MITSUBISHI HEAVY INDUSTRIES, LTD.

Our Technologies, Your Tomorrow

R410A

2013

Eco·lution

High Performance Air to Water Heat Pump

Hydrolution HM

Air to Water Heat Pump

50Hz

13HM01E

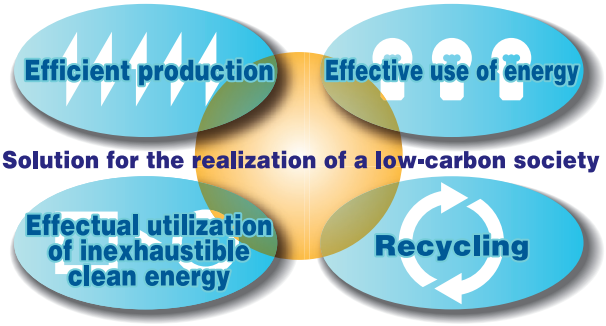
Air to Water Heat Pump

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.

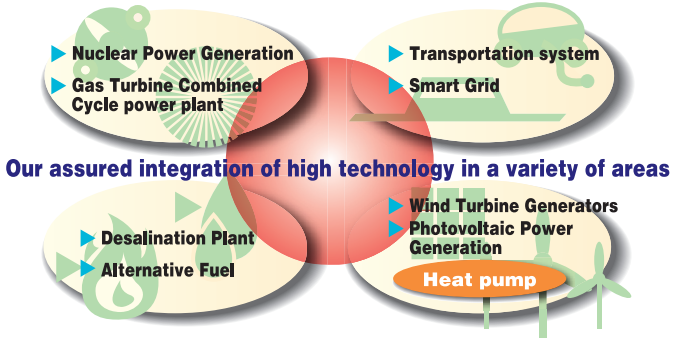
Mitsubishi Heavy Industries provides total solutions to reduce environmental load in entire social infrastructure.



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.

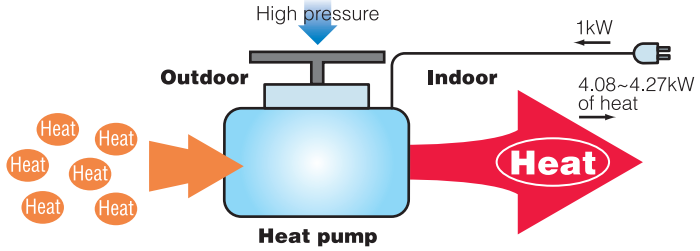


Heat pump technology for low-carbon society

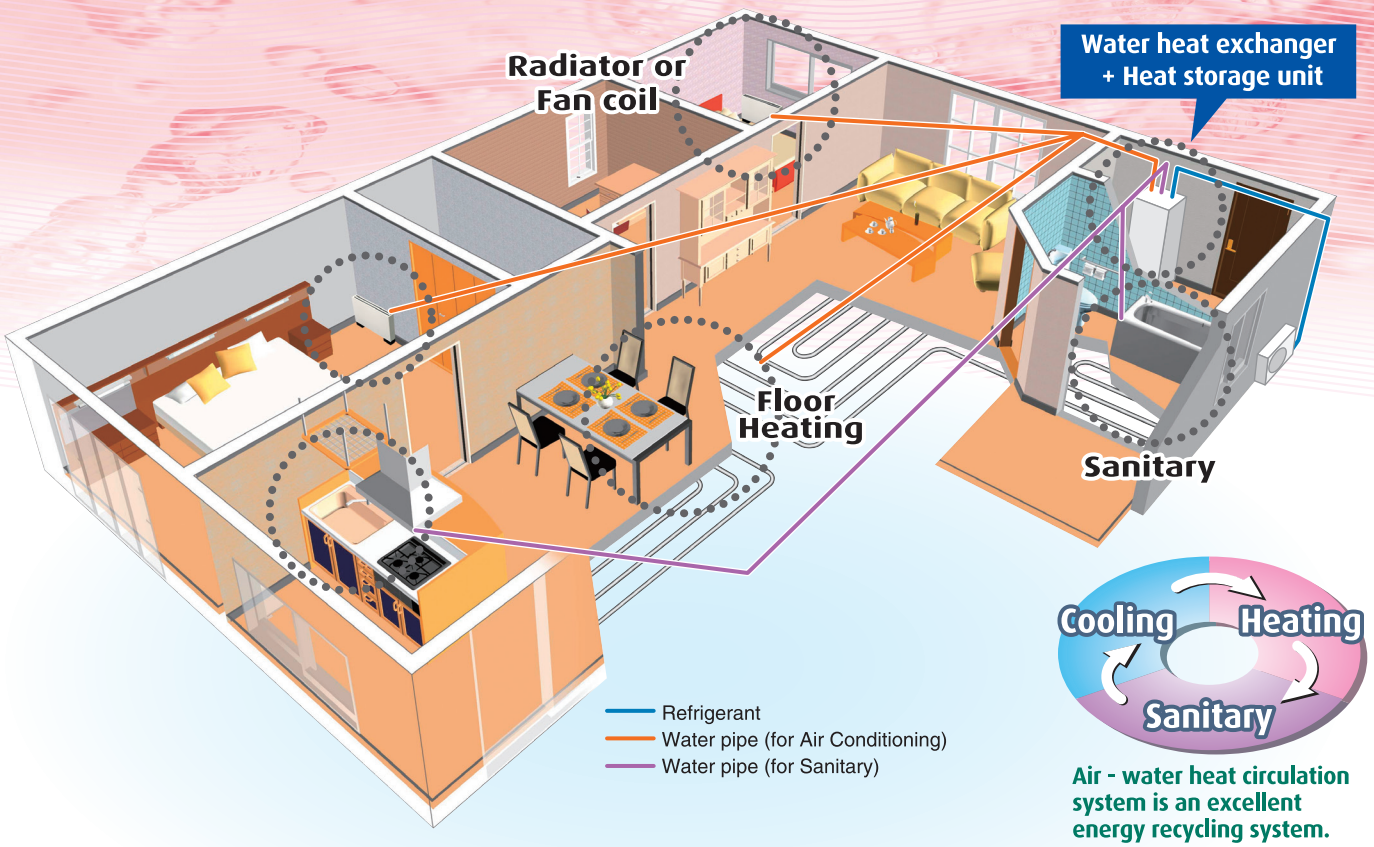
Air to water heat pump is a revolutionary energy recycling system which reduces environmental load by reusing heat energy produced in daily life.
This first-rate energy saving system has been developed by our exceptional technology.

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 4.27kW of heat energy from 1kW of energy input making the system 4.27 times more efficient than traditional means.



Product Information

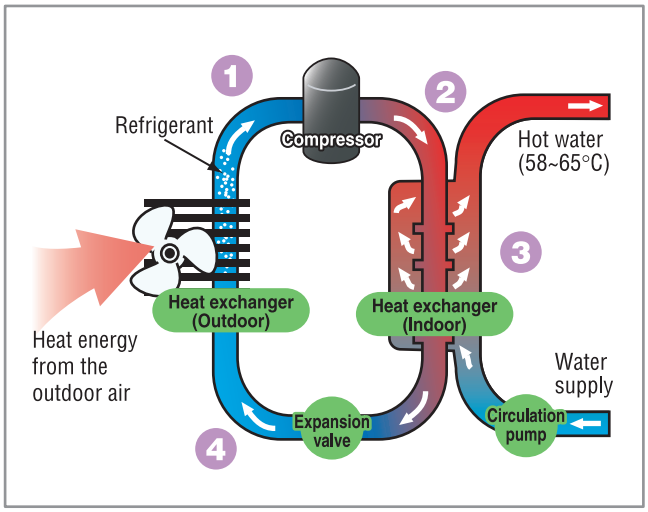


Air - water heat circulation system is an excellent energy recycling system.

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

Outdoor unit

FDCW71VNX-A

FDCW100VNX-A

Indoor unit

HMA100V1/V2
HMA100VM1

6HP

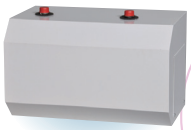
Outdoor unit

FDCW140VNX-A

Indoor unit

HMS140V1/V2
HMS140VA1/VA2

Tank unit



HT30

MT300

MT500

Features

• Energy saving

Optimum annual operation costs thanks to the inverter driven compressor.
The speed of the compressor is controlled according to the demand resulting in the industries highest COP level of 4.08~4.27* in heating operation.
(*: condition 2 on page 5)

• Integrated design

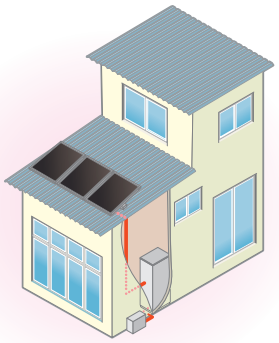
The compact size (600 x 650mm footprint) has been achieved by intergrating the hot water tank for sanitary water use together with the water heat exchanger within the indoor unit (HMA100V1/V2 and HMA100VM1 only). Electrical and piping work is simpler due to the intergrated design.

• 65˚C hot water

Max temperature flow line is 65˚C with the use of an auxiliary electric heater (as standard) used for hot water back-up and to cope with irregular and excessive hot water demand.
(58°C with only use of compressor)

• External heating

Possible to connect external heating sources including solar collectors. Refer to our installation manual for details.
(except HT30)



Combination with solar collectors

• Drain pan heater

Condensate from the heat pump during heating operation (especially in cold regions) accumulates and freezes within the outdoor unit resulting in insufficient heating capacity or damage to the heat exchanger. Our units have a drain pan heater included as standard preventing condensate from freezing and protecting the heat exchanger in cold conditions.

• Sterilization

Various sterilization temperature settings according to the requirements of each country.

• Water supply pressure

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.)

• Silent mode

Silent mode function can reduce the sound level from the outdoor unit in the heating mode by reducing compressor and fan speed. ON/OFF timer operation can be set with a remote control.

Specifications

			3HP		3.5HP		6HP	
Indoor Model			HMA100V1 HMA100V2	HMA100VM1	HMA100V1 HMA100V2	HMA100VM1	HMS140VA1 HMS140VA2	HMS140V1 HMS140V2
Outdoor Model			FDCW71VNX-A		FDCW100VNX-A		FDCW140VNX-A	
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	kW	8.0 (3.0-8.0)		9.0 (3.5-11.0)		16.0 (5.8-16.0)	
	condition 2	kW	8.3 (2.0-8.3)		9.2 (3.5-10.0)		16.0 (4.2-16.0)	
COP	condition 1		3.33		3.44		3.31	
	condition 2		4.09		4.28		4.20	
Cooling Nominal capacity	condition 1	kW	7.1 (2.0-7.1)		8.0 (3.0-9.0)		11.8 (3.1-11.8)	–
	condition 2	kW	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		2.65	–
	condition 2		3.35		3.62		3.78	3.59
Tapping capacity	12liter/min	liter	270		270		–	
	16liter/min	liter	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					
Max height difference between IU and OU		m	7					
Indoor Unit	Height	mm	1,760 (+20 - 50mm, adjustable feet)				1,004	
	Width	mm	600				513	
	Depth	mm	650				360	
	Weight (without water in the system)	kg	140				60	
	Immersion heater		9kW 4steps				–	
	Volume total	liter	270 ±5%				–	
	Volume hot water coil	liter	14				–	
	Volume expansion vessel	liter	–				18	
	Dimensions, climate system pipe	mm	22				28	
	Dimensions, hot water pipe	mm	22				–	
	Water pipe connections		Compression fittings					
Outdoor Unit	Height	mm	595		845		1,300	
	Width	mm	780 (+67 with valve cover)		970		970	
	Depth	mm	340		370 (+80 with foot rail)		370 (+80 with foot rail)	
	Weight	kg	60		74		105	
	Sound Power level*2	dB(A)	64		64.5		71	
	Sound Pressure level*2	dB(A)	48		50		54	
	Airflow	m^3/min	50		73		100	
	Type of compressor		Rotary					
	Ref control		EEV					
	Refrigerant volume*3 (pipe length without additional charge)	kg (m)	2.55 (15)		2.9 (12)		4.0 (15)	
	Dimensions, refrigerant pipe	mm(inches)	Gas pipe: OD 15.88 (5/8"), Liquid pipe: OD 9.52 (3/8")					
	Ref pipe connections		Frare					

*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 2
MIC position: 1m away in front of outdoor unit at the height of 1m
*3 R410A refrigerant contained in the products is a fluorinated greenhouse gas listed in Regulation (EU) No 517/2014.

Tank Unit (for HMS140VA1/VA2, HMS140V1/V2 only)

Model			HT30	MT300	MT500
Power source			1phase 230V / 3phase 400V 50Hz		
Volume		liter	30	300	500
Volume hot water coil		liter	–	14	21
Tapping capacity	12liter/min	liter	–	320	960
	16liter/min	liter	–	230	560
Immersion heater		kW	9kW 4steps		
Height		mm	358	1,880 (+20~45mm)	1,695 (+20~55mm)
Width		mm	593	600	759
Depth		mm	360	600	879
Weight		kg	23	110	131
Dimensions, climate system pipe		mm(inch)	25.4(1")		28
Dimensions, hot water pipe		mm(inch)	–	25.4(1")	

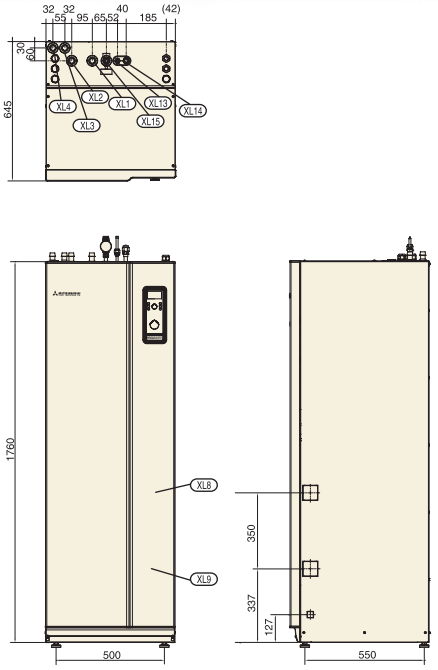
Test conditions

		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

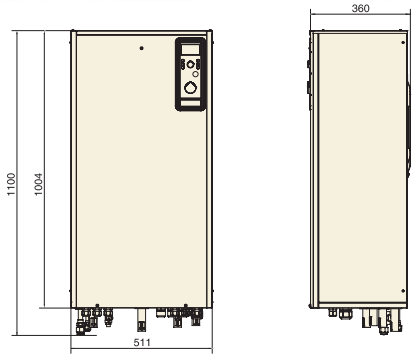
Dimensions

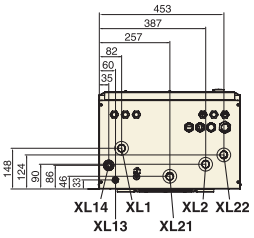
Indoor unit

HMA100V1/V2, 100VM1(3HP, 3.5HP)



HMS140VA1/VA2, 140V1/V2(6HP)

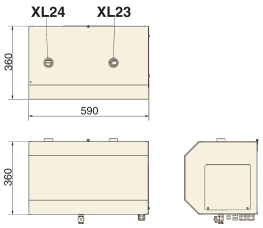




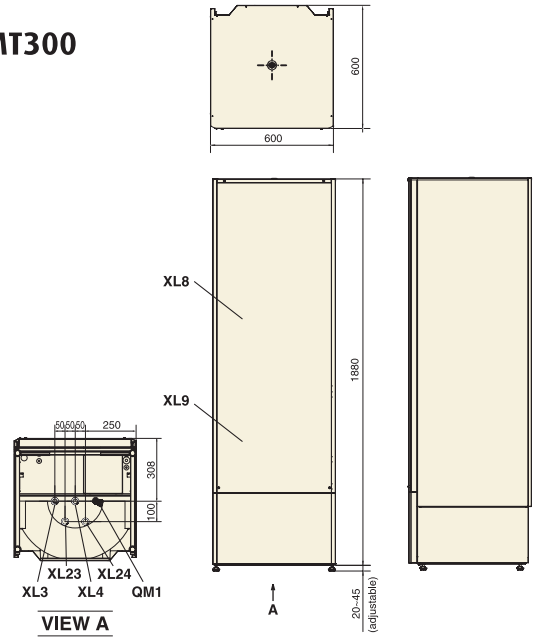
Mark	Item	3HP/3.5HP	6HP
XL1	Climate system supply	22mm	28mm
XL2	Climate system return	22mm	28mm
XL3	Cold water	22mm	—
XL4	Hot water	22mm	—
XL13	Liquid line refrigerant	3/8"	3/8"
XL14	Gas line refrigerant	5/8"	5/8"
XL21	Tank circuit supply	—	28mm
XL22	Tank circuit return	—	28mm

Tank for indoor unit (6HP)

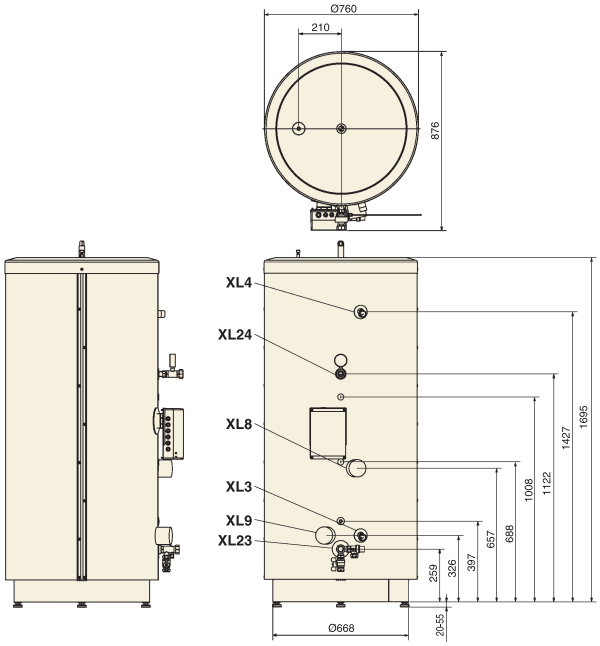
HT30



MT300



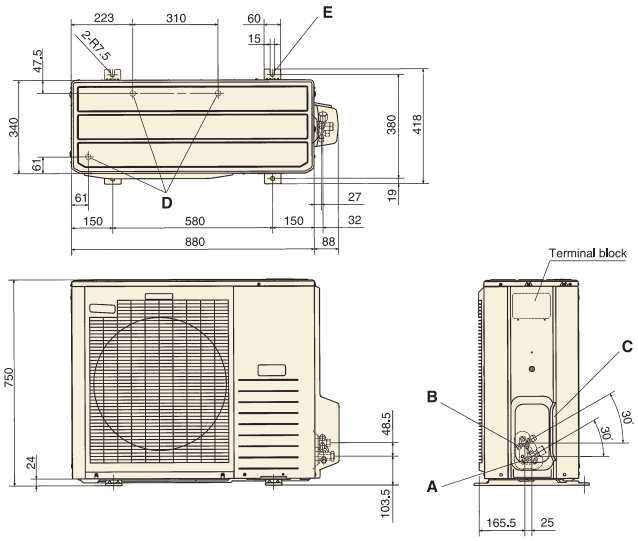
MT500



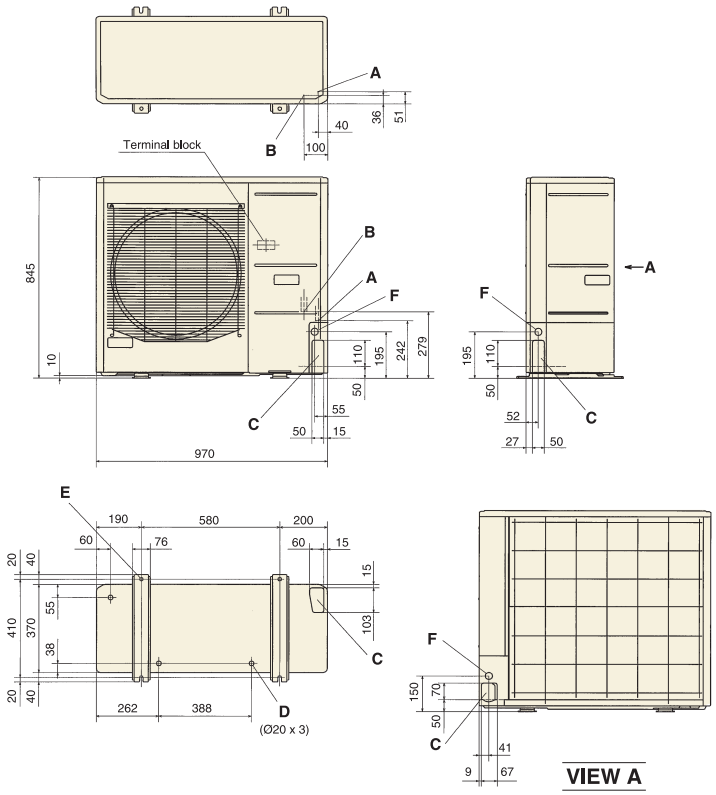
Mark	Item	HT30	MT300	MT500
XL3	Cold water	—	G1 ext.(1")	G1 ext.(1")
XL4	Hot water	—	G1 ext.(1")	G1 ext.(1")
XL8	External heat source in	—	R1 int	G1 int
XL9	External heat source out	—	R1 int	G1 int
XL23	Circulation supply	G1 ext.(1")	G1 ext.(1")	28mm
XL24	Circulation return	G1 ext.(1")	G1 ext.(1")	28mm

Outdoor unit

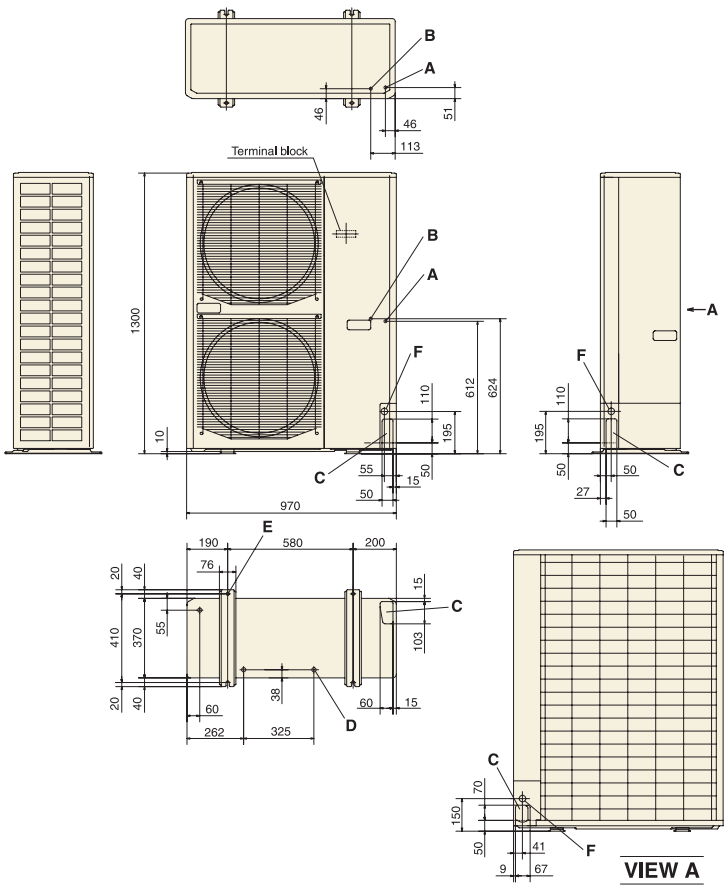
FDCW71VNX-A(3HP)



FDCW100VNX-A(3.5HP)



FDCW140VNX-A(6HP)



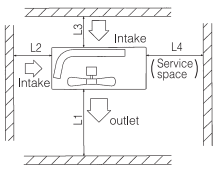
Mark	Item	3HP / 3.5HP	6HP
A	Service valve connection (gas side)	ø15.88(5/8") (Flare)	
B	Service valve connection (liquid side)	ø9.52(3/8") (Flare)	
C	Pipe/cable draw-out hole		
D	Drain discharge hole	ø20x3places	
E	Anchor bolt hole	M10x4places	
F	Cable draw-out port	ø30.3x3places	ø30(front) ø45(side)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

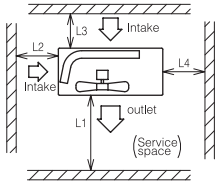
3HP

Dimensions \ Examples of installation	1	2	3
L_1	Open	Open	500
L_2	300	250	Open
L_3	100	150	100
L_4	250	250	250



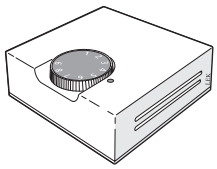
3.5HP/6HP

Dimensions \ Examples of installation	1	2	3
L_1	Open	Open	500
L_2	300	5	Open
L_3	150	300	150
L_4	5	5	5



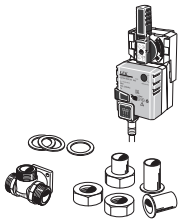
Accessories

MH-RG10



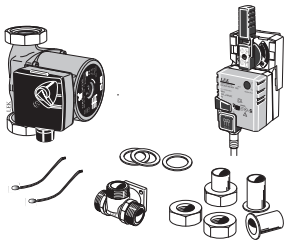
Room sensor
Part No. MCD291A001

VCC22 for HMA100
VCC28 for HMS140



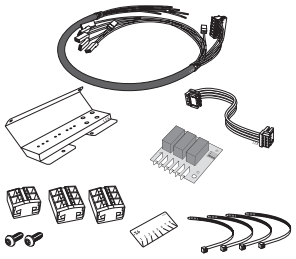
Reversing valve for changing operation of cooling and heating
Part No. MCD291A002(VCC22)
MCD291A005(VCC28)

ESV22 for HMA100
ESV28 for HMS140



Extra mixing valve group for adjusting temperature in heating operation
Part No. MCD291A003(ESV22)
MCD291A006(ESV28)

ACK22 for VCC22/ESV22
ACK28 for VCC28/ESV28



Cable kit
Part No. MCD291A004(ACK22)
MCD291A007(ACK28)

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.

MITSUBISHI HEAVY INDUSTRIES, LTD.

Mitsubishi Heavy Industries, Ltd.
Air-Conditioning & Refrigeration Systems Headquarters
16-5, Konan 2-chome, Minato-ku, Tokyo, 108-8215 Japan
http://www.mhi.co.jp

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 : JQA-0709

MITSUBISHI HEAVY INDUSTRIES-MAHAJAK AIR CONDITIONERS CO., LTD.
Certified ISO 9001
Certificate Number : 04100 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 : JQA-EM0256

MITSUBISHI HEAVY INDUSTRIES-MAHAJAK AIR CONDITIONERS CO.,LTD.
Certificate Number : 04104 1998 0813 E5

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