

MOVE THE WORLD FORWARD  MITSUBISHI
HEAVY
INDUSTRIES
GROUP

HYDROLUTION



 **MITSUBISHI HEAVY INDUSTRIES
AIR CONDITIONING EUROPE**



HEATING



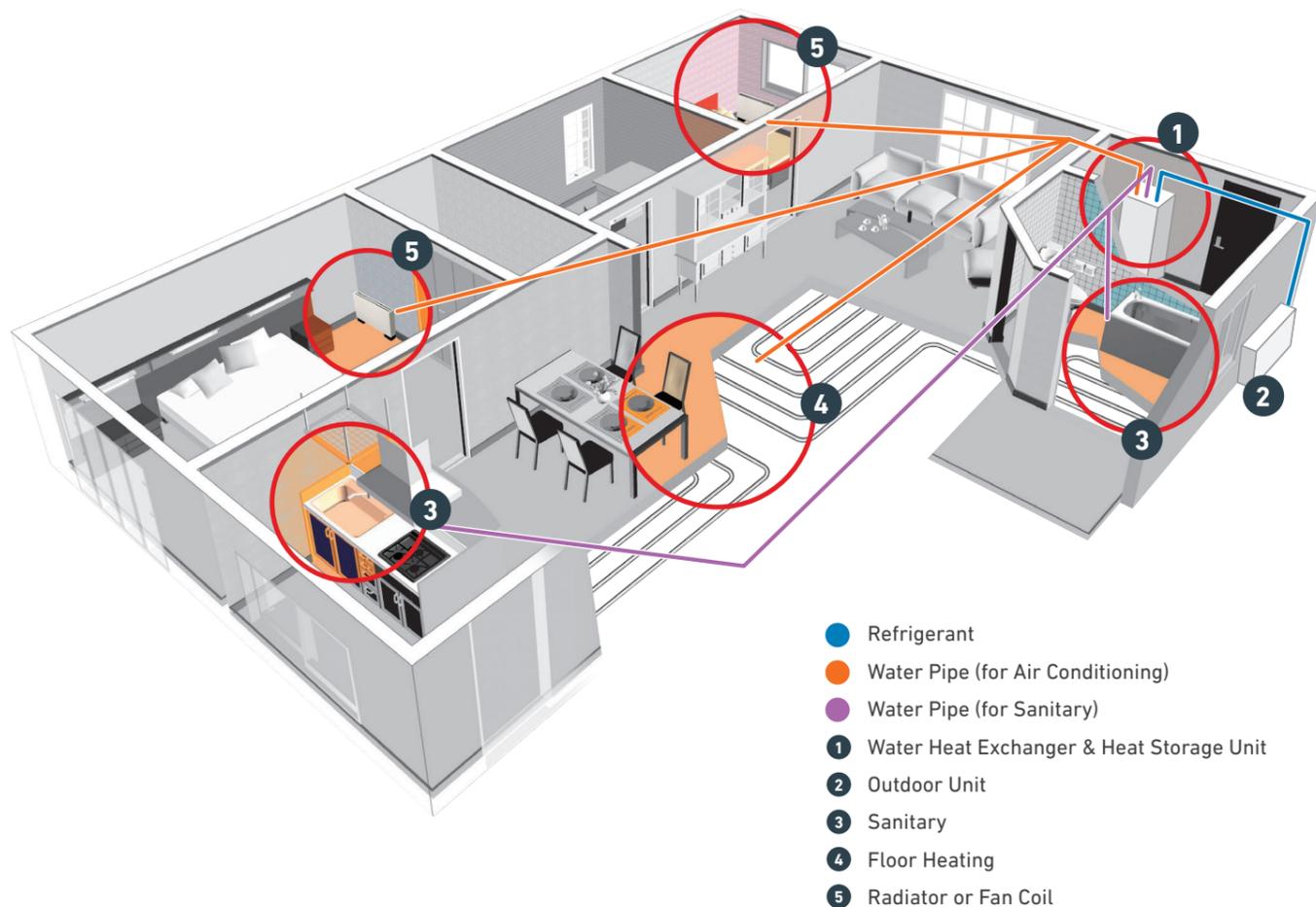
HOT SANITARY



COOLING

WHY A MHI HEAT PUMP?

Mitsubishi Heavy Industries 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.



WHY A MHI HEAT PUMP?



Mitsubishi Heavy Industries utilises its 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 unrivalled technology to realise utmost energy savings, safety and assurance.

- 1 Our recognised contribution 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.
- 2 Our assured integration of high technology is the mainstay of a low carbon society.**
We have assured integration of high technology in a variety of areas including new clear power generation, transportation systems, desalination plants, and wind turbine generators. Our product portfolio covering entire social infrastructure is supported by our proven high technology. We integrate proprietary technologies which have already demonstrated their own significant capabilities in their fields to enhance the effect in our total solutions. Our air to water heat pump is an innovative system developed by using integration of high technology.

- 3 Heat pump technology for a low-carbon society**
Air to water heat pumps are 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.
- 4 Saving running costs 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 5.32kW of heat energy from 1kW of energy input making the system 5.32 times more efficient than traditional means.

BENEFITS OF HYDROLUTION

Our heat pump is a complete modern system for heating and cooling room air and producing sanitary hot water. It absorbs 'free' heat from outdoor air and amplifies it to generate ideal temperatures and hot water swiftly and efficiently.

ENERGY SAVING

Optimum annual operation costs are achieved thanks to the inverter driven compressor. The speed of the compressor is controlled according to the demand resulting in the highest COP levels of 4.09~5.42* in heating operation and is in accordance with Lot 1 energy class.

*Condition 2 on page 9

HIGH EFFICIENCY

The compressor is designed to be efficient even at low ambient temperatures (down to -20°C) in order to be able to withstand the toughest winter climates.

INTEGRATED DESIGN

The compact size has been achieved by integrating the hot water tank for sanitary water use together with the water heat exchanger within the indoor units (HMA 60-S and HMA 100-S only). Electrical and piping work is simpler due to the integrated design.

65°C HOT WATER

Maximum flow line temperature is 65°C with the use of an auxiliary electric heater used for hot water back-up and to cope with irregular and excessive hot water demand. The heat pump can keep producing the temperature of 58°C hot water without an auxiliary electric heater and can still produce this even at ambient temperatures between -20-43°C.

SILENT MODE

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

Sound pressure level at 5m is 35 dB(A).

INTERNET CONNECTION

Customers can get a brief overview and the status of the MHI heat pump and the heating system remotely. It allows customers to control heating and hot water production.

NEXT GENERATION REFRIGERANT R32

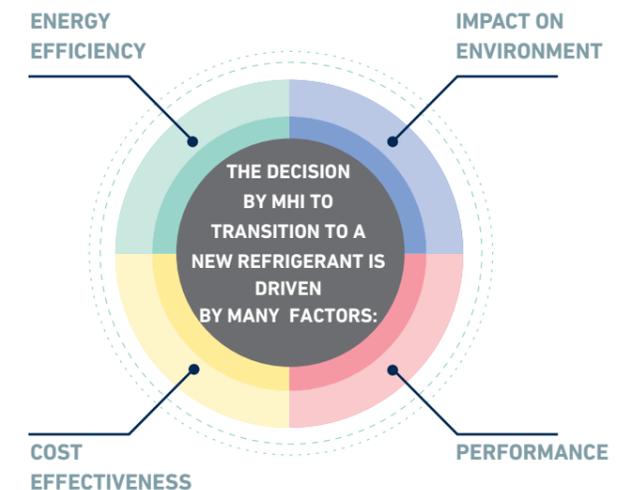
R32 REFRIGERANT



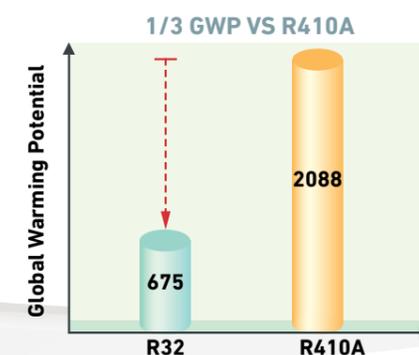
This next generation refrigerant boasts nearly 70% lower Global Warming Potential rate than R410A. Due to its superior qualities, R32 offers amazing energy efficiency benefits. It has a potential refrigerating effect that is 1.5 times that of R410A, meaning that it needs less energy to achieve the desired temperatures and requires less refrigerant volumes to operate.

BENEFITS OF R32

- 1 Low Global Warming potential and Superior Energy Efficiency
- 2 Zero Ozone Depletion
- 3 Easy to recycle
- 4 It complies with F-Gas
- 5 Single component, easy to handle refrigerant
- 6 Already used in air conditioning systems and heat pumps worldwide
- 7 It requires up to 13% less charge compared to R410A



LOW GLOBAL WARMING



GWP values based on IPCC 4th Assessment report

REDUCED REFRIGERANT CHARGE



SPECIFICATIONS

Mitsubishi Heavy Industries air to water heat pumps are a complete modern system for heating, cooling and producing hot sanitary water for living, offering effective energy saving.



Indoor Unit (HMA)

- Flexible all in one indoor module for heating, cooling and hot water
- Upgrading existing heating systems or new builds with requirements for high hot water performance
- Equipped with a capacity of 180 litres of heated domestic water heater
- Integrated expansion vessel (10L)
- Has a built in condenser, as well two diverting valves (one of heating and cooling, the other for heating and hot water)
- Integrated electrical heater for backup
- Extra additional heat connection (eg: gas boiler, oil boiler).
- Integrated controller (advanced version)
- Available only in R410A version.

Outdoor Unit

- FDCW60VNX-W **NEW**
- MHI high quality outdoor unit using low GWP refrigerant - R32
- Available only in 6kW version as a flexible combination (connectable to split box)
- Silent mode range expanded assuring sound pressure level of 35 db(A) at 5 meters
- Improved piping height from 7 to 20 meter
- Very energy efficient with a wide operation range
- Latest inverter & DC twin rotary compressor technology
- Compact design for easy installation
- Built in drain pan heater to improve defrost
- Blue coated fin for heat exchanger to prevent corrosion.

Advanced Controllers

RC-HY20-W, RC-HY40-W

Easy Operation: Advanced user friendly controller, which have large multicolor displays. It shows information about the status of the units.
 RC-HY20-W: Base version without extension module.
 RC-HY40-W: Advanced version with extension module. Room sensor and current sensor with cascade heat pump control function



Monitor and Control: The controller is compatible with myUpway, which is the internet function giving you a quick over view and presents the status of the installed units in order to monitor and manage the entire system. If an error occurs users will receive an email notification.

Tank Unit

- Storage tank with coil designed to store hot sanitary water.
- Temperature indicator allows user to read and control water temperature in the tank
- Large heating surface of the coil provides high hot utility water efficiency
- Manages water pressure up to 10 bar

Split Box

- Built in condenser
- Easy installation by use of wall bracket
- Good for flexible applications

Our domestic air-to-water heat pump range offers a complete modern system for heating, cooling and producing hot sanitary water for houses.

Thanks to the integration of a hot water heater, immersion heater, circulating pump and climate system within the indoor unit, the Hydrolution range is one of the safest, most economical and environmentally friendly options available today.



SPECIFICATIONS

All-in-one combination

Indoor Model		HMA 60-S NEW		HMA 100-S NEW		HMA 100-S NEW		
Outdoor Model		FDCW60VNX-A		FDCW71VNX-A		FDCW100VNX-A		
Power source		400V 3N AC (230V single-phase) 50Hz		400V 3N AC (230V single-phase) 50Hz		400V 3N AC (230V single-phase) 50Hz		
Heating Nominal capacity	condition 1	kW	2.28 (0.50 - 8.00)	8.0 (3.0 - 8.0)	9.0 (3.5 - 11.0)			
	condition 2	kW	2.67 (0.50 - 7.40)	8.3 (2.0 - 8.3)	9.2 (3.5 - 10.0)			
COP	condition 1		3.62	3.33	3.44			
	condition 2		5.32	4.09	4.28			
Cooling Nominal capacity	condition 1	kW	4.86 (0.80 - 6.00)	7.1 (2.0 - 7.1)	8.0 (3.0 - 9.0)			
	condition 2	kW	7.03 (1.20 - 7.80)	10.7 (2.7 - 10.7)	11.0 (3.3 - 12.0)			
EER	condition 1		2.64	2.68	2.81			
	condition 2		3.52	3.35	3.62			
Seasonal Space Heating *1 Energy Efficiency Class (W55/W35)			A++/A++	A+/A+	A++/A++			
Water Heating Energy Efficiency Class *1			A	A	A			
Seasonal Space Heating Energy Efficiency (W55/W35) *1		%	188/138	149/119	165/126			
Water Heating Energy Efficiency *1		%	89	99	98			
Seasonal Space Heating Energy *1 *2 Efficiency Class of package (W55/W35)			A++/A+++	A+/A++	A++/A++			
Seasonal Space Heating Energy *1 *2 Efficiency of package (W55/W35)			192/142	153/123	169/130			
Operation range (Ambient temperature)		heating	-20° - 43°C					
		cooling	15° - 43°C					
Operation range (Water temperature)		heating	25- 58°C (65°C, with immersion heater)					
		cooling	7-25°C					
Max refrigerant pipe length		m	30					
Max height difference between IU and OU		m	7					
Indoor unit	Height x Width x Depth		mm	1600(+ 40 max) x 600 x 610	1600(+ 40 max) x 600 x 610	1600(+ 40 max) x 600 x 610		
	Weight (without water in the system)		kg	160	164	164		
	Tank Surface			Enamel Coated				
	Tank Volume total		liter	180	180	180		
	Volume of coil		liter	4.8	4.8	4.8		
	Volume expansion vessel		liter	10	10	10		
	Dimensions, climate system pipe		mm	22	22	22		
	Dimensions, hot water pipe		mm	22	22	22		
	Water pipe connections			Compression fittings				
	Immersion Heater		KW	9 (4.5 for single-phase) (3 Step)				
Max current		A	20 (45 for 230V Single-phase)	20 (45 for 230V Single-phase)	23 (45 for 230V Single-phase)			

*1 European Average climate conditions

*2 In case of a room temperature sensor connected

*3 Sound pressure level is 1m away in front of outdoor unit at the height of 1m

Outdoor unit

Model		FDCW60VNX-W NEW		FDCW60VNX-A		FDCW71VNX-A		FDCW100VNX-A		FDCW140VNX-A	
Power source		1 phase 230V 50Hz									
Height x Width x Depth		mm	640 x 800 x 290		750 x 880 x 340		845 x 970 x 370		1300 x 970 x 370		
Weight		kg	46		60		81		105		
Sound Power level (A7/W35)		dB(A)	52	53	64	64.5	71				
Sound Pressure level*3 (A7/W35)		dB(A)	44	45	48	50	54				
Airflow		m ³ /min	41.5		50		73		100		
Refrigerant type			R32		R410A						
Refrigerant volume (pipe length without additional charge)		kg (m)	1.3 (15)	1.5 (15)	2.55 (15)	2.9 (15)	4.0 (15)				
Dimensions, refrigerant pipe		mm(inch)	Gas pipe: OD 12.7(1/2"), Liquid pipe: OD 6.35(1/4")		Gas pipe: OD 15.88 (5/8"), Liquid pipe: OD 9.52 (3/8")						
Ref pipe connections			Flare Connection								
Max current		A	15		16		23		25		

Flexible combination

Split box		HSB60-W NEW		HSB60-W		HSB100		HSB100		HSB140	
Outdoor Model		FDCW60VNX-W		FDCW60VNX-A		FDCW71VNX-A		FDCW100VNX-A		FDCW140VNX-A	
Power source		1 phase 230V 50Hz		1 phase 230V 50Hz		1 phase 230V 50Hz		1 phase 230V 50Hz		1 phase 230V 50Hz	
Heating Nominal capacity	condition 1	kW	2.7 (2.70 - 8.00)	2.28 (0.50 - 8.00)	8.0 (3.0 - 8.0)	9.0 (3.5 - 11.0)	16.5 (5.8-16.5)				
	condition 2	kW	5.08 (0.90 - 7.60)	-	8.3 (2.0 - 8.3)	9.2 (3.5 - 10.0)	16.5 (4.2-17.2)				
COP	condition 1		3.06	3.62	3.33	3.44	3.31				
	condition 2		5.16	5.32	4.09	4.28	4.2				
Cooling Nominal capacity	condition 1	kW	5.31(0.60 - 6.30)	4.86 (0.80 - 6.00)	7.1 (2.0 - 7.1)	8.0 (3.0 - 9.0)	11.8 (3.1-11.8)				
	condition 2	kW	7.54 (1.20 - 7.80)	7.03 (1.20 - 7.80)	10.7 (2.7 - 10.7)	11.0 (3.3 - 12.0)	16.5 (5.2-16.5)				
EER	condition 1		2.73	2.64	2.68	2.81	2.65				
	condition 2		3.57	3.52	3.35	3.62	3.78				
Seasonal Space Heating Energy Efficiency Class (W55/W35)			A++/A+++	A++/A++	A+/A+	A++/A++	A++/A++				
Seasonal Space Heating Energy Efficiency (W55/W35)		%	137/190	138/188	119/149	126/165	133/166				
Seasonal Space Heating Energy *2 Efficiency Class of package (W55/W35)			A++/A+++	A++/A+++	A+/A++	A++/A++	A++/A++				
Seasonal Space Heating Energy *2 Efficiency of package (W55/W35)		%	141/194	142/192	123/153	130/169	137/170				
Operation range (Ambient temperature)		heating	-20°C - 43°C								
		cooling	15°C - 43°C								
Operation range (Water temperature)		heating	25°C - 58°C (65°C, with immersion heater)								
		cooling	7-25°C								
Refrigerant type			R32		R410A						
Max refrigerant pipe length		m	30		30						
Max height difference between IU and OU		m	20		7						

Tank unit

Model		PT300		PT500	
Power source		-		-	
Volume		liter	279	476	
Volume of coil		liter	9.4	13	
Immersion heater		kW	Not included	Not included	
Height x Width x Depth		mm	1634 x 673 x 734	1835 x 832 x 897	
Weight		kg	115	156	
Dimensions, climate system pipe		inch	1" Male	1" Male	
Dimensions, hot water pipe		inch	1" Male	1" Male	
Inner Surface			Enamel		
Design Pressure Tank		Bar	10		
Design Pressure Coil		Bar	16		
Energy Class			C	C	

Split box

Model		HSB60-W NEW		HSB100		HSB140	
Power source		1 phase 230V 50Hz		1 phase 230V 50Hz		1 phase 230V 50Hz	
Operation range (Water temperature)		heating	25-58°C (65°C, with immersion heater)				
		cooling	7-25°C				
Max pressure, climate system		bar	10				
Connection Water System		mm	22	28	28		
Ambient temperature		°C	5 - 35				
Height x Width x Depth		mm	400 x 460 x 250				
Weight		kg	16	18	23		
Recommended fuse rating		A	6	6	6		
Refrigerant type			R32 or R410A		R410A	R410A	

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			

SYSTEM COMBINATIONS

Mitsubishi Heavy Industries extensive product range offers the right heat pump to suit every demand. Our product is a suitable comprehensive solution for existing buildings and houses as well as new builds.

ALL-IN-ONE COMBINATION (Outdoor Unit + HMA system)

ALL-IN-ONE COMBINATION provides the comprehensive solution for all your heating, cooling and domestic hot water needs.

Each ALL-IN-ONE COMBINATION includes the set of an outdoor unit and HMA system, providing an all-inclusive indoor unit integrating hot water heater, immersion heater, circulating pump and climate system within one unit.

- **Heating, Cooling and Hot water**
- **Easy installation and operation**
A single neatly packaged all-in-one indoor unit and a well designed outdoor make the installation as smooth and straight forward as possible.
- **Ideal for residential use from apartments to small houses**



SYSTEM COMBINATIONS

FLEXIBLE COMBINATION (HSB system)

FLEXIBLE COMBINATION offers space heating and cooling with the option to add sanitary hot water to the system.

FLEXIBLE COMBINATION consists of an outdoor unit and HSB system (Split box) and by combining the separate accessories, FLEXIBLE COMBINATION makes installation even more complete for your climate needs.

- **Heating and cooling only option**
Mitsubishi Heavy industries air to water heat pumps captures fresh air to heat or cool the property and ensure maximum comfort throughout the year. Heating and cooling only option is available by additionally connecting any FLEXIBLE COMBINATION with a charging pump and an immersion heater.
- **Hot water option**
Hot water system option can be available by additionally connecting any FLEXIBLE COMBINATION with a charging pump, an immersion heater, a tank and shuttle valve.
- **Flexible installation of units**
You can combine the variety of accessories to suit your demand.
- **Available from 6kW (R32/R410A) to 14kW (R410A)**



SYSTEM COMBINATIONS



		Controller	Outdoor	All-in-one	Split box	Tank	Immersion heater (tank)	Immersion Heater	Charging Pump	Shuttle Valve
All-in-one	Combination 1		FDCW60VNX-A	HMA 60-S						
	Combination 2		FDCW71VNX-A	HMA 100-S	-	-	-	-	-	-
	Combination 3		FDCW100VNX-A							
Flexible	Combination 4	RC-HY20-W RC-HY40-W	FDCW60VNX-A/W		HSB60-W	PT300 PT500	ME1030M + HR10M (Optional)	ELK9M (Optional)	CPD11-25M/65 CPD11-25M/75	VST05M VST11M VST20M
	Combination 5		FDCW71VNX-A		HSB100					
	Combination 6		FDCW100VNX-A							
	Combination 7		FDCW140VNX-A		HSB140					
Heating and Cooling Only	Combination 8		FDCW60VNX-A/W		HSB60-W					
	Combination 9		FDCW71VNX-A		HSB100					
	Combination 10		FDCW100VNX-A							
	Combination 11		FDCW140VNX-A		HSB140					

SYSTEM COMBINATIONS

The following combination of the products is recommended.

1 R410A



All-in-one 6

- Building heating load up to 8 kW
- Heating, hot water, cooling
- Cooling down to 7 °C

2 R410A



All-In-One 8

- Building heating load up to 8 kW
- Heating, hot water, cooling
- Cooling down to 7 °C

3 R410A



All-In-One 12

- Building heating load up to 11 kW
- Heating, hot water, cooling
- Cooling down to 7 °C

4 R410A R32



Flexible 6

- Split-box system for heating, hot water as required & cooling
- Building heating load up to 8 kW
- Cooling down to 7 °C

5 R410A



Flexible 8

- Split-box system for heating, hot water as required & cooling
- Building heating load up to 8 kW
- Cooling down to 7 °C

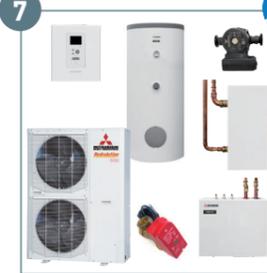
6 R410A



Flexible 12

- Split-box system for heating, hot water as required & cooling
- Building heating load up to 11 kW
- Cooling down to 7 °C

7 R410A



Flexible 16

- Split-box system for heating, hot water as required & cooling
- Building heating load up to 16.5 kW
- Cooling down to 7 °C

8 R410A R32



Heating & Cooling 6

- Split-box system for heating & cooling
- Building heating load up to 8 kW
- Cooling down to 7 °C

9 R410A



Heating & Cooling 8

- Split-box system for heating & cooling
- Building heating load up to 8 kW
- Cooling down to 7 °C

10 R410A



Heating & Cooling 12

- Split-box system for heating & cooling
- Building heating load up to 11 kW
- Cooling down to 7 °C

11 R410A



Heating & Cooling 16

- Split-box system for heating & cooling
- Building heating load up to 16.5 kW
- Cooling down to 7 °C



*FDCW60VNX-W

ACCESSORIES



ECS40M/ECS41M

Extra mixing valve set, including a room sensor, for adjusting temperature in several climate systems. (e.g. A radiator system and an underfloor heating)

Contents

- | | |
|----------------------------|------------------------|
| 4 x Cable ties | 2 x Aluminium tape |
| 1 x Circulation pump | 1 x Insulation tape |
| 1 x Shunt motor | 2 x Replacement gasket |
| 1 x 3-way valve | 2 x Temperature sensor |
| 1 x Kit for accessory card | 1 x Room sensor |
| 2 x Heating pipe paste | |

ECS40M for maximum 80m² floor heating

ECS41M for 80-250 m² floor heating

RC-HY40-W

HMA



RTS40M

Room sensor
RC-HY40 and HMA include one sensor

RC-HY20-W

RC-HY40-W

HMA



AXC30M

Accessory card

RC-HY40-W

HMA



RMU40M

Room sensor/controller with multicolour display

HMA

RC-HY40-W



VST05M / VST11M / VST20M

Reversing valve for using hot water accessories and prioritising hot water demand.

VST05M (Ø 22mm, Max.electric charge output: 11kW)

VST11M (Ø 28mm, Max.electric charge output: 17kW)

VST20M (DN32, (1 1/4"), Max.electric charge output: 40kW)

RC-HY20-W

RC-HY40-W

ACCESSORIES



VCC05M / VCC11M

Reversing valve for changing operation of cooling and heating.

VCC05M (Ø 22mm)

VCC11M (Ø 28mm)

RC-HY20-W

RC-HY40-W



EMK300M / EMK500M

Energy measurement kit for measuring the flow and temperature differences in the charge circuit. Information can be shown on RC-HY40's display.

EMK300M (Measurement range 5.0-85 l/min)

EMK500M (Measurement range 9.0-150 l/min)

RC-HY40-W

HMA



Anode M300 / Anode M500

Magnesium anode chain

Anode M300 for PT300 (Ø26 x 8 pieces (G1"))

Anode M500 for PT500 (Ø33 x 5 pieces (G1 1/4"))

PT300

PT500



Anode T300 / Anode T500

Anode titanium complete

Anode T300 for PT300 (Length: 200mm, G3/4", 230V)

Anode T500 for PT500 (Length: 400mm, G3/4" 230V)

PT300

PT500



HR10M

Relay for ME1030M

Used to control external 1 to 3 phase loads such as oil burners, immersion heaters and pumps.

PT300

PT500



ME1030M

Immersion heater designed to heat up domestic hot water installations. (3kW, G1 1/2", 230V)

PT300

PT500

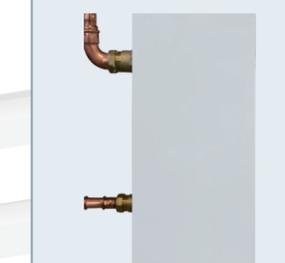


CPD11-25M/65 / CPD11-25M/75

DC Motor controlled water pump.

HSB60-W/100 --> CPD11-25M/65

HSB140 --> CPD11-25M/75



ELK9M

Immersion heater that can be used to supplement the heating capacity of heat pumps.

Power source: 3~400V50Hz

Output: 9kw

Fuse 13A

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 fibres, 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 a 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 Air Conditioning Europe Ltd
5 The Square, Stockley Park, Uxbridge, UB11 1ET
<http://www.mhiae.com>

ISO9001

Our Air-Conditioning & Refrigeration Division 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 Division
Certified ISO 9001
Certificate number : JQA-0709



MITSUBISHI HEAVY INDUSTRIES-
MAHAJAK AIR CONDITIONERS CO., LTD.
Certified ISO 9001
Certificate Number : 44 100 980813

ISO14001

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



LRQA REGISTER - LRQA
ISO 14001
Certificate Number: YKA4005636



MITSUBISHI HEAVY INDUSTRIES-
MAHAJAK AIR CONDITIONERS CO.,LTD.
Certificate Number : 04 104 980813

