

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

FLEXIBLE CONFIGURATION

In Flexible mode, HYDROLUTION can be used for heating and cooling only or in combination with one or more storage tanks to produce domestic hot water as well. A flexible, modular system that is well suited to both new construction and application in existing buildings.

FLEXIBLE COMBINATIONS (HSB SYSTEM)

The Flexible combination offers space heating and cooling with the option of adding domestic hot water production.

HYDROLUTION Flexible consists of an outdoor unit and an HSB (split box) system. By combining accessories, installation is even more comprehensive and adapts to any air conditioning requirement.

The advantages of the Flexible solution:

- **HEATING AND COOLING ONLY OPTION**, available by connecting a circulation pump and a heating element in addition to the HYDROLUTION Flexible.
- **DHW OPTION**, available by connecting a circulation pump, a heating element, a tank and a diverter valve in addition to the HYDROLUTION Flexible.
- **FLEXIBLE UNIT INSTALLATION**, components can be combined as needed.
- **AVAILABLE POWER LEVELS**
 - 10 kW - R410A
 - 14 kW - R410A



THE HYDROLUTION SYSTEM - MODULARITY

Flexible installation

The HYDROLUTION installation version in modular mode lets you combine 8 systems to one another in the Flexible version in Heating configuration, managed by the RC-HY40-W control.

In addition to raising the power output, the modular HYDROLUTION combination guarantees installation flexibility, **regulation efficiency, system durability and service continuity.**

It is possible to combine all the power levels of the individual systems to one another in order to achieve an installed power commensurate with the actual needs. In this way, it is possible to avoid having an oversized system, significantly reducing costs.

Below are some examples of possible modular configuration combinations.



Example of modular configuration with two 10 kW and 16 kW outdoor units for a total installed power of 26 kW.



Example of modular configuration with two 16 kW outdoor units for a total installed power of 32 kW.



Example of modular configuration with two 16 kW outdoor units and a 10 kW unit for a total installed power of 42 kW.

HYDROLUTION operation is managed by the DM parameter. The DM parameter is defined as the sum of the differences, calculated each minute, between the actual delivery temperature and the temperature calculated by the control system.

THE HYDROLUTION SYSTEM - MODULARITY

Regulation efficiency

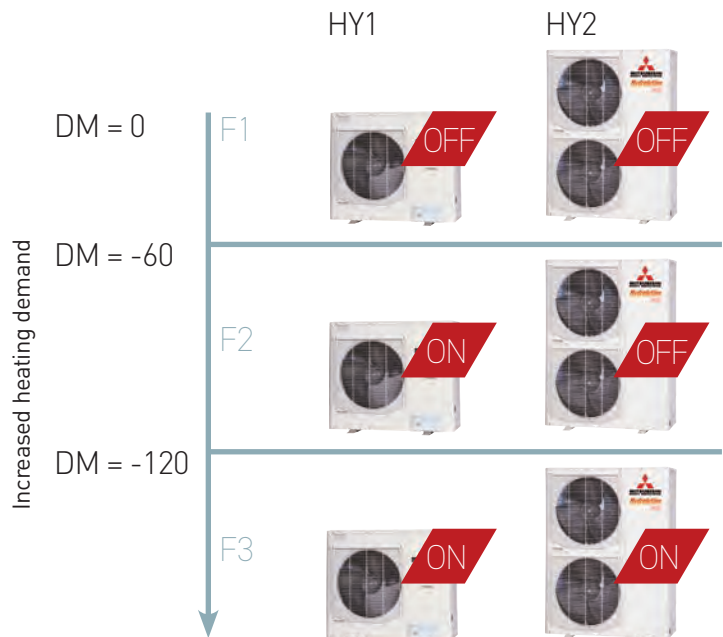
Thanks to its control logic, it is possible through the RC-HY40-W to have quick system responses to changing loads and efficient on/off management of individual outdoor units combined to one another.

The various HYDROLUTION operating phases (operating frequency of compressors, activation/deactivation of one or more outdoor units) in both individual installation mode and in modular installation mode are activated based on the variation of the DM parameter (degrees per minute).

Phase 1: DM more than -60.

Phase 2: DM between -120 and -60.

Phase 3: DM less than -120.



A durable system

The RC-HY40-W control system is able to store the number of operating hours of compressors on each individual outdoor unit of the system in its memory.

To meet system demands, RC-HY40-W gives priority to first starting the outdoor unit with less operating hours, so as to optimise the useful life of the entire system.

Phase 1: DM more than -60.

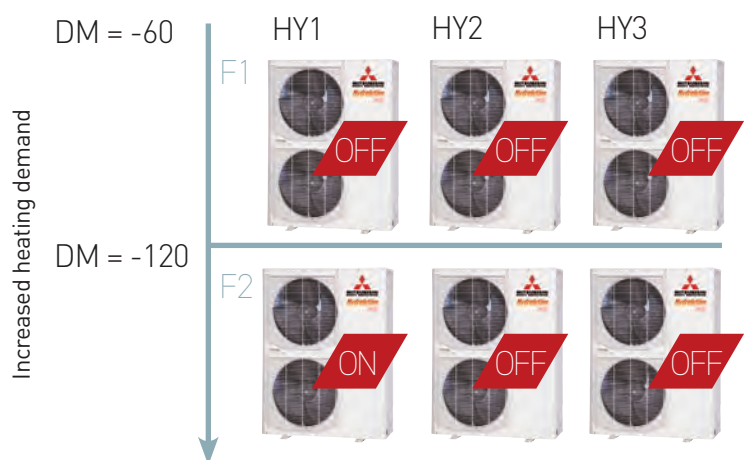
Phase 2: DM between -120 and -60.

Below is an example:

HY1 = 100 accumulated hours of operation.

HY2 = 120 accumulated hours of operation.

HY3 = 150 accumulated hours of operation.



When the heat demand increases, first HY1 starts up, then HY2 and HY3 in sequence.

Service continuity

In the event of malfunction of one of the outdoor units in a modular combination, service continuity is guaranteed by the starting up of another outdoor unit that is part of the system.

Below is an example:

Phase 1: HY3 off.

Phase 2: HY2 error, HY3 switches on.



THE HYDROLUTION SYSTEM - MODULAR COMBINATIONS



UP TO 128 KW

Maximum power 128 kW

8 FDCW 140VNX-A 16 kW units



UP TO 112 KW

Maximum power 112 kW

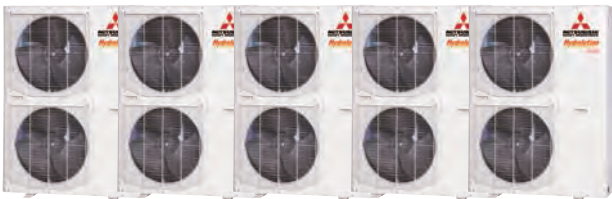
7 FDCW 140VNX-A 16 kW units



UP TO 96 KW

Maximum power 96 kW

6 FDCW 140VNX-A 16 kW units



UP TO 80 KW

Maximum power 80 kW

5 FDCW 140VNX-A 16 kW units



UP TO 64 KW

Maximum power 64 kW

4 FDCW 140VNX-A 16 kW units

THE HYDROLUTION SYSTEM - MODULAR COMBINATIONS



UP TO 48 KW

Maximum power 48 kW

3 FDCW 140VNX-A 16 kW units



UP TO 36 KW

Maximum power 36 kW

FDCW 140VNX-A da 16 kW unit + 2 FDCW 100VNX-A 10 kW units



UP TO 32 KW

Maximum power 32 kW

2 FDCW 140VNX-A 16 kW units



UP TO 20 KW

Maximum power 20 kW

2 FDCW 100VNX-A 10 kW units

THE HYDROLUTION SYSTEM - ACCESSORIES

Description	Code
	Exchanger for 10 and 16 kW units. HSB100-W HSB140
	Electric heater integration KIT for Flexible system. ELK9M1
	10 kW All in One units. HMA 100-S
	Single unit control. RC-HY20-W
	Modular unit control (up to 8). RC-HY40-W
	Circulation pump (3.5HP). CPD11-25M-65
	Circulation pump (6HP). CPD11-25M-75
	Hot water and heating diverter valve (3.5 - 6HP). VST11M
	Flow reversal valve for power > 16 kW and up to 40 kW. VST20M
	Conditioning heating diverter valve (3.5 - 6HP). VCC11M
	Control kit for secondary heating systems (max 8 syst.) up to 1200 L/h. ECS40M
	Control kit for secondary heating systems (max 8 syst.) up to 1950 L/h. ECS41M
	Circulator control kit for modular combinations. AXC30M
	Room temperature sensor. RTS40M
	Remote control. RMU40M
	Remote control MODBUS. MODBUS40M

THE HYDROLUTION SYSTEM - ACCESSORIES



Description

Integrated stainless steel storage tank and coil for instant domestic hot water production.
300-litre volume.
Dimensions (Ø x h) 650 x 1486 mm.

Code

WT-AP-DW1-300 C-1



Integrated stainless steel storage tank and coil for instant domestic hot water production.
500-litre volume.
Dimensions (Ø x h) 750 x 1786 mm.

WT-AP-DW1-500 C-1

1.5 kW integrative heating element.

WT-EH-15-C

Titanium anode for 300-litre tank.

WT-AT-2-4-C

Titanium anode for 500-litre tank.

WT-AT-5-C

Hydraulic separator - 25-litre thermal flywheel.

WT-SI-PDC-25 C

Hydraulic separator - 51-litre thermal flywheel.

WT-SI-PDC-50 C

Thermal valve for 100-litre PDC.

WT-VT-PDC-100 C



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

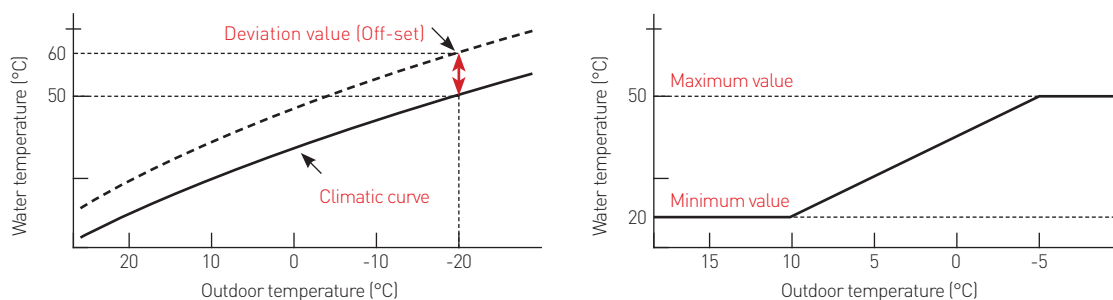


Activation of the "Silent" function significantly reduces the noise emitted by outdoor units, reducing compressor and fan speed. It is possible to set 2 hourly programs in this operating mode.



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.

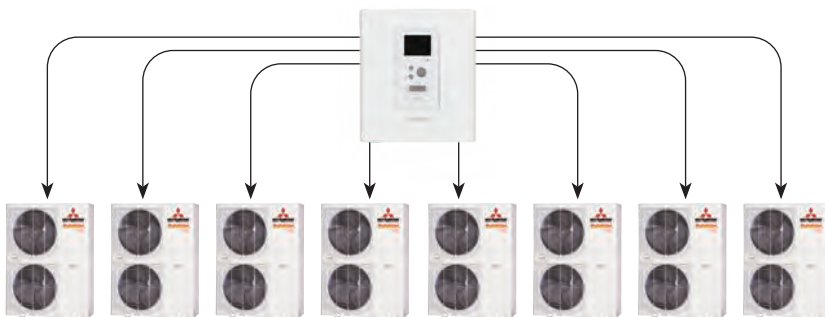
THE HYDROLUTION SYSTEM - CONTROL SYSTEMS

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.



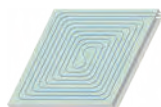
- **RC-HY40-W is able to manage up to 8 HYDROLUTION systems** in Flexible heating configuration.
- **RC-HY40-W guarantees** regulation efficiency , system durability and service continuity.



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	kW	9.20 (3.50~10.00)
	Electrical absorption			2.15
	Performance coefficient			4.28
	Rated power	A7//W45	kW	9.00 (3.50~11.00)
	Electrical absorption			2.62
	Performance coefficient			3.44
Cooling	Rated power	A35//W18	kW	11.00 (3.30~12.00)
	Electrical absorption			3.04
	Performance coefficient			3.62
	Rated power	A35//W7	kW	8.00 (3.00~9.00)
	Electrical absorption			2.85
	Performance coefficient			2.81
Seasonal heating data	Theoretical load [Pdesignh] @-10°C	35/55	kW	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		kWh/a	1702
Operating limits	Outside air temperature	Heating & DHW	°C	-20~43
		Cooling		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	23
Power cable (recommended)			Type	3x6 mm ²
Product specifications	Fan	Type	qty.	DC Inverter
		Air flow	m ³ /h	4380
	Sound power level		dB(A)	58
	Sound pressure level (at 1 m)		dB(A)	50
	Dimensions	LxDxH	mm	970x370x845
Weight	Net	kg	81	
Indoor unit model				HMA 100-S
Operating limits	Delivery water temperature	Heat.	°C	25~58
		Cool.		7~25
	DHW temperature (tank)	Max	80	
Hydraulic system data	DHW tank capacity		L	180
	Water/freon heat exchanger		Type	Braze-welded plates
	Circulation pump	Brand		Wilo
	Water connections	Dimensions	mm	22
	Operating pressure (system)	Max	bar	3
		Expansion tank	Volume	L
Electrical data	Power supply	Supply 230V/400V	Ph-V-Hz	1ph-230V-50Hz / 3ph-400V-50Hz
				Electrical integration
	Electrical absorption (Max)		A	45 / 23
	Power cable (recommended)		Type	3x10 mm ² / 3x6 mm ²
	Sound power level		dB(A)	33
Product specifications	Dimensions	LxDxH	mm	600x610x1589
	Weight	Net	kg	164
	Control (included)			On-board machine
	Remote control via Modbus (optional)			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	845 x 970 x 370		1300 x 970 x 370
Net	kg	81		105
Sound power level [A7/W35]	dB(A)	64,5		71
Sound pressure level at 1 metre [A7/W35]	dB(A)	50		54
Handled air (max)	m ³ /h	4380		6000
Refrigerant type	R410A			
Refrigerant volume (splitting length without additional load)	kg (m)	2,9 (15)		4,0 (15)
Refrigerant pipe diameter	gas	mm	15,88 (5/8")	
	liquid	(inches)	9,52 (3/8")	
Connection type			Flare	
Maximum absorption	A	23		25

THE HYDROLUTION SYSTEM - TECHNICAL DATA

FLEXIBLE indoor units

Outdoor unit model				FDCW 100 VNX-A	FDCW 140 VNX-A	
Heating	Rated power	A7//W35	kW	9.20 [3.50~10.00]	16.00 [4.20~16.00]	
	Electrical absorption			2.15	3.81	
	Performance coefficient			4.28	4.20	
	Rated power	A7//W45	kW	9.00 [3.50~11.00]	16.00 [5.80~16.00]	
	Electrical absorption			2.62	4.83	
	Performance coefficient			3.44	3.31	
Cooling	Rated power	A35//W18	kW	11.00 [3.30~12.00]	16.50 [5.20~16.50]	
	Electrical absorption			3.04	4.36	
	Performance coefficient			3.62	3.78	
	Rated power	A35//W7	kW	8.00 [3.00~9.00]	11.80 [3.10~11.80]	
	Electrical absorption			2.85	4.45	
	Performance coefficient			2.81	2.65	
Seasonal heating data	Theoretical load [Pdesignh] @ -10°C	35/55	kW	9/10	13/13	
	Seasonal energy efficiency (ns)			%	165/126	166/133
	Energy efficiency class			-	A++/A++	A++/A++
	Annual energy consumption			kWh/a	4181/6391	7906/6099
Seasonal data sanitary water	Warm-up time			XXL	XXL	
	Energy efficiency (nwh)		%	89	88	
	Classe di efficienza energetica			A	A	
	Consumo energetico annuo		kWh/a	2430	2449	
Operating limits	Outside air temperature	Heating & DHW	°C	-20~43	-20~43	
		Cooling		15~43	15~43	
Refrigerant circuit data	Refrigerant type [GWP]			R410A [2088]	R410A [2088]	
	Pre-charge quantity (tons CO2)		kg [t]	2.9 [6.055]	4.0 [8.352]	
	Diameter of liquid/gas piping		mm [inch]	9.52[3/8"] / 15.88[5/8"]	9.52[3/8"] / 15.88[5/8"]	
	Max. splitting length		m	30	30	
	Max height difference O.U./I.U. / I.U.-O.U.		m	7	7	
	Splitting length without additional load		m	15	15	
	Additional load		g/m	60	60	
	Refrigerant control system			Electronic expansion valve		
	Compressor		Type	Rotary- DC Inverter		
	Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz	
Maximum current			A	23	25	
Power cable (recommended)			Type	3x6 mm ²	3x6 mm ²	
Product specifications	Fan	Type	qty.	DC Inverter		
		Air flow	m ³ /h	4380	6000	
	Sound power level			58	58	
	Sound pressure level (at 1 m)			50	54	
	Dimensions	LxDxH	mm	970x370x845	970x370x1300	
Weight	Net	kg	81	105		
Indoor unit model				HSB 100-W	HSB 140	
Operating limits	Delivery water temperature	Heat.	°C	25~58	25~58	
		Cool.		7~25	7~25	
	DHW temperature (tank)	Max	80	80		
Hydraulic system data	DHW tank capacity		L	300	500	
	Water/freon heat exchanger		Type	Braze-welded plates		
	Water connections	Dimensions	mm	28	28	
	Operating pressure (system)	Max	bar	3	3	
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz		
	Power cable (recommended)		Type	3x1.5 mm ²	3x1.5 mm ²	
Product specifications	Sound power level			33	33	
	Dimensions	LxDxH	mm	460x250x400	460x250x400	
	Weight	Net	kg	18	23	
	Control (included)			RC-HY20-W / RC-HY40-W		
	Remote control via Modbus (optional)			MODBUS40M1		

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.

1. Not compatible with RC-HY20-W.

Split box

Model	HSB100-W	HSB140
Power	1 ph-230V 50Hz	
Operating limit (water temperature)	heating	25~60° C (65° C, with heating element)
	cooling	7~25° C
Maximum pressure	10	
Connector diameter	28	28
Room temperature	5~35	
Height x Width x Depth	400 x 460 x 250	
Net	18	23
Refrigerant type	R410A/R32	R410A

Tank

Model	WT-AP-DW1-300 C-1	WT-AP-DW1-500 C-1
Power	-	-
Volume	litre	291
Heating element	kW	498
Height/diameter	mm/ø	Optional
Net	kg	1486/650
Connector diameter	inches	75
Maximum tank pressure	Bar	118
Maximum exchanger pressure	Bar	1" 1/4"
Energy class		10
		12
	C	C