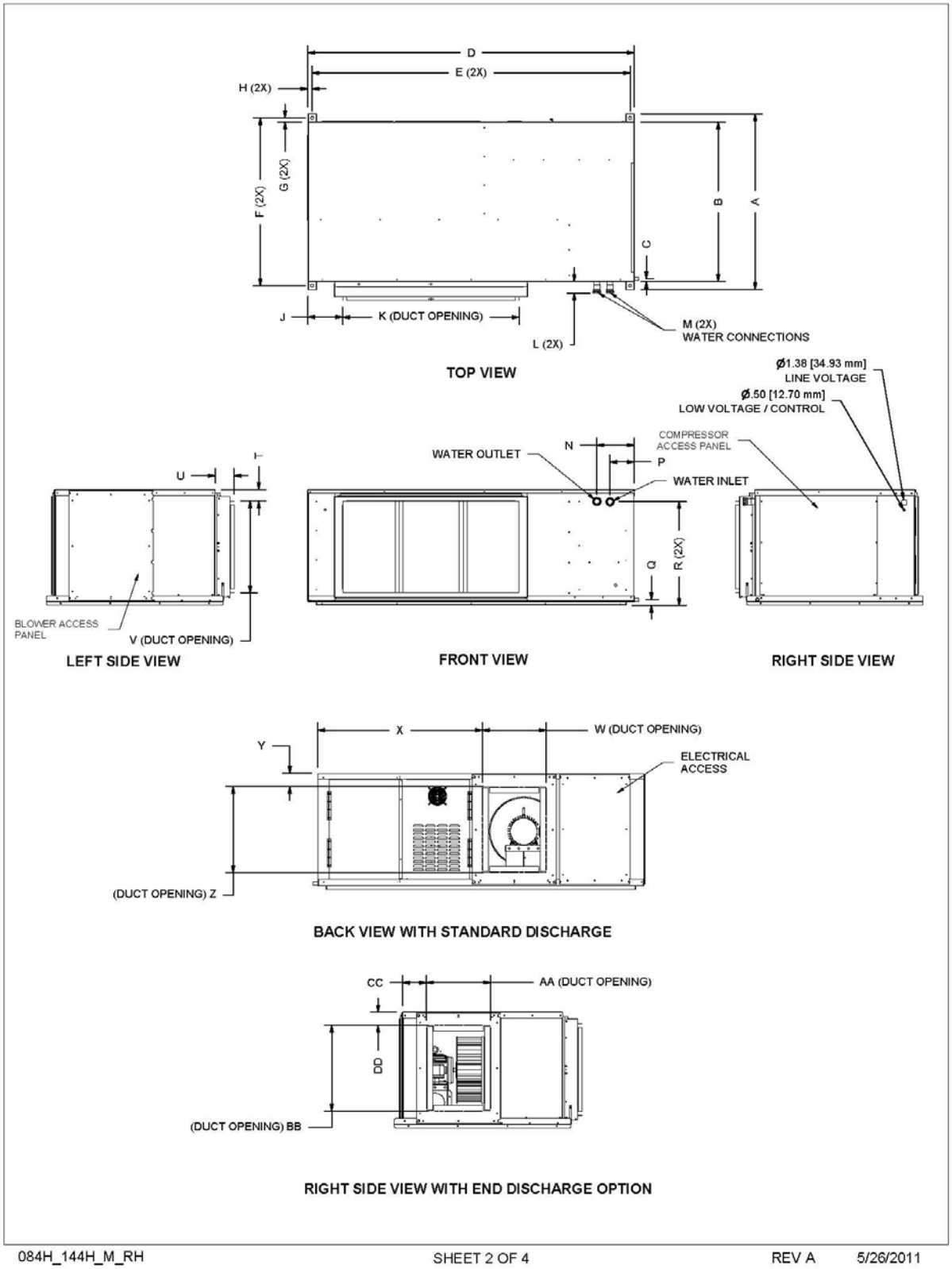
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Right hand water connections and electrical box location viewed looking into the return air duct connection.

084H_144H_M_RH SHEET 1 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Right Hand



Submittal Data – Horizontal Sizes 084 to 144, Right Hand

DIMENSION INCHES [CM]	UNIT SIZE			
	084	096	120	144
A	44 [111]	44 [111]	44 [111]	44 [111]
B	40 [101]	40 [101]	40 [101]	40 [101]
C	.6 [2]	.6 [2]	.6 [2]	.6 [2]
D	81.5 [207]	81.5 [207]	81.5 [207]	81.5 [207]
E	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]
F	42 [106.7]	42 [106.7]	42 [106.7]	42 [106.7]
G	1 [2.5]	1 [2.5]	1 [2.5]	1 [2.5]
H	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]
J	8.8 [22.4]	8.8 [22.4]	6.8 [17.5]	4.6 [11.6]
K	44 [111.8]	44 [111.8]	50 [127]	56 [142.2]
L	3 [7.6]	3 [7.6]	3 [7.6]	3 [7.6]
M	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
N	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]
P	6 [15.2]	6 [15.2]	6 [15.2]	6 [15.2]
Q	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]
R	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]
S	29 [73.7]	29 [73.7]	29 [73.7]	29 [73.7]
T	2.9 [7.3]	2.9 [7.3]	1.8 [4.7]	1.8 [4.7]
U	4.8 [12]	4.8 [12]	4.8 [12]	4.8 [12]
V	23 [58.4]	23 [58.4]	24 [61]	24 [61]
W	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
X	25.6 [65]	25.6 [65]	25.6 [65]	25.6 [65]
Y	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]
Z	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
AA	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
BB	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
CC	6.8 [17.1]	6.8 [17.1]	6.8 [17.1]	6.8 [17.1]
DD	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]

WEIGHTS LBS [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	970 [440]	970 [440]	1,150 [522]	1,170 [531]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	16 x 25 x 1 (3)	16 x 25 x 1 (3)	18-1/4 x 27-1/2 x 1 (3)	18-1/4 x 27-1/2 x 1 (1) 20 x 27-1/5 x 1 (2)

048H_144H_M_RH SHEET 3 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Right Hand

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084H_144H_M_RH SHEET 4 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Right Hand with Waterside Economizer Coil

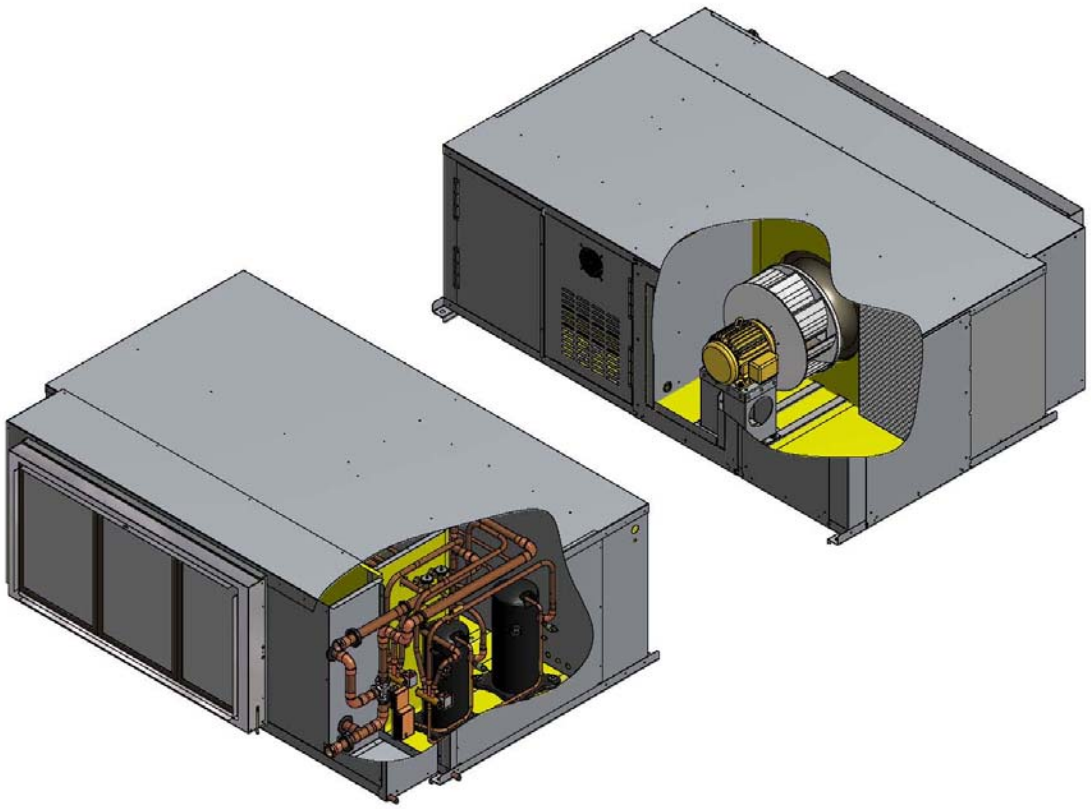
Mammoth WATER SOURCE HEAT PUMP	HORIZONTAL M VINTAGE TWIN CIRCUIT w / WATER SIDE ECONOMIZER	SUBMITTAL PACKAGE 084H_144H_M_RH_WSE RIGHT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

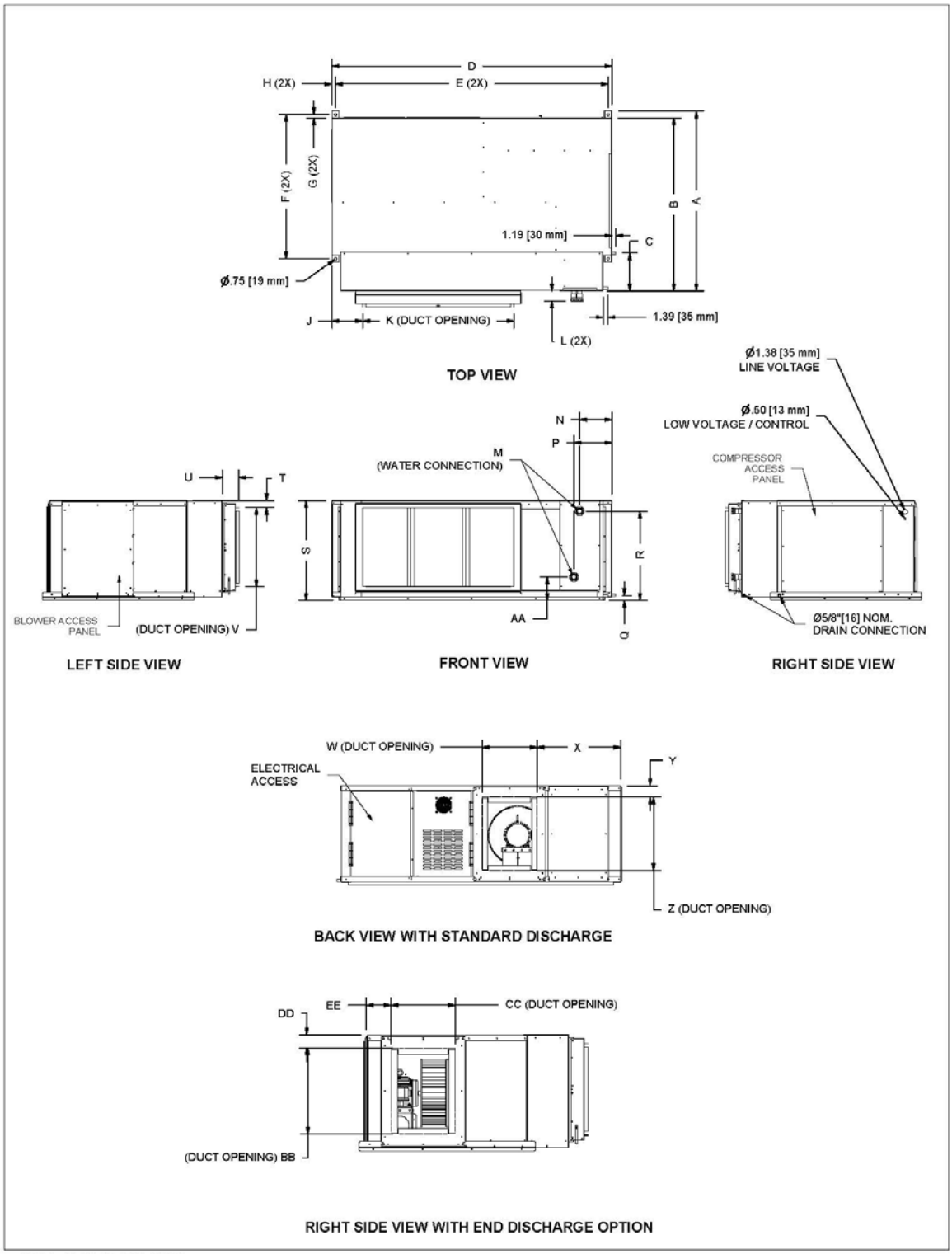
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Right hand water connections and electrical box location viewed looking into the return air duct connection.

084H_144H_M_RH_WSE SHEET 1 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Right Hand with Waterside Economizer Coil



Submittal Data – Horizontal Sizes 084 to 144, Right Hand with Waterside Economizer Coil

DIMENSION INCHES [CM]	UNIT SIZE			
	084	096	120	144
A	52.3 [132.7]	52.3 [132.7]	52.3 [132.7]	52.3 [132.7]
B	51.3 [130]	51.3 [130]	51.3 [130]	51.3 [130]
C	11 [27.9]	11 [27.9]	11 [27.9]	11 [27.9]
D	81.5 [207]	81.5 [207]	81.5 [207]	81.5 [207]
E	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]
F	42 [106.7]	42 [106.7]	42 [106.7]	42 [106.7]
G	1 [2.5]	1 [2.5]	1 [2.5]	1 [2.5]
H	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]
J	8.8 [22.4]	8.8 [22.4]	9.2 [23.4]	5.5 [14]
K	44 [111.8]	44 [111.8]	50 [127]	56 [142.2]
L	3 [7.6]	3 [7.6]	3 [7.6]	3 [7.6]
M	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
N	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]
P	11 [27.9]	11 [27.9]	11 [27.9]	11 [27.9]
Q	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]
R	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]
S	29 [73.7]	29 [73.7]	29 [73.7]	29 [73.7]
T	4.7 [11.9]	2.3 [5.8]	1.8 [4.6]	1.8 [4.6]
U	4.7 [11.9]	4.3 [10.9]	5 [12.7]	5 [12.7]
V	23 [58.4]	23 [58.4]	23 [58.4]	23 [58.4]
W	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
X	25.6 [65]	25.6 [65]	25.6 [65]	25.6 [65]
Y	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]
Z	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
AA	6.8 [17.2]	6.8 [17.2]	6.8 [17.2]	6.8 [17.2]
BB	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
CC	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
DD	3.2 [8.1]	3.2 [8.1]	3.2 [8.1]	3.2 [8.1]

WEIGHTS LBS [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	1030 [467]	1230 [556]	1300 [590]	1320 [600]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	16 x 25 x 1 (3)	16 x 25 x 1 (3)	18-1/4 x 27-1/2 x 1 (3)	18-1/4 x 27-1/2 x 1 (1) 20 x 27-1/5 x 1 (2)

048H_144H_M_RH_WSE SHEET 3 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Right Hand with Waterside Economizer Coil

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084H_144H_M_RH_WSE SHEET 4 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand

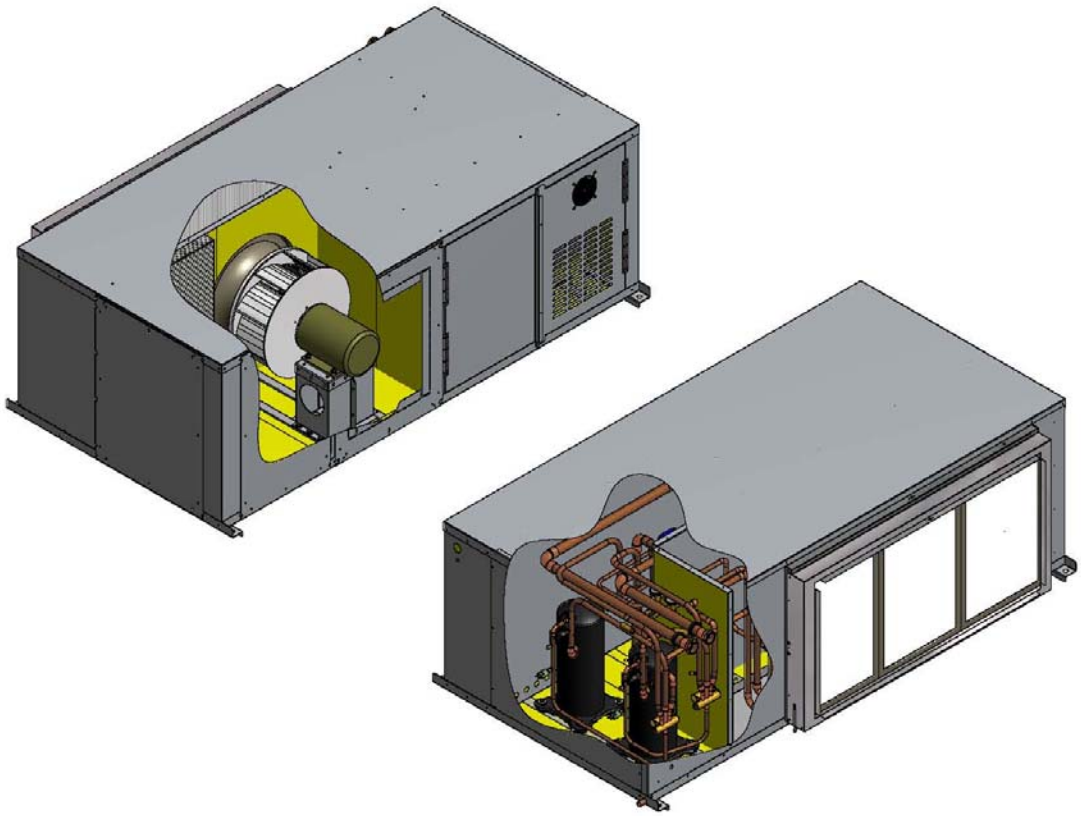
Mammoth WATER SOURCE HEAT PUMP	HORIZONTAL M VINTAGE TWIN CIRCUIT	SUBMITTAL PACKAGE 084H_144H_M_LH LEFT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

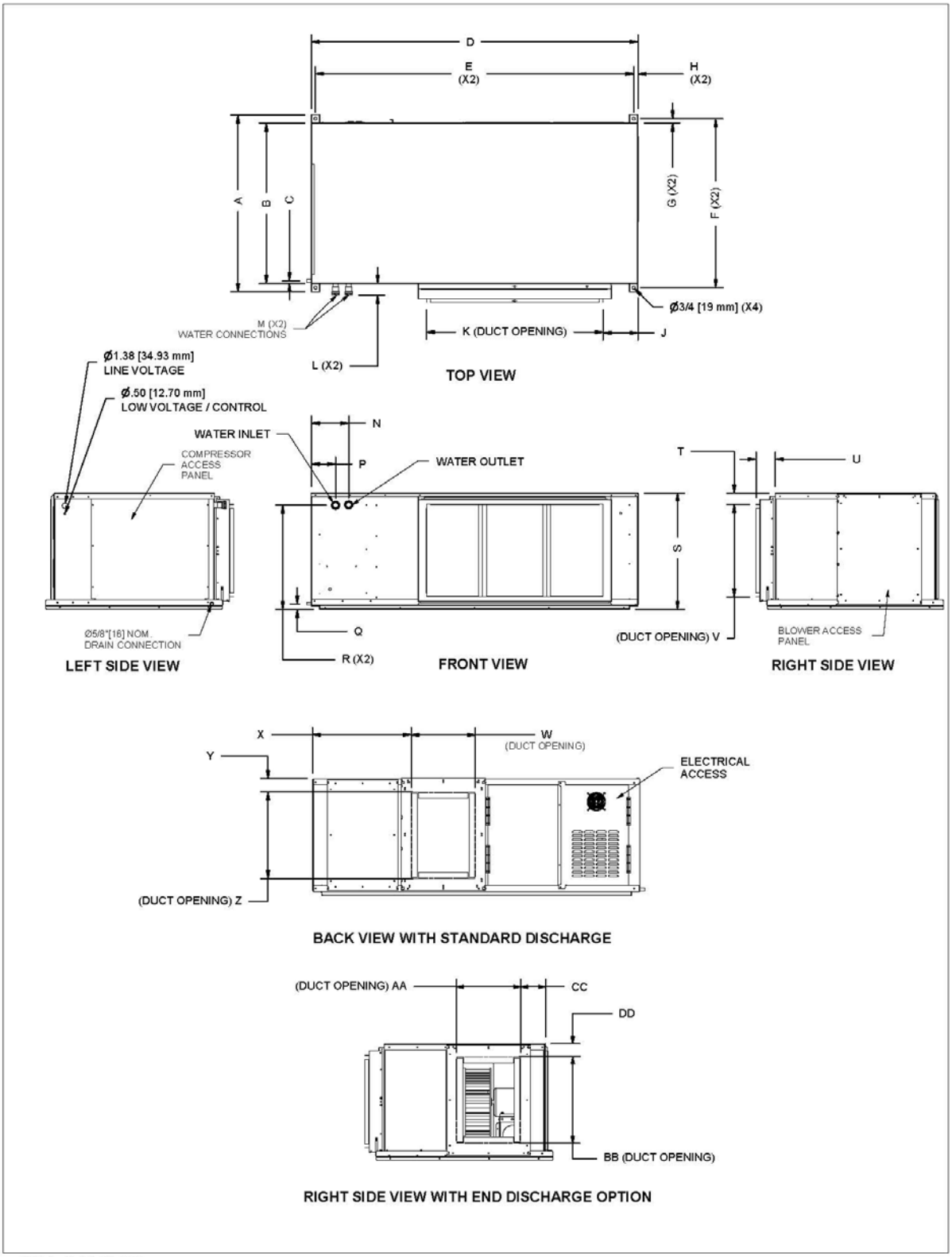
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Left hand water connections and electrical box location viewed looking into the return air duct connection.

084H_144H_M_LH SHEET 1 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand



Submittal Data – Horizontal Sizes 084 to 144, Left Hand

DIMENSION INCHES [CM]	UNIT SIZE			
	084	096	120	144
A	44 [111]	44 [111]	44 [111]	44 [111]
B	40 [101]	40 [101]	40 [101]	40 [101]
C	.6 [2]	.6 [2]	.6 [2]	.6 [2]
D	81.5 [207]	81.5 [207]	81.5 [207]	81.5 [207]
E	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]
F	42 [106.7]	42 [106.7]	42 [106.7]	42 [106.7]
G	1 [2.5]	1 [2.5]	1 [2.5]	1 [2.5]
H	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]
J	8.8 [22.4]	8.8 [22.4]	6.8 [17.5]	4.6 [11.6]
K	44 [111.8]	44 [111.8]	50 [127]	56 [142.2]
L	3 [7.6]	3 [7.6]	3 [7.6]	3 [7.6]
M	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
N	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]
P	6 [15.2]	6 [15.2]	6 [15.2]	6 [15.2]
Q	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]
R	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]
S	29 [73.7]	29 [73.7]	29 [73.7]	29 [73.7]
T	2.9 [7.3]	2.9 [7.3]	1.8 [4.7]	1.8 [4.7]
U	4.8 [12]	4.8 [12]	4.8 [12]	4.8 [12]
V	23 [58.4]	23 [58.4]	24 [61]	24 [61]
W	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
X	25.6 [65]	25.6 [65]	25.6 [65]	25.6 [65]
Y	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]
Z	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
AA	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
BB	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
CC	6.8 [17.1]	6.8 [17.1]	6.8 [17.1]	6.8 [17.1]
DD	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]

WEIGHTS LBS [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	970 [440]	970 [440]	1,150 [522]	1,170 [531]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	16 x 25 x 1 (3)	16 x 25 x 1 (3)	18-1/4 x 27-1/2 x 1 (3)	18-1/4 x 27-1/2 x 1 (1) 20 x 27-1/5 x 1 (2)

048H_144H_M_LH SHEET 3 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084H_144H_M_LH SHEET 4 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand with Waterside Economizer Coil

Mammoth WATER SOURCE HEAT PUMP	HORIZONTAL M VINTAGE TWIN CIRCUIT w / WATER SIDE ECONOMIZER	SUBMITTAL PACKAGE 084H_144H_M_LH_WSE LEFT HAND

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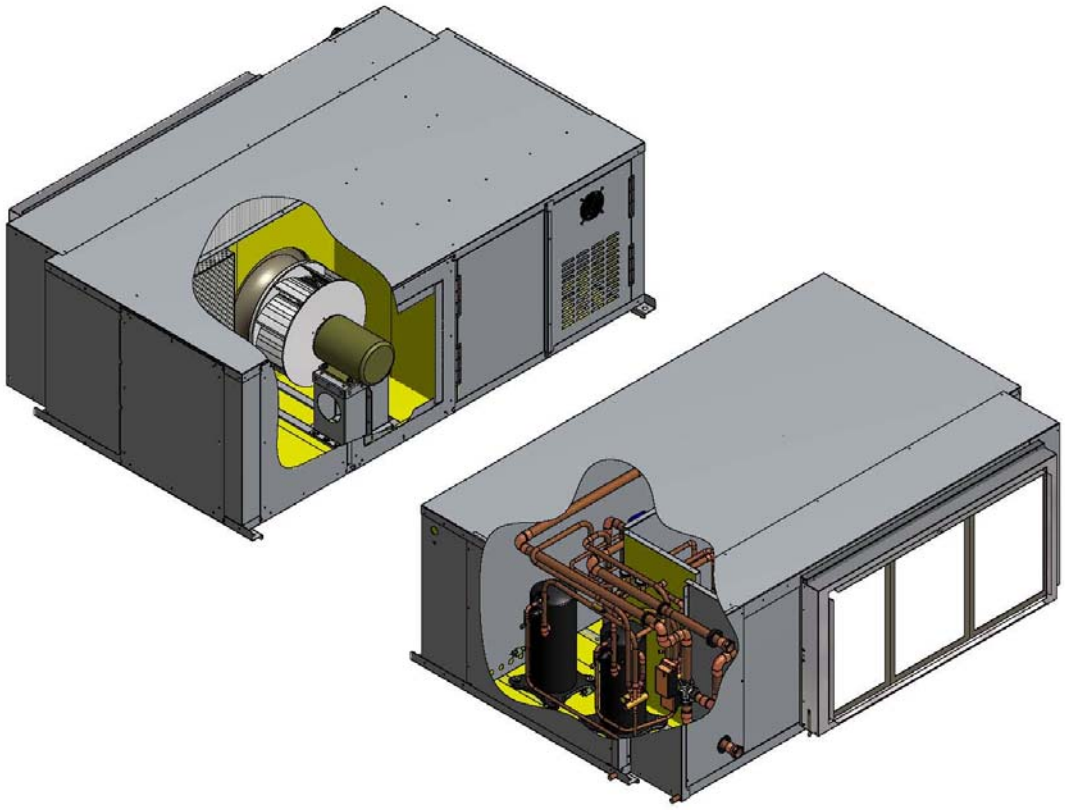
General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

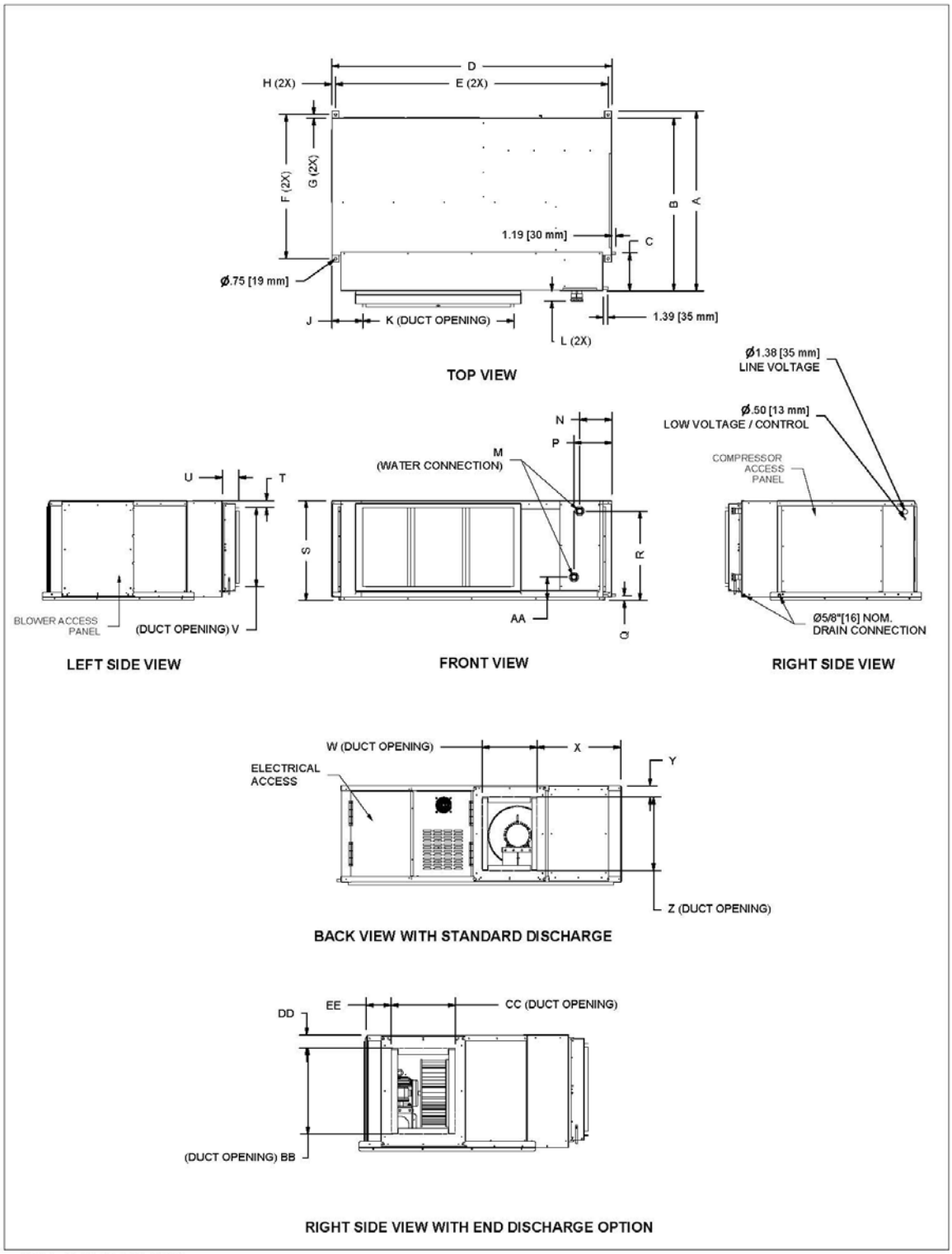
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Left hand water connections and electrical box location viewed looking into the return air duct connection.

084H_144H_M_LH_WSE SHEET 1 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand with Waterside Economizer Coil



Submittal Data – Horizontal Sizes 084 to 144, Left Hand with Waterside Economizer Coil

DIMENSION INCHES [CM]	UNIT SIZE			
	084	096	120	144
A	52.3 [132.7]	52.3 [132.7]	52.3 [132.7]	52.3 [132.7]
B	51.3 [130]	51.3 [130]	51.3 [130]	51.3 [130]
C	11 [27.9]	11 [27.9]	11 [27.9]	11 [27.9]
D	81.5 [207]	81.5 [207]	81.5 [207]	81.5 [207]
E	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]	79.4 [201.6]
F	42 [106.7]	42 [106.7]	42 [106.7]	42 [106.7]
G	1 [2.5]	1 [2.5]	1 [2.5]	1 [2.5]
H	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]	1.1 [2.8]
J	8.8 [22.4]	8.8 [22.4]	9.2 [23.4]	5.5 [14]
K	44 [111.8]	44 [111.8]	50 [127]	56 [142.2]
L	3 [7.6]	3 [7.6]	3 [7.6]	3 [7.6]
M	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
N	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]	9.4 [23.9]
P	11 [27.9]	11 [27.9]	11 [27.9]	11 [27.9]
Q	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]	1.4 [3.5]
R	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]	25.9 [65.7]
S	29 [73.7]	29 [73.7]	29 [73.7]	29 [73.7]
T	4.7 [11.9]	2.3 [5.8]	1.8 [4.6]	1.8 [4.6]
U	4.7 [11.9]	4.3 [10.9]	5 [12.7]	5 [12.7]
V	23 [58.4]	23 [58.4]	23 [58.4]	23 [58.4]
W	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
X	25.6 [65]	25.6 [65]	25.6 [65]	25.6 [65]
Y	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]	3.3 [8.3]
Z	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
AA	6.8 [17.2]	6.8 [17.2]	6.8 [17.2]	6.8 [17.2]
BB	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]	21.5 [54.6]
CC	16 [40.6]	16 [40.6]	16 [40.6]	16 [40.6]
DD	3.2 [8.1]	3.2 [8.1]	3.2 [8.1]	3.2 [8.1]

WEIGHTS LBS [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	1030 [467]	1230 [556]	1300 [590]	1320 [600]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	16 x 25 x 1 (3)	16 x 25 x 1 (3)	18-1/4 x 27-1/2 x 1 (3)	18-1/4 x 27-1/2 x 1 (1) 20 x 27-1/5 x 1 (2)

048H_144H_M_LH_WSE SHEET 3 OF 4 REV A 5/26/2011

Submittal Data – Horizontal Sizes 084 to 144, Left Hand with Waterside Economizer Coil

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084H_144H_M_LH_WSE SHEET 4 OF 4 REV A 5/26/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand

Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE TWIN CIRCUIT	SUBMITTAL PACKAGE 084V_144V_M_RH RIGHT HAND

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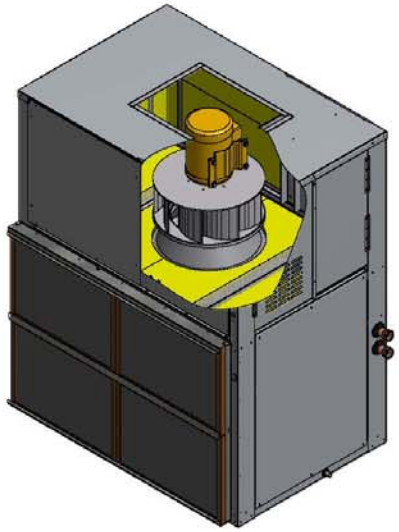
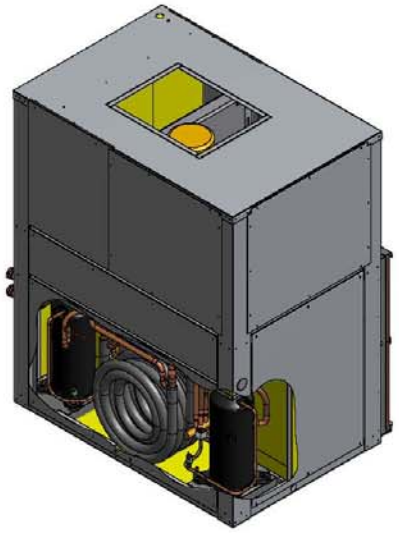
General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.

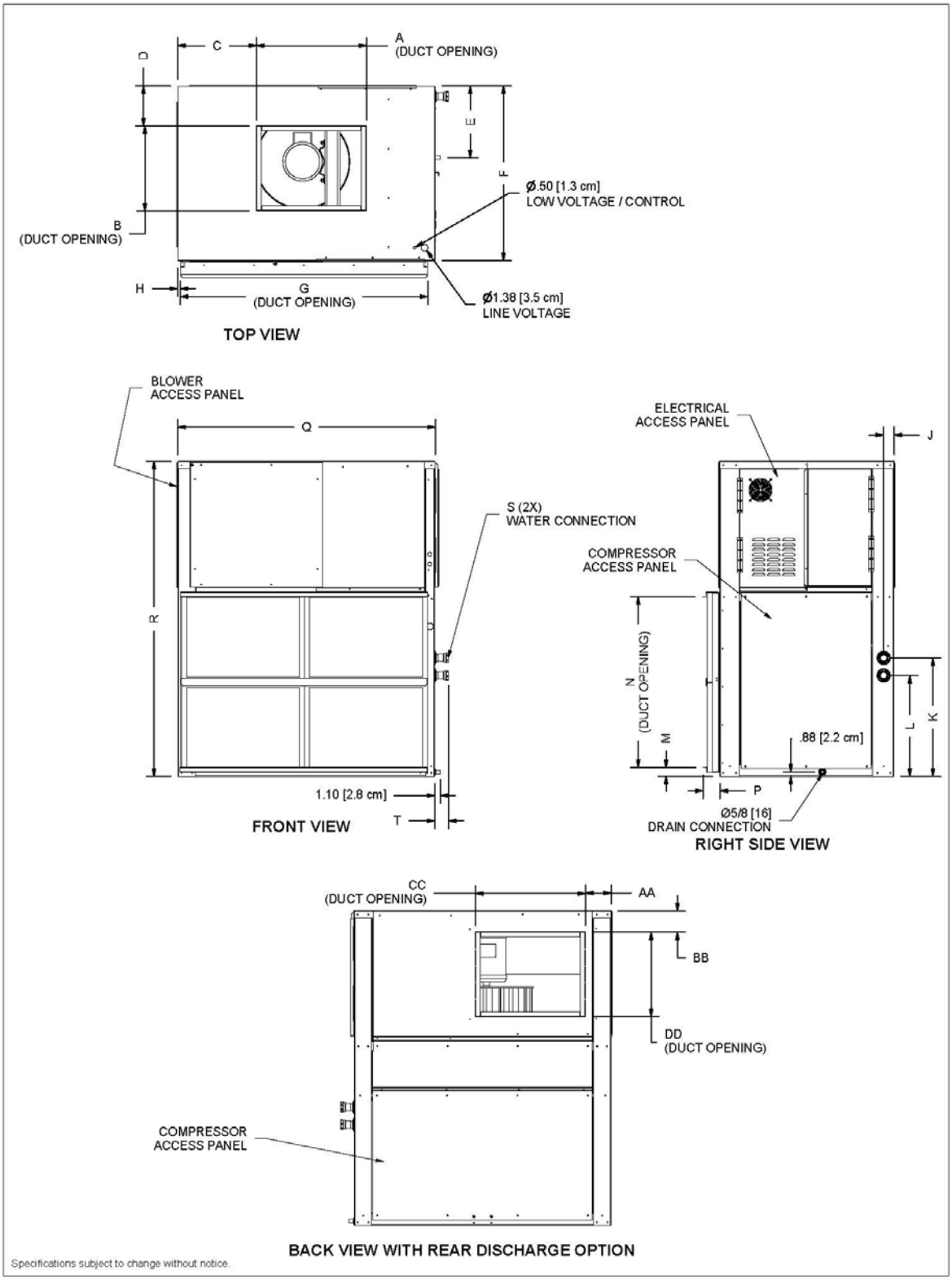




Right hand water connections and electrical box location viewed looking into the return air duct connection.

084V_144V_M_RH SHEET 1 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand



Submittal Data – Vertical Sizes 084 to 144, Right Hand

DIMENSIONS INCH [CM]	UNIT SIZE			
	084	096	120	144
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
C	15.8 [40]	15.8 [40]	15.8 [40]	15.8 [40]
D	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
E	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
F	35 [89]	35 [89]	35 [89]	35 [89]
G	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]
H	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]
J	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
K	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]
L	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]
M	1.8 [4.6]	1.8 [4.6]	1.8 [4.6]	1.8 [4.6]
N	24 [61]	24 [61]	34.2 [86.9]	34.2 [86.9]
P	2.6 [6.6]	2.6 [6.6]	1.8 [4.4]	1.8 [4.4]
Q	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]
R	63 [160]	63 [160]	63 [160]	63 [160]
S	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT
T	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
AA	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]
BB	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	25 X 25 X 1 (2)	16 x 25 x 1 (3)	18 x 25 x 1 (4)	18 x 25 x 1 (4)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	950 [431]	990 [450]	1060 [481]	1090 [495]

084V_144V_M_RH SHEET 3 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084V_144V_M_RH SHEET 4 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand with Waterside Economizer Coil

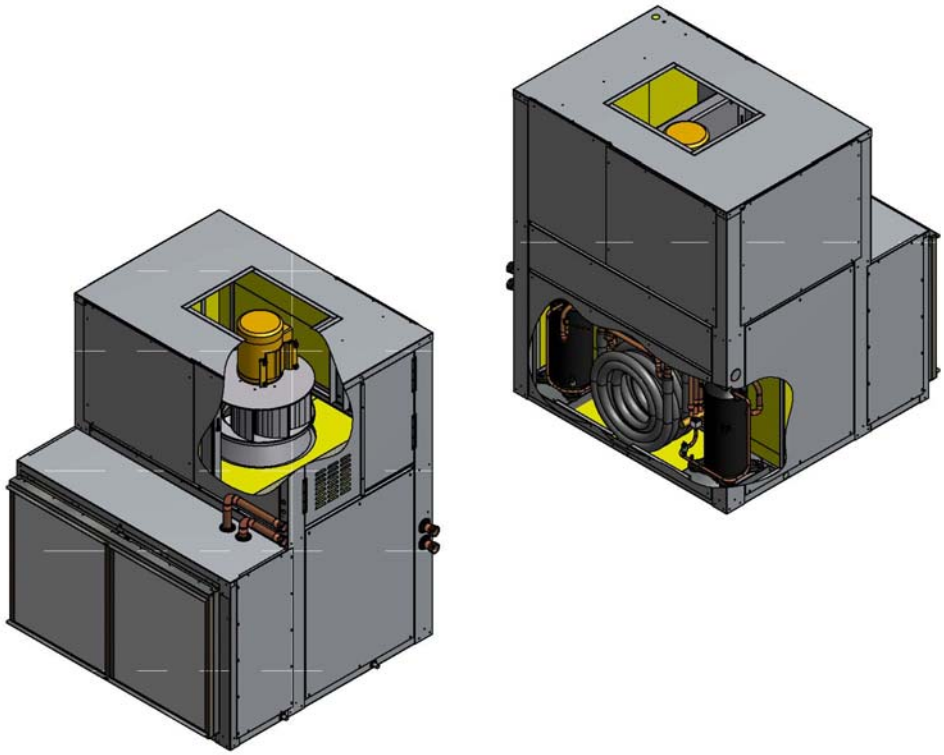
Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE TWIN CIRCUIT w/ WATER SIDE ECONOMIZER	SUBMITTAL PACKAGE 084V_144V_M_RH_WSE RIGHT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

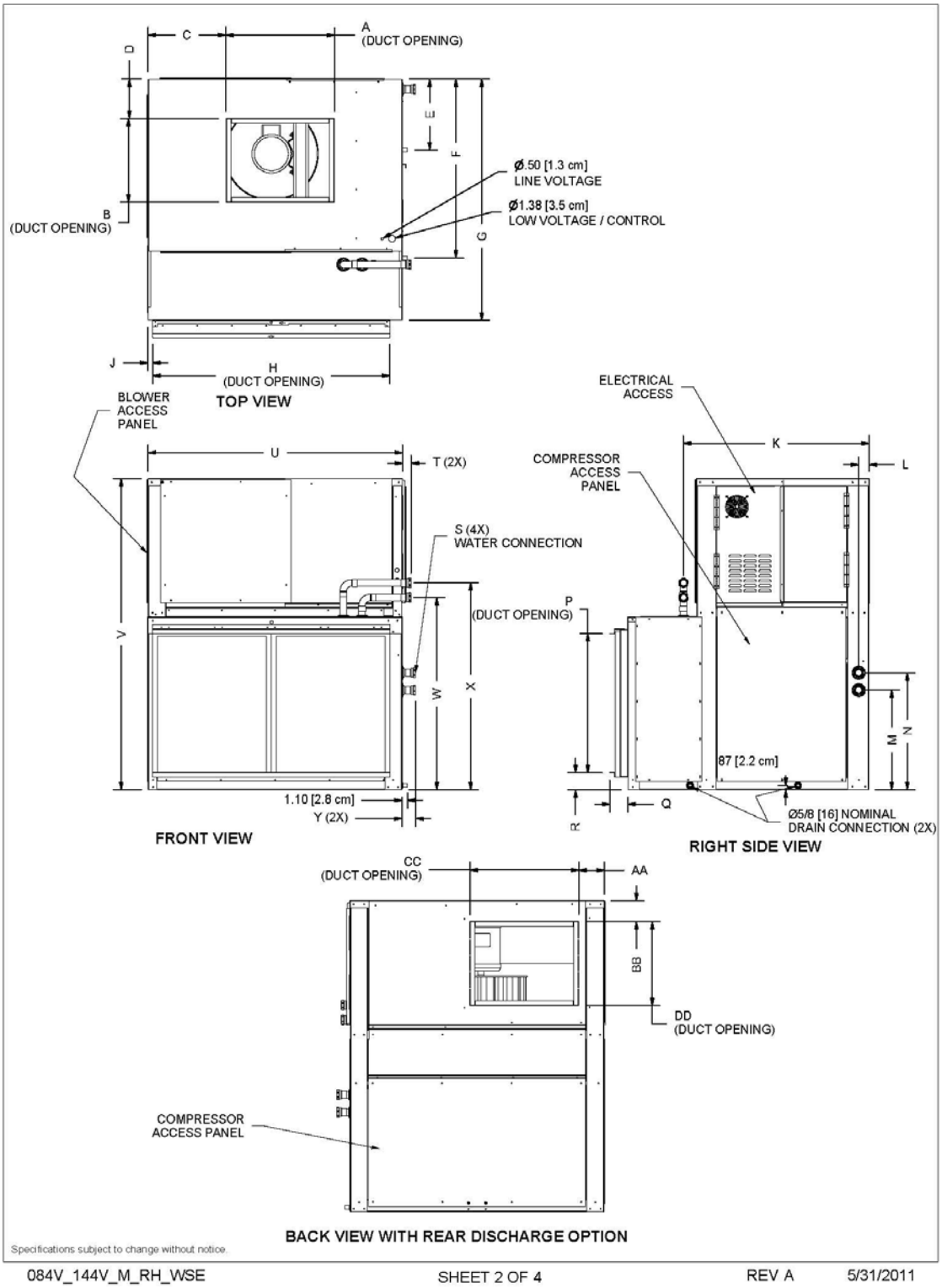
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Right hand water connections and electrical box location viewed looking into the return air duct connection.

084V_144V_M_RH_WSE SHEET 1 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand with Waterside Economizer Coil



Submittal Data – Vertical Sizes 084 to 144, Right Hand with Waterside Economizer Coil

DIMENSIONS INCH [CM]	UNIT SIZE			
	084	096	120	144
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
C	15.8 [40]	15.8 [40]	15.8 [40]	15.8 [40]
D	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
E	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
F	36.3 [92.1]	36.3 [92.1]	36.3 [92.1]	36.3 [92.1]
G	48.8 [123.8]	48.8 [123.8]	48.8 [123.8]	48.8 [123.8]
H	47 [119.4]	47 [119.4]	47 [119.4]	47 [119.4]
J	1.4 [3.5}	1.4 [3.5}	1.4 [3.5}	1.4 [3.5}
K	37.6 [95.6]	37.6 [95.6]	37.6 [95.6]	37.6 [95.6]
L	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
M	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]
N	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]
P	22.3 [56.5]	22.3 [56.5]	22.3 [56.5]	22.3 [56.5]
Q	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]
R	3.5 [8.6]	3.5 [8.6]	3.5 [8.6]	3.5 [8.6]
S	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT
T	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
U	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]
V	63 [160]	63 [160]	63 [160]	63 [160]
W	39.5 [100]	39.5 [100]	39.5 [100]	39.5 [100]
X	42.3 [107]	42.3 [107]	42.3 [107]	42.3 [107]
Y	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
AA	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]
BB	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	25 X 25 X 1 (2)	25 X 25 X 1 (2)	24 X 29.5 X 1 (2)	24 X 29.5 X 1 (2)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	1050 [477]	1215 [552]	1270 [577]	1295 [588]

084V_144V_M_RH_WSE SHEET 3 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Right Hand with Waterside Economizer Coil

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084H_144H_M_RH_WSE SHEET 4 OF 4 REV A 5/26/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand

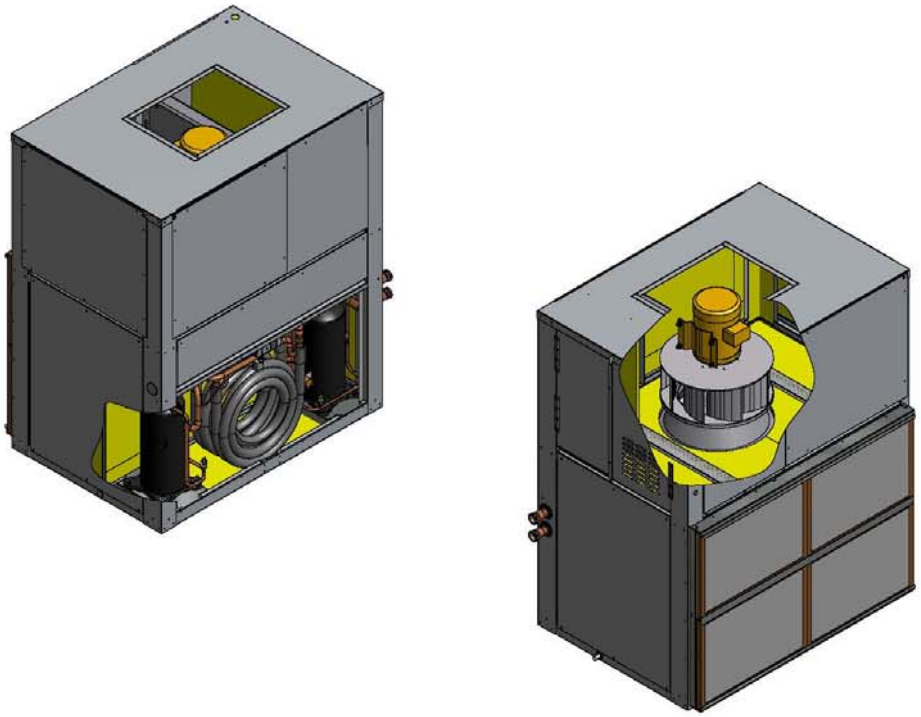
Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE TWIN CIRCUIT	SUBMITTAL PACKAGE 084V_144V_M_LH LEFT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

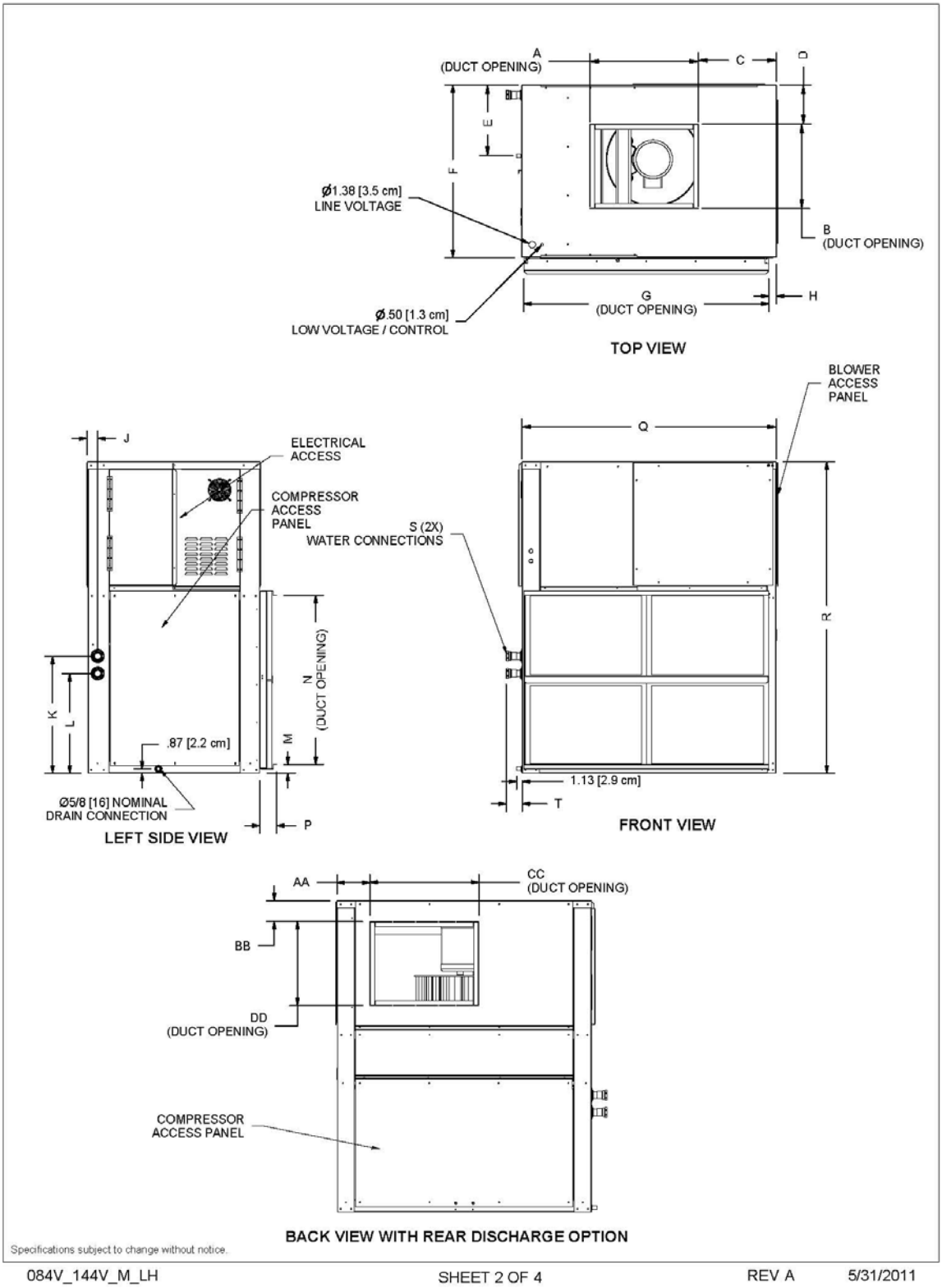
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Left hand water connections and electrical box location viewed looking into the return air duct connection.

084V_144V_M_LH SHEET 1 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand



Submittal Data – Vertical Sizes 084 to 144, Left Hand

DIMENSIONS INCH [CM]	UNIT SIZE			
	084	096	120	144
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
C	15.8 [40]	15.8 [40]	15.8 [40]	15.8 [40]
D	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
E	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
F	35 [89]	35 [89]	35 [89]	35 [89]
G	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]
H	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]
J	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
K	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]
L	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]
M	2.6 [6.6]	2.6 [6.6]	1.8 [4.6]	1.8 [4.6]
N	24 [61]	24 [61]	34.2 [86.9]	34.2 [86.9]
P	3.8 [9.5]	3.8 [9.5]	3.8 [9.5]	3.8 [9.5]
Q	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]
R	63 [160]	63 [160]	63 [160]	63 [160]
S	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT
T	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
AA	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]
BB	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	25 X 25 X 1 (2)	16 x 25 x 1 (3)	18 x 25 x 1 (4)	18 x 25 x 1 (4)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	950 [431]	990 [450]	1060 [481]	1090 [495]

084V_144V_M_LH SHEET 3 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084V_144V_M_LH SHEET 4 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand with Waterside Economizer Coil

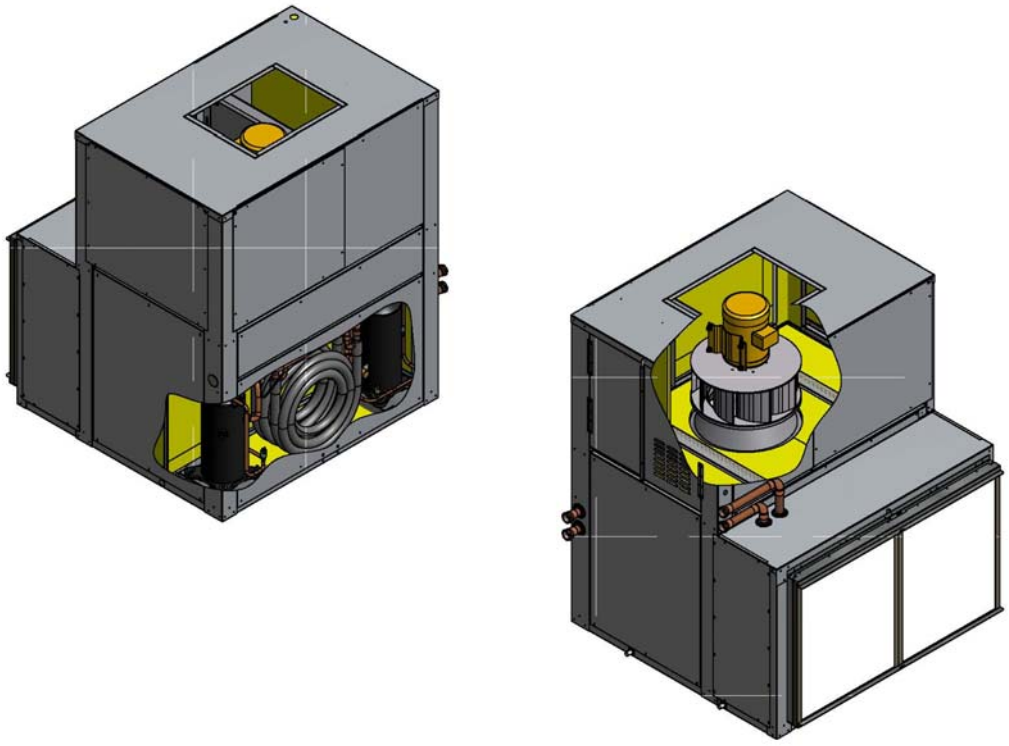
Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE TWIN CIRCUIT w/ WATER SIDE ECONOMIZER	SUBMITTAL PACKAGE 084V_144V_M_LH_WSE LEFT HAND

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

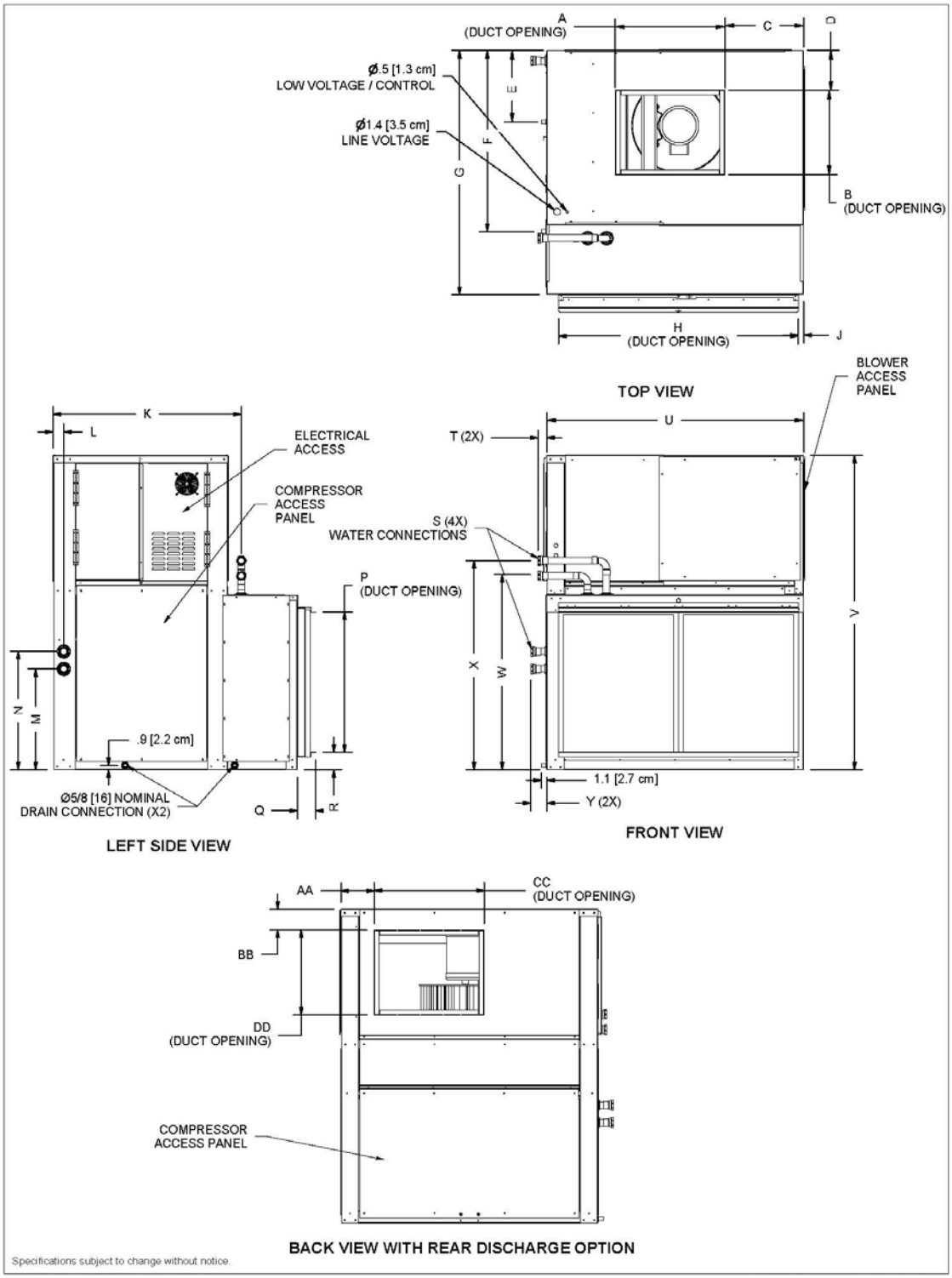
FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



Left hand water connections and electrical box location viewed looking into the return air duct connection.

084V_144V_M_LH_WSE SHEET 1 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand with Waterside Economizer Coil



Submittal Data – Vertical Sizes 084 to 144, Left Hand with Waterside Economizer Coil

DIMENSIONS INCH [CM]	UNIT SIZE			
	084	096	120	144
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
C	15.8 [40]	15.8 [40]	15.8 [40]	15.8 [40]
D	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
E	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
F	36.3 [92.1]	36.3 [92.1]	36.3 [92.1]	36.3 [92.1]
G	48.8 [123.8]	48.8 [123.8]	48.8 [123.8]	48.8 [123.8]
H	47 [119.4]	47 [119.4]	47 [119.4]	47 [119.4]
J	1.4 [3.5}	1.4 [3.5}	1.4 [3.5}	1.4 [3.5}
K	37.6 [95.6]	37.6 [95.6]	37.6 [95.6]	37.6 [95.6]
L	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
M	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]	20.3 [51.6]
N	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]	23.8 [60.5]
P	23.6 [60]	23.6 [60]	28.2 [71.6]	28.2 [71.6]
Q	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]
R	3 [7.6]	3 [7.6]	3.5 [8.6]	3.5 [8.6]
S	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT	1-1/4 [3.2]FNPT
T	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
U	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]	51.5 [130.8]
V	63 [160]	63 [160]	63 [160]	63 [160]
W	39.5 [100]	39.5 [100]	39.5 [100]	39.5 [100]
X	42.3 [107]	42.3 [107]	42.3 [107]	42.3 [107]
Y	2.4 [6]	2.4 [6]	2.4 [6]	2.4 [6]
AA	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]	6.6 [16.8]
BB	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]	4.3 [10.8]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	084	096	120	144
FILTER SIZE	25 X 25 X 1 (2)	25 X 25 X 1 (2)	24 x 29.5 x 1 (2)	24 x 29.5 x 1 (2)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	084	096	120	144
SHIPPING	1050 [477]	1215 [552]	1270 [577]	1295 [588]

084V_144V_M_LH_WSE SHEET 3 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 084 to 144, Left Hand with Waterside Economizer Coil

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
084	208-230/60/3	12.2	101	1.5	6.9	10.8	35.2	187/253	38.3	50
				2	7.8					
084	460/60/3	5.4	44	1.5	3	4.3	15.1	414/506	16.5	25
				2	3.4					
084	380-415/50/3	5.5	46	1.5	2.5	4.3	13.1	342/456	16.7	25
				2	3.5					
084	575/60/3	4.4	34	1.5	2.4	4.3	13.1	518/633	14.2	25
				2	2.7					
096	208-230/60/3	13	127	1.5	6.9	10.8	36.8	187/253	40.1	60
				2	7.8					
				3	11	13.9	39.9		43.2	
096	460/60/3	5.5	52	1.5	3	4.3	15.3	414/506	16.7	25
				2	3.4					
				3	4.8	5.9	16.9		18.3	
096	380-415/50/3	5.6	43	1.5	2.5	4.3	15.5	342/456	16.9	25
				2	3.5					
				3	5.4	5.9	17.1		18.5	
096	575/60/3	4.9	33	1.5	2.4	4.3	13.1	518/633	15.3	25
				2	2.7					
				3	3.9					
120	208-230/60/3	16.7	127	3	11	13.9	47.3	187/253	51.5	70
				5	17.5	24	57.4		61.2	80
120	460/60/3	7.2	62	3	4.8	5.9	20.3	414/506	22.1	35
				5	7.6	9.4	23.8		25.6	
120	380-415/50/3	7	51.5	3	5.4	5.9	19.9	342/456	21.7	30
				5	8.6	9.4	23.4		25.2	35
120	575/60/3	5.7	39	3	3.9	4.3	15.7	518/633	17.1	25
				5	6.1	8.8	20.2		21.6	30
144	208-230/60/3	19.3	179	3	11	13.9	52.5	187/253	57.3	80
				5	17.5	24	62.6		67.4	90
144	460/60/3	8.3	62	3	4.8	5.9	22.5	414/506	24.6	35
				5	7.6	9.4	26		28.1	40
144	380-415/50/3	8.3	64	3	5.4	5.9	22.5	342/456	24.6	35
				5	8.6	9.4	26		28.1	40
144	575/60/3	6.8	50	3	3.9	4.3	17.9	518/633	19.6	30
				5	6.1	9.4	23		24.7	35

084V_144V_M_LH_WSE SHEET 4 OF 4 REV A 5/31/2011

Submittal Data – Vertical Sizes 168 to 288

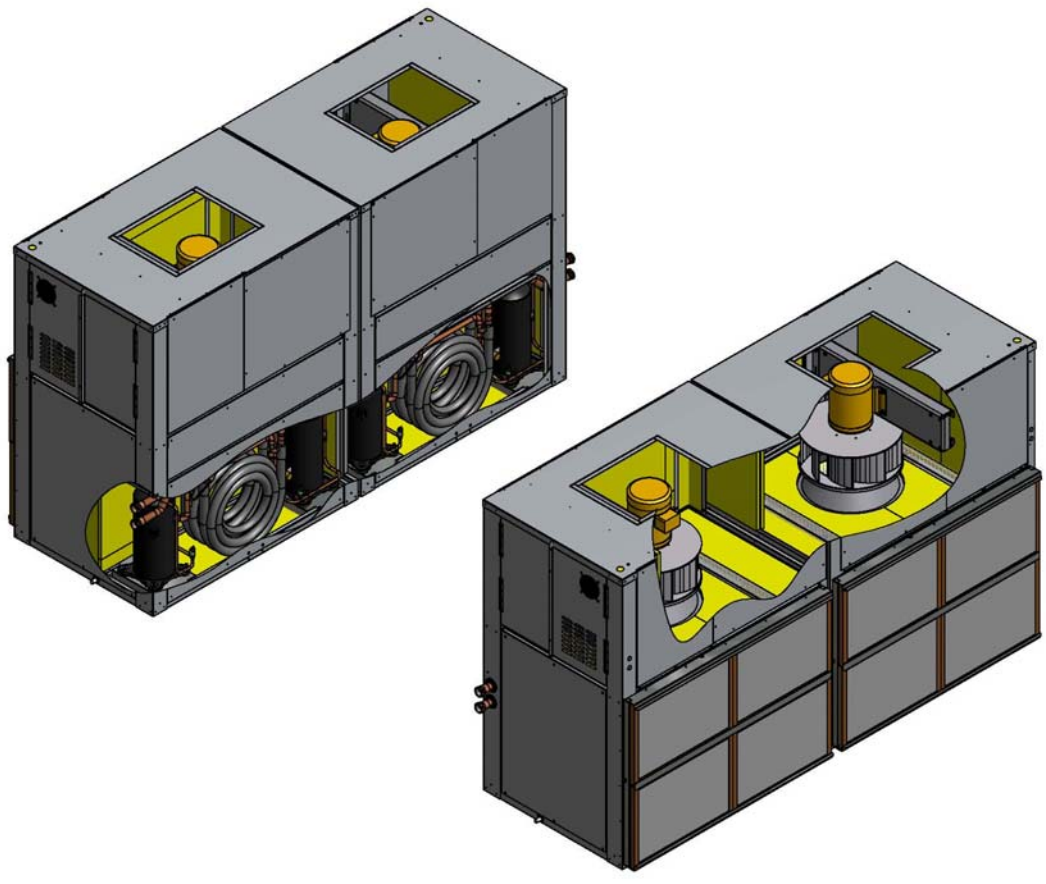
Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE QUAD	SUBMITTAL PACKAGE 168V_288V_M_QUAD

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

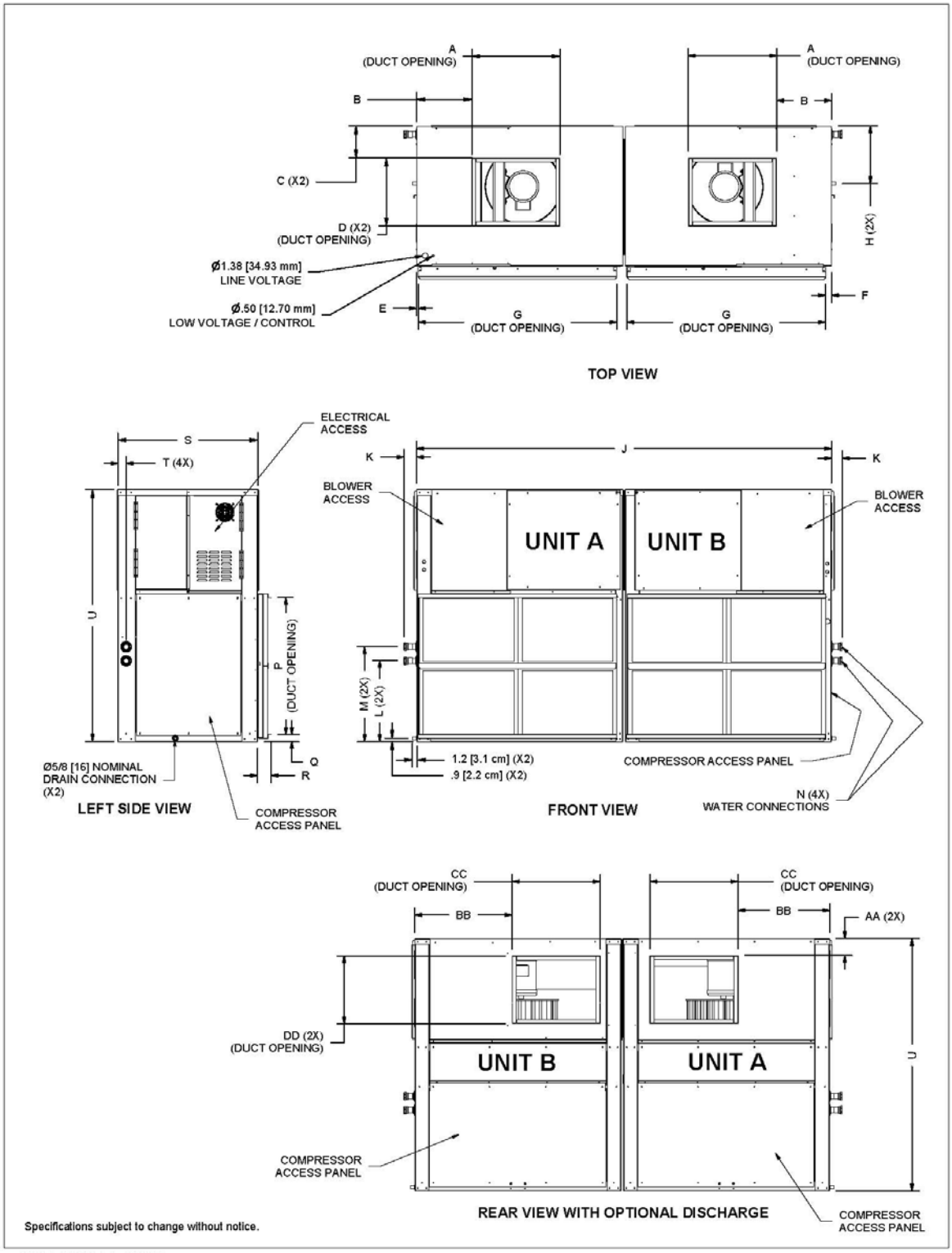
CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



168V_288V_M_QUAD SHEET 1 OF 4 REV A 6/2/2011

Submittal Data – Vertical Sizes 168 to 288



Submittal Data – Vertical Sizes 168 to 288

DIMENSION INCHES [CM]	UNIT SIZE			
	168	192	240	288
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	13.8 [34.9]	13.8 [34.9]	13.8 [34.9]	13.8 [34.9]
C	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
D	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
E	.4 [1]	.4 [1]	.4 [1]	.4 [1]
F	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]
G	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]
H	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
J	103 [261.6]	103 [261.6]	103 [261.6]	103 [261.6]
K	1.9 [4.8]	1.9 [4.8]	1.9 [4.8]	1.9 [4.8]
L	20.1 [51]	20.1 [51]	20.1 [51]	20.1 [51]
M	23.1 [58.7]	23.1 [58.7]	23.1 [58.7]	23.1 [58.7]
N	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
P	24 [61]	24 [61]	34.2 [86.9]	34.2 [86.9]
Q	2.6 [6.6]	2.6 [6.6]	1.8 [4.4]	1.8 [4.4]
R	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]	3.4 [8.6]
S	37.5 [95.3]	37.5 [95.3]	37.5 [95.3]	37.5 [95.3]
T	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
U	63 [160]	63 [160]	63 [160]	63 [160]
AA	4.2 [10.7]	4.2 [10.7]	4.2 [10.7]	4.2 [10.7]
BB	22.8 [57.9]	22.8 [57.9]	22.8 [57.9]	22.8 [57.9]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	168	192	240	288
FILTER SIZE	25 X 25 X 1 (4)	16 X 25 X 1 (6)	18 X 25 X 1 (8)	18 X 25 X 1 (8)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	168	192	240	288
SHIPPING	1900 [862]	1980 [900]	2120 [962]	2180 [990]

168V_288V_M_QUAD SHEET 3 OF 4 REV A 6/2/2011

Submittal Data – Vertical Sizes 168 to 288

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
168	208-230/60/3	12.2	101	2 @ 1.5	13.8	21.6	70.4	187/253	76.6	100
				2 @ 2	15.6					
168	460/60/3	5.4	44	2 @ 1.5	6	8.6	30.2	414/506	33	45
				2 @ 2	6.4					
168	380-415/50/3	5.5	46	2 @ 1.5	5	8.6	26.2	342/456	33.4	40
				2 @ 2	7					
168	575/60/3	4.4	34	2 @ 1.5	4.8	8.6	26.2	518/633	28.4	40
				2 @ 2	5.4					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
192	208-230/60/3	13	127	2 @ 1.5	13.8	21.6	73.6	187/253	76.9	125
				2 @ 2	15.6					
				2 @ 3	22	27.8	74.8		83.1	
192	460/60/3	5.5	52	2 @ 1.5	6	8.6	30.6	414/506	32	45
				2 @ 2	6.8					
				2 @ 3	9.6	11.8	33.8		35.2	
192	380-415/50/3	5.6	43	2 @ 1.5	5	8.6	31	342/456	32.4	40
				2 @ 2	7					
				2 @ 3	10.8	10.8	33.2		34.6	45
192	575/60/3	4.9	33	2 @ 1.5	4.8	7.2	28.2	518/633	29.4	45
				2 @ 2	5.4	7.2				
				2 @ 3	7.8	10.2	31.2		31	

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
240	208-230/60/3	16.7	127	2 @ 3	22	27.8	94.6	187/253	98.8	150
				2 @ 5	35	48	114.8		119.1	
240	460/60/3	7.2	62	2 @ 3	9.6	11.8	40.6	414/506	42.4	70
				2 @ 5	15.2	18.8	47.6		49.4	
240	380-415/50/3	7	51.5	2 @ 3	10.4	10.8	38.8	342/456	40.6	50
				2 @ 5	17.2	18.8	46.8		48.6	60
240	575/60/3	5.7	39	2 @ 3	3.9	4.3	15.7	518/633	32.8	45
				2 @ 5	6.1	8.8	20.2		37.2	

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
288	208-230/60/3	19.3	179	2 @ 3	22	27.8	105	187/253	109.8	175
				2 @ 5	35	48	125.2		139.9	
288	460/60/3	8.3	62	2 @ 3	9.6	11.8	45	414/506	47.1	70
				2 @ 5	15.2	18.8	52		54.1	
288	380-415/50/3	8.3	64	2 @ 3	10.4	10.8	44	342/456	46.1	60
				2 @ 5	17.2	18.8	52		54.1	70
288	575/60/3	6.8	50	2 @ 3	7.8	8.6	35.8	518/633	37.5	50
				2 @ 5	12.2	18.8	46		47.7	60

168V_288M_M_QUAD SHEET 4 OF 4 REV A 6/2/2011

Submittal Data – Vertical Sizes 168 to 288 with Waterside Economizer Coil

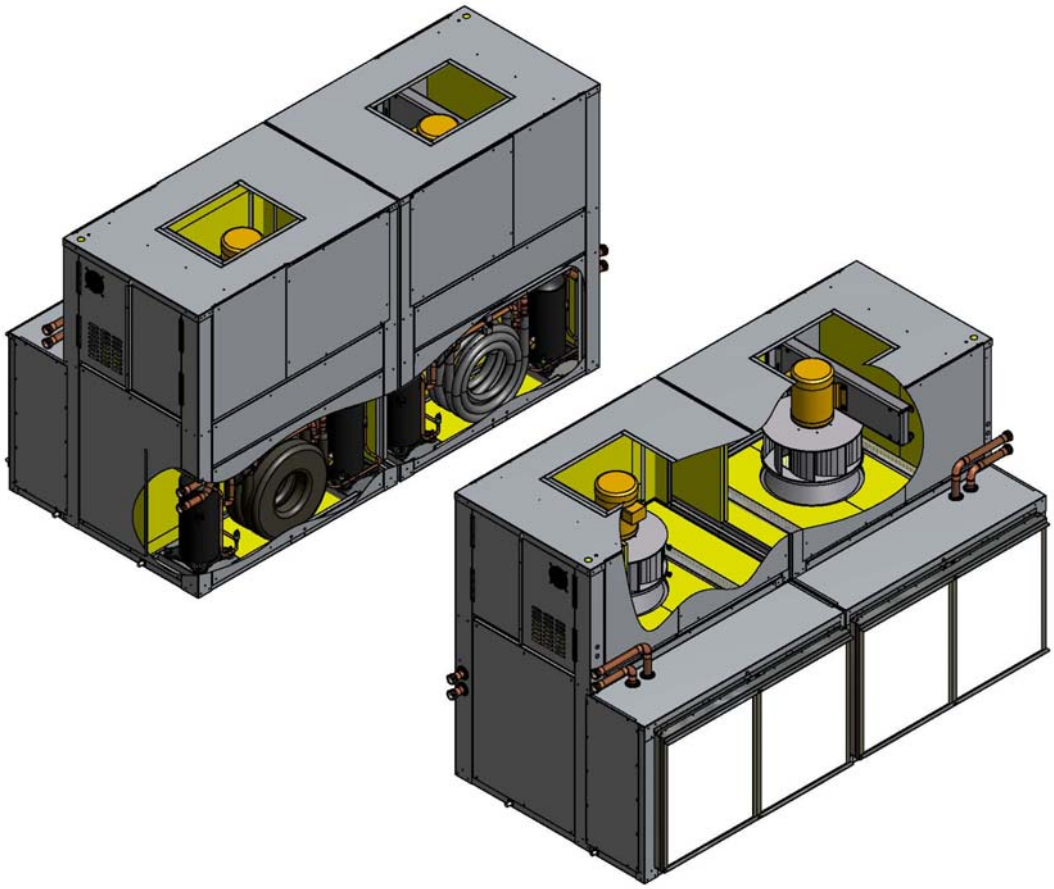
Mammoth WATER SOURCE HEAT PUMP	VERTICAL M VINTAGE QUAD w/ WATER SIDE ECONOMIZER	SUBMITTAL PACKAGE 168V_288V_M_QUAD_WSE

Mammoth Inc. certifies that it will furnish equipment in accordance with this drawing and specifications, and subject to its published warranty. Purchaser's approval of this drawing signifies that the equipment is acceptable under the provisions of the job specifications. Any change made hereon by any person whomever is subject to acceptance by Mammoth Inc. 13200 Pioneer Trail, Ste 150, Eden Prairie, MN 55347.

General Specifications

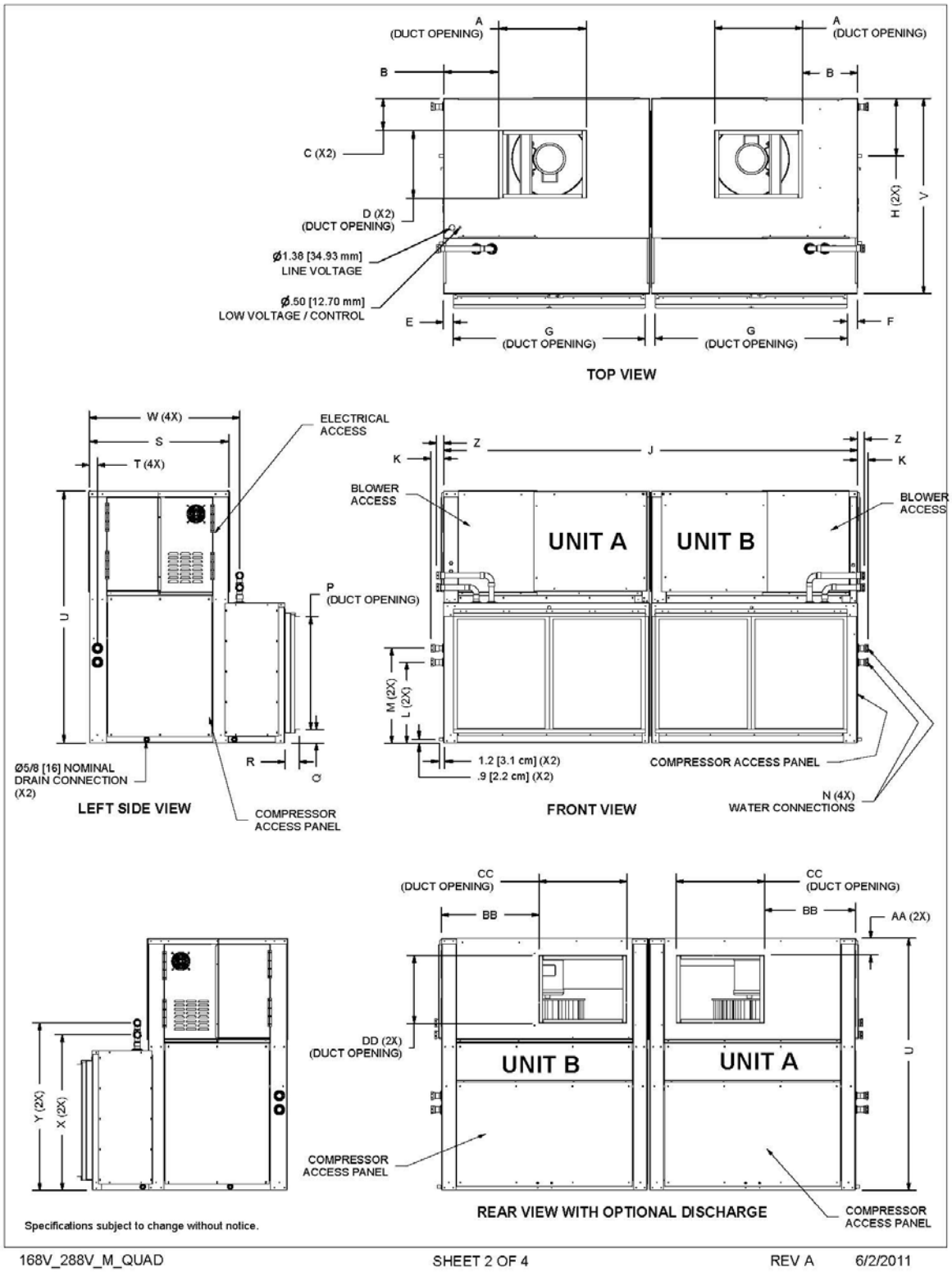
CABINET - Outer casing of G-60 galvanized steel.
REFRIGERANT CIRCUIT - Hermetically sealed 410A circuitry with reversing valve (HP only), TX metering device, and high/low side access valve.
COMPRESSOR - Hermetic type with PSC or three phase motor, overload protection and mounted on neoprene isolators.
AIR COIL - Seamless copper tubes and aluminum fins.
HEAT EXCHANGER - Coaxial water to refrigerant with steel outer tube and convoluted copper inner tube.
FILTER - 1-inch thick disposable
INSULATION - Thermally and acoustically optimized 3/4 inch thick, 1 1/2 lb. density faced.

FAN - Direct drive, dynamically balanced, airfoil shaped plug fan.
FAN MOTOR - Premium efficiency TEAO with sealed, locked bearings, and overload protection.
ELECTRICAL - 24-volt microprocessor control system with fan relay, compressor contactor, reversing valve coil (HP only).
CONTROL - Standard CAV operation by field mounted, wall type thermostat. Optional VAV operation with MDDC.



168V_288V_M_QUAD_WSE SHEET 1 OF 4 REV A 6/2/2011

Submittal Data – Vertical Sizes 168 to 288 with Waterside Economizer Coil



Submittal Data – Vertical Sizes 168 to 288 with Waterside Economizer Coil

DIMENSION INCHES [CM]	UNIT SIZE			
	168	192	240	288
A	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
B	13.8 [34.9]	13.8 [34.9]	13.8 [34.9]	13.8 [34.9]
C	8 [20.3]	8 [20.3]	8 [20.3]	8 [20.3]
D	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]
E	.4 [1]	.4 [1]	.4 [1]	.4 [1]
F	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]	1.5 [3.8]
G	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]	49.5 [125.7]
H	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]	14.4 [36.6]
J	103 [261.6]	103 [261.6]	103 [261.6]	103 [261.6]
K	1.9 [4.8]	1.9 [4.8]	1.9 [4.8]	1.9 [4.8]
L	20.1 [51]	20.1 [51]	20.1 [51]	20.1 [51]
M	23.1 [58.7]	23.1 [58.7]	23.1 [58.7]	23.1 [58.7]
N	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT	1-1/4 [3.2] FNPT
P	23.6 [60]	23.6 [60]	28.2 [71.6]	28.2 [71.6]
Q	3 [7.6]	3 [7.6]	3.5 [8.6]	3.5 [8.6]
R	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]	4.4 [11.2]
S	37.5 [95.3]	37.5 [95.3]	37.5 [95.3]	37.5 [95.3]
T	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]	2.1 [5.4]
U	63 [160]	63 [160]	63 [160]	63 [160]
V	48.9 [124.2]	48.9 [124.2]	48.9 [124.2]	48.9 [124.2]
W	37.6 [95.5]	37.6 [95.5]	37.6 [95.5]	37.6 [95.5]
X	38.9 [98.8]	38.9 [98.8]	38.9 [98.8]	38.9 [98.8]
Y	41.9 [106.4]	41.9 [106.4]	41.9 [106.4]	41.9 [106.4]
Z	19 [48.3]	19 [48.3]	19 [48.3]	19 [48.3]
AA	4.2 [10.7]	4.2 [10.7]	4.2 [10.7]	4.2 [10.7]
BB	22.8 [57.9]	22.8 [57.9]	22.8 [57.9]	22.8 [57.9]
CC	22 [55.9]	22 [55.9]	22 [55.9]	22 [55.9]
DD	17 [43.2]	17 [43.2]	17 [43.2]	17 [43.2]

FILTER SIZE & QTY'S.				
UNIT SIZE	168	192	240	288
FILTER SIZE	25 X 25 X 1 (4)	25 X 25 X 1 (4)	24 X 29.5 X 1 (4)	24 X 29.5 X 1 (4)

WEIGHTS Lbs [Kg]	UNIT SIZE			
	168	192	240	288
SHIPPING	1900 [862]	1980 [900]	2120 [962]	2180 [990]

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Submittal Data – Vertical Sizes 168 to 288 with Waterside Economizer Coil

ELECTRICAL DATA

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
168	208-230/60/3	12.2	101	2 @ 1.5	13.8	21.6	70.4	187/253	76.6	100
				2 @ 2	15.6					
168	460/60/3	5.4	44	2 @ 1.5	6	8.6	30.2	414/506	33	45
				2 @ 2	6.4					
168	380-415/50/3	5.5	46	2 @ 1.5	5	8.6	26.2	342/456	33.4	40
				2 @ 2	7					
168	575/60/3	4.4	34	2 @ 1.5	4.8	8.6	26.2	518/633	28.4	40
				2 @ 2	5.4					

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
192	208-230/60/3	13	127	2 @ 1.5	13.8	21.6	73.6	187/253	76.9	125
				2 @ 2	15.6					
				2 @ 3	22	27.8	74.8		83.1	
192	460/60/3	5.5	52	2 @ 1.5	6	8.6	30.6	414/506	32	45
				2 @ 2	6.8					
				2 @ 3	9.6	11.8	33.8		35.2	
192	380-415/50/3	5.6	43	2 @ 1.5	5	8.6	31	342/456	32.4	40
				2 @ 2	7					
				2 @ 3	10.8	10.8	33.2		34.6	45
192	575/60/3	4.9	33	2 @ 1.5	4.8	7.2	28.2	518/633	29.4	45
				2 @ 2	5.4	7.2				
				2 @ 3	7.8	10.2	31.2		31	

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
240	208-230/60/3	16.7	127	2 @ 3	22	27.8	94.6	187/253	98.8	150
				2 @ 5	35	48	114.8		119.1	
240	460/60/3	7.2	62	2 @ 3	9.6	11.8	40.6	414/506	42.4	70
				2 @ 5	15.2	18.8	47.6		49.4	
240	380-415/50/3	7	51.5	2 @ 3	10.4	10.8	38.8	342/456	40.6	50
				2 @ 5	17.2	18.8	46.8		48.6	60
240	575/60/3	5.7	39	2 @ 3	3.9	4.3	15.7	518/633	32.8	45
				2 @ 5	6.1	8.8	20.2		37.2	

Unit Size	Voltage	Compressor		Blower Motor HP	Blower Motor FLA	VFD Input Current	Total Amps	Min/Max Voltages	Minimum Circuit Amps	Maximum Overcurrent Protection (MOPD)
		RLA	LRA							
288	208-230/60/3	19.3	179	2 @ 3	22	27.8	105	187/253	109.8	175
				2 @ 5	35	48	125.2		139.9	
288	460/60/3	8.3	62	2 @ 3	9.6	11.8	45	414/506	47.1	70
				2 @ 5	15.2	18.8	52		54.1	
288	380-415/50/3	8.3	64	2 @ 3	10.4	10.8	44	342/456	46.1	60
				2 @ 5	17.2	18.8	52		54.1	70
288	575/60/3	6.8	50	2 @ 3	7.8	8.6	35.8	518/633	37.5	50
				2 @ 5	12.2	18.8	46		47.7	60

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info@mammoth-inc.com

www.mammoth-inc.com

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