Ferroli

PRODUCT RANGE

HEAT PUMPS

2012

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Ferroli

5 10 20

MAXIMUM OUTLET WATER TEMPERATURE [°C]

°C

65.0 °C

ENHANCED EVI VAPOUR INJECTION

60.0 °C

55.0 °C

HXP HT 6 - 23

AIR - WATER

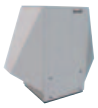
Outdoor or indoor installation

under development

HSP 4 - 11

AIR - WATER

Outdoor or indoor installation



HXP

AIR - WATER

Outdoor or indoor installation

KSR 3 - 9

AIR - WATER

Split installation

KXR 10 - 20

AIR - WATER

Split installation

HSW 3 - 11

WATER - WATER

Indoor installation

HXW

WATER - WATER

Indoor installation

HSW LT 3 - 11

WATER - WATER

Indoor installation

HXW LT

WATER - WATER

Indoor installation

HXA 5 - 18

AIR - WATER

Outdoor installation

NOMINAL HEATING CAPACITY **[kW]**

30 50 100

HMP HT 26 - 46

AIR - WATER

Outdoor or indoor installation

HGP HT 50 - 100

AIR - WATER

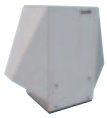
Outdoor or indoor installation

HGA HT 50 - 100

AIR - WATER

Outdoor installation

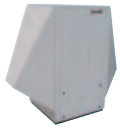
11 - 21



HMP 24 - 45

AIR - WATER

Outdoor or indoor installation



HGP 50 - 90

AIR - WATER

Outdoor or indoor installation

HGA 50 - 90

AIR - WATER

Outdoor installation

12 - 27

12 - 27

HMW LT 28 - 55

WATER - WATER

Indoor installation

HEAT PUMP SYSTEM BENEFITS

> A new strategy for heating and comfort

Satisfy the room comfort needs using the heat available in the environment as renewable and inhexaustible energy source

renewable source

The air, the water and the ground, the three most common elements on Earth, represent a virtually inhexaustible source of energy and heat, that the modern technology applied to heat pumps allow to be used in an optimized way in order to satisfy the heating and cooling needs of all the dwellings with efficient and ecological solutions.

energy efficiency

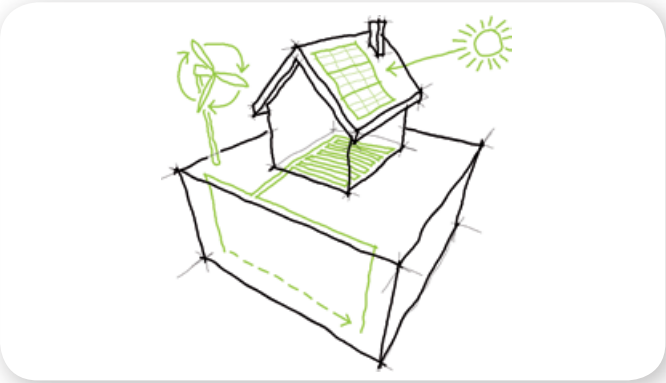
Heat pumps allow to get much higher efficiency levels compared to the traditional heating systems because they draw the main part of the required energy directly from the environment. The continuos improvement of the technologies applied to all the components and the constant optimization of the thermodynamic cycle, upon which the heat pump operating mode is based, allow to achieve always better performances.

operating costs reduction

The high energetic efficiency guaranteed by the heat pump and the advanced control system able to assure the maximum synergy between all the components of the plant allow to optimize the overall efficiency of the system during the whole year and to minimize the operating costs. The energy required to guarantee the room comfort is always produced in the most efficient way avoiding waste and taking advantage of the most convenient source both on the energetic and on the economical point of view.

domestic hot water production

Heat pumps can satisfy also the domestic hot water production needs coordinating the different requests by means of an accurate priority management.
A proper water storage tank is always required in order to guarantee the maximum comfort in all the possible situations.



control and integration: the future is the system

The heat pumps are equipped with a control system that allow the management of the whole plant to coordinate all the available heating sources (heat pump, thermal solar, boiler, stove…) in order to satisfy in the best way the room comfort needs using the less quantity of energy as possible, produced in the most efficient way.

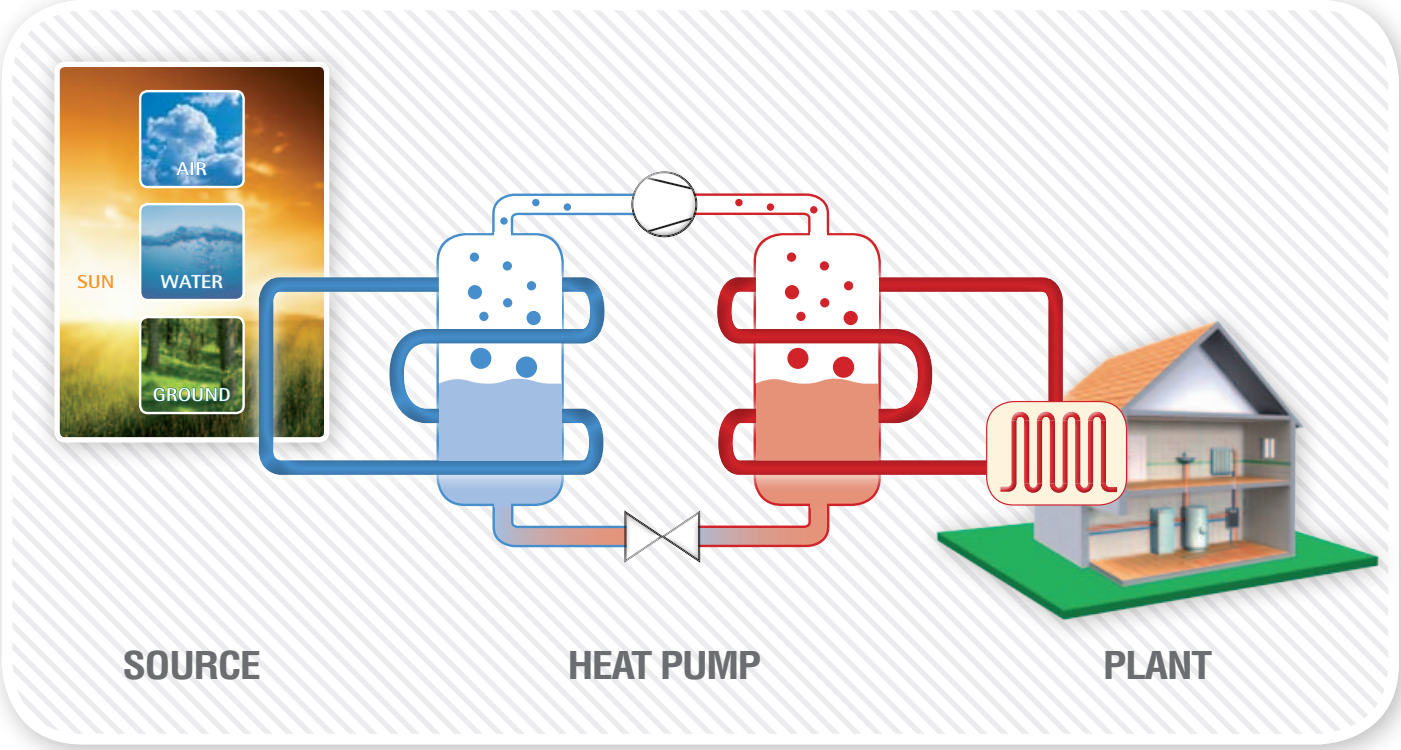
cooling function

The heat pump can also be used to produce cold water to be used in the cooling plant. The thermodynamic cycle inversion allow to reverse the normal heat flux that, instead of flowing from the outdoor environment to the plant, flows from the plant to the outdoor environment. The possibility to use the heat pump also for cooling extends the operating period also to the summertime making the heat pump a complete solution for the residential heating and cooling needs and exalting the advantages of the heat pump system in terms of efficiency, overall dimensions and integrated control.

IS THE HEAT PUMP CONSIDERED AS A "RENEWABLE SOURCE"?

> The outdoor environment (air, water and ground) contains a huge quantity of completely renewable thermal energy

The temperature level of all this energy does not allow its direct use in order to satisfy the heating requests



The heat pump is able to increase the temperature level of such energy and to transfer it to the plant by means of a thermodynamic cycle.
In order to perform such operation an amount of electrical energy (normally not renewable) is required. Also this energy is transformed in heat and released to the plant.

Therefore not all the thermal energy supplied by the heat pump can be considered as renewable but only the portion taken from the outdoor environment.

The heat pump could become a completely renewable source if also the electrical energy used to operate the thermodynamic cycle would come from a renewable source (i.e. photovoltaic, wind, hydroelectric…)

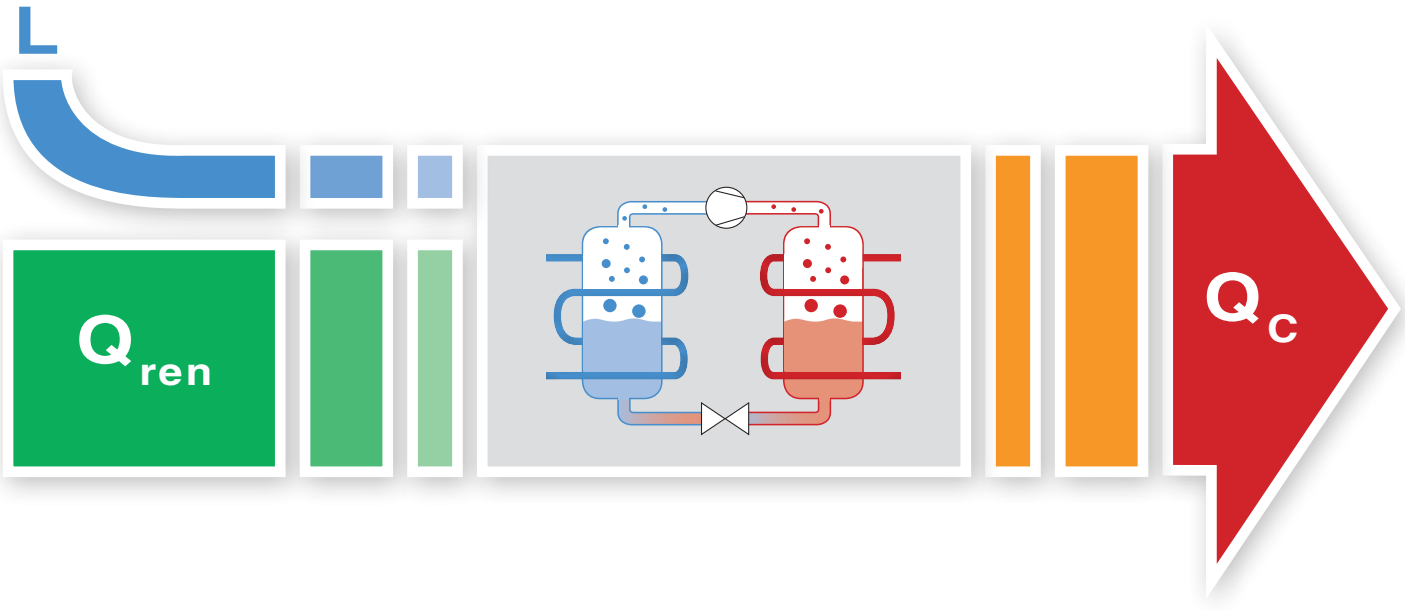
In order to quantify the renewable energy (*Qren*) produced by a heat pump is necessary to consider its seasonal performance factor (*SPF*) that represents the ratio between the useful energy (*Qc*) available during the heating period and the electrical energy (*L*) required for the heat pump operation.

$$SPF = \frac{Qc}{L}$$

The portion of energy that comes from renewable source, given by the difference between the total thermal energy available for the plant and the electrical energy used, is therefore as bigger as higher is the heat pump efficiency.

$$Qren = Qc - L = Qc \cdot \left(1 - \frac{1}{SPF}\right)$$

The seasonal efficiency of the modern heat pumps usually guarantees a **renewable energy percentage** variable **from 75% to 100%** of the total thermal energy supplied.



ENERGETIC ADVANTAGE

> The heat pump require ELECTRICAL ENERGY to work. In order to make a comparison with a traditional heating system that uses fossil fuel to work is necessary to consider the PRIMARY ENERGY consumption.

For the same amount of thermal energy supplied to the plant, the quantity of primary energy required with a traditional heating system depends only on the efficiency of the generator.

Considering as a traditional heating system a ***CONDENSING BOILER*** with an efficiency equal to 109%, to produce 100 thermal units, 92 primary energy units are required.

In the case of a ***HEAT PUMP*** the quantity of primary energy required depends on the heat pump efficiency (COP) and on the conversion efficiency of the primary energy into electrical energy. Considering a conversion efficiency equal to 46% and a COP equal to 3,3 , to produce 100 thermal units, 30 electrical energy units are required, corresponding to 66 primary energy units.

When is the advantage guaranteed?

Considering a conversion efficiency equal to 46%, the heat pump system achieves a total efficiency, evaluated in terms of primary energy, higher than the one of a traditional heating system if the *COP* is higher than *2,36*.

The modern heat pumps, if properly designed and installed, normally achieve a seasonal efficiency higher than such value and suitable to guarantee always the energetic advantage of the heat pump system over the traditional heating systems.

ECONOMIC ADVANTAGE

Though the energetic advantage of the heat pump system over a traditional heating system is easily demonstrated, the economic advantage is affected by a much higher number of factors and particularly by the ratio between the electrical energy cost and the fossil fuel cost.

The three main factors to be taken into account are:

> the electrical energy cost

> the fossil fuel cost

> the heat pump seasonal efficiency

When is the advantage guaranteed?

When the cost of the electrical energy and of the fossil fuel are known, is easy to calculate which is the minimum seasonal efficiency that the heat pump has to guarantee in order to be the best solution also from an economic point of view.

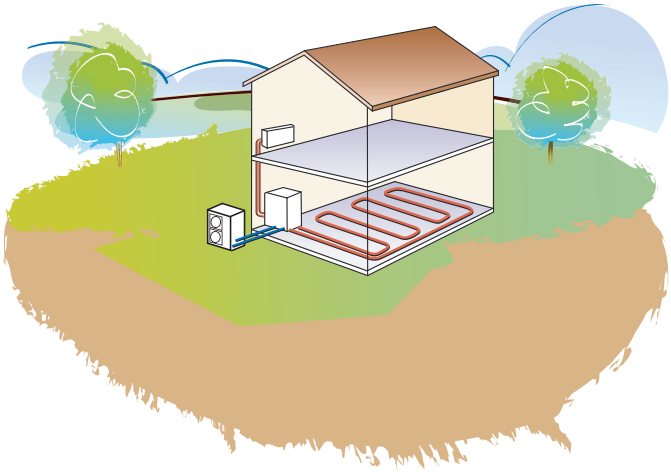
Unlike a traditional heating system where the variability range of the generator efficiency is narrow, the heat pump systems can achieve seasonal efficiency levels very different according to:

> TYPE OF THERMAL SOURCE

> TYPE OF DISTRIBUTION PLANT

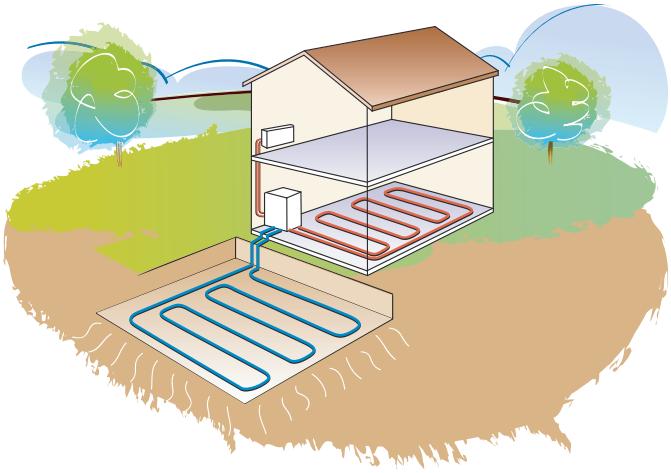
type of THERMAL SOURCE

The thermal source is the natural element from which the heat pump takes the thermal energy that is transferred to the plant, once its temperature level has been increased.
Heat pumps can be classified into two main groups:



AIR-WATER
heat pumps

use the outdoor air as source



WATER-WATER
heat pumps

use the water as source (from well, river, lake or flowing inside geothermal probes)

type of DISTRIBUTION PLANT

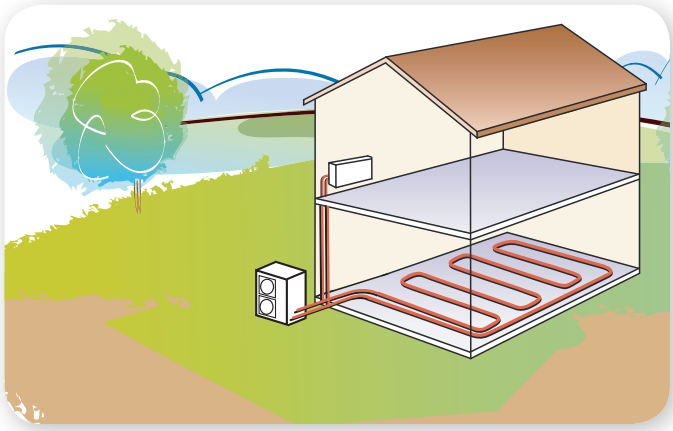
The type of distribution plant strongly defines the temperature level at which the water inside the heat pump has to be heated. The lower the temperature of the water the higher is the efficiency of the heat pump.

RADIATOR
60-70°C

FAN COIL
40-50°C

RADIANT PLANT
25-35°C

AIR - WATER HEAT PUMPS

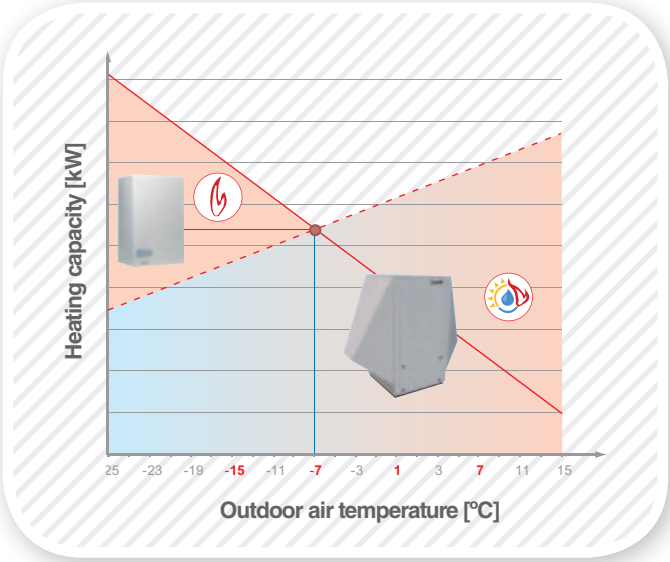


Outdoor air, often underestimated as thermal source, represents a very interesting solution, even in very cold and wet countries. The technology evolution has lead air-water heat pumps to be not only reliable but also convenient thanks to their simple installation and to their lower investment cost compared to water-water heat pumps.

outdoor installation

The simplest solution to use the energy contained in the outdoor air is to install the heat pump directly outdoor.
It is necessary to reserve enough space around the heat pump to guarantee a proper air circulation and to prevent the freezing risk of the pipes that connect the heat pump to the plant using brine solutions or undergrounding completely the pipes.

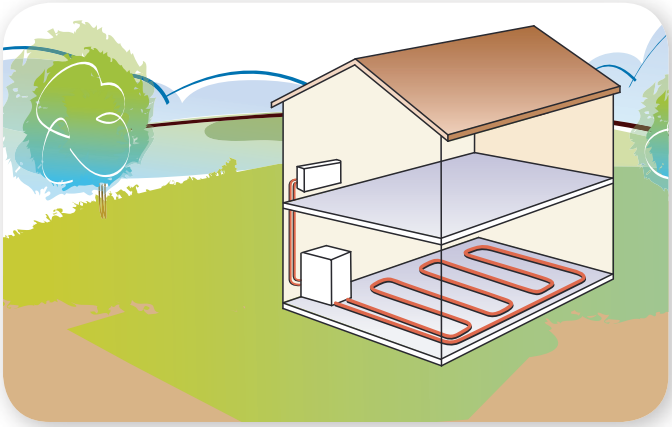
> Type of installation



> Performances

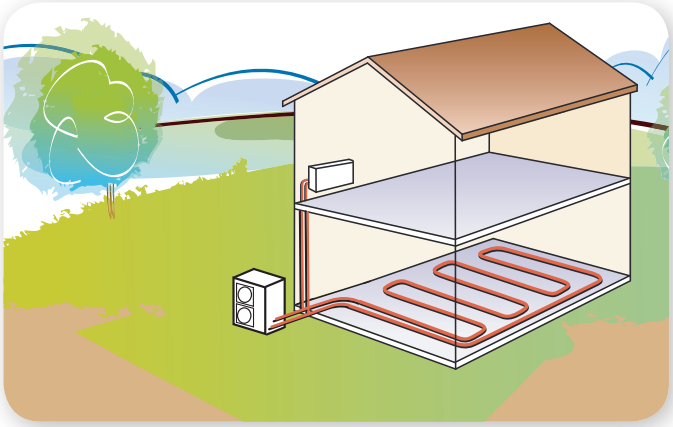
bivalent operating mode

The heating capacity supplied by the heat pump decreases when the outdoor air temperature decreases (at -15°C the heating capacity is about the half compard to the corresponding capacity at 7°C). To satisfy the heating requests of the building, that increases when the utdoor air temperature decreases due to the higher thermal losses, without applying an uneconomic heat pump oversizing, is necessary to integrate the heating power supplied by the heat pump with



indoor installation

The heat pump, installed in a technical room inside the building, aspires and ejects the outdoor air through properly designed ducts.
The advantages, besides the lack of an outdoor place dedicated to the heat pump and the corresponding aesthetic impact, are the outdoor noise emissions reduction, the possibility to perform all the maintenance operations in a technical room repaired from bad weather, the thermal losses reduction due to the outdoor pipes and the water pipes freezing risk elimination.
The heat pump efficiency is slightly penalized compared to the outdoor installation due to the higher electrical energy quantity required for the air circulation through the ducts.
This kind of installation allows to use the exhaust air to heat, with a recuperator, the air at the heat pump inlet in order to increase its efficiency.



split installation

The heat pump is made of two units: one installed outdoor (extracts the heat from the air) and one installed indoor (transfers the heat to the plant). The two units are connected by means of refrigerant pipes, not affected by freezing risks, to be realized minimizing their lenght in order not to penalize the heat pump efficiency. Two solutions for this kind of installation are possible:

COMPRESSOR CONTAINED IN THE OUTDOOR UNIT:
the required place inside the building is very little as well as the indoor noise level is very low.

COMPRESSOR CONTAINED IN THE INDOOR UNIT:
the required place outside the building is very little as well as the outdoor noise level is very low and is possible to perform the maintenance operations in a technical room repaired from bad weather.

an auxiliary heating source (boiler, stove, electrical heaters…) performing a bivalent operating mode. Below a defined outdoor air temperature value the heat pump, in order to satisfy properly the plant requests, is integrated or replaced by an auxiliary heating source that, in well designed plants, covers only the peaks and does not significantly penalize the system seasonal efficiency.

defrosting cycles

When the outdoor air temperature is low, the humidity contained in the air tends to deposit on the surface of the finned coil of the heat pump producing a thin ice layer that reduces the thermal exchange capability and therefore the performances.
Periodically the proper operating mode of the heat pump is automatically restored by means of a defrosting cycle that, in order not to penalize the heat pump efficiency, has to be minimized in terms of lenght and frequency.

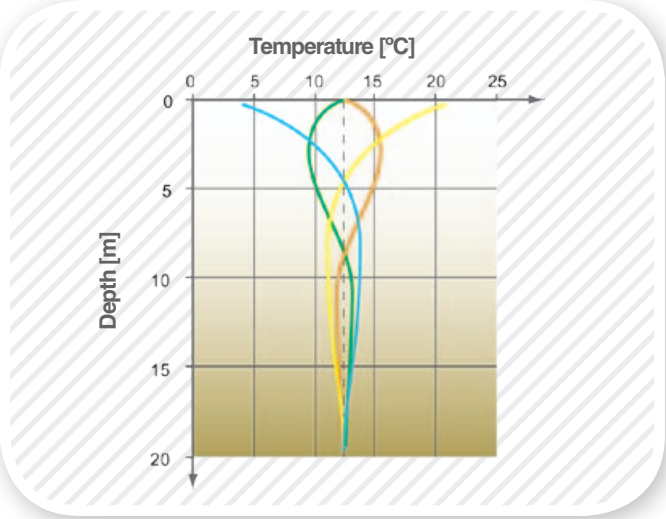
WATER - WATER HEAT PUMPS

Water and ground, thanks to their high thermal capacity, mantain during the whole year a very steady temperature at an average value higher than the one of the outdoor air allowing the water-water heat pumps to achieve absolutely the best efficiencies. Moreover the stability of the performances of the water-water heat pumps, due to source stability, allows to satisfy completely the plant needs without the necessity of an auxiliary heating source (monovalent operating mode). Though the plant realization is more complex and expensive compared to the air-water heat pumps, the water-water heat pumps have very small dimensions and very low noise levels that allow to be easily installed inside the building. Furthermore the absence of water pipes outdoor eliminates the freezing risk and reduces the thermal losses.

Type of sources

> GROUND / Closed loop (geothermal)

The ground represents a huge energy reserve steadily regenerated through the sun and the rain. At depths higher than 15 meters the temperature is pratically constant during the whole year and nearly equal to the annual average outdoor air temperature. The energy extraction from the ground is realized by means of *geothermal probes* made of pipes buried in the ground with a brine solution that flows inside them. Different types of probes are available but the most common are the vertical and the horizontal ones.



The *design of the geothermal probes* has to guarantee a proper heat exchange between the ground and the brine solution that flows inside them in order not to penalize the heat pump efficiency and capacity. The *ground has to have the possibility to regenerate itself*. A too intensive installation fo the geothermal probes can produce a gradual lowering of the ground temperature that after few years would penalize the system performances. The possibility to use the heat pump also for cooling facilitates the ground regeneration bringing it back, during summer time, at the starting temperature level.

vertical probes

They are realized with pipes vertically inserted in the ground up to a depth of about 100 meters. They allow to taking better advantage of the ground temperature steadiness and they need a small surface. Their realization is however expensive and often bounded to the local regulations in force for groundwater respect.

horizontal probes

They are realized with pipes horizontally distributed on the ground at a depth of about 2 meters. They are simple and cheap to be realized but they require a large surface free from asphalt and trees and they are much more influenced by the ground temperature oscillations.

VERTICAL PROBES

HORIZONTAL PROBES

> WATER Open loop

The heat pump extracts the energy directly from the water taken from wells, rivers, lakes… The water enters directly in the heat pump and is then released in the environment. The absence of intermediate heat exchanges allows to optimize the system efficiency. On the other hand it is necessary to pay attention not to pollute the used water and not to modify too much the temperature respecting the local regulations in force, often very restrictive

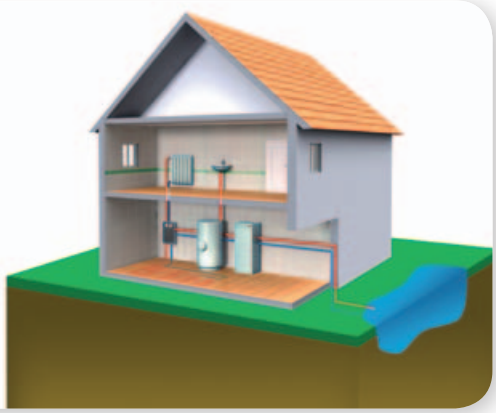
surface water

The surface water should be preferred to reduce the energy required to the source side pump operation.

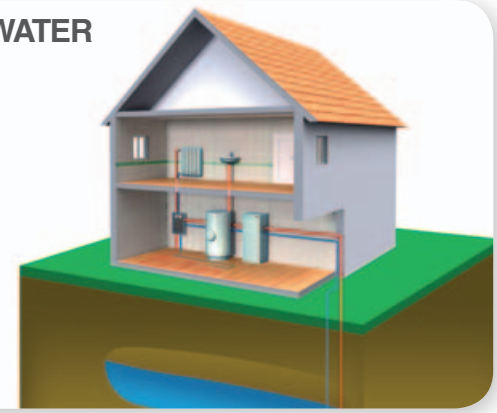
groundwater

It guarantees a higher temperature steadiness but requires a higher power input for the water extraction. Moreover it is necessary to realize two independent wells, one for extraction and one for admission, respecting the local regulations in force. In any case it is recommended to verify the quality and the cleaning of the water in order to avoid the heat pump heat exchanger fouling and corrosion. The presence of intermediate heat exchangers, required not to send the source water directly in the heat pump heat exchanger, must be considered in the system performances evaluation.

SURFACE WATER

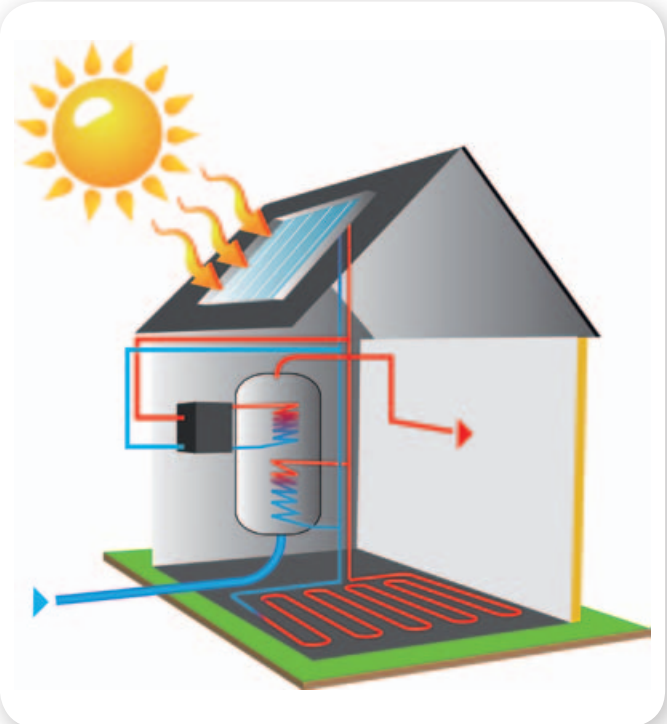


GROUND WATER



THE HEAT PUMP INTEGRATED INSIDE THE PLANT

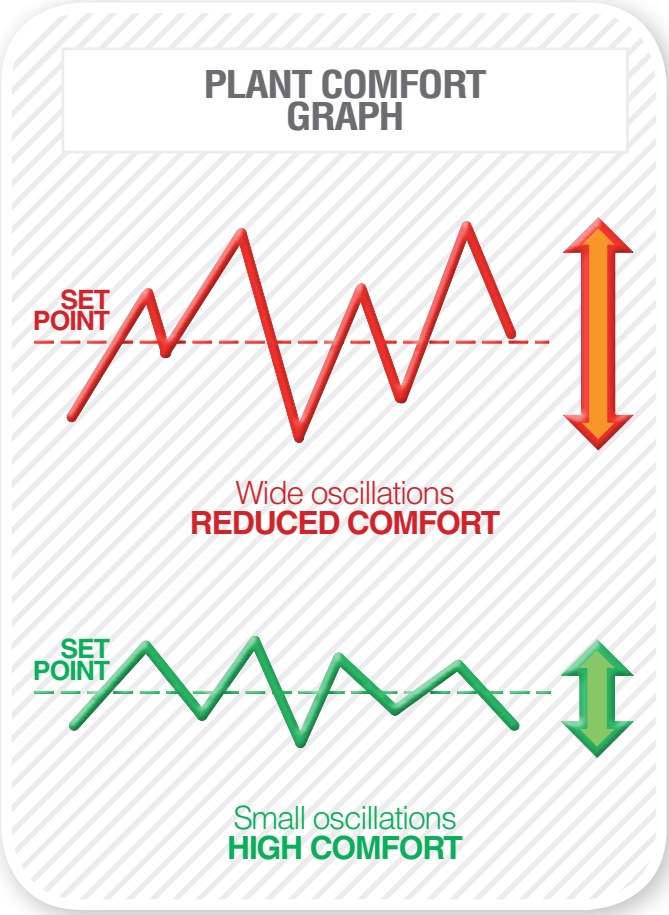
The constant evolution of the different components that are involved in the plant is not enough in order to guarantee to obtain the best possible total performances
Only the coordination between all the available heating sources and an integrated management of the distribution systems are able to guarantee to satisfy in every moment and in the best way the comfort needs using the minimum energy quantity as possible, generated in the most efficient way as possible.
The heat pump controller is able to perform all these functions by means of advanced control algorithms and smart logics of activation and coordination of the plant components.



> Tank for the plant

when is it necessary?

The tank for the plant is often considered as an expensive and large component that is necesssary to "protect" the heat pump. *Indeed the heat pump works properly and in an absolutely safe way also without tank*.



When the heat pump is connected to distribution plant with a low water content (i.e. radiator plants or fan coil plants) the temperature oscillations of the water sent to the hydronic terminals can become very wide causing *not comfortable situations* in the ambient.

In order to restrict the temperature oscillations it is necessary to increase the *thermal inertia* of the plant increasing the available water volume so as to slowing down the temperature variations and allow the system to dynamically adapt to plant needs keeping a high comfort level.

the main functions of the tank for the plant

Besides the function of stabilize the water temperature in the plant, the tank has a lot of other functions that are highlighted in the modern plants, more and more advanced and complex.

The tank thermal inertia allow to stabilize the water temperature in the plant in order to guarantee a constant ambient temperature (perceived by the user as comfortable).

In plant equipped with AIR-WATER heat pumps the tank allows NOT to send cold water to the hydronic terminals during the defrosting cycles.

The tank is the connection point between the different heating sources (heat pump, solar panel, boiler, stove…) and the distribution circuits (radiant circuits, fan coil circuits, radiator circuits…). The heating requests coming from the building are converted, by means of climatic curves optimized for each circuit, into a single set point for the tank that dynamically changes to be always optimized to guarantee the best efficiency.
The tank temperature becomes a fundamental index to carry out the coordination logics of the available heating sources.

The tank allows to produce thermal energy when is much more convenient and to use it when is requested by the plant.
For example it is possible to take advantage of the time slots during which the electrical energy is cheaper or to use an overproduction coming from photovoltaic panels.

The tank allows to reduce the heating request peaks and therefore to install smaller heat pumps with a corresponding reduction of the committed electrical power.

The possibility to use the tank temperature to coordinate the available heating sources allows moreover to optimize the circulation pumps management activating them only when necessary. Without tank it would be necessary to maintain a water flow through the heat pump heat exchanger to control the return temperature and keep it close to the set point value.

The tank allows to satisfy the heating needs with the thermal energy produced by other renewable sources like solar thermal or biomass since their availability and the plant needs not always occur at the same time.

The tank represent a thermal energy storage that guarantees the plant to be in some extent autonomous also when the heat pump is used to satisfy other needs (for example in the domestic hot water production) or the electrical energy is not available.
For example in many european countries electrical power supply contracts are available that can offer a lower energy cost if the user can accept the power supply to be interrupted up to 2 hours in a row. In such cases the tank is chosen according to this specific need.

> Domestic hot water

Which are the differences with a traditional system

The domestic hot water production with a heat pump always requires a *tank*. The instantaneous domestic hot water production would require a too high absorbed electrical power for residential applications. Moreover with the heat pump is not possible to heat the water inside the tank up to temperatures higher than *50-55°C* (according to the kind of heat pump).

tank containing domestic hot water

The tank contains domestic hot water ready to be used that can be heated in two different ways.

COIL The tank is heated by means of a coil inside which the hot water produced by the heat pump flows. The coil must be properly sized in order to be coupled with heat pumps (at least a surface of 0,5 m^2 per heating power kW supplied by the heat pump are recommended).

"PRIMARY" HEAT EXCHANGER The tank is heated by means of an external heat exchanger placed between the heat pump and the tank. The efficiency of the thermal exchange is higher than the one of the coil and allows to get higher temperatures inside the tank with the same water temperature produced by the heat pump.

In both cases the disinfection legionella cycles, if necessary, must ne performed with the help of an auxiliary heating source (electrical heaters, boiler, solar...)

tank containing "technical" water

The tank contains hot water to be used to produce instantaneously domestic hot water, just when it is requested, by means of an external ***"SECONDARY" HEAT EXCHANGER***.

The hot water contained inside the tank is not affected by the legionella problem.

> Heating sources

How to optimize their use?

To optimize the integration of different heating sources within the same plant is necessary to use in every moment the source that is able to satisfy the plant needs in the most efficient way, both on the energetic point of view and on the economic point of view.

The heat pump controller allows to customize the control logic that enables the available sources modifying some activation thresholds according to the cost of the different energy sources and the features of the generators installed in the plant.

Generally the most common logic according which the priority are assigned is realized by the activation in sequence of :

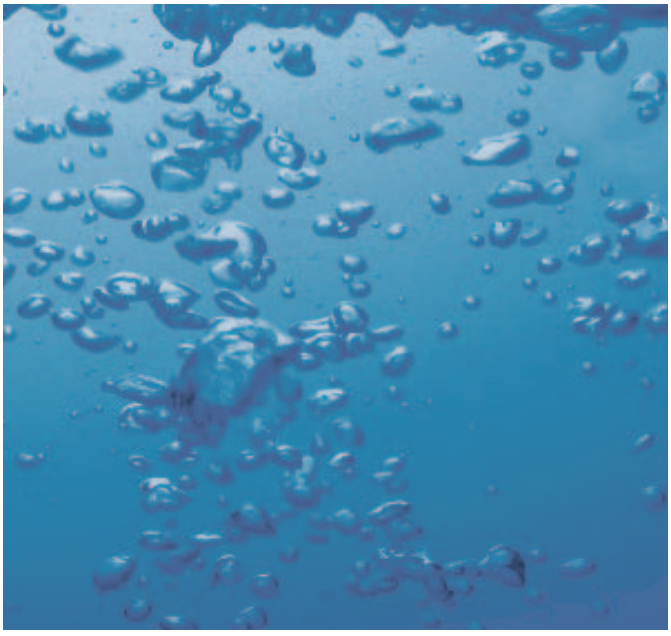
> THERMAL SOLAR (both for domestic hot water production and for heating)

> WATER-WATER heat pump

> AIR-WATER heat pump

> COMBUSTION generators (boiler, stove...)

> ELECTRICAL HEATERS



TECHNICAL datasheets

> HXA

AIR - WATER
HEAT PUMPS
FOR OUTDOOR INSTALLATION

Available range

Unit type
IP Reversible 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 outdoor 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.

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 rotary or scroll compressor (according to the model) mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve, reverse cycle valve, axial fans with safety protection grilles, finned coil realized with copper pipes and alluminium fins. The circuit is protected by high and low pressure switches and differential pressure switch 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.

All three-phase power supply units are provided with a phase sequence and correct sequence controller device.

All the units are supplied 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

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Coil protecion grille
Remote thermostat
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor

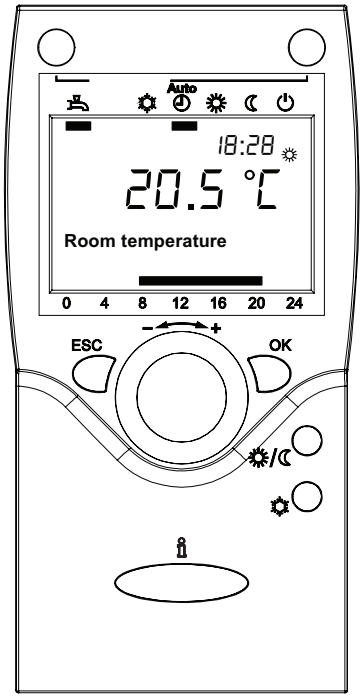
CONTROL SYSTEM

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 :

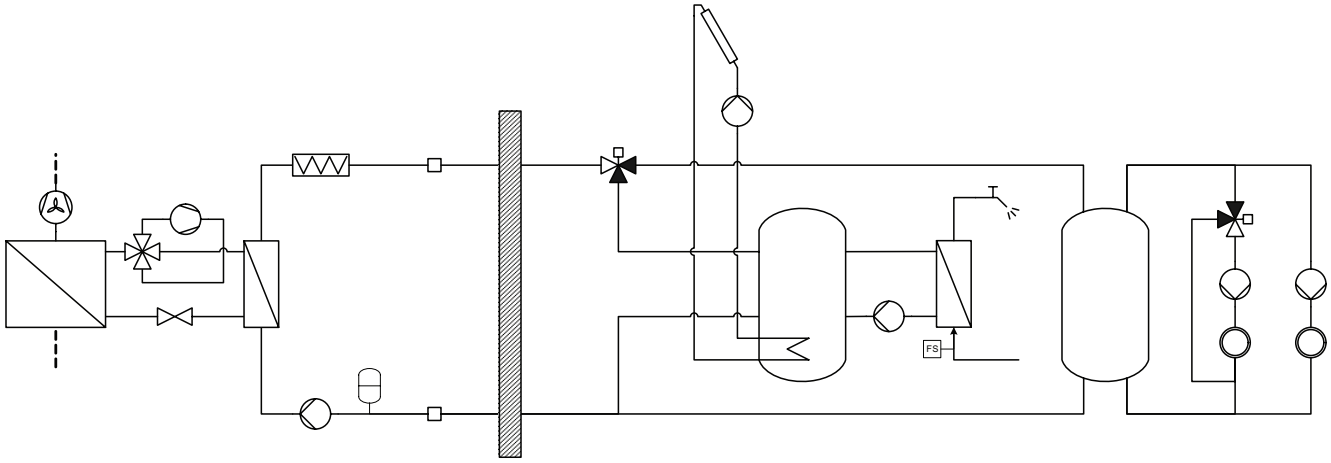
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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)

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.



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 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)

		Cooling		Heating		
OPERATING LIMITS	Unit type	min	max	min	max	
Outdoor air inlet temperature	IP	5	48	-15	42	°C
Water outlet temperature	IP	6	25	30	55	°C

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	5.1	6.1	7.1	8.1	10.1	12.1	15.1	18.1	
A7W35	Heating capacity	4,76	5,83	6,92	8,03	10,2	11,9	15,7	18,6	kW
	Power input	1,21	1,49	1,87	2,28	2,86	3,39	4,28	5,29	kW
	COP	**3,93**	**3,91**	**3,70**	**3,52**	**3,57**	**3,51**	**3,67**	**3,52**	-
	Water flow rate plant side	823	1008	1195	1385	1749	2043	2702	3204	l/h
	Pressure drops plant side	10	15	20	25	37	47	51	46	kPa
A2W35	Heating capacity	3,95	4,85	5,75	6,67	8,43	9,85	13,1	15,5	kW
	Power input	1,19	1,47	1,84	2,24	2,81	3,31	4,17	5,16	kW
	COP	**3,32**	**3,30**	**3,13**	**2,98**	**3,00**	**2,98**	**3,14**	**3,00**	-
	Water flow rate plant side	684	838	994	1152	1453	1697	2251	2667	l/h
	Pressure drops plant side	7	11	14	18	27	35	38	34	kPa
A35W18	Cooling capacity	5,12	6,27	7,43	8,60	10,8	12,6	16,7	19,8	kW
	Power input	1,54	1,91	2,39	2,91	3,64	4,32	5,44	6,73	kW
	EER	**3,32**	**3,28**	**3,11**	**2,96**	**2,97**	**2,92**	**3,07**	**2,94**	-
	Water flow rate plant side	885	1085	1286	1490	1879	2190	2914	3448	l/h
	Pressure drops plant side	12	17	22	28	41	53	58	52	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	5.1	6.1	7.1	8.1	10.1	12.1	15.1	18.1	
A7W45	Heating capacity	4,65	5,70	6,76	7,84	9,91	11,6	15,3	18,2	kW
	Power input	1,44	1,78	2,23	2,72	3,40	4,02	5,06	6,27	kW
	COP	**3,23**	**3,20**	**3,03**	**2,88**	**2,91**	**2,89**	**3,02**	**2,90**	-
	Water flow rate plant side	806	989	1171	1357	1712	1999	2642	3146	l/h
	Pressure drops plant side	10	14	19	24	35	45	49	45	kPa
A2W45	Heating capacity	3,84	4,72	5,59	6,49	8,19	9,58	12,7	15,1	kW
	Power input	1,42	1,76	2,20	2,68	3,34	3,95	4,96	6,15	kW
	COP	**2,70**	**2,68**	**2,54**	**2,42**	**2,45**	**2,43**	**2,56**	**2,46**	-
	Water flow rate plant side	667	819	970	1124	1418	1656	2190	2607	l/h
	Pressure drops plant side	7	10	14	18	26	33	36	33	kPa
A35W7	Cooling capacity	4,24	5,20	6,15	7,14	8,98	10,4	13,9	16,5	kW
	Power input	1,50	1,85	2,31	2,80	3,50	4,14	5,21	6,46	kW
	EER	**2,83**	**2,81**	**2,66**	**2,55**	**2,57**	**2,51**	**2,67**	**2,55**	-
	Water flow rate plant side	729	894	1059	1229	1548	1802	2403	2849	l/h
	Pressure drops plant side	8	12	16	21	30	39	42	38	kPa

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

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

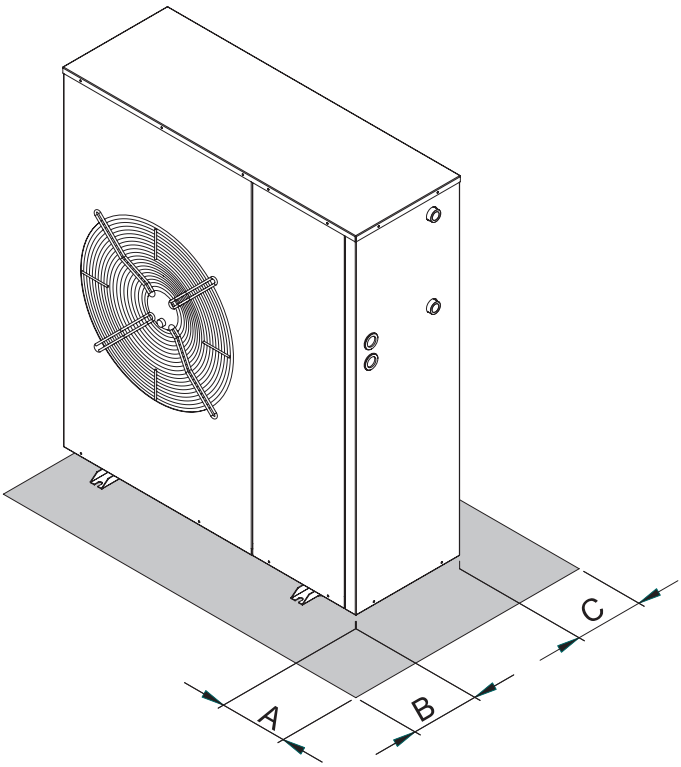
ACOUSTIC performances	5.1	6.1	7.1	8.1	10.1	12.1	15.1	18.1	
Sound power level	68	68	69	69	72	72	74	74	dB(A)
Sound pressure level at 1 metre	54	54	55	55	57	57	59	59	dB(A)
Sound pressure level at 5 metres	43	43	44	44	46	46	48	48	dB(A)
Sound pressure level at 10 metres	37	37	38	38	41	41	43	43	dB(A)

The acoustic performances are referred to units operating in cooling 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.

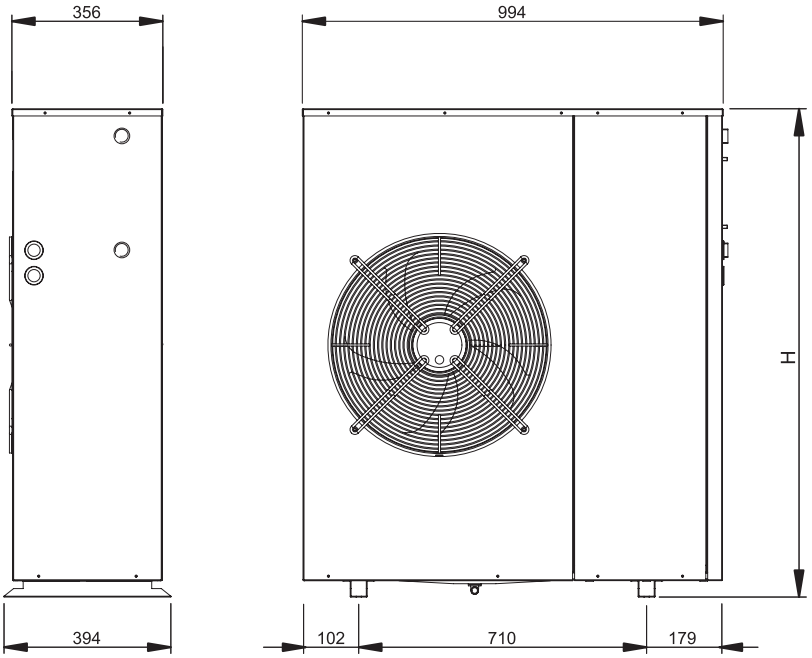
TECHNICAL DATA	5.1	6.1	7.1	8.1	10.1	12.1	15.1	18.1	
Power supply	230 - 1 - 50				230 - 1 - 50 400 - 3N - 50		400 - 3N - 50		V-ph-Hz
Compressor type	rotary				scroll				-
N° compressors / N° refrigerant circuits	1 / 1								n°
Plant side heat exchanger type	stainless steel brazed plates								-
Source side heat exchanger type	finned coil								-
Fans type	axial								-
N° fans	1						2		n°
Hydraulic fittings	1" M								-

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.



	5.1 - 6.1 7.1 - 8.1	10.1 - 12.1	15.1 - 18.1	
A	400			mm
B	600			mm
C	200			mm
H	900	1150	1450	mm



> HSP

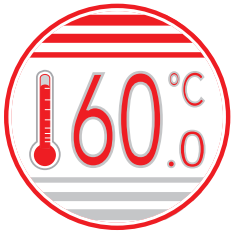
AIR - WATER
HEAT PUMPS
FOR OUTDOOR OR INDOOR INSTALLATION

Available range

Unit type
IP Reversible 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 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.

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 rotary 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 are supplied 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
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor

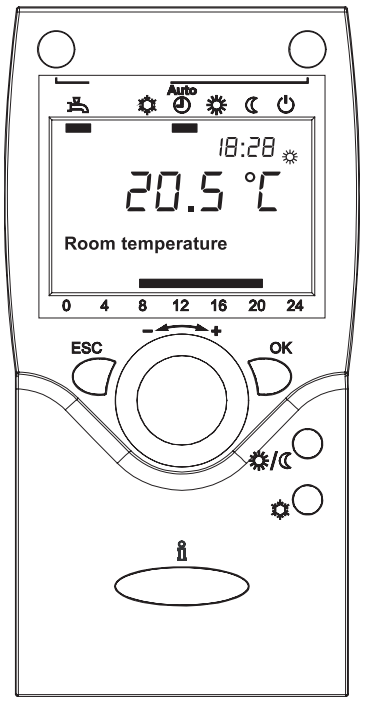
CONTROL SYSTEM

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 :

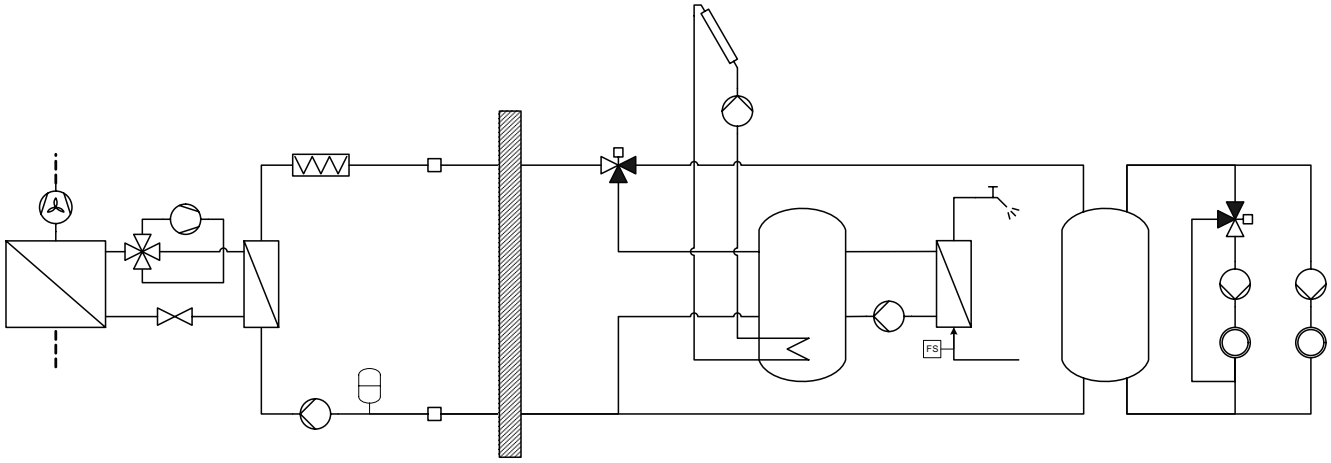
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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)

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.



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 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)

		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	Base acoustic setting up (AB)	4.1	5.1	6.1	7.1	9.1	11.1	
A7W35	Heating capacity	4,06	4,70	5,92	7,22	8,92	10,7	kW
	Power input	0,90	1,09	1,35	1,70	2,06	2,58	kW
	COP	**4,51**	**4,31**	**4,39**	**4,25**	**4,33**	**4,15**	-
	Water flow rate plant side	703	812	1023	1249	1543	1853	l/h
	Pressure drops plant side	5	7	7	10	10	13	kPa
A2W35	Heating capacity	3,37	3,90	4,91	6,00	7,42	8,92	kW
	Power input	0,89	1,07	1,33	1,67	2,03	2,53	kW
	COP	**3,79**	**3,64**	**3,69**	**3,59**	**3,66**	**3,53**	-
	Water flow rate plant side	584	675	850	1037	1283	1543	l/h
	Pressure drops plant side	4	5	5	7	7	10	kPa
A35W18	Cooling capacity	4,25	4,90	6,19	7,55	9,33	11,2	kW
	Power input	1,26	1,52	1,88	2,36	2,87	3,61	kW
	EER	**3,37**	**3,22**	**3,29**	**3,20**	**3,25**	**3,10**	-
	Water flow rate plant side	733	847	1069	1304	1612	1931	l/h
	Pressure drops plant side	6	7	8	11	11	14	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	4.1	5.1	6.1	7.1	9.1	11.1	
A7W45	Heating capacity	3,96	4,58	5,78	7,05	8,71	10,5	kW
	Power input	1,10	1,32	1,65	2,06	2,50	3,14	kW
	COP	**3,60**	**3,47**	**3,50**	**3,42**	**3,48**	**3,34**	-
	Water flow rate plant side	688	796	1003	1223	1512	1825	l/h
	Pressure drops plant side	5	7	7	10	10	13	kPa
A2W45	Heating capacity	3,28	3,79	4,77	5,83	7,21	8,67	kW
	Power input	1,09	1,31	1,62	2,04	2,48	3,09	kW
	COP	**3,01**	**2,89**	**2,94**	**2,86**	**2,91**	**2,81**	-
	Water flow rate plant side	570	659	829	1011	1251	1505	l/h
	Pressure drops plant side	3	5	5	7	7	9	kPa
A35W7	Cooling capacity	3,29	3,80	4,79	5,84	7,22	8,68	kW
	Power input	1,17	1,40	1,74	2,19	2,66	3,34	kW
	EER	**2,81**	**2,71**	**2,75**	**2,67**	**2,71**	**2,60**	-
	Water flow rate plant side	565	652	822	1004	1241	1491	l/h
	Pressure drops plant side	3	5	5	7	7	9	kPa

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

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

ACOUSTIC performances

Unit without accessory "Protection caps"	4.1	5.1	6.1	7.1	9.1	11.1	
Sound power level	67	68	69	70	71	71	dB(A)
Sound pressure level at 1 metre	51	52	53	54	55	55	dB(A)
Sound pressure level at 5 metres	41	42	43	44	45	45	dB(A)
Sound pressure level at 10 metres	35	36	37	38	39	39	dB(A)
Unit with accessory "Protection caps"	**4.1**	**5.1**	**6.1**	**7.1**	**9.1**	**11.1**	
Sound power level	63	64	65	66	67	67	dB(A)
Sound pressure level at 1 metre	48	49	50	51	52	52	dB(A)
Sound pressure level at 5 metres	37	38	39	40	41	41	dB(A)
Sound pressure level at 10 metres	32	33	34	35	36	36	dB(A)

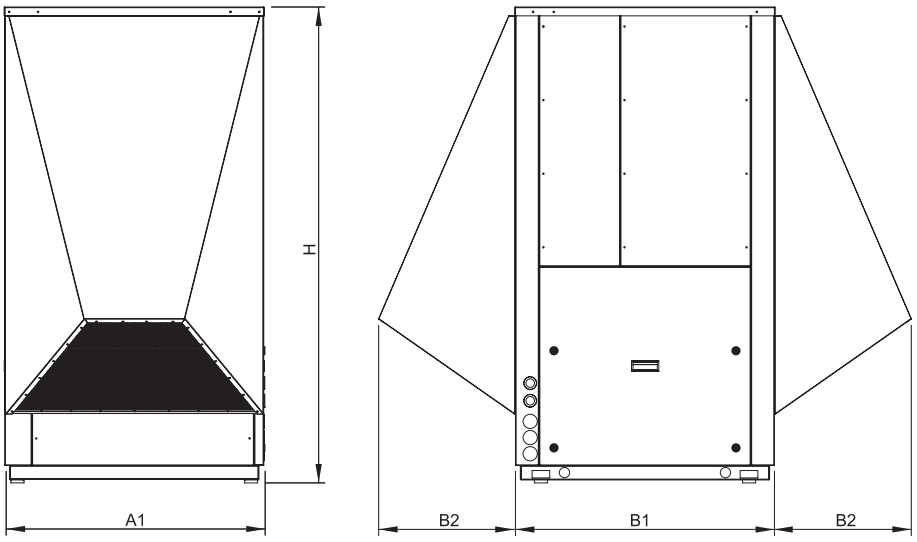
The acoustic performances are referred to units operating in cooling mode at nominal conditions A7W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to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

TECHNICAL DATA	4.1	5.1	6.1	7.1	9.1	11.1	
Power supply	230 - 1 - 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" M						-

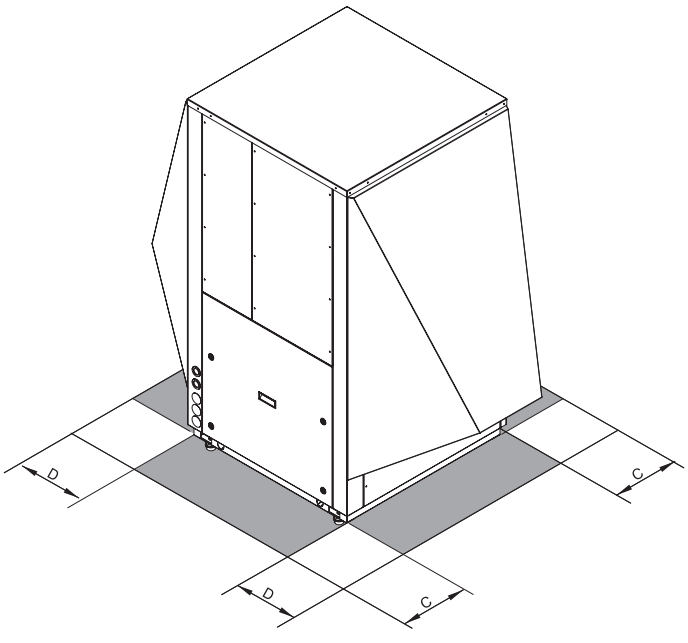
DIMENSIONS AND MINIMUM OPERATING AREA

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

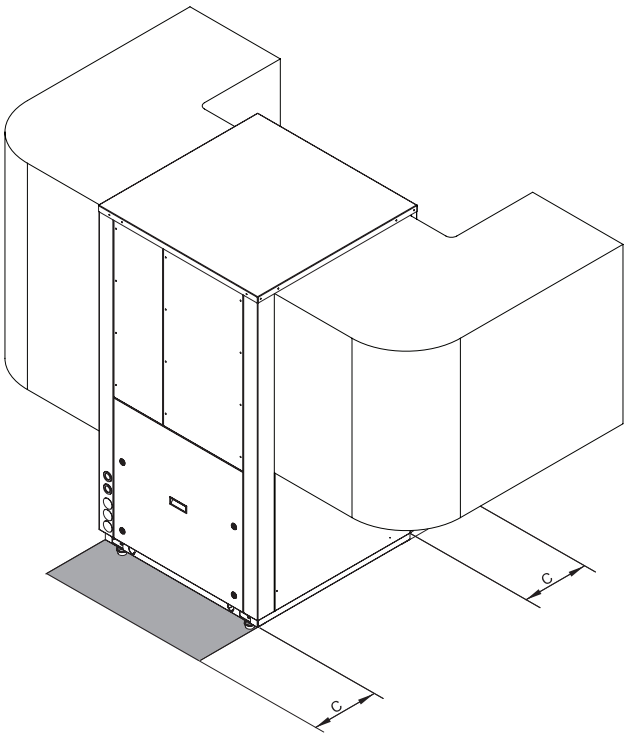
	4.1 - 5.1 - 6.1 7.1 - 9.1 - 11.1	
A1	730	mm
B1	730	mm
B2	450	mm
H	1470	mm



C	600 mm
D	600 mm



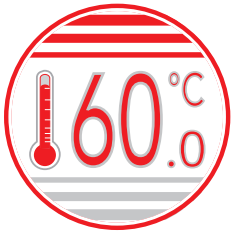
Outdoor installation



Indoor installation

> HXP

AIR - WATER
HEAT PUMPS
FOR OUTDOOR OR INDOOR INSTALLATION



Available range

Unit type
IP Reversible 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 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.

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 three-phase power supply units are provided with a phase sequence and correct sequence controller device.

All the units are supplied 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
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor

CONTROL SYSTEM

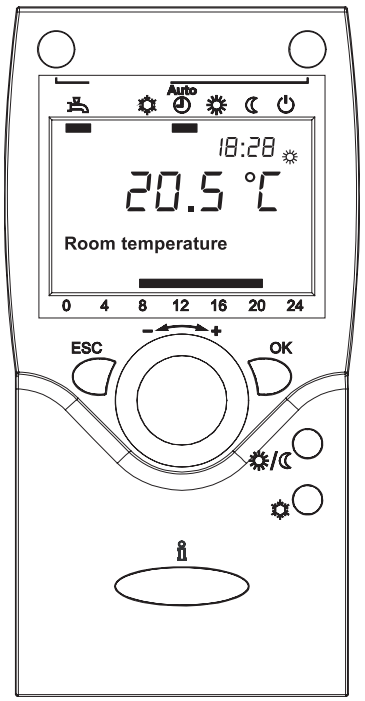
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

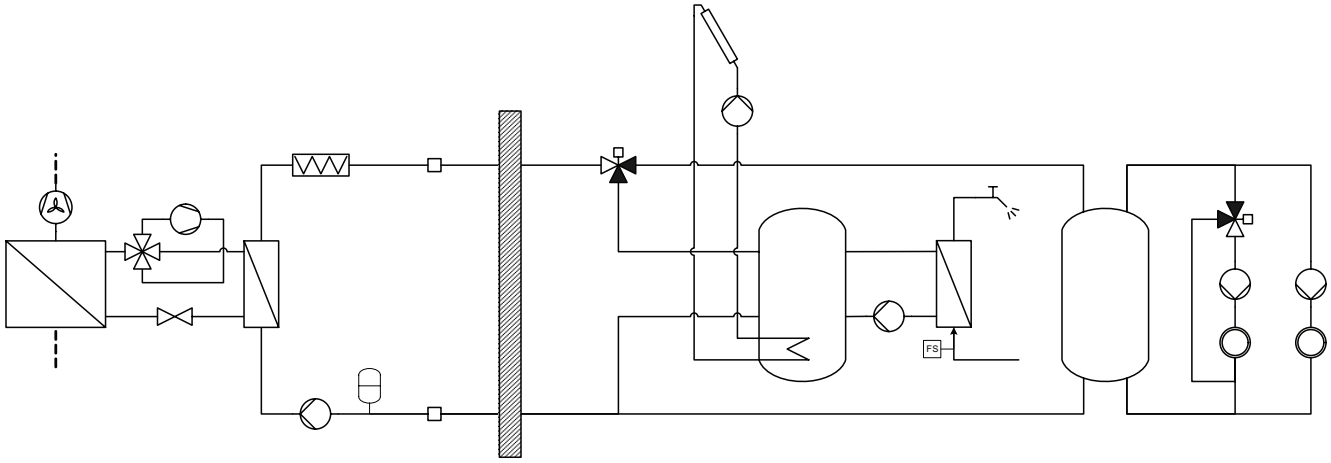
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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)

		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	Base acoustic setting up (AB)	11.1	13.1	16.1	18.1	21.1	
A7W35	Heating capacity	11,1	12,8	15,3	18,1	21,0	kW
	Power input	2,65	3,07	3,68	4,14	4,81	kW
	COP	**4,19**	**4,17**	**4,16**	**4,37**	**4,37**	-
	Water flow rate plant side	1922	2217	2632	3135	3619	l/h
	Pressure drops plant side	14	18	24	13	17	kPa
A2W35	Heating capacity	9,26	10,7	12,7	15,1	17,4	kW
	Power input	2,60	3,01	3,61	4,07	4,72	kW
	COP	**3,56**	**3,55**	**3,52**	**3,71**	**3,69**	-
	Water flow rate plant side	1600	1853	2199	2615	3013	l/h
	Pressure drops plant side	10	13	18	9	12	kPa
A35W18	Cooling capacity	11,7	13,5	15,8	19,1	21,8	kW
	Power input	3,68	4,27	5,11	5,77	6,70	kW
	EER	**3,18**	**3,16**	**3,09**	**3,31**	**3,25**	-
	Water flow rate plant side	2017	2328	2741	3293	3776	l/h
	Pressure drops plant side	15	19	25	14	19	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	11.1	13.1	16.1	18.1	21.1	
A7W45	Heating capacity	10,9	12,5	15,0	17,7	20,5	kW
	Power input	3,21	3,72	4,47	5,04	5,85	kW
	COP	**3,40**	**3,36**	**3,36**	**3,51**	**3,50**	-
	Water flow rate plant side	1894	2172	2590	3076	3545	l/h
	Pressure drops plant side	14	17	23	13	17	kPa
A2W45	Heating capacity	8,99	10,4	12,3	14,6	16,9	kW
	Power input	3,17	3,67	4,40	4,97	5,76	kW
	COP	**2,84**	**2,83**	**2,80**	**2,94**	**2,93**	-
	Water flow rate plant side	1561	1807	2138	2537	2937	l/h
	Pressure drops plant side	10	13	17	9	12	kPa
A35W7	Cooling capacity	9,00	10,4	12,3	14,7	16,9	kW
	Power input	3,41	3,96	4,73	5,35	6,20	kW
	EER	**2,64**	**2,63**	**2,60**	**2,75**	**2,73**	-
	Water flow rate plant side	1546	1785	2111	2523	2900	l/h
	Pressure drops plant side	10	13	17	9	11	kPa

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

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

ACOUSTIC performances

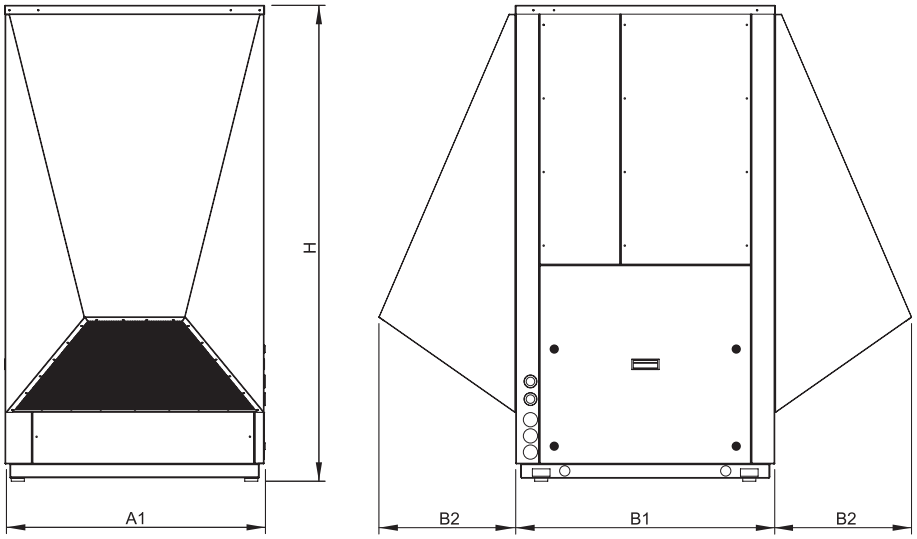
Unit without accessory "Protection caps"	11.1	13.1	16.1	18.1	21.1	
Sound power level	72	72	72	74	74	dB(A)
Sound pressure level at 1 metre	56	56	57	59	59	dB(A)
Sound pressure level at 5 metres	46	46	46	48	48	dB(A)
Sound pressure level at 10 metres	40	40	41	43	43	dB(A)
Unit with accessory "Protection caps"	**11.1**	**13.1**	**16.1**	**18.1**	**21.1**	
Sound power level	68	68	69	71	71	dB(A)
Sound pressure level at 1 metre	53	53	54	55	55	dB(A)
Sound pressure level at 5 metres	42	42	43	45	45	dB(A)
Sound pressure level at 10 metres	37	37	38	40	40	dB(A)

The acoustic performances are referred to units operating in cooling 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.

TECHNICAL DATA	11.1	13.1	16.1	18.1	21.1	
Power supply	230 - 1 - 50 400 - 3N - 50		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" M			1"1/4 M		-

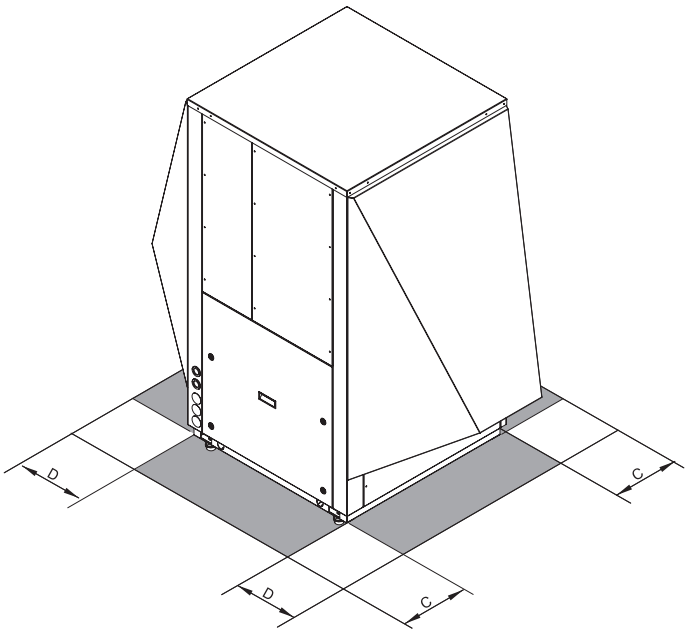
DIMENSIONS AND MINIMUM OPERATING AREA

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

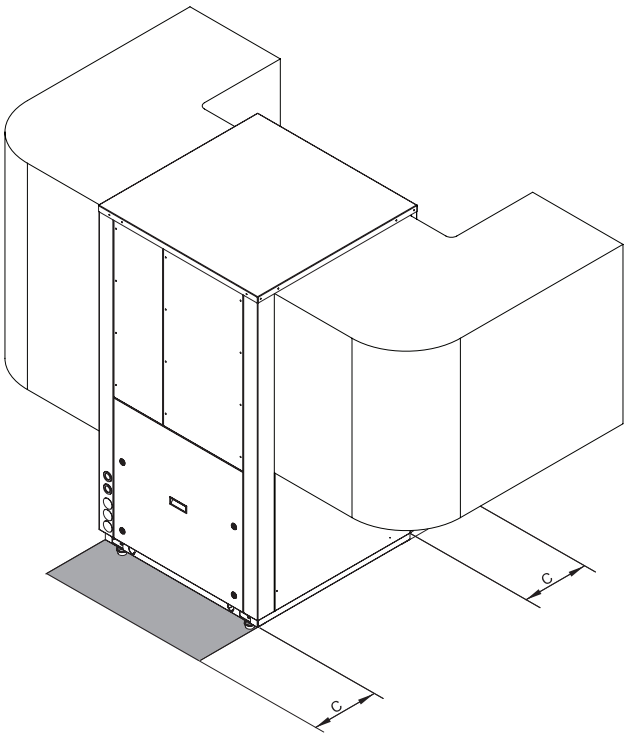


	11.1 - 13.1 - 16.1	18.1 - 21.1	
A1	730	880	mm
B1	730	880	mm
B2	450	465	mm
H	1470	1620	mm

C	600 mm
D	600 mm



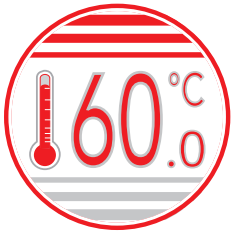
Outdoor installation



Indoor installation

> HMP

AIR - WATER
HEAT PUMPS
FOR OUTDOOR OR INDOOR INSTALLATION



Available range

Unit type
IP Reversible 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 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.

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 three-phase power supply units are provided with a phase sequence and correct sequence controller device.

All the units are supplied 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
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor

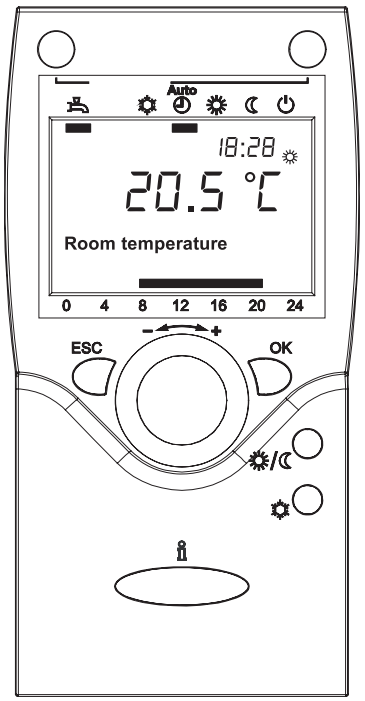
CONTROL SYSTEM

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 :

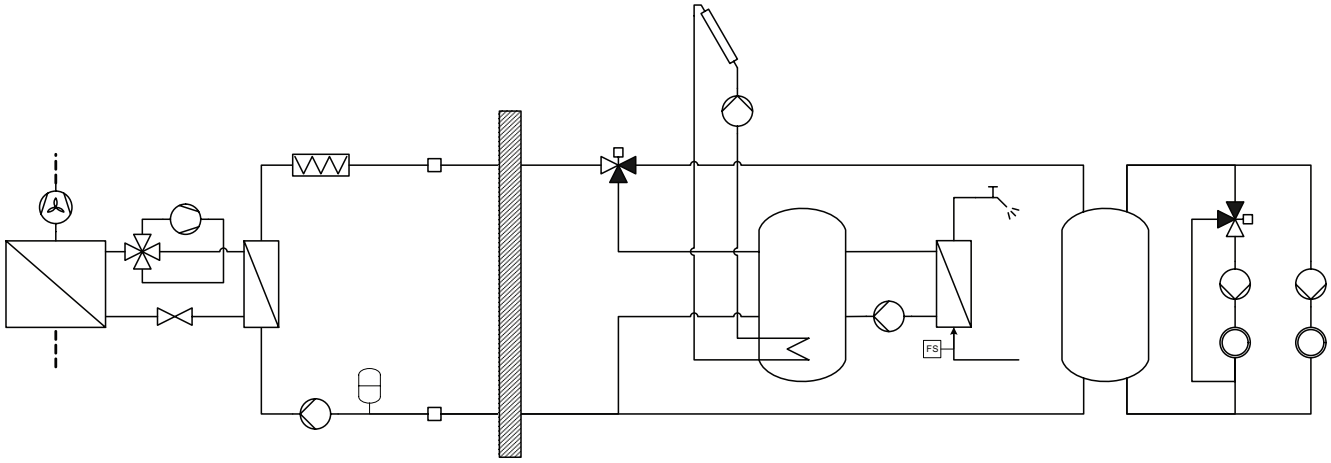
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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)

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.



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 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)

		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	Base 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	Base 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

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

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

ACOUSTIC performances

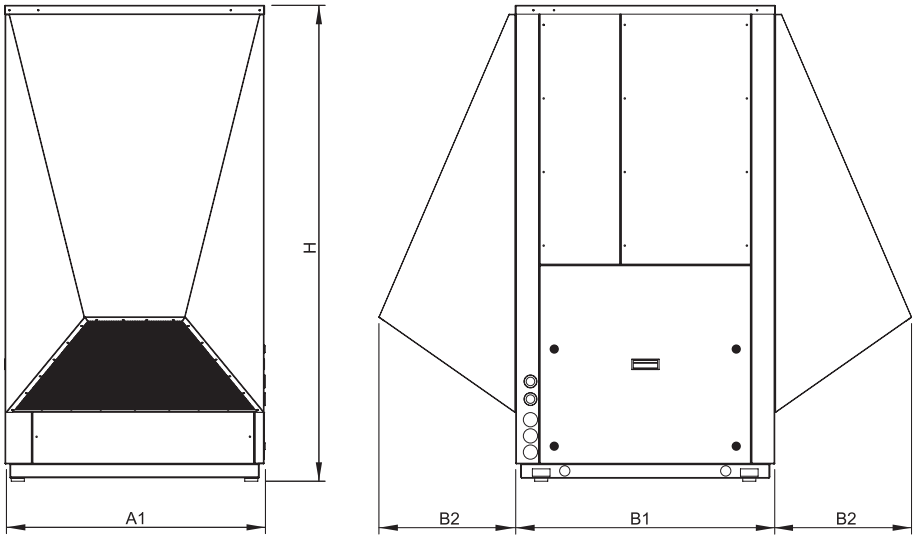
	Unit without accessory "Protection caps"	24.1	27.1	31.1	35.1	40.1	45.1	
	Sound power level	76	76	77	77	78	78	dB(A)
	Sound pressure level at 1 metre	60	60	61	61	67	67	dB(A)
	Sound pressure level at 5 metres	50	50	51	51	53	53	dB(A)
	Sound pressure level at 10 metres	44	44	45	45	47	47	dB(A)
	Unit with accessory "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	64	64	dB(A)
	Sound pressure level at 5 metres	46	46	47	47	50	50	dB(A)
	Sound pressure level at 10 metres	41	41	42	42	44	44	dB(A)

The acoustic performances are referred to units operating in cooling 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.

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						-

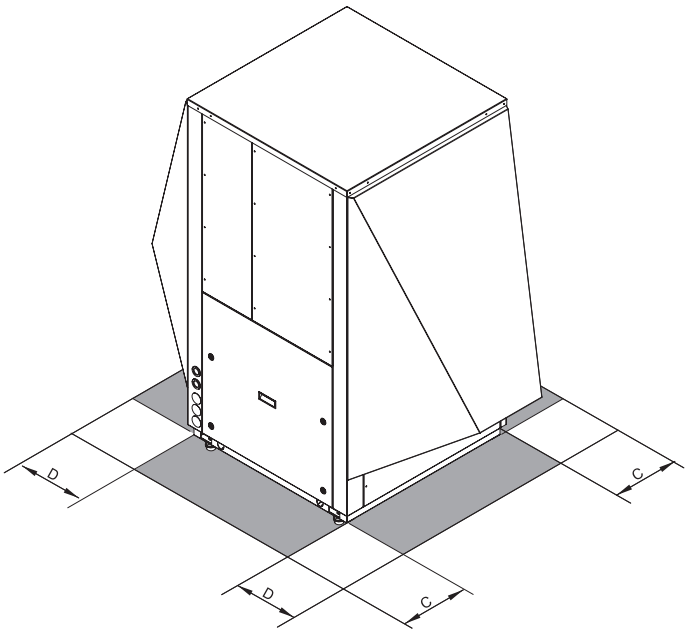
DIMENSIONS AND MINIMUM OPERATING AREA

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

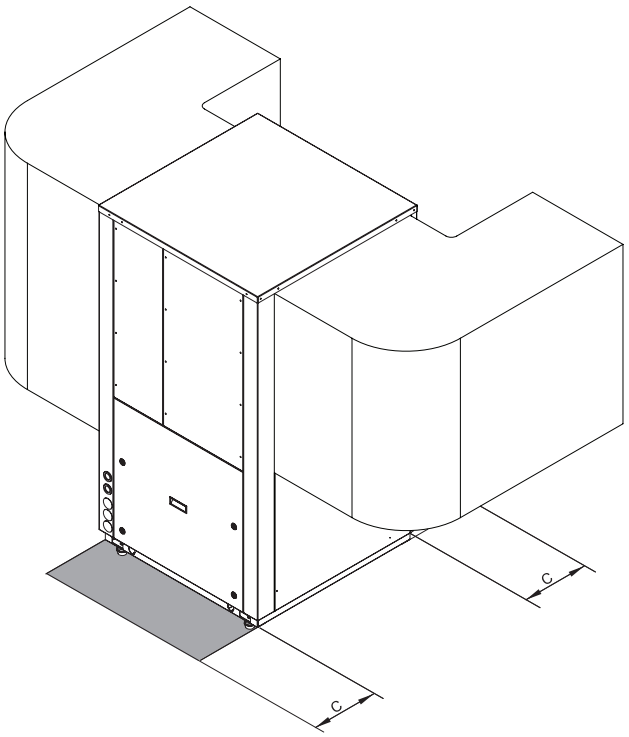


	24.1	27.1 - 31.1 - 35.1	40.1 - 45.1	
A1	880	1180	1480	mm
B1	880	880	880	mm
B2	465	465	465	mm
H	1620	1620	1620	mm

C	600 mm
D	600 mm



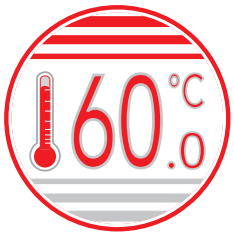
Outdoor installation



Indoor installation

> KSR

AIR-WATER HEAT PUMPS
FOR SPLIT INSTALLATION



Available range

Unit type
IP Heat pump
(reversible on the refrigerant side)

Versions
VB Base version

Acoustic setting up
AB Base setting up
AS Low noise 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 split installation (indoor unit and outdoor unit connected through refrigerant pipes) 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.
The **internal programmer clock** allows to define different daily switching programs for heating, cooling and domestic hot water production.

The heat pump is composed by an indoor unit (motocondensing unit) containing the hydraulic circuit, the electrical board, the compressor and a part of the refrigerant circuit and an outdoor unit (remote evaporator).
The refrigerant circuit, contained in an extractable box to simplify the maintenance operations, is equipped with rotary compressor mounted on damper supports, brazed plate heat exchanger, thermostatic expansion valve and reverse cycle valve and liquid receiver.
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 to avoid condensate generation and to reduce thermal losses.
The outdoor structure of the indoor unit and the refrigerant circuit box are both thermally and acoustically insulated in order to create a double wall against sound propagation and to allow the installation in domestic places.
To avoid vibration propagation towards the hydraulic circuit the refrigerant circuit box is placed on damper supports and the connection pipes are flexible.
The outdoor unit is composed by finned coil made of copper pipes and aluminium louvered fins and axial fan with safety protection grilles. The fan, supplied with DC motor and electronic rotational speed control, guarantees high efficiency and low noise in all the operating conditions.
All the units are supplied 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, hydraulic and refrigerant (between indoor and outdoor units) connections are required for installation.

Options

Domestic hot water production
- not present
- 3 way valve
- 3 way valve and primary heat exchanger
- 3 way valve and secondary heat exchanger

Acoustic setting up
- AB - base setting up
- AS - low noise setting up

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Plant buffer tank connections
- not present
- standard

Accessories

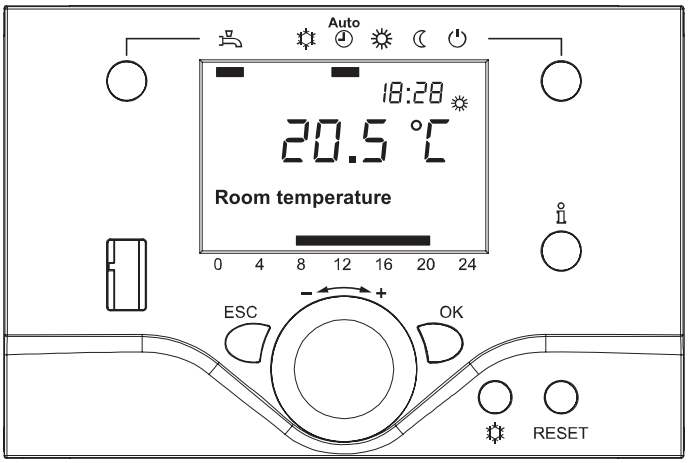
Rubber vibration dampers
Coil protection grille
Remote thermostat
Remote control (wired or wireless)
Room humidity sensor
Integrated tank
Pipes for solar panels connection
Refrigerant circuit box

SISTEMA DI CONTROLLO

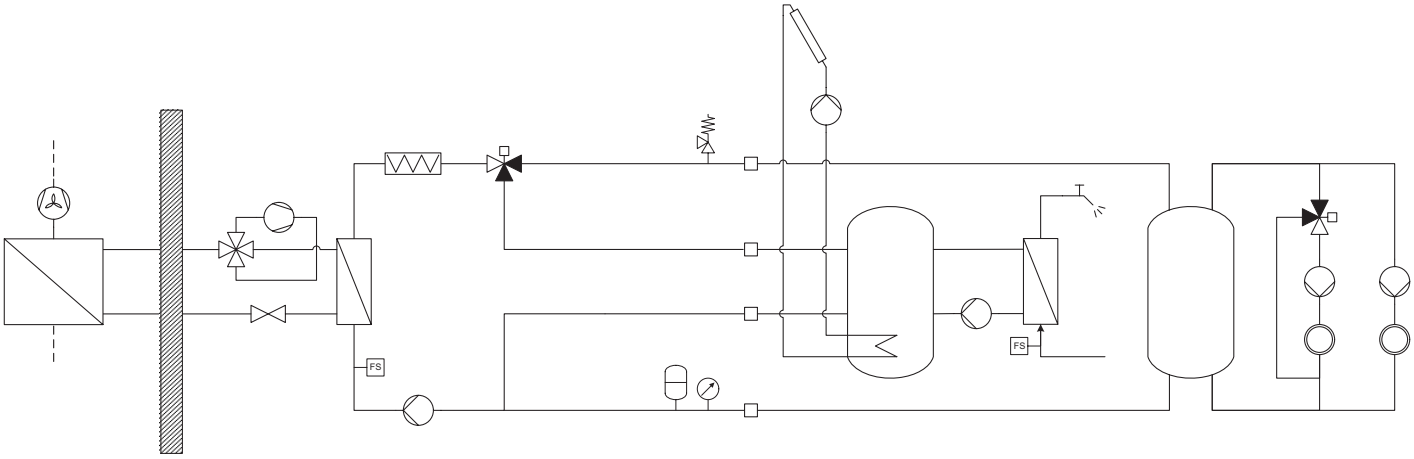
Il controllore a microprocessore è in grado di gestire non solo l'unità ma anche tutti quei componenti dell'impianto che permettono di realizzare un sistema completo.
Le principali **funzioni** del sistema di controllo sono :

- regolazione della temperatura ambiente in funzione della temperatura esterna (regolazione climatica)
- produzione di acqua calda sanitaria (gestione valvola a 3 vie, accumulo, cicli anti legionella …)
- gestione di un circuito di riscaldamento e/o raffreddamento miscelato (pompa e valvola miscelatrice a 3 vie)
- gestione di un circuito di riscaldamento diretto (solo pompa)
- gestione di un serbatoio di accumulo per riscaldamento e/o raffreddamento
- gestione di resistenze elettriche integrative per riscaldamento e acqua calda sanitaria (logica a 3 gradini)
- gestione di una sorgente di riscaldamento integrativa
- integrazione pannelli solari
- controllo umidità ambiente per raffreddamento con sistemi radianti
- orologio programmatore interno (per riscaldamento, raffreddamento e acqua calda sanitaria)
- ingresso digitale per gestione bassa tariffa energia elettrica
- storico e diagnostica allarmi
- conteggio ore di funzionamento di compressore e pompe
- possibilità di gestire più unità in cascata in riscaldamento (massimo 16)

Oltre all'interfaccia utente standard presente su tutte le unità, sono disponibili termostati remoti, cablati o wireless, che permettono di controllare tutti i parametri di funzionamento dell'unità e di rilevare la temperatura nelle diverse zone per realizzare un controllo più preciso e confortevole.



Il controllore dell'unità è in grado di gestire numerose soluzioni impiantistiche diverse abilitando automaticamente gli algoritmi di regolazione necessari in funzione dei componenti che sono stati collegati.
La gestione di tali componenti è possibile attraverso dei moduli di espansione aggiuntivi che comunicano con l'unità tramite un bus interno e forniscono tutti gli ingressi e le uscite richiesti per realizzare un sistema completo.



Il controllore può gestire fino a **due zone in riscaldamento** (di cui una tramite un circuito miscelato e una tramite un circuito diretto) e **una zona in raffreddamento** (tramite un circuito miscelato).
E' possibile realizzare impianti più complessi collegando al controllore della pompa di calore ulteriori moduli di espansione che ampliano senza limiti il numero di zone gestibili.

Per ciascuna zona possono essere impostati :

- set point
- fasce orarie giornaliere o settimanali
- curva climatica
- sonda ambiente di regolazione : può essere in comune con le altre zone o indipendente (in tal caso è necessario installare un termostato ambiente aggiuntivo)

		Raffreddamento		Riscaldamento		
LIMITI OPERATIVI	**Tipo Unità**	**min**	**max**	**min**	**max**	
Temperatura ingresso aria esterna	IP	5	45	-20	42	°C
Temperatura uscita acqua	IP	6	25	30	60	°C

Prestazioni NOMINALI - Impianti radianti

IP	Allestimento Base (AB)	3.1	4.1	5.1	7.1	9.1	
A7W35	Potenza termica	2,40	3,81	5,22	6,82	8,33	kW
	Potenza assorbita	0,56	0,89	1,24	1,61	2,00	kW
	COP	**4,29**	**4,28**	**4,21**	**4,24**	**4,17**	-
	Portata acqua	416	660	902	1179	1439	l/h
	Prevalenza utile	60	54	47	43	40	kPa
A35W18	Potenza frigorifera	2,51	3,99	5,45	7,12	8,69	kW
	Potenza assorbita	0,79	1,25	1,73	2,26	2,78	kW
	EER	**3,18**	**3,19**	**3,15**	**3,15**	**3,13**	-
	Portata acqua	433	688	941	1231	1502	l/h
	Prevalenza utile	60	53	46	41	39	kPa
IP	**Allestimento Silenziato (AS)**	**3.1**	**4.1**	**5.1**	**7.1**	**9.1**	
A7W35	Potenza termica	2,28	3,62	4,96	6,48	7,91	kW
	Potenza assorbita	0,54	0,86	1,20	1,56	1,93	kW
	COP	**4,22**	**4,21**	**4,13**	**4,15**	**4,10**	-
	Portata acqua	395	627	857	1120	1368	l/h
	Prevalenza utile	61	55	48	44	42	kPa
A35W18	Potenza frigorifera	2,41	3,84	5,23	6,85	8,34	kW
	Potenza assorbita	0,85	1,35	1,87	2,43	2,99	kW
	EER	**2,84**	**2,84**	**2,80**	**2,82**	**2,79**	-
	Portata acqua	416	662	903	1183	1441	l/h
	Prevalenza utile	60	54	47	43	40	kPa

Prestazioni NOMINALI - Impianti standard

IP	Allestimento Base (AB)	3.1	4.1	5.1	7.1	9.1	
A7W45	Potenza termica	2,35	3,72	5,10	6,66	8,14	kW
	Potenza assorbita	0,68	1,09	1,51	1,97	2,43	kW
	COP	**3,46**	**3,41**	**3,38**	**3,38**	**3,35**	-
	Portata acqua	408	647	885	1156	1411	l/h
	Prevalenza utile	60	54	47	43	41	kPa
A35W7	Potenza frigorifera	1,95	3,09	4,21	5,51	6,73	kW
	Potenza assorbita	0,73	1,16	1,61	2,09	2,57	kW
	EER	**2,67**	**2,66**	**2,61**	**2,64**	**2,62**	-
	Portata acqua	335	530	724	947	1157	l/h
	Prevalenza utile	62	58	52	49	47	kPa
IP	**Allestimento Silenziato (AS)**	**3.1**	**4.1**	**5.1**	**7.1**	**9.1**	
A7W45	Potenza termica	2,23	3,53	4,84	6,33	7,73	kW
	Potenza assorbita	0,66	1,05	1,47	1,91	2,35	kW
	COP	**3,38**	**3,36**	**3,29**	**3,31**	**3,29**	-
	Portata acqua	388	613	839	1098	1342	l/h
	Prevalenza utile	60	55	49	45	42	kPa
A35W7	Potenza frigorifera	1,86	2,97	4,05	5,29	6,46	kW
	Potenza assorbita	0,79	1,25	1,73	2,26	2,77	kW
	EER	**2,35**	**2,38**	**2,34**	**2,34**	**2,33**	-
	Portata acqua	319	510	695	910	1110	l/h
	Prevalenza utile	62	58	53	50	49	kPa

Dati dichiarati secondo **EN 14511**. I valori si riferiscono ad unità prive di eventuali opzioni o accessori.
A35W7 = sorgente : aria in 35°C b.s. / impianto : acqua in 12°C out 7°C
A35W18 = sorgente : aria in 35°C b.s. / impianto : acqua in 23°C out 18°C
A7W45 = sorgente : aria in 7°C b.s. 6°C b.u. / impianto : acqua in 40°C out 45°C
A7W35 = sorgente : aria in 7°C b.s. 6°C b.u. / impianto : acqua in 30°C out 35°C

DATI TECNICI	3.1	4.1	5.1	7.1	9.1	
Alimentazione elettrica	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	V-ph-Hz
Tipo di compressori	rotativo	rotativo	rotativo	rotativo	rotativo	-
N° di compressori / N° circuiti frigoriferi	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	n°
Tipo scambiatore lato impianto	piastre inox saldobrasate	piastre inox saldobrasate	piastre inox saldobrasate	piastre inox saldobrasate	piastre inox saldobrasate	-
Tipo scambiatore lato sorgente	batteria alettata	batteria alettata	batteria alettata	batteria alettata	batteria alettata	-
Tipo di ventilatori	assiale	assiale	assiale	assiale	assiale	-
N° di ventilatori	1	1	1	1	1	n°
Attacchi idraulici	1" M	1" M	1" M	1" M	1" M	-
Attacchi frigoriferi - linea del liquido	3/8"	3/8"	3/8"	3/8"	3/8"	-
Attacchi frigoriferi - linea del gas	5/8"	5/8"	5/8"	5/8"	5/8"	-

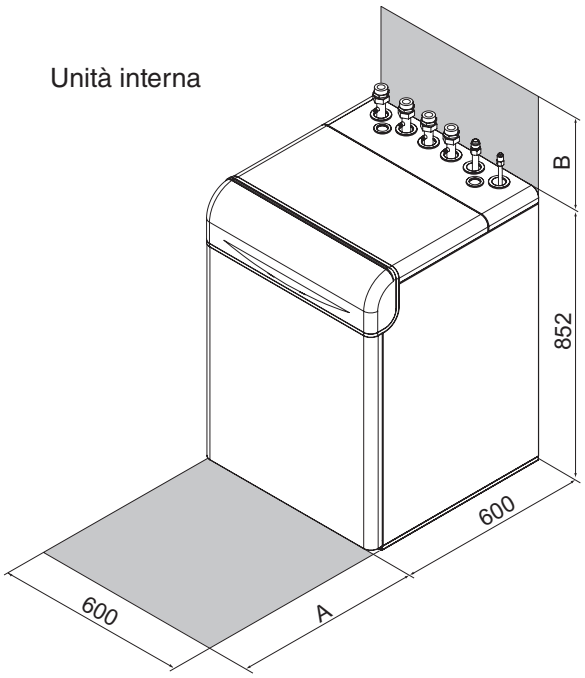
Prestazioni sonore

Unità interna	3.1	4.1	5.1	7.1	9.1	
Livello di potenza sonora	51	52	52	53	53	dB(A)
Livello di pressione sonora a 1 metro	36	37	37	38	38	dB(A)
Livello di pressione sonora a 5 metri	25	26	26	27	27	dB(A)
Livello di pressione sonora a 10 metri	19	20	20	21	21	dB(A)
Unità esterna Allestimento Base (AB)	**3.1**	**4.1**	**5.1**	**7.1**	**9.1**	
Livello di potenza sonora	68	68	68	71	71	dB(A)
Livello di pressione sonora a 1 metro	54	54	54	56	56	dB(A)
Livello di pressione sonora a 5 metri	43	43	43	45	45	dB(A)
Livello di pressione sonora a 10 metri	37	37	37	40	40	dB(A)
Unità esterna Allestimento Silenziato (AS)	**3.1**	**4.1**	**5.1**	**7.1**	**9.1**	
Livello di potenza sonora	65	65	65	68	68	dB(A)
Livello di pressione sonora a 1 metro	51	51	51	53	53	dB(A)
Livello di pressione sonora a 5 metri	40	40	40	42	42	dB(A)
Livello di pressione sonora a 10 metri	34	34	34	37	37	dB(A)

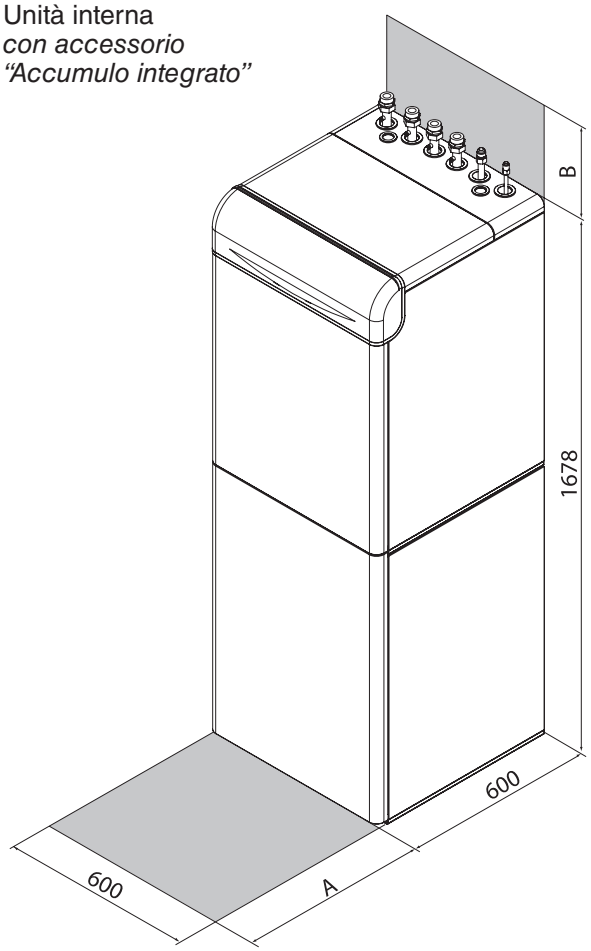
Le prestazioni sonore sono riferite all'unità funzionante in riscaldamento in condizioni nominali A7W35.
Unità posizionata in campo libero su superficie riflettente (fattore di direzionalità pari a 2).
Il livello di potenza sonora è misurato secondo la normativa ISO 3744.
Il livello di pressione sonora è calcolato secondo la ISO 3744 ed è riferito ad 1/5/10 metri di distanza dalla superficie esterna dell'unità.

DIMENSIONI E SPAZIO MINIMO OPERATIVO

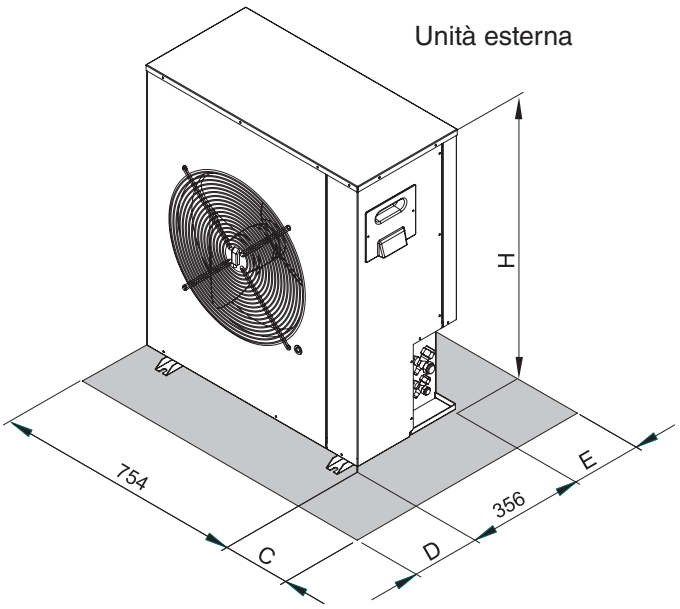
Unità interna



Unità interna
con accessorio
"Accumulo integrato"



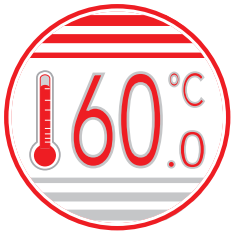
Unità esterna



	3.1	4.1	5.1	7.1	9.1	
H	903	903	903	1153	1153	mm
A	600	600	600	600	600	mm
B	300	300	300	300	300	mm
C	400	400	400	400	400	mm
D	600	600	600	600	600	mm
E	200	200	200	200	200	mm

> KXR

AIR-WATER HEAT PUMPS FOR SPLIT INSTALLATION



Available range

Unit type
IP Heat pump
(reversible on the refrigerant side)

Versions
VB Base version

Acoustic setting up
AB Base setting up
AS Low noise 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 split installation (indoor unit and outdoor unit connected through refrigerant pipes) 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.
The **internal programmer clock** allows to define different daily switching programs for heating, cooling and domestic hot water production.

The heat pump is composed by an indoor unit (motocondensing unit) containing the hydraulic circuit, the electrical board, the compressor and a part of the refrigerant circuit and an outdoor unit (remote evaporator).
The refrigerant circuit, contained in an extractable box to simplify the maintenance operations, is equipped with scroll compressor mounted on damper supports, brazed plate heat exchanger, thermostatic expansion valve and reverse cycle valve and liquid receiver.
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 to avoid condensate generation and to reduce thermal losses.
The outdoor structure of the indoor unit and the refrigerant circuit box are both thermally and acoustically insulated in order to create a double wall against sound propagation and to allow the installation in domestic places.
To avoid vibration propagation towards the hydraulic circuit the refrigerant circuit box is placed on damper supports and the connection pipes are flexible.
The outdoor unit is composed by finned coil made of copper pipes and aluminium louvered fins and axial fan with safety protection grilles. The fan, supplied with DC motor and electronic rotational speed control, guarantees high efficiency and low noise in all the operating conditions.
All the units are supplied with an outdoor temperature sensor in order to realize the climatic control.

All three-phase power supply units are provided with a phase sequence and correct sequence controller device.
All the units are accurately built and individually tested in the factory. Only electric, hydraulic and refrigerant (between indoor and outdoor units) connections are required for installation.

Options

Domestic hot water production
- not present
- 3 way valve
- 3 way valve and primary heat exchanger

Acoustic setting up
- AB - base setting up
- AS - low noise setting up

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Accessories

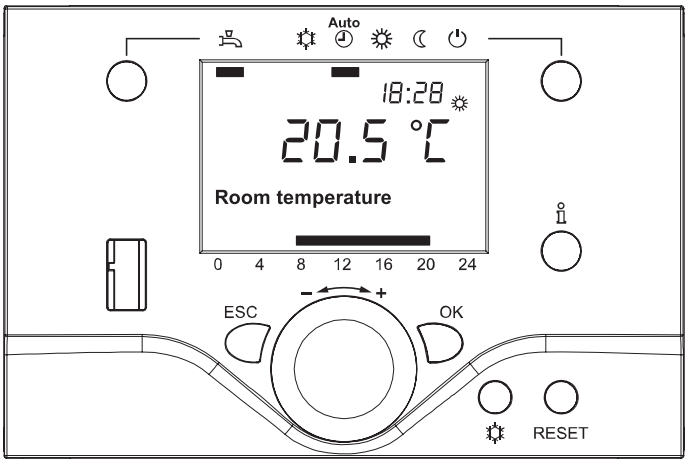
Rubber vibration dampers
Coil protection grille
Remote thermostat
Remote control (wired or wireless)
Room humidity sensor
Refrigerant circuit box

CONTROL SYSTEM

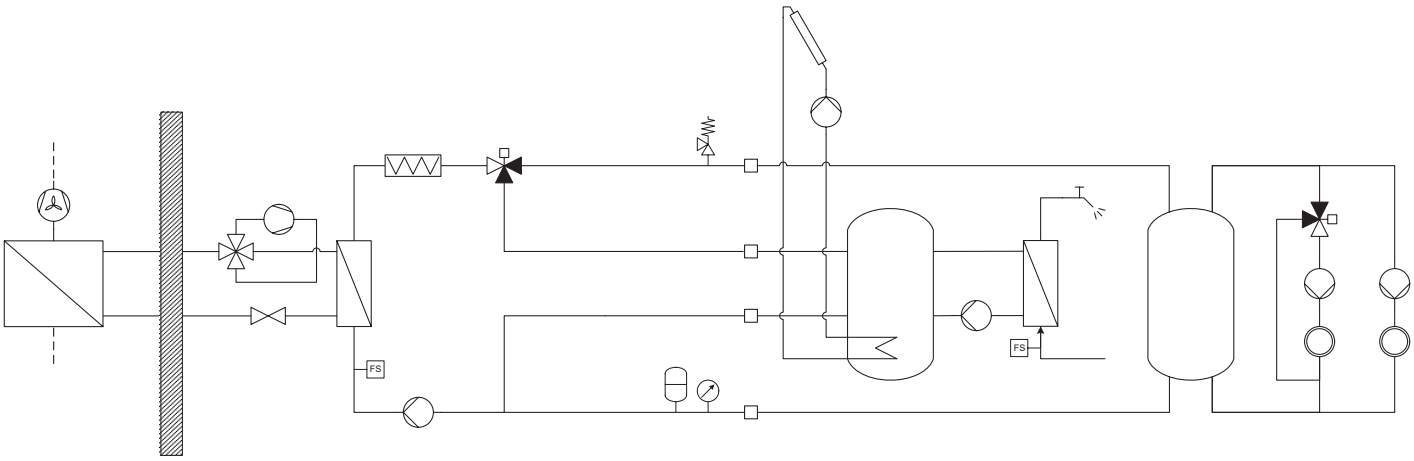
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.
The main **functions** of the control system are :

- 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)
- management of an integrative heating source
- 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 present on all the units, 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)

		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	Base acoustic setting up (AB)	10.1	12.1	14.1	17.1	20.1	
A7W35	Heating capacity	10,1	11,9	14,2	17,3	19,5	kW
	Power input	2,42	2,83	3,39	4,09	4,66	kW
	COP	**4,17**	**4,20**	**4,19**	**4,23**	**4,18**	-
	Water flow rate	1749	2061	2459	2996	3377	l/h
	Available static head	63	63	56	53	46	kPa
A35W18	Cooling capacity	10,6	12,5	14,9	18,1	20,4	kW
	Power input	3,37	3,94	4,74	5,72	6,49	kW
	EER	**3,15**	**3,17**	**3,14**	**3,16**	**3,14**	-
	Water flow rate	1828	2155	2569	3121	3535	l/h
	Available static head	61	62	54	51	43	kPa
IP	**Low noise acoustic setting up (AS)**	**10.1**	**12.1**	**14.1**	**17.1**	**20.1**	
A7W35	Heating capacity	9,63	11,3	13,5	16,4	18,5	kW
	Power input	2,35	2,75	3,29	3,97	4,51	kW
	COP	**4,10**	**4,11**	**4,10**	**4,13**	**4,10**	-
	Water flow rate	1664	1957	2338	2840	3204	l/h
	Available static head	65	65	59	55	49	kPa
A35W18	Cooling capacity	10,2	12,0	14,3	17,4	19,7	kW
	Power input	3,64	4,25	5,10	6,16	7,01	kW
	EER	**2,80**	**2,82**	**2,80**	**2,82**	**2,81**	-
	Water flow rate	1759	2069	2466	3000	3397	l/h
	Available static head	63	63	56	53	46	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	10.1	12.1	14.1	17.1	20.1	
A7W45	Heating capacity	9,90	11,6	13,9	16,9	19,1	kW
	Power input	2,94	3,44	4,13	4,98	5,66	kW
	COP	**3,37**	**3,37**	**3,37**	**3,39**	**3,37**	-
	Water flow rate	1717	2016	2416	2937	3319	l/h
	Available static head	63	64	57	54	47	kPa
A35W7	Cooling capacity	8,19	9,66	11,5	14,0	15,8	kW
	Power input	3,12	3,66	4,39	5,30	6,02	kW
	EER	**2,63**	**2,64**	**2,62**	**2,64**	**2,62**	-
	Water flow rate	1407	1659	1974	2403	2711	l/h
	Available static head	70	70	65	63	58	kPa
IP	**Low noise acoustic setting up (AS)**	**10.1**	**12.1**	**14.1**	**17.1**	**20.1**	
A7W45	Heating capacity	9,41	11,1	13,2	16,0	18,1	kW
	Power input	2,86	3,35	4,00	4,84	5,49	kW
	COP	**3,29**	**3,31**	**3,30**	**3,31**	**3,30**	-
	Water flow rate	1632	1929	2294	2781	3146	l/h
	Available static head	65	65	59	56	50	kPa
A35W7	Cooling capacity	7,86	9,26	11,0	13,4	15,2	kW
	Power input	3,38	3,95	4,73	5,72	6,49	kW
	EER	**2,33**	**2,34**	**2,33**	**2,34**	**2,34**	-
	Water flow rate	1351	1591	1888	2300	2609	l/h
	Available static head	71	71	67	64	59	kPa

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

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

TECHNICAL DATA	10.1	12.1	14.1	17.1	20.1	
Power supply	230 - 1 - 50 400 - 3N - 50	230 - 1 - 50 400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	400 - 3N - 50	V-ph-Hz
Compressor type	scroll	scroll	scroll	scroll	scroll	-
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	1	1	1	n°
Hydraulic fittings	1" M	1" M	1" M	1" M	1" M	-
Refrigerant fittings - liquid line	3/8"	3/8"	1/2"	1/2"	1/2"	-
Refrigerant fittings - gas line	5/8"	5/8"	3/4"	3/4"	3/4"	-

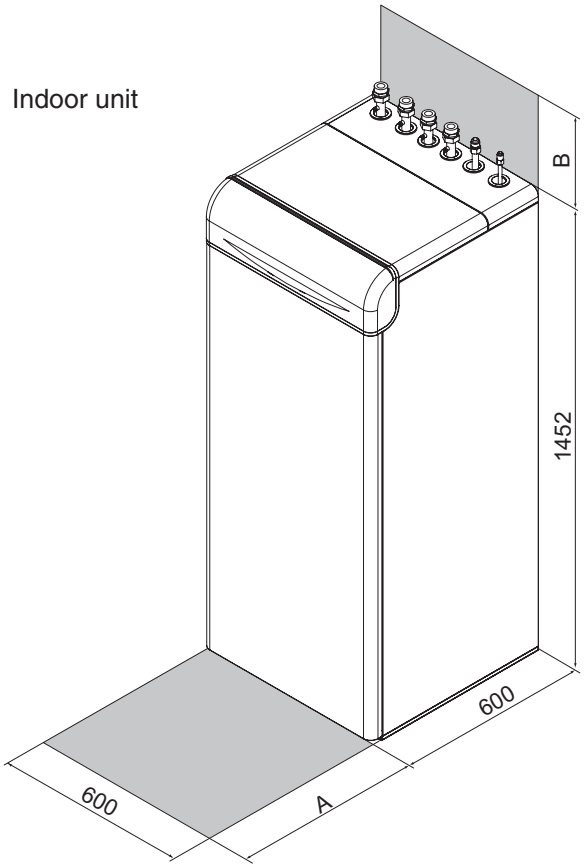
Acoustic performances

Indoor unit	10.1	12.1	14.1	17.1	20.1	
Sound power level	54	55	55	56	56	dB(A)
Sound pressure level at 1 metre	39	40	40	41	41	dB(A)
Sound pressure level at 5 metres	29	30	30	31	31	dB(A)
Sound pressure level at 10 metres	23	24	24	25	25	dB(A)
Outdoor unit Base acoustic setting up (AB)	**10.1**	**12.1**	**14.1**	**17.1**	**20.1**	
Sound power level	71	71	73	73	73	dB(A)
Sound pressure level at 1 metre	56	56	58	58	58	dB(A)
Sound pressure level at 5 metres	45	45	47	47	47	dB(A)
Sound pressure level at 10 metres	40	40	42	42	42	dB(A)
Outdoor unit Low noise acoustic setting up (AS)	**10.1**	**12.1**	**14.1**	**17.1**	**20.1**	
Sound power level	68	68	70	70	70	dB(A)
Sound pressure level at 1 metre	53	53	55	55	55	dB(A)
Sound pressure level at 5 metres	42	42	44	44	44	dB(A)
Sound pressure level at 10 metres	37	37	39	39	39	dB(A)

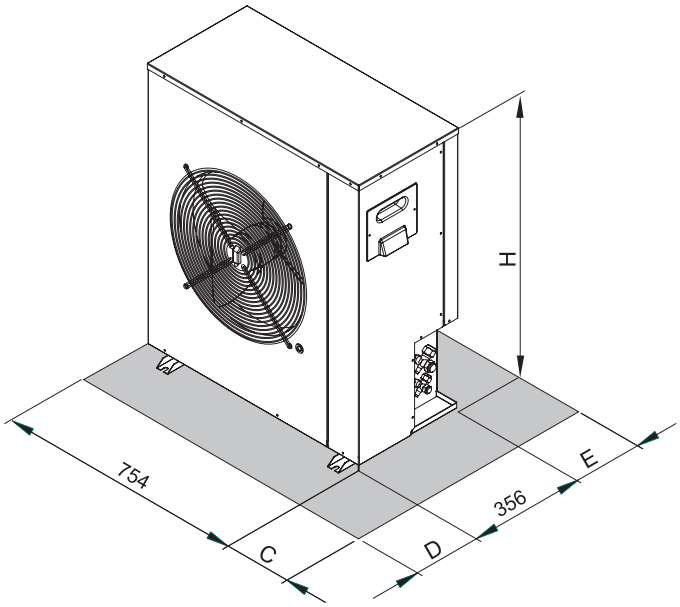
The acoustic performances are referred to units operating in cooling mode at nominal conditions A35W7.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to 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

Indoor unit



Outdoor unit



	10.1	12.1	14.1	17.1	20.1	
H	1153	1153	1453	1453	1453	mm
A	600	600	600	600	600	mm
B	300	300	300	300	300	mm
C	400	400	400	400	400	mm
D	600	600	600	600	600	mm
E	200	200	200	200	200	mm

> HSW

WATER - WATER AND BRINE - WATER
HEAT PUMPS
FOR INDOOR INSTALLATION

Available range

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

Versions
VB Base version

Acoustic setting up
AB Base setting up

Unit description

This series of **water-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 indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

As source both water (from well, river, lake…) or brine solutions (from geothermic probes) can be used.

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 "passive cooling" (free cooling), through "active cooling" (refrigerant circuit inversion) or through both systems actuated in sequence. When the unit is used in radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed.

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

The refrigerant circuit, contained in an **extractable box** to simplify the maintenance operations, is equipped with rotary compressor mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve and reverse cycle valve (for reversible units). The circuit is protected by high and low pressure switches and flow switches on both the exchangers.

The outdoor structure and the refrigerant circuit box are both **thermally and acoustically insulated** in order to create a double wall against sound propagation and to allow the installation in domestic places.

To avoid vibration propagation towards the hydraulic circuit the refrigerant circuit box is placed on damper supports and the connection pipes are flexible. Moreover all the hydraulic pipes are thermally insulated to avoid condensate generation.

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

Options

Source side flow rate management
- not present
- pump
- 2 way valve

Domestic hot water production
- not present
- 3 way valve
- 3 way valve and primary heat exchanger
- 3 way valve and secondary heat exchanger

Plant buffer tank connections
- not present
- standard

Passive cooling
- not present
- standard

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Remote thermostat
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor
Integrated tank
Pipes for solar panels connection
Refrigerant circuit box

CONTROL SYSTEM

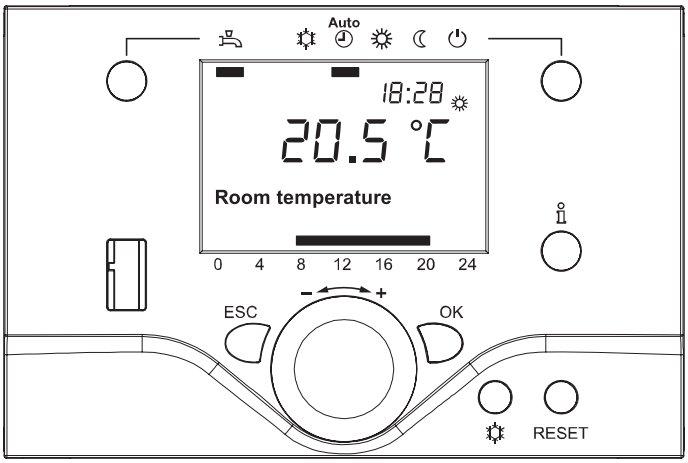
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

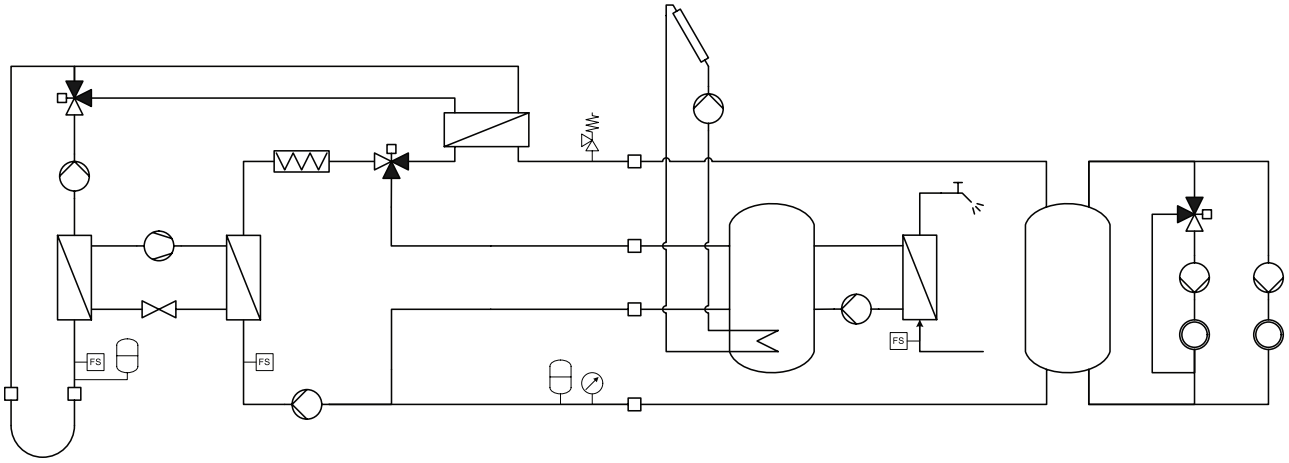
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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
- passive cooling
- 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 present on all the units, 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)

		Cooling		Heating		
OPERATING LIMITS	**Unit type**	**min**	**max**	**min**	**max**	
Plant flow temperature	-	6	30	15	60	°C
Source return temperature (water)	-	5	45	5	25	°C
Source return temperature (brine)	-	-10	45	-10	25	°C

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	3.1	5.1	7.1	9.1	11.1	
W10W35	Heating capacity	3,30	5,01	6,72	9,13	11,6	kW
	Power input	0,58	0,89	1,23	1,67	2,15	kW
	COP	**5,69**	**5,63**	**5,46**	**5,47**	**5,40**	-
	Water flow rate plant side	571	866	1160	1576	2009	l/h
	Available static head plant side	59	51	41	33	26	kPa
	Water flow rate source side	780	1181	1578	2147	2730	l/h
	Pressure drops source side	6	13	21	24	25	kPa
B0W35	Heating capacity	2,44	3,70	4,97	6,74	8,57	kW
	Power input	0,57	0,88	1,21	1,64	2,12	kW
	COP	**4,28**	**4,20**	**4,11**	**4,11**	**4,04**	-
	Water flow rate plant side	423	641	859	1165	1481	l/h
	Available static head plant side	63	57	51	46	42	kPa
	Water flow rate source side	595	900	1199	1632	2062	l/h
	Pressure drops source side	4	9	14	16	17	kPa
W30W18	Cooling capacity	3,59	5,43	7,27	9,87	12,6	kW
	Power input	0,59	0,90	1,25	1,69	2,17	kW
	EER	**6,08**	**6,03**	**5,82**	**5,84**	**5,81**	-
	Water flow rate plant side	619	938	1257	1709	2173	l/h
	Available static head plant side	58	49	37	28	21	kPa
	Water flow rate source side	722	1094	1470	1995	2541	l/h
	Pressure drops source side	6	12	19	21	22	kPa
B30W18	Cooling capacity	3,51	5,30	7,11	9,63	12,3	kW
	Power input	0,60	0,92	1,28	1,72	2,22	kW
	EER	**5,85**	**5,76**	**5,55**	**5,60**	**5,54**	-
	Water flow rate plant side	605	916	1229	1667	2121	l/h
	Available static head plant side	59	49	38	30	23	kPa
	Water flow rate source side	771	1166	1570	2127	2710	l/h
	Pressure drops source side	7	13	22	25	26	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	3.1	5.1	7.1	9.1	11.1	
W10W45	Heating capacity	3,03	4,61	6,19	8,40	10,6	kW
	Power input	0,71	1,09	1,50	2,02	2,59	kW
	COP	**4,27**	**4,23**	**4,13**	**4,16**	**4,09**	-
	Water flow rate plant side	527	799	1072	1456	1842	l/h
	Available static head plant side	60	53	44	37	31	kPa
	Water flow rate source side	666	1009	1347	1835	2310	l/h
	Pressure drops source side	5	10	16	19	19	kPa
B0W45	Heating capacity	2,27	3,44	4,62	6,27	7,96	kW
	Power input	0,69	1,06	1,46	1,96	2,53	kW
	COP	**3,29**	**3,25**	**3,16**	**3,20**	**3,15**	-
	Water flow rate plant side	395	598	801	1088	1382	l/h
	Available static head plant side	63	58	53	48	45	kPa
	Water flow rate source side	503	760	1009	1378	1737	l/h
	Pressure drops source side	3	6	11	12	13	kPa
W30W7	Cooling capacity	2,73	4,13	5,54	7,52	9,54	kW
	Power input	0,59	0,91	1,26	1,69	2,16	kW
	EER	**4,63**	**4,54**	**4,40**	**4,45**	**4,42**	-
	Water flow rate plant side	469	710	952	1294	1641	l/h
	Available static head plant side	62	56	48	43	38	kPa
	Water flow rate source side	575	873	1174	1592	2021	l/h
	Pressure drops source side	4	8	13	15	15	kPa
B30W7	Cooling capacity	2,67	4,05	5,42	7,35	9,33	kW
	Power input	0,60	0,92	1,28	1,72	2,21	kW
	EER	**4,45**	**4,40**	**4,23**	**4,27**	**4,22**	-
	Water flow rate plant side	458	695	932	1265	1605	l/h
	Available static head plant side	62	56	49	44	39	kPa
	Water flow rate source side	615	933	1256	1702	2162	l/h
	Pressure drops source side	4	9	15	17	18	kPa

Data declared according to **EN 14511**. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

W10W35 (source : water in 10°C out 7°C / plant : water in 30°C out 35°C)
B0W35 (source : brine in 0°C out -3°C / plant : water in 30°C out 35°C)
W30W18 (source : water in 30°C out 35°C / plant : water in 23°C out 18°C)
B30W18 (source : brine in 30°C out 35°C / plant : water in 23°C out 18°C)

W10W45 (source : water in 10°C out 7°C / plant : water in 40°C out 45°C)
B0W45 (source : brine in 0°C out -3°C / plant : water in 40°C out 45°C)
W30W7 (source : water in 30°C out 35°C / plant : water in 12°C out 7°C)
B30W7 (source : brine in 30°C out 35°C / plant : water in 12°C out 7°C)

TECHNICAL DATA	3.1	5.1	7.1	9.1	11.1	
Power supply	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	V-ph-Hz
Compressor type	rotary	rotary	rotary	rotary	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	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	-
Hydraulic fittings	1" M	1" M	1" M	1" M	1" M	-

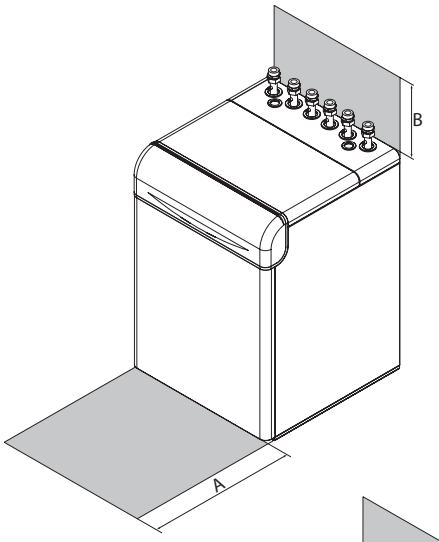
ACOUSTIC PERFORMANCES	3.1	5.1	7.1	9.1	11.1	
Sound power level	51	52	52	53	53	dB(A)
Sound pressure level at 1 metre	36	37	37	38	38	dB(A)
Sound pressure level at 5 metres	25	26	26	27	27	dB(A)
Sound pressure level at 10 metres	19	20	20	21	21	dB(A)

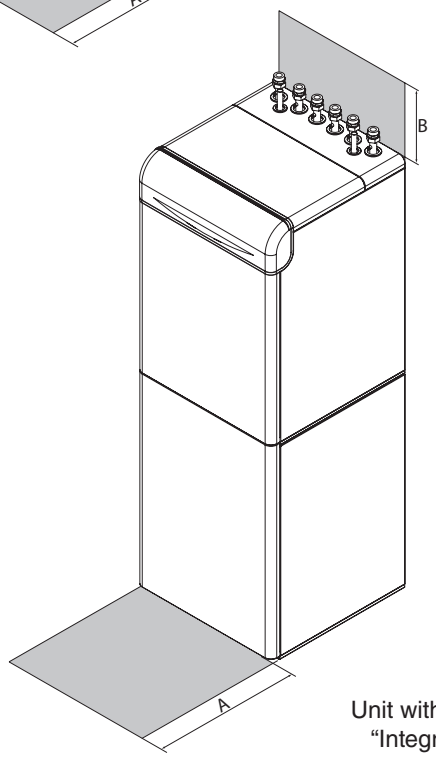
The acoustic performances are referred to units operating in cooling mode at nominal conditions W10W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to 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

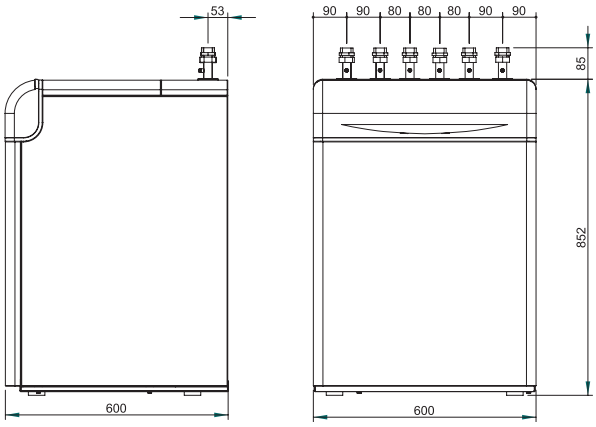
Respect the free area around the unit as shown in figure in order to guarantee a good accessibility and facilitate maintenance and control operations.

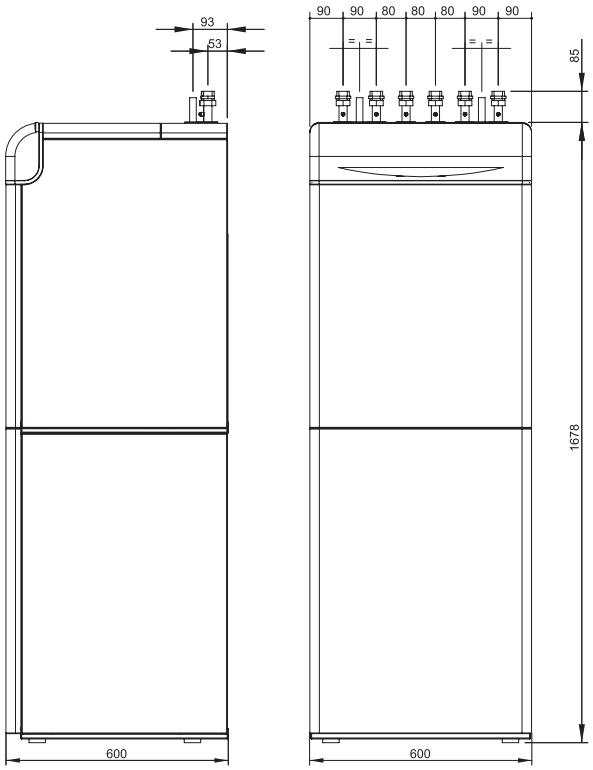
A	600 mm
B	300 mm





Unit with accessory "Integrated tank"





> HXW

WATER - WATER AND BRINE - WATER HEAT PUMPS FOR INDOOR INSTALLATION

Available range

Unit type

IH Heat pump

IP Reversible heat pump
(reversible on the refrigerant side)

Versions

VB Base version

Acoustic setting up

AB Base setting up

Unit description

This series of **water-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 indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

As source both water (from well, river, lake…) or brine solutions (from geothermic probes) can be used.

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 "passive cooling" (free cooling), through "active cooling" (refrigerant circuit inversion) or through both systems actuated in sequence. When the unit is used in radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed.

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

The refrigerant circuit, contained in an **extractable box** to simplify the maintenance operations, is equipped with scroll compressor mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve and reverse cycle valve (for reversible units). The circuit is protected by high and low pressure switches and flow switches on both the exchangers.

The outdoor structure and the refrigerant circuit box are both **thermally and acoustically insulated** in order to create a double wall against sound propagation and to allow the installation in domestic places.

To avoid vibration propagation towards the hydraulic circuit the refrigerant circuit box is placed on damper supports and the connection pipes are flexible. Moreover all the hydraulic pipes are thermally insulated to avoid condensate generation.

The three phase electrical power supply heat pumps are supplied with phase sequence and voltage controller integrated inside the unit controller.

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

Options

Source side flow rate management
- not present
- pump
- 2 way valve

Domestic hot water production
- not present
- 3 way valve
- 3 way valve and primary heat exchanger

Passive cooling
- not present
- standard

Integrative electrical heaters
- not present
- standard in the flow

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Remote thermostat
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor
Refrigerant circuit box

CONTROL SYSTEM

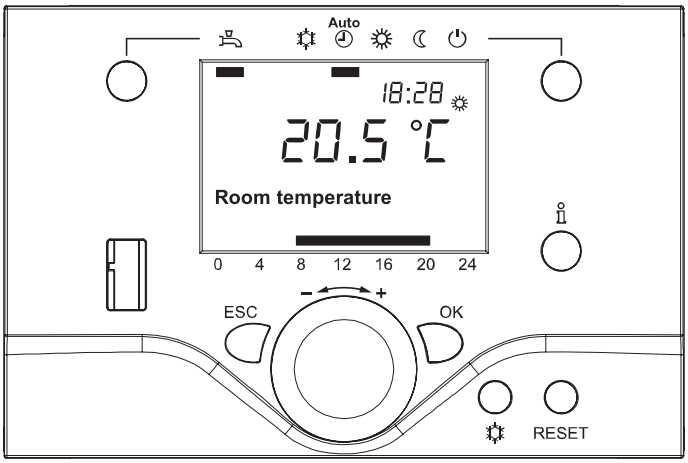
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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
- passive cooling
- 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 present on all the units, 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.



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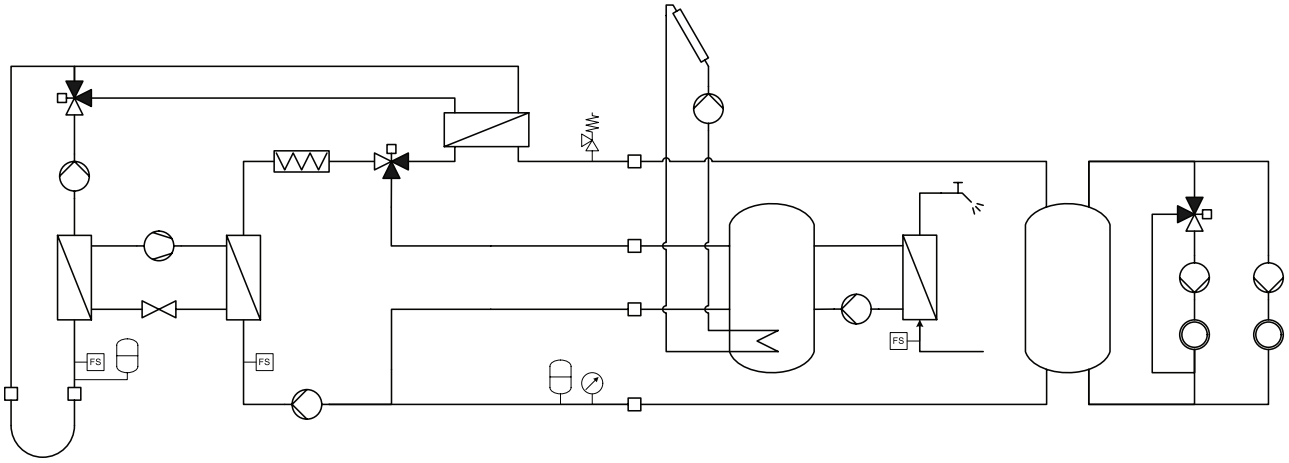


The controller is able to manage up to **two zones in heating** (one by means of a mixed circuit and the other by means of a direct circuit) and **one zone in cooling** (by means of a mixed circuit).

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)

		Cooling		Heating		
OPERATING LIMITS	**Unit type**	**min**	**max**	**min**	**max**	
Plant flow temperature	-	6	30	15	60	°C
Source return temperature (water)	-	5	45	5	25	°C
Source return temperature (brine)	-	-10	45	-10	25	°C

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	12.1	14.1	17.1	20.1	23.1	27.1	
W10W35	Heating capacity	11,8	14,3	16,7	20,4	23,6	26,7	kW
	Power input	2,18	2,66	3,10	3,82	4,43	5,02	kW
	COP	**5,41**	**5,38**	**5,39**	**5,34**	**5,33**	**5,32**	-
	Water flow rate plant side	2043	2459	2892	3516	4070	4607	l/h
	Available static head plant side	56	46	47	33	32	19	kPa
	Water flow rate source side	2773	3336	3922	4774	5512	6255	l/h
	Pressure drops source side	17	24	20	29	25	32	kPa
B0W35	Heating capacity	8,71	10,6	12,4	15,0	17,4	19,7	kW
	Power input	2,15	2,62	3,07	3,73	4,35	4,90	kW
	COP	**4,05**	**4,05**	**4,04**	**4,02**	**4,00**	**4,02**	-
	Water flow rate plant side	1507	1836	2147	2598	3013	3412	l/h
	Available static head plant side	68	61	62	54	52	45	kPa
	Water flow rate source side	2093	2558	2987	3617	4180	4753	l/h
	Pressure drops source side	11	15	13	18	16	20	kPa
W30W18	Cooling capacity	12,8	15,4	18,1	22,0	25,4	28,8	kW
	Power input	2,21	2,70	3,14	3,87	4,50	5,09	kW
	EER	**5,79**	**5,70**	**5,76**	**5,68**	**5,64**	**5,66**	-
	Water flow rate plant side	2207	2673	3138	3811	4397	4983	l/h
	Available static head plant side	53	40	42	25	24	9	kPa
	Water flow rate source side	2586	3129	3675	4459	5159	5834	l/h
	Pressure drops source side	15	21	18	26	22	28	kPa
B30W18	Cooling capacity	12,5	15,1	17,7	21,6	24,9	28,3	kW
	Power input	2,25	2,76	3,22	3,96	4,59	5,21	kW
	EER	**5,56**	**5,47**	**5,50**	**5,45**	**5,42**	**5,43**	-
	Water flow rate plant side	2155	2621	3069	3742	4311	4897	l/h
	Available static head plant side	54	41	44	27	26	12	kPa
	Water flow rate source side	2759	3351	3926	4780	5521	6258	l/h
	Pressure drops source side	18	25	21	31	26	33	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	12.1	14.1	17.1	20.1	23.1	27.1	
W10W45	Heating capacity	10,8	13,1	15,4	18,8	21,7	24,6	kW
	Power input	2,63	3,21	3,76	4,58	5,34	6,02	kW
	COP	**4,11**	**4,08**	**4,10**	**4,10**	**4,06**	**4,09**	-
	Water flow rate plant side	1877	2277	2676	3250	3754	4258	l/h
	Available static head plant side	60	50	52	39	38	27	kPa
	Water flow rate source side	2350	2853	3353	4080	4688	5343	l/h
	Pressure drops source side	13	18	15	22	18	23	kPa
B0W45	Heating capacity	8,10	9,84	11,5	14,0	16,2	18,3	kW
	Power input	2,57	3,12	3,67	4,45	5,20	5,83	kW
	COP	**3,15**	**3,15**	**3,13**	**3,15**	**3,12**	**3,14**	-
	Water flow rate plant side	1406	1707	1999	2433	2815	3180	l/h
	Available static head plant side	69	64	64	57	56	49	kPa
	Water flow rate source side	1763	2144	2504	3061	3519	3996	l/h
	Pressure drops source side	8	11	9	13	11	14	kPa
W30W7	Cooling capacity	9,71	11,8	13,8	16,8	19,4	21,9	kW
	Power input	2,21	2,68	3,14	3,82	4,47	5,02	kW
	EER	**4,39**	**4,40**	**4,39**	**4,40**	**4,34**	**4,36**	-
	Water flow rate plant side	1670	2025	2368	2883	3329	3775	l/h
	Available static head plant side	65	57	58	48	47	38	kPa
	Water flow rate source side	2061	2497	2923	3554	4116	4655	l/h
	Pressure drops source side	10	14	12	17	14	18	kPa
B30W7	Cooling capacity	9,50	11,6	13,6	16,5	19,1	21,5	kW
	Power input	2,25	2,74	3,21	3,91	4,56	5,14	kW
	EER	**4,22**	**4,23**	**4,24**	**4,22**	**4,19**	**4,18**	-
	Water flow rate plant side	1634	1991	2334	2832	3278	3707	l/h
	Available static head plant side	66	58	59	49	48	39	kPa
	Water flow rate source side	2206	2683	3148	3815	4428	4998	l/h
	Pressure drops source side	12	17	14	20	17	22	kPa

Data declared according to **EN 14511**. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

W10W35 (source : water in 10°C out 7°C / plant : water in 30°C out 35°C)
B0W35 (source : brine in 0°C out -3°C / plant : water in 30°C out 35°C)
W30W18 (source : water in 30°C out 35°C / plant : water in 23°C out 18°C)
B30W18 (source : brine in 30°C out 35°C / plant : water in 23°C out 18°C)

W10W45 (source : water in 10°C out 7°C / plant : water in 40°C out 45°C)
B0W45 (source : brine in 0°C out -3°C / plant : water in 40°C out 45°C)
W30W7 (source : water in 30°C out 35°C / plant : water in 12°C out 7°C)
B30W7 (source : brine in 30°C out 35°C / plant : water in 12°C out 7°C)

TECHNICAL DATA	12.1	14.1	17.1	20.1	23.1	27.1	
Power supply	230-1-50 400-3N-50	230-1-50 400-3N-50	230-1-50 400-3N-50	400-3N-50	400-3N-50	400-3N-50	V-ph-Hz
Compressor type	scroll	scroll	scroll	scroll	scroll	scroll	-
N° compressors / N° refrigerant circuits	1 / 1	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	stainless steel brazed plates	-
Source side heat exchanger type	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	-
Hydraulic fittings	1" M	1" M	1" M	1" M	1" M	1" M	-

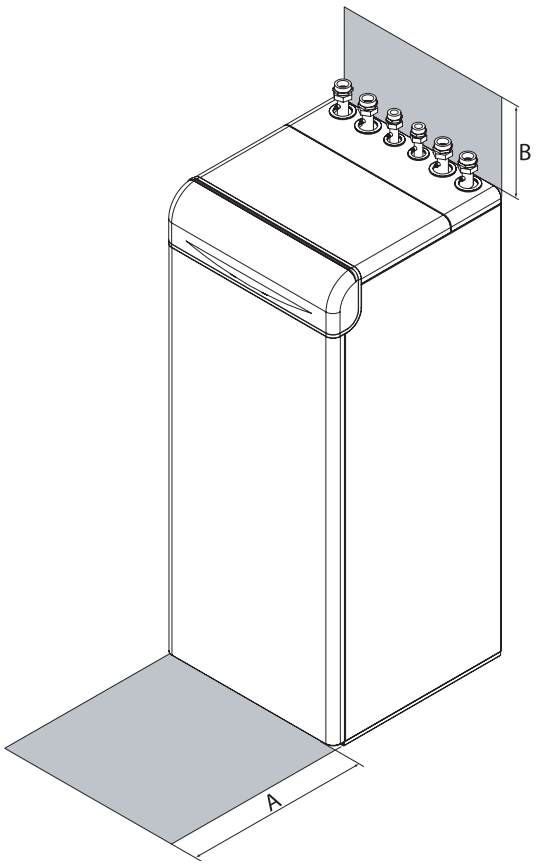
ACOUSTIC PERFORMANCES	12.1	14.1	17.1	20.1	23.1	27.1	
Sound power level	54	54	55	55	56	56	dB(A)
Sound pressure level at 1 metre	39	39	40	40	41	41	dB(A)
Sound pressure level at 5 metres	29	29	30	30	31	31	dB(A)
Sound pressure level at 10 metres	23	23	24	24	25	25	dB(A)

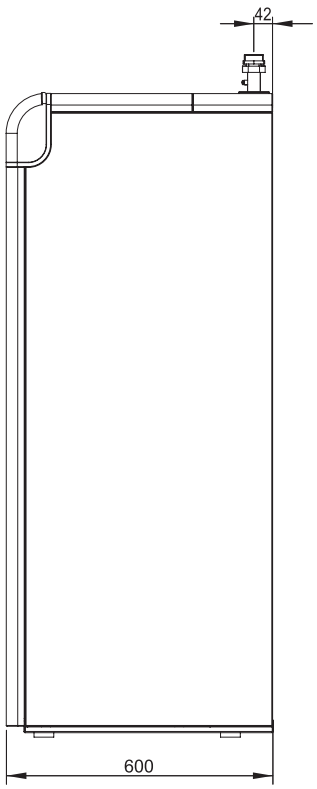
The acoustic performances are referred to units operating in cooling mode at nominal conditions W10W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

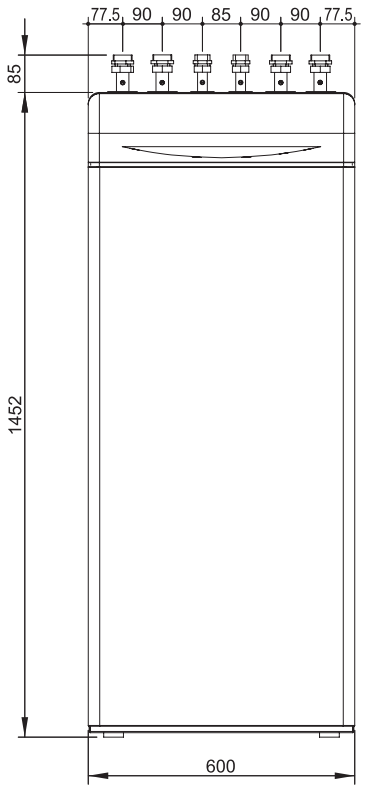
DIMENSIONS AND MINIMUM OPERATING AREA

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

A	600 mm
B	300 mm







> HSW LT

WATER - WATER AND BRINE - WATER
HEAT PUMPS
FOR INDOOR INSTALLATION

Available range

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

Versions
VB Base version

Acoustic setting up
AB Base setting up

Unit description

This series of **water-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 indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

As source both water (from well, river, lake…) or brine solutions (from geothermic probes) can be used.

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 "passive cooling" (free cooling), through "active cooling" (refrigerant circuit inversion) or through both systems actuated in sequence. When the unit is used in radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed.

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

The refrigerant circuit is equipped with rotary compressor mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve and reverse cycle valve (for reversible units). The circuit is protected by high and low pressure switches and flow switches on both the exchangers.

The outdoor structure is **thermally and acoustically insulated** in order to reduce sound propagation and to allow the installation in domestic places.

All the hydraulic pipes are thermally insulated to avoid condensate generation.

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

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Remote thermostat
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor
Plant tank

CONTROL SYSTEM

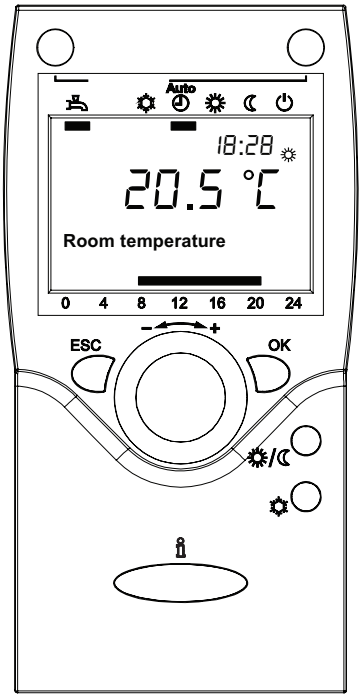
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

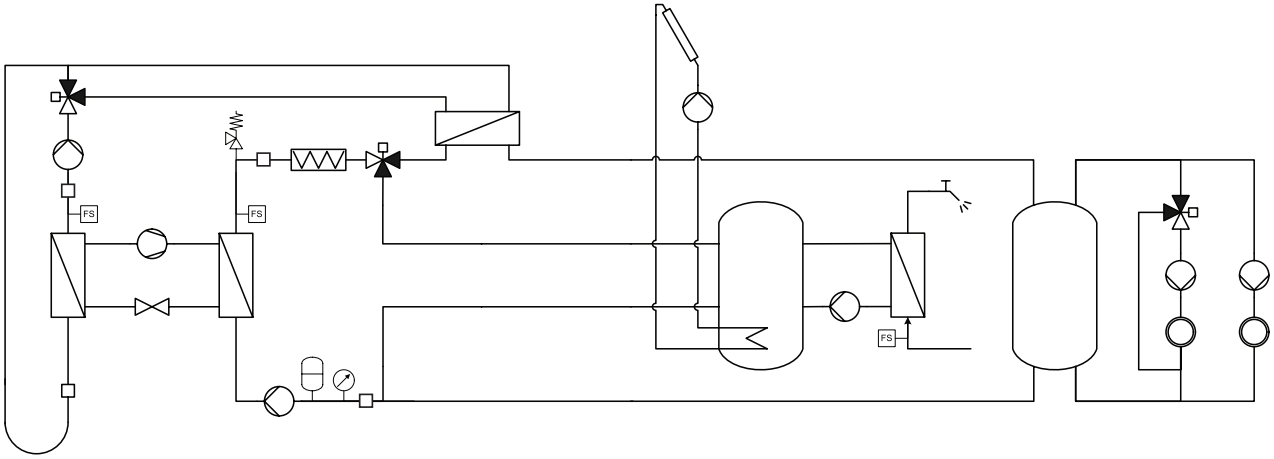
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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
- passive cooling
- 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)

		Cooling		Heating		
OPERATING LIMITS	Unit type	min	max	min	max	
Plant flow temperature	-	6	30	15	60	°C
Source return temperature (water)	-	5	45	5	25	°C
Source return temperature (brine)	-	-10	45	-10	25	°C

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	3.1	5.1	7.1	9.1	11.1	
W10W35	Heating capacity	3,30	5,01	6,72	9,13	11,6	kW
	Power input	0,58	0,89	1,23	1,67	2,15	kW
	COP	**5,69**	**5,63**	**5,46**	**5,47**	**5,40**	-
	Water flow rate plant side	571	866	1160	1576	2009	l/h
	Pressure drops plant side	5	11	19	21	22	kPa
	Water flow rate source side	780	1181	1578	2147	2730	l/h
	Pressure drops source side	6	13	21	24	25	kPa
B0W35	Heating capacity	2,44	3,70	4,97	6,74	8,57	kW
	Power input	0,57	0,88	1,21	1,64	2,12	kW
	COP	**4,28**	**4,20**	**4,11**	**4,11**	**4,04**	-
	Water flow rate plant side	423	641	859	1165	1481	l/h
	Pressure drops plant side	2	7	11	13	13	kPa
	Water flow rate source side	595	900	1199	1632	2062	l/h
	Pressure drops source side	4	9	14	16	17	kPa
W30W18	Cooling capacity	3,59	5,43	7,27	9,87	12,6	kW
	Power input	0,59	0,90	1,25	1,69	2,17	kW
	EER	**6,08**	**6,03**	**5,82**	**5,84**	**5,81**	-
	Water flow rate plant side	619	938	1257	1709	2173	l/h
	Pressure drops plant side	6	13	21	24	25	kPa
	Water flow rate source side	722	1094	1470	1995	2541	l/h
	Pressure drops source side	6	12	19	21	22	kPa
B30W18	Cooling capacity	3,51	5,30	7,11	9,63	12,3	kW
	Power input	0,60	0,92	1,28	1,72	2,22	kW
	EER	**5,85**	**5,76**	**5,55**	**5,60**	**5,54**	-
	Water flow rate plant side	605	916	1229	1667	2121	l/h
	Pressure drops plant side	6	13	21	23	24	kPa
	Water flow rate source side	771	1166	1570	2127	2710	l/h
	Pressure drops source side	7	13	22	25	26	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	3.1	5.1	7.1	9.1	11.1	
W10W45	Heating capacity	3,03	4,61	6,19	8,40	10,6	kW
	Power input	0,71	1,09	1,50	2,02	2,59	kW
	COP	**4,27**	**4,23**	**4,13**	**4,16**	**4,09**	-
	Water flow rate plant side	527	799	1072	1456	1842	l/h
	Pressure drops plant side	4	10	16	18	19	kPa
	Water flow rate source side	666	1009	1347	1835	2310	l/h
	Pressure drops source side	5	10	16	19	19	kPa
B0W45	Heating capacity	2,27	3,44	4,62	6,27	7,96	kW
	Power input	0,69	1,06	1,46	1,96	2,53	kW
	COP	**3,29**	**3,25**	**3,16**	**3,20**	**3,15**	-
	Water flow rate plant side	395	598	801	1088	1382	l/h
	Pressure drops plant side	2	6	10	11	12	kPa
	Water flow rate source side	503	760	1009	1378	1737	l/h
	Pressure drops source side	3	6	11	12	13	kPa
W30W7	Cooling capacity	2,73	4,13	5,54	7,52	9,54	kW
	Power input	0,59	0,91	1,26	1,69	2,16	kW
	EER	**4,63**	**4,54**	**4,40**	**4,45**	**4,42**	-
	Water flow rate plant side	469	710	952	1294	1641	l/h
	Pressure drops plant side	3	8	13	15	16	kPa
	Water flow rate source side	575	873	1174	1592	2021	l/h
	Pressure drops source side	4	8	13	15	15	kPa
B30W7	Cooling capacity	2,67	4,05	5,42	7,35	9,33	kW
	Power input	0,60	0,92	1,28	1,72	2,21	kW
	EER	**4,45**	**4,40**	**4,23**	**4,27**	**4,22**	-
	Water flow rate plant side	458	695	932	1265	1605	l/h
	Pressure drops plant side	3	8	13	15	15	kPa
	Water flow rate source side	615	933	1256	1702	2162	l/h
	Pressure drops source side	4	9	15	17	18	kPa

Data declared according to **EN 14511**. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

W10W35 (source : water in 10°C out 7°C / plant : water in 30°C out 35°C)
B0W35 (source : brine in 0°C out -3°C / plant : water in 30°C out 35°C)
W30W18 (source : water in 30°C out 35°C / plant : water in 23°C out 18°C)
B30W18 (source : brine in 30°C out 35°C / plant : water in 23°C out 18°C)

W10W45 (source : water in 10°C out 7°C / plant : water in 40°C out 45°C)
B0W45 (source : brine in 0°C out -3°C / plant : water in 40°C out 45°C)
W30W7 (source : water in 30°C out 35°C / plant : water in 12°C out 7°C)
B30W7 (source : brine in 30°C out 35°C / plant : water in 12°C out 7°C)

TECHNICAL DATA	3.1	5.1	7.1	9.1	11.1	
Power supply	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	230 - 1 - 50	V-ph-Hz
Compressor type	rotary	rotary	rotary	rotary	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	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	-
Hydraulic fittings	1" M	1" M	1" M	1" M	1" M	-

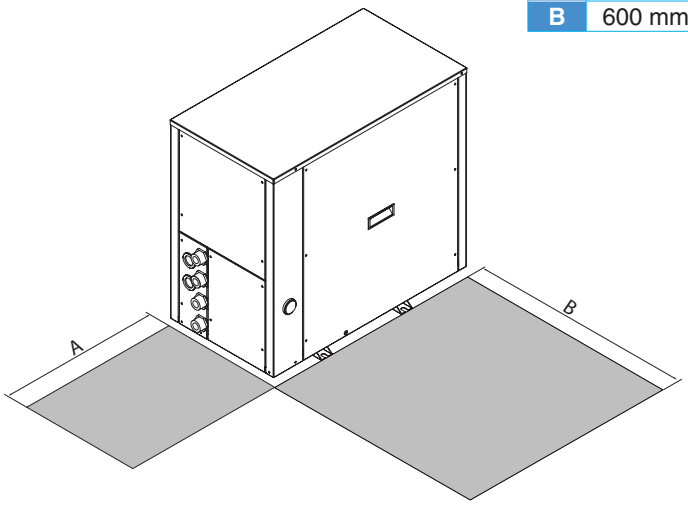
ACOUSTIC PERFORMANCES	3.1	5.1	7.1	9.1	11.1	
Sound power level	60	61	61	62	62	dB(A)
Sound pressure level at 1 metre	46	47	47	48	48	dB(A)
Sound pressure level at 5 metres	34	35	35	36	36	dB(A)
Sound pressure level at 10 metres	28	29	29	30	30	dB(A)

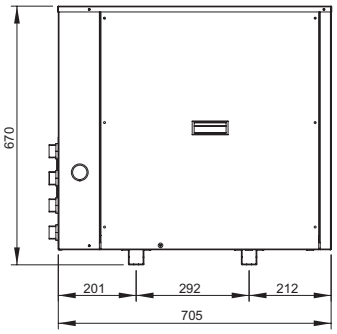
The acoustic performances are referred to units operating in cooling mode at nominal conditions W10W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

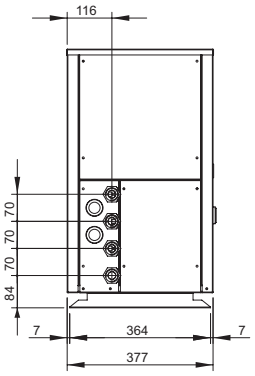
DIMENSIONS AND MINIMUM OPERATING AREA

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

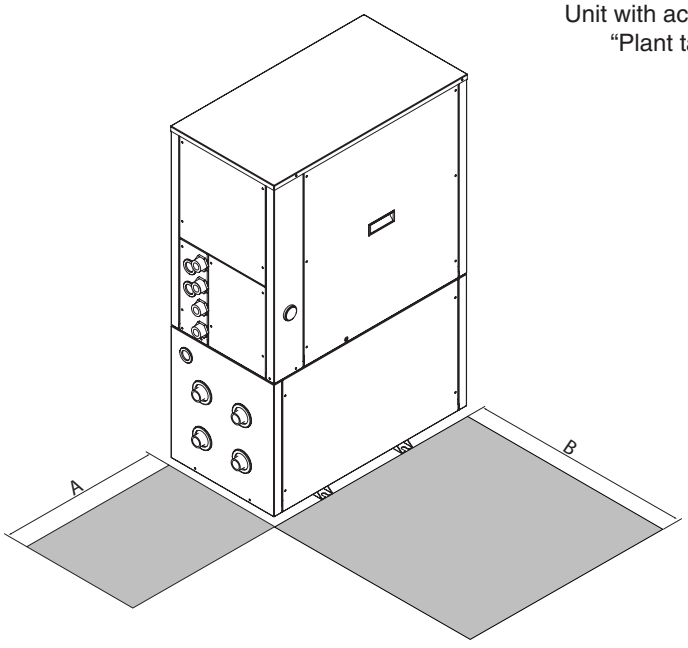
A	600 mm
B	600 mm

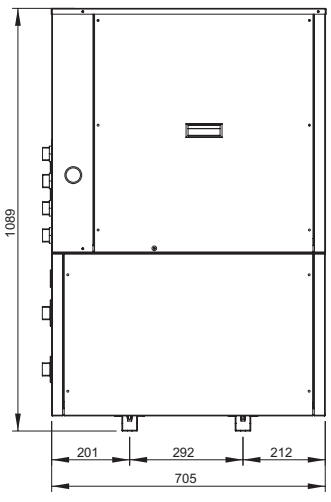


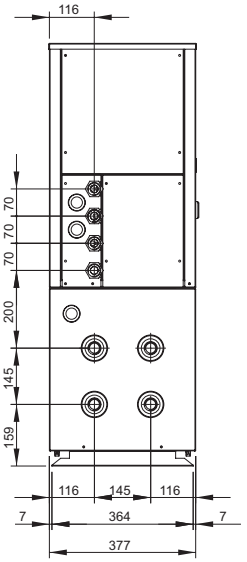




Unit with accessory
"Plant tank"







> HXW LT

WATER - WATER AND BRINE - WATER
HEAT PUMPS
FOR INDOOR INSTALLATION

Available range

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

Versions
VB Base version

Acoustic setting up
AB Base setting up

Unit description

This series of **water-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 indoor installation and can be applied to **fan coil** plants, **radiant** floor plants and high efficiency **radiators** plants.

As source both water (from well, river, lake…) or brine solutions (from geothermic probes) can be used.

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 "passive cooling" (free cooling), through "active cooling" (refrigerant circuit inversion) or through both systems actuated in sequence. When the unit is used in radiant floor plants, to avoid condensate generation, a room humidity sensor can be installed.

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

The refrigerant circuit is equipped with scroll compressor mounted on damper supports, brazed plate heat exchangers, thermostatic expansion valve and reverse cycle valve (for reversible units). The circuit is protected by high and low pressure switches and flow switches on both the exchangers.

The outdoor structure is **thermally and acoustically insulated** in order to reduce sound propagation and to allow the installation in domestic places.

All the hydraulic pipes are thermally insulated to avoid condensate generation.

The three phase electrical power supply heat pumps are supplied with phase sequence and voltage controller integrated inside the unit controller.

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

Soft starter
- not present
- standard

Accessories

Rubber vibration dampers
Remote thermostat
Remote control (wired or wireless)
Wireless transmitter
Wireless repeater
Condensate sensor
Room hygrostat
Room humidity sensor
Plant tank

CONTROL SYSTEM

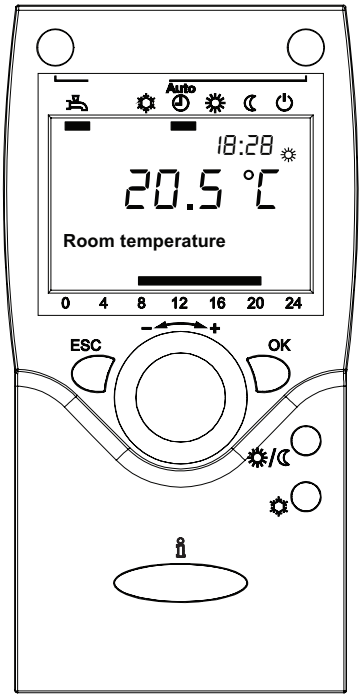
The microprocessor controller is able to manage not only the unit itself but also all that components of the plant which allow to realize a complete system.

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

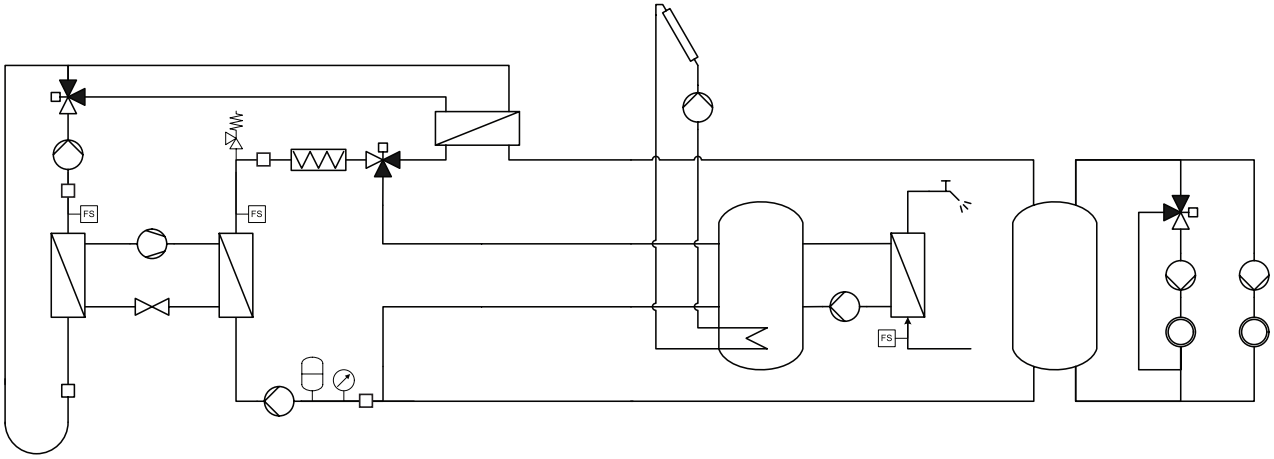
- room temperature control according to the outdoor temperature (climatic control)
- domestic hot water production (management of 3 way valve, storage tank, anti legionella cycles…)
- management of a heating and/or cooling mixed circuit (pump and 3 way mixing valve)
- management of a heating direct circuit (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
- passive cooling
- 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)

		Cooling		Heating		
OPERATING LIMITS	Unit type	min	max	min	max	
Plant flow temperature	-	6	30	15	60	°C
Source return temperature (water)	-	5	45	5	25	°C
Source return temperature (brine)	-	-10	45	-10	25	°C

NOMINAL performances - Radiant plants

IP	Base acoustic setting up (AB)	12.1	14.1	17.1	20.1	23.1	27.1	
W10W35	Heating capacity	11,8	14,3	16,7	20,4	23,6	26,7	kW
	Power input	2,18	2,66	3,10	3,82	4,43	5,02	kW
	COP	**5,41**	**5,38**	**5,39**	**5,34**	**5,33**	**5,32**	-
	Water flow rate plant side	2043	2459	2892	3516	4070	4607	l/h
	Pressure drops plant side	17	24	18	27	22	27	kPa
	Water flow rate source side	2773	3336	3922	4774	5512	6255	l/h
	Pressure drops source side	17	24	20	29	25	32	kPa
B0W35	Heating capacity	8,71	10,6	12,4	15,0	17,4	19,7	kW
	Power input	2,15	2,62	3,07	3,73	4,35	4,90	kW
	COP	**4,05**	**4,05**	**4,04**	**4,02**	**4,00**	**4,02**	-
	Water flow rate plant side	1507	1836	2147	2598	3013	3412	l/h
	Pressure drops plant side	9	14	11	15	12	15	kPa
	Water flow rate source side	2093	2558	2987	3617	4180	4753	l/h
	Pressure drops source side	11	15	13	18	16	20	kPa
W30W18	Cooling capacity	12,8	15,4	18,1	22,0	25,4	28,8	kW
	Power input	2,21	2,70	3,14	3,87	4,50	5,09	kW
	EER	**5,79**	**5,70**	**5,76**	**5,68**	**5,64**	**5,66**	-
	Water flow rate plant side	2207	2673	3138	3811	4397	4983	l/h
	Pressure drops plant side	20	28	22	31	25	32	kPa
	Water flow rate source side	2586	3129	3675	4459	5159	5834	l/h
	Pressure drops source side	15	21	18	26	22	28	kPa
B30W18	Cooling capacity	12,5	15,1	17,7	21,6	24,9	28,3	kW
	Power input	2,25	2,76	3,22	3,96	4,59	5,21	kW
	EER	**5,56**	**5,47**	**5,50**	**5,45**	**5,42**	**5,43**	-
	Water flow rate plant side	2155	2621	3069	3742	4311	4897	l/h
	Pressure drops plant side	19	27	21	30	24	31	kPa
	Water flow rate source side	2759	3351	3926	4780	5521	6258	l/h
	Pressure drops source side	18	25	21	31	26	33	kPa

NOMINAL performances - Standard plants

IP	Base acoustic setting up (AB)	12.1	14.1	17.1	20.1	23.1	27.1	
W10W45	Heating capacity	10,8	13,1	15,4	18,8	21,7	24,6	kW
	Power input	2,63	3,21	3,76	4,58	5,34	6,02	kW
	COP	**4,11**	**4,08**	**4,10**	**4,10**	**4,06**	**4,09**	-
	Water flow rate plant side	1877	2277	2676	3250	3754	4258	l/h
	Pressure drops plant side	14	21	16	23	18	23	kPa
	Water flow rate source side	2350	2853	3353	4080	4688	5343	l/h
	Pressure drops source side	13	18	15	22	18	23	kPa
B0W45	Heating capacity	8,10	9,84	11,5	14,0	16,2	18,3	kW
	Power input	2,57	3,12	3,67	4,45	5,20	5,83	kW
	COP	**3,15**	**3,15**	**3,13**	**3,15**	**3,12**	**3,14**	-
	Water flow rate plant side	1406	1707	1999	2433	2815	3180	l/h
	Pressure drops plant side	8	12	9	13	11	13	kPa
	Water flow rate source side	1763	2144	2504	3061	3519	3996	l/h
	Pressure drops source side	8	11	9	13	11	14	kPa
W30W7	Cooling capacity	9,71	11,8	13,8	16,8	19,4	21,9	kW
	Power input	2,21	2,68	3,14	3,82	4,47	5,02	kW
	EER	**4,39**	**4,40**	**4,39**	**4,40**	**4,34**	**4,36**	-
	Water flow rate plant side	1670	2025	2368	2883	3329	3775	l/h
	Pressure drops plant side	12	17	13	18	15	19	kPa
	Water flow rate source side	2061	2497	2923	3554	4116	4655	l/h
	Pressure drops source side	10	14	12	17	14	18	kPa
B30W7	Cooling capacity	9,50	11,6	13,6	16,5	19,1	21,5	kW
	Power input	2,25	2,74	3,21	3,91	4,56	5,14	kW
	EER	**4,22**	**4,23**	**4,24**	**4,22**	**4,19**	**4,18**	-
	Water flow rate plant side	1634	1991	2334	2832	3278	3707	l/h
	Pressure drops plant side	11	16	12	18	14	18	kPa
	Water flow rate source side	2206	2683	3148	3815	4428	4998	l/h
	Pressure drops source side	12	17	14	20	17	22	kPa

Data declared according to **EN 14511**. The values are referred to units without options or accessories. Brine = water with 30% ethylene glycol.

W10W35 (source : water in 10°C out 7°C / plant : water in 30°C out 35°C)
B0W35 (source : brine in 0°C out -3°C / plant : water in 30°C out 35°C)
W30W18 (source : water in 30°C out 35°C / plant : water in 23°C out 18°C)
B30W18 (source : brine in 30°C out 35°C / plant : water in 23°C out 18°C)

W10W45 (source : water in 10°C out 7°C / plant : water in 40°C out 45°C)
B0W45 (source : brine in 0°C out -3°C / plant : water in 40°C out 45°C)
W30W7 (source : water in 30°C out 35°C / plant : water in 12°C out 7°C)
B30W7 (source : brine in 30°C out 35°C / plant : water in 12°C out 7°C)

TECHNICAL DATA	12.1	14.1	17.1	20.1	23.1	27.1	
Power supply	230-1-50 400-3N-50	230-1-50 400-3N-50	230-1-50 400-3N-50	400-3N-50	400-3N-50	400-3N-50	V-ph-Hz
Compressor type	scroll	scroll	scroll	scroll	scroll	scroll	-
N° compressors / N° refrigerant circuits	1 / 1	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	stainless steel brazed plates	-
Source side heat exchanger type	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	stainless steel brazed plates	-
Hydraulic fittings	1" M	1" M	1" M	1" M	1" M	1" M	-

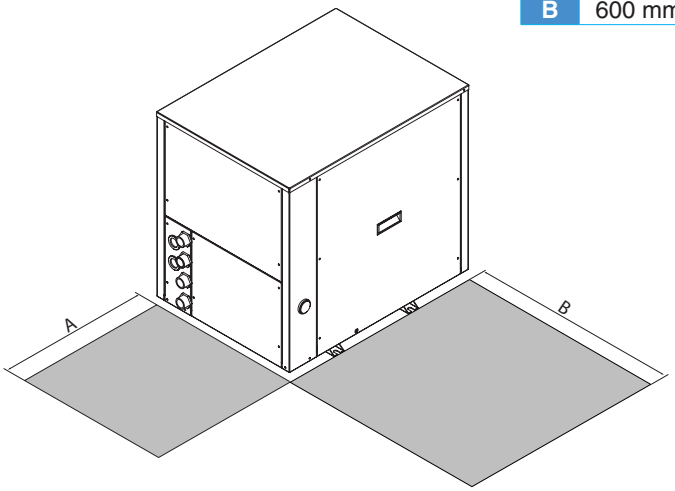
ACOUSTIC PERFORMANCES	12.1	14.1	17.1	20.1	23.1	27.1	
Sound power level	63	63	64	64	65	65	dB(A)
Sound pressure level at 1 metre	50	50	51	51	52	52	dB(A)
Sound pressure level at 5 metres	38	38	39	39	40	40	dB(A)
Sound pressure level at 10 metres	32	32	33	33	34	34	dB(A)

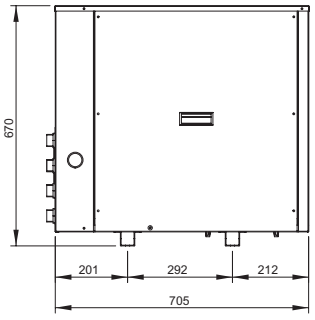
The acoustic performances are referred to units operating in cooling mode at nominal conditions W10W35.
Unit placed in free field on reflecting surface (directional factor equal to 2).
The sound power level is measured according to ISO 3744 standard.
The sound pressure level is calculated according to ISO 3744 and is referred to a distance of 1/5/10 metres from the external surface of the unit.

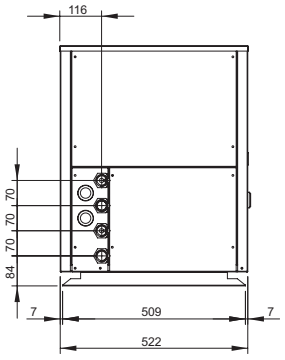
DIMENSIONS AND MINIMUM OPERATING AREA

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

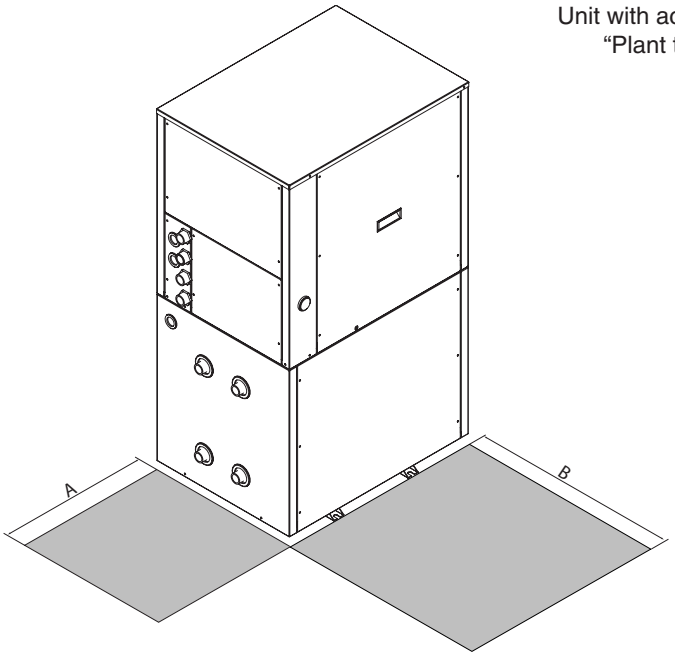
A	600 mm
B	600 mm

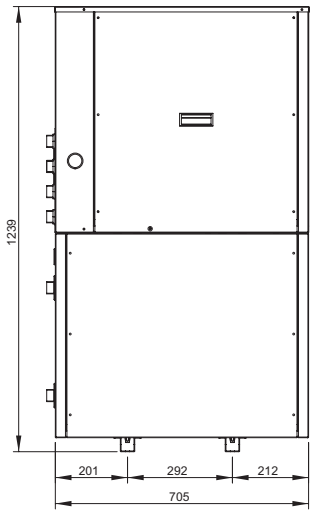


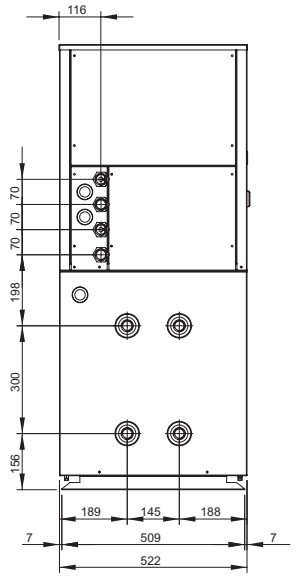




Unit with accessory
"Plant tank"







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