MOVE THE WORLD FORWARD MITSUBISHI HEAVY INDUSTRIES GROUP

HYDROLUTION

MITSUBISHI HEAVY INDUSTRIES
AIR CONDITIONING EUROPE

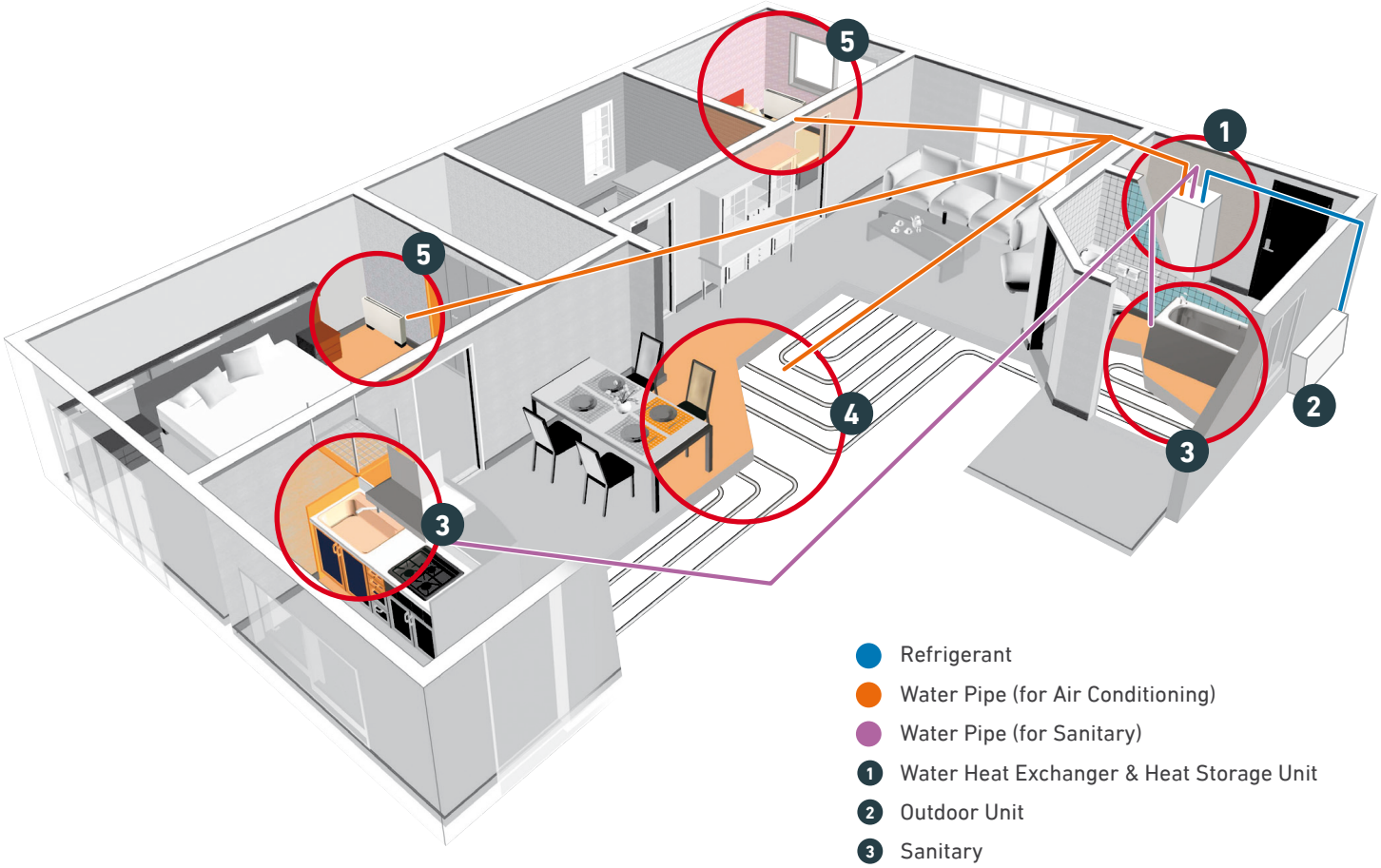
HEATING

HOT SANITARY

COOLING

WHY A MHI HEAT PUMP?

Mitsubishi Heavy Industries Thermal Systems 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.



- Refrigerant
- Water Pipe (for Air Conditioning)
- Water Pipe (for Sanitary)
- 1 Water Heat Exchanger & Heat Storage Unit
- 2 Outdoor Unit
- 3 Sanitary
- 4 Floor Heating
- 5 Radiator or Fan Coil

WHY A MHI HEAT PUMP?

Mitsubishi Heavy Industries Thermal Systems 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 low carbon society.**

We have assured integration of high technology in a variety of areas including new clear power generation, transportation system, desalination plant, and wind turbine generator. 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.

3 **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.

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 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 4.09~5.32* 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 temperature (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 (HMK60 and HMK100 only). Electrical and piping work is simpler due to the integrated design.

65˚C HOT WATER

Maximum temperature flow line 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. Heat pump can keep producing the temperature of 58°C hot water without an auxiliary electric heater. This can still be produced even with the ambient temperature between -20-43°C.

WHY A MHI HEAT PUMP?

DRAIN PAN HEATER

Condensation 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 condensation from freezing and protecting the heat exchanger in cold conditions. There is low risk of anything freezing because there is no water circuit between indoor unit and outdoor unit.

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.

INTERNET CONNECTION

Customer can get a brief overview and the status of the MHI heat pump and the heating system remotely. It will allow the customer to control heating and hot water production.

SPECIFICATIONS

Mitsubishi Heavy Industries Thermal Systems air to water heat pump is a complete modern system for heating, cooling and producing hot sanitary water for houses, offering effective energy saving.

Indoor Unit (HMK)

- Flexible all in one indoor module for heating and hot water
- For 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
- The expansion vessel (10L) is integrated
- The unit already comes with 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

Outdoor Unit

- MHI high quality outdoor unit
- Very energy efficient with a wide operation range
- Latest inverter & DC twin rotary compressor technology
- Proven long term reliability and endurance
- Compact design for easy installation
- FDC60VNX-A includes latest centralized winding motor within compressor allowing high seasonal efficiency
- Built in drain pan heater to improve defrost
- Applied blue coated fin for heat exchanger to prevent corrosion.

Advanced Controllers

RC-HY20, RC-HY40

Easy Operation: This advanced user friendly controller has the large multicolor display, It shows information about the status of the units,

RC-HY20: Base version without extension module. RC-HY40: Advanced version with extension module. Room sensor and current sensor with cascade heat pump control function

myUpway™

Monitor and Control: The controller is compatible with myUpway, which is the internet function giving you a quick over view and the present status of the installed units in order to monitor and manage both the outdoor and the indoor

If the system is affected 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

HYDROLUTION

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			HMK60	HMK100	HMK100
Outdoor Model			FDCW60VNX-A	FDCW71VNX-A	FDCW100VNX-A
Power source			3 phase 400V 50Hz	3 phase 400V 50Hz	3 phase 400V 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°		
		cooling	15° - 43°		
Operation range (Water temperature)		heating	25- 58 (65, with immersion heater)		
		cooling	7-25		
Max refrigerant pipe length		m	30		
Max height difference between IU and OU		m	7		
Indoor unit	Height x Width x Depth	mm	1715(+ 40 max) x 600 x 610	1715(+ 40 max) x 600 x 610	1715(+ 40 max) x 600 x 610
	Weight (without water in the system)	kg	165	165	165
	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 (3 Step)		
Max current		A	20	20	23

*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-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
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*2	dB(A)	53	64	64.5	71
Sound Pressure level*2	dB(A)	45	48	50	54
Airflow	m3/min	41.5	50	73	100
Refrigerant volume (R4 10A) (pipe length without additional charge)	kg (m)	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	HSB100	HSB100	HSB140
Outdoor Model			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
Heating Nominal capacity	condition 1	kW	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	2.67 (0.50 -7.40)	8.3 (2.0 - 8.3)	9.2 (3.5 - 10.0)	16.5 (4.2-17.2)
COP	condition 1		3.62	3.33	3.44	3.31
	condition 2		5.32	4.09	4.28	4.2
Cooling Nominal capacity	condition 1	kW	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	7.03 (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		2.64	2.68	2.81	2.65
	condition 2		3.52	3.35	3.62	3.78
Seasonal Space Heating Energy Efficiency Class (W55/W35)			A++/A++	A+/A+	A++/A++	A++/A++
Seasonal Space Heating Energy Efficiency (W55/W35)		%	188/138	149/119	165/126	166/133
Seasonal Space Heating Energy *2 Efficiency Class of package (W55/W35)			A+++/A++	A++/A+	A++/A++	A++/A++
Seasonal Space Heating Energy *2 Efficiency of package (W55/W35)			192/142	153/123	169/130	170/137
Operation range (Ambient temperature)		heating	-20° -43°			
		cooling	15° - 43°			
Operation range (Water temperature)		heating	25- 58 (65, with immersion heater)			
		cooling	7-25			
Max refrigerant pipe length		m	30			
Max height difference between IU and OU		m	7			
Max Current	Indoor	A	6	6	6	6
	Outdoor	A	15	16	23	25

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	HSB100	HSB140
Power source		1 phase 230V 50Hz	1 phase 230V 50Hz	1 phase 230V 50Hz
Operation range (Water temperature)	heating	25-58 (65, with immersion heater)		
	cooling	7-25		
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

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 Thermal Systems 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.

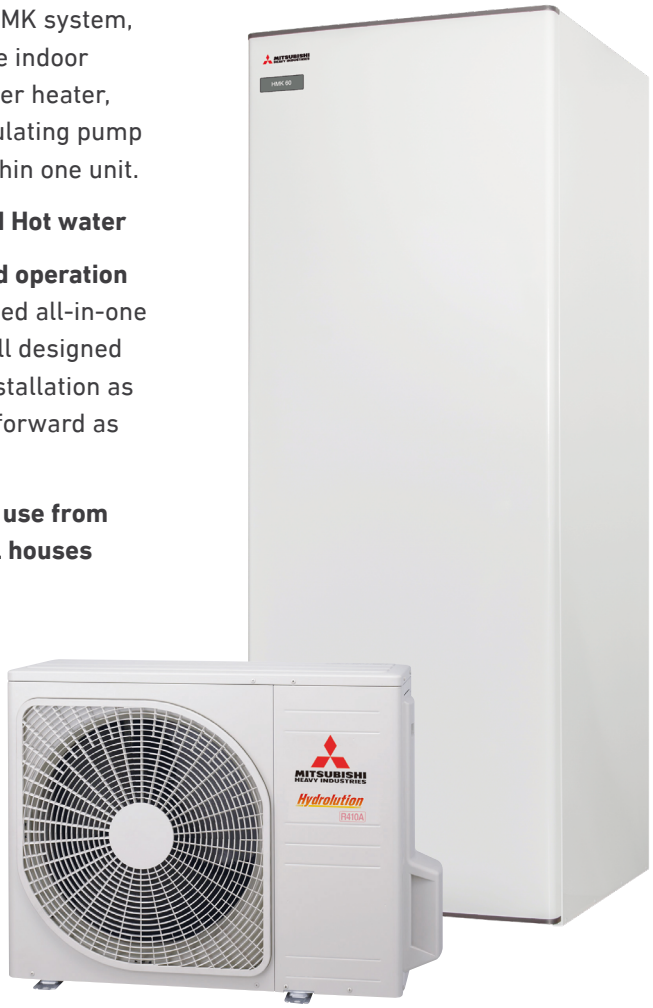
ALL-IN-ONE COMBINATION

(Outdoor Unit + HMK system)

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

Each ALL-IN-ONE COMBINATION is the set of an outdoor and HMK system, which is 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**
  Single neatly packaged all-in-one indoor unit and a well designed outdoor make the installation as smooth and straightforward as possible.
- **Ideal for residential use from apartments to small houses**



SYSTEM COMBINATIONS

FLEXIBLE COMBINATION

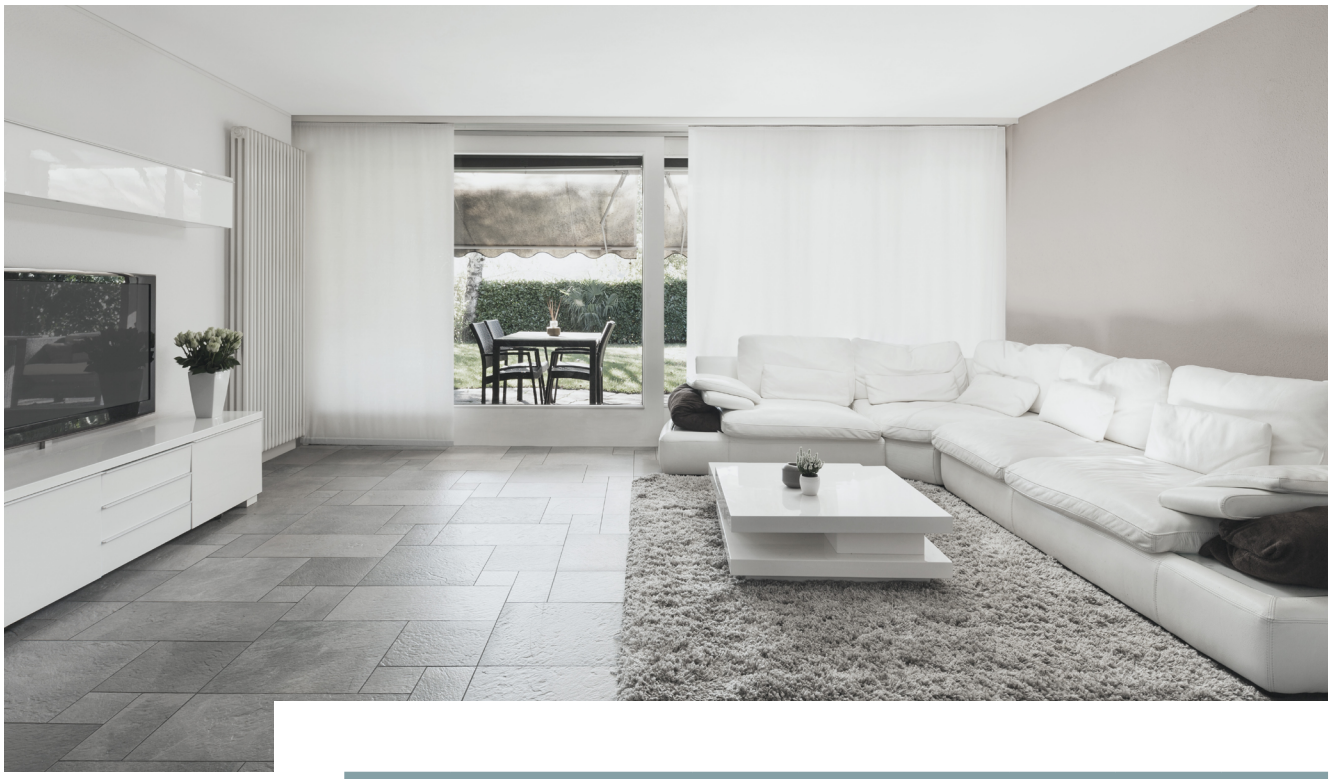
(HSB system)

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

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

- **Heating and cooling only option**
  Mitsubishi Heavy industries Thermal Systems air to water heat pump captures fresh air to heat or cool the property to 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 to 14kW**

SYSTEM COMBINATIONS



		Controller	Outdoor	All-in-one	Split box	Tank	Immersion Heater	Charging Pump	Shuttle Valve
All-in-one	Combination 1	RC-HY20 RC-HY40	FDCW60VNX-A	HMK60	-	-	-	-	-
	Combination 2		FDCW71VNX-A	HMK100					
	Combination 3		FDCW100VNX-A						
Flexible	Combination 4		FDCW60VNX-A	-	HSB60	PT300 PT500	ELK9M	CPD11-25M/65 CPD11-25M/75	VST05M VST11M VST20M
	Combination 5		FDCW71VNX-A		HSB100				
	Combination 6		FDCW100VNX-A						
	Combination 7		FDCW140VNX-A		HSB140	PT500			
Heating and Cooling Only	Combination 8		FDCW60VNX-A	-	HSB60	-			-
	Combination 9		FDCW71VNX-A		HSB100				
	Combination 10		FDCW100VNX-A						
	Combination 11		FDCW140VNX-A		HSB140				

MITSUBISHI HEAVY INDUSTRIES
AIR CONDITIONING EUROPE

SYSTEM COMBINATIONS

The following combination of the products is recommended.

1

All-in-one 6

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

2

All-In-One 8

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

3

All-In-One 12

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

4

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

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

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

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

Heating & Cooling 6

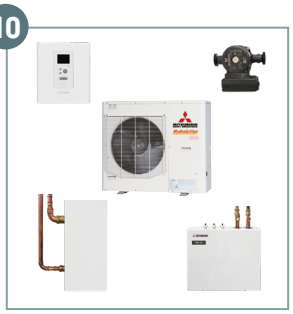
- Split-box system for heating & cooling
- Building heating load up to 8 kW
- Cooling down to 7 ° C

9

Heating & Cooling 8

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

10



Heating & Cooling 12

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

11

Heating & Cooling 16

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

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 under floor heating)

Contents

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

ECS40M for maximum 80m^2 floor heating
ECS41M for 80-250 m^2 floor heating

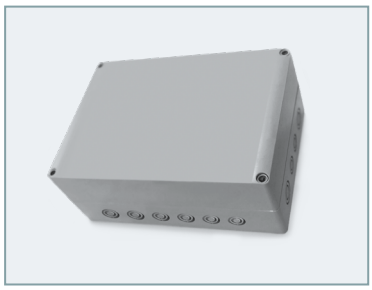
RC-HY40

RTS40M

Room sensor

RC-HY40 includes one sensor

RC-HY20 RC-HY40



AXC30M

Accessory card

RC-HY40

RMU40M

Room sensor/controller with multicolour display

RC-HY40

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, (1¼"), Max.electric charge output: 40kW)

RC-HY20 RC-HY40

ACCESSORIES

VCC05M / VCC11M

Reversing valve for changing operation of cooling and heating.

VCC05M (Ø 22mm)

VCC11M (Ø 28mm)

RC-HY20 **RC-HY40**

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

Anode M300 /Anode M500

Magnesium anode chain

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

Anode M500 for PT500 (Ø33 x 5 pieces (G1¼"))

PT300 **PT500**

Anode T300/Anode T500

Anode titanium complete

Anode T300 for PT300 (Length: 200mm, G¾", 230V)

Anode T500 for PT500 (Length: 400mm, G¾"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, G11/2", 230V)

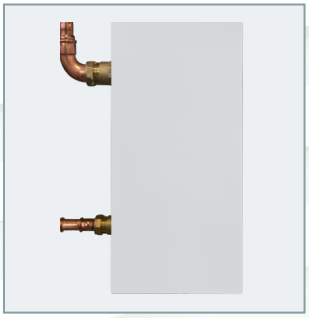
PT300 **PT500**

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

DC Motor controlled water pump.

HSB60/100 --> 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

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.

Certificate Number:YKA4005636

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

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