

> AQUA³

AIR-WATER HEAT PUMPS FOR SPLITTED INSTALLATION



Available range

Unit type

IP Heat pump
(reversible on the refrigerant side)

Versions

VB Base Version

Acoustic setting up

AB Base setting up

Unit description

This series of air-water heat pumps satisfies the heating, cooling and domestic hot water production requirements of residential plants of small and medium size. All the units are suitable for splitted installation (indoor unit and outdoor unit connected by refrigerant pipes) and can be applied to fan coil plants, radiant floor plants and high efficiency radiators plants.

The heat pump is composed by an outdoor unit (motocondensing unit) containing compressor, fan, finned coil and part of the refrigerant circuit and by an indoor unit (remote condenser) containing plate heat exchanger and hydronic circuit.

The function of the outdoor unit is to extract heat from the outdoor air and increase the temperature level up to a value suitable to satisfy the plant heating needs. Such heat is transferred to the indoor unit through refrigerant pipes and released to the plant water by means of a plate heat exchanger. The pump contained inside the indoor unit, allows the water to flow in order to feed the different types of water

terminals of the plant (radiators, fan coils, radiant plants...)

When domestic hot water is requested, the hot water flow produced by the heat pump is diverted towards the domestic hot water tank by means of a 3 way valve contained inside the indoor unit (option). The indoor unit can be supplied with electrical heaters that integrate the heating power of the heat pump (option).

The unit is able to operate also in cooling mode producing cold water to be sent to the water terminals of the plant (fan coils or radiant plants).

The refrigerant circuit, contained in a compartment protected from the air flow to simplify the maintenance operations, is equipped with twin rotary compressor mounted on damper supports, brazed plate heat exchanger, electronic expansion valve, reverse cycle valve, axial fans with safety protection grilles, finned coil made of copper pipes and aluminium louvered fins. The circuit is protected by high and low pressure switches and flow switch on the plate heat exchanger.

The compressor equipped with brushless direct current motor and inverter driver, allows to modulate the power supplied by the unit in order to satisfy the plant needs.

The plate heat exchanger and all the hydraulic pipes are thermally insulated in order to avoid condensate generation and to reduce thermal losses.

All the units are equipped with fans with direct current motor and variable speed control that allows the units to operate with low outdoor temperatures in cooling and high outdoor temperature in heating and permits to reduce noise emissions in such operating conditions.

All the units are supplied with an outdoor temperature sensor, already installed on the unit, in order to realize the climatic control.

All the units are accurately built and individually tested in the factory. Only electric, hydraulic and refrigerant (between indoor and outdoor unit) connections are required for installation.

Options

Domestic hot water 3 way valve

- not present
- standard

Integrative electrical heaters

- not present
- standard

Accessories

Rubber vibration dampers

Room temperature sensor

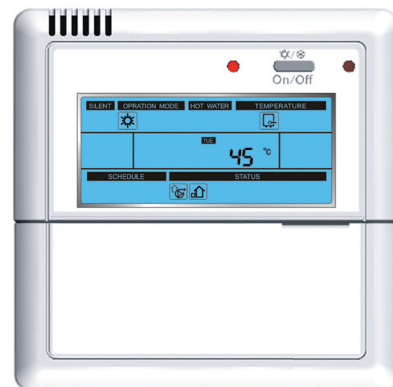
Condensate drain pan (for cooling mode)

CONTROL SYSTEM

The unit is equipped with a microprocessor controller that allows to manage the heat pump and the plant to which it is connected. The user interface, supplied with the unit for wall installation, allows to view and, if necessary, to modify all the operating parameters of the unit. It is available, as an accessory, a room air temperature sensor to realize a climatic control according also to the room temperature.

The main functions available are :

- water temperature management in heating and in cooling
- climatic control in heating (automatic set point adjustment according to outdoor air temperature)
- domestic hot water production (management of tank temperature probe, 3 way valve and electrical heaters)
- anti legionella cycles management for the domestic hot water tank
- fans management by means of continuous rotational speed control
- pump management
- integrative electrical heaters management for heating
- weekly programmer clock
- alarm diagnostic
- general alarm digital output

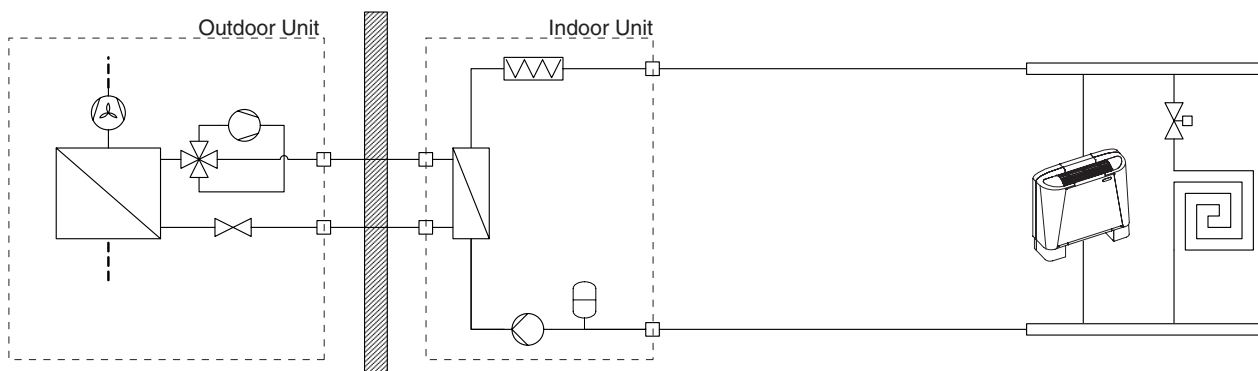


OPERATING DIAGRAMS

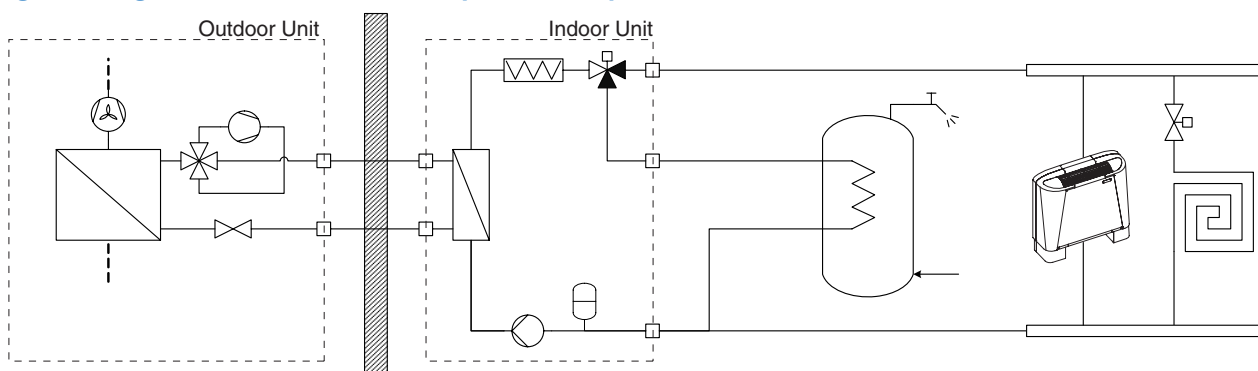
The unit can manage the integration of a supplementary heating source (electrical heaters) that allows to compensate the decrease of the heating output with the decrease of the outdoor air temperature in order to realize a BIVALENT operating mode and to satisfy completely the heating and domestic hot water production needs.

If the heat pump supply also cooling circuits equipped with fan coils, the water flow towards any radiant circuit is avoided by means of proper two way valves managed by the heat pump controller.

Heating / cooling plant



Heating / cooling and domestic hot water production plant



DOMESTIC HOT WATER TANK

The unit can be connected to a tank for domestic hot water equipped with a coil properly designed in order to be fed with hot water at the maximum flow temperature that the heat pump can produce.

The tank management is realized by means of a temperature probe to be placed inside a well in the upper part of the tank.

The unit is able to manage :

- a 3 way valve (to divert the hot water flow from the plant to the coil of the tank)
- an electrical heater placed inside the tank (not mandatory)

The unit is also able to manage weekly anti legionella cycles defining the activation day and hour and temperature set point.

Domestic hot water tank	8.1 - 10.1	12.1 - 14.1 16.1	
Reccomended minimum volume	200	300	l
Coil reccomended minimum surface	4,0	6,0	m ²

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	8.1	10.1	12.1	14.1	16.1	
A7W35	Heating capacity	8,53	10,0	12,1	14,2	15,7	kW
	Power input	2,04	2,46	2,88	3,46	3,98	kW
	COP	4,18	4,07	4,20	4,10	3,94	-
	Water flow rate	1470	1721	2095	2442	2702	l/h
	Pressure drops	-	-	-	-	-	kPa
A2W35	Available static head	40	29	50	41	33	kPa
	Heating capacity	7,09	8,31	10,1	11,7	13,1	kW
	Power input	1,99	2,40	2,83	3,38	3,88	kW
	COP	3,56	3,46	3,57	3,46	3,38	-
	Water flow rate	1224	1434	1749	2026	2251	l/h
A35W18	Pressure drops	-	-	-	-	-	kPa
	Available static head	49	41	59	52	46	kPa
	Cooling capacity	9,07	10,6	12,9	14,9	16,6	kW
	Power input	2,47	3,00	3,52	4,21	4,84	kW
	EER	3,67	3,53	3,66	3,54	3,43	-
A35W18	Water flow rate	1571	1845	2241	2586	2879	l/h
	Pressure drops	-	-	-	-	-	kPa
	Available static head	36	24	47	37	28	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	8.1	10.1	12.1	14.1	16.1	
A7W45	Heating capacity	7,84	9,20	11,1	13,1	14,4	kW
	Power input	2,41	2,92	3,44	4,10	4,72	kW
	COP	3,25	3,15	3,23	3,20	3,05	-
	Water flow rate	1357	1590	1929	2259	2485	l/h
	Pressure drops	-	-	-	-	-	kPa
A2W45	Available static head	44	35	54	46	40	kPa
	Heating capacity	6,44	7,54	9,15	10,6	11,8	kW
	Power input	2,37	2,86	3,37	4,03	4,63	kW
	COP	2,72	2,64	2,72	2,63	2,55	-
	Water flow rate	1116	1305	1587	1842	2051	l/h
A35W7	Pressure drops	-	-	-	-	-	kPa
	Available static head	53	46	62	56	51	kPa
	Cooling capacity	6,72	7,85	9,57	11,1	12,3	kW
	Power input	2,34	2,83	3,33	3,97	4,57	kW
	EER	2,87	2,77	2,87	2,80	2,69	-
A35W7	Water flow rate	1157	1352	1646	1905	2111	l/h
	Pressure drops	-	-	-	-	-	kPa
	Available static head	52	45	61	55	50	kPa

Data declared according to **EN 14511**. The values are referred to units without options and accessories operating at the nominal frequency and with refrigerant lines between the indoor and the outdoor unit of 7,5 meters.

A35W7 = source : air in 35°C d.b. / plant : water in 12°C out 7°C

A35W18 = source : air in 35°C d.b. / plant : water in 23°C out 18°C

A7W45 = source : air in 7°C d.b. 6°C w.b. / plant : water in 40°C out 45°C

A7W35 = source : air in 7°C d.b. 6°C w.b. / plant : water in 30°C out 35°C

A2W45 = source : air in 2°C d.b. 1°C w.b. / plant : water in 40°C out 45°C

A2W35 = source : air in 2°C d.b. 1°C w.b. / plant : water in 30°C out 35°C

Acoustic performances

	Outdoor unit	8.1	10.1	12.1	14.1	16.1	
	Sound power level	66	67	68	69	70	dB(A)
	Sound pressure level at 1 metre	52	53	53	54	55	dB(A)
	Sound pressure level at 5 metres	40	41	42	43	44	dB(A)
	Sound pressure level at 10 metres	35	36	36	37	38	dB(A)
	Indoor unit	8.1	10.1	12.1	14.1	16.1	
	Sound power level	41	41	42	42	42	dB(A)
	Sound pressure level at 1 metre	28	28	29	29	29	dB(A)
	Sound pressure level at 5 metres	15	15	16	16	16	dB(A)
	Sound pressure level at 10 metres	10	10	11	11	11	dB(A)

The acoustic performances are referred to units operating in heating mode at nominal conditions A7W35.

Unit placed in free field on reflecting surface (directional factor equal to 2).

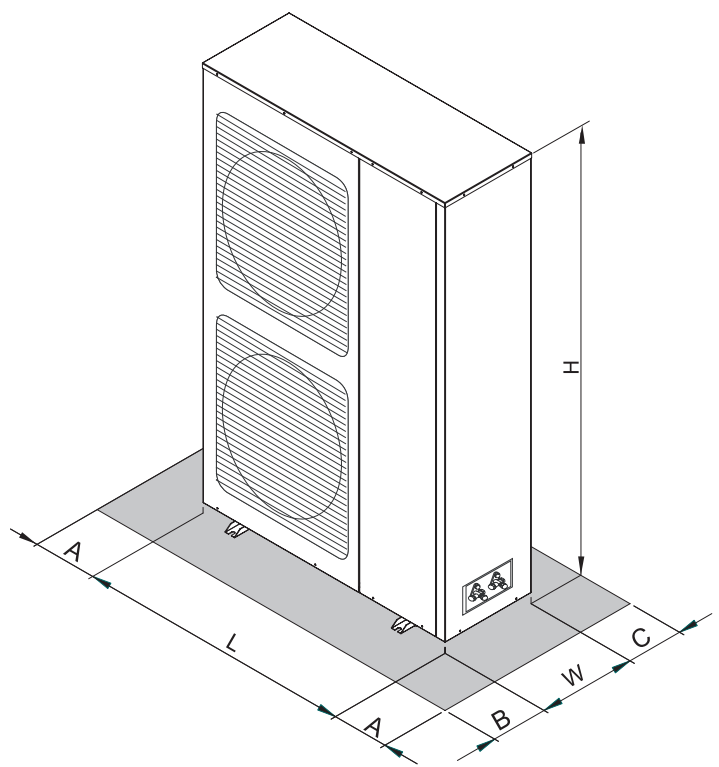
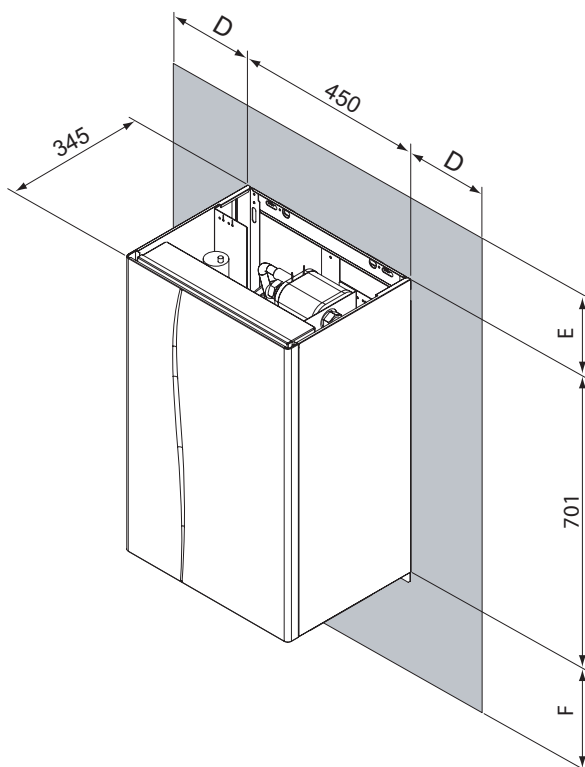
The sound power level is measured according to ISO 3744 standard.

The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

OPERATING LIMITS	Unit type	Cooling		Heating		
		min	max	min	max	
Outdoor air inlet temperature	IP	10	48	-20	45	°C
Water outlet temperature	IP	7	25	25	55	°C

TECHNICAL DATA	8.1	10.1	12.1	14.1	16.1	
Power supply	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	V-ph-Hz
Compressor type	twin rotary	twin rotary	twin rotary	twin rotary	twin rotary	-
N° compressors / N° refrigerant circuits	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	n°
Plant side heat exchanger type	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	-
Source side heat exchanger type	finned coil	finned coil	finned coil	finned coil	finned coil	-
Fans type	axial	axial	axial	axial	axial	-
N° fans	1	1	2	2	2	n°
Pump type	3 speed glandless pump	3 speed glandless pump	3 speed glandless pump	3 speed glandless pump	3 speed glandless pump	-
Expansion vessel volume	10	10	10	10	10	l
Safety valve set	3	3	3	3	3	bar
Hydraulic fittings - plant	1" M	1" M	1" M	1" M	1" M	-
Hydraulic fittings - domestic hot water	1/2" M	1/2" M	1/2" M	1/2" M	1/2" M	-
Refrigerant fittings - liquid line	3/8"	3/8"	3/8"	3/8"	3/8"	-
Refrigerant fittings - gas line	5/8"	5/8"	5/8"	5/8"	5/8"	-

DIMENSIONS AND MINIMUM OPERATING AREA



	8.1	10.1	12.1	14.1	16.1	
L	921	921	950	950	950	mm
W	427	427	412	412	412	mm
H	791	791	1253	1253	1253	mm
A	500	500	500	500	500	mm
B	2000	2000	2000	2000	2000	mm
C	500	500	500	500	500	mm
D	20	20	20	20	20	mm
E	500	500	500	500	500	mm
F	500	500	500	500	500	mm