

**Water Source Heat Pump
Big Size Package Type E Series
22kW-98kW (50Hz R410A)**



The Leader In Custom HVAC & Energy Saving



ISO9001 ISO14001 OHSAS18001

www.mammothchina.com

Mammoth (Shanghai) Air Conditioning Ltd.

Since 1935, Mammoth has been producing and installing air conditioning units with the most innovative technologies. Our solutions are found in some of the world's most important buildings for its unparalleled flexibility and efficiency. When performance and energy efficiency are important factors to a project, our products are often chosen as the final solution.

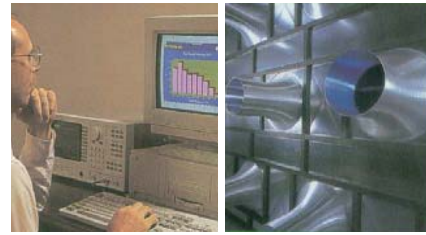


Established in Minneapolis, USA - 1935



Since 1988, Mammoth has been providing energy saving products to projects in China. In 2002, Mammoth invested US\$10 million to establish its manufacturing facility in Anji, China's #1 Ecological County, and its national sales headquarter in Shanghai to provide custom engineered air conditioning systems for projects in China and abroad.

Energy Saving & Innovation



Mammoth produces air conditioning equipment that leverages energy saving and innovative technologies. Our products include, but not limited to, geothermal & water source heat pumps, air & water cooled commercial air conditioning units, fan coils, AHU, VAV box, screw chillers, and energy recovery units.

Customization & Energy Saving is Our Standard



Mammoth has been recognized as a leader in providing custom designed Total Energy Solution HVAC Systems. Our solutions can fit any design applications from WSHP systems to geothermal systems, from hybrid systems to various energy saving systems. Based on the needs of our customers, our recommendations help our customers assess the economic benefits of Mammoth solutions over alternative systems.

Outstanding Achievement



Mammoth has also brought its innovative design concepts to the industry. We have printed numerous technical design manuals and books to facilitate engineers in the design of Renewable Energy HVAC Systems. Together with industry associations and the commercial section of the US Embassy and Consulate General Offices, we have frequently conducted technical seminars in major cities in China and abroad. We have supplied our solutions to projects that amount to almost 10 million sq. m., and have been continuously recognized as the leader in Renewable Energy products in China.



Large Horizontal & Vertical Water Source Heat Pumps

- 1, Four horizontal unit sizes from 7 to 12 tons
- 2, Nine vertical unit sizes from 7 to 30 tons
- 3, Fully run-tested with water in both heating and cooling modes
- 4, Scroll compressors on all units
- 5, Choice of top or rear fan discharge arrangement on vertical units
- 6, Special back-to-back or side-to-side arrangements on vertical unit sizes
- 7, MGP50 control system incorporate with MODBUS communication port
- 8, R410A environmental friendly refrigerant

Unit Configuration

Flexibility is the key to Mammoth's line of large heat pumps and cooling only units. Multiple configurations allow for the most efficient and economical installation.

Refrigeration Components

The refrigeration system for each circuit consists of scroll compressor, coaxial water-to-refrigerant heat exchanger, airside coil, thermal expansion valve, access valves, reversing valve and safety controls.

All unit sizes 100 through 360 have two independent circuits and unit size 086 has single refrigerant circuit.

Compressors are mounted on neoprene isolators and heavy-gauge mounting rails to ensure minimum noise transmission and quiet operation. Each refrigerant circuit has high side and low side access valves for servicing.

The water-to-refrigerant heat exchanger are shell and tube type and consists of copper inner tubes and a steel outer shell. It is rated for 4.2MPa on the refrigerant side and 1.0MPa on the water side. The design 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 heating mode and is fail-safe to the cooling mode for MGP50 controller.

Safety controls include a high and low (loss of charge protection) refrigerant pressure switch for each refrigerant circuit. A lockout relay prevents the compressor from operating if any of the safety switches trip.

Fan Assembly

The fan section consists of the fan wheel/housing assembly, fan motor and the drain pan. The drain pan extends past the air coil and is insulated from the unit casing to prevent sweating. Each unit is available with various fan drive packages to satisfy different duct systems and designs. Each package includes its own fan motor horsepower and sheave combination to achieve a specific fan speed range. Each centrifugal fan wheel is balanced for minimum vibration.

Electrical and Control Box

The control box houses all the electrical components and is located in its own section with its own access panel. Controls include transformer, capacitor(s) and various relays and contactors.

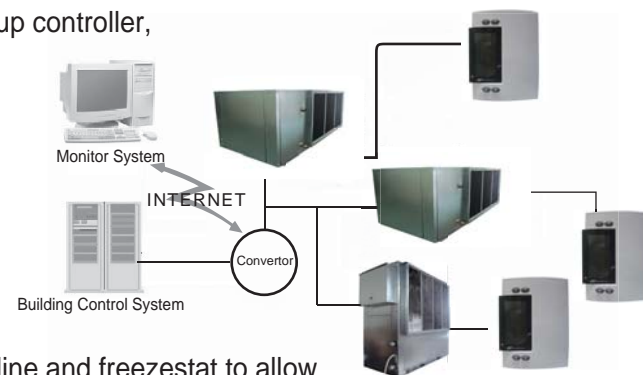
Easy Operating and Control

Luxury thermostat with cooling, heating, ventilation, dehumidify modes. With this thermostat, temperature, fan speed, sleeping and timing setting can be set. Room temperature and error code can be shown on screen. Also there is interlocking control of water pump.



Remote Control

Units can be remote controlled and monitored by group controller, building management system and internet.



Unit Functions Introduction

- ◆ Low Temperature Units: Includes insulated suction line and freeze-stat to allow heating and cooling operation down to 4 °C entering water temperature. (Antifreeze is necessary).
- ◆ Centralized control is available.

Model Nomenclature

M S R - J 170 H H E
1 2 3 4 5 6

- 1 MSR: Mammoth Water Source Heat Pump;
- 2 Power: J=380~415V/3Ph/50Hz
- 3 Unit No.
- 4 Unit Type: H=Horizontal, V=Vertical;
- 5 Temperature Range: H=Standard, L=Low temperature;
- 6 Design Vintage

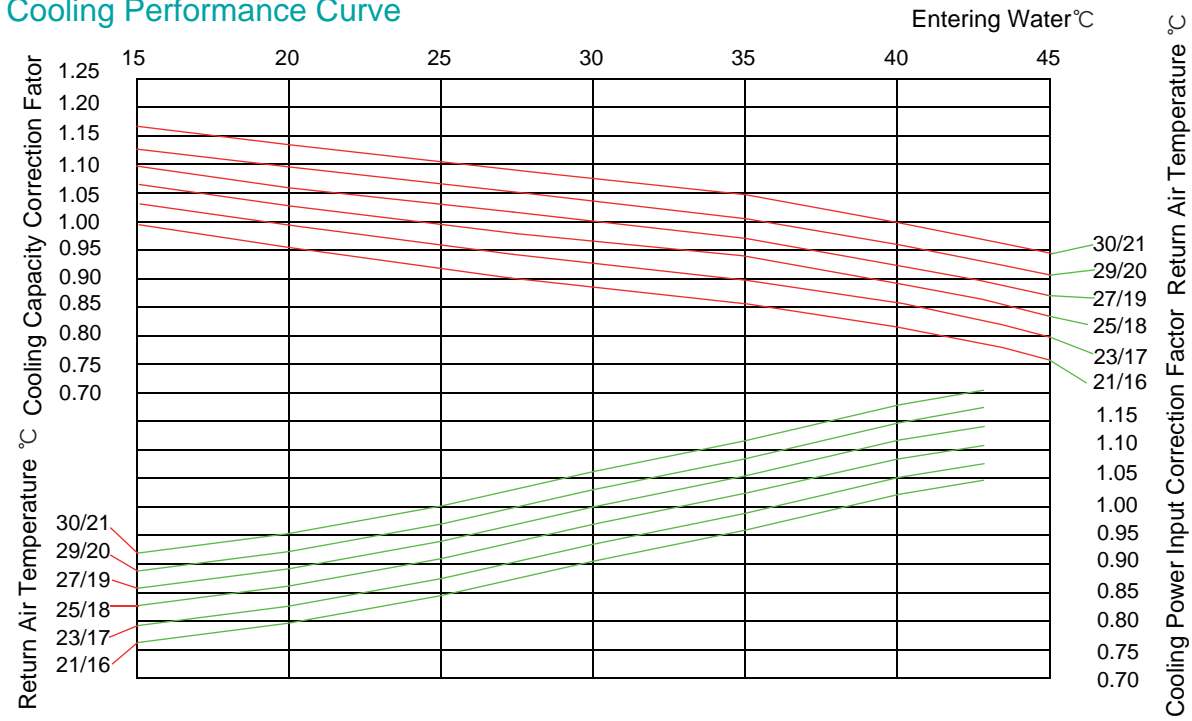
Item	Model	J086	J100	J120	J142	J170	J210
Cooling Capacity	kW	22.0	27.0	31.0	37.0	43.5	58.0
Sensible Cooling	kW	18.3	22.1	25.8	30.8	35.8	48.1
Heating Capacity	kW	26.0	34.0	38.0	45.0	54.0	69.0
Power Source		380~415V/3Ph/50Hz					
Cooling Power Input	kW	5.60	6.80	8.30	9.50	11.75	14.60
Heating Power Input	kW	5.80	7.20	8.60	10.40	12.40	15.65
Cooling Rated Current	A	10.65	12.93	15.78	18.07	22.34	27.76
Heating Rated Current	A	11.03	13.88	16.35	19.78	23.58	29.76
Refrigerant		R410A					
Compressor		Scroll					
Water Flow	m ³ /h	4.73	5.81	6.67	7.96	9.57	12.47
Water Pressure Drop	kPa	30	33	35	52	43	37
Water Connections	in	NPT 1-1/2'			NPT 2'		
Horizontal Overall Dimension	mm	L2125*W1080*H715			L1810*W1080*H1700		
Vertical Overall Dimension	mm	L1305*W775*H1530			L1810*W1050*H1670		
Unit Weight	kg	315	370	390	415	570	640
ESP	Pa	150			250		
Air Flow	m ³ /h	4500	5400	6400	7200	9000	10500

Item	Model	J270	J310	J360
Cooling Capacity	kW	73.0	85.0	98.0
Sensible Cooling	kW	60.6	70.6	80.3
Heating Capacity	kW	88.5	103.0	124.0
Power Source		380~415V/3Ph/50Hz		
Cooling Power Input	kW	19.00	22.00	26.00
Heating Power Input	kW	20.00	23.50	28.50
Cooling Rated Current	A	36.52	42.29	49.97
Heating Rated Current	A	38.44	45.17	54.78
Refrigerant		R410A		
Compressor		Scroll		
Water Flow	m ³ /h	15.70	18.28	21.07
Water Pressure Drop	kPa	40	42	36
Water Connections	mm	NPT 2'		NPT 2 -1/2'
Horizontal Overall Dimension	mm	L2110*W1080*H1670		
Vertical Overall Dimension	mm	L2110*W1050*H1700		
Unit Weight	kg	780	860	920
ESP	Pa	350		
Air Flow	m ³ /h	13500	15500	18500

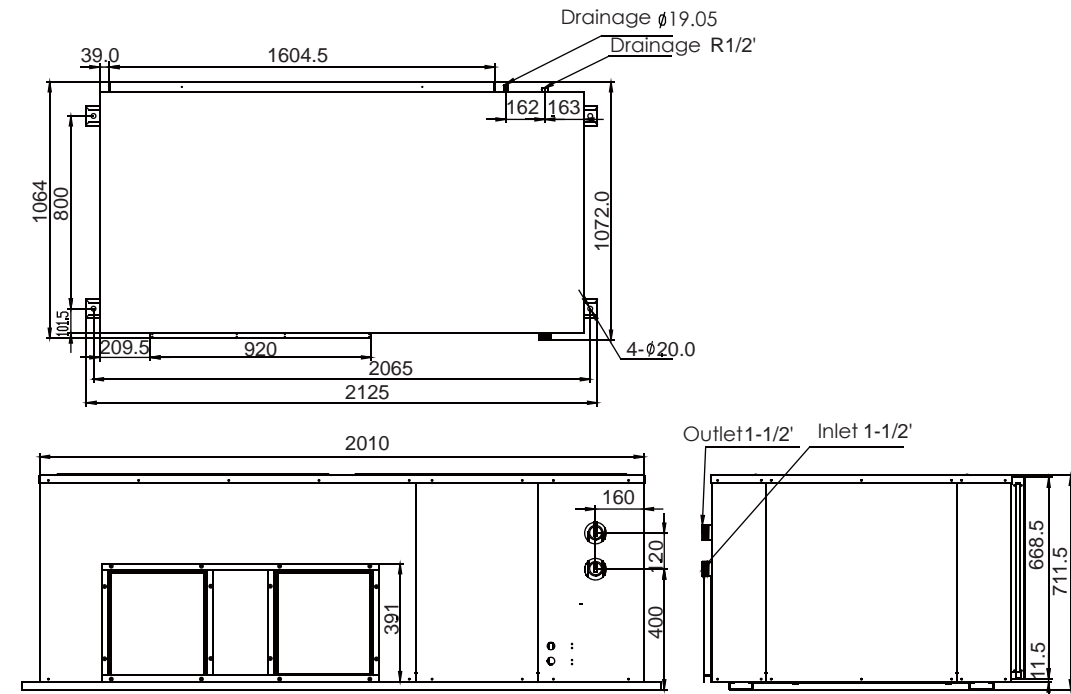
Notes:

1. Standard unit water side design pressure is 1.0MPa, if any other request on pressure please contact us.
2. Cooling capacity is based on 27 °C db/19 °C wb entering air, 30/35 °C entering/leaving water and power input has included fan motor but not water pump.
3. Heating capacity is based on 20 °C db/15 °C wb, 20 °C entering water and power input has included fan motor but not water pump.
4. The ESP above are for standard unit design, customize request is available.
5. Parameters above are subjected to change without notice due to continuous improvement.

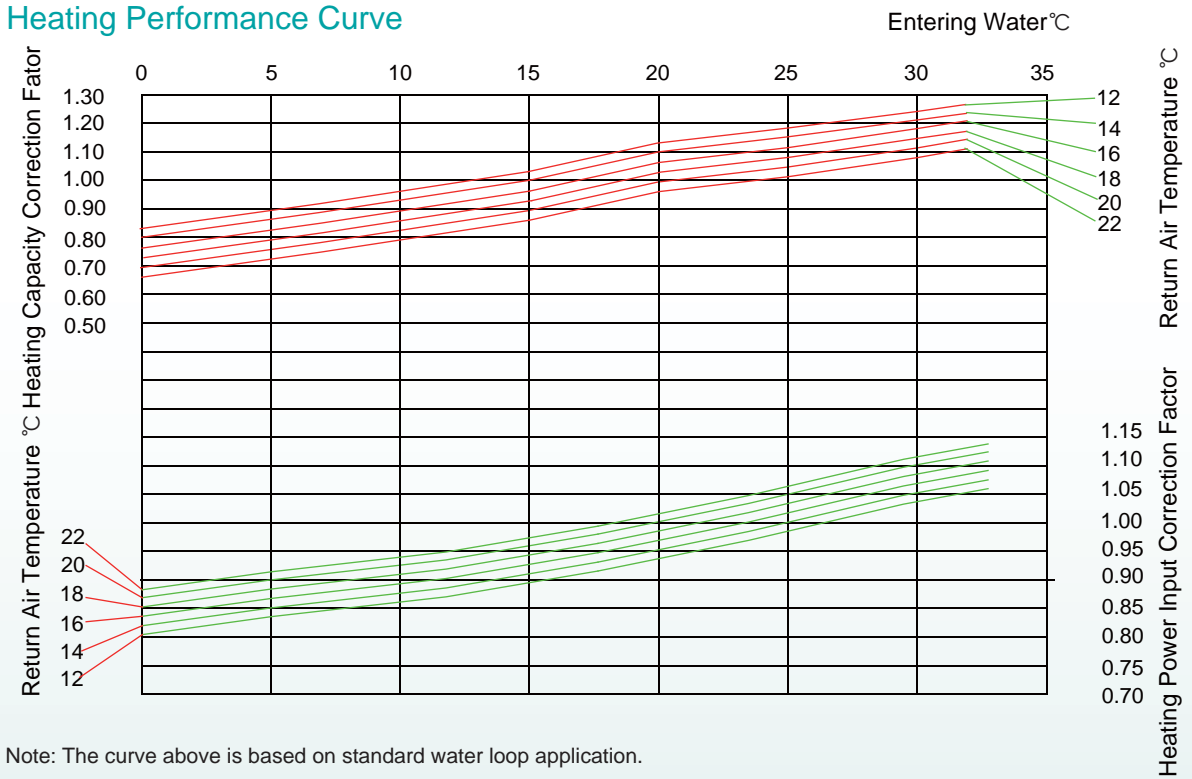
Cooling Performance Curve



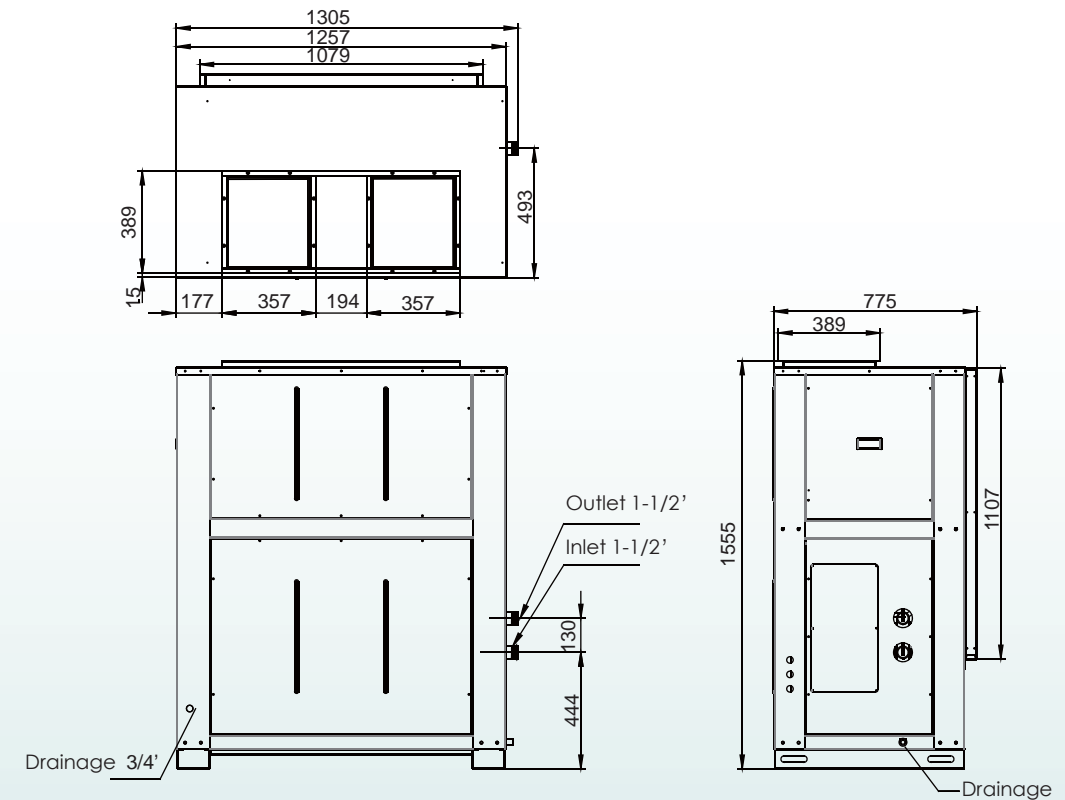
086~142 Horizontal Units



Heating Performance Curve

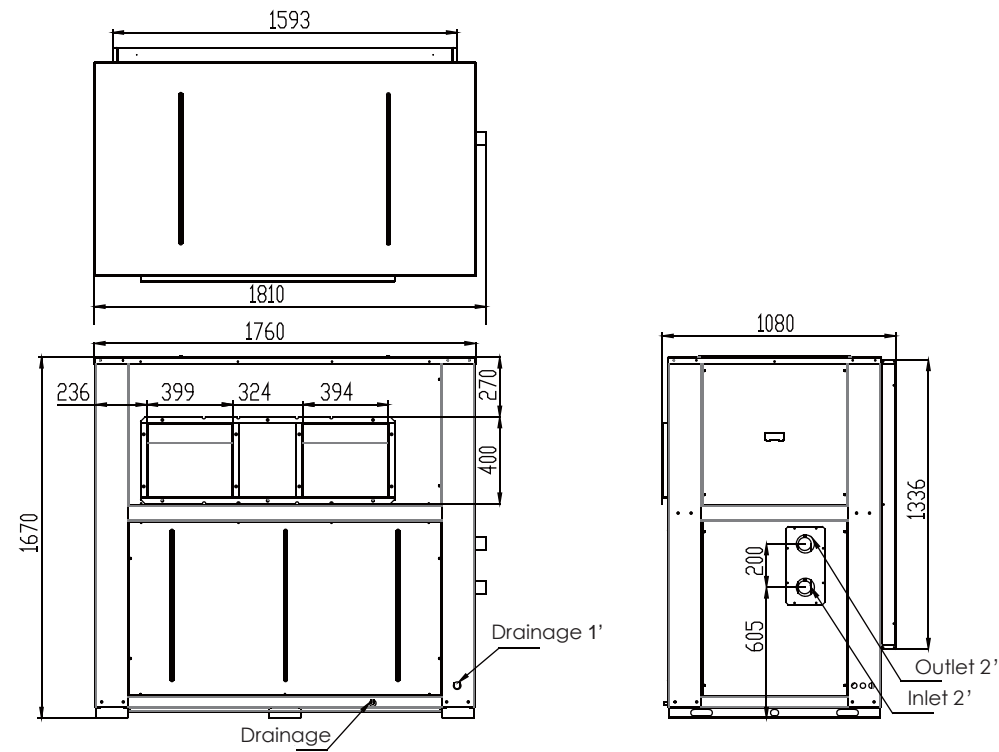


086~142 Vertical Units

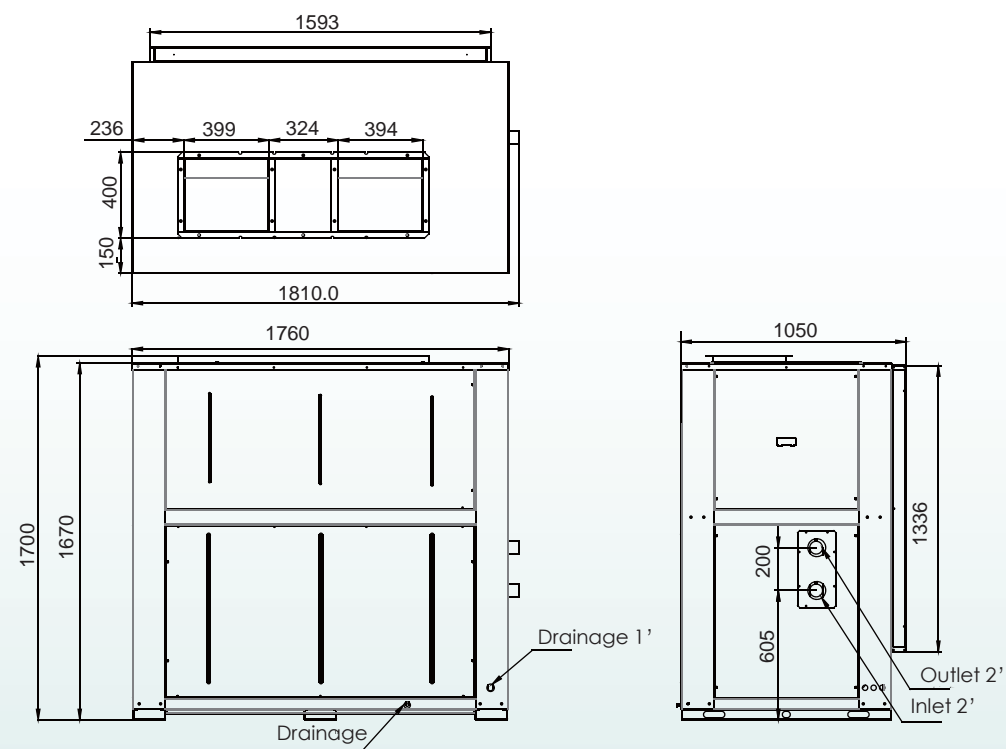


Note: The curve above is based on standard water loop application.

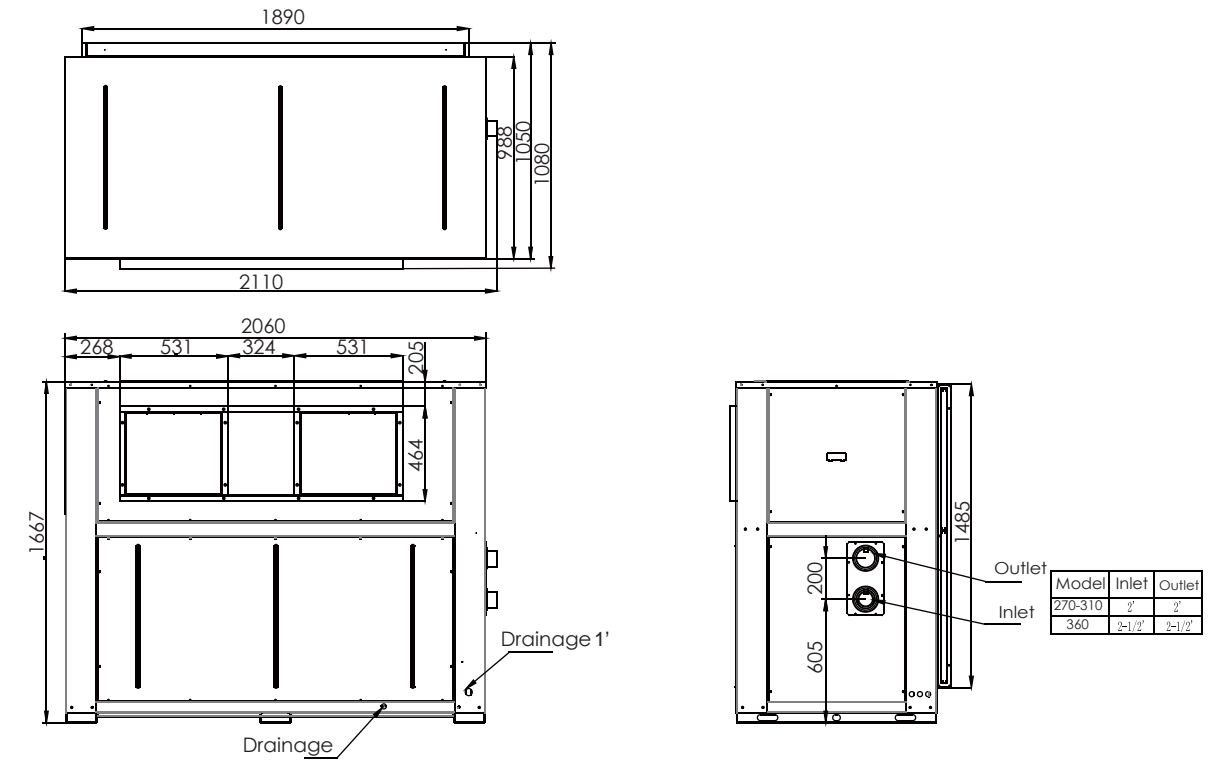
170~210 Horizontal Units



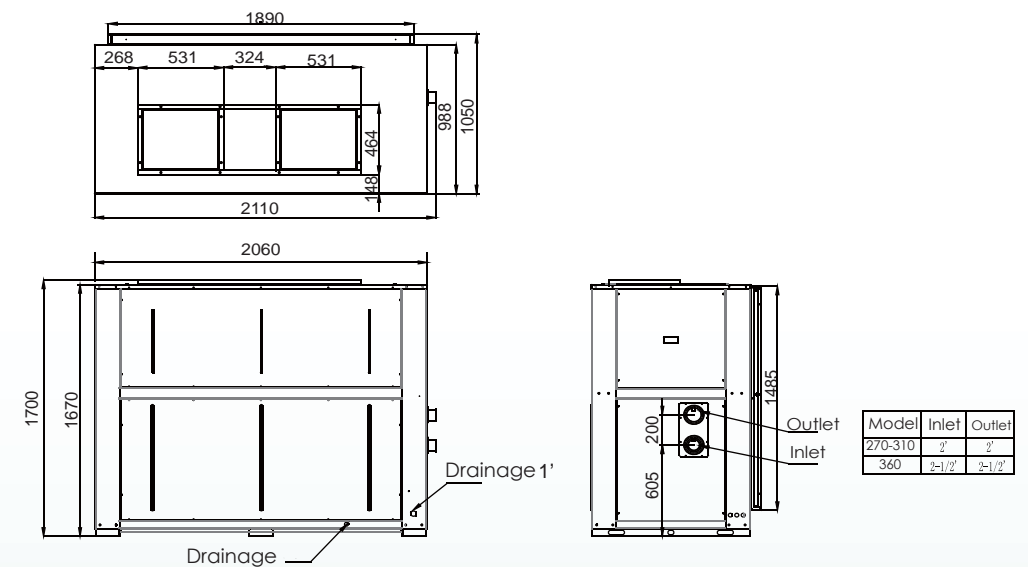
170~210 Vertical Units



270~360 Horizontal Units



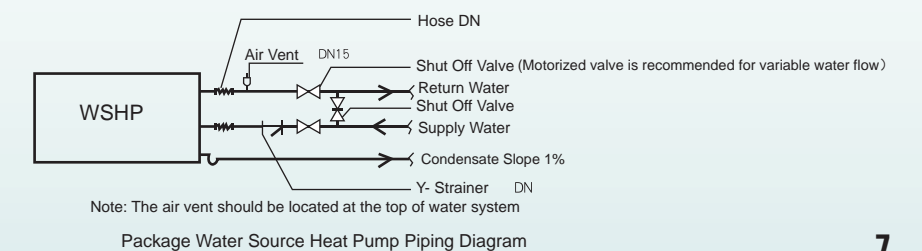
270~360 Vertical Units



Unit Options

- Optional ESP** — Multiple ESP can be selected;
- Electrical Heater** — Electrical heater can be selected for cooling only units

Mammoth offers numerous options, contact us for more information.



Model Size	Rated Voltage	Voltage (min - max)	Compressor		Fan Motor	Total Unit		
			RLA	LRA	FLA	FLA	MCA	MOP
086	380V/50/3	376-440	11.6	73.0	1.4	13.0	15.90	20
100			14.4	73.2	1.8	16.2	19.80	32
120			16.4	74.2	2.4	18.8	22.90	32
142			20.6	83.1	3.2	23.8	28.95	40
170			23.2	84.6	4.0	27.2	33.00	50
210			29.8	111.0	5.0	34.8	42.25	50
270			36.6	114.3	7.2	43.8	52.95	63
310			42.8	151.4	9.0	51.8	62.50	100
360			48.8	183.1	10.0	58.8	71.00	100

RLA = Running Load Amps [RLA or RLC] of a hermetic cooling compressor, is calculated by calculating the product of 64.1% of the maximum load current.

LRA = Locked Rotor Amps;

FLA = Full Load Amps;

MCA = Minimum circuit ampacity (It is chosen to guarantee that the wiring will not overheat under the expected operating conditions. The MCA should not be used to determine the normal operating current, but used for selecting wire sizes) 125% of the largest motor FLA + the remaining sum.

MOP = Maximum overcurrent protection (The maximum overcurrent protection (MOP) is the maximum circuit breaker / fuse size required to properly protect the equipment under anticipated fault conditions.) 250% of the largest motor FLA + the remaining sum.(NEC rule (2.5 x FLA).)