

YOUR AIR, OUR PASSION

GENERAL CATALOG

2017

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Heat Pump Systems

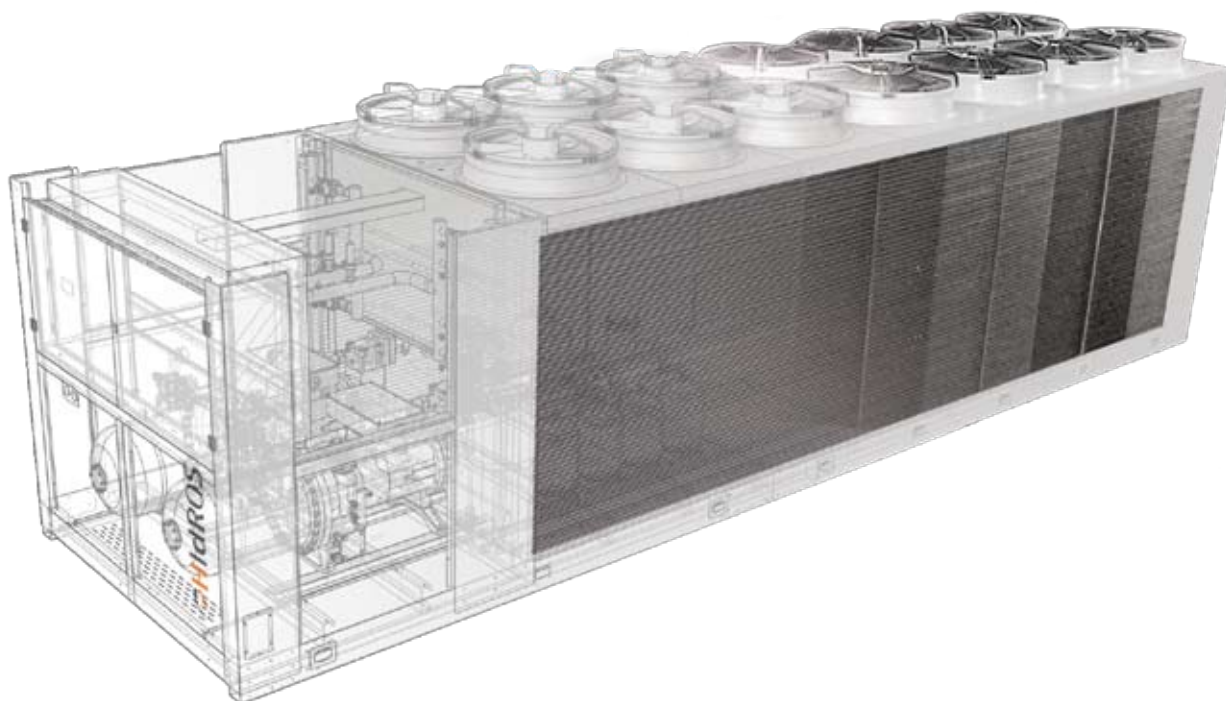
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The Company



HIDROS

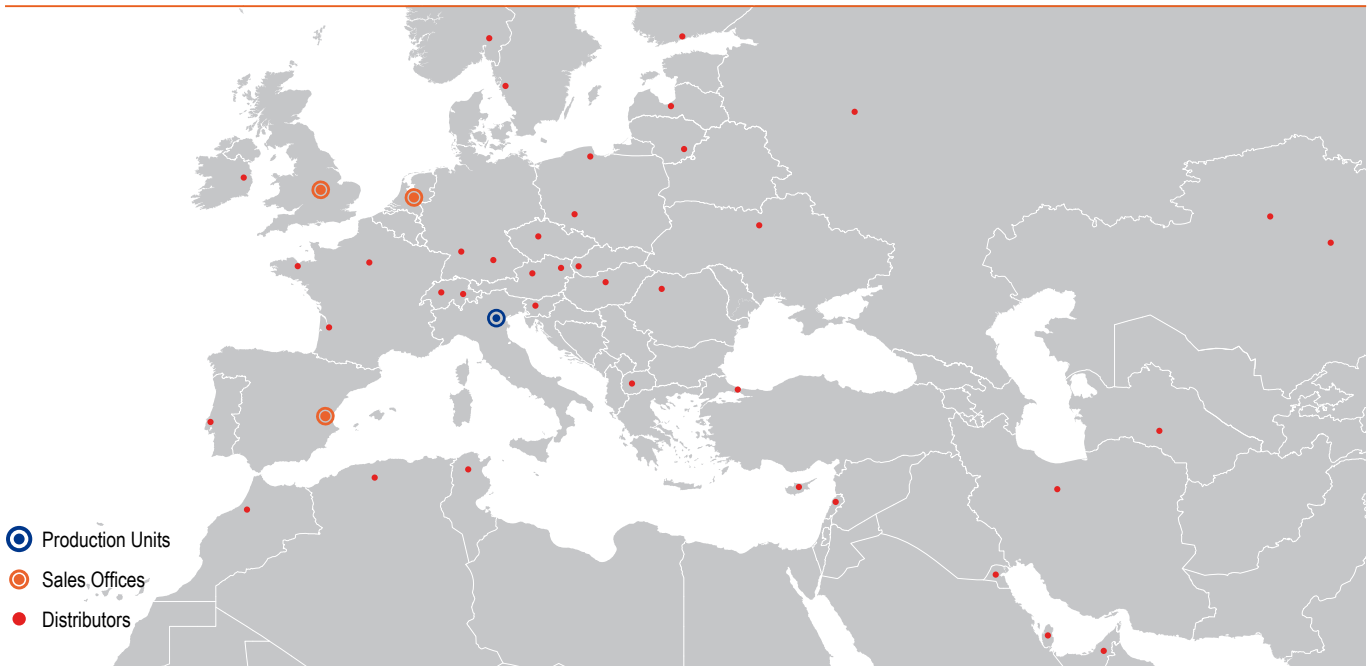
HidROS was formed in 1993 as a distribution company operating in the humidification and dehumidification sector of the air conditioning market. The expansion was rapid and, as the knowledge of the market sector increased, opportunities for the development of specialist products were identified. The decision was therefore taken in 2001 to invest in a production facility and to manufacture their own design products. Since then, the company has added chillers, heat pumps and air handling units to its product portfolio.



Today, HidROS with its qualified staff, designs, develops and tests heat pumps, water chillers, dehumidifying systems and air handling units all based on the refrigerant cycle. The total range of Hidros products includes standard dehumidifiers with capacities from 25 to 3000 l/24h and heat pumps and water chillers with cooling and heating capacities from 5 to 1200 kW. In addition to this, HidROS can offer a wide range of tailor made machines to meet any customer requirement. Expertise, quality, flexibility and enthusiasm are the other essential elements of the company that ensure we provide a rapid response with appropriately engineered solutions.



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Heat pump installations

HIDROS



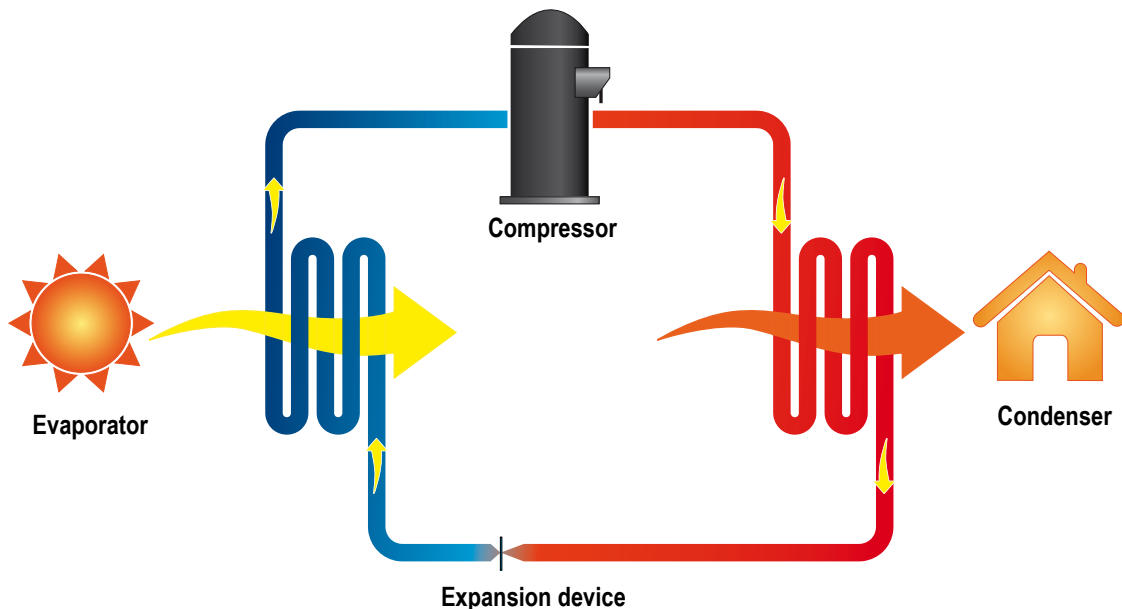




WHAT IS A HEAT PUMP?

A heat pump is a device that moves heat from one location (called the 'source') to another location (called the 'user'), using a small

quantity of high grade energy. Basically, a heat pump operates in a similar manner as an air conditioner, but in reverse.



HOW THE HEAT PUMP WORKS

A heat pump comprises a refrigerant circuit, filled with a special fluid (refrigerant) which, depending on the temperature and pressure conditions in which it is working, will be in either a gaseous or liquid state. The refrigerant circuit is made up of:

- The compressor;
- The condenser (also called user heat exchanger);
- The expansion valve;
- The evaporator (also called source heat exchanger).

To explain the principle of operation it is best to follow the refrigerant around the circuit with reference to the diagram above. Starting at the discharge side of the compressor, the refrigerant is in a gaseous state, has been compressed and is therefore hot and at high pressure. It passes into the condenser (a heat exchanger) where it transfers most of its heat. As it cools it changes state (condenses) to a liquid which is warm and at high pressure. This warm liquid refrigerant then passes through

a pressure-reducing device (the expansion valve). As temperature and pressure are directly linked, dropping the pressure causes the temperature of the refrigerant to plummet. In addition, some of the refrigerant evaporates and the result is a low temperature mix of liquid and gaseous refrigerant that is known as 'Flash Gas'. This mixture then passes to another heat exchanger, the evaporator, where the refrigerant fluid absorbs heat and fully evaporates into a cold, low pressure gas. The refrigerant, in this gaseous state, passes to the compressor where it is pressurized, heated and circulated back around the system. The cycle is continuous. In practical terms, the heat pump is giving heat out to the user in the condenser and is absorbing heat from a source in the evaporator. The user heat is at high temperature (up to 63°C) whilst the absorbed heat from the source (air, ground or water) is at low temperature. In such a system, for the heat provided to be useful, it is essential that the refrigerant reaches a sufficiently high temperature when compressed. Similarly, to make use of low grade heat sources, it must reach a

sufficiently low temperature when expanded. In other words, the pressure difference must be great enough for the refrigerant to condense at the hot side and still evaporate in the lower pressure region at the cold side. The greater the temperature difference, the greater is the required pressure difference and consequently more energy is needed to compress the fluid. Thus, as with all heat pumps, the energy efficiency (amount of heat moved per unit of input work required), decreases with increasing temperature difference. Heat pumps are available in reversible versions. During the Winter they produce heating whilst in Summer they provide cooling. This reversal is performed by a 4 way reversing valve. This valve switches between "heating mode" and "cooling mode" on receipt of a signal from the unit controls. By switching the valve, the refrigerant flows around the circuit in the opposite direction, the user exchanger absorbs heat and the source exchanger supplies heat. This is the opposite of the heating mode.

THE SOURCE, THE USER.

THE SOURCE

The external medium from which the energy is absorbed is called the source. It is generally a low grade (low temperature) source. In the heat pump the refrigerant absorbs heat from the source in the evaporator. The LZT, LZTi, WZT and LZi heat pumps use the ambient air as their source, and they are therefore identified as Air-to-Water heat pumps. The WZH and WHA heat

pumps use water as the source and they are therefore identified as water-to-water heat pumps.

THE USER

For all Hidros heat pumps, water is the medium that is to be heated and this is called the user. In the heat pump, the user is the condenser in which the refrigerant transfers (releases) the thermal energy that was ab-

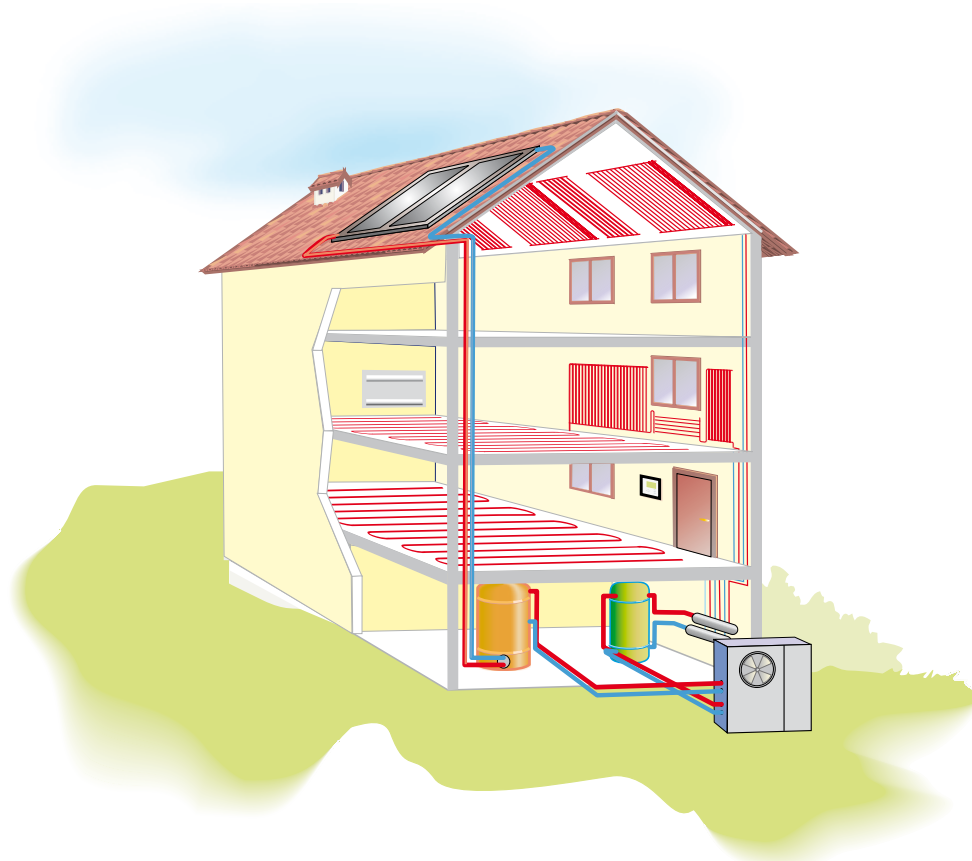
sorbed from the source plus that which was input to the compressor. The warm water then transfers the heat to the building with a heating system that normally uses:

- Fan coils
- Radiators
- Underfloor heating systems.

TYPES OF HEAT PUMPS

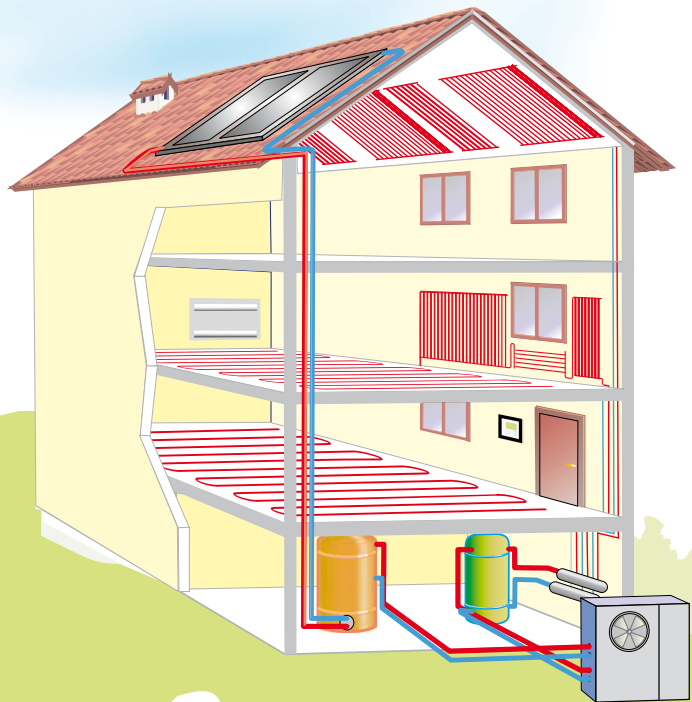
There are different types of heat pumps, classified by the type of the source; the main types are:

- AIR TO WATER HEAT PUMPS;
- WATER TO WATER HEAT PUMPS;
- GROUND SOURCE HEAT PUMPS;
- HYBRID HEAT PUMPS;



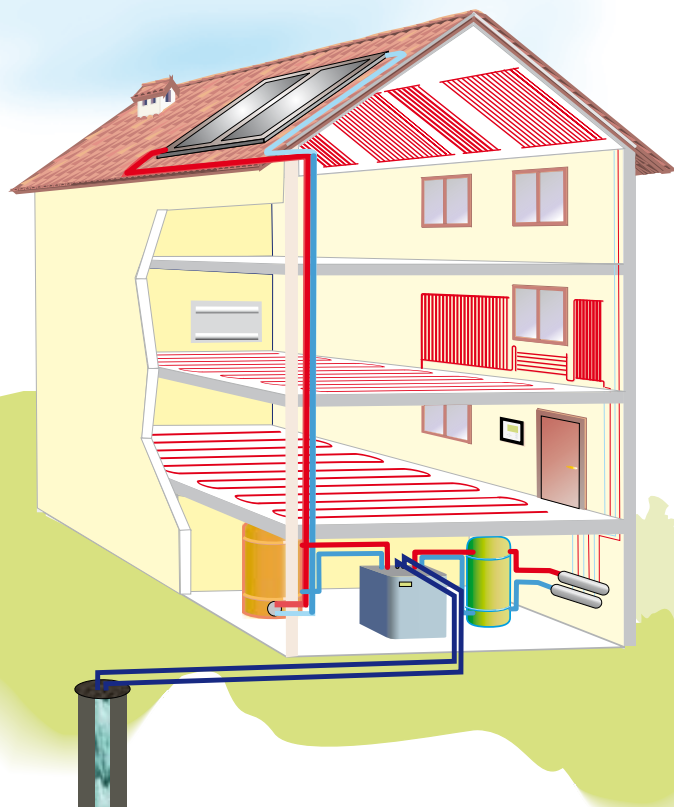
• AIR TO WATER HEAT PUMPS;

Air is used as the source. It has the advantage of being available at all times but with the disadvantage that, when the ambient temperature is close to or below 0°C, removal of heat will cause the heat exchanger to freeze and it is therefore necessary to incorporate a defrost system to clear the ice thus formed. Such a defrost system involves operating the 4 way valve to cause the refrigerant to pass in the opposite direction. This sends hot gas into the source exchanger and this melts the ice. Once the ice is clear, the heat pump reverses the valve again, returning to heating mode. The defrost cycle absorbs energy from the heat pump, energy that is not put into the hot water circuit thereby temporarily reducing the output. It can be estimated that, in major European countries, the energy absorbed by the defrost cycle is between 5 and 13% of the total heating output.



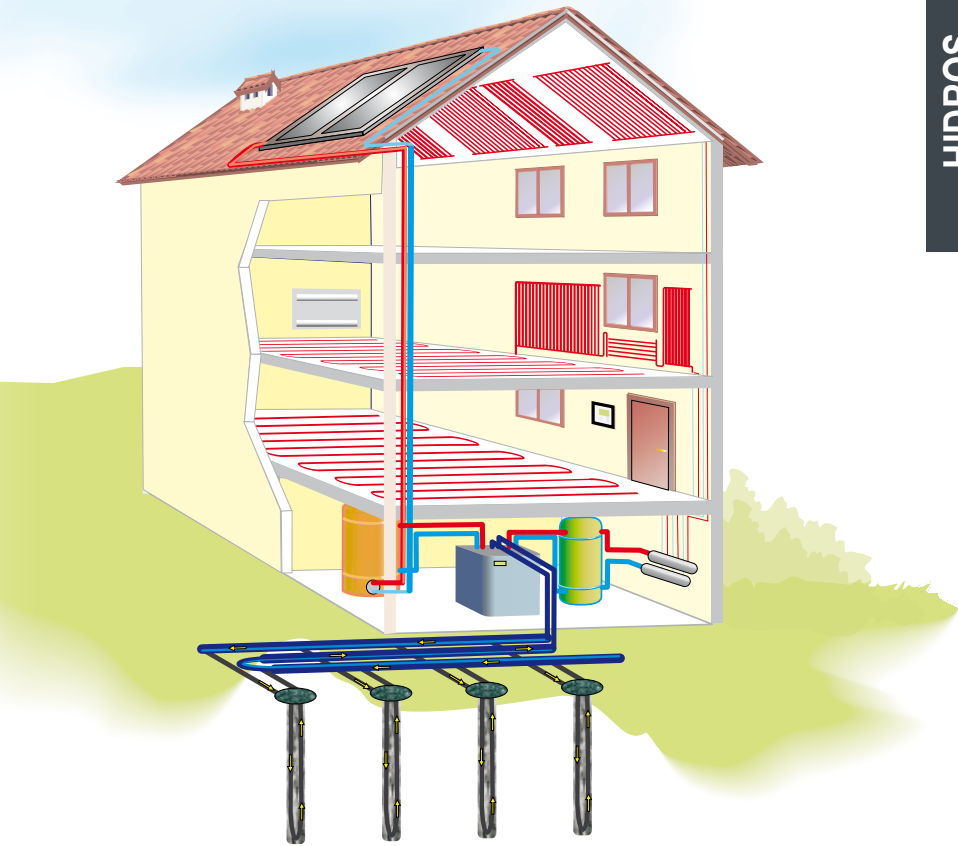
• WATER TO WATER HEAT PUMPS;

Water is used as the source. Using water tends to provide good performance and is not subject to variations caused by external climatic conditions (typical of air to water heat pumps). However, water is not always available, groundwater requires an extraction license and additional costs are incurred in the assembly of an external hydraulic circuit.



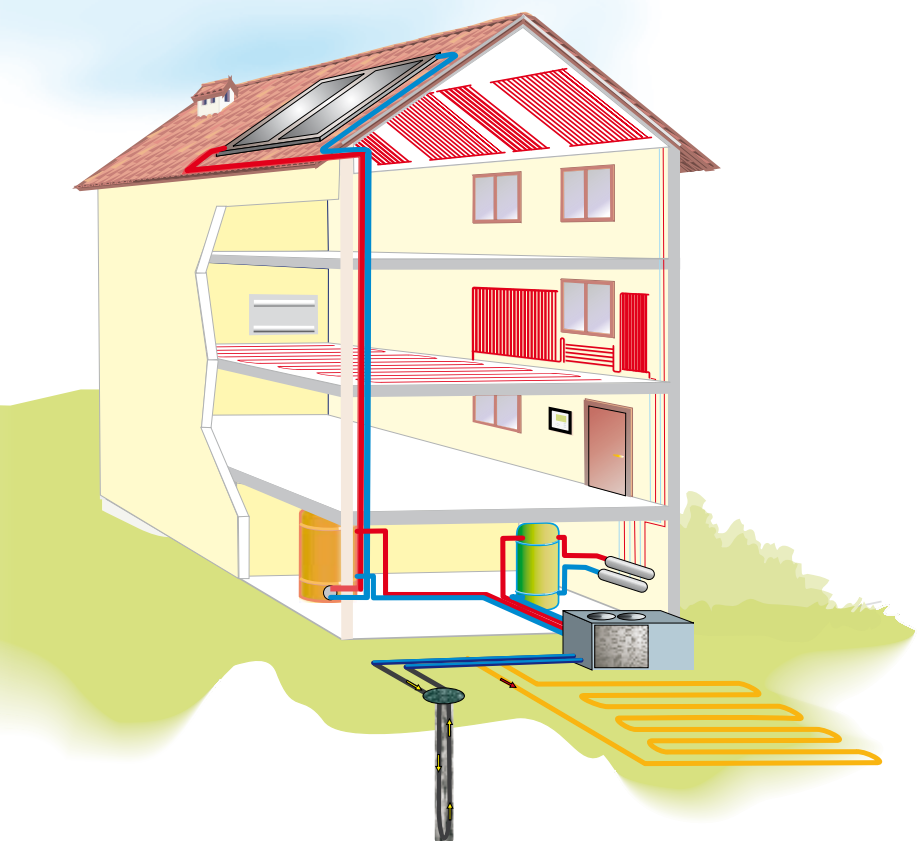
• **GROUND SOURCE HEAT PUMPS;**

In this case the source is the energy that is stored in the ground. Energy is absorbed from the ground by pipes through which brine (water/glycol mixture), is circulating. The pipes can be installed either vertically or horizontally, depending upon which approach absorbs the max amount energy. Horizontal pipes are normally buried at 1 or 1.5 metres depth to avoid variations in temperature caused by changing ambient conditions whilst maintaining the advantage of the effect of solar radiation. As a guide, it is normal to have underground piping equal to 2-3 times the area of the building to be heated. For vertical pipes, they are normally designed to go down to 100 meters deep in order to obtain, as an average, 5 kW per pipe. Ground source heat pumps have the advantage of a constant C.O.P. and heating capacity as they are unaffected by changes in external climatic conditions, however, there is a substantial cost penalty related to the construction of the source exchanger.



• **HYBRID HEAT PUMPS;**

These units are primarily air to water heat pumps but also incorporate a small water source exchanger. This provides the best of both worlds, taking advantage of the lower cost and ease of installation of air to water heat pumps whilst also obtaining (when required) the higher efficiencies that are typical of water to water heat pumps. When the ambient is high, the unit operates as an air to water heat pump. However, as the temperature of the air drops, the water source (can also be connected to a ground loop) is brought into play alongside the air source exchanger and the output and COP of the unit are maintained. By making use of both sources, it is possible to obtain an excellent ratio between cost and performance with average improvement in COP over the ambient range 0 to -10°C of 12%.



EFFICIENCY OF THE HEAT PUMP

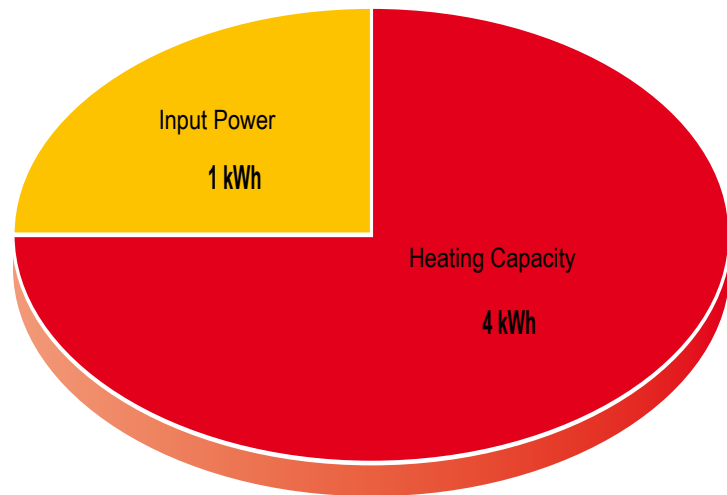
During its operation the heat pump:

- “Absorbs” electricity in the compressor;
- “Absorbs” thermal energy from the source (air or water);
- Releases thermal energy in the user heat exchanger (water).

The main advantage of the heat pump is the capacity to supply more Energy (thermal) than that required for its operation (electrical). The efficiency of a heat pump is measured by the coefficient of performance “C.O.P.” that is the **RATIO** between the thermal energy supplied to the user and the electric input power absorbed by the unit. The C.O.P. is variable depending on the type of the heat pump and the working conditions but is generally in the region of 3 to 5. This means that for 1 kWh of electrical

input energy, the unit will supply between 3 and 5 kWh of thermal energy to the user. The C.O.P. will vary and is dependant upon the temperature at which the heat is transferred (user), the temperature of the

source and, in the case of air source units, the amount of defrost required.



WHY USE A HEAT PUMP?

The graph shows a breakdown of energy use in a typical north European region (i.e. Germany):

The national energy load is subdivided as follows:

- 77.8% Heating;
- 10.5% Domestic hot water;
- 6.6% Home appliances;
- 3.7% Cooking;
- 1.4% Lighting.

It is evident that, because heating is such a substantial part of the total Energy

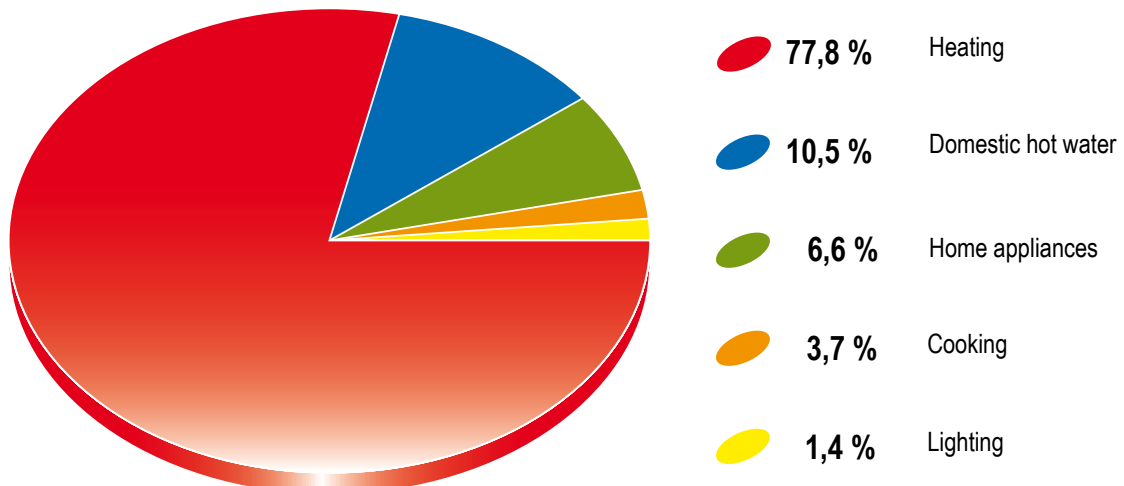
consumption, savings in this area will have a massive effect on the overall energy bill for the country.

The heat pump is substantially more efficient than any other heating source available in the market. With C.O.P.'s of between 3 and 5 they consume 3 to 5 times less Energy than a typical gas or oil system.

This means that not only does it give running cost savings but also many other benefits which include:

- **Low emission of greenhouse gases such as CO₂**

- **Uses electricity that is universally available; Use of renewable energies;**
- **No requirement for fuels, gas, oil tanks, chimneys;**
- **No environmental pollution;**
- **If the electricity used by the heat pump is produced by photovoltaic panels, windmills or water turbines, we have an ideal system with an environmental impact of ZERO.**



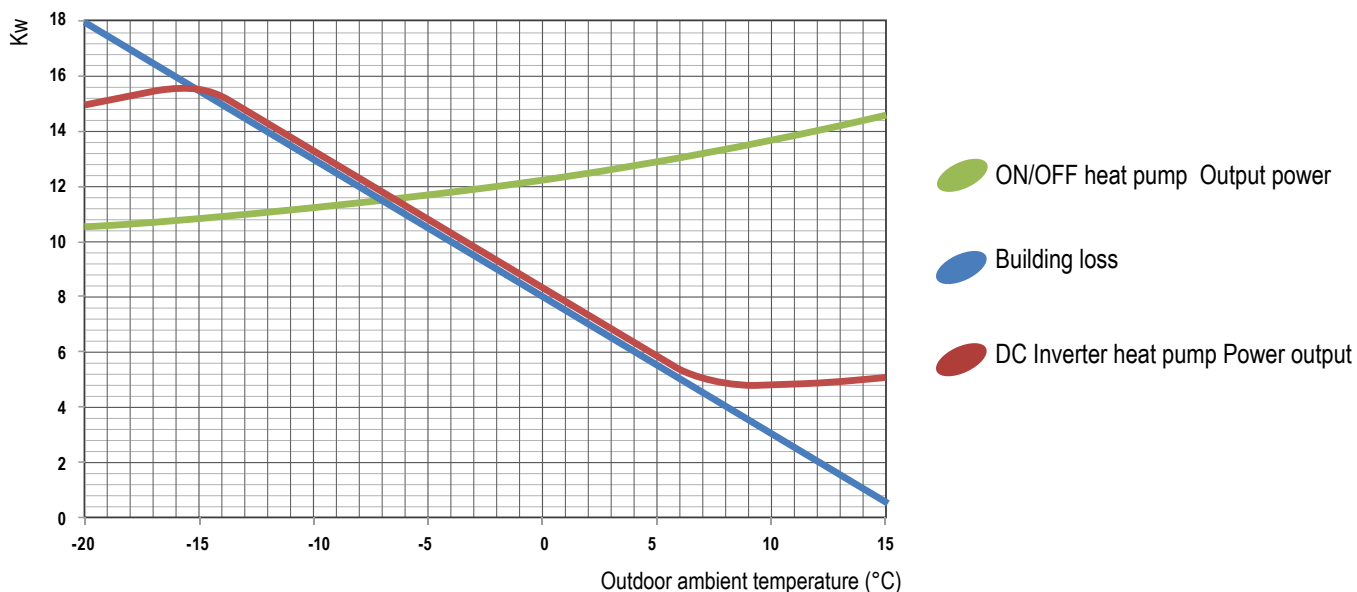
WHAT'S DC INVERTER TECHNOLOGY

The heat pumps of LZTi series, in addition to being equipped with compressors EVI technology (described above) are equipped with variable capacity compressor DC INVERTER technology, an innovative technology that allows you to modulate

the heating and cooling power supplied in accordance with the load changes required by the plant.

This technology uses the latest generation brush less electric motors .

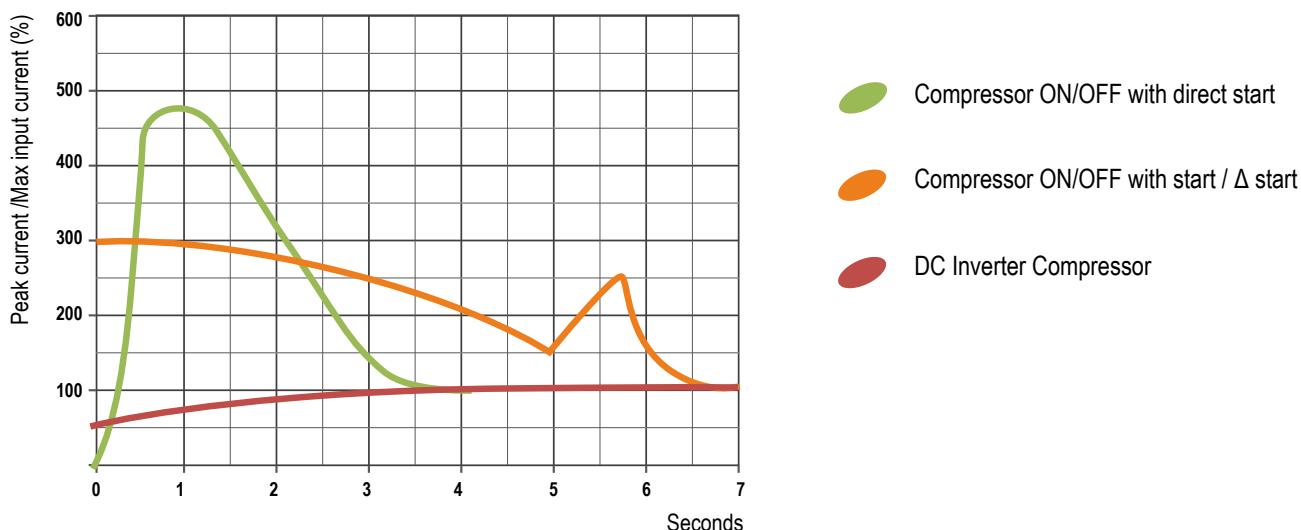
The here below graph illustrates how this new technology of DC INVERTER is able to "follow" the heat load of a building (blue line) unlike what makes an Heat Pump ON/OFF which increases the thermal input delivered with increasing temperature.



So, while the heat pumps with compressors On/Off must operate with important storage systems of water in order to avoid inefficient repeated starts and stops, the unit with DC inverter compressors can

operate with smaller volumes of water, thus suiting application especially in residential installations where, normally, the presence of large storage tanks is not possible.

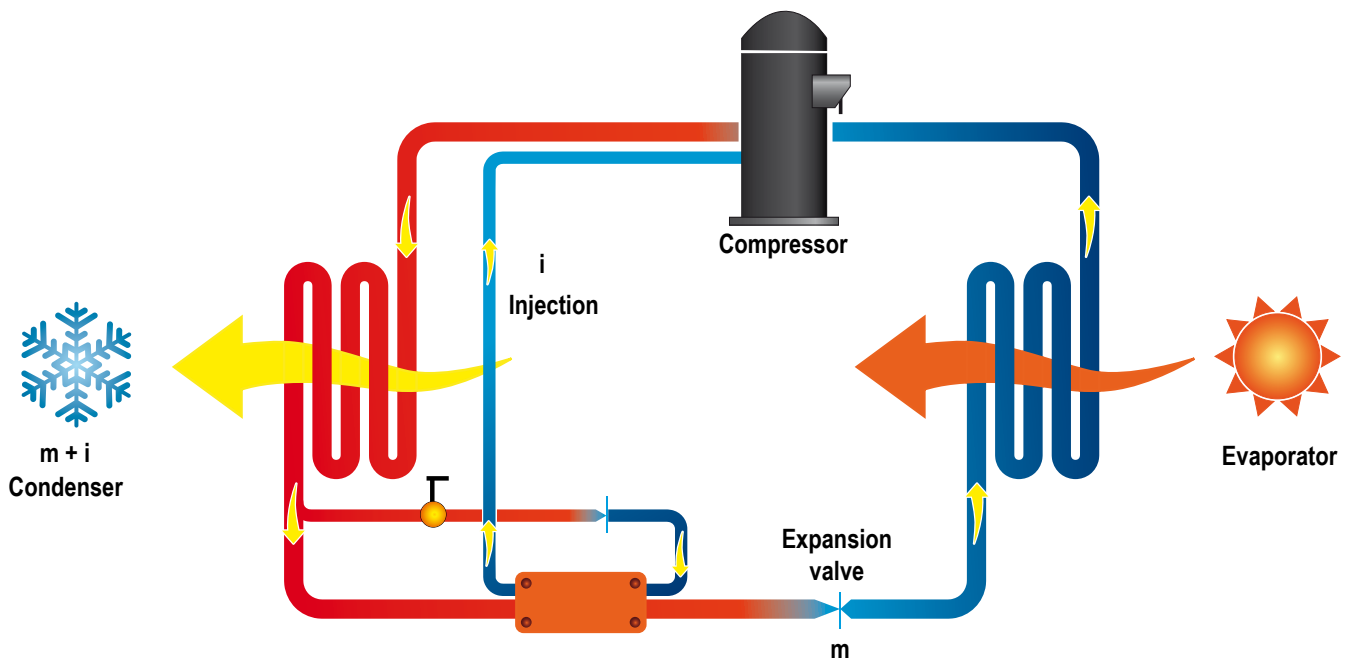
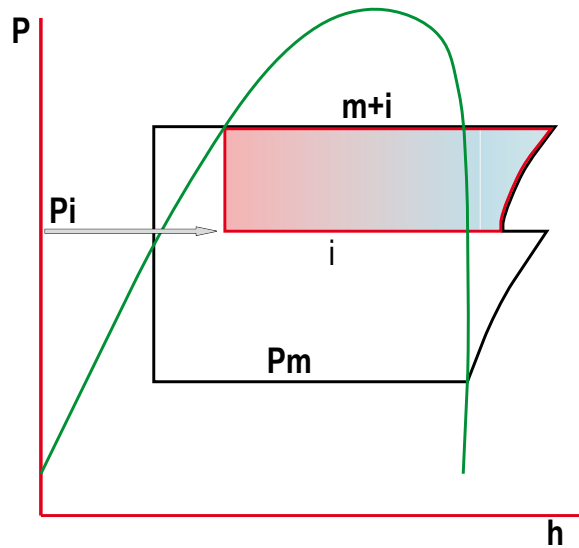
The DC Inverter units also have very low inrush currents, which make them ideal for residential applications .



WHAT IS THE E.V.I. TECHNOLOGY (ENHANCED VAPOUR INJECTION)?

HIDROS LZTi, LZT, CZT, WZT, LWZ heat pumps utilise scroll compressors that are equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. EVI stands for “Economised Vapour Injection.”

The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve. The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated.

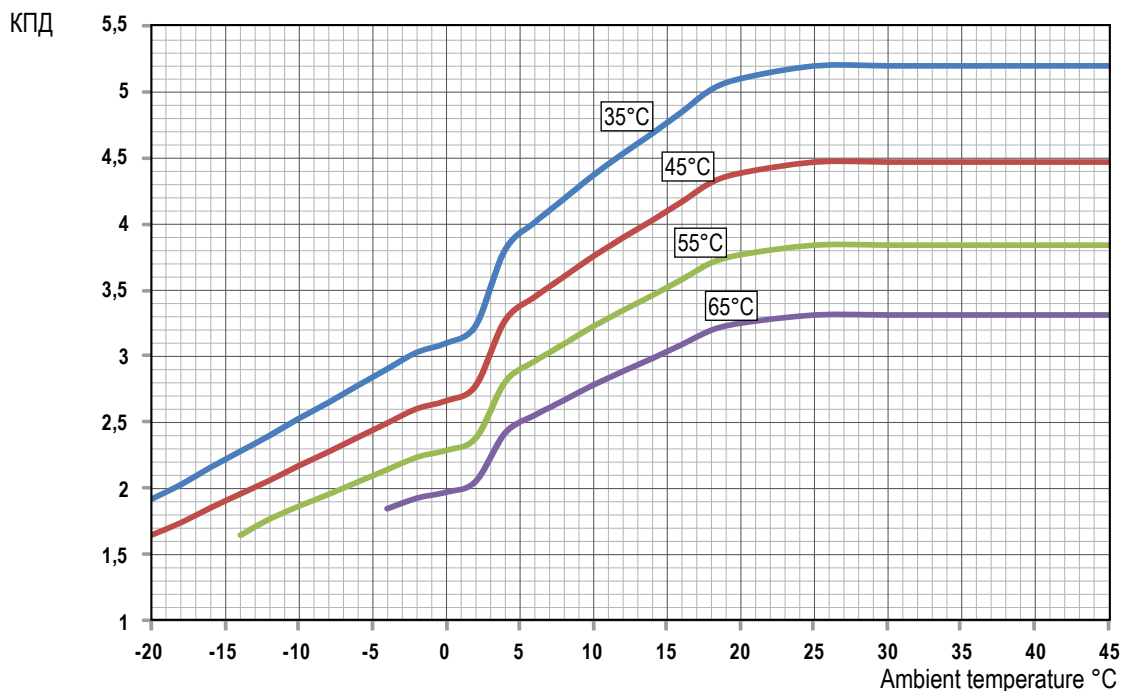


The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The

additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. Using this technology enables Hidros units

to produce hot water up to 65°C and the ability to operate down to -20°C ambient temperature.

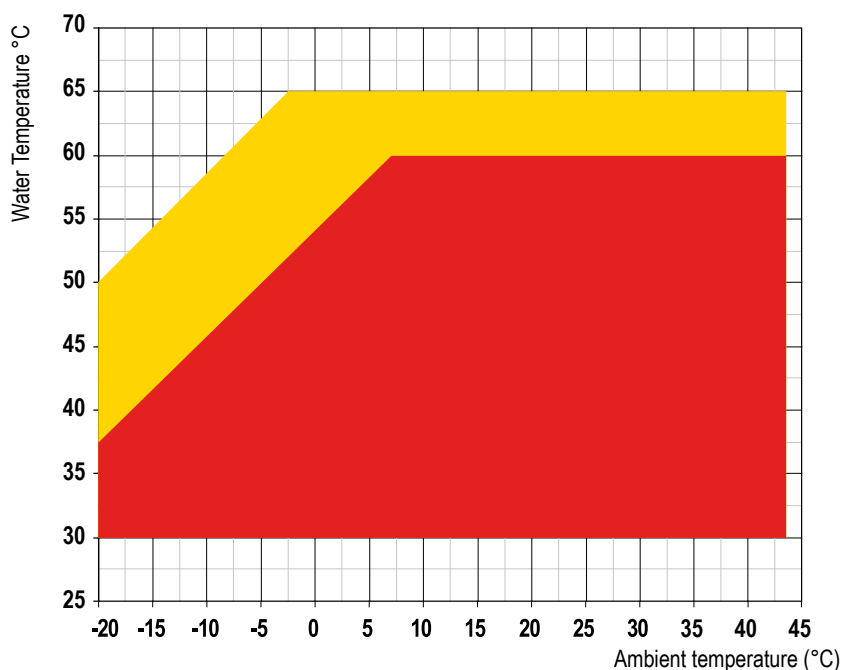
The graphs show the evolution of C.O.P. with different ambient temperatures and produced hot water temperatures; we underline the important decrease of the heating capacity around 3°C, concurrently with the defrost of the source heat exchanger.





The efficiency of EVI compressors at low ambient conditions is about 25% higher than standard scroll compressors. The performance improvement becomes even more evident in applications that require high water temperatures (i.e. when domes-

tic hot water is required). Such applications are beyond the operational limits of a standard scroll compressor. The graph below shows the operation range of the EVI scroll compressors supplied in Hidros units. At -15°C ambient, outlet water temperature

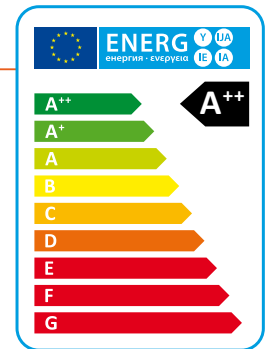
closed to 55°C can still be achieved. This increases the application envelope of the heat pump.



-  Units equipped with scroll compressors with vapour injection technology E.V.I.
-  Units equipped with scroll compressors without the vapour injection system E.V.I.

LRi

High efficiency air to water heat pumps with DC INVERTER compressor



LRi

The LRi series of high efficiency heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating.

They have been optimized on heating mode, are able to produce water up to 60°C and can operate down to -20°C ambient temperature.

LRi units can produce domestic hot water through the activation of an external 3-way-valve.

All models are supplied as standard with a reversing valve for defrost and cold water production in summer.

VERSIONS

- HH** Heating only.
- RV** Reversible heating/cooling.
- LS** Low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.

ACCESSORIES

- E1NT** Hydraulic kit with inverter pump.
- KAVG** Rubber anti-vibration mountings.
- PCRL** Remote control panel.
- RAES** User and recovery heat exchanger antifreeze kit.
- VECE** E.C. fans.

LRi/HH - Heating Only Version		10	15
Energy Class in low temperature - According to EU reg. 811/2013		A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	10,0	15,1
Total input power (EN14511) ⁽¹⁾	kW	2,3	3,6
COP (EN14511) ⁽¹⁾	W/W	4,35	4,23
Power supply	V/Ph/Hz	230/1/50	230/1/50
Max input current standard unit	A	17,5	25,3
Peak current standard unit	A	17,1	24,8
Max air flow in heating mode	m ³ /h	5500	9000
Fans	n°	1	2
Compressors/Circuits	n°/n°	1/1	1/1
Max sound power level in heating mode ⁽³⁾	dB (A)	66	68
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	40
Nominal waterflow	l/h	1720	2600
Available static pressure circulating pump	kPa	40	75

LRi/RV - Reversible Version		10	15
Energy Class in low temperature - According to EU reg. 811/2013		A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	10,0	15,1
Total input power (EN14511) ⁽¹⁾	kW	2,3	3,6
COP (EN14511) ⁽¹⁾	W/W	4,35	4,23
Cooling capacity (EN14511) ⁽²⁾	kW	7,8	13,0
Total input power (EN14511) ⁽²⁾	kW	3,10	4,19
EER (EN14511) ⁽²⁾	W/W	2,52	3,1
Power supply	V/Ph/Hz	230/1/50	230/1/50
Max input current standard unit	A	17,5	25,3
Peak current standard unit	A	17,1	24,8
Max air flow in heating mode	m ³ /h	5500	9000
Max air flow in cooling mode	m ³ /h	5500	9000
Fans	n°	1	2
Compressors/Circuits	n°/n°	1/1	1/1
Max sound power level in heating mode ⁽³⁾	dB (A)	66	68
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	40
Max sound power level in cooling mode ⁽³⁾	dB (A)	66	68
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	38	40
Nominal waterflow	l/h	1720	2600
Available static pressure circulating pump	kPa	40	75

Performances are referred to the following conditions:

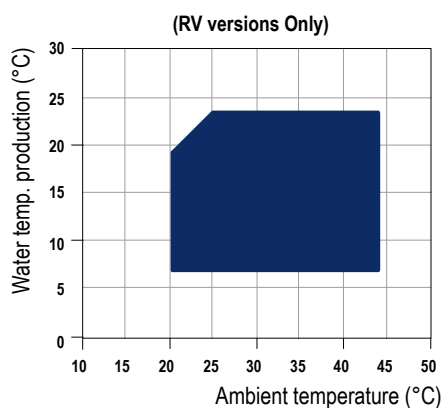
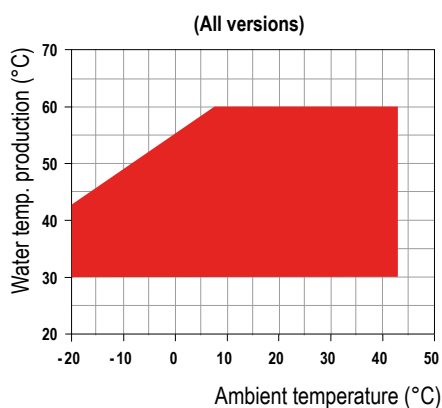
(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.



(2)Cooling: ambient temperature 35°C, water temperature 12/7°C.

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

OPERATION LIMITS



 Heating mode
 Cooling mode

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels.

REFRIGERANT CIRCUIT

The refrigerant circuit is made by using components from leading international companies in accordance with ISO 97/23 for the of braze welding processes.

The refrigerant used is R410A.

The refrigerant circuit includes: sight glass, filter drier, electronic expansion valve, 4-way valve, check valves, liquid receiver, Schrader valves for maintenance and control, a safety device (according to PED regulation).

COMPRESSORS

The compressors are high-efficiency scroll type, variable-speed modulation capability through DC inverter, supplied with a special design that increases the efficiency of the refrigeration cycle under conditions of very low ambient temperature. The compressors are equipped with an innovative electric motor permanent magnet brushless DC inverter-driven, high-efficiency, are all equipped with electrical resistance and thermal overload protection.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and are fitted with an antifreeze heater. Each exchanger

is fitted with a temperature sensor on the discharge water side for antifreeze protection.

E.C. FANS

The fans are axial type with high performance aerofoil blades, the impeller is made of galvanized sheet galvanized, painted with polyurethane powder, to ensure a high protection in aggressive and severe environments. The impeller mounted directly on DC-brushless motor with external rotor, to ensure ideal cooling of the engine and a total absence of losses of the transmission. Impeller dynamically balanced in class 6.3 according to ISO 1940. Engine brushless-DC permanent magnet high efficiency electronic switching unit (driver) separate. Continuous speed variation with voltage signal 0-10 V, PFC integrated protection "burn out" (excessive drop in voltage), fully IP54 driver, serial interface with Modbus RTU communication protocol. The maximum rotation speed of the motor is 600 rpm to guarantee an extremely low noise level.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump.

ELECTRIC ENCLOSURE

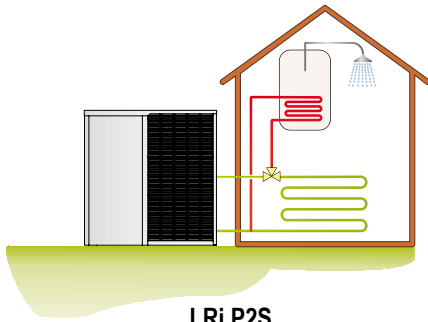
The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and

fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over (heat pumps only) and general alarm.

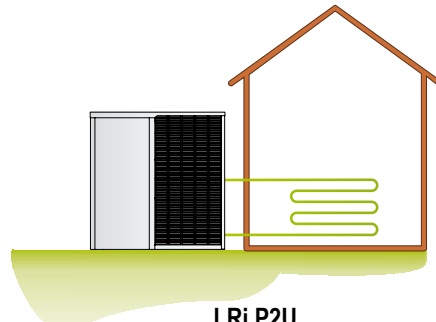
CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch.

VERSIONS



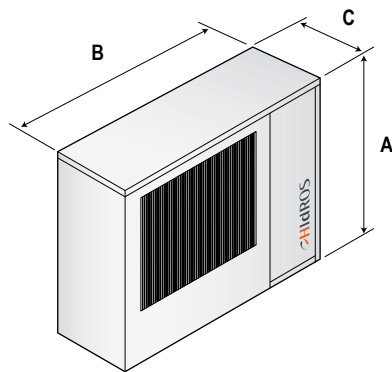
LRI P2S



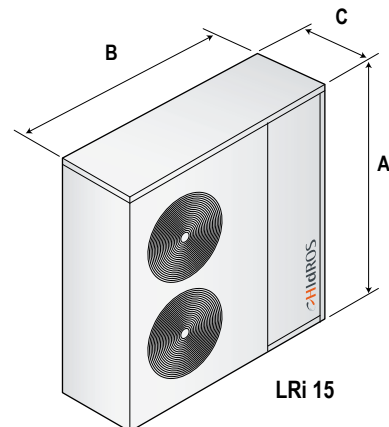
LRI P2U

LRI Model	Code	10	15
Compressor automatic switch		●	●
Flow switch		●	●
User water strainer		●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●
Fresh air temperature probe for set-point compensation	SOND	○	○
DHW Probe		●	●
Specific software for operation priorities		●	●
Remote ON/OFF digital input		●	●
Summer/Winter digital input		●	●
Floating frame technology		●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●
Electronic Expansion Valve	VTEE	●	●
Electronic Soft starter	DSSE	●	●
Remote control panel	PCRL	○	○
Water strainer		○	○
E1NT Hydraulic kit (pump only)	E1NT	●	●
Rubber anti-vibration mountings.	KAVG	○	○
Antifreeze kit	RAES	●	●
E.C. fans	VECE	●	●

● Standard, ○ Optional, – Not available.



LRI 10



LRI 15

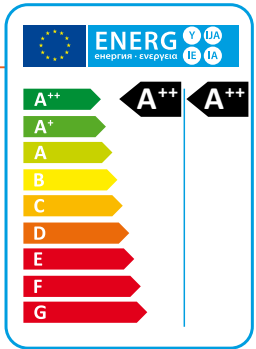
Mod.	A (mm)	B (mm)	C (mm)	Kg
10	890	875	360	75
15	1420	1025	360	120

LZT i

Heat pumps air/water

DC inverter compressor with vapor injection (EVI)

LZT i



The LZTi series of high efficiency heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating. They have been optimized on heating mode, are able to produce water up to 65°C and can operate down to -20°C ambient temperature. LZTi units are available in 2 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard LZTi through the activation of an external 3-way-valve and in the SW6 version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water. All models are supplied as standard with a reversing valve for defrost and cold water production in summer.

VERSIONS

- STD** 2 pipes reversible standard.
- SW6** 4 pipes unit capable of producing hot and cold water at the same time on two independent hydraulic circuits.

ACCESSORIES

- E1NT** Hydraulic kit with inverter pump.
- INSE** Serial interface card RS485.
- KAVG** Rubber anti-vibration mountings.
- RAES** User and recovery heat exchanger antifreeze kit.
- VECC** High static pressure E.C. fans.
- VECE** E.C. fans.

LZTi - LZTi/SW6 Model		08	10	15	20
Energy Class in low temperature - According to EU reg. 811/2013		A++	A++	A++	A++
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	7,7	9,6	15,0	19,0
Total input power (EN14511) ⁽¹⁾	kW	1,79	2,28	3,40	4,50
COP (EN14511) ⁽¹⁾	W/W	4,3	4,2	4,4	4,2
Heating capacity (EN14511) ⁽²⁾	kW	6,10	7,10	11,50	13,50
Total input power (EN14511) ⁽²⁾	kW	1,96	2,50	3,70	4,73
COP (EN14511) ⁽²⁾	W/W	3,1	2,8	3,1	2,8
Cooling capacity (EN14511) ⁽³⁾	kW	7,9	9,3	14,5	18,4
Total input power (EN14511) ⁽³⁾	kW	2,07	2,41	3,71	4,84
EER (EN14511) ⁽³⁾	W/W	3,8	3,8	3,9	3,8
Cooling capacity (EN14511) ⁽⁴⁾	kW	7,1	8,5	13,5	16,0
Total input power (EN14511) ⁽⁴⁾	kW	2,29	2,83	4,20	5,10
EER (EN14511) ⁽⁴⁾	W/W	3,1	3,0	3,2	3,1
Power supply	V/Ph/Hz	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	16,0	19,9	13,5	15,0
Peak current standard unit	A	15,6	19,5	14,5	14,9
Fans	n°	1	1	2	2
Compressors	n°	1 E.V.I. DC inverter	1 E.V.I. DC inverter	1 E.V.I. DC inverter	1 E.V.I. DC inverter
Sound power level ⁽⁵⁾	dB (A)	65	65	67	67
Sound pressure level ⁽⁶⁾	dB (A)	37	37	39	39

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 30/35°C.

(3)Cooling: ambient temperature 35°C, water temperature 23/18°C.

(4)Cooling: ambient temperature 35°C, water temperature 12/7°C.

(5)Sound power level in accordance with ISO 9614.

(6)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel.

The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant circuit is made by using components from leading international companies in accordance with ISO 97/23 for the of braze welding processes.

The refrigerant used is R410A.

The refrigerant circuit includes: sight glass, filter drier, electronic expansion valve, 4-way valve, check valves, liquid receiver, Schrader valves for maintenance and control, a safety device (according to PED regulation).

The units are also equipped with plate heat exchanger AISI316 used as economizer circuit and additional thermostatic steam injection.

COMPRESSORS

The compressors are high-efficiency scroll type, variable-speed modulation capability

through DC inverter, supplied with a special design that increases the efficiency of the refrigeration cycle under conditions of very low ambient temperature.

The units are equipped with an economizer and a steam injection system, a versatile method to improve the capacity and efficiency of the system.

The technology of steam injection, consists into injecting the refrigerant vapor in the middle of the compression process, to increase significantly the capabilities and efficiencies too.

The compressors are equipped with an innovative electric motor permanent magnet brushless DC inverter-driven, high-efficiency, are all equipped with electrical resistance and thermal overload protection.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors are 6 pole type rotating at approximately 900 rpm. As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free

contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions SW6), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced.

NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm

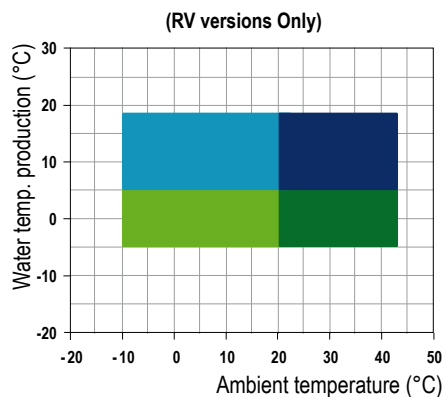
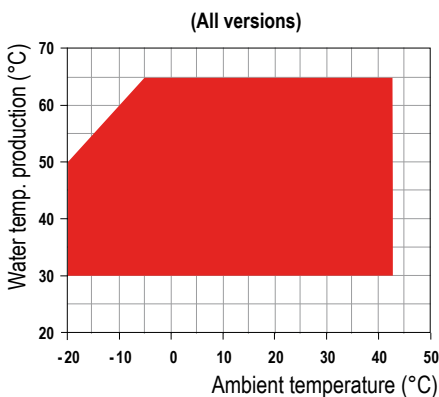
thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).

VERSIONS

UNIT WITH INDEPENDENT DOMESTIC HOT WATER PRODUCTION (SW6)

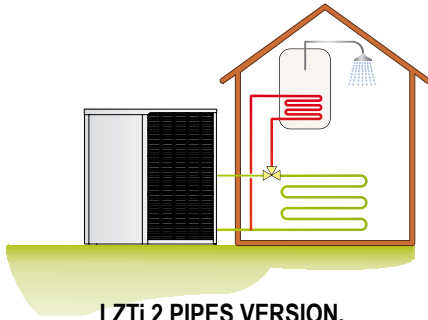
This version is fitted with an additional heat exchanger, used as condenser, to produce domestic hot water irrespective of the operation mode of the unit. The activation of the additional heat exchanger is performed automatically by the microprocessor control when the domestic hot water temperature, measured by the sensor, is lower than the required set point. If, during the summer months, the unit is operating on cooling, this version can produce hot and cold water simultaneously. This version is equipped with return and supply domestic hot water sensors and an advanced control panel with specific software for management of the system priorities.

OPERATION LIMITS

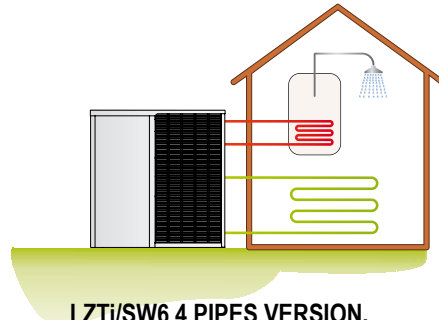


- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

VERSIONS



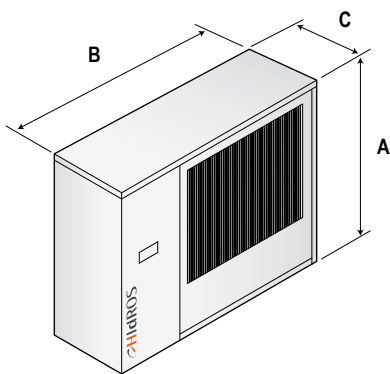
LZTi 2 PIPES VERSION.



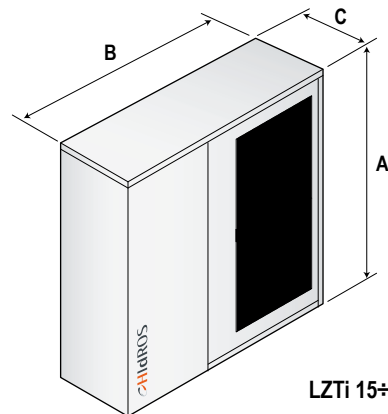
LZTi/SW6 4 PIPES VERSION.

LZTi - LZTi/SW6 Model	Code	08	10	15	20
Main switch		●	●	●	●
Compressor automatic switch		●	●	●	●
Flow switch		●	●	●	●
User water strainer		●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●
Specific software for operation priorities		●	●	●	●
Remote ON/OFF digital input		●	●	●	●
Summer/Winter digital input		●	●	●	●
Floating frame technology		●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●
Electronic Expansion Valve	VTEE	●	●	●	●
Electronic Soft starter	DSSE	●	●	●	●
Remotable control panel		●	●	●	●
High efficiency fans		●	●	●	●
Water strainer		●	●	●	●
E1NT Hydraulic kit (pump only)	E1NT	○	○	○	○
Rubber anti-vibration mountings.	KAVG	○	○	○	○
Antifreeze kit	RAES	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○
E.C. fans	VECE	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○

● Standard, ○ Optional, – Not available.



LZTi 08÷10



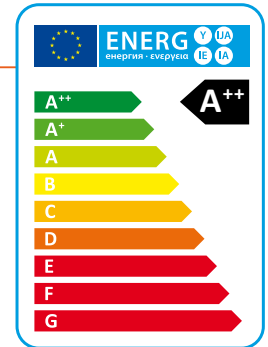
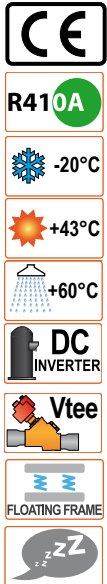
LZTi 15÷20

Mod.	A (mm)	B (mm)	C (mm)	Kg
08	1230	1205	555	180
10	1230	1205	555	180

Mod.	A (mm)	B (mm)	C (mm)	Kg
15	1430	1405	555	270
20	1430	1405	555	270

LZi

High efficiency air to water heat pumps with INVERTER compressor



LZi

The LZi series of high efficiency heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating.

They have been optimized on heating mode, are able to produce water up to 60°C and can operate down to -20°C ambient temperature.

LZi units are available in 2 or 4 pipe (SW6) versions.

Both versions can produce domestic hot water, in the standard LZi through the activation of an external 3-way-valve and in the SW6 version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

All models are supplied as standard with a reversing valve for defrost and cold water production in summer.

VERSIONS

- STD** 2 pipes reversible standard.
- SW6** 4 pipes unit capable of producing hot and cold water at the same time on two independent hydraulic circuits.

ACCESSORIES

- E1NT** Hydraulic kit with inverter pump.
- INSE** Serial interface card RS485.
- KAVG** Rubber anti-vibration mountings.
- RAES** User and recovery heat exchanger antifreeze kit.
- VECC** High static pressure E.C. fans.
- VECE** E.C. fans.

LZi - LZi/SW6 Model		08	10	15	20
Energy Class in low temperature - According to EU reg. 811/2013		A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	7,7	9,6	15,0	19,0
Total input power (EN14511) ⁽¹⁾	kW	1,84	2,34	3,57	4,63
COP (EN14511) ⁽¹⁾	W/W	4,2	4,2	4,2	4,1
Heating capacity (EN14511) ⁽²⁾	kW	6,1	7,1	11,5	13,5
Total input power (EN14511) ⁽²⁾	kW	2,18	2,62	3,96	5,0
COP (EN14511) ⁽²⁾	W/W	2,8	2,7	2,9	2,7
Cooling capacity (EN14511) ⁽³⁾	kW	7,9	9,3	14,5	18,4
Total input power (EN14511) ⁽³⁾	kW	2,08	2,45	3,81	4,84
EER (EN14511) ⁽³⁾	W/W	3,8	3,8	3,8	3,8
Cooling capacity (EN14511) ⁽⁴⁾	kW	7,1	8,5	13,5	16,0
Total input power (EN14511) ⁽⁴⁾	kW	2,37	2,83	4,50	5,33
EER (EN14511) ⁽⁴⁾	W/W	3,0	3,0	3,0	3,0
Power supply	V/Ph/Hz	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	16,0	19,9	13,5	15,0
Peak current standard unit	A	15,6	19,5	14,5	14,9
Fans	n°	1	1	2	2
Compressors	n°	1 DC Inverter	1 DC Inverter	1 DC Inverter	1 DC Inverter
Sound power level ⁽⁵⁾	dB (A)	65	65	67	67
Sound pressure level ⁽⁶⁾	dB (A)	37	37	39	39

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 30/35°C.

(3)Cooling: ambient temperature 35°C, water temperature 23/18°C.

(4)Cooling: ambient temperature 35°C, water temperature 12/7°C.

(5)Sound power level in accordance with ISO 9614.

(6)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel.

The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant circuit is made by using components from leading international companies in accordance with ISO 97/23 for the of braze welding processes.

The refrigerant used is R410A.

The refrigerant circuit includes: sight glass, filter drier, electronic expansion valve, 4-way valve, check valves, liquid receiver, Schrader valves for maintenance and control, a safety device (according to PED regulation).

COMPRESSORS

The compressors are high-efficiency scroll type, variable-speed modulation capability through DC inverter, supplied with a special design that increases the efficiency of the refrigeration cycle under conditions of very low

ambient temperature. The compressors are equipped with an innovative electric motor permanent magnet brushless DC inverter-driven, high-efficiency, are all equipped with electrical resistance and thermal overload protection.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory).

Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors are 6 pole type rotating at approximately 900 rpm. As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is

set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the micro-processor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following

controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions SW6), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions SW6) is already equipped with this probe, but it must be installed in the user circuit.

NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized

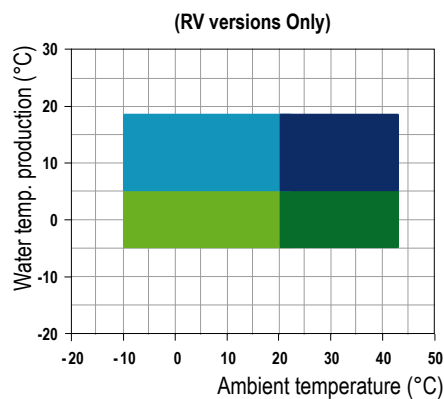
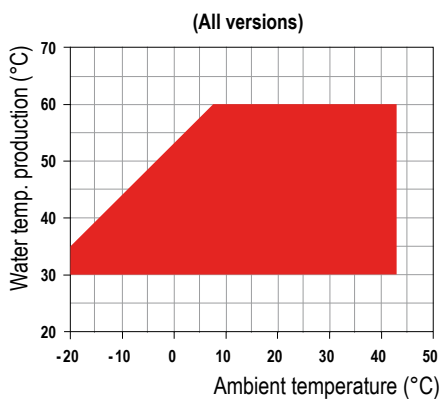
steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).

VERSIONS

UNIT WITH INDEPENDENT DOMESTIC HOT WATER PRODUCTION (SW6)

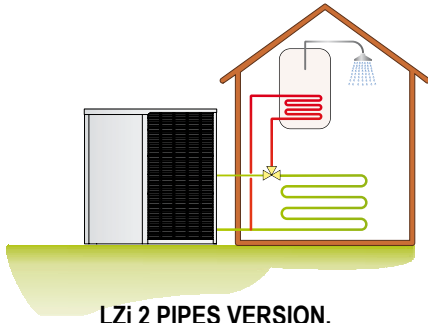
This version is fitted with an additional heat exchanger, used as condenser, to produce domestic hot water irrespective of the operation mode of the unit. The activation of the additional heat exchanger is performed automatically by the microprocessor control when the domestic hot water temperature, measured by the sensor, is lower than the required set point. If, during the summer months, the unit is operating on cooling, this version can produce hot and cold water simultaneously. This version is equipped with return and supply domestic hot water sensors and an advanced control panel with specific software for management of the system priorities.

OPERATION LIMITS

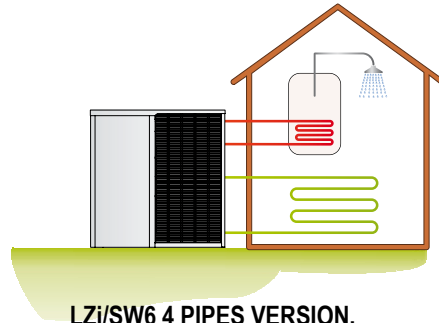


- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

VERSIONS



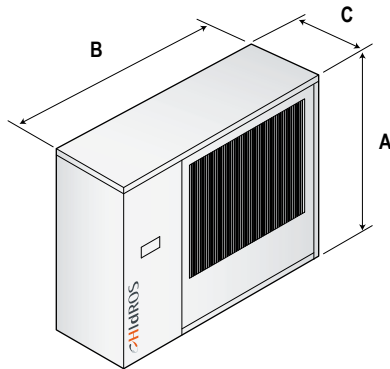
LZi 2 PIPES VERSION.



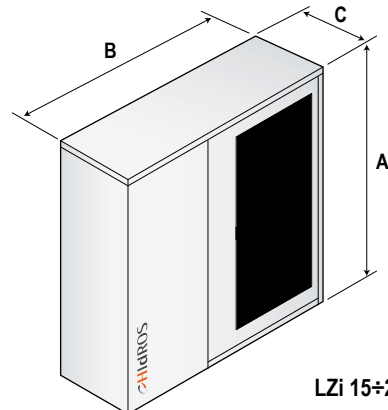
LZi/SW6 4 PIPES VERSION.

LZi - LZi/SW6 Model	Code	08	10	15	20
Main switch		●	●	●	●
Compressor automatic switch		●	●	●	●
Flow switch		●	●	●	●
User water strainer		●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●
Specific software for operation priorities		●	●	●	●
Remote ON/OFF digital input		●	●	●	●
Summer/Winter digital input		●	●	●	●
Floating frame technology		●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●
Electronic Expansion Valve	VTEE	●	●	●	●
Electronic Soft starter	DSSE	●	●	●	●
Remotable control panel		●	●	●	●
High efficiency fans		●	●	●	●
Water strainer		●	●	●	●
E1NT Hydraulic kit (pump only)	E1NT	○	○	○	○
Rubber anti-vibration mountings.	KAVG	○	○	○	○
Antifreeze kit	RAES	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○
E.C. fans	VECE	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○

● Standard, ○ Optional, – Not available.



LZi 08÷10



LZi 15÷20

Mod.	A (mm)	B (mm)	C (mm)	Kg
08	1230	1205	555	180
10	1230	1205	555	180

Mod.	A (mm)	B (mm)	C (mm)	Kg
15	1430	1405	555	270
20	1430	1405	555	270

LHA

High efficiency air to water heat pumps

LHA



R410A

-20°C

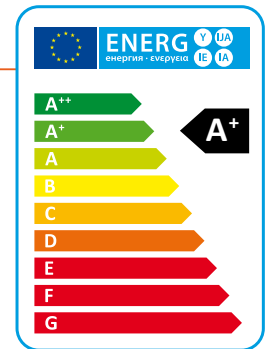
+43°C

+60°C

E.C.

FLOATING FRAME

ZZ



The LHA series of high efficiency heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating.

They have been optimized on heating mode, are able to produce water up to 60°C and can operate down to -20°C ambient temperature.

LHA units are available in 2 pipe, 2+2 pipe and 4 pipe versions.

Some versions can produce domestic hot water, in the P2S version through the activation of an external 3-way-valve and in the P4S version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

All versions are supplied with reverse cycle valve used for winter defrost; the HH version is suitable for use in those countries that have support schemes for use of heat pump technology for heating. The RV versions are also able to produce cold water. The HH heating only versions is factory set and locked to operate only in heating mode whilst.

The noise is extremely low thanks to the use of a special floating vibration damping system which allows a noise reduction of about 10-12 dB(A) (Optional).

VERSIONS

HH	Heating only.
RV	Reversible heating/cooling.
LS	Low noise.
XL	Super low noise.
P2U	2 pipe systems without domestic hot water production.
P2S	2 pipe systems with domestic hot water production by external 3 way valve.
P4U	4 pipe systems heating/cooling.
P4S	2+2 pipe systems with domestic hot water production.

ACCESSORIES

A1NT	Hydraulic kit with one pump without tank.
A1ZZ	Hydraulic kit with tank and one pump.
A2NT	Hydraulic kit with two pump without tank.
A2ZZ	Hydraulic kit with tank and two pump.
DSSE	Electronic soft starter.
INSE	Serial interface card RS485.
KAVG	Rubber anti-vibration mountings.
KP	Hydraulic circuit antifreeze kit.
PCRL	Remote control panel.
RAEV	User and recovery heat exchanger antifreeze kit.
SGRS	Cascade control system via RS485.
SODP	Unit performance optimizer.
VECC	High static pressure E.C. fans.
VECE	E.C. fans.
VTEE	Electronic thermostatic valve.

(LS/HH) Low noise - Heating only version		252	302	402	452	502	602	702	802	902	1002	1202
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,4	34,2	40,2	48,1	56,6	65,1	74,7	82,0	99,5	112,1	123,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,8	8,9	11,5	12,9	14,5	17,4	19,1	22,6	25,5	28,1
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,50	4,20	4,40	4,50	4,30	4,30	4,40	4,40	4,40
Power supply	V/Ph/Hz	400/3+N/50					400/3/50					
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6	75,6	81,6	87,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6	215,6	266,6	272,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2	129,4	160,0	163,6
Max air flow in heating mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000	42000	42000	42000
Fans	n°	2	2	2	1	1	1	2	2	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	75	75	75	78	78	78	80	80	81	81	81
Max sound pressure level in heating mode ⁽³⁾	dB (A)	47	47	47	50	50	50	52	52	53	53	53

(LS/HH) Low noise - Heating only version		1402	1602	1802	2002	2504	3004	3204
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	143,9	158,3	177,1	192,1	246,0	279,4	306,8
Total input power (EN14511) ⁽¹⁾	kW	33,5	36,8	41,2	45,7	57,2	68,1	74,8
COP (EN14511) ⁽¹⁾	W/W	4,30	4,30	4,30	4,20	4,30	4,10	4,10
Power supply	V/Ph/Hz	400/3/50						
Max input current standard unit	A	99,9	108,4	125,3	142,2	175,2	196,0	216,8
Peak current standard unit	A	323,4	331,9	359,3	386,8	360,2	400,2	440,3
Peak current standard unit with soft starter (optional)	A	194,0	199,1	215,6	232,1	216,1	240,1	264,2
Max air flow in heating mode	m ³ /h	62000	62000	62000	62000	81500	110000	110000
Fans	n°	3	3	3	3	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Max sound power level in heating mode ⁽²⁾	dB (A)	84	84	84	84	85	86	86
Max sound pressure level in heating mode ⁽³⁾	dB (A)	56	56	56	56	57	58	58

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Sound power level in accordance with ISO 9614.

(3)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/HH) Super low noise - Heating only version		252	302	402	452	502	602	702	802	902	1002	1202	
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	
Heating capacity (EN14511) ⁽¹⁾	kW	24,8	34,2	39,3	47,5	55,5	66,2	73,5	80,5	97,5	109,4	127,0	
Total input power (EN14511) ⁽¹⁾	kW	5,9	7,9	9,3	11,2	12,6	15,0	16,6	18,2	22,1	24,8	28,8	
COP (EN14511) ⁽¹⁾	W/W	4,22	4,32	4,22	4,22	4,42	4,42	4,42	4,42	4,42	4,42	4,42	
Power supply	V/Ph/Hz	400/3+N/50						400/3/50					
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6	75,6	81,6	87,6	
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6	215,6	266,6	272,6	
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2	129,4	160,0	163,6	
Max air flow in heating mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000	38000	38000	48000	
Fans	n°	2	1	1	1	1	2	2	2	2	2	3	
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	
Max sound power level in heating mode ⁽²⁾	dB (A)	70	70	72	72	72	74	74	74	79	79	76	
Max sound pressure level in heating mode ⁽³⁾	dB (A)	42	42	44	44	44	46	46	46	51	51	48	

(XL/HH) Super low noise - Heating only version		1402	1602	1802	2002	2504	3004	3204
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	141,8	154,5	171,8	204,1	247,4	272,8	311,3
Total input power (EN14511) ⁽¹⁾	kW	32,1	35,8	39,8	46,2	58,6	66,1	73,7
COP (EN14511) ⁽¹⁾	W/W	4,42	4,32	4,32	4,42	4,22	4,13	4,22
Power supply	V/Ph/Hz	400/3/50						
Max input current standard unit	A	99,9	108,4	125,3	142,2	175,2	196,0	216,8
Peak current standard unit	A	323,4	331,9	359,3	386,8	360,2	400,2	440,3
Peak current standard unit with soft starter (optional)	A	194,0	199,1	215,6	232,1	216,1	240,1	264,2
Max air flow in heating mode	m ³ /h	48000	48000	48000	62000	83000	83000	85000
Fans	n°	3	3	3	4	6	6	6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Max sound power level in heating mode ⁽²⁾	dB (A)	76	76	76	78	80	80	80
Max sound pressure level in heating mode ⁽³⁾	dB (A)	48	48	48	50	52	52	52

Performances are referred to the following conditions:

(1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2) Sound power level in accordance with ISO 9614.

(3) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(LS/RV) Low noise - Reversible version		252	302	402	452	502	602	702	802	902	1002	1202
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,4	34,2	40,2	48,1	56,6	65,1	74,7	82,0	99,5	112,1	123,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,8	8,9	11,5	12,9	14,5	17,4	19,1	22,6	25,5	28,1
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,50	4,20	4,40	4,50	4,30	4,30	4,40	4,40	4,40
Cooling capacity (EN14511) ⁽²⁾	kW	19,2	26,8	31,1	39,2	45,2	52,0	62,9	69,1	79,6	89,1	97,7
Total input power (EN14511) ⁽²⁾	kW	7,0	9,4	11,7	13,7	15,8	18,2	20,5	22,5	26,8	31,1	35,4
EER (EN14511) ⁽²⁾	W/W	2,76	2,86	2,65	2,86	2,86	2,86	3,07	3,07	2,97	2,86	2,76
Power supply	V/Ph/Hz	400/3+N/50					400/3/50					
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6	75,6	81,6	87,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6	215,6	266,6	272,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2	129,4	160,0	163,6
Max air flow in heating mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000	42000	42000	42000
Max air flow in cooling mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000	42000	42000	42000
Fans	n°	2	2	2	1	1	1	2	2	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	75	75	75	78	78	78	80	80	81	81	81
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	47	47	47	50	50	50	52	52	53	53	53
Max sound power level in cooling mode ⁽³⁾	dB (A)	75	75	75	78	78	78	80	80	81	81	81
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	47	47	47	50	50	50	52	52	53	53	53

(LS/RV) Low noise - Reversible version		1402	1602	1802	2002	2504	3004	3204
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	143,9	158,3	177,1	192,1	246,0	279,4	306,8
Total input power (EN14511) ⁽¹⁾	kW	33,5	36,8	41,2	45,7	57,2	68,1	74,8
COP (EN14511) ⁽¹⁾	W/W	4,30	4,30	4,30	4,20	4,30	4,10	4,10
Cooling capacity (EN14511) ⁽²⁾	kW	113,8	128,1	141,6	153,5	197,2	219,0	248,6
Total input power (EN14511) ⁽²⁾	kW	38,3	43,2	49,5	57,9	71,5	82,7	90,2
EER (EN14511) ⁽²⁾	W/W	2,97	2,97	2,86	2,65	2,76	2,65	2,76
Power supply	V/Ph/Hz	400/3/50						
Max input current standard unit	A	99,9	108,4	125,3	142,2	175,2	196,0	216,8
Peak current standard unit	A	323,4	331,9	359,3	386,8	360,2	400,2	440,3
Peak current standard unit with soft starter (optional)	A	194,0	199,1	215,6	232,1	216,1	240,1	264,2
Max air flow in heating mode	m ³ /h	62000	62000	62000	62000	81500	110000	110000
Max air flow in cooling mode	m ³ /h	62000	62000	62000	62000	81500	110000	110000
Fans	n°	3	3	3	3	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Max sound power level in heating mode ⁽³⁾	dB (A)	84	84	84	84	85	86	86
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	56	56	56	56	57	58	58
Max sound power level in cooling mode ⁽³⁾	dB (A)	84	84	84	84	85	86	86
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	56	56	56	56	57	58	58

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/RV) Super low noise - Reversible version		252	302	402	452	502	602	702	802	902	1002	1202
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	24,8	34,2	39,3	47,5	55,5	66,2	73,5	80,5	97,5	109,4	127,0
Total input power (EN14511) ⁽¹⁾	kW	5,9	7,9	9,3	11,2	12,6	15,0	16,6	18,2	22,1	24,8	28,8
COP (EN14511) ⁽¹⁾	W/W	4,22	4,32	4,22	4,22	4,42	4,42	4,42	4,42	4,42	4,42	4,42
Cooling capacity (EN14511) ⁽²⁾	kW	18,6	27,8	29,9	38,1	43,7	54,9	60,6	65,9	76,8	87,7	101,0
Total input power (EN14511) ⁽²⁾	kW	7,0	9,4	11,3	13,8	15,3	17,3	19,7	22,2	26,8	30,6	32,9
EER (EN14511) ⁽²⁾	W/W	2,65	2,97	2,65	2,76	2,86	3,18	3,07	2,97	2,86	2,86	3,07
Power supply	V/Ph/Hz	400/3+N/50		400/3/50								
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6	75,6	81,6	87,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6	215,6	266,6	272,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2	129,4	160,0	163,6
Max air flow in heating mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000	38000	38000	48000
Max air flow in cooling mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000	38000	38000	48000
Fans	n°	2	1	1	1	1	2	2	2	2	2	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	72	72	72	74	74	74	79	79	76
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	42	42	44	44	44	46	46	46	51	51	48
Max sound power level in cooling mode ⁽³⁾	dB (A)	70	70	72	72	72	74	74	74	79	79	76
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	42	42	44	44	44	46	46	46	51	51	48

(XL/RV) Super low noise - Reversible version		1402	1602	1802	2002	2504	3004	3204
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	141,8	154,5	171,8	204,1	247,4	272,8	311,3
Total input power (EN14511) ⁽¹⁾	kW	32,1	35,8	39,8	46,2	58,6	66,1	73,7
COP (EN14511) ⁽¹⁾	W/W	4,42	4,32	4,32	4,42	4,22	4,13	4,22
Cooling capacity (EN14511) ⁽²⁾	kW	109,4	121,7	132,4	155,8	195,9	217,0	235,1
Total input power (EN14511) ⁽²⁾	kW	38,2	42,5	50,0	54,4	68,5	78,8	88,7
EER (EN14511) ⁽²⁾	W/W	2,86	2,86	2,65	2,86	2,86	2,76	2,65
Power supply	V/Ph/Hz	400/3/50						
Max input current standard unit	A	99,9	108,4	125,3	142,2	175,2	196,0	216,8
Peak current standard unit	A	323,4	331,9	359,3	386,8	360,2	400,2	440,3
Peak current standard unit with soft starter (optional)	A	194,0	199,1	215,6	232,1	216,1	240,1	264,2
Max air flow in heating mode	m ³ /h	48000	48000	48000	62000	83000	83000	85000
Max air flow in cooling mode	m ³ /h	48000	48000	48000	62000	83000	83000	85000
Fans	n°	3	3	3	4	6	6	6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Max sound power level in heating mode ⁽³⁾	dB (A)	76	76	76	78	80	80	80
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	48	48	48	50	52	52	52
Max sound power level in cooling mode ⁽³⁾	dB (A)	76	76	76	78	80	80	80
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	48	48	48	50	52	52	52

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations).

COMPRESSORS

The compressors used are a high performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle when the source temperature is low. In all units the compressors are connected in tandem.

The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation

speed (and hence low noise) fans. All heat exchangers are supplied standard with fins hydrophilic coating.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335.

They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors, in LS versions are 6 poles type rotating at approximately 900 rpm. In the XL versions the fans are 8 poles type (approx 600 rpm). As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset.

The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionel-

la program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management.

The technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions SW6), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box,

which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is

strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions

P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

VERSIONS

HH heating only versions are available in the P2U, P2S and P4S configuration only.

LHA

VERSION P2U

This is a two pipe version that can produce hot water for heating (HH heating only) and hot or cold water in the RV version. The RV is used with two pipe water based change-over systems. It is not able to produce domestic hot water.

VERSION P2S

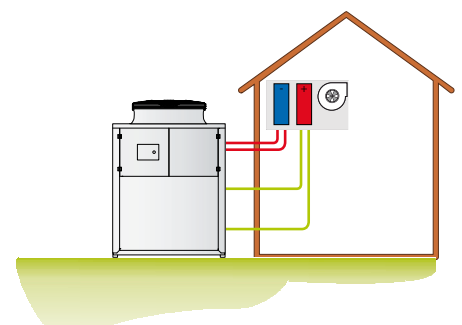
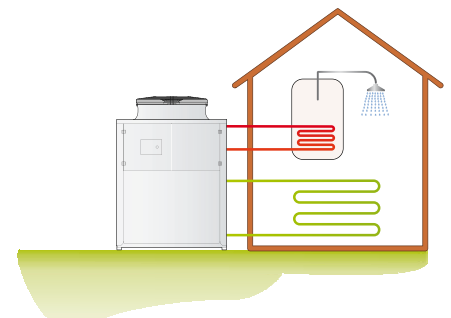
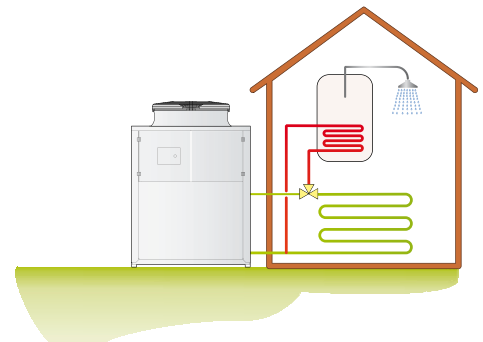
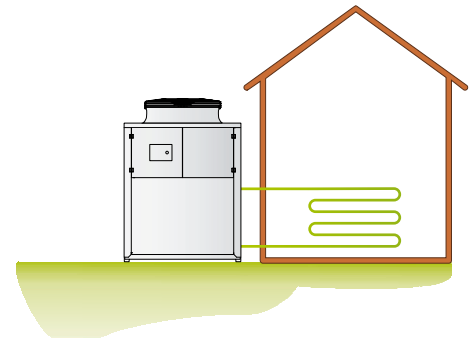
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems.

VERSION P4S

This is a four pipe version that can produce hot water for heating (HH version), hot and cold water for cooling and domestic hot water (only RV versions) in all operational modes using an independent water circuit. When cooling, DHW generation is by heat recovery. This unit is normally used with two pipe water based change-over systems with the DHW circuit being separate.

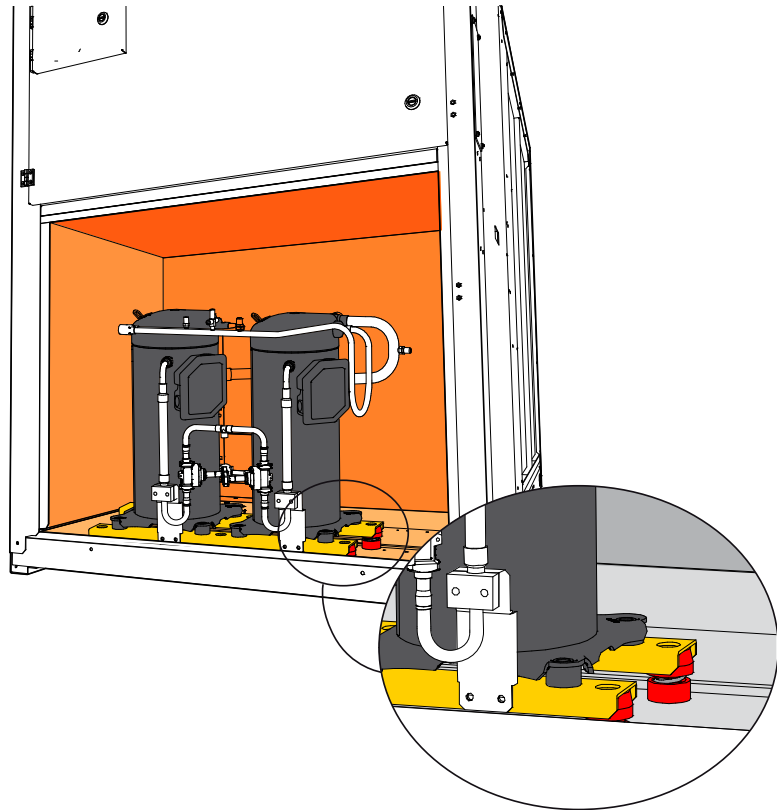
VERSION P4U

This is a four pipe version that provides a modern approach to four pipe water based systems. Instead of using a boiler and chiller, this unit can generate hot water in one circuit, cold water in the other circuit either individually or simultaneously. When operating in simultaneous mode the heating capacity is equal to the cooling duty plus the power input to the compressors. The operating efficiency in this mode is extremely high. Domestic hot water production for this version is not available.

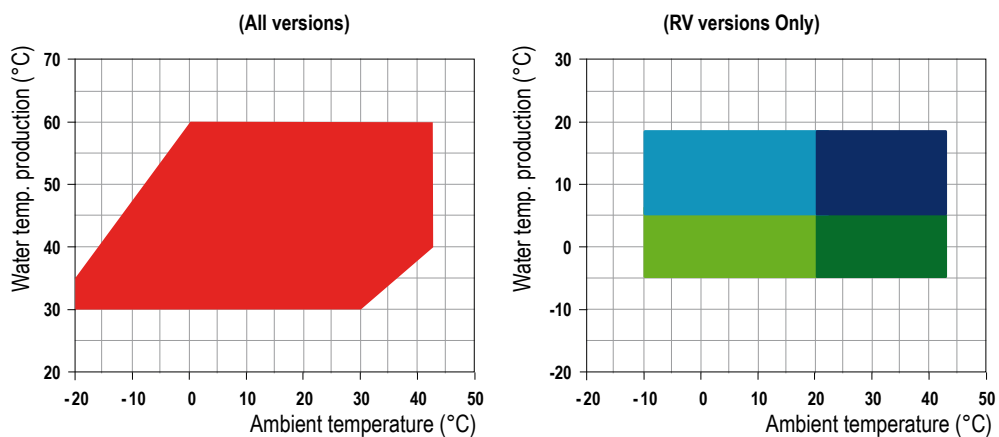


NOISE REDUCTION

All units in XL version are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).



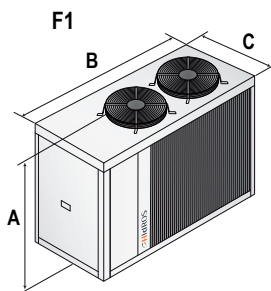
OPERATION LIMITS



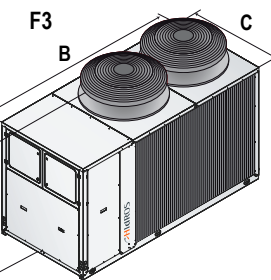
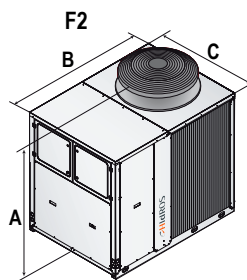
- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

LHA Model	Code	252-402	452-602	702-1202
Flow switch		●	●	●
User water strainer		●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●
Specific software for operation priorities		●	●	●
Remote ON/OFF digital input		●	●	●
Summer/Winter digital input		●	●	●
Floating frame technology	LS	–	–	–
Floating frame technology	XL	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●
E.C. fans (LS versions)	VECE	○	○	○
E.C. fans (XL versions)	VECE	○	○	○
High static pressure E.C. fans	VECC	○	○	○
Cascade control system via RS485	SGRS	○	○	○
Unit performance optimizer	SODP	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	–	–	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	–	–	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	–	–	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○
Electronic Soft starter	DSSE	○	○	○
Remote control panel	PCRL	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○
Electronic thermostatic valve	VTEE	○	○	○

● Standard, ○ Optional, – Not available.



Frame LS Version



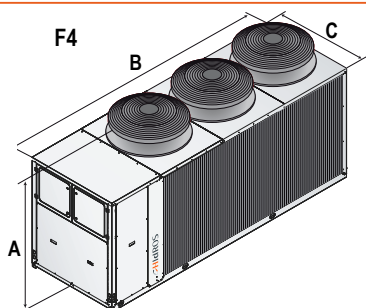
Frame XL Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/LS	F1	2	1470	1900	880	540
302/LS	F1	2	1470	1900	880	550
402/LS	F1	2	1470	1900	880	570
452/LS	F2	1	1820	2200	1150	760
502/LS	F2	1	1820	2200	1150	780
602/LS	F2	1	1820	2200	1150	810
702/LS	F3	2	1820	2900	1150	1100
802/LS	F3	2	1820	2900	1150	1120
902/LS	F3	2	1820	2900	1150	1140
1002/LS	F3	2	1820	2900	1150	1180
1202/LS	F3	2	1820	2900	1150	1210

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	2	1470	1900	880	540
302/XL	F2	1	1820	2200	1150	730
402/XL	F2	1	1820	2200	1150	750
452/XL	F2	1	1820	2200	1150	760
502/XL	F2	1	1820	2200	1150	780
602/XL	F3	2	1820	2900	1150	1070
702/XL	F3	2	1820	2900	1150	1100
802/XL	F3	2	1820	2900	1150	1120
902/XL	F3	2	1820	2900	1150	1140
1002/XL	F3	2	1820	2900	1150	1180
1202/XL	F4	3	1820	3900	1150	1380

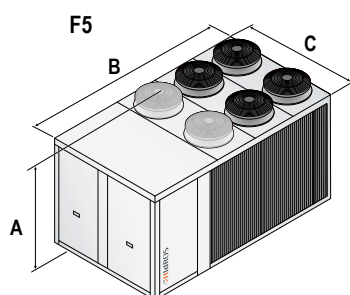
LHA Model	Code	1402-2002	2504-3204
Flow switch		●	●
User water strainer		●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●
Specific software for operation priorities		●	●
Remote ON/OFF digital input		●	●
Summer/Winter digital input		●	●
Floating frame technology	LS	–	–
Floating frame technology	XL	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●
E.C. fans (LS versions)	VECE	○	○
E.C. fans (XL versions)	VECE	○	○
High static pressure E.C. fans	VECC	○	○
Cascade control system via RS485	SGRS	○	○
Unit performance optimizer	SODP	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●
Rubber anti-vibration mountings	KAVG	○	○
Hydraulic circuit antifreeze kit	KP	○	○
Electronic Soft starter	DSSE	○	○
Remote control panel	PCRL	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○
Electronic thermostatic valve	VTEE	○	○

● Standard, ○ Optional, – Not available.



Frame LS Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1402/LS	F4	3	1820	3900	1150	1430
1602/LS	F4	3	1820	3900	1150	1510
1802/LS	F4	3	1820	3900	1150	1560
2002/LS	F4	3	1820	3900	1150	1590
2504/LS	F5	4	2350	4206	2210	3120
3004/LS	F5	6	2350	4206	2210	3170
3204/LS	F5	6	2350	4206	2210	3220
3504/LS	F5	6	2350	4206	2210	3270
4004/LS	F6	6	2350	4856	2210	3610
4504/LS	F6	8	2350	4856	2210	3670
5004/LS	F6	8	2350	4856	2210	3720



Frame XL Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1402/XL	F4	3	1820	3900	1150	1430
1602/XL	F4	3	1820	3900	1150	1510
1802/XL	F4	3	1820	3900	1150	1560
2002/XL	F5	4	2350	4206	2210	2790
2504/XL	F5	6	2350	4206	2210	3150
3004/XL	F5	6	2350	4206	2210	3170
3204/XL	F6	6	2350	4856	2210	3220

LZT

High efficiency air to water heat pumps with E.V.I. compressors



R410A

-20°C

+43°C

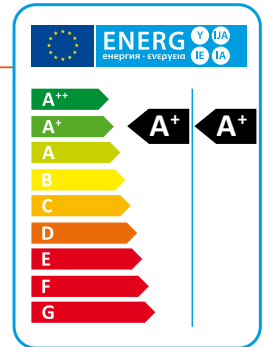
+65°C

E.V.I.

E.C.

FLOATING FRAME

ZZ



LZT

The LZT series of high efficiency heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating.

They have been optimized on heating mode, are able to produce water up to 65°C and can operate down to -20°C ambient temperature.

LZT units are available in 2 pipe, 2+2 pipe and 4 pipe versions.

Some versions can produce domestic hot water, in the P2S version through the activation of an external 3-way-valve and in the P4S version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

All versions are supplied with reverse cycle valve used for winter defrost; the HH version is suitable for use in those countries that have support schemes for use of heat pump technology for heating. The RV versions are also able to produce cold water. The HH heating only versions is factory set and locked to operate only in heating mode whilst.

The noise is extremely low thanks to the use of a special floating vibration damping system which allows a noise reduction of about 10-12 dB(A).

VERSIONS

- HH** Heating only.
- RV** Reversible heating/cooling.
- XL** Super low noise.
- NN** Ultra low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.
- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with domestic hot water production.

ACCESSORIES

- A1NT** Hydraulic kit with one pump without tank.
- A1ZZ** Hydraulic kit with tank and one pump.
- A2NT** Hydraulic kit with two pump without tank.
- A2ZZ** Hydraulic kit with tank and two pump.
- DSSE** Electronic soft starter.
- INSE** Serial interface card RS 485.
- KAVG** Rubber anti-vibration mountings.
- KP** Hydraulic circuit antifreeze kit.
- PCRL** Remote control panel.
- RAEV** User and recovery heat exchanger antifreeze kit.
- SGRS** Cascade control system via RS485.
- SODP** Unit performance optimizer.
- VECC** High static pressure E.C. fans.
- VECE** E.C. fans.
- VTEE** Electronic thermostatic valve.

(XL/HH) Super low noise - Heating only version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,5	32,1	41,8	52,8	63,7	72,8	83,0
Total input power (EN14511) ⁽¹⁾	kW	6,00	7,62	10,00	12,69	14,85	17,05	20,00
COP (EN14511) ⁽¹⁾	W/W	4,25	4,21	4,18	4,16	4,29	4,27	4,15
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽³⁾	dB (A)	42	42	44	44	46	46	46

(XL/HH) Super low noise - Heating only version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	93,2	110,5	149,0	161,0	183,0	210,0
Total input power (EN14511) ⁽¹⁾	kW	22,5	26,3	34,6	38,0	42,7	50,0
COP (EN14511) ⁽¹⁾	W/W	4,14	4,20	4,30	4,23	4,28	4,20
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Max sound power level in heating mode ⁽²⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽³⁾	dB (A)	51	51	49	51	52	52

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Sound power level in accordance with ISO 9614.

(3)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(NN/HH) Ultra low noise - Heating only version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	23,6	29,7	38,5	52,6	58,3	66,8	80,4
Total input power (EN14511) ⁽¹⁾	kW	5,68	7,21	9,30	12,40	13,60	15,90	18,8
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,13	4,25	4,28	4,20	4,27
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7
Max air flow in heating mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	38	38	40	40	40	41

(NN/HH) Ultra low noise - Heating only version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	--
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	--
Heating capacity (EN14511) ⁽¹⁾	kW	90,9	103,5	140,5	165,1	181,0	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,6	33,8	39,7	44,0	--
COP (EN14511) ⁽¹⁾	W/W	4,30	4,20	4,15	4,15	4,11	--
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	--
Max input current standard unit	A	68,0	70,0	113,0	136,0	146,0	--
Peak current standard unit	A	209,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	123,7	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	27000	29000	44000	48000	60000	--
Fans	n°	2	2	4	4	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Max sound power level in heating mode ⁽²⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽³⁾	dB (A)	41	42	43	44	44	--

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
 (2)Sound power level in accordance with ISO 9614.

(3)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/RV) Super low noise - Reversible version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,5	32,1	41,8	52,8	63,7	72,8	83,0
Total input power (EN14511) ⁽¹⁾	kW	6,00	7,62	10,00	12,69	14,85	17,05	20,00
COP (EN14511) ⁽¹⁾	W/W	4,25	4,21	4,18	4,16	4,29	4,27	4,15
Cooling capacity (EN14511) ⁽²⁾	kW	22,4	27,7	36,7	46,2	54,7	62,8	71,0
Total input power (EN14511) ⁽²⁾	kW	7,32	9,10	11,90	15,10	17,80	20,60	23,20
EER (EN14511) ⁽²⁾	W/W	3,06	3,05	3,07	3,05	3,07	3,05	3,05
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Max air flow in cooling mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	42	42	44	44	46	46	46
Max sound power level in cooling mode ⁽³⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	42	42	44	44	46	46	46

(XL/RV) Super low noise - Reversible version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	93,2	110,5	149,0	161,0	183,0	210,0
Total input power (EN14511) ⁽¹⁾	kW	22,5	26,3	34,6	38,0	42,7	50,0
COP (EN14511) ⁽¹⁾	W/W	4,14	4,20	4,30	4,23	4,28	4,20
Cooling capacity (EN14511) ⁽²⁾	kW	79,4	90,0	126,0	140,0	165,0	186,0
Total input power (EN14511) ⁽²⁾	kW	26,9	30,7	41,8	49,1	52,5	64,1
EER (EN14511) ⁽²⁾	W/W	2,95	2,93	3,01	2,85	3,14	2,90
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Max air flow in cooling mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Max sound power level in heating mode ⁽³⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	51	51	49	51	52	52
Max sound power level in cooling mode ⁽³⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	51	51	49	51	52	52

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(NN/RV) Ultra low noise - Reversible version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A++	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	23,6	29,7	38,5	52,6	58,3	66,8	80,4
Total input power (EN14511) ⁽¹⁾	kW	5,68	7,21	9,30	12,40	13,60	15,90	18,8
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,13	4,25	4,28	4,20	4,27
Cooling capacity (EN14511) ⁽²⁾	kW	21,4	26,5	35,6	45,7	53,5	61,1	69,0
Total input power (EN14511) ⁽²⁾	kW	8,1	10,5	14,1	16,2	18,6	22,5	22,9
EER (EN14511) ⁽²⁾	W/W	2,64	2,51	2,52	2,82	2,87	2,71	3,01
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7
Max air flow in heating mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Max air flow in cooling mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Fans	n°	1	1	1	2	2	2	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	38	38	40	40	40	41
Max sound power level in cooling mode ⁽³⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	38	38	38	40	40	40	41

(NN/RV) Ultra low noise - Reversible version		1002	1202	1504	1704	2004	2404
Energy Class in low temp. - According to EU reg. 811/2013		A++	A++	A+	A+	A+	--
Energy Class in high temp. - According to EU reg. 811/2013		A+	A+	A+	A+	A+	--
Heating capacity (EN14511) ⁽¹⁾	kW	90,9	103,5	140,5	165,1	181,0	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,6	33,8	39,7	44,0	--
COP (EN14511) ⁽¹⁾	W/W	4,30	4,20	4,15	4,15	4,11	--
Cooling capacity (EN14511) ⁽²⁾	kW	79,3	88,0	120,0	132,0	155,0	--
Total input power (EN14511) ⁽²⁾	kW	26,0	32,2	42,1	46,3	58,5	--
EER (EN14511) ⁽²⁾	W/W	3,05	2,73	2,85	2,85	2,65	--
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	--
Max input current standard unit	A	68,0	70,0	113,0	136,0	146,0	--
Peak current standard unit	A	209,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	123,7	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	27000	29000	44000	48000	60000	--
Max air flow in cooling mode	m ³ /h	27000	29000	44000	48000	60000	--
Fans	n°	3	3	4	6	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Max sound power level in heating mode ⁽³⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	41	42	43	44	44	--
Max sound power level in cooling mode ⁽³⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	41	42	43	44	44	--

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel.

The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations). The circuit also includes an AISI316 stainless steel heat exchanger that is used as an economizer plus an additional expansion valve for refrigerant vapour injection.

COMPRESSORS

Units use scroll compressors that are equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. EVI stands for "Enhanced Vapour Injection." The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve. The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated.

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology

generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans. All heat exchangers are supplied standard with fins hydrophilic coating.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors are 8 poles type rotating at approximately 900 rpm. In the NN versions the fans are 12 poles type (approx 450 rpm). As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and

have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), overload switches, control circuit automatic breakers, compressor contactors, automatic switches and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P4S and P4U), high pressure manual reset, low pressure automatic reset, compressor

thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving"

function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must

be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

VERSIONS

HH heating only versions are available in the P2U, P2S and P4S configuration only.

VERSION P2U

This is a two pipe version that can produce hot water for heating (HH heating only) and hot or cold water in the RV version. The RV is used with two pipe water based change-over systems. It is not able to produce domestic hot water.

VERSION P2S

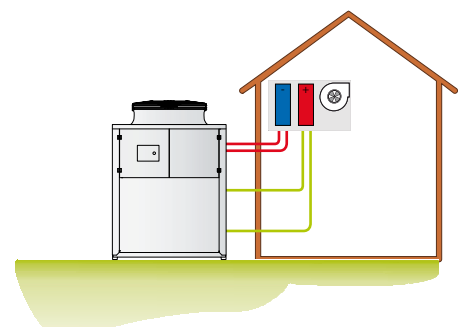
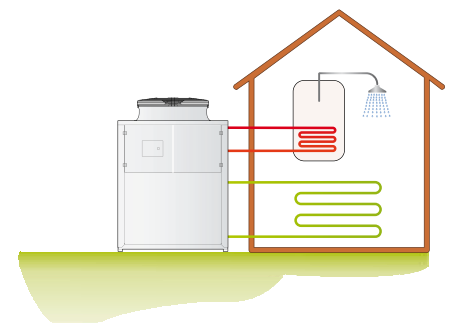
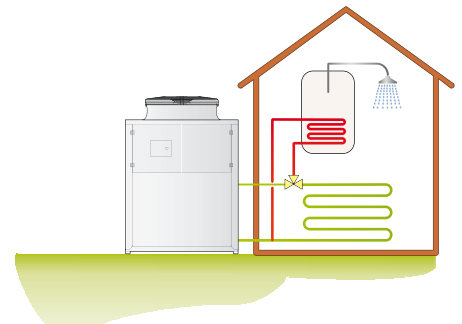
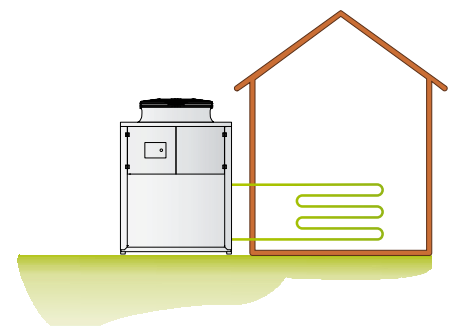
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems.

VERSION P4S

This is a four pipe version that can produce hot water for heating (HH version), hot and cold water for cooling and domestic hot water (only RV versions) in all operational modes using an independent water circuit. When cooling, DHW generation is by heat recovery. This unit is normally used with two pipe water based change-over systems with the DHW circuit being separate.

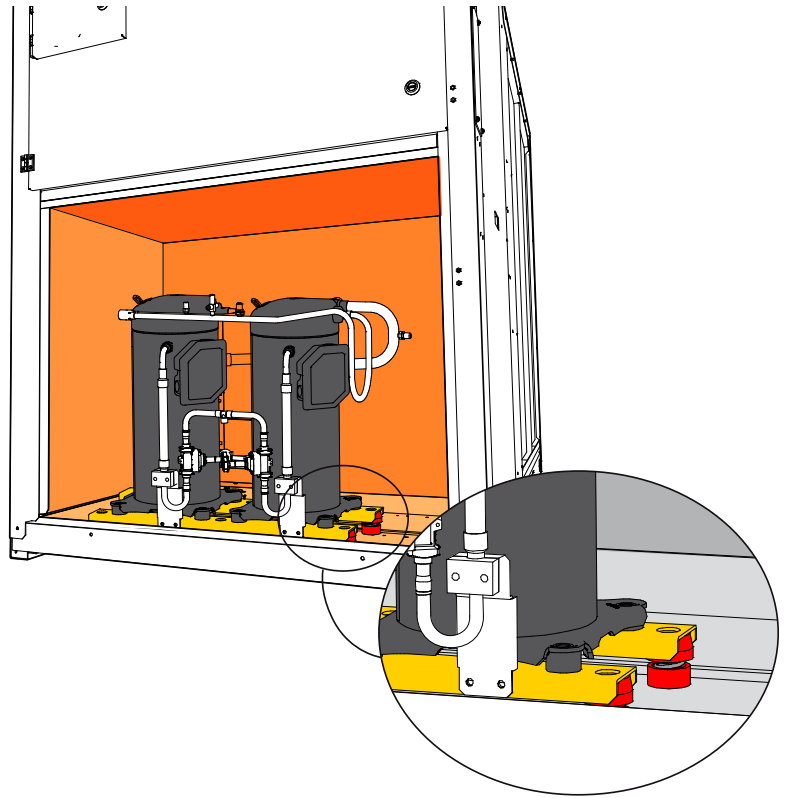
VERSION P4U

This is a four pipe version that provides a modern approach to four pipe water based systems. Instead of using a boiler and chiller, this unit can generate hot water in one circuit, cold water in the other circuit either individually or simultaneously. When operating in simultaneous mode the heating capacity is equal to the cooling duty plus the power input to the compressors. The operating efficiency in this mode is extremely high. Domestic hot water production for this version is not available.

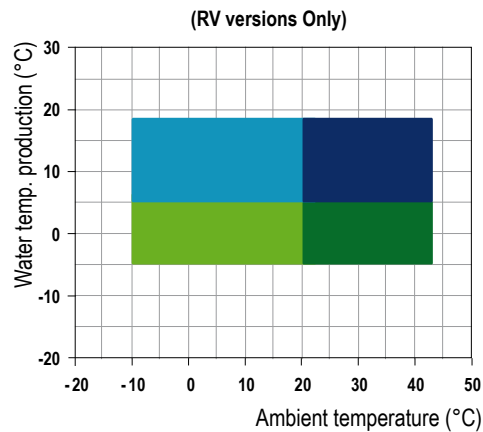
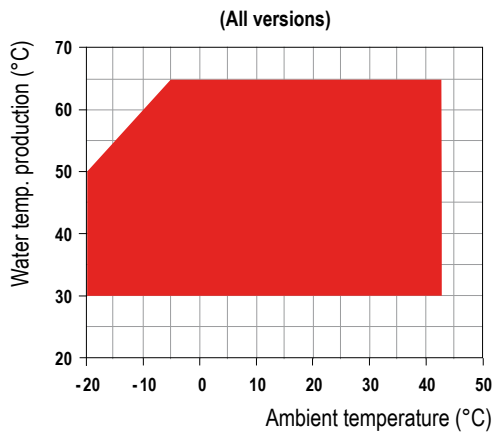


NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).



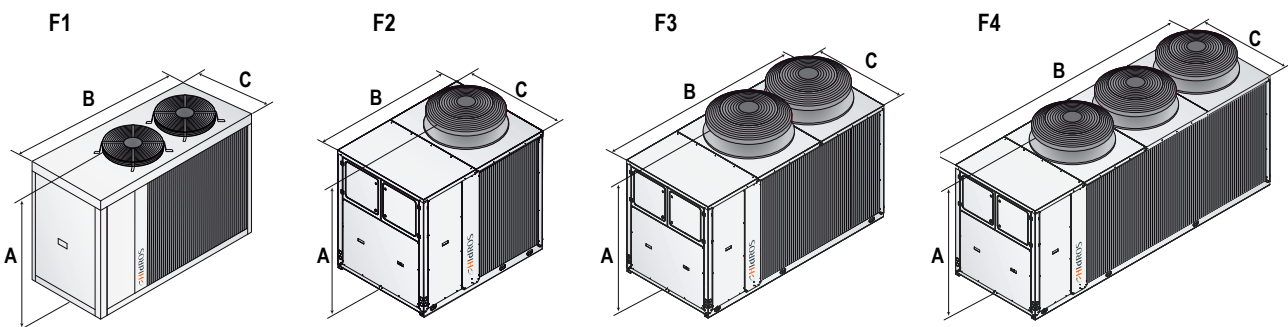
OPERATION LIMITS



- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

LZT Model	Code	252	302	452	502	602	752	852	1002
Flow switch		●	●	●	●	●	●	●	●
User water strainer		●	●	●	●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●
Floating frame technology	XL/NN	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●	●	●
E.C. fans (NN versions)	VECE	●	●	●	●	●	●	●	●
E.C. fans (XL versions)	VECE	○	○	○	○	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	-	-	○	○	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	-	-	○	○	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	-	-	○	○	○	○	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, - Not available.



Frame XL Version

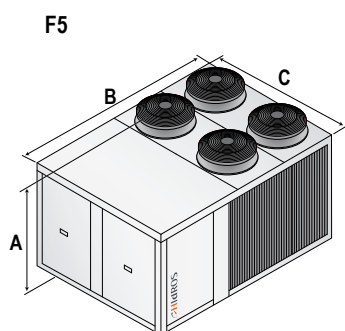
Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	2	1470	1900	880	540
302/XL	F1	2	1470	1900	880	550
452/XL	F2	1	1820	2200	1150	760
502/XL	F2	1	1820	2200	1150	780
602/XL	F3	2	1820	2900	1150	1100
752/XL	F3	2	1820	2900	1150	1120
852/XL	F3	2	1820	2900	1150	1140
1002/XL	F3	2	1820	2900	1150	1180
1202/XL	F3	2	1820	2900	1150	1210

Frame NN Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/NN	F2	1	1820	2200	1150	760
302/NN	F2	1	1820	2200	1150	770
452/NN	F2	1	1820	2200	1150	980
502/NN	F3	2	1820	2900	1150	1000
602/NN	F3	2	1820	2900	1150	1100
752/NN	F3	2	1820	2900	1150	1120
852/NN	F4	3	1820	3900	1150	1340
1002/NN	F4	3	1820	3900	1150	1360
1202/NN	F4	3	1820	3900	1150	1380

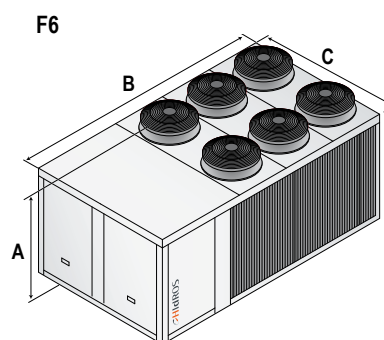
LZT Model	Code	1202	1504	1704	2004	2404
Flow switch		●	●	●	●	●
User water strainer		●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Floating frame technology	XL/NN	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●
E.C. fans (NN versions)	VECE	●	●	●	●	●
E.C. fans (XL versions)	VECE	○	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	○	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	○	○	○	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Frame XL Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1504/XL	F5	4	1820	2900	2300	2480
1704/XL	F5	4	1820	2900	2300	2530
2004/XL	F6	6	1820	3900	2300	2720
2404/XL	F6	6	1820	3900	2300	2760



Frame NN Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1504/NN	F5	4	1820	2900	2300	2480
1704/NN	F6	6	1820	3900	2300	2690
2004/NN	F6	6	1820	3900	2300	2720
2404/NN	--	--	--	--	--	--

CZT

High efficiency air to water heat pumps ductables with E.V.I. compressors



R410A

-20°C

+43°C

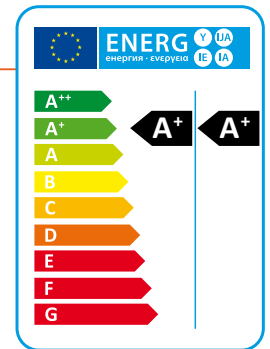
+65°C

E.V.I.

E.C.

FLOATING FRAME

ZZ



CZT

The high efficiency CZT series heat pumps has been specifically designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating.

They have been optimized on heating mode, are able to produce water up to 65°C and can operate down to -20°C ambient temperature.

The units have been designed for internal installation in plant rooms and are fitted with E.C. fans suitable for connection to ductwork.

CZT units are available in 2 pipe, 2+2 pipe and 4 pipe versions.

Some versions can produce domestic hot water, in the P2S version through the activation of an external 3-way-valve and in the P4S version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

All versions are supplied with reverse cycle valve used for winter defrost; the HH version is suitable for use in those countries that have support schemes for use of heat pump technology for heating. The RV versions are also able to produce cold water. The HH heating only versions is factory set and locked to operate only in heating mode whilst.

The noise is extremely low thanks to the use of a special floating vibration damping system which allows a noise reduction of about 10-12 dB(A).

VERSIONS

- HH** Heating only.
- RV** Reversible heating/cooling.
- XL** Super low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.
- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with domestic hot water production.

ACCESSORIES

- A1NT** Hydraulic kit with one pump without tank.
- A1ZZ** Hydraulic kit with tank and one pump.
- A2NT** Hydraulic kit with two pump without tank.
- A2ZZ** Hydraulic kit with tank and two pump.
- DSSE** Electronic soft starter.
- INSE** Serial interface card RS 485.
- KAVG** Rubber anti-vibration mountings.
- KP** Hydraulic circuit antifreeze kit.
- PCRL** Remote control panel.
- RAEV** User and recovery heat exchanger antifreeze kit.
- SGRS** Cascade control system via RS485.
- SODP** Unit performance optimizer.
- VECC** High static pressure E.C. fans.
- VTEE** Electronic thermostatic valve.

(XL/HH) Super low noise - Heating only version		252	302	452	502	602	752
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,7	32,2	43,1	54,9	63,0	72,8
Total input power (EN14511) ⁽¹⁾	kW	6,19	7,81	10,51	13,22	15,29	17,70
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,10	4,15	4,12	4,11
Power supply	V/Ph/Hz	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N
Max input current standard unit	A	20,9	24,6	34,9	40,5	45,5	55,7
Peak current standard unit	A	63,2	83,6	119,0	149,5	143,3	170,5
Peak current standard unit with soft starter (optional)	A	38,1	50,2	71,5	89,7	86,7	102,3
Max air flow in heating mode	m ³ /h	11000	11000	22000	22000	33000	33000
Nominal available static pressure ⁽³⁾	Pa	50	50	50	50	50	50
Maximum available static pressure ⁽⁵⁾	Pa	150	150	150	150	150	150
Fans	n°	1	1	2	2	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	73	73	75	75
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	42	42	45	45	47	47

(XL/RV) Super low noise - Reversible version		252	302	452	502	602	752
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,7	32,2	43,1	54,9	63,0	72,8
Total input power (EN14511) ⁽¹⁾	kW	6,19	7,81	10,51	13,22	15,29	17,70
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,10	4,15	4,12	4,11
Cooling capacity (EN14511) ⁽²⁾	kW	22,4	27,7	36,5	46,0	54,5	62,5
Total input power (EN14511) ⁽²⁾	kW	7,64	9,71	13,27	17,03	18,47	21,25
EER (EN14511) ⁽²⁾	W/W	2,93	2,85	2,75	2,70	2,95	2,94
Power supply	V/Ph/Hz	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N
Max input current standard unit	A	20,0	23,4	35,2	40,4	46,8	56,8
Peak current standard unit	A	62,3	82,5	120,2	149,8	143,8	170,8
Peak current standard unit with soft starter (optional)	A	38,1	50,2	71,5	89,7	86,7	102,3
Max air flow in heating mode	m ³ /h	11000	11000	22000	22000	33000	33000
Max air flow in cooling mode	m ³ /h	11000	11000	22000	22000	33000	33000
Nominal available static pressure ⁽³⁾	Pa	50	50	50	50	50	50
Maximum available static pressure ⁽⁵⁾	Pa	150	150	150	150	150	150
Fans	n°	1	1	2	2	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	73	73	75	75
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	42	42	45	45	47	47
Max sound power level in cooling mode ⁽³⁾	dB (A)	70	70	73	73	75	75
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	42	42	45	45	47	47

Performances are obtained with available static pressure 50 Pa, at the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614, ducted unit, available static pressure 50 Pa.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614, ducted unit, available static pressure 50 Pa.

(5)Available static pressure obtained with oversized electric motor, for the technical data in this working condition please refer to the unit technical manual.

FRAME

All CZT units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel.

The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations). The circuit also includes an AISI316 stainless steel heat exchanger that is used as an economizer plus an additional expansion valve for refrigerant vapour injection.

COMPRESSORS

Units use scroll compressors that are equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. EVI stands for "Enhanced Vapour Injection." The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve. The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated.

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology

generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

E.C. DUCTABLE FANS

Axial fans with High available Static Pressure, supplied with Brushless DC electric motor electronically commutated (E.C. motors), directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanized thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The elec-

tric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, "burn out" thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU. The maximum available static pressure (ASP) is approximately 150 Pa at nominal air flow rate.

MICROPROCESSORS

All CZT units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P4S and P4U), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize

the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic

compensator present at the screening technique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

VERSIONS

HH heating only versions are available in the P2U, P2S and P4S configuration only.

VERSION P2U

This is a two pipe version that can produce hot water for heating (HH heating only) and hot or cold water in the RV version. The RV is used with two pipe water based change-over systems. It is not able to produce domestic hot water.

VERSION P2S

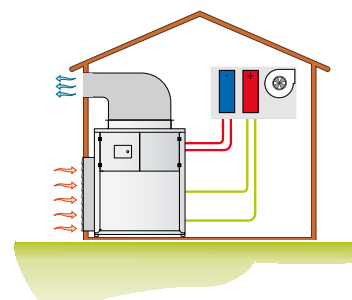
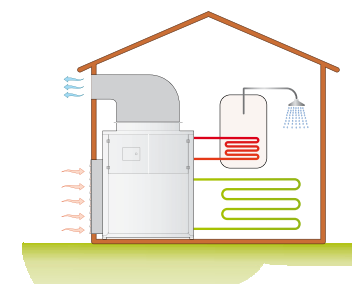
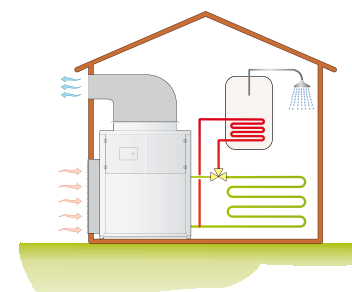
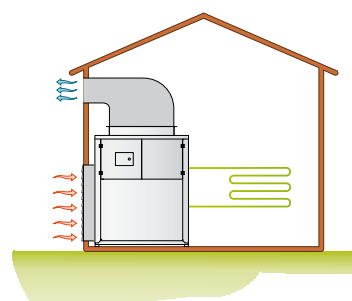
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems.

VERSION P4S

This is a four pipe version that can produce hot water for heating (HH version), hot and cold water for cooling and domestic hot water (only RV versions) in all operational modes using an independent water circuit. When cooling, DHW generation is by heat recovery. This unit is normally used with two pipe water based change-over systems with the DHW circuit being separate.

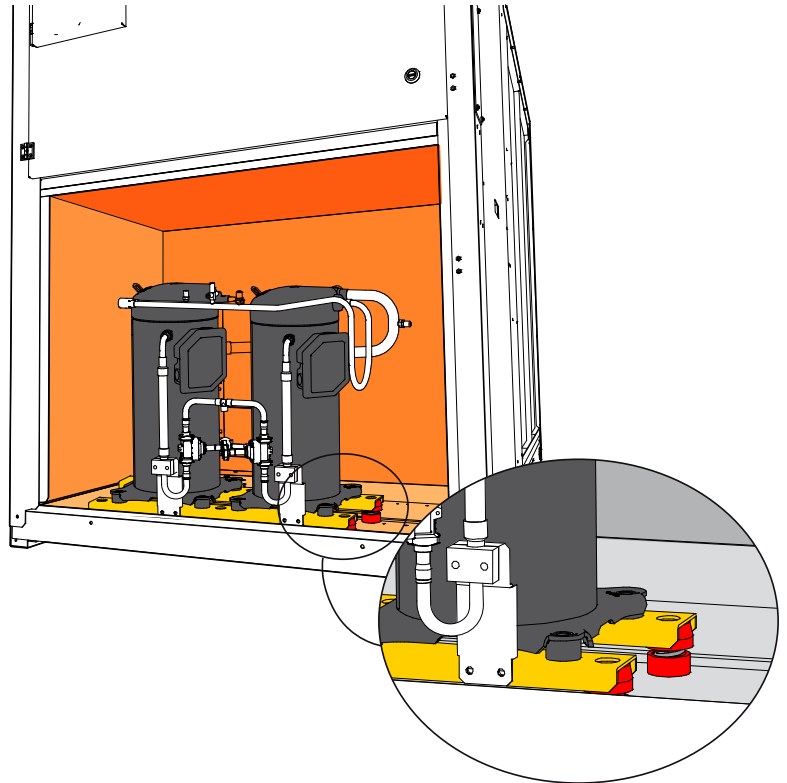
VERSION P4U

This is a four pipe version that provides a modern approach to four pipe water based systems. Instead of using a boiler and chiller, this unit can generate hot water in one circuit, cold water in the other circuit either individually or simultaneously. When operating in simultaneous mode the heating capacity is equal to the cooling duty plus the power input to the compressors. The operating efficiency in this mode is extremely high. Domestic hot water production for this version is not available.

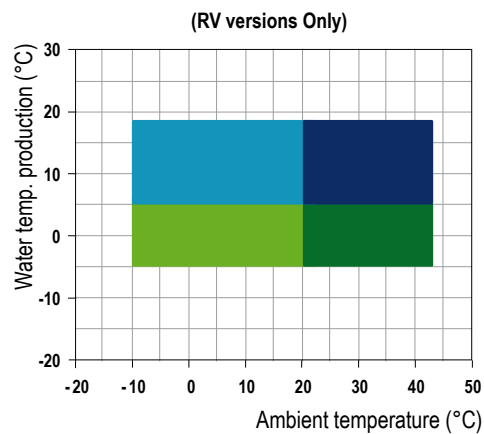
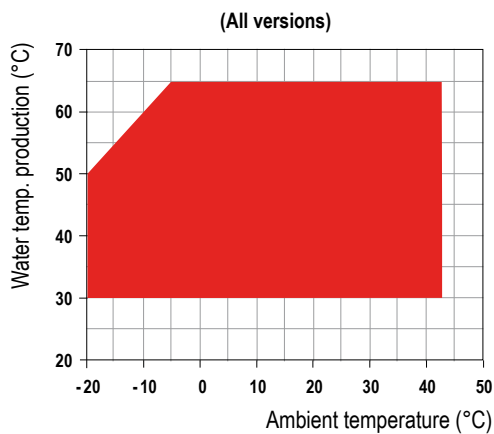


NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).



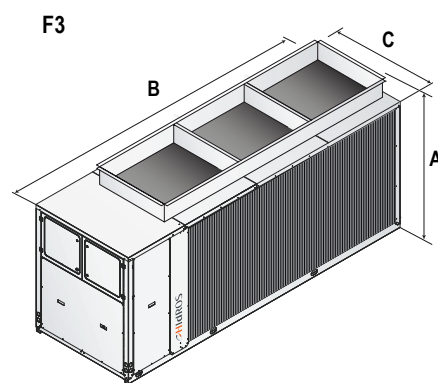
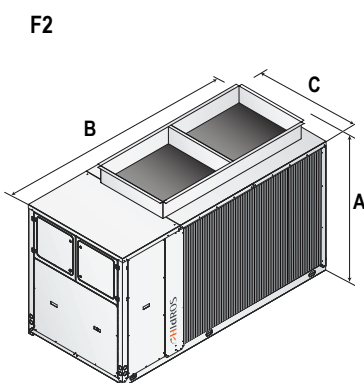
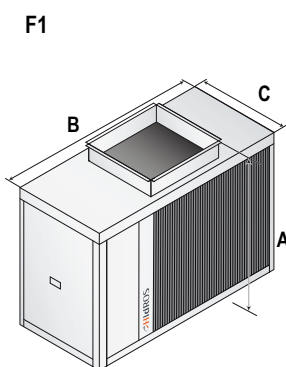
OPERATION LIMITS



- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

CZT Model	Code	252	302	452	502	602	752
Flow switch		●	●	●	●	●	●
User water strainer		●	●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCI	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●
Floating frame technology		●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●
High static pressure E.C. fans	VECC	●	●	●	●	●	●
Cascade control system via RS485	SGRS	○	○	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	–	–	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	–	–	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	–	–	○	○	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	1	1485	1900	880	550
302/XL	F1	1	1485	1900	880	560
452/XL	F2	2	1878	2900	1150	750
502/XL	F2	2	1878	2900	1150	775
602/XL	F3	3	1878	3900	1150	970
752/XL	F3	3	1878	3900	1150	1020

WZT

High efficiency air to water split system heat pumps with E.V.I. compressors



R410A

-20°C

+43°C

+65°C

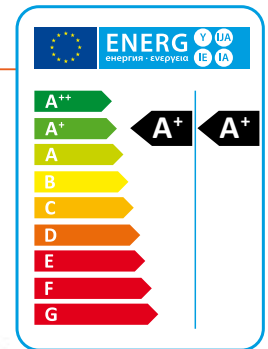
E.V.I.

C.O.P. ≥ 4,1

E.C.

FLOATING FRAME

ZZ



WZT

The air source high efficiency heat pumps WZT series, in the NN configuration, are particularly suitable for those applications where it is necessary to have maximum efficiency in heating mode and a noise level extremely low and, for this purpose, are provided in two sections, linked together by refrigerant lines, installing the compressor in the internal section. The units have been designed specifically to have the best possible efficiency, they may operate down to ambient temperatures of -20°C and produce hot water up to 65°C. The units are available in 2-pipe (P2S, P2U), version 2 + 2 pipe (P4S), and in version 4 pipe (P4U).

The units P2U are not able to produce sanitary hot water, the P2S versions are able to produce domestic hot water through the activation of an external 3-way valve (not supplied), while P4S versions and P4U too are able to produce hot water regardless of the mode unit is operating, through the activation of a specific refrigerating circuit. All models are equipped with reverse cycle valve for winter defrost mode, RV versions are also able to produce cold water in summer (not available for HH version).

The noise level is extremely contained thanks to the use of a special floating system vibration damping that enables a reduction in terms of noise about 10-12 db (A) of compressors side and the fans in the combination with the specific number of turns extremely low (about 450 rpm).

VERSIONS

- HH** Heating only.
- RV** Reversible heating/cooling.
- NN** Ultra low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.
- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with domestic hot water production.

ACCESSORIES

- DSSE** Electronic soft starter.
- INSE** Serial interface card RS485.
- KAVG** Rubber anti-vibration mountings.
- PCRL** Remote control panel.
- RAEV** User and recovery heat exchanger antifreeze kit.
- SGRS** Cascade control system via RS485.
- VTEE** Electronic thermostatic valve.
- VECE** High efficiency E.C. fans.

(NN/HH) Ultra low noise - Heating only version		252	302	452	502	602	752	852	1002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ^{(1) *}	kW	23,6	29,7	38,5	52,6	58,3	66,8	80,4	90,9
Total input power (EN14511) ^{(1) *}	kW	5,68	7,21	9,30	12,40	13,60	15,90	18,8	21,1
COP (EN14511) ^{(1) *}	W/W	4,15	4,12	4,13	4,25	4,28	4,20	4,27	4,3
Nominal waterflow	l/h	4100	5100	6600	9050	10000	11500	13800	15600
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2	68,0
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7	209,0
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7	123,7
Outdoor unit with double heat exchanger max airflow	m ³ /h	--	--	9000	18000	18000	18000	27000	27000
Outdoor unit with double heat exchanger input power	kW	--	--	0,23	0,46	0,46	0,46	0,69	0,69
Outdoor unit with single heat exchanger max airflow	m ³ /h	9000	9000	10000	16000	21000	21000	32000	32000
Outdoor unit with single heat exchanger input power	kW	0,23	0,23	0,18	0,52	0,57	0,57	1,05	1,05
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Sound power indoor unit ⁽³⁾	dB (A)	57	57	58	58	59	59	60	60
Sound pressure indoor unit ⁽⁴⁾	dB (A)	47	47	48	48	49	49	50	50
Sound power outdoor unit with double heat exchang. ⁽³⁾	dB (A)	--	--	55	58	58	58	60	60
Sound pressure outdoor unit with double heat exchang. ⁽⁵⁾	dB (A)	--	--	29	30	31	31	32	32
Sound power outdoor unit with single heat exchanger ⁽³⁾	dB (A)	55	55	64	67	68	68	70	70
Sound pressure outdoor unit with single heat exchanger ⁽⁵⁾	dB (A)	29	29	36	39	40	40	42	42

(NN/RV) Ultra low noise - Reversible version		252	302	452	502	602	752	852	1002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ^{(1) *}	kW	23,6	29,7	38,5	52,6	58,3	66,8	80,4	90,9
Total input power (EN14511) ^{(1) *}	kW	5,68	7,21	9,30	12,40	13,60	15,90	18,8	21,1
COP (EN14511) ^{(1) *}	W/W	4,15	4,12	4,13	4,25	4,28	4,20	4,27	4,3
Nominal waterflow	l/h	4100	5100	6600	9050	10000	11500	13800	15600
Cooling capacity (EN14511) ^{(2) *}	kW	21,4	26,5	35,6	45,7	53,5	61,1	69,0	79,3
Total input power (EN14511) ^{(2) *}	kW	8,1	10,5	14,1	16,2	18,6	22,5	22,9	26,0
EER (EN14511) ^{(2) *}	W/W	2,64	2,51	2,52	2,82	2,87	2,71	3,01	3,05
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2	68,0
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7	209,0
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7	123,7
Outdoor unit with double heat exchanger max airflow	m ³ /h	--	--	9000	18000	18000	18000	27000	27000
Outdoor unit with double heat exchanger input power	kW	--	--	0,23	0,46	0,46	0,46	0,69	0,69
Outdoor unit with single heat exchanger max airflow	m ³ /h	9000	9000	10000	16000	21000	21000	32000	32000
Outdoor unit with single heat exchanger input power	kW	0,23	0,23	0,18	0,52	0,57	0,57	1,05	1,05
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Sound power indoor unit ⁽³⁾	dB (A)	57	57	58	58	59	59	60	60
Sound pressure indoor unit ⁽⁴⁾	dB (A)	47	47	48	48	49	49	50	50
Sound power outdoor unit with double heat exchang ⁽³⁾	dB (A)	--	--	55	58	58	58	60	60
Sound pressure outdoor unit with double heat exchang ⁽⁵⁾	dB (A)	--	--	29	30	31	31	32	32
Sound power outdoor unit with single heat exchanger ⁽³⁾	dB (A)	55	55	64	67	68	68	70	70
Sound pressure outdoor unit with single heat exchanger ⁽⁵⁾	dB (A)	29	29	36	39	40	40	42	42

Performances are referred to the following conditions:

(1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2) Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions only).

(3) Sound power level according to ISO 9614.

* Data referred to outdoor unit with double heat exchanger.

(4) Sound pressure level at 1 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(5) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, in accordance with ISO 9614.

FRAME

All WZT units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations). The circuit also includes an AISI316 stainless steel heat exchanger that is used as an economizer plus an additional expansion valve for refrigerant vapour injection.

COMPRESSORS

Scroll compressors equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. E.V.I. stands for "Economised Vapour Injection." The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve. The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated. The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main

volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. The compressors are connected in tandem, they are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0.1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

E.C. FANS

The fans are axial type with high performance aerofoil blades, the impeller is made of galvanized sheet galvanized, painted with polyurethane powder, to ensure a high protection in aggressive and severe environments. The impeller mounted directly on DC-brushless motor with external rotor, to ensure ideal cooling of the engine and a total absence of losses of the transmission. Impeller dynamically balanced in class 6.3 according to ISO 1940. Engine brushless-DC permanent magnet high

efficiency electronic switching unit (driver) separate. Continuous speed variation with voltage signal 0-10 V, PFC integrated protection "burn out" (excessive drop in voltage), fully IP54 driver, serial interface with Modbus RTU communication protocol. The maximum rotation speed of the motor is 450 rpm to guarantee an extremely low noise level.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/winter change over. The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors.

The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over and general alarm. For all three phase units, a sequence relay that disables the power supply in the event that the phase sequence is incorrect

(scroll compressors can be damaged if they rotate in the wrong direction), is fitted as standard.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return user water temperature sensor, antifreeze

protection sensor installed on the user outlet water temperature, return and supply, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection, pressure transducer (used to optimize the defrost cycle and

the fan speed depending on the ambient conditions), flow switch.

VERSIONS

VERSION P2U

This is a two pipe version that can produce hot water for heating and cold water for cooling. The unit is used with two pipe water based change-over systems. It is not able to produce domestic hot water.

VERSION P2S

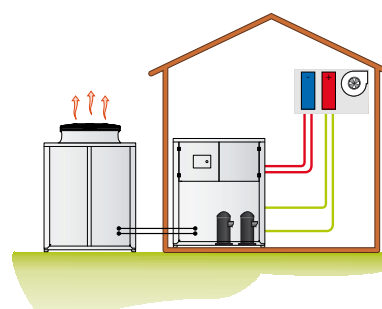
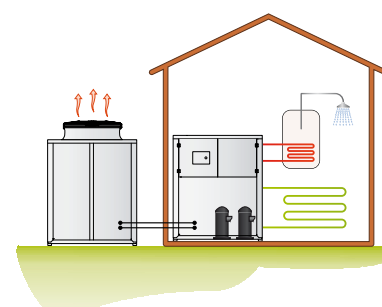
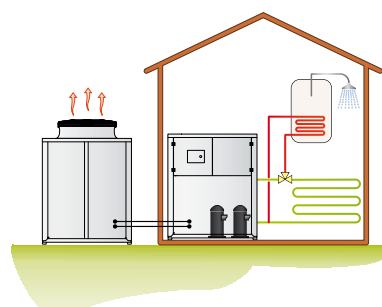
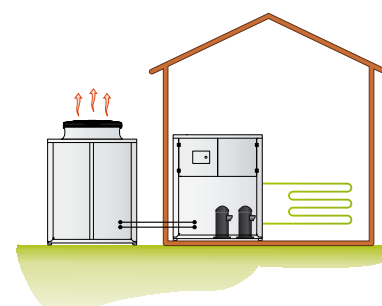
This is a two pipe version that can, in addition to producing hot water for heating and cold water for cooling, also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems.

VERSION P4S

This is a four pipe version that can produce hot water for heating, cold water for cooling and domestic hot water in all operational modes using an independent water circuit. When cooling, DHW generation is by heat recovery. This unit is normally used with two pipe water based change-over systems with the DHW circuit being separate.

VERSION P4U

This is a four pipe version that provides a modern approach to four pipe water based systems. Instead of using a boiler and chiller, this unit can generate hot water in one circuit, cold water in the other circuit either individually or simultaneously. When operating in simultaneous mode the heating capacity is equal to the cooling duty plus the power input to the compressors. The operating efficiency in this mode is extremely high. Domestic hot water production for this version is not available.

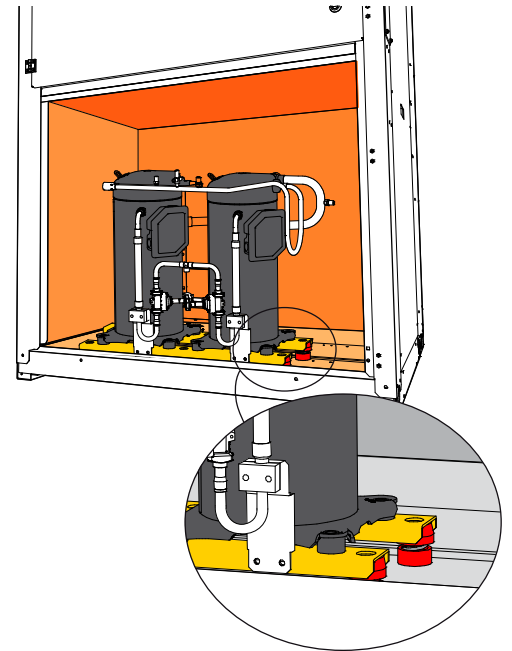


WZT

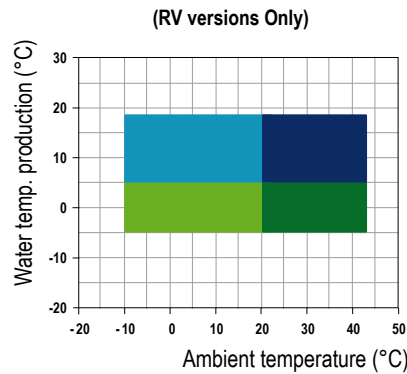
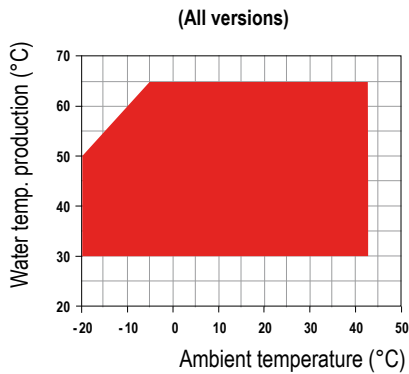
NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized

steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).



OPERATION LIMITS



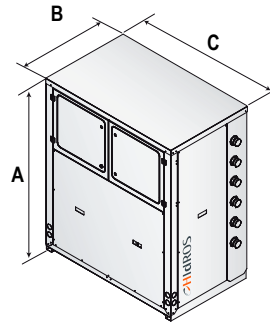
- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

WZT NN Model	Code	252	302	452	502	602	752	852	1002
Main switch		●	●	●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●	●	●
Flow switch		●	●	●	●	●	●	●	●
Evap/cond pressure control by transducer and fan speed control		●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation		●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●
Floating frame technology		●	●	●	●	●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●	●	●	●	●
High efficiency E.C. fans ultra low noise version	VECE	●	●	●	●	●	●	●	●
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV2/4	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

WZT - INDOOR UNIT

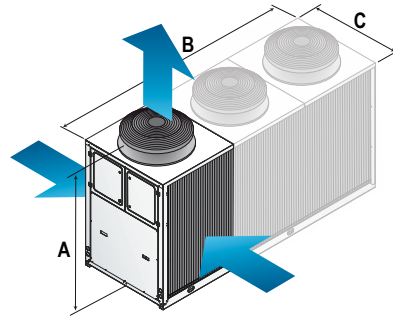
Mod.	A(mm)	B(mm)	C(mm)	Kg
252	1580	800	1300	510
302	1580	800	1300	515
452	1580	800	1300	535
502	1580	800	1300	560
602	1580	800	1300	580
752	1580	800	1300	585
852	1580	800	1300	590
1002	1580	800	1300	600



WZT

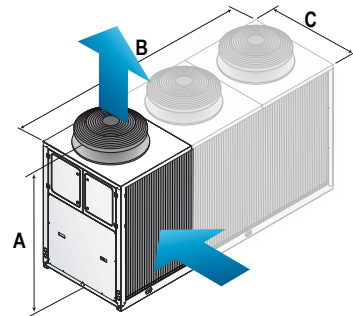
EVR - OUTDOOR UNIT WITH DOUBLE HEAT EXCHANGER AND VERTICAL AIRFLOW

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	--	--	--	--	--
302	--	--	--	--	--
452	1	1820	1450	1150	250
502	2	1820	2150	1150	350
602	2	1820	2150	1150	350
752	2	1820	2150	1150	350
852	3	1820	3150	1150	460
1002	3	1820	3150	1150	460



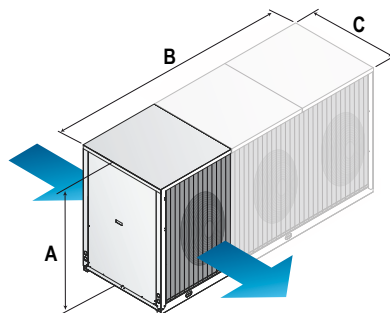
EVV - OUTDOOR UNIT WITH SINGLE HEAT EXCHANGER AND VERTICAL AIRFLOW

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	1	1820	1450	1150	230
302	1	1820	1450	1150	230
452	2	1820	2150	1150	310
502	3	1820	3150	1150	420
602	3	1820	3150	1150	420
752	3	1820	3150	1150	420
852	4	1820	4150	1150	560
1002	4	1820	4150	1150	560



EVH - OUTDOOR UNIT WITH SINGLE HEAT EXCHANGER AND HORIZONTAL AIRFLOW

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	1	1580	1450	1150	230
302	1	1580	1450	1150	230
452	2	1580	2150	1150	310
502	3	1580	3150	1150	420
602	3	1580	3150	1150	420
752	3	1580	3150	1150	420
852	4	1580	4150	1150	560
1002	4	1580	4150	1150	560



XHA

High efficiency air to water split system heat pumps



R410A

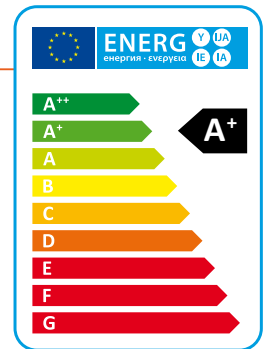
-20°C

+43°C

+60°C

E.C.

FLOATING FRAME



XHA

The air/water heat XHA series pumps are supplied in two sections connected to each other through refrigerant lines, installing the compressor in the outdoor section. The units are designed for installations where it is not possible to use glycol in the hydraulic circuit or there is the real possibility of damage due to frost. All hydraulic components are present in the indoor unit, installed in the technical room. The units are designed specifically to have the best possible efficiency in heating mode, they may operate down to external temperatures of -20 °C and produce hot water up to a temperature of 60 °C. All models are supplied with reverse cycle valve for the winter defrost function; HH versions are designed only for the heating mode, while the RV versions are also able to produce chilled water. The units are also available in the P2S and P2U configurations. The P2S versions are able to produce domestic hot water by the activation of a 3-way valve installed in the indoor unit, not available for versions P2U. All models are suitable for use in those countries that have support schemes for use of heat pump technology for heating. The outdoor unit noise is extremely low thanks to the use of a special floating system vibration damping that allows a reduction of about 10-12 dB of noise (A) with respect to traditional units (optional).

VERSIONS

- HH Heating only.
- RV Reversible heating/cooling.
- LS Low noise.
- XL Super low noise.
- P2U 2 pipe systems without domestic hot water production.
- P2S 2 pipe systems with domestic hot water production.

ACCESSORIES

- A1NT Hydraulic kit with one pump without tank.
- A2NT Hydraulic kit with two pump without tank.
- DSSE Electronic soft starter.
- INSE Serial interface card RS485.
- KAVG Rubber anti-vibration mountings.
- KP Hydraulic circuit antifreeze kit.
- PCRL Remote control panel.
- RAEV User and recovery heat exchanger antifreeze kit.
- SGRS Cascade control system via RS485.
- SODP Unit performance optimizer.
- VECC High static pressure E.C. fans.
- VECE E.C. fans.
- VTEE Electronic thermostatic valve.

(LS/HH) Low noise - Heating only version		252	302	402	452	502	602	702	802
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,4	34,2	40,2	48,1	56,6	65,1	74,7	82,0
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,8	8,9	11,5	12,9	14,5	17,4	19,1
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,50	4,20	4,40	4,50	4,30	4,30
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2
Max air flow in heating mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000
Fans	n°	2	2	2	1	1	1	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	75	75	75	78	78	78	80	80
Max sound pressure level in heating mode ⁽³⁾	dB (A)	47	47	47	50	50	50	52	52

(LS/HH) Low noise - Heating only version		902	1002	1202	1402	1602	1802	2002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	99,5	112,1	123,7	143,9	158,3	177,1	192,1
Total input power (EN14511) ⁽¹⁾	kW	22,6	25,5	28,1	33,5	36,8	41,2	45,7
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,40	4,30	4,30	4,30	4,20
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	75,6	81,6	87,6	99,9	108,4	125,3	142,2
Peak current standard unit	A	215,6	266,6	272,6	323,4	331,9	359,3	386,8
Peak current standard unit with soft starter (optional)	A	129,4	160,0	163,6	194,0	199,1	215,6	232,1
Max air flow in heating mode	m ³ /h	42000	42000	42000	62000	62000	62000	62000
Fans	n°	2	2	2	3	3	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	81	81	81	84	84	84	84
Max sound pressure level in heating mode ⁽³⁾	dB (A)	53	53	53	56	56	56	56

Performances are referred to the following conditions:

(1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2) Sound power level in accordance with ISO 9614.

(3) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/HH) Super low noise - Heating only version		252	302	402	452	502	602	702	802
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	24,8	34,2	39,3	47,5	55,5	66,2	73,5	80,5
Total input power (EN14511) ⁽¹⁾	kW	5,9	7,9	9,3	11,2	12,6	15,0	16,6	18,2
COP (EN14511) ⁽¹⁾	W/W	4,22	4,32	4,22	4,22	4,42	4,42	4,42	4,42
Power supply	V/Ph/Hz	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2
Max air flow in heating mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000
Fans	n°	2	1	1	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	70	70	72	72	72	74	74	74
Max sound pressure level in heating mode ⁽³⁾	dB (A)	42	42	44	44	44	46	46	46

(XL/HH) Super low noise - Heating only version		902	1002	1202	1402	1602	1802	2002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	97,5	109,4	127,0	141,8	154,5	171,8	204,1
Total input power (EN14511) ⁽¹⁾	kW	22,1	24,8	28,8	32,1	35,8	39,8	46,2
COP (EN14511) ⁽¹⁾	W/W	4,42	4,42	4,42	4,42	4,32	4,32	4,42
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	75,6	81,6	87,6	99,9	108,4	125,3	142,2
Peak current standard unit	A	215,6	266,6	272,6	323,4	331,9	359,3	386,8
Peak current standard unit with soft starter (optional)	A	129,4	160,0	163,6	194,0	199,1	215,6	232,1
Max air flow in heating mode	m ³ /h	38000	38000	48000	48000	48000	48000	62000
Fans	n°	2	2	3	3	3	3	4
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽²⁾	dB (A)	79	79	76	76	76	76	78
Max sound pressure level in heating mode ⁽³⁾	dB (A)	51	51	48	48	48	48	50

Performances are referred to the following conditions:

(1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2) Sound power level in accordance with ISO 9614.

(3) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(LS/RV) Low noise - Reversible version		252	302	402	452	502	602	702	802
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	25,4	34,2	40,2	48,1	56,6	65,1	74,7	82,0
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,8	8,9	11,5	12,9	14,5	17,4	19,1
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,50	4,20	4,40	4,50	4,30	4,30
Cooling capacity (EN14511) ⁽²⁾	kW	19,2	26,8	31,1	39,2	45,2	52,0	62,9	69,1
Total input power (EN14511) ⁽²⁾	kW	7,0	9,4	11,7	13,7	15,8	18,2	20,5	22,5
EER (EN14511) ⁽²⁾	W/W	2,76	2,86	2,65	2,86	2,86	2,86	3,07	3,07
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2
Max air flow in heating mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000
Max air flow in cooling mode	m ³ /h	9600	9600	12200	21000	21000	21000	42000	42000
Fans	n°	2	2	2	1	1	1	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	75	75	75	78	78	78	80	80
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	47	47	47	50	50	50	52	52
Max sound power level in cooling mode ⁽³⁾	dB (A)	75	75	75	78	78	78	80	80
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	47	47	47	50	50	50	52	52

(LS/RV) Low noise - Reversible version		902	1002	1202	1402	1602	1802	2002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	99,5	112,1	123,7	143,9	158,3	177,1	192,1
Total input power (EN14511) ⁽¹⁾	kW	22,6	25,5	28,1	33,5	36,8	41,2	45,7
COP (EN14511) ⁽¹⁾	W/W	4,40	4,40	4,40	4,30	4,30	4,30	4,20
Cooling capacity (EN14511) ⁽²⁾	kW	79,6	89,1	97,7	113,8	128,1	141,6	153,5
Total input power (EN14511) ⁽²⁾	kW	26,8	31,1	35,4	38,3	43,2	49,5	57,9
EER (EN14511) ⁽²⁾	W/W	2,97	2,86	2,76	2,97	2,97	2,86	2,65
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	75,6	81,6	87,6	99,9	108,4	125,3	142,2
Peak current standard unit	A	215,6	266,6	272,6	323,4	331,9	359,3	386,8
Peak current standard unit with soft starter (optional)	A	129,4	160,0	163,6	194,0	199,1	215,6	232,1
Max air flow in heating mode	m ³ /h	42000	42000	42000	62000	62000	62000	62000
Max air flow in cooling mode	m ³ /h	42000	42000	42000	62000	62000	62000	62000
Fans	n°	2	2	2	3	3	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	81	81	81	84	84	84	84
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	53	53	53	56	56	56	56
Max sound power level in cooling mode ⁽³⁾	dB (A)	81	81	81	84	84	84	84
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	53	53	53	56	56	56	56

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/RV) Super low noise - Reversible version		252	302	402	452	502	602	702	802
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	24,8	34,2	39,3	47,5	55,5	66,2	73,5	80,5
Total input power (EN14511) ⁽¹⁾	kW	5,9	7,9	9,3	11,2	12,6	15,0	16,6	18,2
COP (EN14511) ⁽¹⁾	W/W	4,22	4,32	4,22	4,22	4,42	4,42	4,42	4,42
Cooling capacity (EN14511) ⁽²⁾	kW	18,6	27,8	29,9	38,1	43,7	54,9	60,6	65,9
Total input power (EN14511) ⁽²⁾	kW	7,0	9,4	11,3	13,8	15,3	17,3	19,7	22,2
EER (EN14511) ⁽²⁾	W/W	2,65	2,97	2,65	2,76	2,86	3,18	3,07	2,97
Power supply	V/Ph/Hz	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	18,5	24,8	33,4	35,8	45,8	47,8	57,6	69,6
Peak current standard unit	A	53,2	77,5	93,4	114,8	135,8	143,8	150,6	178,6
Peak current standard unit with soft starter (optional)	A	31,9	46,5	56,0	68,9	81,5	86,3	90,4	107,2
Max air flow in heating mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000
Max air flow in cooling mode	m ³ /h	7200	14000	14000	14000	17000	33000	33000	33000
Fans	n°	2	1	1	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	72	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	42	42	44	44	44	46	46	46
Max sound power level in cooling mode ⁽³⁾	dB (A)	70	70	72	72	72	74	74	74
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	42	42	44	44	44	46	46	46

(XL/RV) Super low noise - Reversible version		902	1002	1202	1402	1602	1802	2002
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	97,5	109,4	127,0	141,8	154,5	171,8	204,1
Total input power (EN14511) ⁽¹⁾	kW	22,1	24,8	28,8	32,1	35,8	39,8	46,2
COP (EN14511) ⁽¹⁾	W/W	4,42	4,42	4,42	4,42	4,32	4,32	4,42
Cooling capacity (EN14511) ⁽²⁾	kW	76,8	87,7	101,0	109,4	121,7	132,4	155,8
Total input power (EN14511) ⁽²⁾	kW	26,8	30,6	32,9	38,2	42,5	50,0	54,4
EER (EN14511) ⁽²⁾	W/W	2,86	2,86	3,07	2,86	2,86	2,65	2,86
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	75,6	81,6	87,6	99,9	108,4	125,3	142,2
Peak current standard unit	A	215,6	266,6	272,6	323,4	331,9	359,3	386,8
Peak current standard unit with soft starter (optional)	A	129,4	160,0	163,6	194,0	199,1	215,6	232,1
Max air flow in heating mode	m ³ /h	38000	38000	48000	48000	48000	48000	62000
Max air flow in cooling mode	m ³ /h	38000	38000	48000	48000	48000	48000	62000
Fans	n°	2	2	3	3	3	3	4
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽³⁾	dB (A)	79	79	76	76	76	76	78
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	51	51	48	48	48	48	50
Max sound power level in cooling mode ⁽³⁾	dB (A)	79	79	76	76	76	76	78
Max sound pressure level in cooling mode ⁽⁴⁾	dB (A)	51	51	48	48	48	48	50

Performances are referred to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.

(2)Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).

(3)Sound power level in accordance with ISO 9614.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations).

COMPRESSORS

The compressors used are a high performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle when the source temperature is low. In all units the compressors are connected in tandem.

The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans. All heat exchangers are supplied standard with fins hydrophilic coating.

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for anti-freeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335.

They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors, in LS versions are 6 poles type rotating at approximately 900 rpm. In the XL versions the fans are 8 poles type (approx 600 rpm). As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset.

The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over. The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it

to connect to a site BMS system thus enabling remote control and management.

The technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions SW6), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

INDOOR UNIT

The indoor unit is made of galvanized steel frame, painted with polyurethane powder enamel at 180° C, RAL 9018. The indoor unit includes the plate heat exchanger user circuit, made of stainless steel AISI 316. The use of this kind of heat exchangers allows a massive reduction of the refrigerant charge of the unit compared to shell and tube models, and also a reduction of the size of the machine.

The exchangers are factory insulated with

flexible close cell material and can be equipped with antifreeze heater (optional). Each heat exchanger is provided with a temperature sensor as antifreeze protection. The P2S versions are also equipped with complete user circuit circulation pump (single or double) and three-way diverting valve for domestic hot water production.

The P2U versions are not able to produce hot water and are therefore supplied without the three-way diverter valve.

The indoor unit is also supplied with electri-

cal panel with main switch and the display with graphical user interface.

VERSIONS

VERSION P2U

This is a two pipe version that can produce hot water for heating (HH heating only) and hot or cold water in the RV version. The RV is used with two pipe water based change-over systems. The outdoor unit is combined to an indoor module supplied with primary hydraulic circuit water pump. This version is not able to produce domestic hot water.

VERSION P2S

This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems. The outdoor unit is combined to an indoor module supplied with primary hydraulic circuit water pump and three port diverting valve.

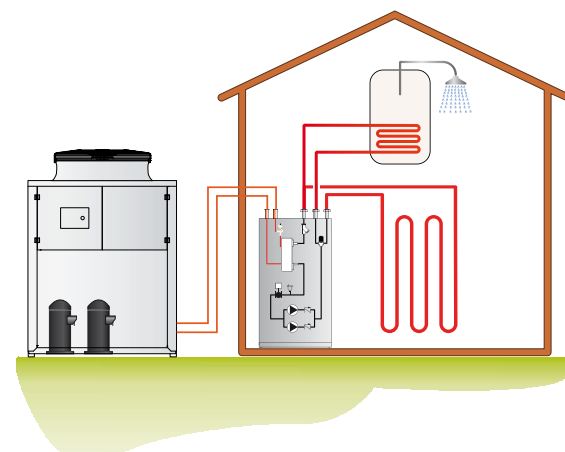
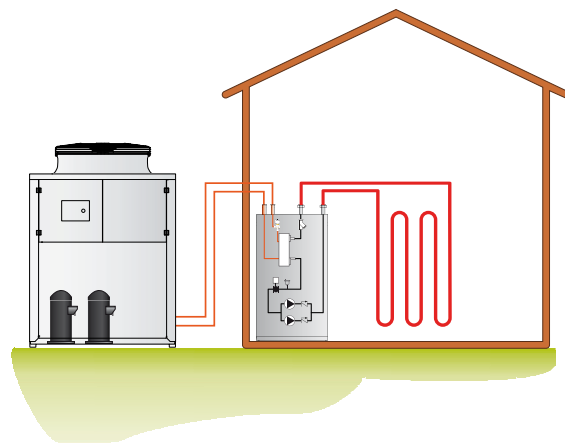
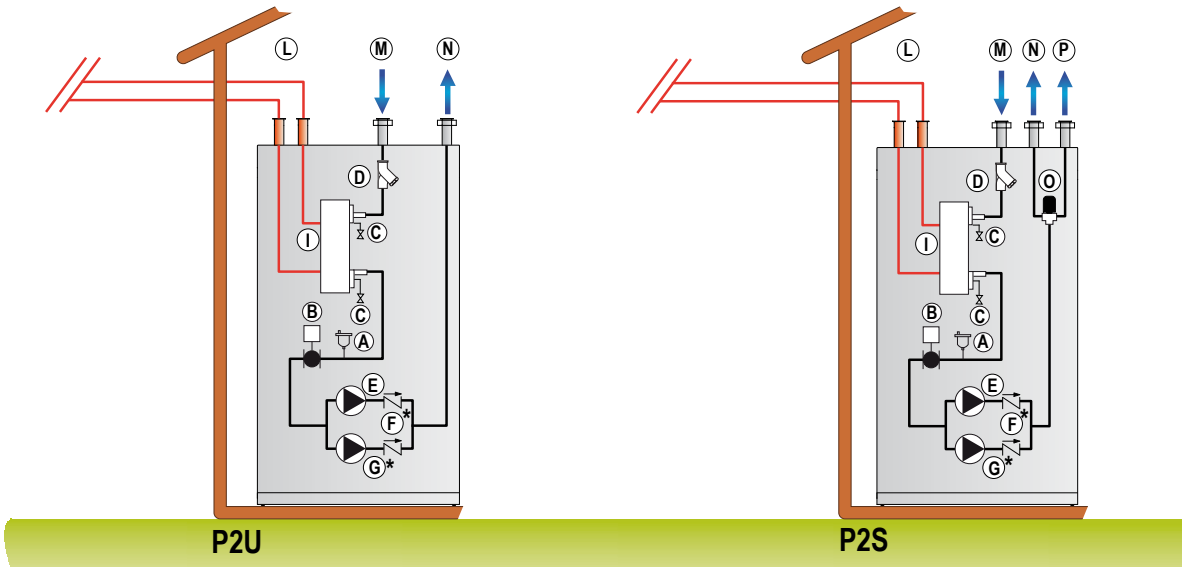


DIAGRAM INDOOR UNIT

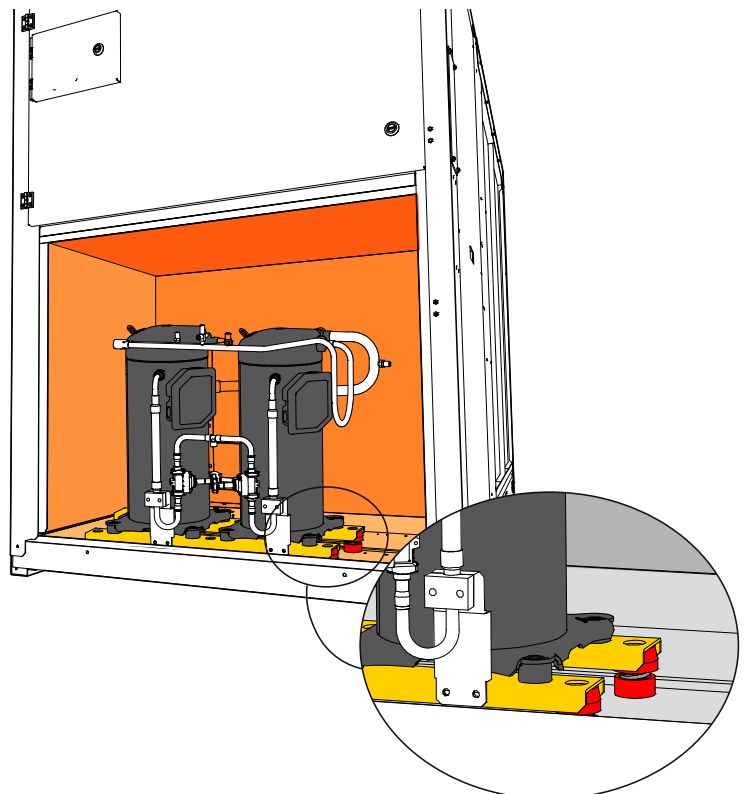


Legend

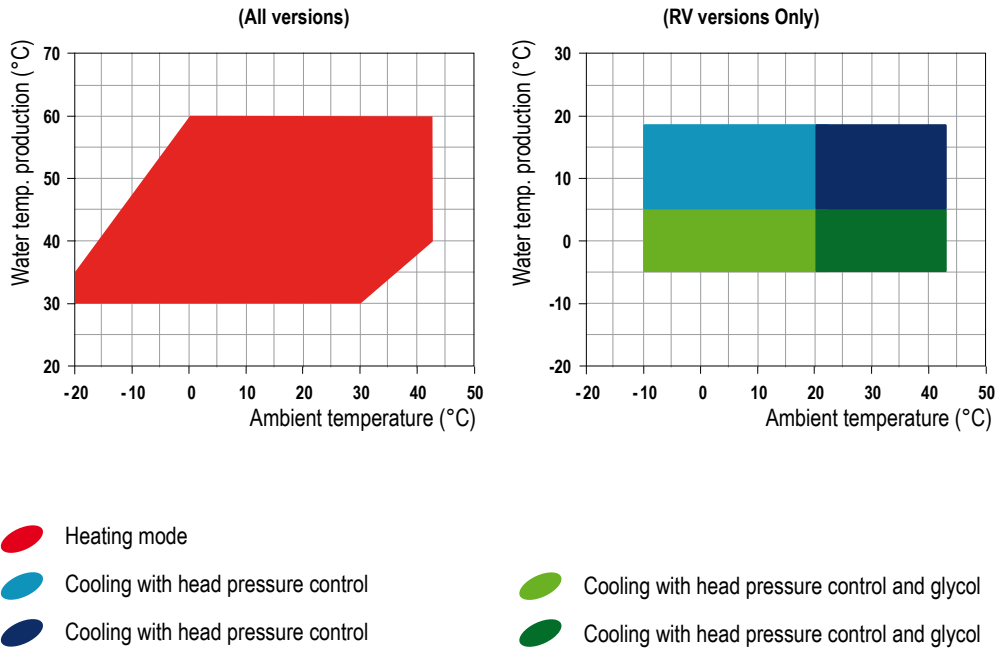
A	Vent Valve	F	One way valve	N	User circuit supply
B	Flow Switch	G	Water Pump	O	Diverting On/Off valve for domestic hot water
C	Drainage valve	I	User heat exchangers	P	Supply Domestic hot water circuit
D	Water Strainer	L	Refrigerant lines	*	Optional
E	Water Pump	M	User circuit return		

NOISE REDUCTION

All units in XL version are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).



OPERATION LIMITS



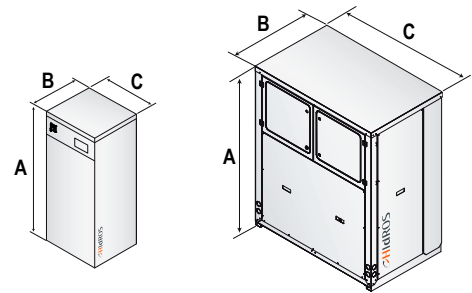
XHA Model	Code	252-402	452-602	702-1202	1402-2002
Flow switch		●	●	●	●
User water strainer		●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●
Specific software for operation priorities		●	●	●	●
Remote ON/OFF digital input		●	●	●	●
Summer/Winter digital input		●	●	●	●
Floating frame technology	LS	–	–	–	–
Floating frame technology	XL	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●
3 way ON/OFF valve DHW production	P2S	●	●	●	●
3 way ON/OFF valve DHW production	P2U	–	–	–	–
E.C. fans (LS versions)	VECE	○	○	○	○
E.C. fans (XL versions)	VECE	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	●	●	●	●
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○	○	○
User heat exchanger antifreeze kit	RAEV2	○	○	○	○
Outdoor unit rubber anti-vibration mountings	KAVG	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○

● Standard, ○ Optional, – Not available.

XHA - INDOOR UNIT

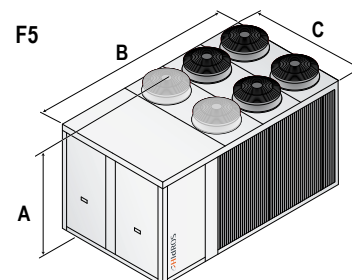
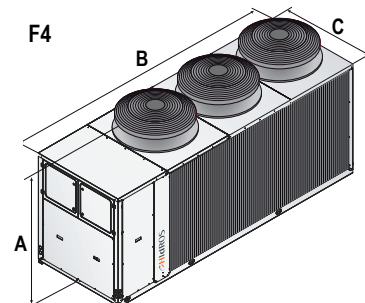
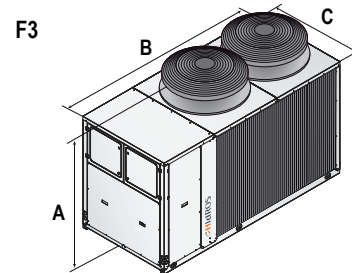
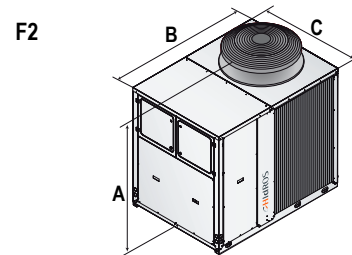
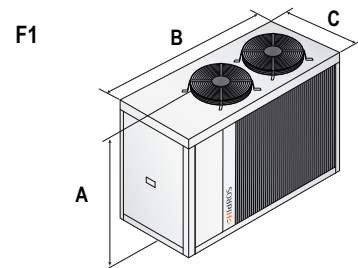
Mod.	A(mm)	B(mm)	C(mm)
252	900	600	600
302	900	600	600
452	900	600	600
502	900	600	600
602	900	600	600
702	900	600	600
802	900	600	600

Mod.	A(mm)	B(mm)	C(mm)
902	1580	800	1150
1002	1580	800	1150
1202	1580	800	1150
1402	1580	800	1150
1602	1580	800	1150
1802	1580	800	1150
2002	1580	800	1150



XHA - OUTDOOR UNIT - LS VERSION

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/LS	F1	2	1470	1900	880	540
302/LS	F1	2	1470	1900	880	550
402/LS	F1	2	1470	1900	880	570
452/LS	F2	1	1820	2200	1150	760
502/LS	F2	1	1820	2200	1150	780
602/LS	F2	1	1820	2200	1150	810
702/LS	F3	2	1820	2900	1150	1100
802/LS	F3	2	1820	2900	1150	1120
902/LS	F3	2	1820	2900	1150	1140
1002/LS	F3	2	1820	2900	1150	1180
1202/LS	F3	2	1820	2900	1150	1210
1402/LS	F4	3	1820	3900	1150	1430
1602/LS	F4	3	1820	3900	1150	1510
1802/LS	F4	3	1820	3900	1150	1560
2002/LS	F4	3	1820	3900	1150	1590



XHA - OUTDOOR UNIT - XL VERSION

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	2	1470	1900	880	540
302/XL	F2	1	1820	2200	1150	730
402/XL	F2	1	1820	2200	1150	750
452/XL	F2	1	1820	2200	1150	760
502/XL	F2	1	1820	2200	1150	780
602/XL	F3	2	1820	2900	1150	1070
702/XL	F3	2	1820	2900	1150	1100
802/XL	F3	2	1820	2900	1150	1120
902/XL	F3	2	1820	2900	1150	1140
1002/XL	F3	2	1820	2900	1150	1180
1202/XL	F4	3	1820	3900	1150	1380
1402/XL	F4	3	1820	3900	1150	1430
1602/XL	F4	3	1820	3900	1150	1510
1802/XL	F4	3	1820	3900	1150	1560
2002/XL	F5	4	2350	4206	2210	2790

LWZ

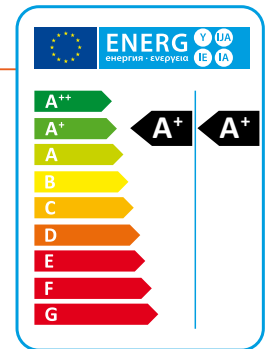
High efficiency HYBRID heat pumps with E.V.I compressor



R410A



C.O.P. ≥ 4,1



LWZ

The high efficiency hybrid heat pumps LWZ series have been specifically designed for application with radiant heating systems or for those applications where it is necessary to have maximum efficiency when heating. They have been optimized on heating mode, are able to produce water up to 65°C and can operate down to -20°C ambient temperature. LWZ units are available in 2 pipe, 2+2 pipe and 4 pipe versions. Some versions can produce domestic hot water, in the P2S version through the activation of an external 3-way-valve and in the P4S version by a separate heat exchanger and hydraulic circuit for the domestic hot water. All versions are supplied with reverse cycle valve used for winter defrost; the HH version is factory set and locked to operate only in heating mode whilst suitable for use in those countries that have support schemes for use of heat pump technology for heating. The main feature of LWZ units is that they have TWO heat exchangers on the source side (one air source, finned coil and the other a water plate type heat exchanger). The unit is primarily an air source heat pump but both source exchangers will work in series at low ambient conditions to maximize the operating efficiency of the unit. The COP will be superior to a standard air source heat pump. The RV versions are also able to produce cold water. The noise is extremely low thanks to the use of a special floating vibration damping system which allows a noise reduction of about 10-12 dB(A) (Optional).

VERSIONS

- HH** Heating only.
- RV** Reversible heating/cooling.
- XL** Super low noise.
- NN** Ultra low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.
- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with domestic hot water production.

ACCESSORIES

- A1NT** Hydraulic kit with one pump without tank.
- A1ZZ** Hydraulic kit with tank and one pump.
- A2NT** Hydraulic kit with two pump without tank.
- A2ZZ** Hydraulic kit with tank and two pump.
- DSSE** Electronic soft starter.
- INSE** Serial interface card RS485.
- KAVG** Rubber anti-vibration mountings.
- KP** Hydraulic circuit antifreeze kit.
- PCRL** Remote control panel.
- RAEV** User and recovery heat exchanger antifreeze kit.
- SGRS** Cascade control system via RS485.
- SODP** Unit performance optimizer.
- VECC** High static pressure E.C. fans.
- VECE** E.C. fans.
- VTEE** Electronic thermostatic valve.

(XL/HH) Super low noise - Heating only version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	16,6	21,2	27,5	34,2	41,9	48,3	53,5
Total input power (EN14511) ⁽¹⁾	kW	6,1	7,7	9,9	12,1	15,2	17,2	19,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,75	2,78	2,82	2,76	2,80	2,68
Heating capacity (EN14511) ⁽²⁾	kW	17,5	22,3	28,9	35,9	44,0	50,7	56,1
Total input power (EN14511) ⁽²⁾	kW	5,6	7,1	9,1	11,2	13,9	15,7	18,2
COP (EN14511) ⁽²⁾	W/W	3,12	3,14	3,17	3,21	3,17	3,22	3,08
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽⁵⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	42	42	44	44	46	46	46

(XL/RV) Super low noise - Reversible version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	16,6	21,2	27,5	34,2	41,9	48,3	53,5
Total input power (EN14511) ⁽¹⁾	kW	6,1	7,7	9,9	12,1	15,2	17,2	19,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,75	2,78	2,82	2,76	2,80	2,68
Heating capacity (EN14511) ⁽²⁾	kW	17,5	22,3	28,9	35,9	44,0	50,7	56,1
Total input power (EN14511) ⁽²⁾	kW	5,6	7,1	9,1	11,2	13,9	15,7	18,2
COP (EN14511) ⁽²⁾	W/W	3,12	3,14	3,17	3,21	3,17	3,22	3,08
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Cooling capacity (EN14511) ⁽³⁾	kW	22,4	27,7	36,7	46,2	54,7	62,8	71,0
Total input power (EN14511) ⁽³⁾	kW	7,3	9,1	11,9	15,1	17,8	20,6	23,2
EER (EN14511) ⁽³⁾	W/W	3,06	3,05	3,07	3,05	3,07	3,05	3,05
Cooling capacity (EN14511) ⁽⁴⁾	kW	23,5	29,1	38,5	48,5	57,4	65,9	74,6
Total input power (EN14511) ⁽⁴⁾	kW	7,0	8,7	11,4	14,5	17,0	19,7	22,2
EER (EN14511) ⁽⁴⁾	W/W	3,37	3,36	3,38	3,36	3,38	3,36	3,36
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Max air flow in cooling mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽⁵⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	42	42	44	44	46	46	46
Max sound power level in cooling mode ⁽⁵⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in cooling mode ⁽⁶⁾	dB (A)	42	42	44	44	46	46	46

Performance refer to the following conditions:

(1)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger not activated.

(2)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger activated.

(3)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger not activated.

(4)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger activated.

(5)Sound power level in accordance with ISO 9614.

(6)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(XL/HH) Super low noise - Heating only version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	61,0	72,3	99,2	106,3	120,9	138,5
Total input power (EN14511) ⁽¹⁾	kW	23,0	26,5	34,9	38,1	42,6	50,2
COP (EN14511) ⁽¹⁾	W/W	2,65	2,73	2,84	2,79	2,84	2,76
Heating capacity (EN14511) ⁽²⁾	kW	64,0	75,9	104,1	111,6	127,0	145,4
Total input power (EN14511) ⁽²⁾	kW	21,0	24,2	31,9	34,8	38,9	45,8
COP (EN14511) ⁽²⁾	W/W	3,05	3,14	3,27	3,21	3,27	3,17
Integration water supply	l/h	3300	4000	5400	5800	6600	7600
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Max sound power level in heating mode ⁽⁵⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	51	51	49	51	52	52

(XL/RV) Super low noise - Reversible version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	61,0	72,3	99,2	106,3	120,9	138,5
Total input power (EN14511) ⁽¹⁾	kW	23,0	26,5	34,9	38,1	42,6	50,2
COP (EN14511) ⁽¹⁾	W/W	2,65	2,73	2,84	2,79	2,84	2,76
Heating capacity (EN14511) ⁽²⁾	kW	64,0	75,9	104,1	111,6	127,0	145,4
Total input power (EN14511) ⁽²⁾	kW	21,0	24,2	31,9	34,8	38,9	45,8
COP (EN14511) ⁽²⁾	W/W	3,05	3,14	3,27	3,21	3,27	3,17
Integration water supply	l/h	3300	4000	5400	5800	6600	7600
Cooling capacity (EN14511) ⁽³⁾	kW	79,4	90,0	126,0	140,0	165,0	186,0
Total input power (EN14511) ⁽³⁾	kW	26,9	30,7	41,8	49,1	52,5	64,1
EER (EN14511) ⁽³⁾	W/W	2,95	2,93	3,01	2,85	3,14	2,90
Cooling capacity (EN14511) ⁽⁴⁾	kW	83,4	94,5	132,3	147,0	173,3	195,3
Total input power (EN14511) ⁽⁴⁾	kW	25,7	29,3	40,0	46,9	50,2	61,2
EER (EN14511) ⁽⁴⁾	W/W	3,25	3,22	3,31	3,14	3,45	3,19
Integration water supply	l/h	3300	4000	5400	5800	6600	7600
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Max air flow in cooling mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Max sound power level in heating mode ⁽⁵⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	51	51	49	51	52	52
Max sound power level in cooling mode ⁽⁵⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in cooling mode ⁽⁶⁾	dB (A)	51	51	49	51	52	52

Performance refer to the following conditions:

(1)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger not activated.

(2)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger activated.

(3)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger not activated.

(4)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger activated.

(5)Sound power level in accordance with ISO 9614.

(6)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(NN/HH) Ultra low noise - Heating only version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	15,7	20,0	25,6	34,3	38,9	44,6	51,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,3	11,8	14,0	16,0	18,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,72	2,76	2,90	2,77	2,78	2,74
Heating capacity (EN14511) ⁽²⁾	kW	16,5	21,0	26,8	36,0	40,8	46,8	54,3
Total input power (EN14511) ⁽²⁾	kW	5,3	6,8	8,5	10,9	12,8	14,7	17,2
COP (EN14511) ⁽²⁾	W/W	3,12	3,10	3,15	3,31	3,19	3,20	3,15
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽⁵⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	38	38	38	40	40	40	41

(NN/RV) Ultra low noise - Reversible version		252	302	452	502	602	752	852
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A++	A+
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	A+	A+
Heating capacity (EN14511) ⁽¹⁾	kW	15,7	20,0	25,6	34,3	38,9	44,6	51,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,3	11,8	14,0	16,0	18,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,72	2,76	2,90	2,77	2,78	2,74
Heating capacity (EN14511) ⁽²⁾	kW	16,5	21,0	26,8	36,0	40,8	46,8	54,3
Total input power (EN14511) ⁽²⁾	kW	5,3	6,8	8,5	10,9	12,8	14,7	17,2
COP (EN14511) ⁽²⁾	W/W	3,12	3,10	3,15	3,31	3,19	3,20	3,15
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Cooling capacity (EN14511) ⁽³⁾	kW	21,4	26,5	35,6	45,7	53,5	61,1	69,0
Total input power (EN14511) ⁽³⁾	kW	8,1	10,5	14,1	16,2	18,6	22,5	22,9
EER (EN14511) ⁽³⁾	W/W	2,64	2,51	2,52	2,82	2,87	2,71	3,01
Cooling capacity (EN14511) ⁽⁴⁾	kW	22,5	27,8	37,4	48,0	56,2	64,2	72,5
Total input power (EN14511) ⁽⁴⁾	kW	7,7	10,1	13,5	15,5	17,8	21,5	21,9
EER (EN14511) ⁽⁴⁾	W/W	2,90	2,76	2,77	3,10	3,16	2,98	3,31
Integration water supply	l/h	950	1200	1500	1900	2300	2700	2900
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7
Max air flow in heating mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Max air flow in cooling mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Fans	n°	1	1	1	2	2	2	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Max sound power level in heating mode ⁽⁵⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	38	38	38	40	40	40	41
Max sound power level in cooling mode ⁽⁵⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in cooling mode ⁽⁶⁾	dB (A)	38	38	38	40	40	40	41

Performance refer to the following conditions:

(1)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger not activated.

(2)Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger activated.

(3)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger not activated.

(4)Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger activated.

(5)Sound power level in accordance with ISO 9614.

(6)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

(NN/HH) Ultra low noise - Heating only version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A+	A+	A++	A++	A+	--
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	--
Heating capacity (EN14511) ⁽¹⁾	kW	60,6	67,6	93,6	108,6	119,7	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,2	34,0	39,8	44,0	--
COP (EN14511) ⁽¹⁾	W/W	2,87	2,79	2,75	2,73	2,72	--
Heating capacity (EN14511) ⁽²⁾	kW	63,7	71,0	98,2	114,0	125,6	--
Total input power (EN14511) ⁽²⁾	kW	19,3	22,1	31,1	36,3	40,2	--
COP (EN14511) ⁽²⁾	W/W	3,30	3,21	3,16	3,14	3,13	--
Integration water supply	l/h	3300	4000	5400	5800	6600	--
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	--
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	--
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	--
Fans	n°	2	2	4	4	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Max sound power level in heating mode ⁽⁵⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	41	42	43	44	44	--

(NN/RV) Ultra low noise - Reversible version		1002	1202	1504	1704	2004	2404
Energy Class in low temperature - According to EU reg. 811/2013		A++	A++	A+	A+	A+	--
Energy Class in high temperature - According to EU reg. 811/2013		A+	A+	A+	A+	A+	--
Heating capacity (EN14511) ⁽¹⁾	kW	60,6	67,6	93,6	108,6	119,7	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,2	34,0	39,8	44,0	--
COP (EN14511) ⁽¹⁾	W/W	2,87	2,79	2,75	2,73	2,72	--
Heating capacity (EN14511) ⁽²⁾	kW	63,7	71,0	98,2	114,0	125,6	--
Total input power (EN14511) ⁽²⁾	kW	19,3	22,1	31,1	36,3	40,2	--
COP (EN14511) ⁽²⁾	W/W	3,30	3,21	3,16	3,14	3,13	--
Integration water supply	l/h	3300	4000	5400	5800	6600	--
Cooling capacity (EN14511) ⁽³⁾	kW	79,3	88,0	120,0	132,0	155,0	--
Total input power (EN14511) ⁽³⁾	kW	26,0	32,2	42,1	46,3	58,5	--
EER (EN14511) ⁽³⁾	W/W	3,05	2,73	2,85	2,85	2,65	--
Cooling capacity (EN14511) ⁽⁴⁾	kW	83,3	92,4	126,0	138,6	162,8	--
Total input power (EN14511) ⁽⁴⁾	kW	24,8	30,8	40,2	44,2	55,8	--
EER (EN14511) ⁽⁴⁾	W/W	3,36	3,00	3,14	3,14	2,92	--
Integration water supply	l/h	3300	4000	5400	5800	6600	--
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	--
Max input current standard unit	A	68,0	70,0	113,0	136,0	146,0	--
Peak current standard unit	A	209,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	123,7	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	27000	29000	44000	48000	60000	--
Max air flow in cooling mode	m ³ /h	27000	29000	44000	48000	60000	--
Fans	n°	3	3	4	6	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Max sound power level in heating mode ⁽⁵⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	41	42	43	44	44	--
Max sound power level in cooling mode ⁽⁵⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in cooling mode ⁽⁶⁾	dB (A)	41	42	43	44	44	--

Performance refer to the following conditions:

- (1) Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger not activated.
- (2) Heating: Ambient temperature -7°C DB, -8°C WB, water outlet temperature 35°C. Integrative source heat exchanger activated.
- (3) Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger not activated.
- (4) Cooling (RV versions Only): ambient temperature 35°C, water temperature 12/7°C. Integrative source heat exchanger activated.
- (5) Sound power level in accordance with ISO 9614.
- (6) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

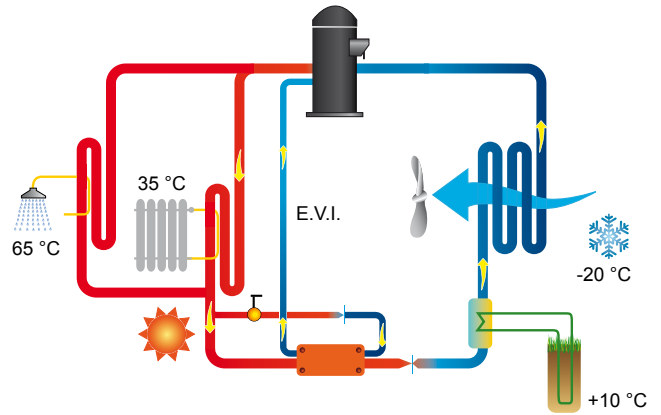
PRINCIPLE OF OPERATION

The use of the water source heat exchanger only in harsh environmental conditions, allows the unit to operate with the air source for most of the time, integrating the power missing with the water but also ensuring an extreme reduction of water consumption.

The applications of hybrid heat pumps are absolutely interesting in those cases where supplementary sources of different nature are available at lower cost. The integrated power from the water heat exchanger to water is about 30% of the power unit, in this way there are not needed high cost of adduction.

Some water sources used:

- Integrative source through the use of well water
- Integrative source through the use of geothermal
- Integrative source through the use of wastewater
- Integrative source through the use of solar panels.



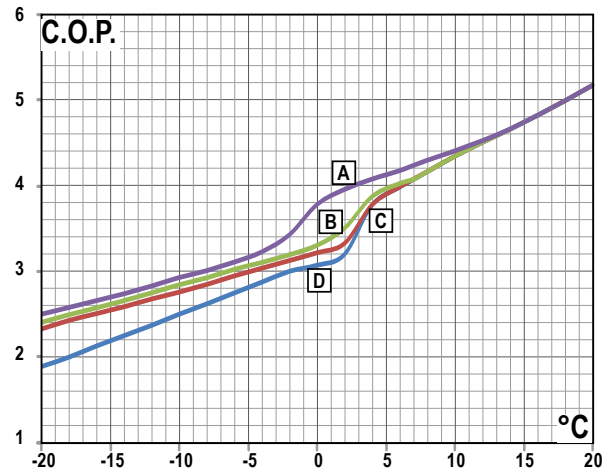
LWZ

PERFORMANCE COMPARISON C.O.P. IN HYBRID WWZ UNITS AND IN LZT UNIT.

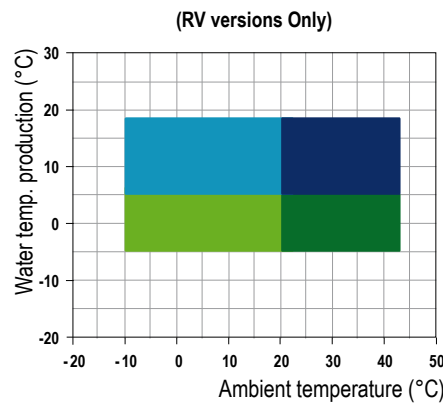
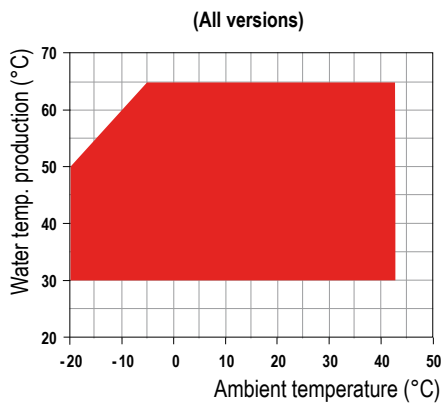
The graph shows the evolution of LWZ units C.O.P. (curves A, B, C) at different external temperatures (with user water produced at 35 °C), compared to a unit of equal power series LZT (curve D).

The curves A, B, C refer to different conditions of the water source and, in particular:

Curve A: 10/7 °C, Curve B: 3/0 °C, Curve C: 0/-3 °C. As can be seen the performance difference is always increased with decreasing outdoor temperature to fit to the maximum value in correspondence of -20°C outside.



OPERATION LIMITS



- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control

- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel.

The standard colour of the units is RAL9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations). The circuit also includes an AISI316 stainless steel heat exchanger that is used as an economizer plus an additional expansion valve for refrigerant vapour injection.

COMPRESSORS

Units use scroll compressors that are equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. E.V.I. stands for "Enhanced Vapour Injection." The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve. The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated.

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume

of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

The source heat exchanger is made from 3/8" copper pipes and 0,1mm thick aluminium fins with the tubes being mechanically expanded into the aluminium fins in order to maximise heat transfer. Furthermore, the design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise) fans.

USER HEAT EXCHANGERS + INTEGRATION

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

FANS

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via anti-vibration mountings. The electric motors are 8 poles type rotating at approximately 900 rpm. In the NN versions the fans are 12 poles type (approx 450 rpm). As standard, all

units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset. The control panel is supplied with display showing all operational icons. The microprocessor is set for automatic defrost (when operating in severe ambient conditions) and for summer/ winter change over.

The control also manages the anti-legionella program, the integration with other heating sources (electric heaters, boilers, solar panels etc), the operation of a three port modulating valve (for diverting to DHW or heating) and both the heating circuit pump and the domestic hot water circuit pump. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following

controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P4S and P4U), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening tech-

nique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

NOISE REDUCTION

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized

steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).

VERSIONS

HH heating only versions are available in the P2U, P2S and P4S configuration only.

VERSION P2U

This is a two pipe version that can produce hot water for heating (HH heating only) and hot or cold water in the RV version. The RV is used with two pipe water based change-over systems. It is not able to produce domestic hot water.

VERSION P2S

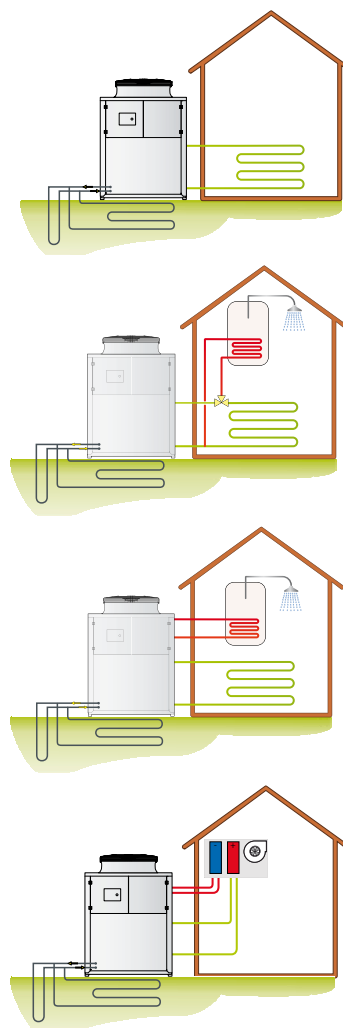
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production has priority irrespective of the mode of operation of the unit. The unit is normally used with two pipe water based change-over systems.

VERSION P4S

This is a four pipe version that can produce hot water for heating (HH version), hot and cold water for cooling and domestic hot water (only RV versions) in all operational modes using an independent water circuit. When cooling, DHW generation is by heat recovery. This unit is normally used with two pipe water based change-over systems with the DHW circuit being separate.

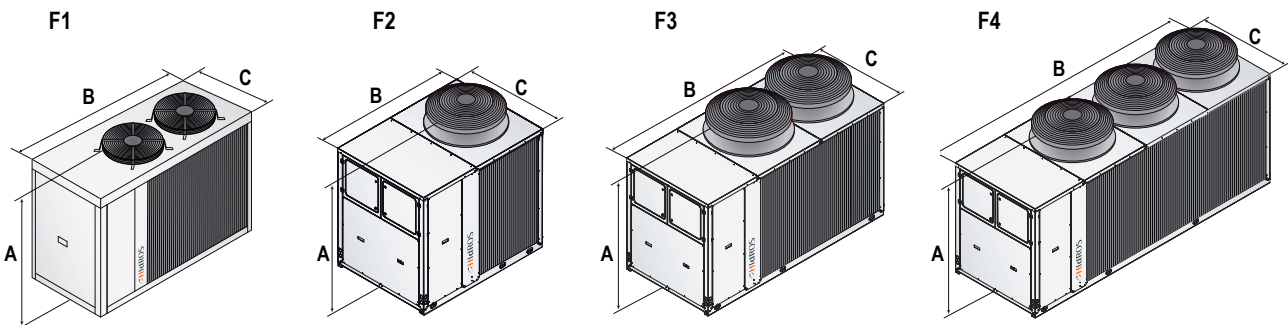
VERSION P4U

This is a four pipe version that provides a modern approach to four pipe water based systems. Instead of using a boiler and chiller, this unit can generate hot water in one circuit, cold water in the other circuit either individually or simultaneously. When operating in simultaneous mode the heating capacity is equal to the cooling duty plus the power input to the compressors. The operating efficiency in this mode is extremely high. Domestic hot water production for this version is not available.



LWZ Model	Code	252	302	452	502	602	752	852	1002
Flow switch		●	●	●	●	●	●	●	●
User water strainer		●	●	●	●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●
Floating frame technology	XL/NN	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●	●	●
E.C. fans (NN versions)	VECE	●	●	●	●	●	●	●	●
E.C. fans (XL versions)	VECE	○	○	○	○	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	-	-	○	○	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	-	-	○	○	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	-	-	○	○	○	○	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, - Not available.



Frame XL Version

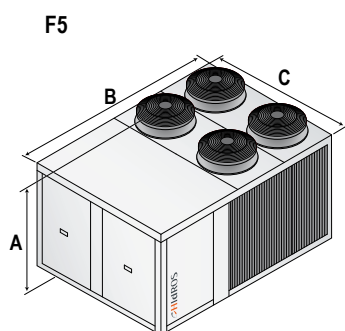
Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	2	1470	1900	880	330
302/XL	F1	2	1470	1900	880	340
452/XL	F2	1	1820	2200	1150	450
502/XL	F2	1	1820	2200	1150	490
602/XL	F3	2	1820	2900	1150	700
752/XL	F3	2	1820	2900	1150	760
852/XL	F3	2	1820	2900	1150	810
1002/XL	F3	2	1820	2900	1150	850
1202/XL	F3	2	1820	2900	1150	880

Frame NN Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/NN	F2	1	1820	2200	1150	430
302/NN	F2	1	1820	2200	1150	450
452/NN	F2	1	1820	2200	1150	470
502/NN	F3	2	1820	2900	1150	700
602/NN	F3	2	1820	2900	1150	760
752/NN	F3	2	1820	2900	1150	790
852/NN	F4	3	1820	3900	1150	1050
1002/NN	F4	3	1820	3900	1150	1140
1202/NN	F4	3	1820	3900	1150	1170

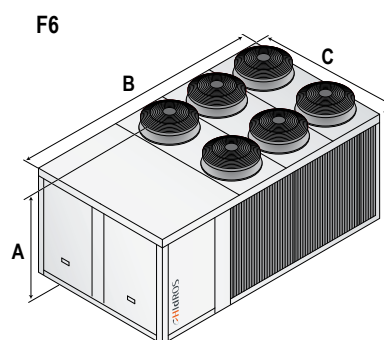
LWZ Model	Code	1202	1504	1704	2004	2404
Flow switch		●	●	●	●	●
User water strainer		●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Floating frame technology	XL/NN	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●
E.C. fans (NN versions)	VECE	●	●	●	●	●
E.C. fans (XL versions)	VECE	○	○	○	○	○
High static pressure E.C. fans	VECC	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○
Unit performance optimizer	SODP	○	○	○	○	○
Hydraulic kit with one pump with tank - user circuit	A1ZZU	○	○	○	○	○
Hydraulic kit with two pumps with tank - user circuit	A2ZZU	○	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	○	○	○	○	○
User and recovery heat exchanger antifreeze kit	RAEV2/4	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Hydraulic circuit antifreeze kit	KP	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Frame XL Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1504/XL	F5	4	1820	2900	2300	2480
1704/XL	F5	4	1820	2900	2300	2530
2004/XL	F6	6	1820	3900	2300	2720
2404/XL	F6	6	1820	3900	2300	2760

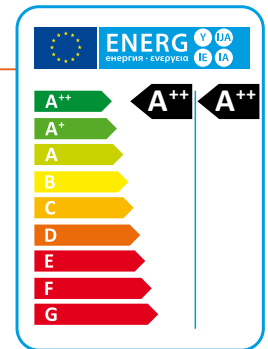
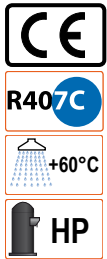


Frame NN Version

Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
1504/NN	F5	4	1820	2900	2300	2480
1704/NN	F6	6	1820	3900	2300	2690
2004/NN	F6	6	1820	3900	2300	2720
2404/NN	--	--	--	--	--	--

WZH

Ground source heat pumps



WZH

WZH heat pumps are particularly suitable for applications that utilise well water or ground source probes. These units have been designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating. They have been optimized on heating mode and are able to produce water up to 60°C.

WZH heat pumps are available in several versions. The most simple is a 2 pipe unit that can provide heating only. By fitting an external 3 port valve the unit can provide either heating or domestic hot water. There is also a 4 pipe unit that produces domestic hot water in a separate hydraulic circuit and can generate this irrespective of whether the unit is in heating or cooling mode. All the WZH units are also available in Free Cooling (FC) versions which provide low energy cooling by simply using the cool water that is available from either the ground source probes or the well water.

Differing versions and a wide range of accessories, enable the optimal solution to be selected.

VERSIONS

- Standard, heating only.
- RV Reversible heating/cooling.
- SW5 Heating only + domestic hot water circuit.
- RV/SW6 Reversible version heating/cooling with independent DHW circuit.
- FC Free cooling version (available in all versions).

ACCESSORIES

- DSSE Electronic soft starter.
- INSE Serial interface card RS485.
- KAVG Rubber anti-vibration mountings.
- KAVM Spring anti-vibration mountings.
- LS00 Low noise version.
- MAML Refrigerant circuit pressure gauges.
- PCRL Remote control panel.
- V2M0 2 way modulating valve to reduce source water consumption (4-20 mA; 0-10 V).

WZH - WZH/RV Model		05	07	09	11	13	15	20	30
Energy Class in low temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++
Energy Class in high temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	7,4	10,0	12,5	14,4	17,8	20,9	27,0	38,0
Input power (EN14511) ⁽¹⁾	kW	1,5	1,9	2,4	2,7	3,2	3,8	5,2	7,1
COP (EN14511) ⁽¹⁾	w/w	4,9	5,3	5,2	5,3	5,6	5,5	5,2	5,4
Heating capacity (EN14511) ⁽²⁾	kW	5,5	7,6	9,5	11,0	13,4	16,0	20,6	28,6
Input power (EN14511) ⁽²⁾	kW	1,4	1,7	2,3	2,5	3,0	3,5	4,7	6,3
COP (EN14511) ⁽²⁾	w/w	3,9	4,5	4,1	4,4	4,5	4,6	4,4	4,5
Cooling capacity (EN14511) ⁽³⁾	kW	8,2	11,1	13,9	15,9	19,8	22,8	29,0	41,9
Input power (EN14511) ⁽³⁾	kW	1,7	2,0	2,5	2,8	3,5	4,1	5,9	7,9
EER (EN14511) ⁽³⁾	w/w	4,8	5,6	5,6	5,7	5,7	5,6	4,9	5,3
Cooling capacity (EN14511) ⁽⁴⁾	kW	5,6	8,0	10,0	11,6	14,0	16,8	21,2	29,5
Input power (EN14511) ⁽⁴⁾	kW	1,5	1,7	2,3	2,6	3,1	3,7	5,2	6,7
EER (EN14511) ⁽⁴⁾	w/w	3,7	4,7	4,3	4,5	4,5	4,5	4,1	4,4
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Peak current	A	42,0	68,0	75,0	82,0	68,0	77,0	102,0	129,0
Maximum input current	A	10,0	13,3	16,5	19,6	12,0	14,1	18,2	21,4
Compressors / Circuits	n° / n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Sound power ⁽⁵⁾	dB(A)	51	52	52	53	54	54	60	60
Sound pressure ⁽⁶⁾	dB(A)	43	44	44	45	46	46	52	52

Performances are referred to the following conditions:

(1)Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 10/7°C. Unit without pressostatic valve.

(2)Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 0/-3°C. Unit without pressostatic valve, 10% glycol.

(3)Cooling: data are referred to unit with pressostatic valve: evaporator water in/out 23/18°C, condenser water temperature in/out 30/35°C.

(4)Cooling: data are referred to unit with pressostatic valve: evaporator water in/out 12/7°C, condenser water temperature in/out 30/35°C.

(5)Sound power in accordance with ISO 9614.

(6)Sound pressure level measured at 1 mt from the unit in free field conditions direction factor Q=2 in accordance with ISO 9614.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R407C. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. Each refrigerant circuit is totally independent from the other with the result that any fault or alarm condition on one circuit does not influence the other. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and con-

trol and pressure safety device (for compliance with PED regulations).

COMPRESSORS

The compressors used are a high performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle when the source temperature is low. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure thus enabling them to be maintained even if the unit is operating. Access to this enclosure is via the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE SIDE HEAT EXCHANGERS

The source side heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. It

has a single water side circuit. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type and increases the efficiency of the refrigerant cycle at part loads. The source heat exchangers are factory insulated with flexible close cell material and are provided with a temperature sensor for antifreeze protection.

USER SIDE HEAT EXCHANGERS

The user side heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. It has a single water side circuit. All units are supplied with a sub-cooler to enhance the performance of the refrigerant cycle. The user heat exchangers are factory insulated with flexible close cell material.

MICROPROCESSORS

All units are supplied as standard with mi-

microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, volt free contact for remote general alarm, alarms and operation LED's. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE

73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors.

The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over (reversible type only) and general alarm. For all three phase units, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), is fitted as standard.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return and supply user heat exchanger sensors, return and supply source heat exchanger sensors, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, pump thermal overload protection (when present), source heat exchanger flow switch.

VERSIONS

WZH/RV 2 PIPES VERSION

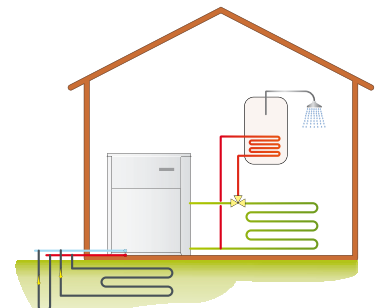
This version is capable of cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit.

WZH/RV/SW6 4 PIPES VERSION

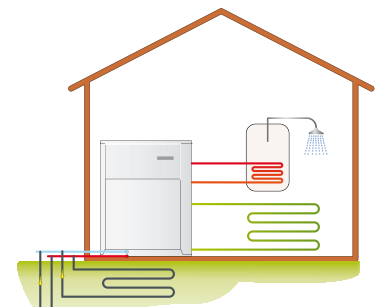
This version is supplied with 4 pipes on the user side and is able to produce simultaneously, hot and cold water on 2 independent hydraulic circuits. On this version, the domestic hot water production is independent of the operation mode of the unit.

FREE COOLING VERSION

These versions, in addition to the characteristics described previously, can produce cold water during summer operation using the cold water available from the source ground probes. All free cooling versions are supplied with an intermediate heat exchanger and a 3 way valve which modulates the water flow to the user circuit depending on the required user cold water temperature. During free cooling mode the compressors may be off or will operate partially to augment the free cooling available.



WZH/RV

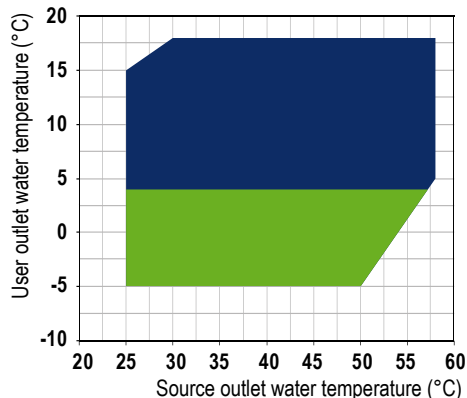
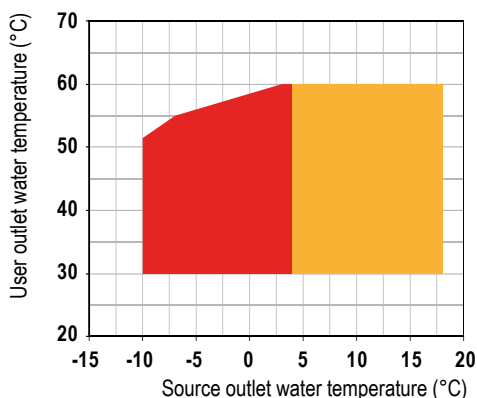


WZH/RV/SW6

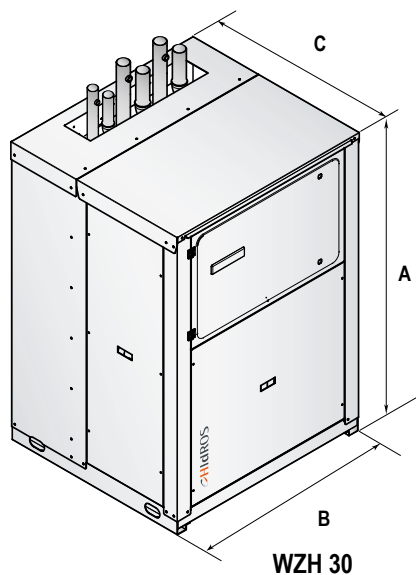
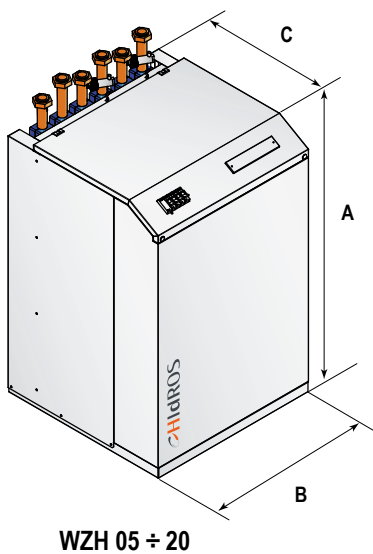
WZH Model	Code	05	07	09	11	13	15	20	30
Main switch		●	●	●	●	●	●	●	●
Microprocessor control		●	●	●	●	●	●	●	●
Contacts for pumps (source, user, domestic hot water pump)		●	●	●	●	●	●	●	●
Low noise version LS (standard)	LS00	●	●	●	●	●	●	●	●
2 way modulating to control source water consumption (4-20 mA; 0-10 v)	V2M0	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

OPERATION LIMITS



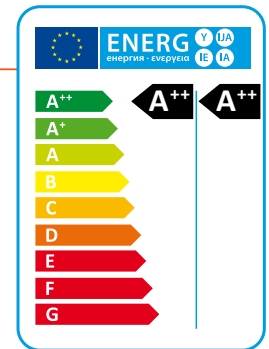
- Heating
 - Heating with glycol source circuit
 - Cooling
 - Cooling with glycol user circuit
- Operating limits with 5°C Δt



Mod.	A (mm)	B (mm)	C (mm)	Kg
05	900	600	600	130
07	900	600	600	135
09	900	600	600	138
11	900	600	600	140
13	1255	600	600	170
15	1255	600	600	175
20	1255	600	600	180
30	1270	850	770	340

WHA

Ground source heat pumps



WHA

WHA heat pumps are particularly suitable for applications that utilise ground source probes. These units have been designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating. They have been optimized on heating mode and are able to produce water up to 60°C.

WHA heat pumps are available in several versions. The most simple is a 2 pipe unit that can provide heating only. By fitting an external 3 port valve the unit can provide either heating or domestic hot water. There is also a 4 pipe unit that produces domestic hot water in a separate hydraulic circuit and can generate this irrespective of whether the unit is in heating or cooling mode. All the WHA units are also available in Free Cooling (FC) versions which provide low energy cooling by simply using the cool water that is available from either the ground source probes or the well water.

Differing versions and a wide range of accessories, enable the optimal solution to be selected.

VERSIONS

- Standard, heating only.
- RV Reversible heating/cooling.
- SW5 Heating only + domestic hot water circuit.
- RV/SW6 Reversible version heating/cooling with independent DHW circuit.
- FC Free cooling version (available in all versions).

ACCESSORIES

- A1NT Hydraulic kit with one pump without tank.
- A1ZZ Hydraulic kit with tank and one pump.
- A2NT Hydraulic kit with two pump without tank.
- A2ZZ Hydraulic kit with tank and two pump.
- DSSE Electronic soft starter.
- INSE Serial interface card RS485.
- KAVG Rubber anti-vibration mountings.
- KAVM Spring anti-vibration mountings.
- LS00 Low noise version.
- MAML Refrigerant circuit pressure gauges.
- PCRL Remote control panel.
- S1NT Source pump hydraulic kit (only water pump).
- V2M0 2 way modulating valve to reduce source water consumption (4-20 mA; 0-10 V).
- VSLI Liquid line solenoid valve.
- VTEE Electronic thermostatic valve.

WHA - Only heating version		039	045	050	060	070	080	090	110	120
Energy Class in low temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++	A++
Energy Class in high temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	51,7	59,0	71,2	80,0	92,5	105,9	120,8	136,1	152,0
Total input power (EN14511) ⁽¹⁾	kW	9,8	11,0	12,5	14,3	16,9	19,4	22,2	24,9	28,3
COP (EN14511) ⁽¹⁾	W/W	5,3	5,4	5,7	5,6	5,5	5,5	5,4	5,5	5,4
Heating capacity (EN14511) ⁽²⁾	kW	38,9	44,2	53,9	60,3	69,5	79,5	89,9	100,7	112,5
Total input power (EN14511) ⁽²⁾	kW	9,5	10,8	12,3	14,1	16,4	18,6	21,3	23,9	27,2
COP (EN14511) ⁽²⁾	W/W	4,1	4,1	4,4	4,3	4,2	4,3	4,2	4,2	4,1
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	111,0	132,0	140,0	143,0	199,0	208,0	259,0	265,0	312,0
Maximum input current	A	32,0	42,0	44,0	50,0	59,0	68,0	74,0	80,0	88,5
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2
Sound power ⁽³⁾	dB(A)	74	74	75	76	76	77	77	78	78
Sound pressure ⁽⁴⁾	dB(A)	46	46	47	48	48	49	49	50	50

WHA - Only heating version		130	152	162	190	210	240
Energy Class in low temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++
Energy Class in high temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	169,2	195,0	222,1	243,8	271,3	306,9
Total input power (EN14511) ⁽¹⁾	kW	31,6	36,8	41,0	45,1	51,0	57,3
COP (EN14511) ⁽¹⁾	W/W	5,4	5,3	5,4	5,4	5,3	5,3
Heating capacity (EN14511) ⁽²⁾	kW	125,6	140,4	159,1	177,8	196,0	222,9
Total input power (EN14511) ⁽²⁾	kW	30,5	35,1	39,2	43,1	48,7	54,9
COP (EN14511) ⁽²⁾	W/W	4,1	4,0	4,0	4,1	4,0	4,1
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5
Maximum input current	A	97,0	113,9	130,8	148,0	160,0	177,0
Compressors / Circuits	n°/n°	2/1	2/1	2/1	4/2	4/2	4/2
Capacity steps	n°	2	2	2	4	4	4
Sound power ⁽³⁾	dB(A)	79	79	79	80	82	82
Sound pressure ⁽⁴⁾	dB(A)	51	51	51	52	54	54

Performances are referred to the following conditions:

(1)Heating: user water temperature 30/35°C, source water temperature 10/7°C.

(2)Heating: user water temperature 30/35°C, source water temperature 0/-3°C, 10% glycol.

(3)Sound power level in accordance with ISO 9614 (LS version). Operation mode 1, without water pumps.

(4)Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614 (LS version). Operation mode 1, without water pumps.

WHA/RV - Reversible version		039	045	050	060	070	080	090	110	120
Energy Class in low temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++	A++
Energy Class in high temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	51,7	59,0	71,2	80,0	92,5	105,9	120,8	136,1	152,0
Total input power (EN14511) ⁽¹⁾	kW	9,8	11,0	12,5	14,3	16,9	19,4	22,2	24,9	28,3
COP (EN14511) ⁽¹⁾	W/W	5,3	5,4	5,7	5,6	5,5	5,5	5,4	5,5	5,4
Heating capacity (EN14511) ⁽²⁾	kW	38,9	44,2	53,9	60,3	69,5	79,5	89,9	100,7	112,5
Total input power (EN14511) ⁽²⁾	kW	9,5	10,8	12,3	14,1	16,4	18,6	21,3	23,9	27,2
COP (EN14511) ⁽²⁾	W/W	4,1	4,1	4,4	4,3	4,2	4,3	4,2	4,2	4,1
Cooling capacity (EN14511) ⁽³⁾	kW	59,8	68,1	83,9	94,0	107,8	124,1	142,5	161,8	178,7
Total input power (EN14511) ⁽³⁾	kW	10,3	11,3	13,1	14,9	17,4	19,6	23,0	26,4	29,8
EER (EN14511) ⁽³⁾	W/W	5,8	6,0	6,4	6,3	6,2	6,3	6,2	6,1	6,0
Cooling capacity (EN14511) ⁽⁴⁾	kW	42,9	49,0	60,3	67,4	77,5	88,9	101,3	114,3	126,9
Total input power (EN14511) ⁽⁴⁾	kW	10,0	11,3	12,9	14,7	17,4	19,9	22,7	25,5	29,0
EER (EN14511) ⁽⁴⁾	W/W	4,3	4,3	4,7	4,6	4,4	4,5	4,5	4,5	4,4
Free Cooling capacity ⁽⁵⁾	kW	22,8	22,9	36,0	36,3	36,6	49,3	71,0	72,4	73,5
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	111,0	132,0	140,0	143,0	199,0	208,0	259,0	265,0	312,0
Maximum input current	A	32,0	42,0	44,0	50,0	59,0	68,0	74,0	80,0	88,5
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2
Sound power ⁽⁶⁾	dB(A)	74	74	75	76	76	77	77	78	78
Sound pressure ⁽⁷⁾	dB(A)	46	46	47	48	48	49	49	50	50

WHA/RV - Reversible version		130	152	162	190	210	240
Energy Class in low temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++
Energy Class in high temperature - EU reg. 811/2013		A++	A++	A++	A++	A++	A++
Heating capacity (EN14511) ⁽¹⁾	kW	169,2	195,0	222,1	243,8	271,3	306,9
Total input power (EN14511) ⁽¹⁾	kW	31,6	36,8	41,0	45,1	51,0	57,3
COP (EN14511) ⁽¹⁾	W/W	5,4	5,3	5,4	5,4	5,3	5,3
Heating capacity (EN14511) ⁽²⁾	kW	125,6	140,4	159,1	177,8	196,0	222,9
Total input power (EN14511) ⁽²⁾	kW	30,5	35,1	39,2	43,1	48,7	54,9
COP (EN14511) ⁽²⁾	W/W	4,1	4,0	4,0	4,1	4,0	4,1
Cooling capacity (EN14511) ⁽³⁾	kW	198,5	231,4	265,2	289,5	321,7	363,7
Total input power (EN14511) ⁽³⁾	kW	33,1	38,9	43,7	47,0	54,2	60,5
EER (EN14511) ⁽³⁾	W/W	6,0	5,9	6,1	6,1	5,9	6,0
Cooling capacity (EN14511) ⁽⁴⁾	kW	141,2	163,6	187,4	205,1	226,9	257,3
Total input power (EN14511) ⁽⁴⁾	kW	32,3	37,8	42,2	46,3	52,4	58,8
EER (EN14511) ⁽⁴⁾	W/W	4,4	4,3	4,4	4,4	4,3	4,4
Free Cooling capacity ⁽⁵⁾	kW	74,1	93,1	94,0	128,2	129,6	130,9
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5
Maximum input current	A	97,0	113,9	130,8	148,0	160,0	177,0
Compressors / Circuits	n°/n°	2/1	2/1	2/1	4/2	4/2	4/2
Capacity steps	n°	2	2	2	4	4	4
Sound power ⁽⁶⁾	dB(A)	79	79	79	80	82	82
Sound pressure ⁽⁷⁾	dB(A)	51	51	51	52	54	54

Performances are referred to the following conditions:

(1) Heating: user water temperature 30/35°C, source water temperature 10/7°C.

(2) Heating: user water temperature 30/35°C, source water temperature 0/-3°C con 10% glycol.

(3) Cooling: user water temperature 23/18°C, source water temperature 30/35°C.

(4) Cooling: user water temperature 12/7°C, source water temperature 30/35°C.

(5) Free Cooling: user water temperature 20°C, source water temperature 10°C, compressors OFF.

(6) Sound power level in accordance with ISO 9614 (LS version). Operation mode 1, without water pumps.

(7) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614 (LS version). Operation mode 1, without water pumps.

FRAME

All units are made from hot-galvanised sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL 9018.

REFRIGERANT CIRCUIT

The refrigerant utilised is R410A. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. Each refrigerant circuit is totally independent from the other with the result that any fault or alarm condition on one circuit does not influence the other.

The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control and pressure safety device (for compliance with PED regulations).

COMPRESSORS

The compressors used are a high performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle when the source temperature is low. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure thus enabling them to be maintained even if the unit is operating. Access to this enclosure is via the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

SOURCE HEAT EXCHANGER

Source heat exchanger are braze-welded plates and are made of stainless steel AISI 316. From size 039 to size 162 are single-circuit, from size 190 are all double circuit cross-flow. The use of this type of exchangers greatly reduces the refrigerant charge of the unit compared to the conventional shell and tube evaporators, and increases the efficiency of the refrigerant loads. The heat exchangers are factory insulated with flexible close cell material and are protected by a temperature sensor used as antifreeze protection kit.

USER EXCHANGER

The user side heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. From size 039 to size 162 they have a single water side circuit, from the size 190 they are double circuit, "cross flow" type. All units are supplied with a sub-cooler to enhance the performance of the refrigerant cycle. The user heat exchangers are factory insulated with flexible close cell material.

MICROPROCESSORS

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, anti-freeze protection, compressor timing, compressor automatic starting sequence, alarm reset, volt free contact for remote general alarm, alarms and operation LED's. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The technical department can discuss and evaluate, in conjunction with the customer, solutions using MOD-BUS protocols.

ELECTRIC ENCLOSURE

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE 73/23 and 89/336. Access to the enclosure is achieved by removing the front panel of the unit. The following

components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over (reversible type only) and general alarm. For all three phase units, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), is fitted as standard.

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return and supply user heat exchanger sensors, return and supply source heat exchanger sensors, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, pump thermal overload protection (when present), source heat exchanger flow switch.



HYDRAULIC KIT

All units can be supplied with water pump circulation kit installed on Source, User or Recovery circuit.

VERSIONS

WHA/RV 2 PIPES VERSION.

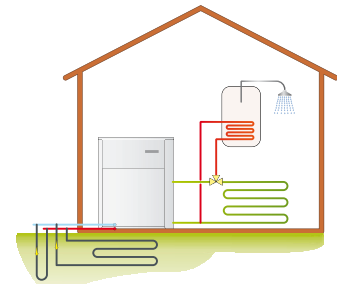
This version is capable of cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit.

WHA/RV/SW6 4 PIPES VERSION.

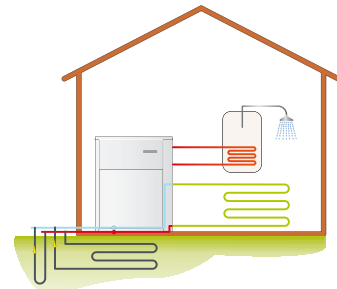
This version has 4 pipes on the user side and is able to produce simultaneously, hot and cold water on 2 independent hydraulic circuits. The domestic hot water production is independent of the operation mode of the unit.

VERSIONE FREE COOLING

These versions, in addition to the characteristics described above, can produce cold water during summer operation using the cold water available from the source ground probes. All free cooling versions are supplied with an intermediate heat exchanger and a 3 way valve which modulates the water flow to the user circuit depending on the required user cold water temperature. During free cooling mode the compressors may be off or will operate partially to augment the free cooling available.



WHA/RV



WHA/RV/SW6

WHA

CONFIGURATIONS

MOD.	P2	P4	P2+FC	P4+FC	P2+A	P4+A	P2+FC+A	P4+FC+A
39	F1	F1	F1	F1	F3	F4	F4	F4
45	F1	F1	F1	F1	F3	F4	F4	F4
50	F1	F1	F1	F1	F3	F4	F4	F4
60	F1	F1	F1	F1	F3	F4	F4	F4
70	F1	F1	F1	F1	F3	F4	F4	F4
80	F1	F1	F1	F1	F3	F4	F4	F4
90	F2	F2	F2	F2	F3	F4	F4	F4
110	F2	F2	F2	F2	F3	F4	F4	F4
120	F2	F2	F2	F2	F3	F4	F4	F4
130	F2	F2	F2	F2	F3	F4	F4	F4
152	F2	F2	F2	F2	F3	F4	F4	F4
162	F2	F2	F2	F2	F3	F4	F4	F4
190	F3	F4	F4	F4	F4	F5	F5	F5
210	F3	F4	F4	F4	F4	F5	F5	F5
240	F3	F4	F4	F4	F4	F5	F5	F5

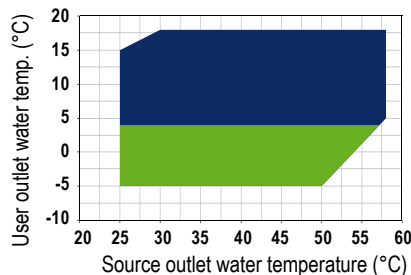
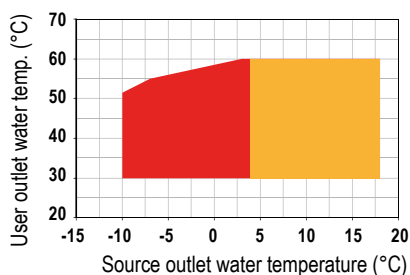
Legend

P2	2 pipe system	P2+A	2 pipe system with hydraulic kit
P4	4 pipe system	P4+A	4 pipe system with hydraulic kit
P2+FC	2 pipe system with Free Cooling	P2+FC+A	2 pipe system with Free Cooling and hydraulic kit
P4+FC	4 pipe system with Free Cooling	P4+FC+A	4 pipe system with Free Cooling and hydraulic kit

WHA Model	Code	039÷080	090÷110	120÷162	190÷240
Main switch		●	●	●	●
Microprocessor control		●	●	●	●
Remote ON/OFF digital input		●	●	●	●
Summer/Winter digital input		●	●	●	●
LS low noise version	LS00	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○
Hydraulic kit with one pump without tank - source circuit	A1NTS	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○	○	○
Hydraulic kit with two pumps without tank - source circuit	A2NTS	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	○	○	○	○

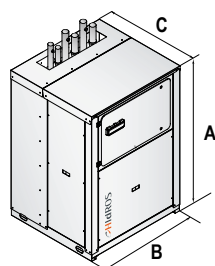
● Standard, ○ Optional, – Not available.

OPERATION LIMITS

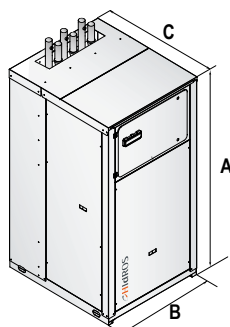


- Heating
- Heating with glycol source circuit
- Cooling
- Cooling with glycol user circuit

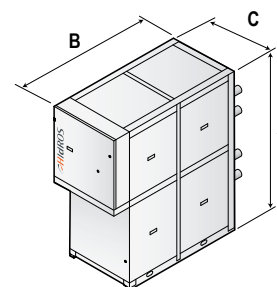
Operating limits with 5°C Δt



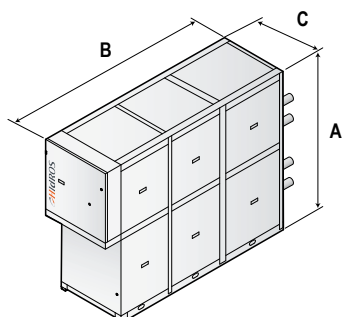
Frame 1



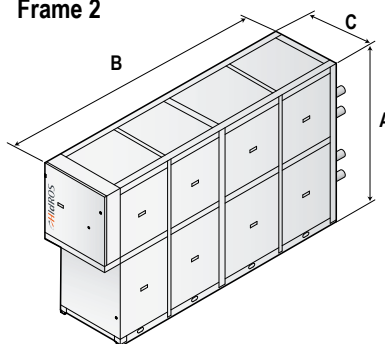
Frame 2



Frame 3



Frame 4



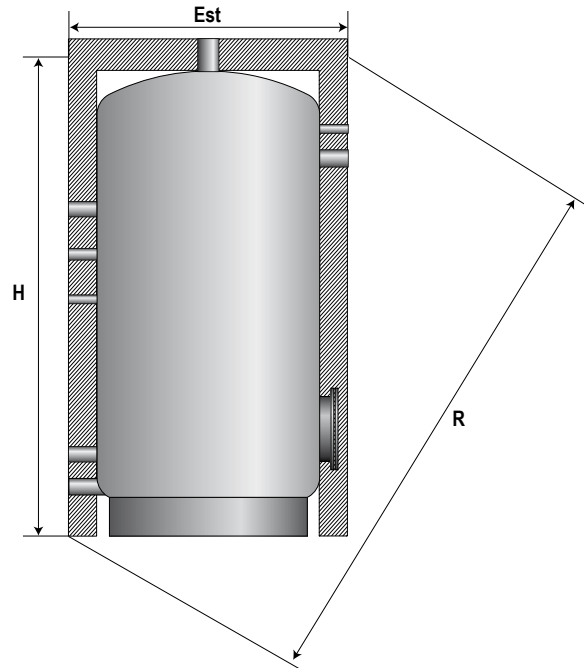
Frame 5

Mod.	A (mm)	B (mm)	C (mm)
F1	1566	1101	1005
F2	1986	1101	1255
F3	1900	2170	800
F4	1900	3120	800
F5	1900	4200	800

TW - TWS

Domestic hot water cylinders

TW - TWS



The TW-TWS series domestic hot water cylinders, are designed to heat and store domestic hot water, using an indirect coil. They are supplied with a double spiral heat exchanger, specifically designed for application with heat pumps.

The units can also be used, in combination with gas or oil boilers. The outlet of the hot water is located in the upper part of the cylinder in order to get the highest possible water temperature.

The units are manufactured from carbon steel S235 JR, enamelled at 850°C, according to DIN 4753.

The TW versions are supplied with a single heat exchanger, in carbon steel, enamelled, designed for heat pumps applications. The TWS versions also incorporate a solar heat exchanger, located in the lower part of the tank to enhance the heating capacity.

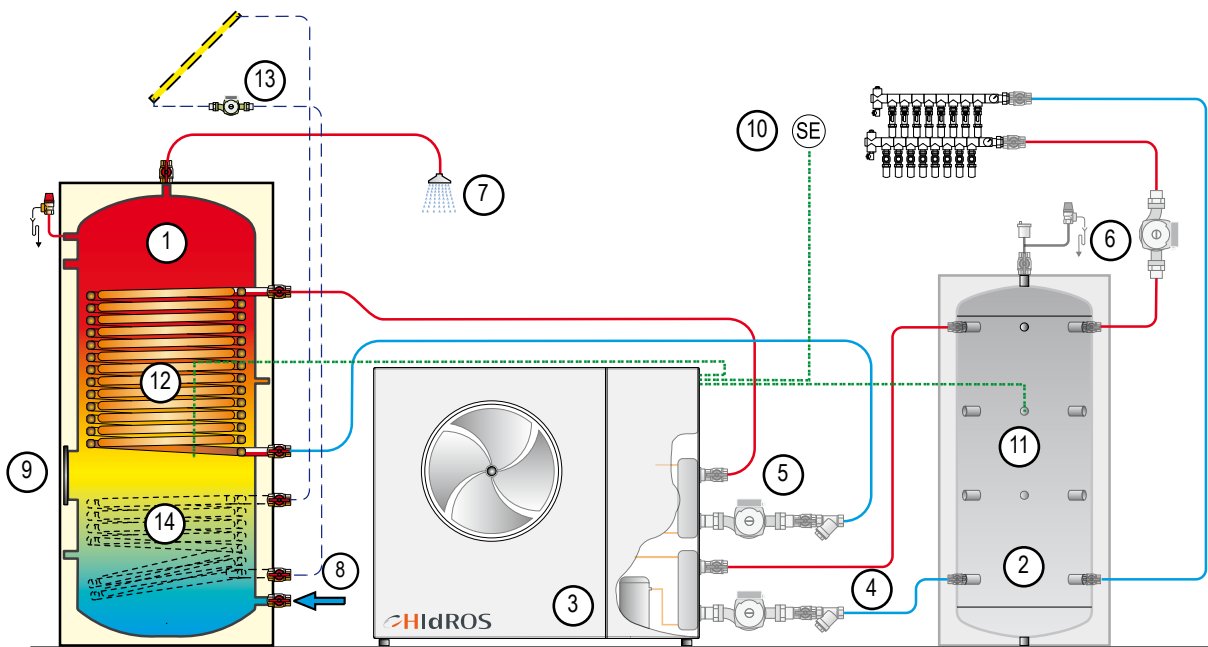
Both versions are supplied complete with magnesium anode, probe holders, inspection flange and backup electric heater flange.

VERSIONS AND ACCESSORIES

TW	Domestic hot water cylinder.
TWS	Domestic hot water cylinder + solar coil.
RE	Back up electric heater.

PRODUCT SPECIFICATIONS

- Thermal insulation protective jacket.
- External protection with durable enamel coating.
- Cathodic protection with magnesium anode.
- Thermometer located in sensor pocket.
- Inspection flange.



1	Domestic hot water cylinder TW/TWS	8	Cold water inlet
2	Buffer tank TF	9	Back up heater flange
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Solar system
7	Domestic hot water outlet	14	Solar coil (TWS versions only)

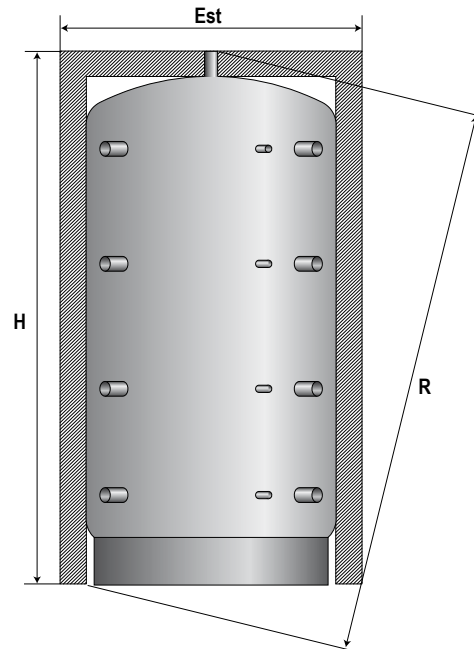
The above scheme is for illustrative purposes only

Model TW - TWS			300	400	500	600	800	1000
Thermal insulation	mm		50	50	50	50	100	100
Coefficient of thermal conductivity	W/mK		0,023	0,023	0,023	0,023	0,023	0,023
Maximum working pressure	bar		8	8	8	8	8	8
Heat pump D.H.W. heat exchanger surface (TW/TWS)	m ²		3,5/--	4,6/--	6,0/4,2	6,0/5,7	6,0/5,2	6,0/6,0
Max D.H.W. heat exchanger power (T _p 55°C / T _s 50° C)	Kw		10	12	18	18	18	18
D.H.W. exchanger water content	lt		24,9/---	32,7/---	42,6/29,8	42,6/40,5	42,6/36,9	42,6/42,6
D.H.W. exchanger waterflow	l/h		4000	4000	4000	4000	4000	4000
D.H.W. exchanger pressure drops	Kpa		9,0	11,0	13,0	13,0	13,0	13,0
Solar coil surface (TWS versions only)	m ²		-	-	1,9	2,2	2,2	3,6
Solar coil water content (TWS versions only)	lt.		-	-	13,5	15,6	15,6	25,6
Solar coil waterflow (TWS versions only)	l/h		-	-	4000	4000	4000	4000
Solar coil pressure drops (TWS versions only)	Kpa		-	-	5,0	6,0	6,0	6,0
Diameter with insulation	EST.	mm	650	750	750	750	990	990
Total height TW/TWS	H	mm	1365/ --	1395/ --	1645	1895	1710	2035
Diagonal length	R	mm	1515/ --	1585/ --	1810	2025	1970	2270
Weight TW/TWS		Kg	125/ --	165/ --	200/260	240/305	230/320	305/330
Code		TW	TW00.30	TW00.40	TW00.50	TW00.60	TW00.80	TW01.00
Code		TWS	-	-	TWS0.50	TWS0.60	TWS0.80	TWS1.00

TP - TPS

Hot water storage tanks

TP - TPS



TP-TPS Hot water storage tanks are designed for use with heat stations and are connected directly to the heat pump. They are thermally insulated with a flexible, removable polyurethane cover (CFC free and self extinguishing).

The tanks are supplied with 8 water connections and several probe pockets. The TP versions are supplied without any heat exchanger, while the TPS version incorporates a solar heat exchanger, located in the lower part of the tank to maximise the heating capacity.

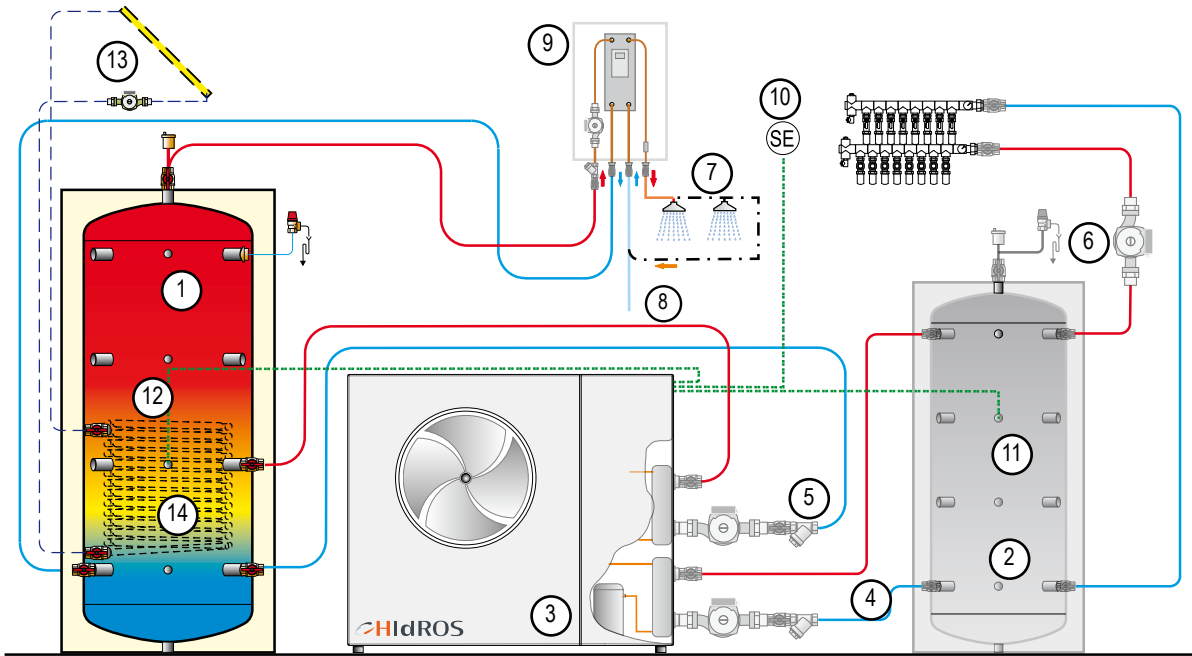
TP-TPS storage tanks are suitable for hot water only, they are not to be used for cold water storage.

VERSIONS AND ACCESSORIES

TP	Hot water storage tank.
TPS	Hot water storage tank + solar coil.
RE	Back up electric heater.

PRODUCT SPECIFICATIONS

- Thermal insulation protective jacket.
- External protection with durable enamel coating.
- Manufactured from carbon steel ST235JR.
- Thermometer located in sensor pocket.



1	Hot water storage tanks TP/TPS	8	Cold water inlet
2	Buffer tank TF	9	Domestic hot water station
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Solar system
7	Domestic hot water outlet	14	Solar coil (TPS versions only)

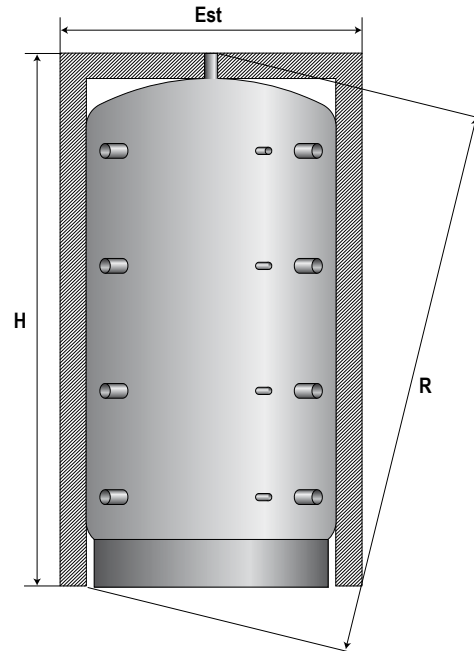
The above scheme is for illustrative purposes only

Model TP - TPS		300	500	800	1000	1250	1500	2000	2500	3000	4000	5000
Thermal insulation	mm	50	50	100	100	85	100	70	85	70	70	70
Coefficient of thermal conductivity	W/mK	0,023	0,023	0,023	0,023	0,023	0,023	0,023	0,023	0,023	0,023	0,023
Maximum working pressure	bar	4	4	4	4	4	4	4	4	4	4	4
Maximum working temperature	°C	95	95	95	95	95	95	95	95	95	95	95
Solar heat exchanger surface (only TPS)	m ²	1,6	2,0	2,7	3,5	3,8	4,5	4,8	5,0	6,0	7,0	8,0
Solar heat exchanger water content (only TPS)	l	11,4	14,2	19,2	24,9	26,9	31,9	34,1	35,5	42,6	49,7	56,8
Solar heat exchanger waterflow (only TPS)	l/h	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
Solar heat exchanger pressure drop (only TPS)	KPa	12	15	19	24	27	35	37	38	44	46	48
Diameter without insulation	mm	500	650	790	790	950	1000	1100	1200	1250	1400	1600
Diameter with insulation	EST mm	600	750	990	990	1120	1170	1240	1370	1420	1540	1740
Total height	H mm	1565	1650	1730	2080	2095	2135	2350	2495	2710	2820	2850
Diagonal dimension	R mm	1680	1820	1790	2125	2160	2210	2420	2580	2800	2920	2970
Weight TP/TPS	Kg	101	143	186	231	265	288	386	420	475	653	757
Code	TP	TP00.30	TP00.50	TP00.80	TP01.00	TP01.25	TP01.50	TP02.00	TP02.50	TP03.00	TP04.00	TP05.00
Code	TPS	TPS0.30	TPS0.50	TPS0.80	TPS1.00	TPS1.25	TPS1.50	TPS2.00	TPS2.50	TPS3.00	TPS4.00	TPS5.00

TF

Hot and cold water storage tanks

TF



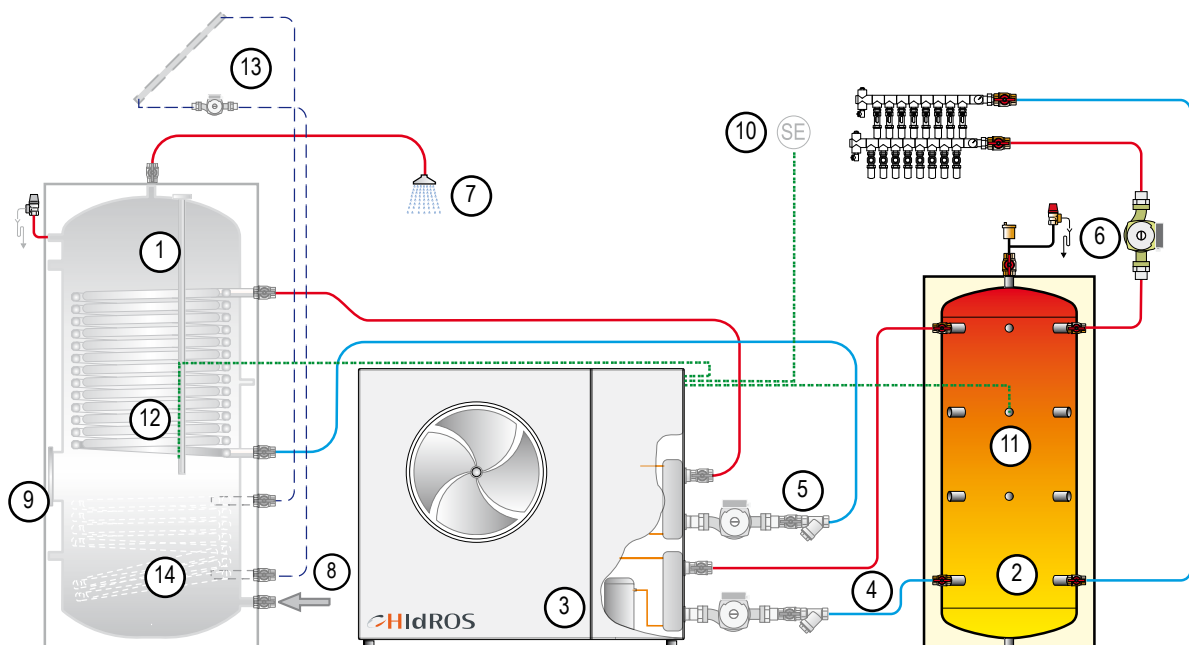
The TF series of hot & cold water storage tanks are designed to provide buffer storage for the heating (cooling) system. They are thermally insulated with a flexible, removable, polyurethane cover (CFC free and self extinguishing). The tanks are supplied with 8 water connections and several probe pockets. They are suitable for either hot or cold water.

VERSIONS AND ACCESSORIES

TF	Hot and cold water storage tank.
RE	Back up electric heater.

PRODUCT SPECIFICATIONS

- Poliurethane rigid thermal insulation up to size 500. Sizes from 800 to 5000 are supplied with an additional "anti-condensation elastomer".
- All sizes are supplied with an external protection layer in sky.
- External treatment in durable coating.



1	Hot and cold water tanks TW/TWS	8	Cold water inlet
2	Buffer tank TF	9	Back up heater flange
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Solar system
7	Domestic hot water outlet	14	Solar coil (TWS versions only)

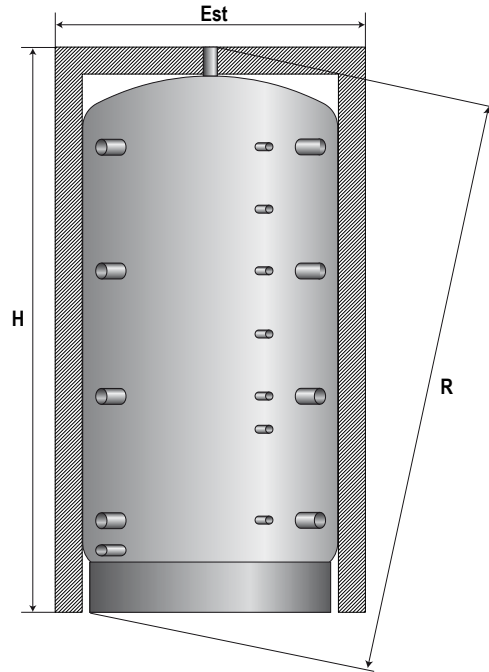
The above scheme is for illustrative purposes only

Model TF		100	200	300	500	800	1000	1500	2000	3000	5000
Thermal insulation	mm	50	50	50	50	110	110	110	110	110	110
Coefficient of thermal conductivity	W/mK	0,023	0,023	0,023	0,023	0,040	0,040	0,040	0,040	0,040	0,040
Maximum working pressure	bar	4	4	4	4	4	4	4	4	4	4
Maximum working temperature	°C	95	95	95	95	95	95	95	95	95	95
Diameter without insulation	mm	400	500	500	650	790	790	1000	1100	1250	1600
Diameter with insulation	EST mm	500	600	600	750	990	990	1200	1300	1450	1800
Total height	H mm	890	1070	1565	1650	1730	2080	2135	2350	2710	2850
Diagonal length	R mm	1020	1230	1680	1690	1780	2130	2210	2420	2800	2970
Weight	Kg	80	90	101	143	186	265	288	386	475	757
Code	TF	TF00.10	TF00.20	TF00.30	TF00.50	TF00.80	TF01.00	TF01.50	TF02.00	TF03.00	TF05.00

TH - THS

Domestic hot water generators

TH - THS



TH-THS domestic hot water generators are designed to utilise the heat pump output with a high efficiency AISI 316L stainless steel pipe heat exchanger to instantaneously produce domestic hot water.

This arrangement eliminates the need for storage of hot water and the attendant legionella risk and treatments.

They are thermally insulated with a flexible, removable polyurethane cover (CFC free and self extinguishing).

They are supplied with 8 water connections and several probe pockets.

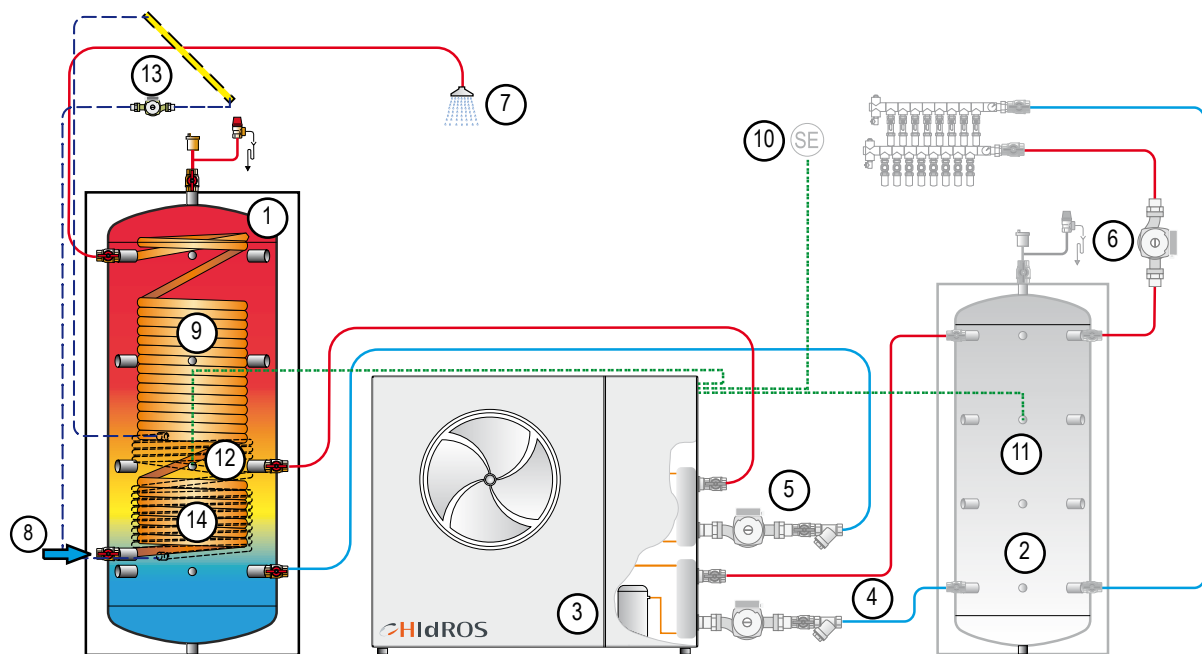
The THS versions incorporate an additional solar heat exchanger, located in the lower part to maximise the heating capacity.

VERSIONS AND ACCESSORIES

TH	Domestic hot water generators.
THS	Hot water storage tank + solar coil.
RE	Back up electric heaters.

PRODUCT SPECIFICATIONS

- Thermal insulation protective jacket.
- External protection with durable enamel coating.
- Internal construction made by carbon steel ST235JR.
- Domestic hot water heat exchanger, made in AISI316L corrugated stainless steel pipe, protected by pickling and passivation treatment.
- Thermometer with well for probe holder.



1	Domestic hot water generator TH	8	Cold water inlet
2	Buffer tank TF	9	D.H.W. stainless steel heat exchanger
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Solar system
7	Domestic hot water outlet	14	Solar coil (THS versions only)

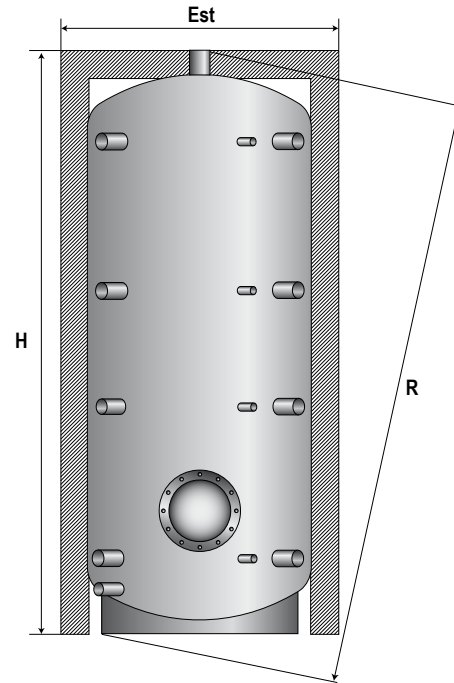
The above scheme is for illustrative purposes only

Model TH - THS		650	800	1000	1500	2000	
Thermal insulation with rigid polyurethane foam	mm	70	100	100	100	70	
Coefficient of thermal conductivity	W/mK	0,023	0,023	0,023	0,023	0,023	
Maximum working pressure	bar	6	6	6	6	6	
Maximum working temperature	°C	95	95	95	95	95	
Heat exchanger surface	m ²	5,5	7,0	7,5	10,0	11,0	
Heat exchanger content	l	39,1	49,7	53,3	71,0	78,1	
Domestic hot water production (water temperature 55°C)	l/min	10	10	10	10	10	
Heat exchanger pressure drop	KPa	0,45	0,47	0,50	0,55	0,60	
Tank volume D.H.W. production (water temperature 45°C, cold water 10°C)	l	250	340	440	810	1200	
Solar heat exchanger surface (only THS)	m ²	2,5	2,7	3,5	4,5	4,8	
Solar heat exchanger water content (only THS)	l	17,8	19,2	24,9	31,9	34,1	
Solar heat exchanger waterflow (only THS)	l/h	3000	3000	3000	3000	3000	
Solar heat exchanger pressure drop (only THS)	KPa	19	19	24	35	37	
Diameter without insulation	mm	750	790	790	1000	1100	
Diameter with insulation	EST	mm	950	990	990	1200	1300
Total height	H	mm	1735	1730	2080	2135	2350
Diagonal length	R	mm	1780	1790	2130	2210	2420
Weight TH-THS	Kg	207	221	270	345	453	
Code	TH	TH00.65	TH00.80	TH01.00	TH01.50	TH02.00	
Code	THS	THS0.65	THS0.80	THS1.00	THS1.50	THS2.00	

TA - TAS

Domestic hot water storage tanks

TA - TAS



TA - TAS tanks are designed to be operated in conjunction with a plate heat exchanger to generate domestic hot water requirements.

This approach result in a faster response time than a traditional cylinder with an indirect coil.

They are manufactured from carbon steel S235JR enamelled in accordance with DIN 4753.

They are supplied complete with magnesium anode, probe holders, and inspection flange.

TA tanks are supplied complete with 6 water connections placed in different positions of the tank and several sensor pockets.

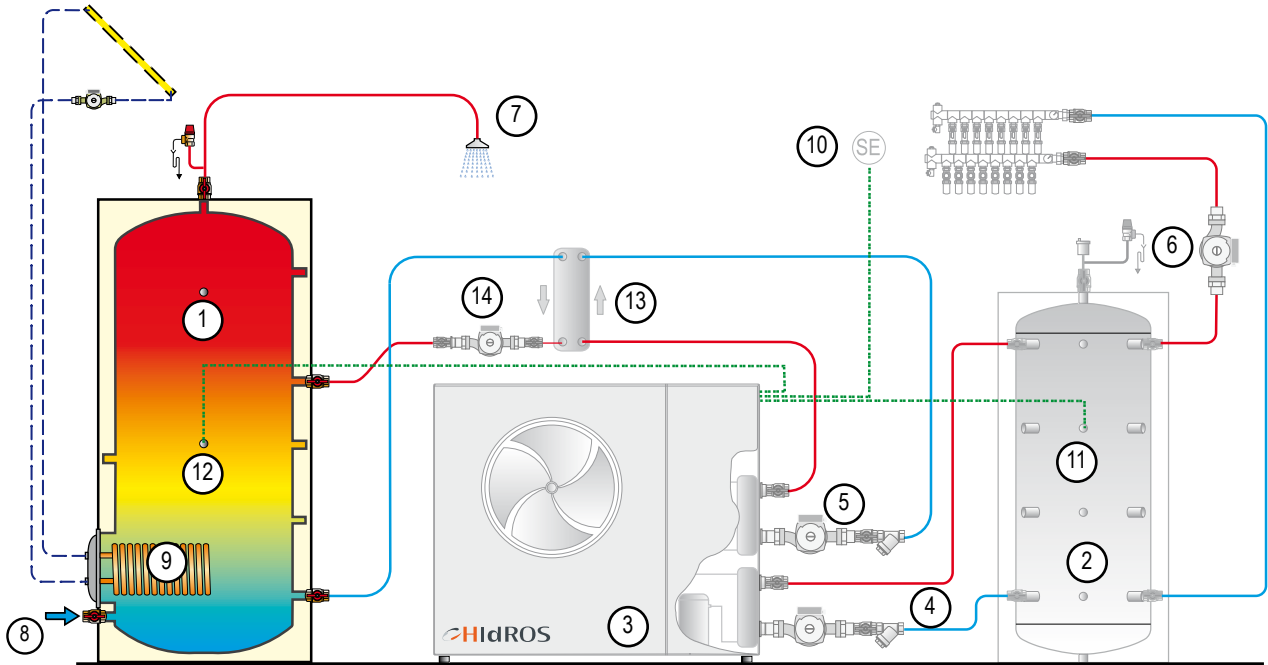
The TAS versions incorporate an additional solar heat exchanger, located in the lower part to maximise the heating capacity.

VERSIONS AND ACCESSORIES

TA	Domestic hot water storage tank
TAS	Hot water storage tank + solar coil.
RE	Back up electric heater.

PRODUCT SPECIFICATIONS

- Thermal insulation protective jacket.
- External protection by high resistance enamel painting.
- Treatment with internal protective glazing inorganic food up to standard DIN 4753.3.
- Cathodic protection with magnesium anode.
- Thermometer with well for probe holder.
- Inspection flange.



1	Domestic hot water storage tank	8	Cold water inlet
2	Buffer tank	9	Domestic hot stainless steel heat exchanger
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Primary circuit pump (D.H.W. circuit)	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Plate heat exchanger
7	Domestic hot water outlet	14	D.H.W. circuit water pump

The above scheme is for illustrative purposes only

Model TA - TAS		200	300	500	800	1000	1500	2000
Thermal insulation with rigid polyurethane foam + sky	mm	50	50	50	100	100	100	70
Coefficient of thermal conductivity	W/mK	0,023	0,023	0,023	0,023	0,023	0,023	0,023
Maximum working pressure	bar	8	8	8	8	8	8	8
Maximum working temperature	°C	95	95	95	95	95	95	95
Solar heat exchanger surface (only TAS) *	m ²	1,5	1,5	3,1	4,5	4,5	6,3	6,3
Solar heat exchanger water content (only TAS) *	l	9	9	19	32	32	45	45
Solar heat exchanger waterflow (only TAS) *	l/h	1500	1500	2500	2500	2500	2500	2500
Solar heat exchanger pressure drop (only TAS) *	KPa	21	21	17	20	20	35	35
Diameter without insulation	mm	450	500	650	790	790	1000	1100
Diameter with insulation	EST mm	550	600	750	990	990	1200	1300
Total height	H mm	1400	1675	1730	1730	2080	2135	2350
Diagonal length	R mm	1430	1700	1770	1790	2125	2210	2425
Weight	Kg	53	66	83	128	159	254	395
Code	TA	TA00.20	TA00.30	TA00.50	TA00.80	TA01.00	TA01.50	TA02.00
Code	TAS	TAS0.20	TAS0.30	TAS0.50	TAS0.80	TAS1.00	TAS1.50	TAS2.00

* For any request of increased heat exchanger please contact the Company.

PI

Domestic hot water heat stations



PI

The PI series of domestic hot water heat stations are complete plug and play systems, suitable for the production of the domestic hot water in combination with TP-TPS tanks.

A stainless steel plate heat exchangers to AISI 316, they incorporate high efficiency variable speed water pump and an electronic controller with display and electronic D.H.W. flow switch. The electronic control maintains a constant value of the outlet water temperature by modulating the waterflow of the primary circuit.

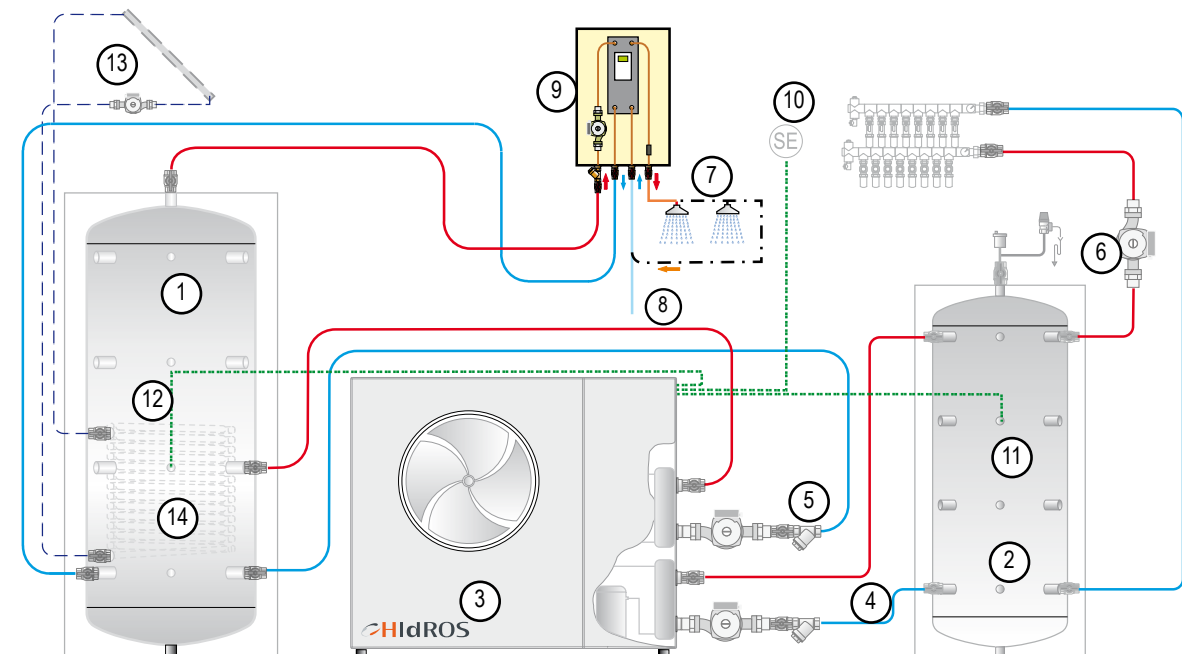
These devices enable the production of domestic hot water with minimal FORMATION OF LIMESTONE due to the very small amount of water present in the secondary water circuit.

VERSIONS AND ACCESSORIES

PI Domestic hot water heat station.

PRODUCT SPECIFICATIONS

- Precise regulation of water outlet temperature.
- Electronic driven water pump with very low input power.
- Graphic display with indication of water temperatures and heating capacity.
- Regulation of primary circuit water pump rpm depending on the required set point. Range: 30 - 65°C.
- Maximum water temperature Tmax. Range 60 -75°C.
- Management of recirculation water pump (max. input power 185W). Ability to control the secondary circuit water pump to maintain a constant temperature in the circuit (adjustable 10 - 40 °C).



1	Hot water storage tanks TP/TPS	8	Cold water inlet
2	Buffer tank TF	9	Domestic hot water station
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Solar system
7	Domestic hot water outlet	14	Solar coil (TPS versions only)

The above scheme is for illustrative purposes only

Model PI		25	40	60	70	80	100	120
Power supply		230V / 50 hz / 1 ph						
Water pump input power	W	40	80	310	310	310	450	450
Nominal domestic hot water circuit waterflow	l/min	25	40	60	70	80	100	120
Minimum domestic hot water flow	l/min	2	4	5	5	10	10	10
Water pump input current	A	0,58	0,96	1,37	1,37	1,37	2,01	2,01
Recirculation pump max. input power (optional)	W	185	185	185	185	185	185	185
Primary circuit waterflow	lt/h	2500	2800	6700	8200	9000	11000	14000
Primary circuit available static pressure	KPa	2,2	2,5	2,0	4,0	2,0	2,0	4,0
Weight	Kg	20,5	22,5	130,0	130,0	140,0	150,0	150,0
Primary water circuit volume	l	0,85	1,35	1,79	2,08	2,22	2,65	3,22
Domestic hot water circuit volume	l	0,95	1,45	1,93	2,22	2,36	2,79	3,36
Max. working pressure	bar	6	6	6	6	6	6	6
Protection degree	IP	40	40	40	40	40	40	40
Primary circuit water connections	Ø	1"	1"1/4	1"1/4	1"1/4	1"1/4	1"1/2	1"1/2
Domestic hot water circuit water connections	Ø	3/4"	1"	1"	1"	1"	1"1/4	1"1/4
Max. working temperature	°C	95	95	95	95	95	95	95

SCP

Plate heat exchangers for domestic hot water production

SCP



(A)



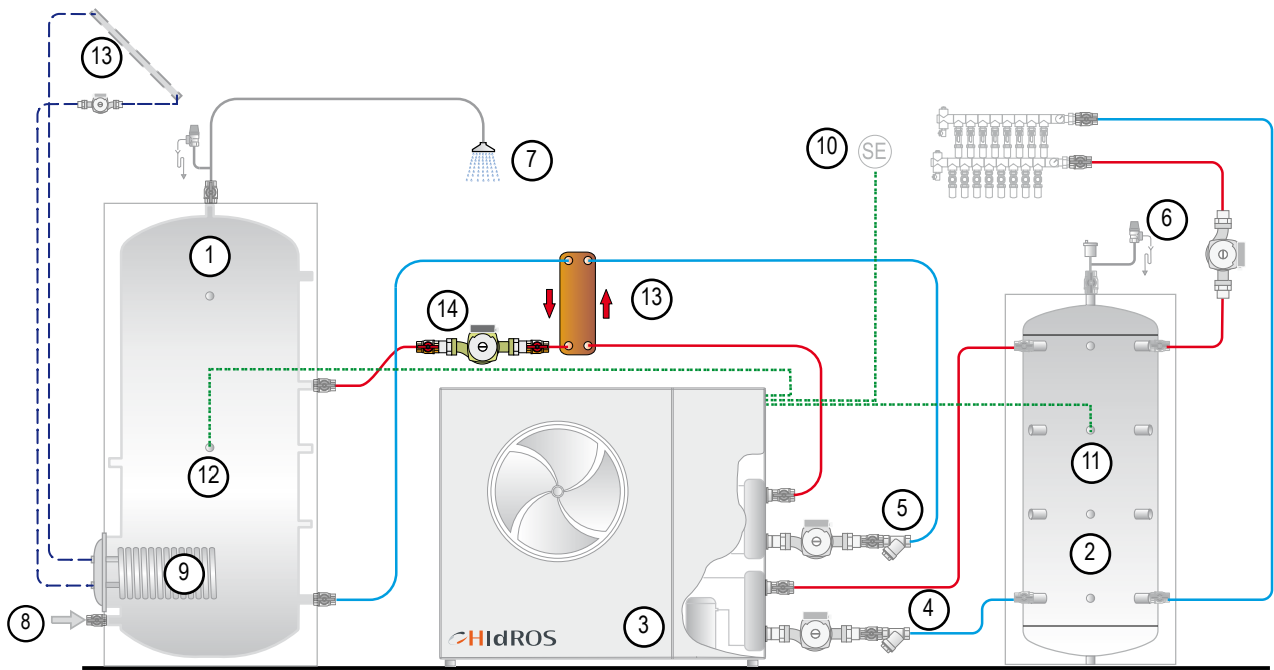
(B)

The SCP plate exchangers are designed for the production of the domestic hot water in combination with heat pump systems. The heat exchanger up to 20 Kw of heating capacity are brazed type, not inspectionable (picture A) while the bigger sizes are inspectionable and fixed with bolts and gaskets.

The use of plate heat exchanger allow the production of domestic hot water in an extreme efficient way, increasing the seasonal C.O.P. of the heat pump compared to other traditional systems.

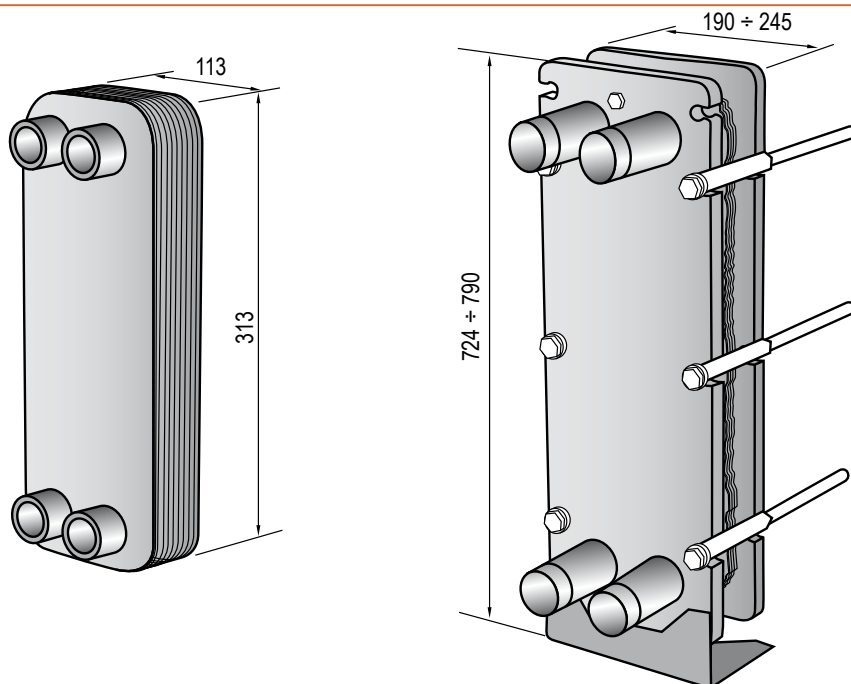
PRODUCT SPECIFICATIONS

- Heating capacities from 10 to 160 Kw, available on request for higher capacities.
- Working pressure up to 30 bar, up to 16 bar for bolts and gaskets versions.
- Produced in stainless steel AISI316.
- Treated water connections.
- Primary circuit water flows from 1500 l/h to 2800 l/h.



1	Domestic hot water storage tanks	8	Cold water inlet
2	Buffer tank	9	Domestic hot stainless steel heat exchanger
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied with the heat pump)
6	Underfloor system water pump	13	Plate heat exchanger
7	Domestic hot water outlet	14	D.H.W. circuit water pump

The above scheme is for illustrative purposes only



RG

Control systems and Components

RG



A programmable system comprising a central control that is connected, using two wire cables, to various control modules. In addition, the system communicates with all hidros heat pumps and will manage the heating, cooling and domestic hot water production.

The basic system can control 6 independent zones taking information from temperature and humidity sensors and activating valves, pumps and supplementary heaters.

XWEB supervision software can be added enabling remote monitoring and control via internet or GSM modem.

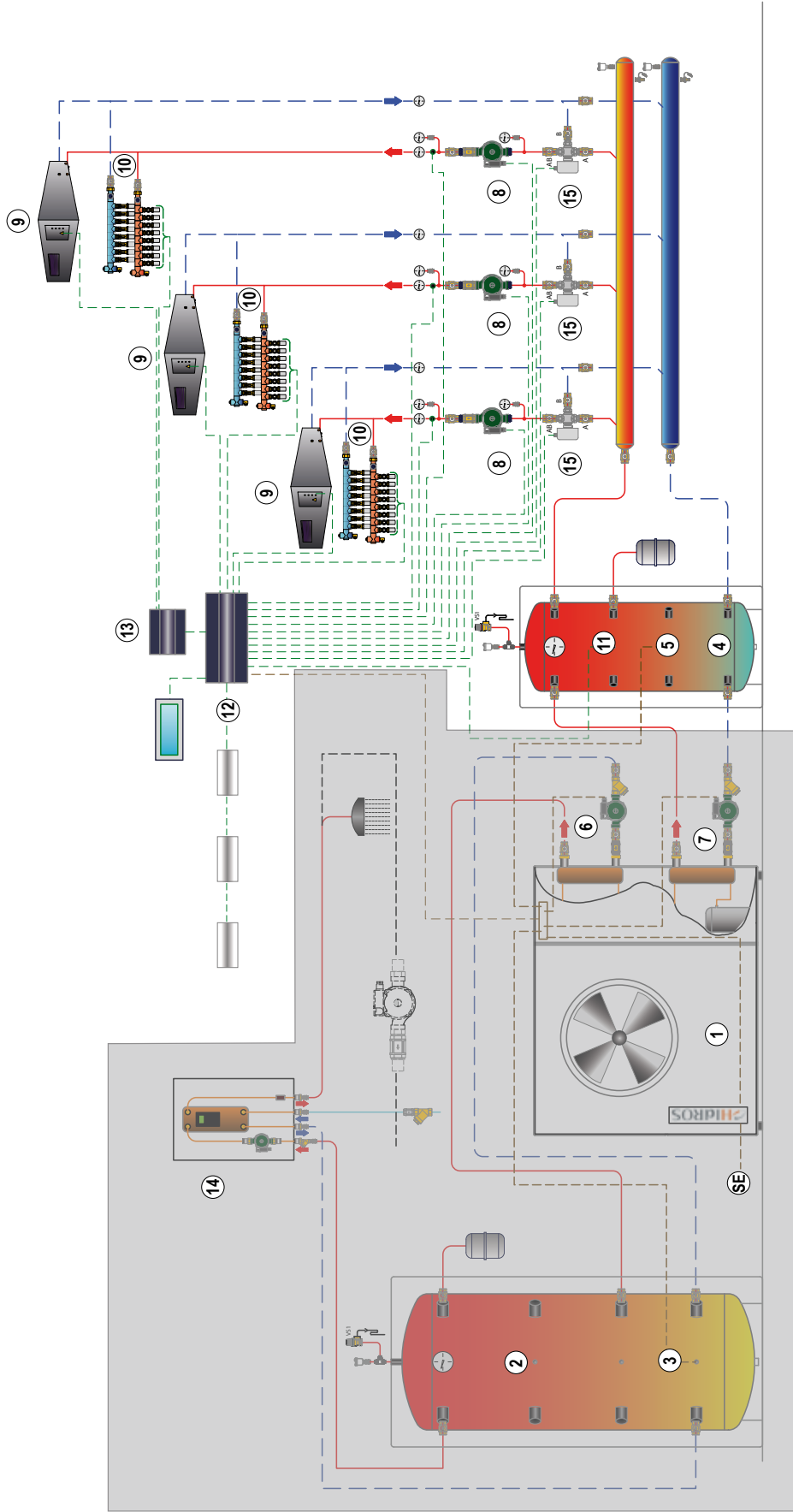
Mod-BUS protocol also enables integration of the system with other home automation products.

VERSIONS AND ACCESSORIES

- 3 Mixing valves and 3 water pumps;
- 6 Zones with independent humidity and temperature control and dew point checking;
- Expansion module with an additional 6 zones.

PRODUCT SPECIFICATIONS

- Dehumidification mode possible for 3 independent zones;
- Normal operation + set back temperature;
- Summer/winter change over;
- Control of supplementary heat;
- Cooling mode possible for 3 independent zones;
- Heat pump Alarm display;
- Serial interface port RS 485 (master and slave);
- Communication protocol Mod BUS-RTU
- Connection to XWEB supervision systems or other open source applications;



Installation of a control system for an air to water heat pump model LZTi, LZi, LZT 4 pipes version, with DHW circuit priority, with weather-compensated ambient sensor. The management of the system is done by temperature/humidity sensors, connected via BUS line, programmable PLC controller and graphic display for the visualization of all the parameters. The software allows the control of the temperature and the humidity up to 32 zones, 3 dehumidifiers, 3 water pumps, boiler, water chiller and heat pump.

The above scheme is for illustrative purposes only

1	Heat Pump	4	Buffer Tank	7	Heating System Pump	10	Zone Manifold	13	Expansion Module
2	Hot Water Tank	5	Buffer Tank Sensor	8	Circulating Pump	11	System min Temp Sensor	14	Hot water Heat Station
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Central Controller	15	Mixing Valve


RGAA.01 PROGRAMMABLE CONTROLLER

Plant programmable logic controller, able to manage: 6 independent zones in heating and cooling mode, 3 modulating valves and related water pumps, winter weather compensation set point, summer dew point control, 2 independent dehumidifiers with cooling integration, time zones set with 2 temperature levels, summer and winter working mode, heat pump remote start and stop, display of heat pump general alarm. The device is supplied with 2xRS485 serial output connection, (master and slave), standard communication protocol Mod BUS-RTU that allows the connection to the XWEB monitoring systems or existing applications. Power supply 24 Volt.


RGBB.01 GRAPHIC DISPLAY

Graphic keypad, with LCD display, 240x96 pixel, 8 buttons with easy-to-use interface, suitable for wall mounting installation, supplied with buzzer. The built-in keyboard allows the user to display and set the temperature and humidity parameters in the different zones, summer and winter heat pump working mode, display the heat pump general alarm and set the time zones.


RGBB.02 GRAPHIC DISPLAY TOUCH SCREEN (HMI)

Display TFT LCD 800x420 pixel, 262k colors with easy-to-use interface, suitable for wall mounting installation. The built-in keyboard allows the user to display and set the temperature and humidity parameters in the different zones, summer and winter heat pump working mode, display the heat pump general alarm and set the time zones.

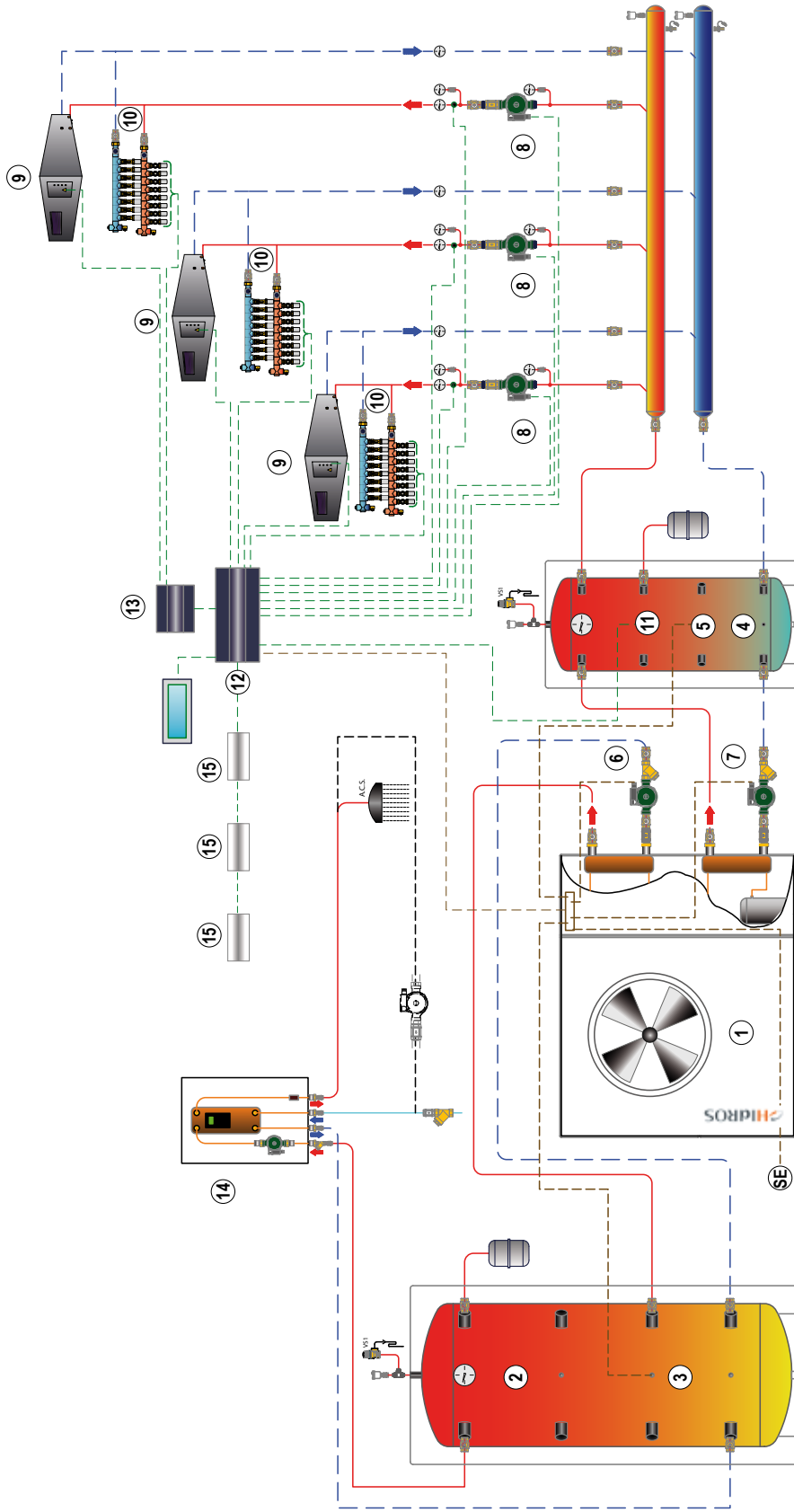
- Microprocessor ARM9;
- Mass storage media: SD card.


RGDD.01 TEMPERATURE AND HUMIDITY SENSOR

- Wall mounting electronic temperature+humidity sensor;
- ABS plastic box;
- Working range 0-95% R.H. +/- 0-50°C;
- 0-10V signal;
- Accuracy +/- 2% R.H.; +/- 0,25°C;
- Power supply 24 VAC.


MICR.0540 WEB SERVER SUPERVISOR MODULE

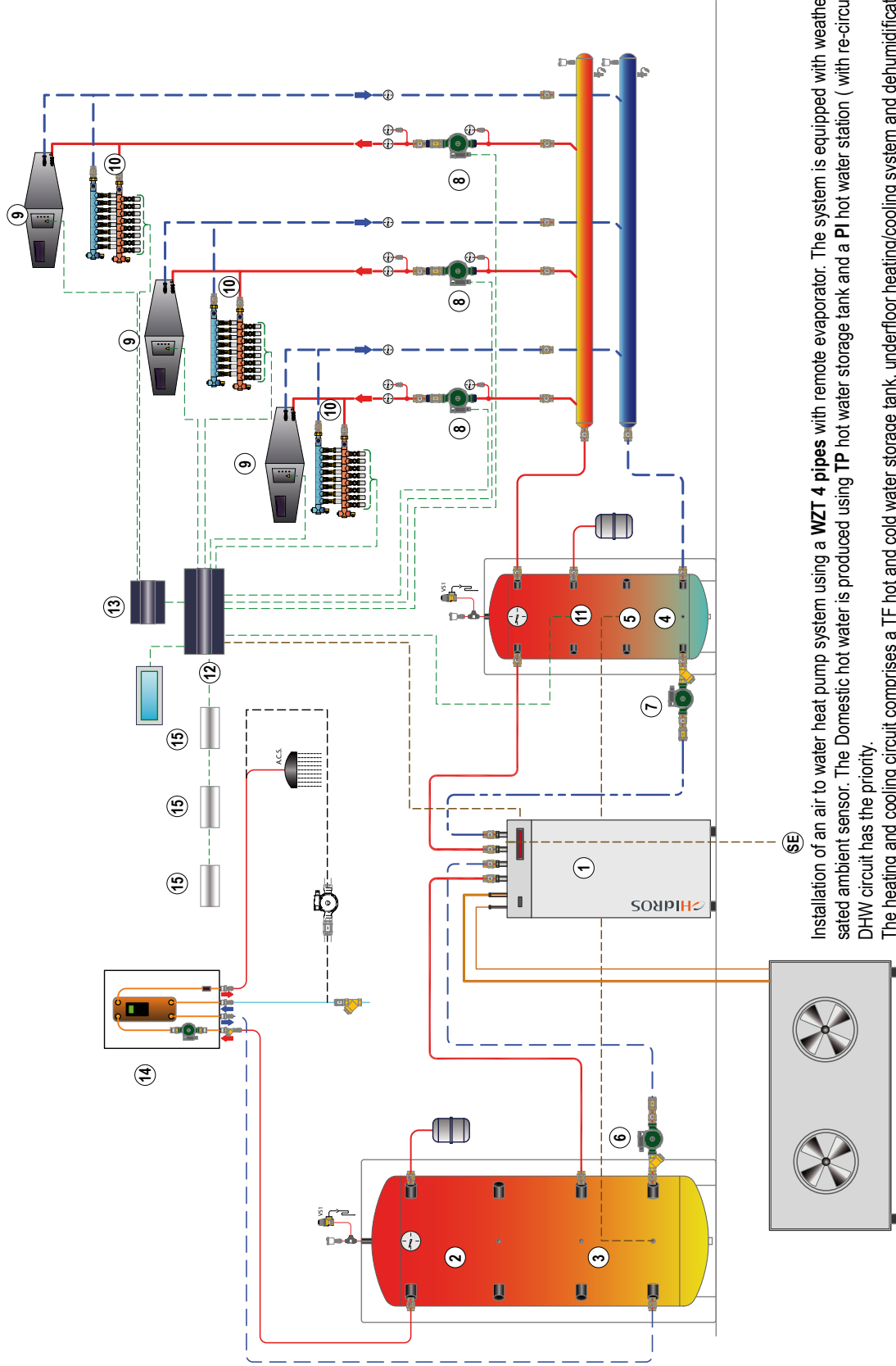
- WEB SERVER for supervision of the parameters;
- Power supply: 230 V AC +/- 10%;
- Internal memory 48 MB;
- Communication protocol modBUS-RTU;
- Output: LAN: x1 - USB: x 2;
- Alarm relays: RS485 x 2, system x 1;
- Ports: RS232 for external modem - RS485 digital input;
- Internal modem: Optional (analogue or GSM);
- Sampling interval: 1 to 60 min;
- Alarm signalling: via fax, mail, SMS or relay output.



Installation of an air to water heat pump system using a LZTi, LZi, LZT 4 pipes version, with DHW circuit priority, equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a TP hot water storage tank and a PI hot water station (with re-circulation). The heating and cooling circuit comprises a TF hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by **GH/MZ, GHE** dehumidifiers with cooling integration. Supervision of the system is by temperature/humidity sensors, connected in BUS line, programmable PLC with Modbus protocol and graphic display for the visualization of the different parameters.

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1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Expansion Module
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Heat Station
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	Temperature Sensor



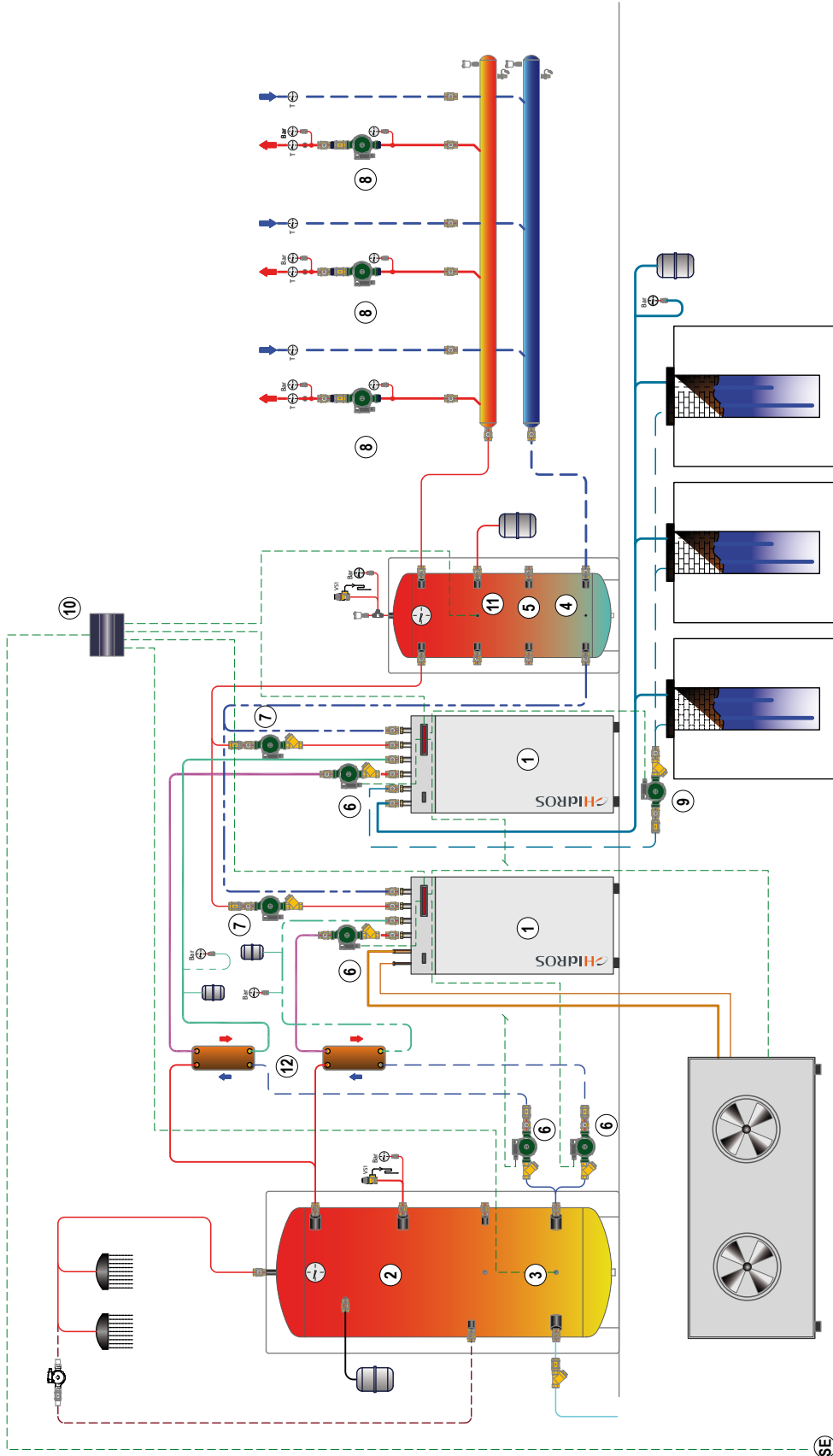
Installation of an air to water heat pump system using a **WZT 4 pipes** with remote evaporator. The system is equipped with weather -compensated ambient sensor. The Domestic hot water is produced using **TP** hot water storage tank and a **PI** hot water station (with re-circulation). The DHW circuit has the priority.

The heating and cooling circuit comprises a **TF** hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by **GH/GHE/WZ** dehumidifiers with cooling integration.

Supervision of the system is by temperature/humidity sensors, connected in BUS line, programmable PLC with Modbus protocol and graphic display for the visualization of the different parameters.

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1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Expansion Module
2	Hot Water Tank	5	Hot Water Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Heat Station
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	Temperature Sensor

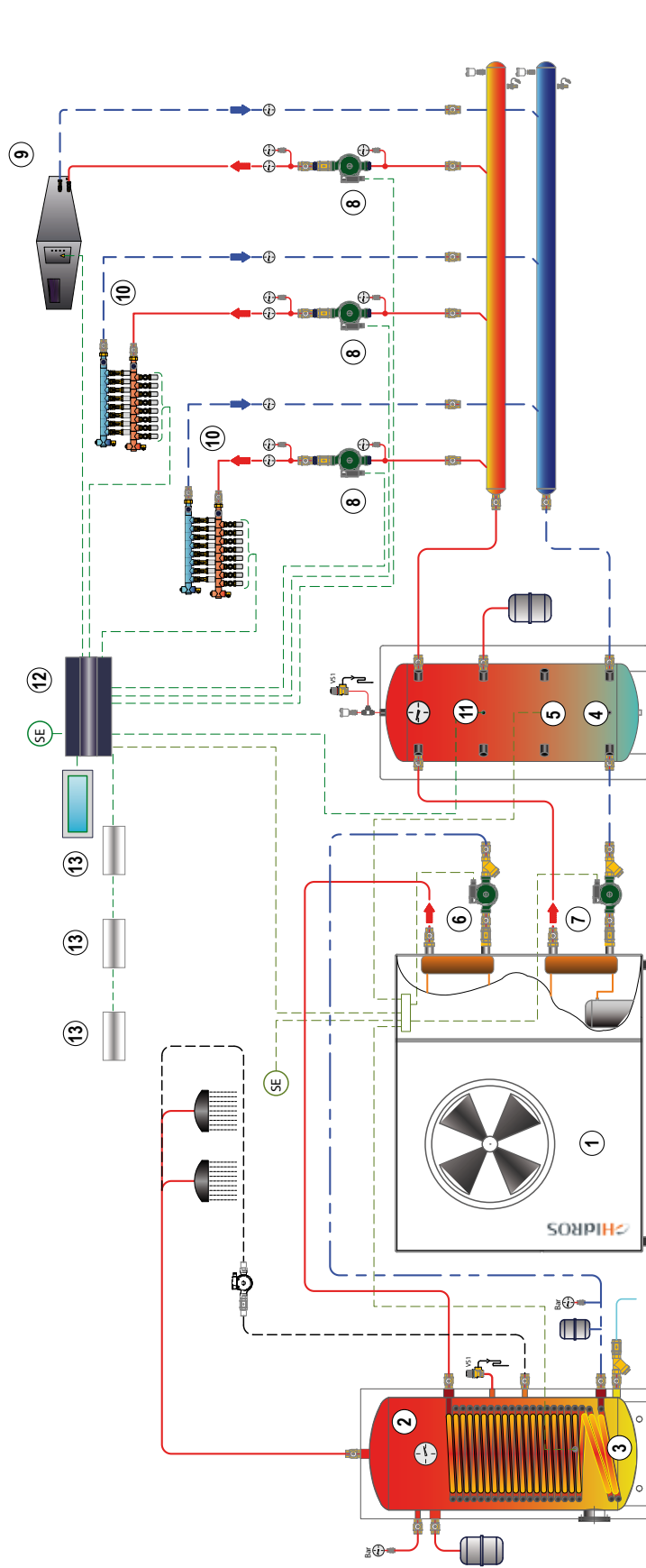


Installation of a heat pump system that is composed of a split type air to water heat pump **WZT 4** pipes and a ground source heat pump **WZH 4** pipes. They are managed in cascade. The system is equipped with a weather-compensated ambient sensor able to manage both units.

The Domestic hot water is produced using a **TA** domestic hot water storage tank and plate heat exchangers. The heating and cooling circuit comprises a **TF** hot and cold water storage tank and underfloor heating/cooling system. The supervision of the system is made by a cascade controller with Modbus protocol.

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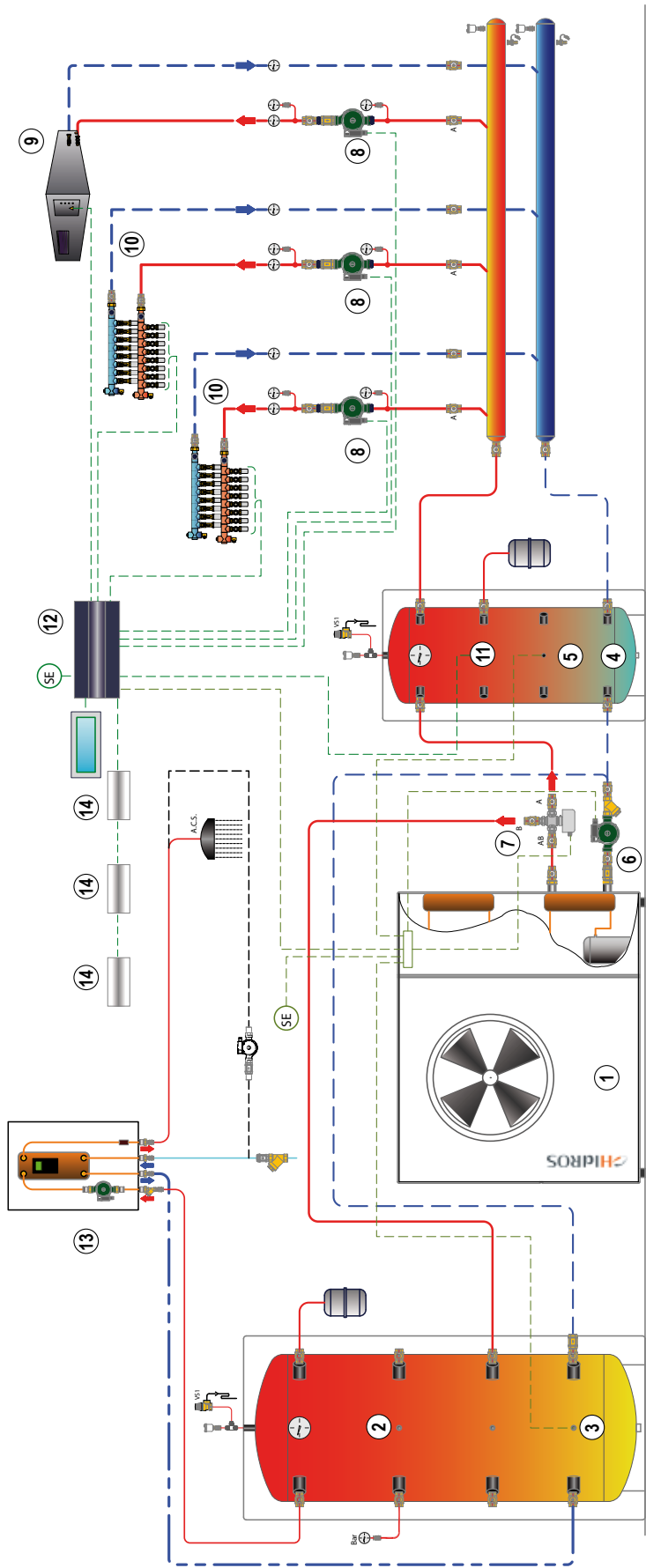
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Cascade Controller	13
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14
3	Hot Water Sensor	6	Hot Water Pump	9	Source Exchanger Pump	12	Plate heat Exchanger	15



Installation of an air to water heat pump system using a LZTi, LZi, LZT 4 pipes. The system is equipped with weather-compensated ambient sensor. The Domestic hot water is produced using a TW domestic hot water cylinder. The DHW circuit has the priority. The heating and cooling circuit comprises TF hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by GH/WZ, GHE dehumidifiers with cooling integration. Supervision of the system is by temperature/humidity sensors, connected in BUS line, programmable PLC with Modbus protocol and graphic display for the visualization of the different parameters.

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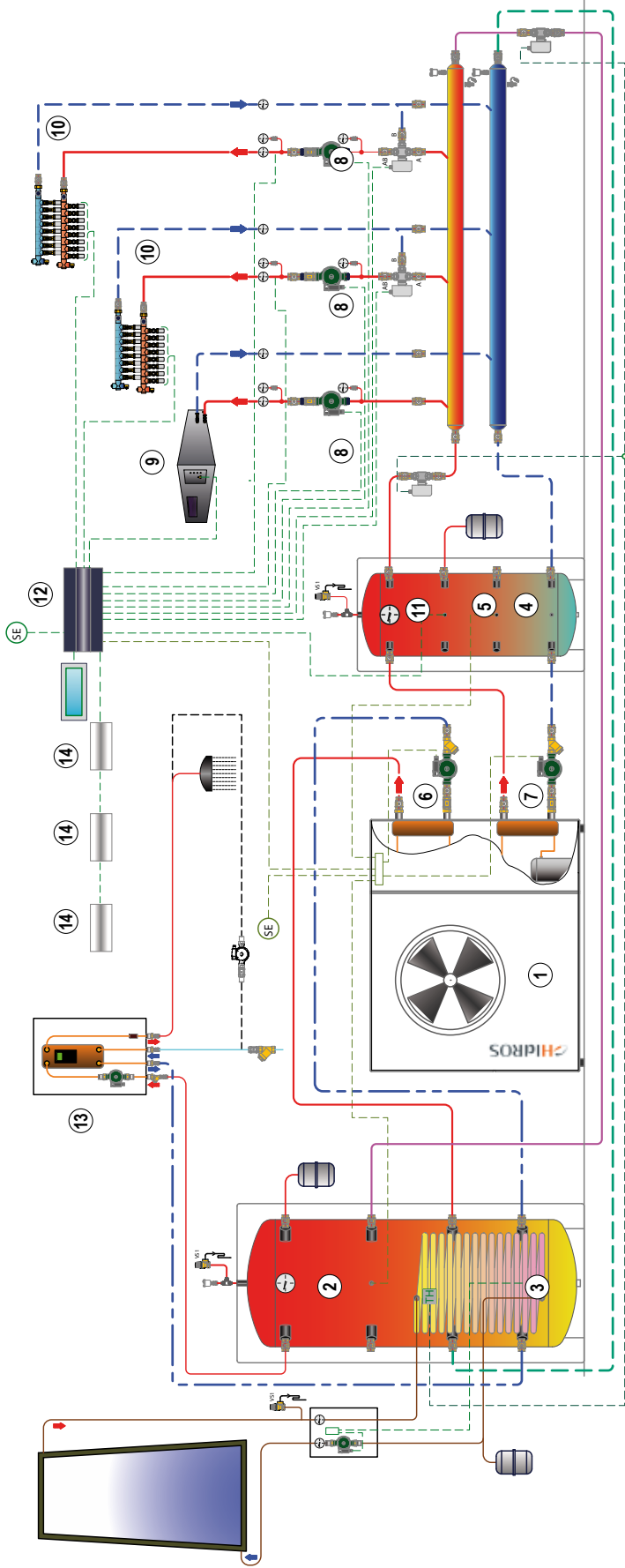
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Temperature Sensor
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	



Installation of an air to water heat pump system using a LZTi, LZi, LZT. The system is equipped with weather-compensated ambient sensor. The Domestic hot water is produced using a 3 way diverting valve (controlled by the unit microprocessor), a TP hot water storage tank and a PI hot water station with re-circulation. The DHW circuit has the priority. The heating and cooling circuit comprises a TF hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by GHWZ, GHE dehumidifiers with cooling integration. Supervision of the system is made by temperature/humidity sensors, connected in BUS line, programmable PLC with Modbus protocol and graphic display for the visualization of the different parameters.

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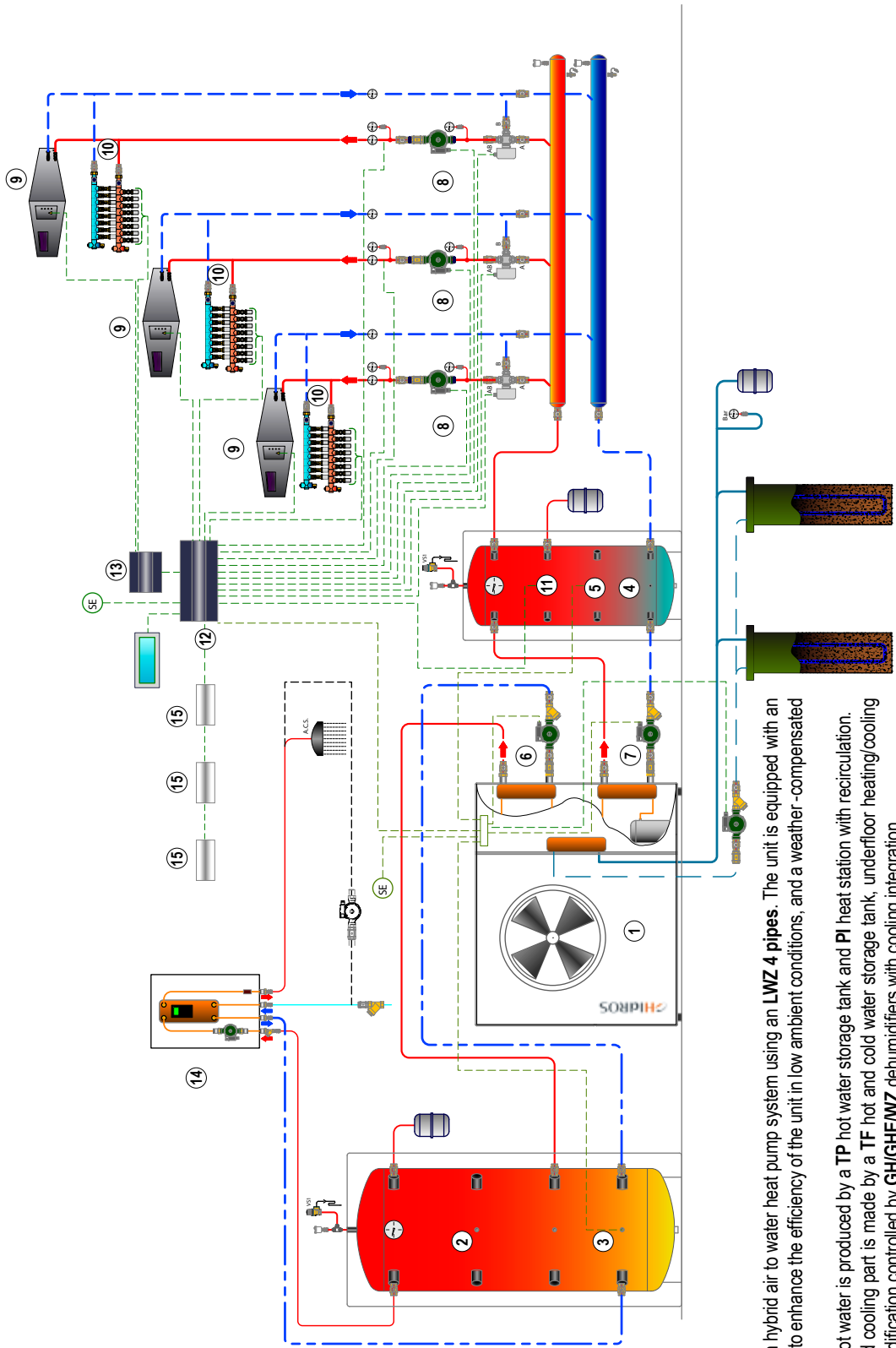
1	Heat Pump	4	Buffer Tank	7	Diverting Valve	10	Zone Manifold	13	Heat Station
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Temperature Sensors
3	Hot Water Sensor	6	Heating Pump	9	Dehumidifier	12	Controller	15	



Installation of an air-to-water heat pump system using a **LZTi, LZi, LZT, 4 pipes version**. The system is equipped with weather-compensated ambient sensor. The Domestic hot water is produced using a **TPS** hot water storage tank with solar coil and a **PI** hot water station with re-circulation. The DHW circuit has the priority. The heating and cooling circuit comprises a **TF** hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by **GH/MZ, GHE** dehumidifiers with cooling integration. Integration of the solar system is possible either on the DHW circuit or the heating circuit, by using a "limit" thermostat to recover the surplus of energy on the DHW circuit. Supervision of the system is by temperature/humidity sensors with mixing valves for the management of the hot water temperature in winter mode and the cold water temperature in summer with respect to the ambient dew point. The sensors are connected in BUS line, programmable PLC with Modbus protocol and graphic display for visualization of the various parameters.

The above scheme is for illustrative purposes only

1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Heat Station
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Temperature Sensor
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	



Installation of an hybrid air to water heat pump system using an **LWZ 4** pipes. The unit is equipped with an auxiliary source to enhance the efficiency of the unit in low ambient conditions, and a weather -compensated ambient sensor.

The Domestic hot water is produced by a **TP** hot water storage tank and **PI** heat station with recirculation. The heating and cooling part is made by a **TF** hot and cold water storage tank, underfloor heating/cooling system, dehumidification controlled by **GHI/GHE/MWZ** dehumidifiers with cooling integration.

The supervision of the system is made by temperature/humidity sensors, connected in BUS line, programmable PLC with Modbus protocol and graphic display for the visualization of the different parameters.

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1	Heat Pump	4	Buffer Tank	7	Diverting Valve	10	Zone Manifold	13	Expansion Module
2	Hot water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Heat Station
3	Hot water Sensor	6	Heating Pump	9	Dehumidifier	12	Controller	15	Temperature Sensor