> HMP

AIR - WATER
HEAT PUMPS
FOR OUTDOOR OR INDOOR INSTALLATION

Available range

Unit type
IP Reversible heat pump
(reversible on the refrigerant side)

Versions (heat recovery)
VB Base version
VD Desuperheater 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 both for outdoor or indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

The control system allows to manage not only the refrigerant circuit but the whole plant with the possibility to choose different solutions both for the heating and cooling plant and for the domestic hot water management. The possibility of solar panels or other heating sources integration is also available.

The **heating** function optimizes the flow water temperature according both to the ambient temperature and to the outdoor temperature through climatic curves adaptable to the building features. It's possible to manage a storage tank and two independent circuits (a direct one and a mixed one).

The **domestic hot water** management allows to control the three way valve, the storage tank and the anti-legionella cycles (if necessary).

The **cooling** function can be realized through "active cooling" (refrigerant circuit inversion). When the unit is used in radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed. During cooling mode operation a part of the heating power in excess can be recovered for the domestic hot water production (VD version).

The **internal programmer clock** allows to define different daily switching programs for heating, cooling and domestic hot water production.

The refrigerant circuit, contained in a box repaired from the air flow to simplify the maintenance operations, is equipped with scroll compressor mounted on damper supports, brazed plate heat exchangers, electronic expansion valve, reverse cycle valve, centrifugal fan (plug fan), finned coil realized with copper pipes and alluminium fins. The circuit is protected by high and low pressure switches and flow switches on the plate heat exchanger.

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

The plug fan with electronic control of the rotational speed guarantees high efficiencies and low noise in all the operating conditions and allows to install the unit both outdoor (with protection caps) or indoor (with ducted air inlet and outlet).

All the units with three-phase power supply are provided with a phase sequence and correct sequence controller device and with an outdoor temperature sensor in order to realize the climatic control.

All the units are accurately built and individually tested in the factory. Only electric and hydraulic connections are required for installation.

Options

Plant side flow rate management
- not present
- standard pump
- high head pump
- high efficiency pump

Domestic hot water production
- not present
- 3 way valve

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Adjustable rubber vibration dampers
Protecion caps
Remote thermostat (wired or wireless)
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor

CONTROL SYSTEM

The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

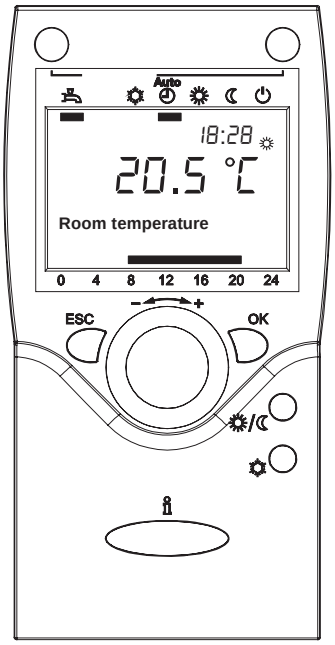
The main **functions** of the control system are :

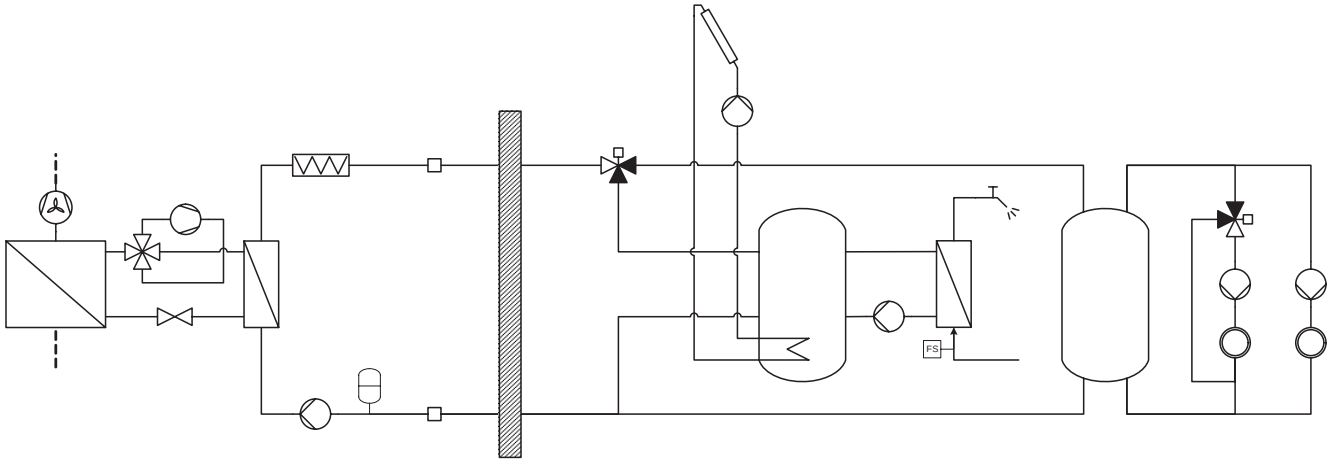
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (only pump)
- management of a storage tank for heating and/or cooling
- management of electrical heaters for heating and domestic hot water (3 steps logic)
- solar panels integration
- room humidity control for cooling with radiant systems
- internal programmer clock (for heating, cooling and domestic hot water)
- digital input for electrical energy low tariff
- alarm memory management and diagnostic
- compressor and pump operating hour counter
- possibility to manage more units in cascade (maximum 16)

Besides the standard user interface to be placed indoor, wired or wireless remote thermostats are available which allow to control all the operating parameters of the unit and to acquire the temperature in the different zones in order to realize a more precise and comfortable control.

The unit controller is able to manage a lot of different plant solutions enabling automatically the necessary control algorythms according to the components which have been connected.

The management of such components is possible through additional expansion modules which communicate with the unit by means of an internal bus and provide all the inputs and outputs required to fulfil a complete system.





The controller is able to manage up to **two zones in heating** (one by means of a mixed circuit and the other by means of a direct circuit) and **one zone in cooling** (by means of a mixed circuit).

It's possible to realize more complex plants connecting to the heat pump controller further expansion modules in order to extend without limits the number of zones to be managed.

For each zone the following parameters can be set :

- set point
- daily or weekly operating time table
- climatic control curve
- room control sensor : it can be in common with the other zones or independent (in that case it's necessary to install an additional room thermostat)

AERAULIC performances	24.1	27.1	31.1	35.1	40.1	45.1	
Nominal air flow rate	7150	7850	7850	7850	11400	11400	m³/h
Nominal available static head	50	50	50	50	150	150	Pa

		Cooling		Heating		
OPERATING LIMITS	Unit type	min	max	min	max	
Outdoor air inlet temperature	IP	5	45	-20	42	°C
Water outlet temperature	IP	6	25	30	60	°C

NOMINAL performances - Radiant plants

IP	Acoustic setting up : AB	24.1	27.1	31.1	35.1	40.1	45.1	
A7W35	Heating capacity	23,5	26,9	30,7	34,3	39,6	45,2	kW
	Power input	5,18	5,81	6,79	7,75	8,72	10,0	kW
	COP	**4,54**	**4,63**	**4,52**	**4,43**	**4,54**	**4,52**	-
	Water flow rate plant side	4052	4641	5299	5905	6823	7793	l/h
	Pressure drops plant side	21	18	23	28	25	32	kPa
A2W35	Heating capacity	19,5	22,3	25,6	28,5	32,8	37,5	kW
	Power input	5,08	5,70	6,66	7,59	8,53	9,82	kW
	COP	**3,84**	**3,91**	**3,84**	**3,75**	**3,85**	**3,82**	-
	Water flow rate plant side	3377	3862	4416	4918	5663	6477	l/h
	Pressure drops plant side	15	13	16	20	18	23	kPa
A35W18	Cooling capacity	24,5	28,0	32,0	35,6	41,0	46,9	kW
	Power input	7,20	8,08	9,46	10,8	12,2	14,0	kW
	EER	**3,40**	**3,47**	**3,38**	**3,30**	**3,36**	**3,35**	-
	Water flow rate plant side	4242	4845	5535	6173	7104	8138	l/h
	Pressure drops plant side	23	19	25	31	27	35	kPa

NOMINAL performances - Standard plants

IP	Acoustic setting up : AB	24.1	27.1	31.1	35.1	40.1	45.1	
A7W45	Heating capacity	23,0	26,3	30,0	33,5	38,5	44,1	kW
	Power input	6,29	7,05	8,25	9,42	10,5	12,2	kW
	COP	**3,66**	**3,73**	**3,64**	**3,56**	**3,67**	**3,61**	-
	Water flow rate plant side	3980	4553	5196	5805	6674	7629	l/h
	Pressure drops plant side	21	17	22	27	24	31	kPa
A2W45	Heating capacity	18,9	21,7	24,9	27,7	31,9	36,4	kW
	Power input	6,19	6,95	8,12	9,25	10,4	11,9	kW
	COP	**3,05**	**3,12**	**3,07**	**2,99**	**3,07**	**3,06**	-
	Water flow rate plant side	3285	3771	4310	4797	5527	6309	l/h
	Pressure drops plant side	14	12	15	19	17	22	kPa
A35W7	Cooling capacity	19,1	21,8	24,8	27,6	31,8	36,4	kW
	Power input	6,65	7,47	8,73	9,95	11,2	12,8	kW
	EER	**2,87**	**2,92**	**2,84**	**2,77**	**2,84**	**2,84**	-
	Water flow rate plant side	3278	3741	4273	4754	5474	6264	l/h
	Pressure drops plant side	14	12	15	19	17	22	kPa

NOMINAL performances - HIGH temperature plants

IP	Acoustic setting up : AB	24.1	27.1	31.1	35.1	40.1	45.1	
A7W55	Heating capacity	22,0	25,2	28,8	32,1	37,0	42,4	kW
	Power input	7,26	8,16	9,51	10,8	12,2	14,0	kW
	COP	**3,03**	**3,09**	**3,03**	**2,97**	**3,03**	**3,03**	-
	Water flow rate plant side	2397	2746	3138	3498	4032	4609	l/h
	Pressure drops plant side	8	7	8	10	9	12	kPa
A2W55	Heating capacity	18,1	20,7	23,6	26,3	30,3	34,7	kW
	Power input	7,19	8,08	9,42	10,7	12,1	13,8	kW
	COP	**2,52**	**2,56**	**2,51**	**2,46**	**2,50**	**2,51**	-
	Water flow rate plant side	1972	2256	2572	2866	3302	3781	l/h
	Pressure drops plant side	5	5	6	7	6	8	kPa

Data declared according to **EN 14511**. The values are referred to units without options and accessories.

A7W65 = source : air in 7°C d.b. 6°C w.b. / plant : water in 55°C out 65°C
A7W55 = source : air in 7°C d.b. 6°C w.b. / plant : water in 47°C out 55°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
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

A2W65 = source : air in 2°C d.b. 1°C w.b. / plant : water in 55°C out 65°C
A2W55 = source : air in 2°C d.b. 1°C w.b. / plant : water in 47°C out 55°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

TECHNICAL DATA	24.1	27.1	31.1	35.1	40.1	45.1	
Power supply	400 - 3N - 50						V-ph-Hz
Compressor type	scroll						-
N° compressors / N° refrigerant circuits	1 / 1						n°
Plant side heat exchanger type	stainless steel brazed plates						-
Source side heat exchanger type	finned coil						-
Fans type	plug fan						-
N° fans	1						n°
Hydraulic fittings	1"1/4 M						-
Hydraulic fittings heat recovery (VD)	1" M						-

ACOUSTIC PERFORMANCES

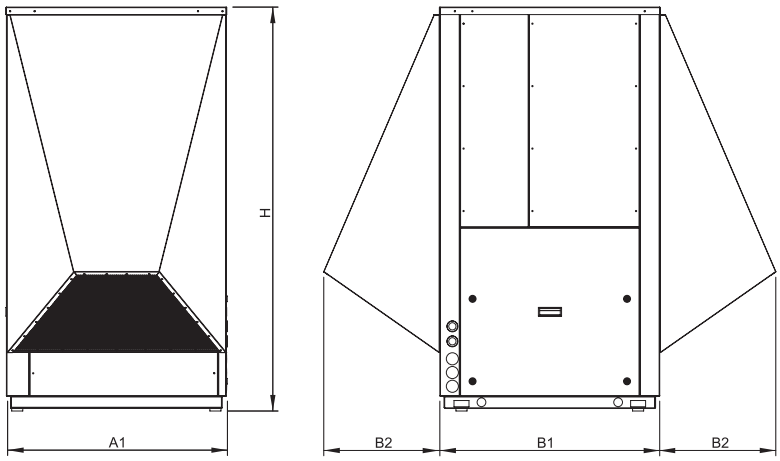
Unit without accessory "Protection caps"	24.1	27.1	31.1	35.1	40.1	45.1	
Sound power level	76	76	77	77	78	78	dB(A)
Sound pressure level at 1 metre	60	60	61	61	62	62	dB(A)
Sound pressure level at 5 metres	50	50	51	51	52	52	dB(A)
Sound pressure level at 10 metres	44	44	45	45	46	46	dB(A)
Unit with accessory "Protection caps"	**24.1**	**27.1**	**31.1**	**35.1**	**40.1**	**45.1**	
Sound power level	72	72	73	73	74	74	dB(A)
Sound pressure level at 1 metre	56	56	57	57	58	58	dB(A)
Sound pressure level at 5 metres	46	46	47	47	48	48	dB(A)
Sound pressure level at 10 metres	41	41	42	42	43	43	dB(A)

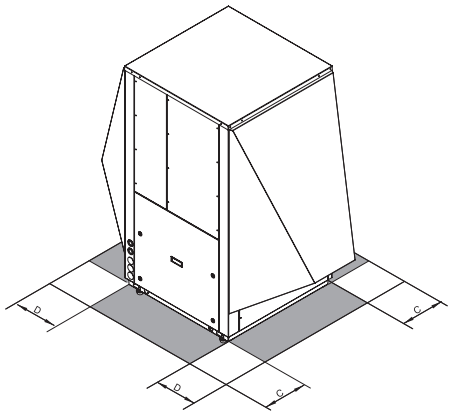
The acoustic performances are referred to units operating in heating mode at nominal conditions A7W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

DIMENSIONS AND MINIMUM OPERATING AREA

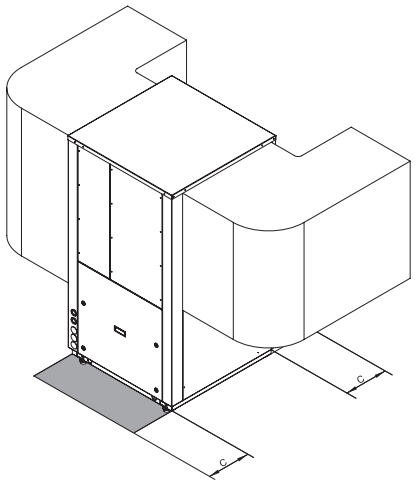
Respect the free area around the unit as shown in figure in order to guarantee a good accessibility and facilitate maintenance and control operations.

C	600 mm
D	600 mm





Outdoor installation



Indoor installation

	24.1	27.1 - 31.1 - 35.1	40.1 - 45.1	
A1	880	1180	1480	mm
B1	880	880	880	mm
B2	465	465	465	mm
H	1620	1620	1620	mm