

Eco-lution

High Performance Air to Water Heat Pump



Hydrolution
HM

Air to Water Heat Pump

50Hz
10HM01E-A-0

Air to Water Heat Pump

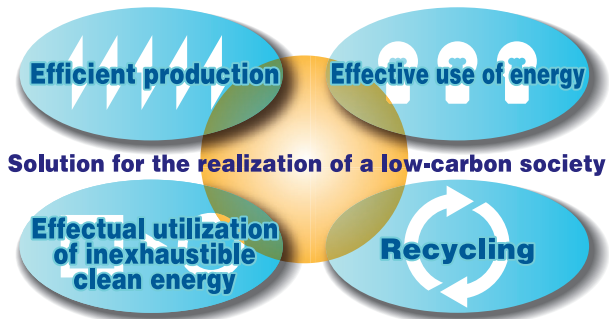
Mitsubishi Heavy Industries has integration of high technology in a variety of areas and provides comprehensive solutions for realization of a low-carbon society.

Air to water heat pump is one of our products supported by our unrivaled technology to realize utmost energy savings, safety and assurance.

Our realized contributions to global environment

Our contributions to a low-carbon society encompass the entire product life cycle from efficient production, effective use of energy, effectual utilization of inexhaustible clean energy and recycling. This is a part of our accomplishments through unique technological features.

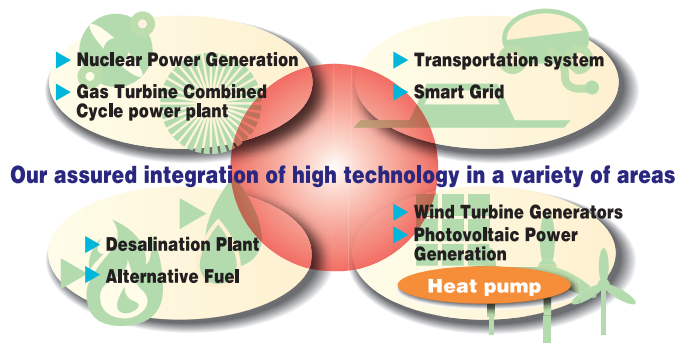
Mitsubishi Heavy Industries provides total solutions to reduce environmental load in entire social infrastructure.



Assured integration of high technology in a variety of areas

Our product portfolio covering entire social infrastructure is supported by our proven high technology. We integrate proprietary technologies which have already demonstrated its significant capabilities in their own fields to augment its effects in our total solutions. Our air to water heat pump is an innovative system developed by such integration of high technology.

Our assured integration of high technology is the mainstay of low-carbon society.

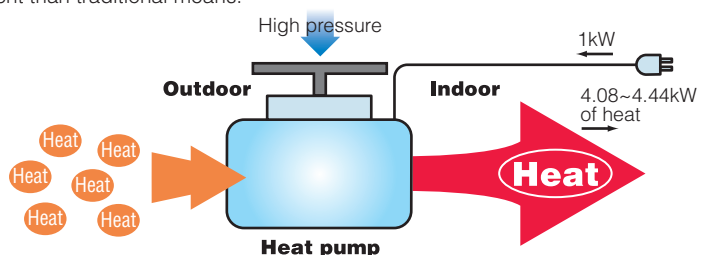


Heat pump technology for low-carbon society

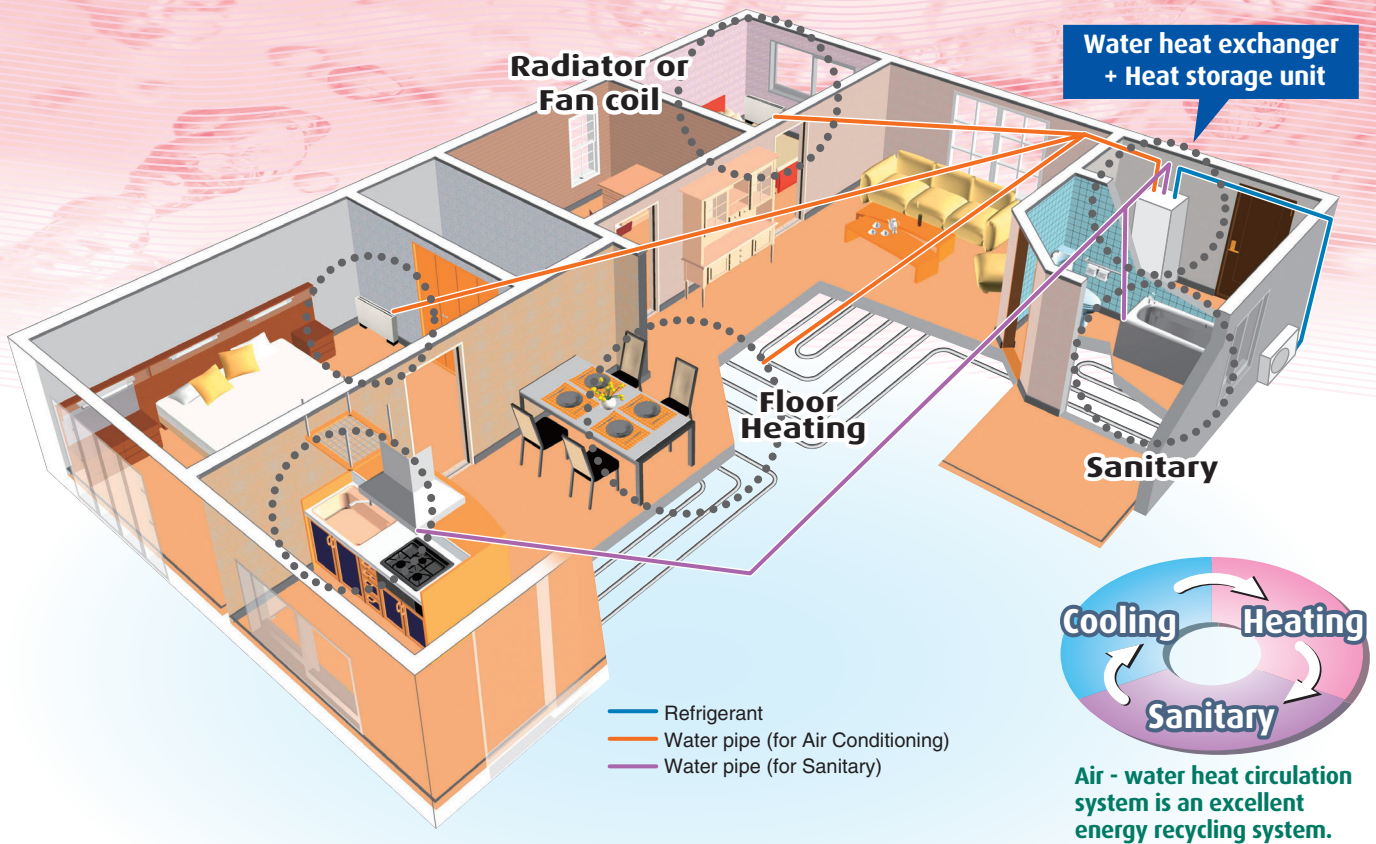
Air to water heat pump is a revolutionary energy recycling system which reduces environmental load by reusing heat energy produced in daily life. This first-rate energy saving system has been developed by our exceptional technology.

Saving running cost with use of heat pump technology

Typically less than 1kW of output heat energy can be produced by conventional oil or gas boilers. Heat pump technology is capable of producing up to 4.44kW of heat energy from 1kW of energy input making the system 4.44 times more efficient than traditional means.



Product Information

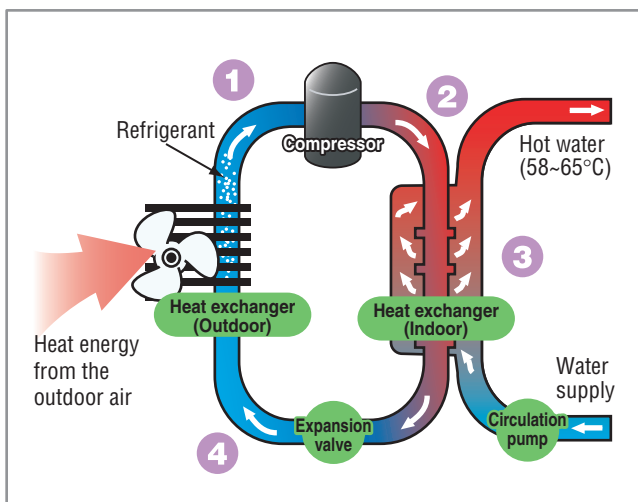


Our Air to Water Heat Pump is a complete modern system for heating, cooling and producing hot sanitary water for houses, offering effective energy saving and reducing carbon dioxide emission. Our product is safe and economical with integrated hot water heater, immersion heater, circulating pump and climate system within the indoor unit.

The heat energy is retrieved from the outdoor air through the outdoor unit, and is transferred to the indoor unit by the medium of refrigerant circulated in closed piping system.

This eliminates the needs of bore holes and coils in the ground for conventional systems.

Heat pump technology system



Our Air to Water Heat Pump is a system that can offer heating, hot sanitary water and cooling. The mechanism of heat pump during heating can be simplified as follows.

1. The outdoor unit retrieves the heat energy from the outdoor air (heat source) and increases its temperature through compressing process by compressor.
2. The hot refrigerant (now in gas state) is routed to Indoor unit.
3. The refrigerant releases the heating energy to water for further distribution in the climate system.
4. The refrigerant (now in liquid state) is routed back to the outdoor unit and this process is repeated.

By reversing the entire process for cooling, the refrigerant in this system retrieves the heat energy from water and releases it to outdoor air in accordance with heat pump theory. the indoor unit determines when the outdoor unit is to run or not to run by using the collated data from the temperature sensor. In the event of extra heat demands, the indoor unit can utilize additional heat in the form of the immersion heater, or any connected external addition.

3HP, 3.5HP

6HP



FDCW71VNX



FDCW100VNX



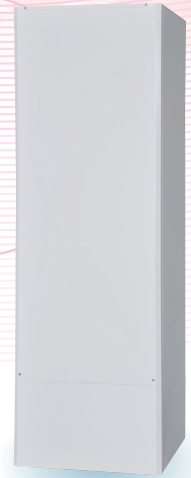
HMA100V
HMA100VM



FDCW140VNX



HMS140V

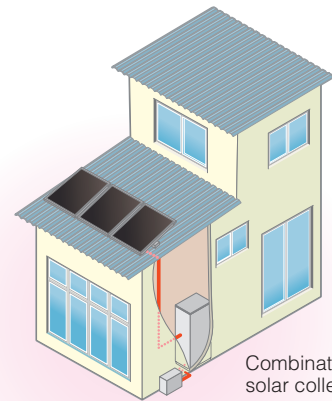


MT300

Features

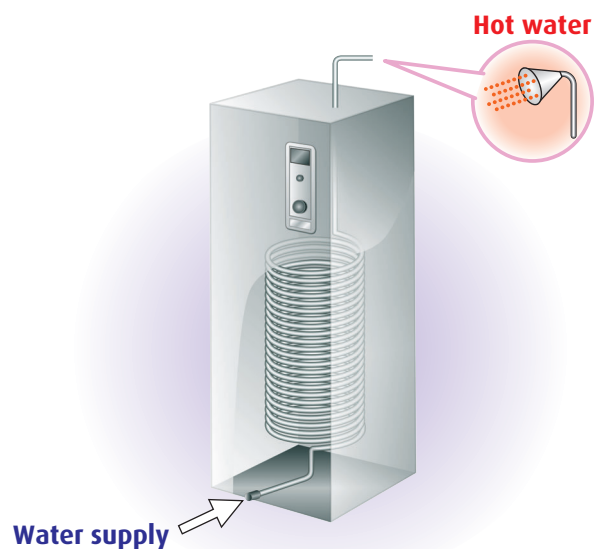
- Optimum annual operation costs thanks to the inverter driven compressor.
The speed of the compressor is controlled according to the demand, and the industries highest COP level of 4.08~4.44* in heating operation has been achieved.
(*: condition 2 on page 5)
- The compact size (600x650mm footprint) has been achieved by integrating the hot water tank for sanitary water together with the water heat exchanger in indoor unit. Electric wiring and piping works are simpler due to integrated indoor unit design.
- Max temperature flow line is 65°C with use of a large-capacity auxiliary electric heater as standard equipment for back-up so that the system will be able to cope with irregular and excessive use of hot water.
(58°C with only use of compressor)
- Various sterilization temperature settings according to the requirements of each country.
- Water supply pressure at showers and faucets to second and third floors will not drop.
By utilizing the direct incoming water supply and not using water from a storage tank water pressure and quality is maintained as well as the reduction in risk of legionella bacteria generation.

(If a third party water storage tank is used there will be a reduction of water pressure at showers and faucets when they are used at the same time.)



Combination with solar collectors

- Possible to connect external heating sources including solar collectors. Refer to our installation manual for details.



Specifications

3HP, 3.5HP, 6HP

		3HP		3.5HP		6HP
		HMA100V	HMA100VM	HMA100V	HMA100VM	HMS140V
Indoor Model		FDCW71VNX		FDCW100VNX		FDCW140VNX
Outdoor Model		FDCW71VNX		FDCW100VNX		FDCW140VNX
Power source		1 phase 230V 50Hz 3 phase 400V 50Hz	3 phase 230V 50Hz	1 phase 230V 50Hz 3 phase 400V 50Hz	3 phase 230V 50Hz	1 phase 230V 50Hz 3 phase 400V 50Hz
Heating Nominal capacity	condition 1	8.0 (3.0-8.0)		9.0 (3.5-12.0)		16.5 (5.8-16.5)
	condition 2	8.3 (2.0-8.3)		9.2 (3.5-10.5)		16.5 (4.2-17.2)
COP	condition 1	3.33		3.60		3.31
	condition 2	4.08		4.44		4.20
Cooling Nominal capacity	condition 1	7.1 (2.0-7.1)		8.0 (3.0-9.0)		–
	condition 2	10.7 (2.7-10.7)		11.0 (3.3-12.0)		16.5 (5.2-16.5)
EER	condition 1	2.68		2.81		–
	condition 2	3.35		3.62		3.59
Tapping capacity	12liter/min	270		270		–
	16liter/min	200		200		–
Operation range (Ambient temperature)	heating	–20-43*1				–
	cooling	15-43				–
Operation range (Water temperature)	heating	25-58 (65 with immersion heater)				–
	cooling	7-25				18-25
Max refrigerant pipe length	m	30		12		30
Max height difference between IU and OU	m	7				–
Indoor Unit	Height	1760 (+20-50mm, adjustable feet)				1004
	Width	600				513
	Depth	650				360
	Weight (without water in the system)	140				60
	Immersion heater	9kW 4steps				–
	Volume total	270 ±5%				–
	Volume hot water coil	14				–
	Volume expansion vessel	–				18
	Dimensions, climate system pipe	22				28
	Dimensions, hot water pipe	22				–
Water pipe connections		Compression fittings				–
Outdoor Unit	Height	595		845		1300
	Width	780 (+67 with valve cover)		970		970
	Depth	340		370 (+80 with foot rail)		370 (+80 with foot rail)
	Weight	60		74		105
	Sound Power level*2	64		64.5		71
	Sound Pressure level*2	48		50		54
	Airflow	50		73		100
	Type of compressor	Rotary				–
	Ref control	EEV				–
	Refrigerant volume (pipe length without additional charge)	kg (m)	2.55 (15)		2.9 (12)	
Dimensions, refrigerant pipe	mm(inches)	Gas pipe : OD 15.88 (5/8"), Liquid pipe : OD 9.52 (3/8")				–
Ref pipe connections		Flare				–

Tank Unit (for HMS140V only)

Model		HT30	MT300	MT500
Power source		1 phase 230V / 3 phase 400V 50Hz		
Volume		30	300	500
Volume hot water coil		–	14	21
Tapping capacity	12liter/min	–	320	To be determined
	16liter/min	–	230	To be determined
Immersion heater		9kW 4steps		
Height		358	1880	1695
Width		593	597	759
Depth		360	598	879
Weight		23	110	131
Dimensions, climate system pipe		25.4 (1")		28
Dimensions, hot water pipe		25.4 (1")		

Test conditions

		Water Temperature	Ambient Temperature
Heating	condition 1	45°C out / 40°C in	7°C DB / 6°C WB
	condition 2	35°C out / 30°C in	
Cooling	condition 1	7°C out / 12°C in	35°C DB
	condition 2	18°C out / 23°C in	
Tapping		40°C out / 15°C in	7°C DB / 6°C WB

*1 : According to the outdoor air temperature and installation condition, it is required to use wind guard for outdoor unit. Refer to Technical manual for details.

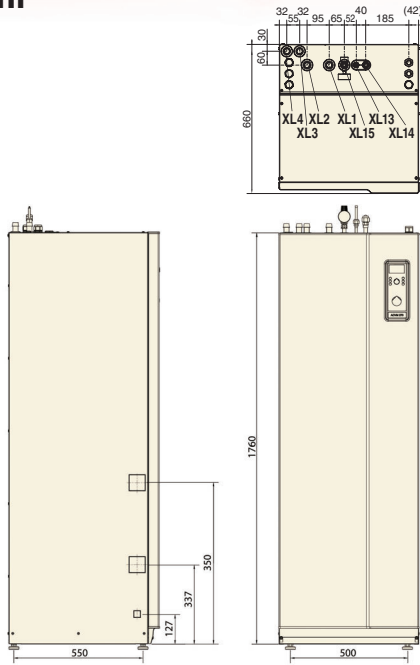
*2 : Test condition for sound pressure level

Temperature condition : Heating condition 1

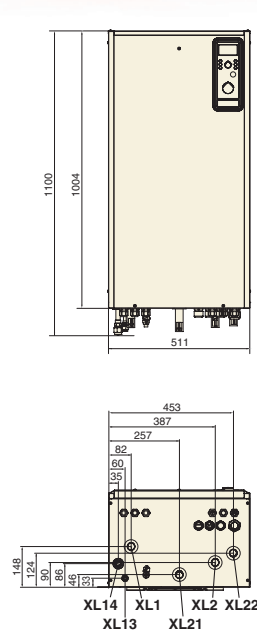
MIC position : 1m away in front of outdoor unit at the height of 1m

Dimensions

Indoor unit 3HP, 3.5HP

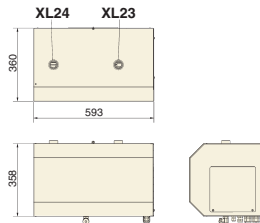


6HP

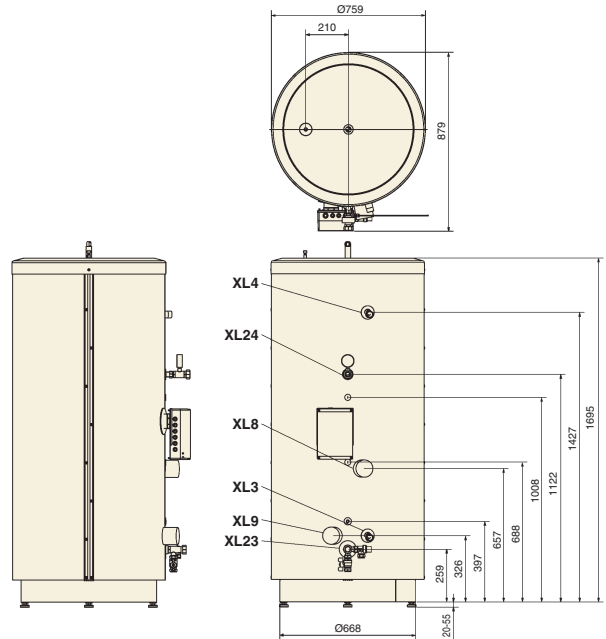


Mark	Item	3HP/3.5HP	6HP
XL1	Climate system supply	22mm	28mm
XL2	Climate system return	22mm	28mm
XL3	Cold water	22mm	—
XL4	Hot water	22mm	—
XL13	Liquid line refrigerant	3/8"	3/8"
XL14	Gas line refrigerant	5/8"	5/8"
XL21	Tank circuit supply	—	28mm
XL22	Tank circuit return	—	28mm

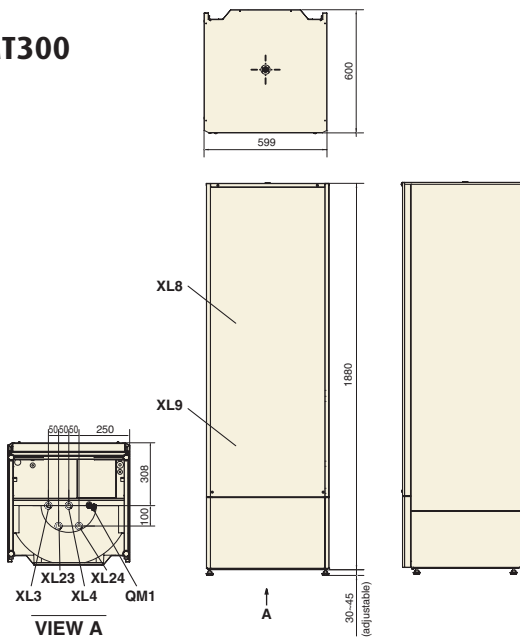
Tank for indoor unit (6HP) HT30



MT500

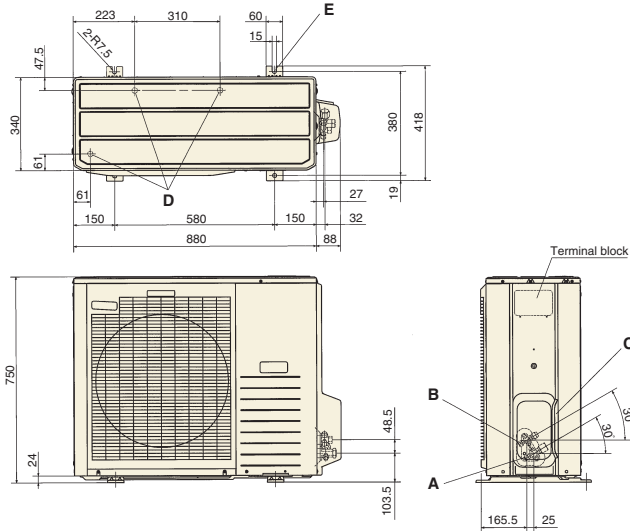


MT300

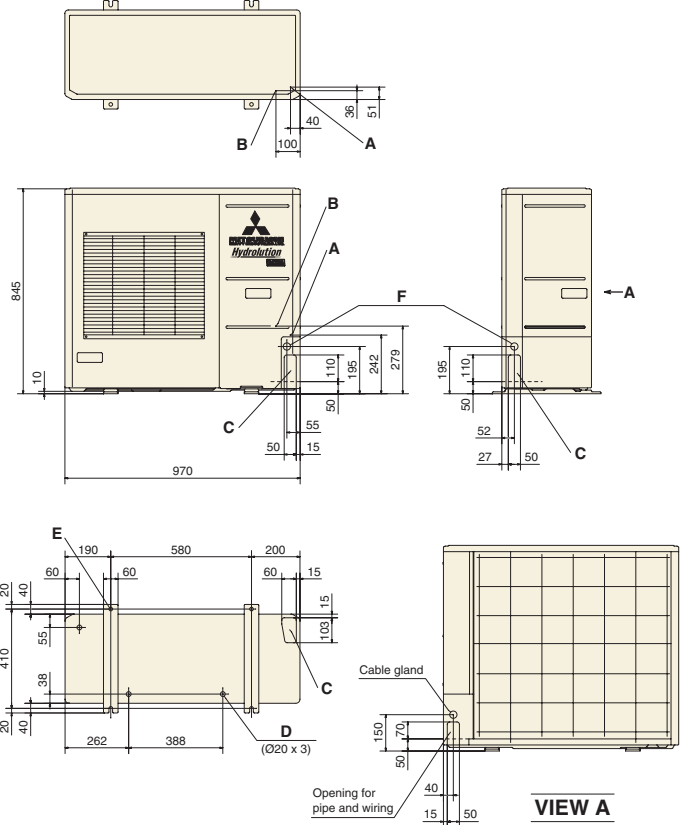


Mark	Item	HT30	MT300	MT500
XL3	Cold water	—	G1 ext.(1")	G1 ext.(1")
XL4	Hot water	—	G1 ext.(1")	G1 ext.(1")
XL8	External heat source in	—	R1 int	G1 int
XL9	External heat source out	—	R1 int	G1 int
XL23	Circulation supply	G1 ext.(1")	G1 ext.(1")	28mm
XL24	Circulation return	G1 ext.(1")	G1 ext.(1")	28mm

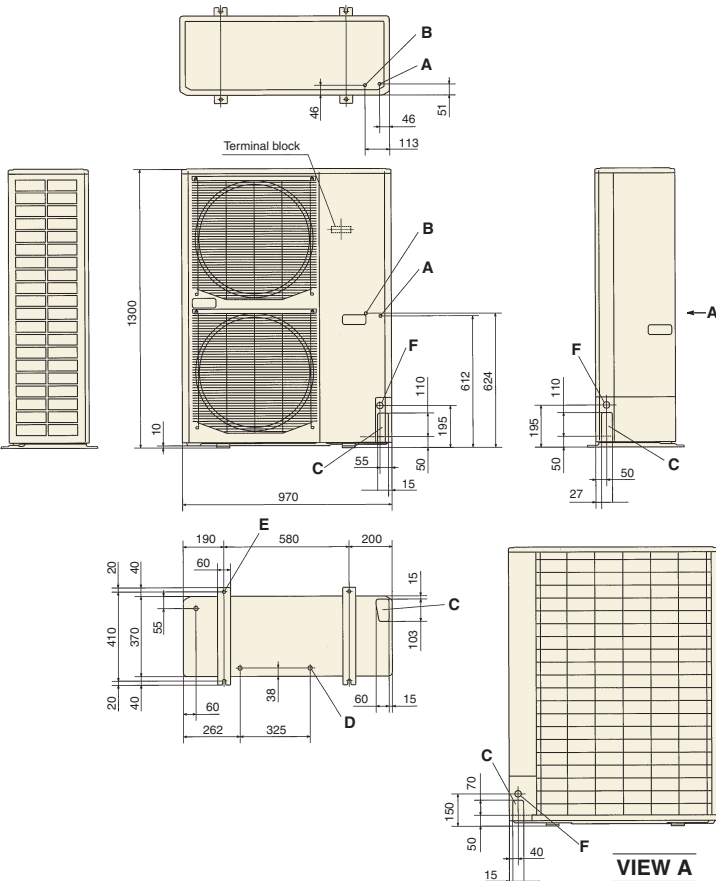
Outdoor unit 3HP



3.5HP



6HP



Mark	Item	3HP / 3.5HP	6HP
A	Service valve connection (gas side)	ø15.88(5/8") (Flare)	
B	Service valve connection (liquid side)	ø9.52(3/8") (Flare)	
C	Pipe/cable draw-out hole		
D	Drain discharge hole	ø20x3places	
E	Anchor bolt hole	M10x4places	
F	Cable draw-out port	ø30.3x3places	ø30(front) ø45(side) ø50(back)

- Notes:
- (1) It must not be surrounded by walls on the four sides.
 - (2) The unit must be fixed with anchor bolts. An anchor bolt must not protrude more than 15mm.
 - (3) Where the unit is subject to strong winds, lay it in such a direction that the blower outlet faces perpendicularly to the dominant wind direction.
 - (4) Leave 1m or more space above the unit.
 - (5) A wall in front of the blower outlet must not exceed the units height.
 - (6) The model name label is attached on the lower right corner of the front panel.

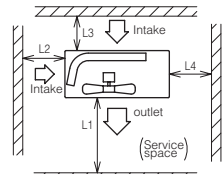
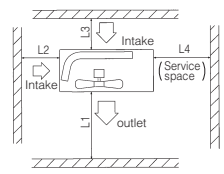
Minimum installation space

3HP

Examples of installation	1	2	3
Dimensions			
L ₁	Open	Open	500
L ₂	300	250	Open
L ₃	100	150	100
L ₄	250	250	250

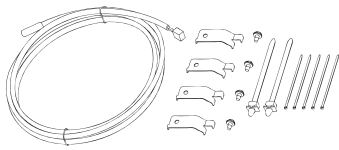
3.5HP/6HP

Examples of installation	1	2	3
Dimensions			
L ₁	Open	Open	500
L ₂	300	5	Open
L ₃	150	300	150
L ₄	5	5	5



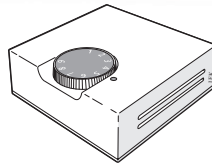
Accessories

Drain Pan heater



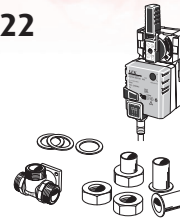
Drain pan heater to a outdoor unit for operation in colder climates
Part no. PCZ006A033

MH-RG 10



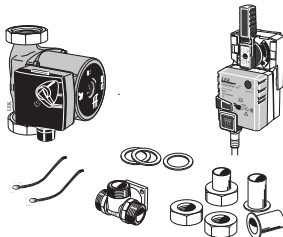
Room sensor
Part no. MCD291A001

VCC22



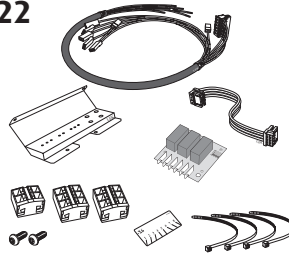
Reversing valve for changing operation of cooling and heating
Part no. MCD291A002

ESV22



Extra mixing valve group for adjusting temperature in heating operation
Part no. MCD291A003

ACK22



Cable kit for ESV 22 or VCC 22
Part no. MCD291A004

Before starting use

Before use

In order to get the greatest benefit from Our Air to Water Heat Pump, read thoroughly the User's manual.

Places

Do not install in places where combustible gas could leak or where there are sparks.
Keep away from places where combustible gas could be generated, flow or accumulate, or locations containing carbon fibers otherwise there is a danger of fire.

Installation

Installation must be carried out in accordance with current norms and directives.

Current regulations require the inspection of installation before commissioning and the inspection must be carried out by suitable qualified personnel and should be documented.

Improper installation will lead to water leakage, electric shocks, fires and other serious problems.

Make sure that the indoor unit and the outdoor unit are stable in installation and fixed on stable base.



Japan Head Office:

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ISO9001

Our Air Conditioning & Refrigeration Systems Headquarters is an ISO9001 approved factory for residential air conditioners and commercial-use air conditioners (including heat pumps).



BIWAJIMA PLANT
Mitsubishi Heavy Industries, Ltd.
Air-conditioning & Refrigeration Systems Headquarters
Certified ISO 9001
Certificate number: JGA-0709



MITSUBISHI HEAVY INDUSTRIES-
MAHAJAK AIR CONDITIONERS CO., LTD.
Certified ISO 9001
Certificate Number: 041100-1998-0813

ISO14001

Our Air Conditioning & Refrigeration Systems Headquarters has been assessed and found to comply with the requirements of ISO14001.



BIWAJIMA PLANT
Mitsubishi Heavy Industries, Ltd.
Air-conditioning & Refrigeration Systems Headquarters
Certified ISO 14001
Certificate number: JGA-EM0256



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MAHAJAK AIR CONDITIONERS CO., LTD.
Certified ISO 14001
Certificate Number: 041104-1998-0813.E5

