

HYDROLUTION FOR HEATING AND DHW PRODUCTION

HYDROLUTION is a complete system for heating, cooling and hot water. A highly energy-efficient system that reduces consumption and emissions.

HIGH PERFORMANCE

- Delivery temperature 58° C, at the top of its category Even with outside temperatures between -20° C and 43° C.
- Water up to 65° C with electrical integration.


58°C

Delivery temperature without heating element


65°C

Temperature with electrical integration


-20°C

Operating limits

ENVIRONMENTALLY RESPONSIBLE

- Ecological, guaranteeing low environmental impact and silent operation.
- Makes use of a Thermal Account for all power levels.

R410A

For all power levels

EFFICIENCY AT THE TOP

- COP between 4.20 and 4.28 in heating.
- The compressor is designed to be efficient down to -20° C and is suitable for the coldest climates.

-20°C

Maximum efficiency up to -20° C

4,28

Maximum COP in heating

FLEXIBILITY AND RELIABILITY

- Modular, efficient and low operating costs.
- Boasts wide installation flexibility and versatility of application (from large apartment buildings to single apartments).
- Can also be installed in tight spaces thanks to the All in One configuration.
- Can be integrated with traditional heating systems and renewable sources.
- Compact size.

ADVANTAGES

- Guarantees water sanitation thanks to periodic anti-legionella cycles.
- Silent mode which reduces the sound emission level to 35 dB(A) at 5 metres.
- Remote control of heating mode and DHW production via MODBUS.

35dB

Sound level at 5 metres



Remote control

HYDROLUTION, THE MODULAR SYSTEM FOR HEATING, COOLING AND PRODUCING DHW

128 kW

MAXIMUM
DELIVERABLE
POWER

A++

ENERGY
CLASS AT
35° C



THE HYDROLUTION SYSTEM - ADVANTAGES



Cutting-edge design and technological innovation are at the base of the HYDROLUTION system.



ENERGY SAVING

HYDROLUTION outdoor units are equipped with Inverter technology and a Twin Rotary compressor: it is possible to vary the operating frequency of the compressor according to the actual demand of the system, resulting in optimisation of the COP and EER values.



VERY QUIET OUTDOOR UNIT OPERATION

The noise emitted by outdoor air conditioning system units can be a problem, especially during the night. HYDROLUTION systems can reduce fan and compressor speed thanks to their "Silent" mode. The result is significantly less noise. Outdoor unit operation can be set to "Silent" mode via the RC-HY20/40-W control.



EXTREME COMPACTNESS

In the case of the internal units of the All in One version, the small footprint is due to the high performance of the internal components, in particular the domestic water tank and the plate heat exchanger.



HOT WATER UP TO 65° C

HYDROLUTION is a heat pump that is particularly suitable for primary heating, tested in numerous projects in Europe: it is capable of producing hot water **up to 58° C**. It is possible to raise this limit up to 65° C by means of an integrative heat source, **and to keep it constant, even with an external temperature of -20° C**. For this reason, it can be combined with: low temperature heating elements (radiant panels), medium temperature heating elements (radiators, warmcoils).



HIGHLY RELIABLE

The outdoor unit compressor is designed for efficiency even in very cold climates.



BLUE FIN TREATMENT

Outdoor unit corrosion due to weathering can compromise correct system operation. The "Blue Fin" treatment applied on the heat exchanger helps prevent corrosion.

THE HYDROLUTION SYSTEM - CONFIGURATIONS

ALL IN ONE CONFIGURATION

Mitsubishi Heavy Industries' wide range of products offers the right heat pump to meet all needs.

All in One is a comprehensive solution that is suitable for renovations and new buildings.

ALL IN ONE COMBINATION (OUTDOOR + INDOOR UNIT)

The All in One combination provides a comprehensive solution for all heating, cooling and domestic hot water needs.

Every All in One combination includes an outdoor unit and an HMA system with an integrated DHW tank, a heating element and a circulation pump.

The advantages of HYDROLUTION All in One:

- Heating, cooling and hot water in a single unit.
- Easy installation and operation; the indoor and outdoor units are compact and make installation as easy as possible.
- Ideal for residential use in flats and small homes.
- Three settable control levels (economic, normal, luxury) for DWH production.

■ AVAILABLE POWER LEVELS

10 kW - R410A



THE HYDROLUTION SOLUTION - HMA MODULE

HMA MODULE

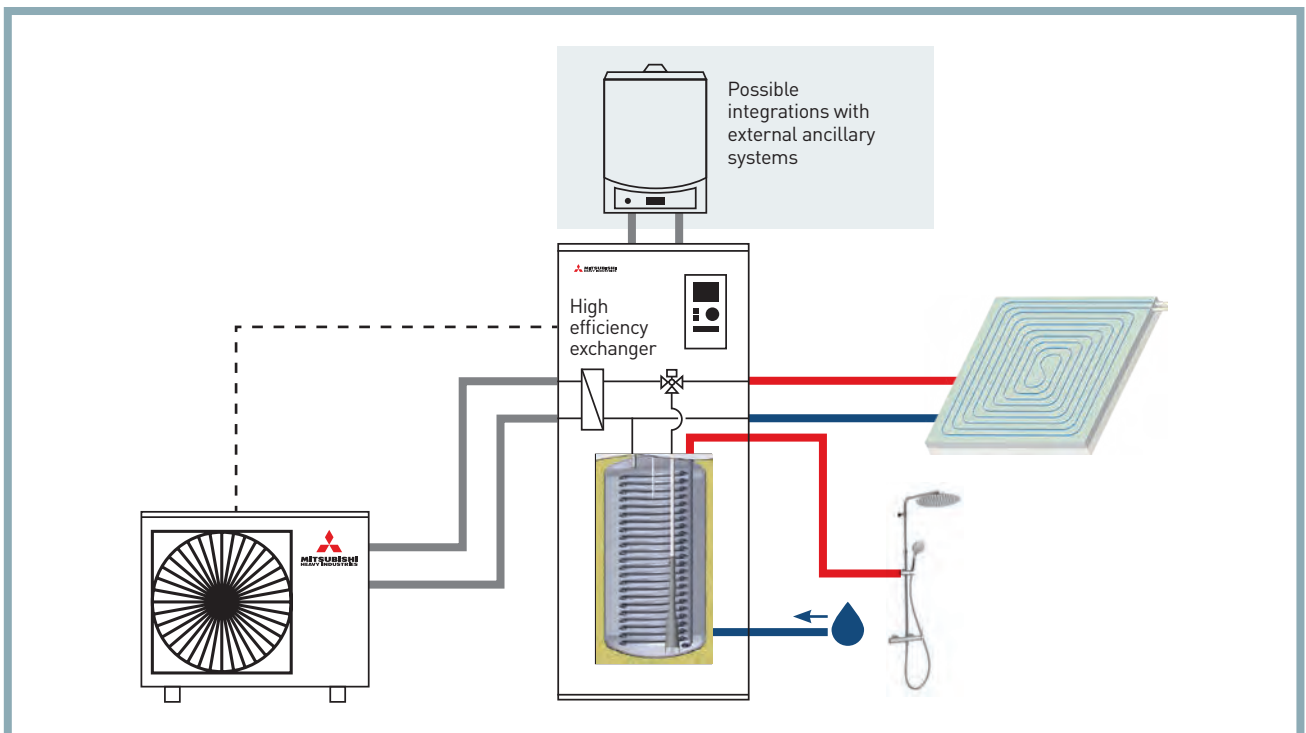
The All in One HYDROLUTION solution meets the main household heating, cooling and DHW needs with a plug-in solution.

MAIN ADVANTAGES OF THE HMA MODULE

- Integrated on-board control that facilitates system management and installation.
- Compact, high-efficiency heat exchanger that helps reach desired temperatures quickly.
- Integrated 180 litre tank for DHW production.
- Possibility of single-phase or three-phase power supply via a dedicated terminal block.



OPERATING DIAGRAM





THE HYDROLUTION CONTROL SYSTEM

To guarantee maximum system efficiency in an air-water heat pump like that of HYDROLUTION, MHI has designed and built a complete line of management and monitoring devices [RC-HY20-W and RC-HY40-W].

A residential heating system must be subjected to accurate control 24/h: **RC-HY20-W and RC-HY40-W** have been designed to simplify this control and reduce management costs and energy consumption.

The functions of these control devices are extremely flexible and as such they adapt to the configuration of the system to which they are applied.

RC-HY20-W and RC-HY40-W Features and functions

The **RC-HY20-W and RC-HY40-W** control devices can be used to manage and regulate **centralised and autonomous** systems made with HYDROLUTION in the Flexible heating, Flexible heating and DHW, All in One versions. More specifically, they:

- Manage the system operating modes (on/off) and timing programs.
- Guarantee system regulation efficiency.
- Automatically manage supply water temperature.
- Manage the Anti-legionella cycles and DHW recirculation pump activation.
- Activate the 'Silent' function.



RC-HY20-W

Sectors of application

Flexible heating
Flexible heating and DHW



RC-HY40-W

Sectors of application

Flexible heating
Flexible heating and DHW
All in One
Modular flexible heating

THE HYDROLUTION SYSTEM - CONTROL SYSTEMS



System ON/OFF and timing programming

The **RC-HY20-W** and **RC-HY40-W** control devices can be used to manage operation (on and off) of the **HYDROLUTION** system as well as "Silent" function operation, programming heating and DHW supply, over the period of a week. During heat pump heating operation, it is possible to:

- Create 3 daily programs in heating mode with the possibility of setting the deviation with respect to the climatic reference curve, or the desired temperature in the single period (only if the internal temperature sensor is present).
- Set 2 hourly programmings in cooling mode;
- Set 2 hourly system operating programs in "Silent" mode.
- Program DHW temperature and supply
 - a) It is possible to program two daily production cycles with different temperature levels for each day of the week using the 3 different DHW production control parameters: economic – normal – luxury.
 - b) It is possible to increase the DHW production temperature for a certain period of time (up to 12 hours) by activating the "Temporary luxury" function.
 - c) It is possible to reduce heating and temporarily suspend DHW production by activating the "Holiday" function.

System regulation efficiency



It is possible to guarantee system efficiency by monitoring the DM parameter (degrees per minute), which allows for quick responses and better management of the operating frequencies of the outdoor unit compressor.

Anti-legionella cycle and DHW recirculation



It is possible to set Anti-legionella cycle programming using the "Sterilize" function: the cycle activation interval is from 1 to 90 days.

It is also possible to set 3 daily DHW recirculation pump operating periods.

"Silent" function

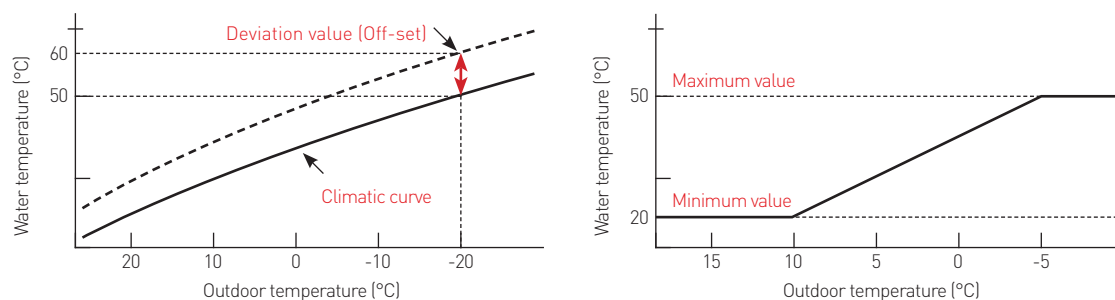


Activation of the "Silent" function significantly reduces the noise emitted by outdoor units, reducing compressor and fan speed. It is possible to set 2 hourly programs in this operating mode.



Automatic system delivery temperature management

System delivery temperature management is carried out by means of the operating climatic curve setting. From the control device, the user can set a custom climatic curve and modify it quickly as needed, indicating the deviation value with respect to the reference climatic curve ("Off-set" function). A lower and upper system delivery water temperature limit can be established.



Climatic curve: to guarantee energy efficiency and indoor comfort, the system regulates the degrees °C of the supply water when the outside temperature changes.

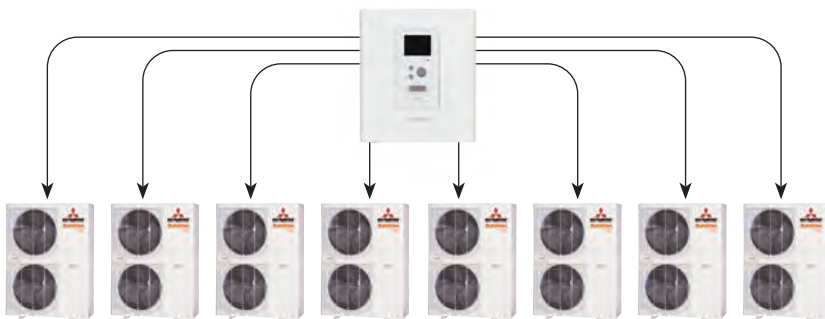
THE HYDROLUTION SYSTEM - CONTROL SYSTEMS

RC-HY40-W Features and functions

[Modular Flexible heating configuration]

In addition to being equipped with the characteristics listed in the previous paragraphs, the RC-HY40-W control device offers highly sophisticated continuous monitoring features and provides valuable information on consumption and performance, as well as a wide range of operational data.

The features are described in more detail below.



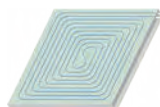
- **RC-HY40-W is able to manage up to 8 HYDROLUTION systems** in Flexible heating configuration.
- **RC-HY40-W guarantees** regulation efficiency , system durability and service continuity.



warmcoils



high efficiency radiators



radiant panels

- **RC-HY40-W is able to manage up to 8 distribution systems at different temperatures** (radiant panels, radiators and fancoils). If there are heating systems that work at different delivery temperatures inside an apartment building, users can set the corresponding climatic curve for each system and use the RC-HY40 control to manage up to 8 distribution systems at different temperatures. An ECSM40/ECSM41 accessory kit needs to be added for each distribution system.
- **RC-HY40-W is able to manage energy consumption metering and distribution:** connection of an energy meter kit to the RC-HY40-W control makes it possible to quantify system consumption and view it directly from the control system. Distribution of the energy consumption of the various utilities can be implemented through the installation of separate heat meters and distribution boxes for each apartment.

THE HYDROLUTION SYSTEM - CONTROL SYSTEMS

RC-HY40-W

Integration with external heat sources

RC-HY40-W is able to manage HYDROLUTION system integration with external heat generators. It is possible to raise the maximum water temperature limit of the system to **65°C** through an external generator (i.e. pellet or methane boilers). In the event of heat pump failure, DHW production and heating are guaranteed by the aid of the emergency function, which activates the automatic integration system.

Below are the possible operating modes for this management.

AUTOMATIC MODE

Lets you set the external operating temperature limits of heat pump and boiler heating.

MANUAL MODE

Lets you activate/deactivate integration from external heat generators.

Lets you activate/deactivate heat pump heating.

EXTERNAL GENERATOR ONLY MODE

Lets you use a single external generator for heating and DHW production.

In the event of heat pump failure, DHW production and heating are guaranteed by the aid of the emergency function, which activates the automatic integration system.



THE HYDROLUTION SYSTEM - TECHNICAL DATA

“All in One” indoor units

Outdoor unit model				FDCW 100 VNX-A	
Heating	Rated power		A7//W35	9.20 (3.50~10.00)	
	Electrical absorption			2.15	
	Performance coefficient			4.28	
	Rated power		A7//W45	9.00 (3.50~11.00)	
	Electrical absorption			2.62	
	Performance coefficient			3.44	
Cooling	Rated power		A35//W18	11.00 (3.30~12.00)	
	Electrical absorption			3.04	
	Performance coefficient			3.62	
	Rated power		A35//W7	8.00 (3.00~9.00)	
	Electrical absorption			2.85	
	Performance coefficient			2.81	
Seasonal heating data	Theoretical load [Pdesignh] @-10°C		35/55	9/10	
	Seasonal energy efficiency (ns)			165/126	
	Energy efficiency class			A++/A++	
	Annual energy consumption			4181/6391	
Seasonal data sanitary water	Warm-up time			XL	
	Energy efficiency (nwh)			98	
	Classe di efficienza energetica			A	
	Consumo energetico annuo			1702	
Operating limits	Outside air temperature		Heating & DHW Cooling	°C	
				-20~43 15~43	
Refrigerant circuit data	Refrigerant type [GWP]			R410A (2088)	
	Pre-charge quantity (tons CO2)			kg (t)	2.9 (6.055)
	Diameter of liquid/gas piping			mm (inch)	9.52(3/8") / 15.88(5/8")
	Max. splitting length			m	30
	Max height difference O.U./I.U. / I.U.-O.U.			m	7
	Splitting length without additional load			m	15
	Additional load			g/m	60
	Refrigerant control system			Electronic expansion valve	
	Compressor			Type	Rotary- DC Inverter
	Electrical data	Power supply			Ph-V-Hz
Maximum current		A	1ph-230V-50Hz		
Power cable (recommended)		Type	3x6 mm ²		
Product specifications	Fan			Type	
	Air flow			qty.	DC Inverter
	Sound power level			m ³ /h	4380
	Sound pressure level (at 1 m)			dB(A)	58
	Dimensions			dB(A)	50
	Dimensions		LxDxH	mm	
	Weight			Net	kg
Indoor unit model				HMA 100-S	
Operating limits	Delivery water temperature		Heat. Cool.	°C	
	DHW temperature (tank)			Max	25~58 7~25
Hydraulic system data	DHW tank capacity			L	
	Water/freon heat exchanger			Type	80 180
	Circulation pump			Brand	Braze-welded plates
	Water connections			Dimensions	Wilo
	Operating pressure (system)			Max	22
	Expansion tank			Volume	3
Electrical data	Power supply			Ph-V-Hz	
	Electrical integration			Supply 230V/400V	1ph-230V-50Hz / 3ph-400V-50Hz
	Electrical absorption (Max)			A	4.5 / 9
	Power cable (recommended)			Type	45 / 23
	Sound power level			dB(A)	3x10 mm ² / 3x6 mm ²
Product specifications	Dimensions		LxDxH	mm	
	Weight			Net	kg
	Control (included)			600x610x1589	
	Remote control via Modbus (optional)			164	
				On-board machine MODBUS40M	

The data contained above refer to the following standards: EN 14511:2018; EN 14825:2019; EN50564:2011; EN12102-1:2018; EN12102-2:2019; [EU]No:811:2013; [EU]No:813:2013; OJ 2014/C 207/02:2014.

Outdoor units

Model	FDCW100VNX-A		FDCW140VNX-A	
Power	1 ph-230V-50Hz			
Height x Width x Depth	mm		mm	
Net	845 x 970 x 370		1300 x 970 x 370	
Sound power level [A7/W35]	kg		kg	
Sound pressure level at 1 metre [A7/W35]	81		105	
Handled air (max)	dB(A)		dB(A)	
Refrigerant type	64,5		71	
Refrigerant volume (splitting length without additional load)	50		54	
Refrigerant pipe diameter	m ³ /h		m ³ /h	
Connection type	4380		6000	
Maximum absorption	A		A	
	23		25	
			R410A	
	2,9 (15)		4,0 (15)	
	gas		15,88 (5/8")	
	liquid		9,52 (3/8")	
			Flare	