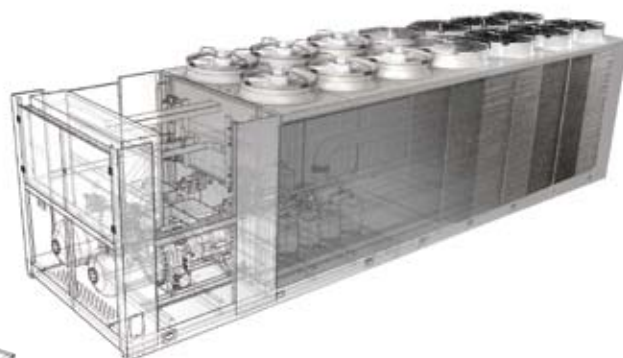
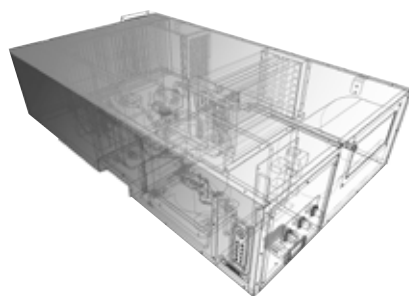




YOUR AIR, OUR PASSION

# 2013 GENERAL CATALOG



● Heat pump systems ● Dehumidifiers ● Water chillers



ISO 9001 - Cert. n. 5205/0



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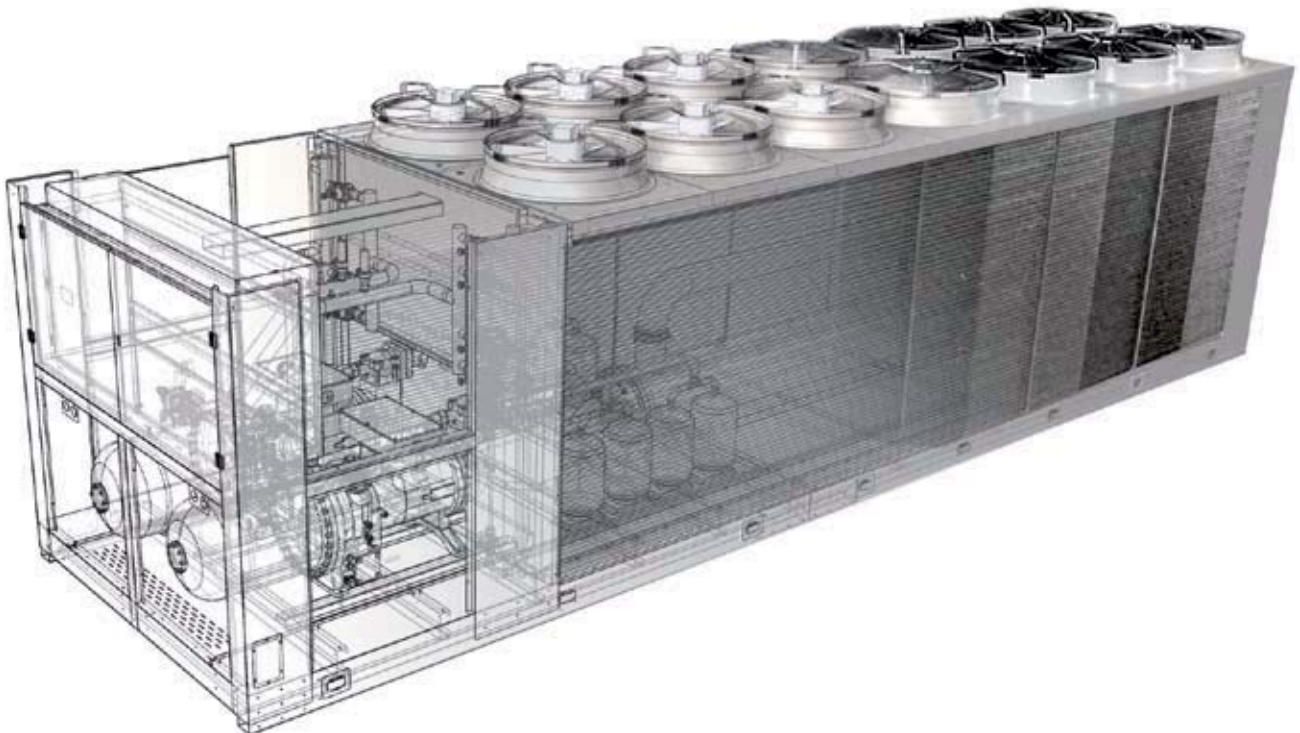
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## The Company



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.

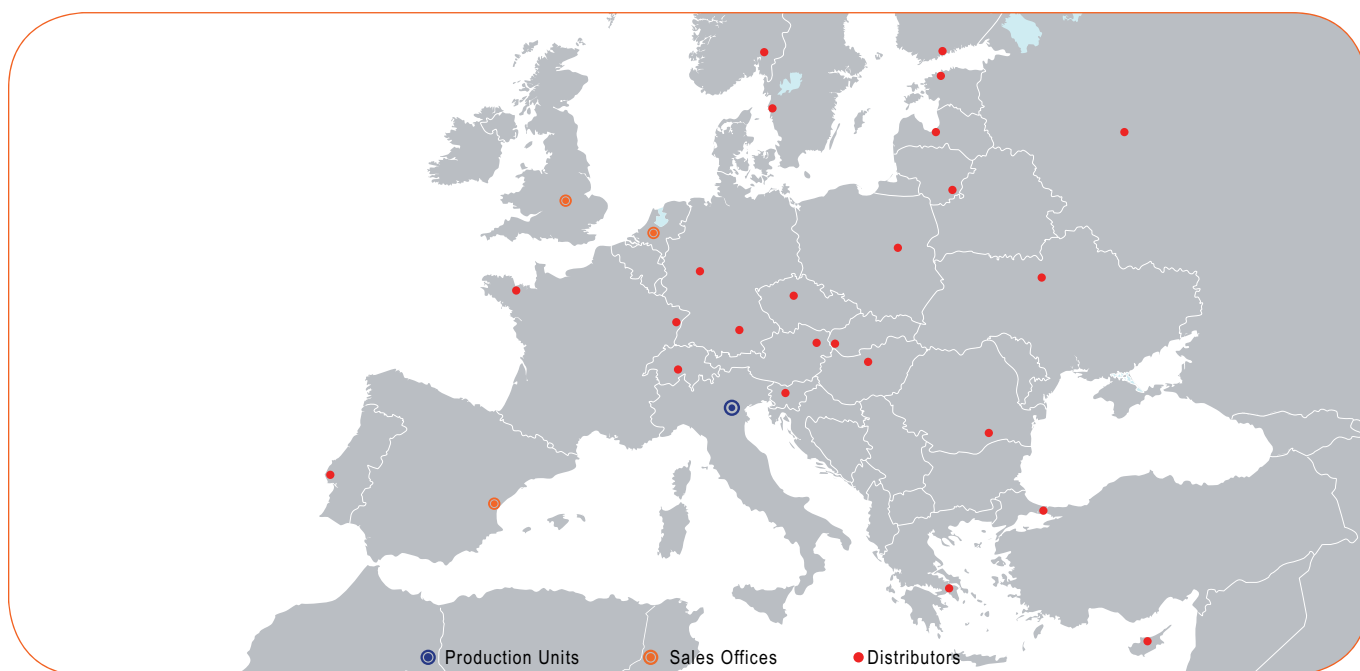




Today, HIDROS with its qualified staff, designs, develops and tests heat pumps, water chillers, dehumidifying systems and air handling units all based on the refrigerant cycle. The total range of Hidros products includes standard dehumidifiers with capacities from 25 to 3000 l/24h and heat pumps and water chillers with cooling and heating capacities from 5 to 900 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  
WZT/RV 092 model

Water to water heat pump  
WZT 072 model



WZT Outdoor unit



Heat pump  
LZT 072 - RGK 1250 model

Heat pump  
LZT/SW6 092 model





## Chiller installations

HIDROS



Air to water unit LDA/HP  
300 SP



Air to water unit LDA 070



Air to water unit  
LDA 300 model



Water to water chiller reversible  
WDA/RV 190 model

## Dehumidifiers installations



DS 3000 Unit

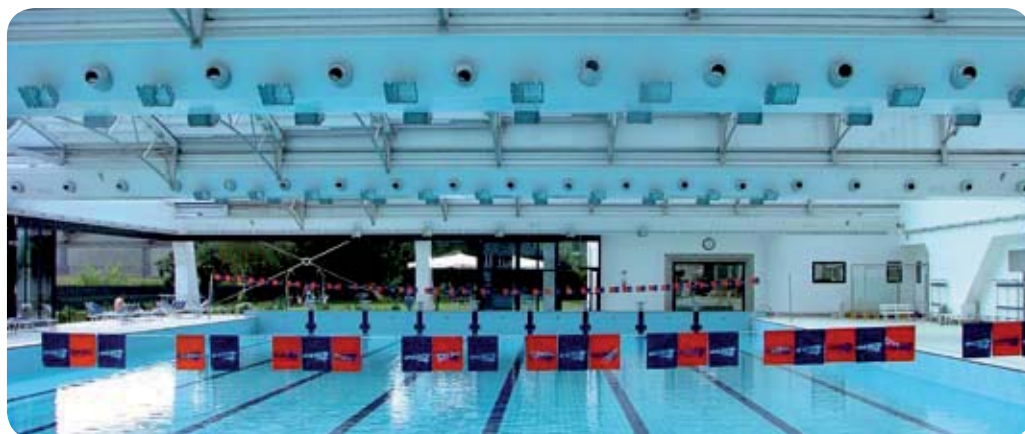
HIDROS

ITM 330S Unit



UTH 015Z Unit

Air to water special unit

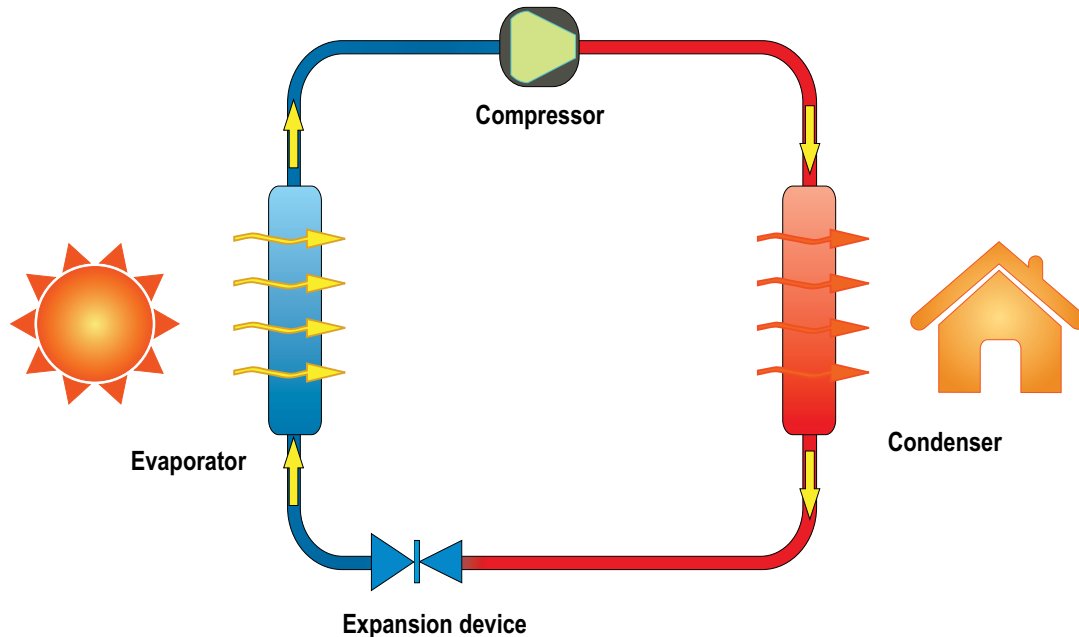




## WHAT IS A HEAT PUMP?

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

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, WZT and LPH 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 absorbed from the source plus that which was

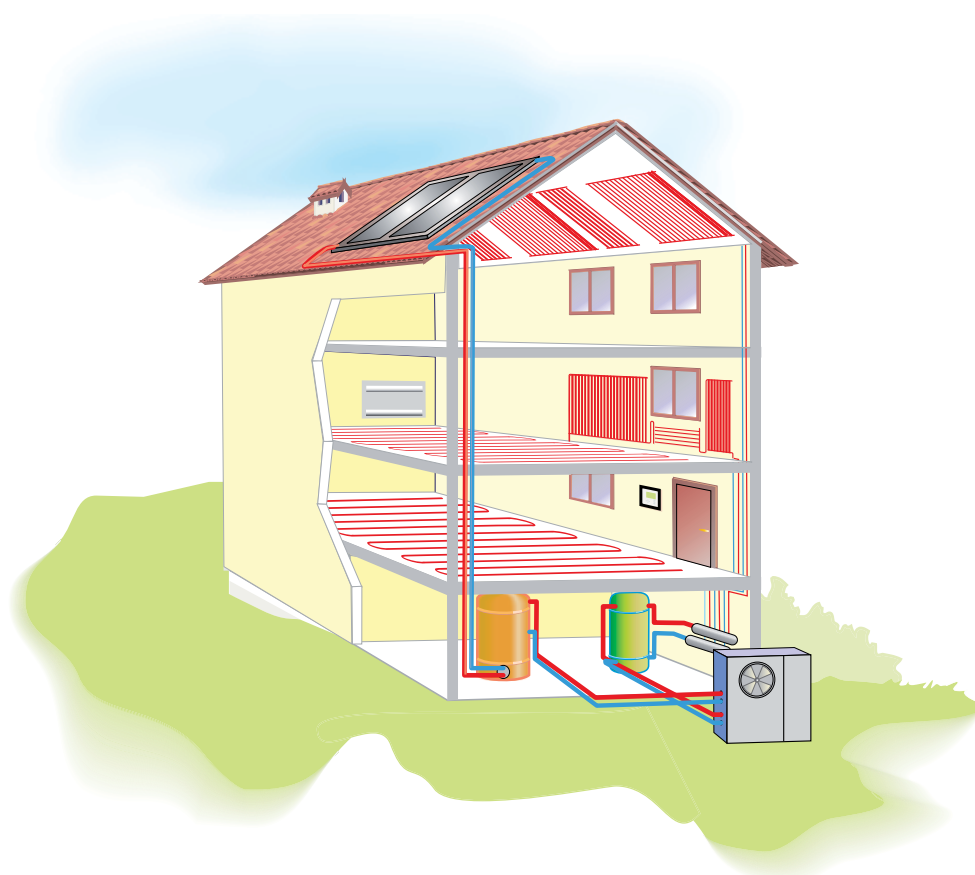
input to the compressor. The warm water then transfers the heat to the building with a heating system that normally uses:

Fan coils  
Radiators  
Underfloor heating systems.

## TYPES OF HEAT PUMPS

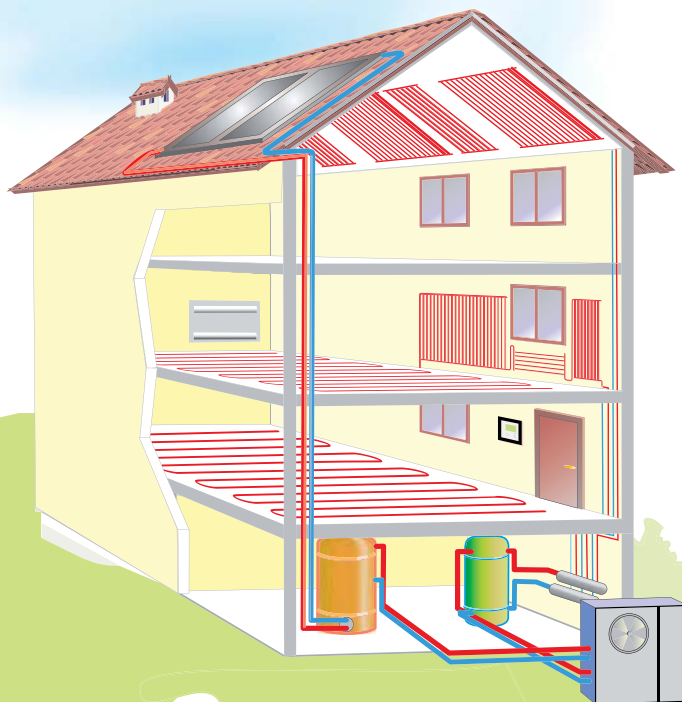
There are different types of heat pumps, classified by the type of the source; the main types are:

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



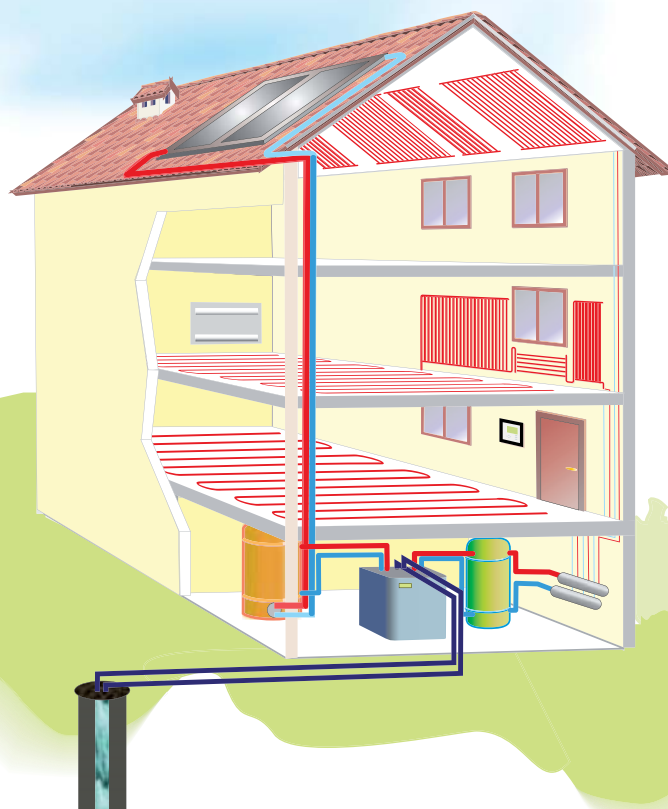
## • AIR TO WATER HEAT PUMPS;

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.



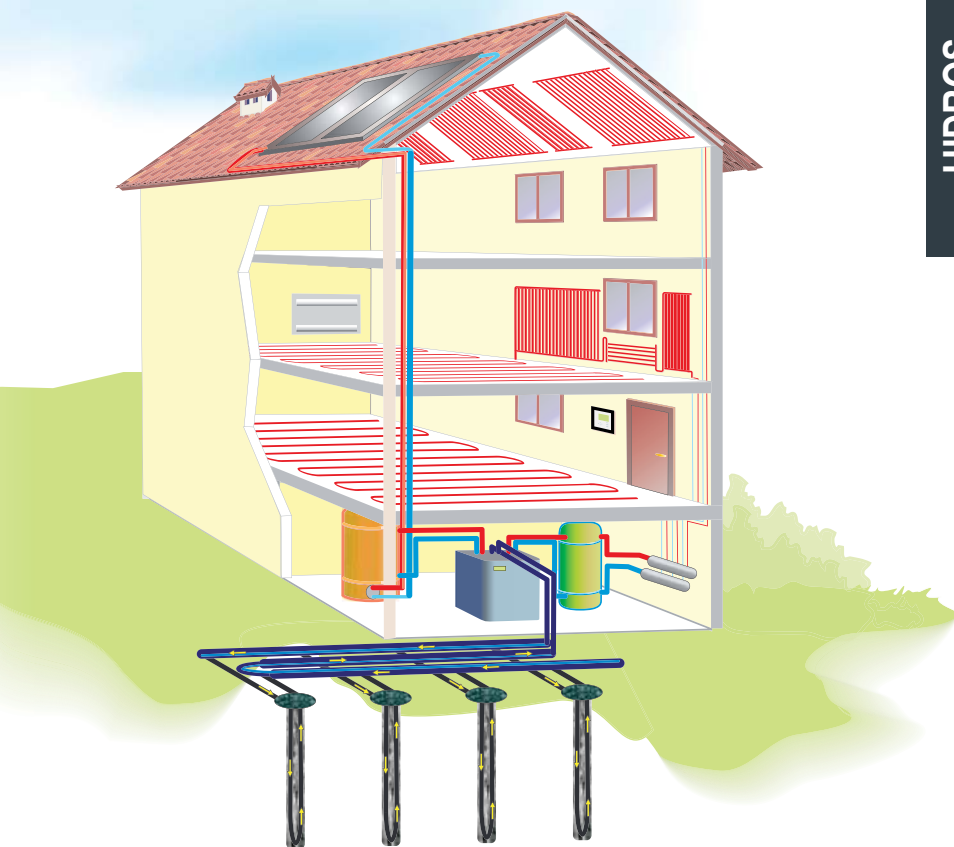
## • WATER TO WATER HEAT PUMPS;

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.



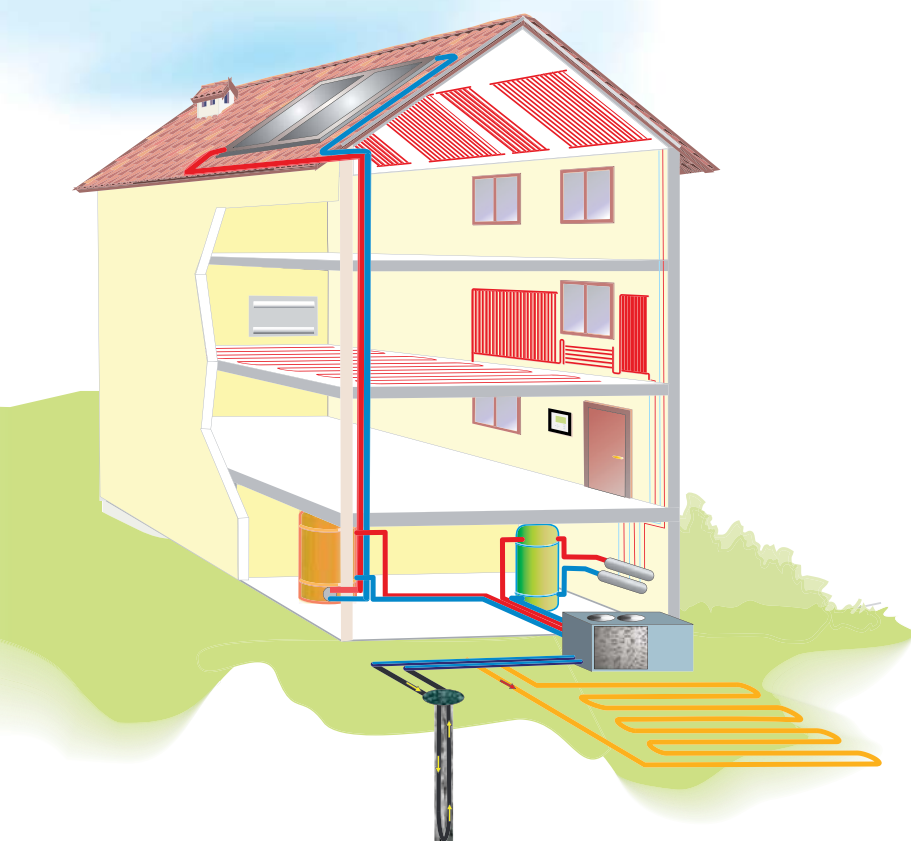
### • GROUND SOURCE HEAT PUMPS;

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

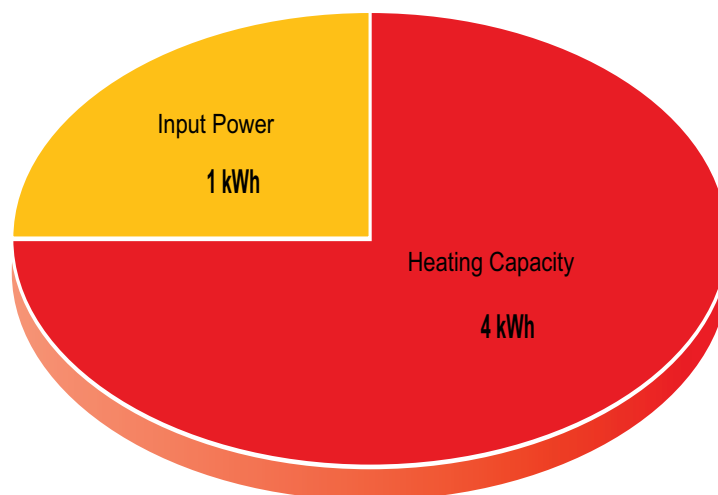
During its operation the heat pump:

- “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

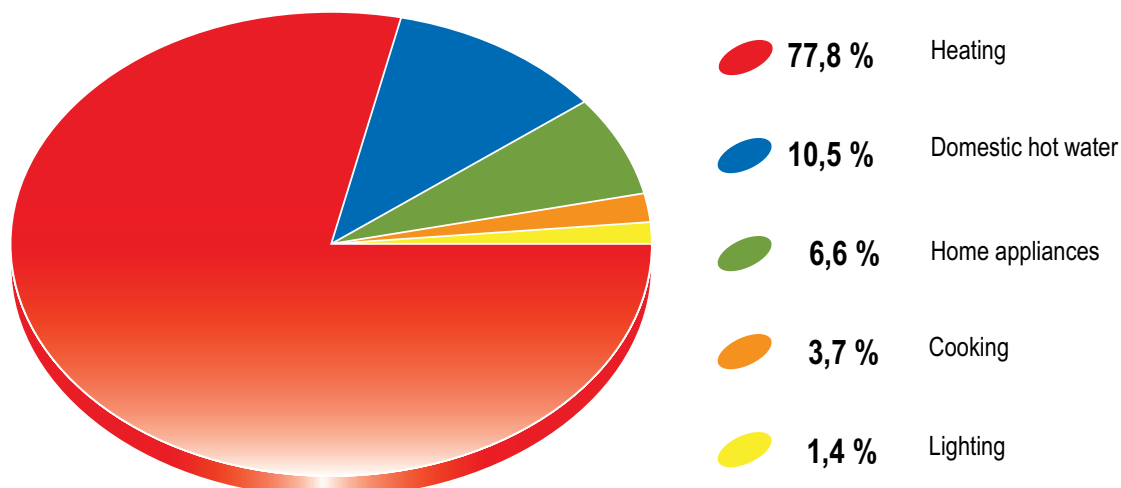
consumption, savings in this area will have a massive effect on the overall energy bill for the country.

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:**

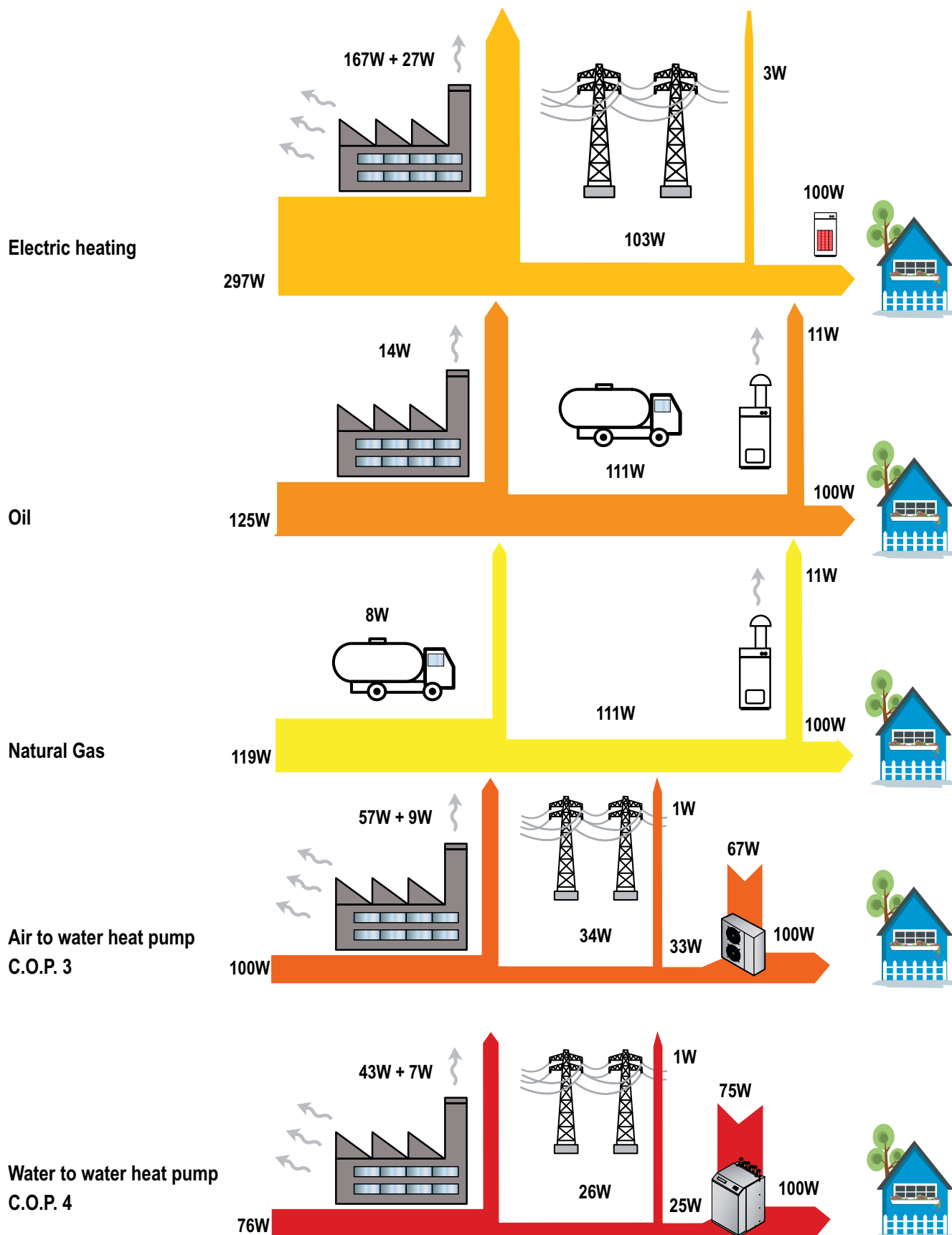
- **Low emission of greenhouse gases such as CO<sub>2</sub>**

- **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.**



## THE USE OF PRIMARY ENERGY

The diagrams below show the use of primary energy by the different heating systems that are available on the market.





The use of heat pumps reduces the use of primary energy when compared to other heating systems thereby showing a massive reduction of CO2 emissions;

Heating system	Used primary energy percentage
Electric heating	(297%),
Oil	(125%),
Natural Gas	(120%),
Air to water heat pump	(100%),
Water to water heat pump	(76%),

- *Heat pumps are the heating system of the future; (easy to maintain, efficient, environmentally friendly);*
- *The heat pump can be used for heating, cooling and domestic hot water production;*
- *Because of their efficiency, there are already many users with heat pumps, widely used in Northern European countries*
- *The price of electricity remains relatively stable, compared with gas. This facilitates investment planning.*
- *Once installed, the heat pump requires minimal maintenance*

## APPLICATIONS OF THE HEAT PUMPS

Heat pumps are now in common use in commercial buildings as an alternative to the traditional systems of heating and cooling using boilers and water chillers. The same unit is able to produce heating in winter and cooling in summer thanks to a simple valve which changes the functions of evaporator and condenser (reversible type). Using a heat pump for heating and cooling is much more energy efficient, has a lower capital cost and the pay-back period is therefore shorter when compared to the traditional boiler/chiller approach. In the residential market, heat pumps are used for heating and the production of domestic hot water.

## DOMESTIC HOT WATER (SW)

HIDROS heat pumps are capable of producing hot water up to 63°C (LZT, CZT, WZT & LWZ units) enabling such units to be used in applications where domestic hot water is required. Although the heat pump can generate water at 60°C, it is common, when using heat pumps, for the water to be stored at 45 - 50°C. It is therefore necessary to use tanks that are larger than those used with normal boilers.

The average volumes of domestic hot water that are required if storing at 45°C are given below:

N°User	D.H.W. (lt/24h)	N°User	D.H.W. (lt/24h)	N°User	D.H.W. (lt/24h)	N°User	D.H.W. (lt/24h)
1	70	2	140	3	190	5	270

## HOW TO DESIGN A HEAT PUMP SYSTEM

The correct selection of the heat pump is extremely important to the overall efficiency of the heating system; an oversized heat pump can create comfort problems in the room due to large swings in water temperature (and can have an adverse financial effect), whilst an undersized heat pump will cause a reduction in the system efficiency due to the requirement to augment the output with external sources such as electric heaters or boilers.

It is also clear that an excellent heat pump, combined with a poor heating system will result in a poor overall system thereby confirming the requirement for correct matching of the heat pump and heating system.

In general, it can be assumed that for every 1°C less that we heat the water we obtain an average C.O.P. increase of about 2-2,5% (even greater in water to water units) with important consequences to the efficiency

of the whole system and the overall Energy saving.

Underfloor heating systems, from this point of view, are extremely interesting since they operate with water temperatures around 30-38°C, while radiators or fan coil systems require higher temperatures (around 50°C) with an inevitable reduction in the general C.O.P.

In general, heat pump systems are designed with a maximum water outlet temperature of 55°C. If higher temperatures are required (for example, refurbishment of old buildings where it is not possible to replace the old heat emitters), then integration of the heat pump with other energy sources (electric heaters or boilers) has to be considered, especially at low ambient conditions.

When the water temperature is lower than 55°C, heat pumps normally do not need to be augmented by other energy sources and their use is taken into consideration only for financial reasons that will be considered in the following pages.

Some examples:

Heat pump LZT14T @:	Ambient temperature: 2°C	
Water temperature	35°C	C.O.P. 3,4
Water temperature	45°C	C.O.P. 3,0
Water temperature	55°C	C.O.P. 2,6

Heat pump WHA 50 @:	Source water temperature: 10 - 7°C	
Water temperature	35°C	C.O.P. 5,7
Water temperature	45°C	C.O.P. 4,4
Water temperature	55°C	C.O.P. 3,3

Currently, the main design approaches with heat pumps are:

- Monovalent systems;
- Monovalent systems with electric integration;
- Bivalent systems.

This booklet does not consider bivalent systems (which involve the use of energy sources other than electricity) and only focuses on the first 2 systems:

## MONOVALENT SYSTEMS

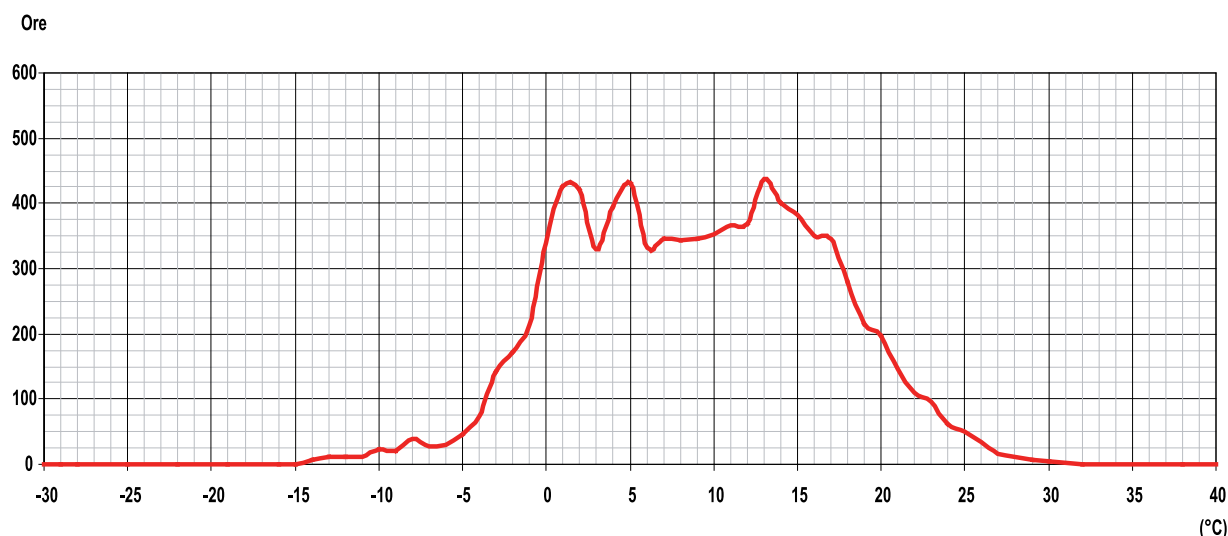
In general, monovalent systems are those applications where it is not necessary to augment the heating capacity of the unit. The heat pump supplies 100% of the heating required by the building.

For monovalent systems the heat pump is selected to match the maximum building heating load that occurs at the minimum ambient conditions that can be expected.

Example:

Location: Stuttgart (Germany)

This location has the following climatic trend;



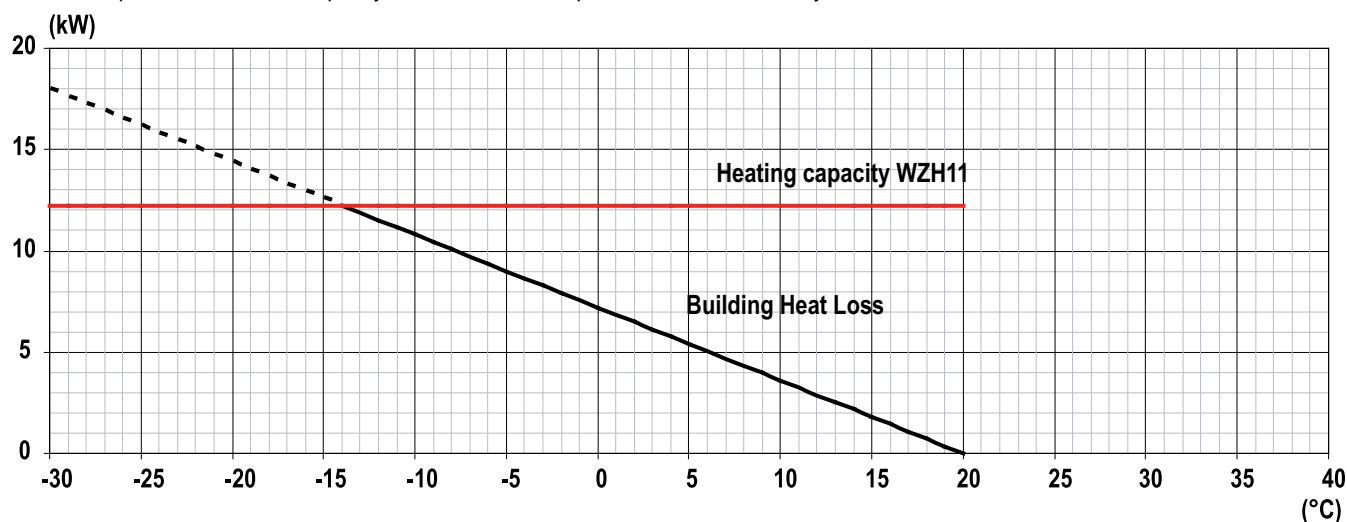
Ambient temperature °C	-30	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10
Hours/Year	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	12	11	11	24
Ambient temperature °C	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11
Hours/Year	20	38	27	29	45	74	141	171	214	338	426	421	329	395	430	332	345	343	345	353	366
Ambient temperature °C	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Hours/Year	368	437	400	382	350	345	279	215	197	146	111	97	61	50	34	17	12	6	4	3	0
Ambient temperature °C	33	34	35	36	37	38	39	40													
Hours/Year	0	0	0	0	0	0	0	0													

From the graph and table above, it can be seen that this location has a minimum ambient temperature of -14°C for 6 hours per year. For this example we have a building which has a heat loss of 9 kW at -5°C ambient, with an indoor temperature of 20°C, located in Stuttgart. The building heat loss line can be plotted using this data (9kW @ -5°C, 0kW @ 20°C) and this is shown on the following two graphs. (calculated in accordance to UNI12813\*). This enables us to determine the required heating load which is 12.2kW at the worst ambient condition (-14°C).

\* Refer always to the load laws in force in the country in which the heat pump is installed.

## SOLUTION WITH A GROUND SOURCE HEAT PUMP

The main characteristic of the ground source and/or water to water heat pump is that of maintaining a constant C.O.P. and heating capacity for varying ambient conditions. This enables an optimum size unit to be selected with constant, guaranteed performance despite variations in external temperature. The over capacity as the ambient temperature rises is relatively small.

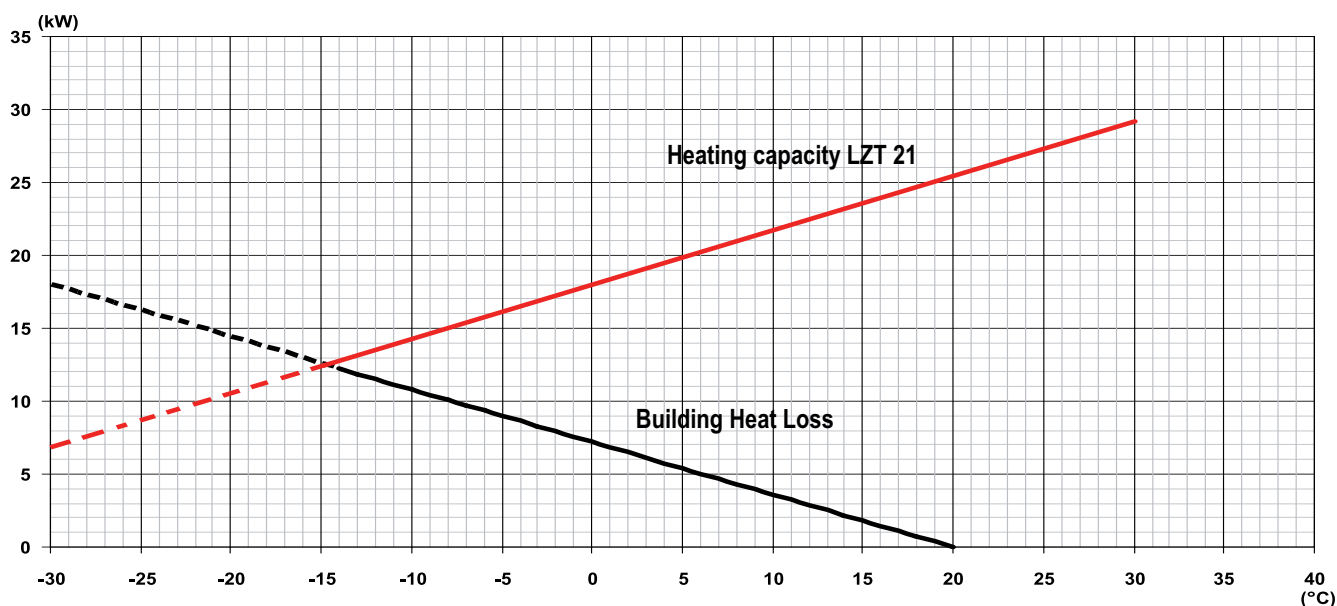


In this example, the ground source heat pump that satisfies the required capacity is the model WZH09. It has a heating capacity of 12.9 kW with a source water temperature of 0°C and user water outlet temperature of 35°C.

Ambient temperature:	Heat Loss	Heating capacity WZH11
0°C	7 kW	12,3 kW
-5°C	9 kW	12,3 kW
-14°C	12,2 kW	12,3 kW

## SOLUTION WITH AN AIR TO WATER HEAT PUMP LZT SERIES

If we were to select an air to water heat pump (LZT or WZT series) for the same example, the trend of the heating capacity and heat loss becomes the following:



Ambient temperature:	User	Heat Loss	Heating capacity LZT21
0°C	35°C	7 kW	16,9 kW
-5°C	35°C	9 kW	15,0 kW
-14°C	35°C	12,2 kW	12,1 kW

In this case, if we were to use a monovalent system, we need to select an LZT21 which, at -14°C ambient temperature, has a heating capacity of 12.9 kW. It can be seen however, that the selection of a LZT21 despite being technically correct, is not a good solution from either an economic or energy use viewpoint as it requires an OVERSIZED unit that is clearly too large for the remaining period of the year. Using a LZT21 also requires a bigger water pump and, larger pipe diameters. In addition, the unit could be more noisy than required and physically

may not fit into the space available.

This example shows the main difference between a ground source heat pump and an air to water heat pump. For the ground source there is only one variable (the building heat loss) whilst for the air source both the building heat loss and the heat pump capacity are variable and are diverging. This characteristic of an air source heat pump has a negative effect when the unit is installed in locations with severe ambient conditions (very cold). Conversely, it is a positive effect when the unit is installed

in warmer locations, where an air source heat pump is more efficient than a ground source one.

Generally speaking, in installations that use air to water heat pumps a monovalent system that is augmented by integrated electric heaters is the choice.

## MONOVALENT SYSTEMS WITH ELECTRIC INTEGRATION

A monovalent system with electric integration is one where the heating capacity of the heat pump is augmented, for short periods, by integral electric heaters. In such a system, the heat pump will, for 90- 95% of the winter season provide the total heating requirement of the building with the

electric heaters being activated to operate in conjunction with the heat pump thereby meeting the heat load for the 5% to 10% of the time that the ambient is at, or close to, its minimum value. This ratio has been found to be a good compromise when a capital cost/benefits analysis is performed.

Selection of the heat pump for such a system, is performed for a minimum ambient temperature below which the temperature drops for only 5 - 10% of the total heating season.

For our chosen example, the following data is available:

Ambient temperature:	N°hours year:	Winter season
-14°C a 20°C	8219	Total winter season
-14°C a +5°C	3162	38,4%
-14 a 0°C	1161	14,0%
-14 a -5°C	223	2,70%
-14 a -10°C	64	0,77%
-14°C	6	0.07%

To select an air to water heat pump with integrated electric heaters, for the same building as previous, we proceed as follows:

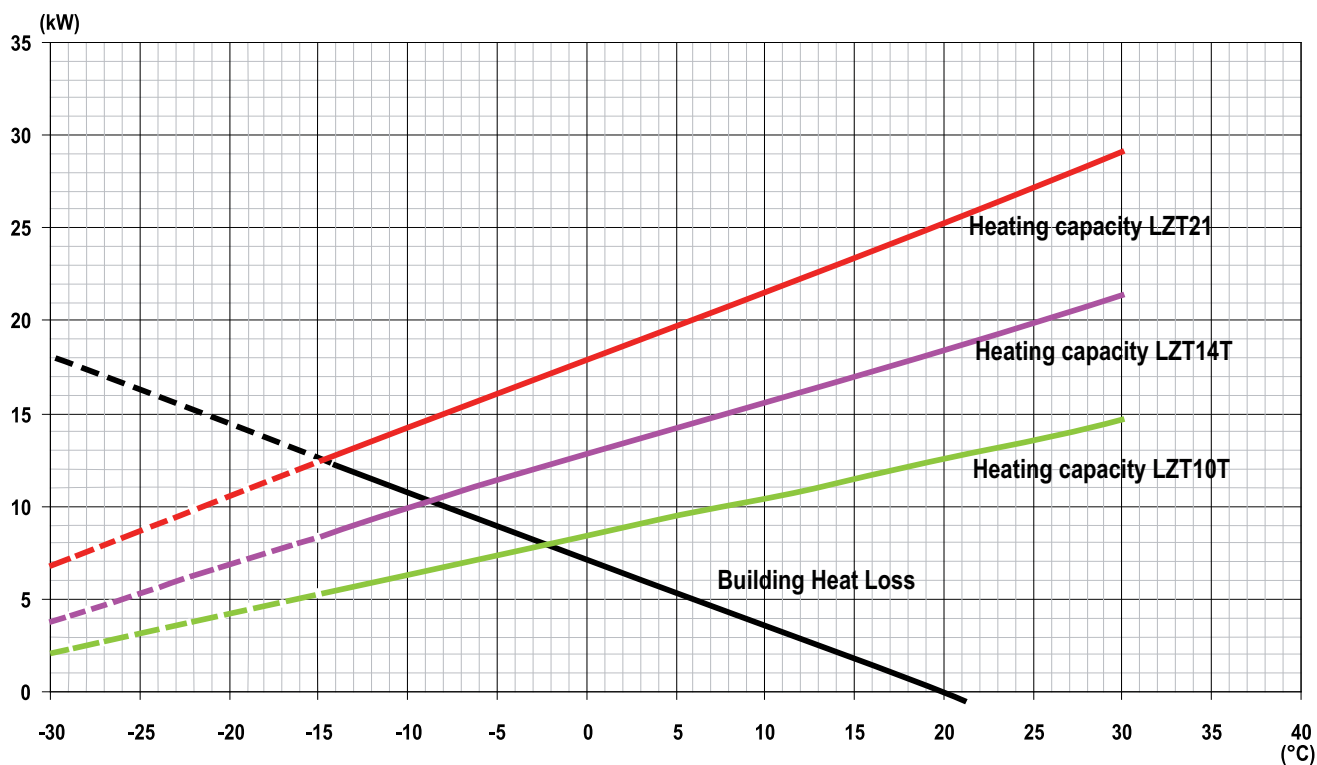
The minimum ambient temperature at which the heat pump will meet the total building heat loss, must be established. This is the temperature for which the ambient is equal to or greater than for 90 – 95% of the year. In other words, the period of time during which the heat pump will be undersized

cannot be greater than 5/10 %. The graph below shows that the amount of time that the ambient temperature is between -14°C (minimum winter ambient temperature) and -5°C equates to 223 hours per year, corresponding of 2.7% of the total winter season.

If we extend the temperature band, we can see that the ambient temperature is below 0°C for 1161 hours, equivalent to 14% of the total winter season. If we superimpose

on the graph, the heating capacities for models LZT10T, 14T and 21, we can identify the following:





The intersection point of the heat loss line and the heating capacity lines identify the minimum ambient temperature at which the selected heat pump is able to satisfy the heat loss of the building. It can therefore be seen that it is necessary to augment the heating capacity of the heat pump with electric heaters at lower ambient temperatures.

Using a Heat Pump:

Using a LZT21 the intersection occurs at -14°C;

Using a LZT14T the intersection occurs at -8°C;

Using a LZT10T the intersection occurs at -2°C;

The correct selection in this case is a LZT14T that, with an intersection of -8°C, is the best compromise between cost and benefits.

## SELECTION SOFTWARE

To assist in making the correct selection of heat pump, Hidros has developed and provides to designers, a sophisticated software that enables all of the following parameters of the system to be calculated:

- Intersection point between heat pump output and building heat loss;
- Season thermal energy produced by the heat pump;
- Calculation of the energy requirements for domestic hot water;
- Energy losses in defrosting (air to water heat pump only);

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### HEAT PUMP SEASON EFFICIENCY SIMULATION

Project reference:		Compensation curve	Ambient Temp.	°C	-5	5
		Correction factor	User water Temp.	°C	35	35
Location:	Germany - Stuttgart	Room Temperature	°C	20		
Building heat loss @ -5°C	kW 9,0	Language	English			
Number of persons	n. 4	User water temperature	°C	35		
Cost kWh Heat Pump	€/kWh 0,11	Ambient temperature System OFF	≥°C	16		
Cost kWh Integration	€/kWh 0,11	Domestic hot water for person	l/24h	20		
Heat pump model:	LZT 14T 400/3	Domestic hot water temperature	°C	50		
		Cold water temperature	°C	10		

### BUILDING HEAT LOSS / HEATING PRODUCED BY THE HEAT PUMP

The graphic shows the building energy loss (in kwh including DHW energy - red line), compared to the heating capacity developed by the heat pump (in kwh- black line). The graphic includes the heat loss of the heat pump due to the defrost cycle.

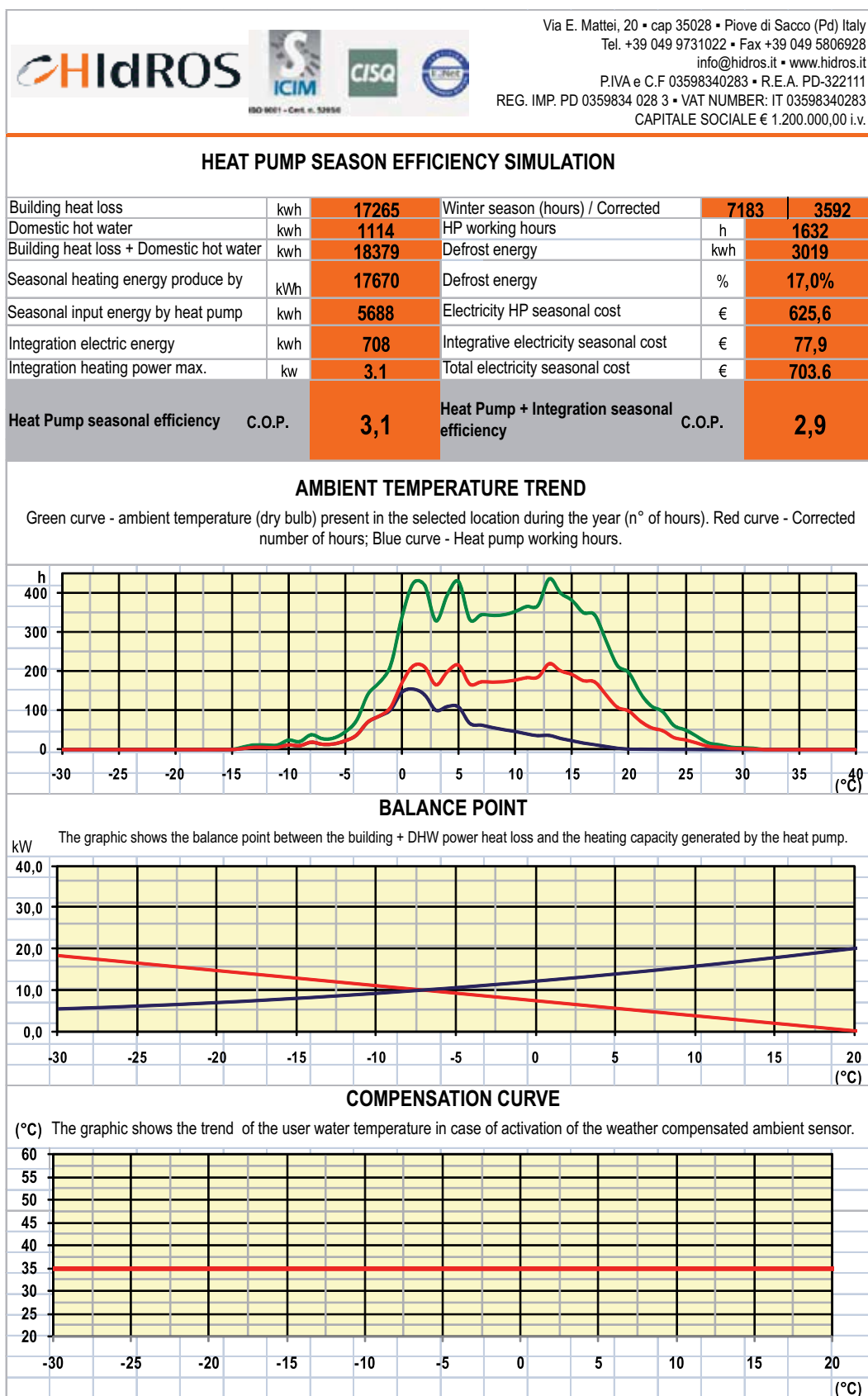
### AMBIENT TEMPERATURE TREND

The table shows the ambient temperature (dry bulb) present in the selected localities during the year (n° of hours).

Ambient temperature (°C)	-30	-29	-28	-27	-26	-25	-24	-23	-22	-21	-20	-19	-18	-17	-16	-15
Hours (h)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ambient temperature (°C)	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	1
Hours (h)	6	12	11	11	24	20	38	27	29	45	74	141	171	214	338	426
Ambient temperature (°C)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Hours (h)	421	329	395	430	332	345	343	345	353	366	368	437	400	382	350	345
Ambient temperature (°C)	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Hours (h)	279	215	197	146	111	97	61	50	34	17	12	6	4	3	0	0
Ambient temperature (°C)	34	35	36	37	38	39	40	<b>Total hours</b>				<b>8760</b>				
Hours (h)	0	0	0	0	0	0	0									

- Energy input for Heat Pumps with integrated electric elements;
- Operating costs;
- System seasonal C.O.P..

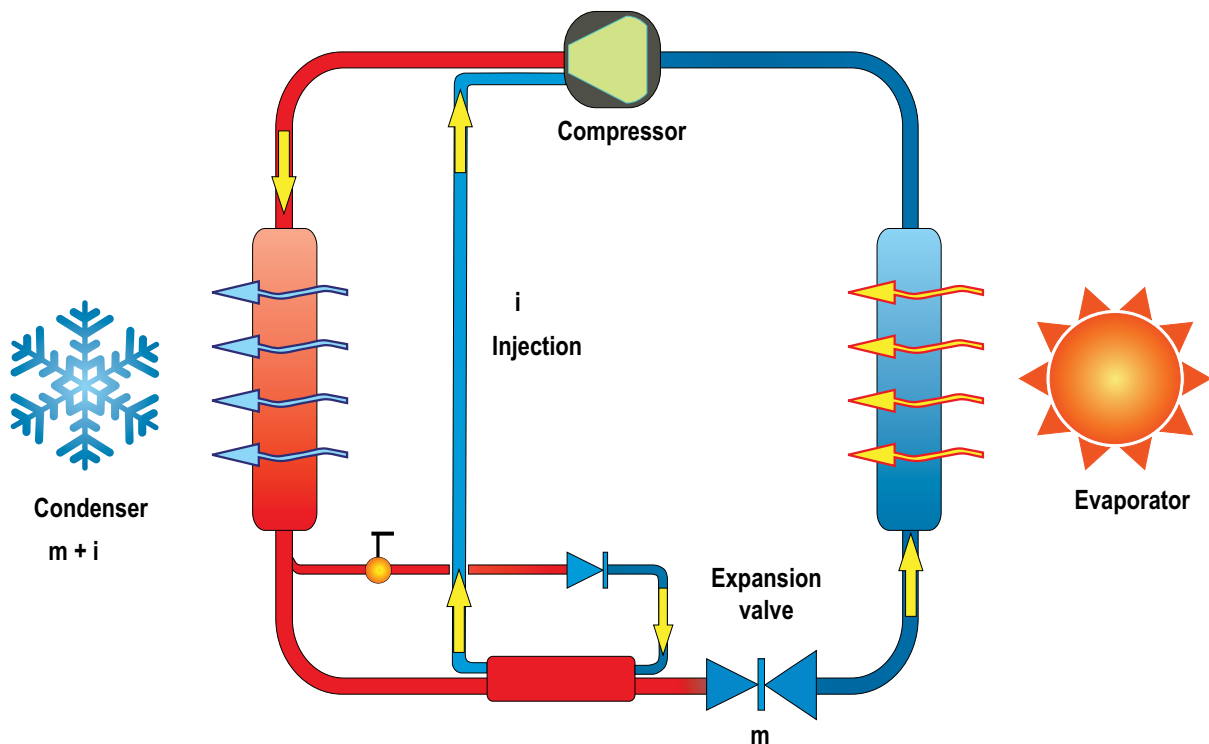
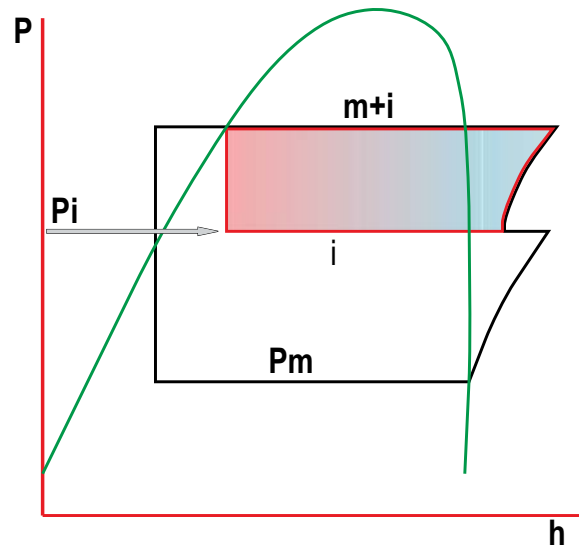
Please contact the company for the availability of the software.



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

HIDROS LZT, WZT, WWZ and LWZ heat pumps from model size 10 upwards 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.

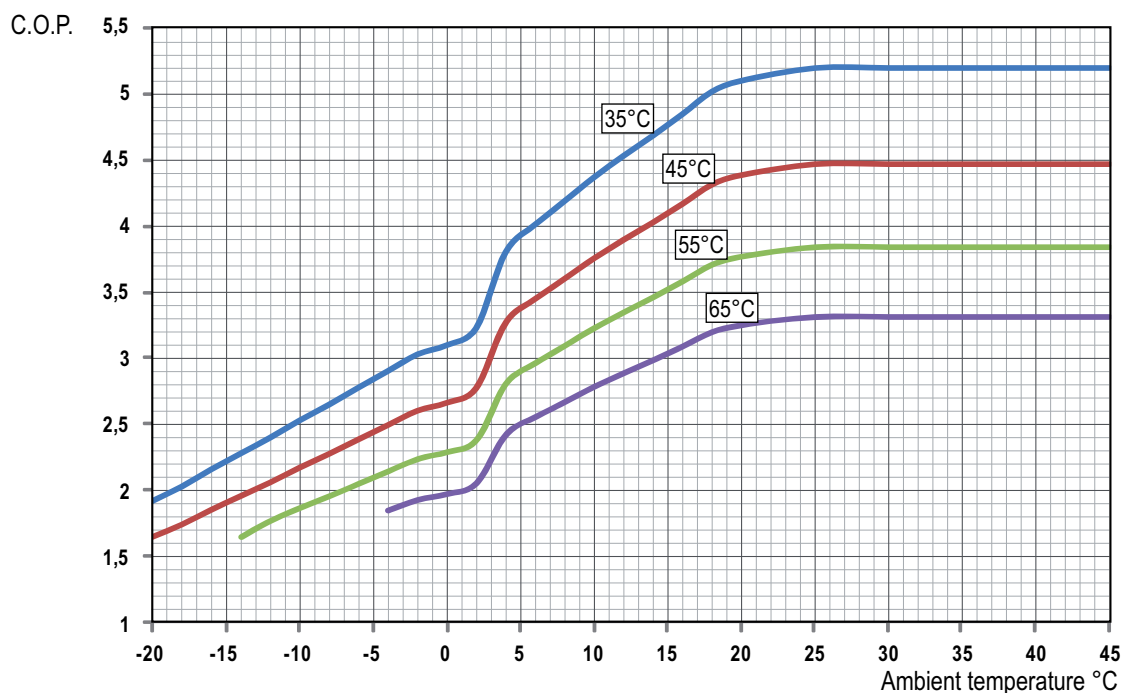


The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The

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.

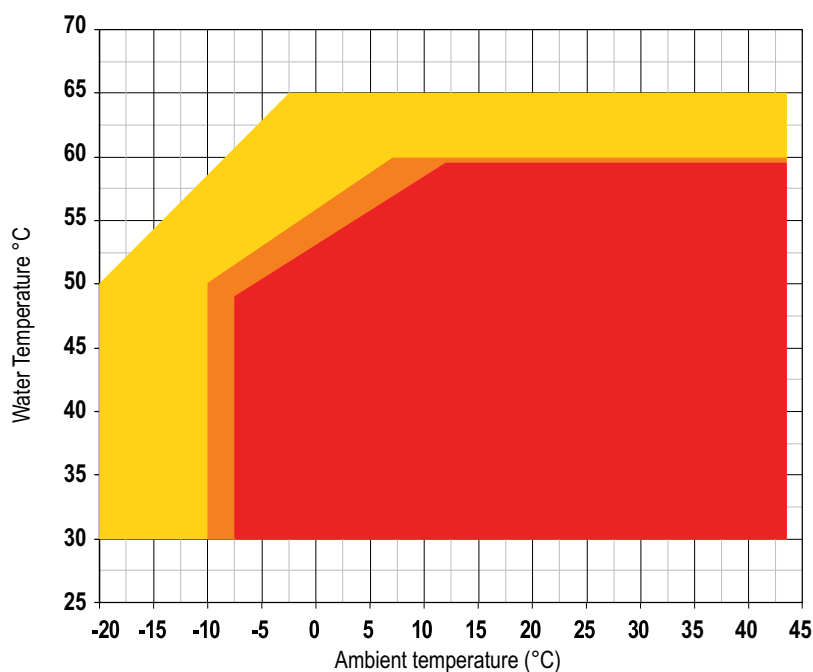
The graphs show the evolution of C.O.P. with different ambient temperatures and produced hot water temperatures; we underline the important decrease of the heating capacity around 3°C, concurrently with the defrost of the source heat exchanger.






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 HP (high performance) without the vapour injection system E.V.I.
-  Units equipped with standard scroll compressors with freon R410A.



## LZT

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



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 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard LZT 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.

### OTHER VERSION

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

### ACCESSORIES

- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **DSSE:** Electronic soft starter.
- **INSE:** Serial interface card RS 485.
- **KAVG:** Rubber anti-vibration mountings.
- **RAEV:** Evaporator antifreeze heater.
- **RAES:** Antifreeze kit.
- **LS00:** Low noise version.
- **MAML:** Refrigerant circuit pressure gauges.
- **PCRL:** Remote control panel.
- **VTEE:** Electronic thermostatic valve.
- **VECE:** High efficiency E.C. fans.

LZT - LZT/SW6 Models		010M	010T	014M	014T	021	026	036
Heating capacity (EN14511) <sup>(1)</sup>	kW	9,6	9,6	13,9	13,9	19,6	26,5	37,4
Total input power (EN14511) <sup>(1)</sup>	kW	2,3	2,3	3,4	3,2	4,5	6,4	8,4
COP (EN14511) <sup>(1)</sup>	W/W	4,2	4,2	4,1	4,3	4,4	4,1	4,5
Heating capacity (EN14511) <sup>(2)</sup>	kW	9,6	9,6	14,1	13,9	19,3	26,7	36,5
Total input power (EN14511) <sup>(2)</sup>	kW	2,7	2,7	4,0	3,8	5,3	7,7	9,9
COP (EN14511) <sup>(2)</sup>	W/W	3,6	3,6	3,5	3,7	3,6	3,5	3,7
Heating capacity (EN14511) <sup>(3)</sup>	kW	6,9	6,8	9,9	9,9	14,3	19,1	25,5
Total input power (EN14511) <sup>(3)</sup>	kW	2,1	2,0	3,1	3,0	4,1	5,9	7,5
COP (EN14511) <sup>(3)</sup>	W/W	3,3	3,4	3,2	3,3	3,5	3,2	3,4
Cooling capacity (EN14511) <sup>(4)</sup>	kW	11,3	11,3	15,4	15,5	21,4	30,9	42,2
Total input power (EN14511) <sup>(4)</sup>	kW	3,0	3,0	4,1	4,0	5,6	8,1	10,8
EER (EN14511) <sup>(4)</sup>	W/W	3,8	3,8	3,8	3,9	3,8	3,8	3,9
Cooling capacity (EN14511) <sup>(5)</sup>	kW	8,5	8,7	11,5	11,6	16,4	22,9	30,4
Total input power (EN14511) <sup>(5)</sup>	kW	2,6	2,5	3,8	3,7	5,1	7,1	9,5
EER (EN14511) <sup>(5)</sup>	W/W	3,3	3,5	3,0	3,1	3,2	3,2	3,2
Power supply	V/Ph/Hz	230/1/50	400/3+N/50	230/1/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50
Max input current standard unit	A	21,0	7,0	32,0	12,0	15,8	21,0	25,8
Peak current standard unit	A	98,0	41,0	162,0	66,0	102,8	101,6	129,6
Peak current standard unit with soft starter (optional)	A	58,8	24,6	97,3	39,7	62,3	61,9	78,7
Fans	n°	1	1	2	2	2	2	2
Compressors	n°/scroll	1	1	1	1	1	1	1
Sound power level <sup>(6)</sup>	dB (A)	69	69	71	71	75	79	79
Sound pressure level <sup>(7)</sup>	dB (A)	41	41	43	43	47	51	51
Water pump (optional)	kW	0,2	0,2	0,3	0,3	0,45	0,55	0,55
Water tank (optional)	l	40	40	60	60	60	180	180

LZT - LZT/SW6 Models		046	052	072	082	092	144	164	184
Heating capacity (EN14511) <sup>(1)</sup>	kW	44,7	52,1	74,7	89,4	106,3	154,2	181,0	213,1
Total input power (EN14511) <sup>(1)</sup>	kW	10,0	11,8	18,1	22,0	26,2	40,4	48,0	55,6
COP (EN14511) <sup>(1)</sup>	W/W	4,5	4,4	4,1	4,1	4,1	3,8	3,8	3,8
Heating capacity (EN14511) <sup>(2)</sup>	kW	45,3	52,8	73,0	90,7	106,1	150,1	183,6	212,5
Total input power (EN14511) <sup>(2)</sup>	kW	12,2	14,3	21,0	26,5	30,3	46,1	57,0	63,9
COP (EN14511) <sup>(2)</sup>	W/W	3,7	3,7	3,5	3,4	3,5	3,2	3,2	3,3
Heating capacity (EN14511) <sup>(3)</sup>	kW	32,4	37,3	50,4	64,7	74,6	106,0	130,9	148,4
Total input power (EN14511) <sup>(3)</sup>	kW	9,2	10,8	16,4	20,4	24,0	37,2	45,0	51,5
COP (EN14511) <sup>(3)</sup>	W/W	3,5	3,5	3,1	3,2	3,1	2,8	2,9	2,9
Cooling capacity (EN14511) <sup>(4)</sup>	kW	46,6	57,8	84,4	93,2	117,0	169,6	187,8	242,9
Total input power (EN14511) <sup>(4)</sup>	kW	12,5	15,2	23,6	27,0	33,2	51,1	56,6	70,0
EER (EN14511) <sup>(4)</sup>	W/W	3,7	3,8	3,6	3,5	3,5	3,3	3,3	3,4
Cooling capacity (EN14511) <sup>(5)</sup>	kW	37,3	42,4	61,8	75,0	90,2	122,0	151,3	186,3
Total input power (EN14511) <sup>(5)</sup>	kW	12,1	13,3	21,4	26,4	31,1	46,5	56,1	65,5
EER (EN14511) <sup>(5)</sup>	W/W	3,1	3,2	2,9	2,9	2,9	2,6	2,7	2,8
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
Max input current standard unit	A	29,3	39,2	55,0	62,0	76,9	118,6	132,6	162,4
Peak current standard unit	A	169,6	119,9	158,8	202,3	242,9	222,4	272,9	328,4
Peak current standard unit with soft starter (optional)	A	102,7	80,2	106,9	135,5	164,2	168,3	206,1	250,7
Fans	n°	2	2	2	2	3	6	6	8
Compressors	n°/scroll	1	2	2	2	2	4	4	4
Sound power level <sup>(6)</sup>	dB (A)	79	82	82	82	83	85	85	86
Sound pressure level <sup>(7)</sup>	dB (A)	51	54	54	54	55	57	57	58
Water pump (optional)	kW	1,0	1,3	1,3	1,5	1,5	2,2	2,2	3,0
Water tank (optional)	l	300	300	300	300	500	1000	1000	1000

Performance refer 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, 6°C WB, water temperature 40/45°C.  
 (3) Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 30/35°C.  
 (4) Cooling: ambient temperature 35°C, water temperature 23/18°C.

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

(6) Sound power level in accordance with ISO 9614 (LS version).

(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).

## LZT

### FRAME

All LZT 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. 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). From model size 10 upwards 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

HIDROS LZT heat pumps from model size 10 upwards 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 interstage 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. From size 52 upwards, 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 via 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. The exchangers can be protected by a metallic filter that is available as an accessory.

### 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.

### 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 LZT 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

# LZT

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.

## OTHER VERSIONS

### LZT/SW6 UNIT WITH INDEPENDENT DOMESTIC HOT WATER PRODUCTION

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.

## VERSIONS

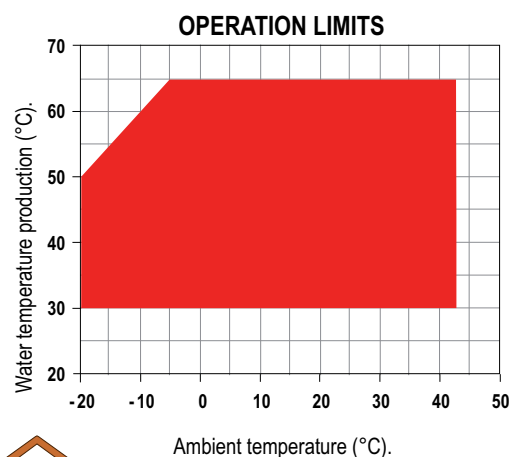
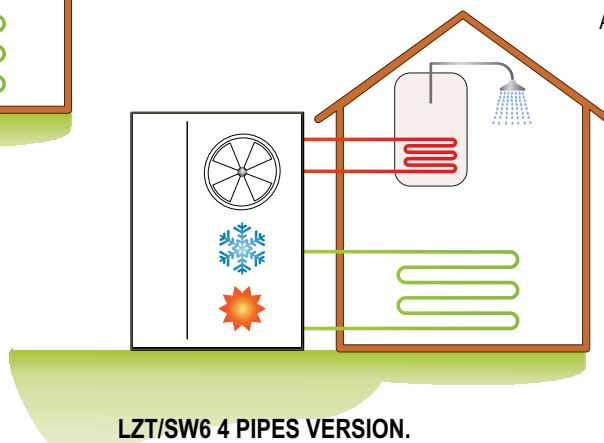
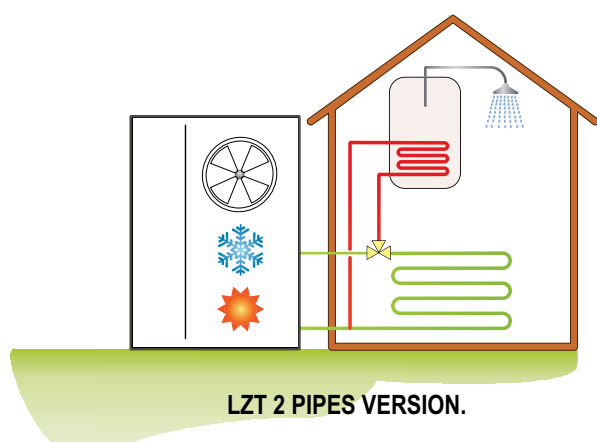
### LZT / A1 HIGH EFFICIENCY HEAT PUMP WITH INTEGRATED HYDRAULIC KIT

LZT heat pumps have available, as an option, a built in hydraulic kit that includes: Water tank in different sizes (depending on the size of the unit) factory insulated with flexible close cell material and prepared for the installation of an antifreeze kit (option) and a water pump, centrifugal type, suitable for chilled water operation. The pump is directly controlled by the microprocessor. The water tank is installed on the hot water outlet water side in order to minimize fluctuations in the water temperature due to the compressors cycling at part load conditions.

Also provided in the hydraulic circuit are an expansion vessel, pressure relief valve and system isolating valves with fittings.

### LZT/LS LOW NOISE VERSION

This version has acoustic insulation applied to the unit (both the compressor and its enclosure) in the form of compressor jackets and insulating material made with high density media coated with a heavy bitumen layer.

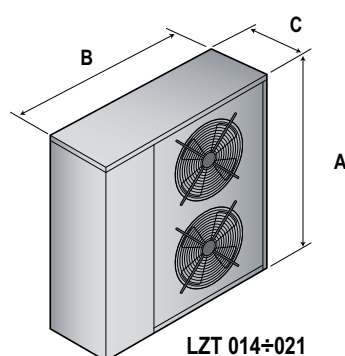
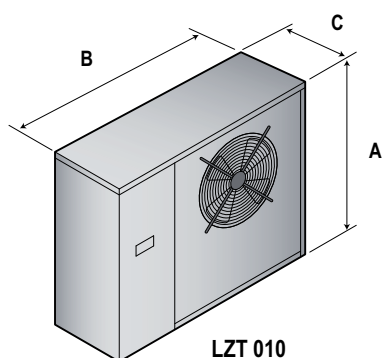


## LZT

LZT

LZT - LZT/SW6 Versions	Code	010M	010T	014M	014T	021	026	036
Main switch		●	●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●	●
Flow switch		●	●	●	●	●	●	●
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		●	●	●	●	●	●	●
LS Low noise version	LS00	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●	●
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○	○
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	–	–	–	–	–	–	–
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	–	–	–	–	–	–	–
Rubber anti-vibration mountings.	KAVG	○	○	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	●	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○
Coil protection mesh with metallic filter	FAMM	–	–	–	–	–	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○
High efficiency E.C. fans.	VECE	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



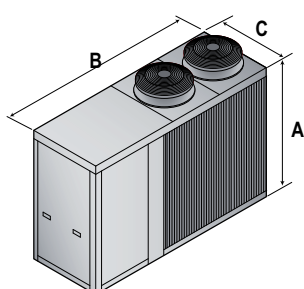
Mod.	A (mm)	B (mm)	C (mm)	Kg
10M/10MA	989	1103	380	118/179
10T/10TA	989	1103	380	120/181

Mod.	A (mm)	B (mm)	C (mm)	Kg
14M/14MA	1323	1203	423	127/207
14T/14TA	1323	1203	423	133/212
21/21A	1424	1453	473	390/550

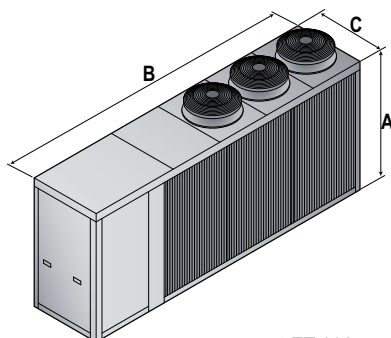


LZT - LZT/SW6 Versions	Code	046	052	072	082	092	144	164	184
Main switch		●	●	●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●	●	●
Flow switch		●	●	●	●	●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●
LS Low noise version	LS00	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●	●	●
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○	○	○
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	○	○	○	○	○	○	○	○
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings.	KAVG	○	○	○	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○	○	○

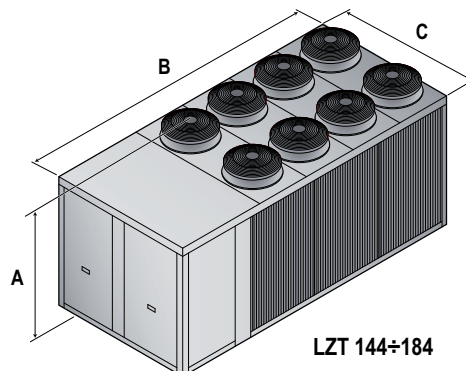
● Standard, ○ Optional, – Not available.



LZT 026÷082



LZT 092



LZT 144÷184

Mod.	A (mm)	B (mm)	C (mm)	Kg
26/26A	1406	1870	850	350/510
36/36A	1406	1870	850	390/550
46/46A	1759	2608	1105	660/810
52/52A	1759	2608	1105	710/880
72/72A	1842	2608	1105	725/895

Mod.	A (mm)	B (mm)	C (mm)	Kg
82/82A	1842	2608	1105	810/980
92/92A	1842	3608	1105	1070/1280
144/144A	2350	4108	2210	3150/4300
164/164A	2350	4108	2210	3220/4370
184/184A	2350	4720	2210	3750/4900

## LZA

High efficiency air to water heat pumps with HP compressor



R410A

-10°C

+43°C

+60°C

HP

C.O.P. ≥ 4,1

E.C.



LZA

The LZA 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 -10°C ambient temperature.

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

Both versions can produce domestic hot water, in the standard LZA 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.

### OTHER VERSIONS

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

### ACCESSORIES

- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **DSSE:** Electronic soft starter.
- **INSE:** Serial interface card RS 485.
- **KAVG:** Rubber anti-vibration mountings.
- **RAEV:** Evaporator antifreeze heater.
- **RAES:** Antifreeze kit.
- **LS00:** Low noise version.
- **PCRL:** Remote control panel.
- **VTEE:** Electronic thermostatic valve.
- **VECE:** High efficiency E.C. fans.



LZA - LZA/SW6 Models		06	08	10M	10T
Heating capacity (EN14511) <sup>(1)</sup>	kW	6,7	8,3	10,9	11,0
Total input power (EN14511) <sup>(1)</sup>	kW	1,5	1,8	2,4	2,4
COP (EN14511) <sup>(1)</sup>	W/W	4,3	4,5	4,5	4,6
Heating capacity (EN14511) <sup>(2)</sup>	kW	4,7	5,7	7,5	7,6
Total input power (EN14511) <sup>(2)</sup>	kW	1,5	1,8	2,3	2,3
COP (EN14511) <sup>(2)</sup>	W/W	3,1	3,1	3,2	3,3
Cooling capacity (EN14511) <sup>(3)</sup>	kW	8,1	10,1	13,1	13,2
Total input power (EN14511) <sup>(3)</sup>	kW	1,8	2,3	3,3	3,2
EER (EN14511) <sup>(3)</sup>	W/W	4,4	4,3	3,9	4,1
Cooling capacity (EN14511) <sup>(4)</sup>	kW	5,9	7,5	9,7	9,9
Total input power (EN14511) <sup>(4)</sup>	kW	1,7	2,2	3,0	3,0
EER (EN14511) <sup>(4)</sup>	W/W	3,4	3,4	3,2	3,3
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50
Max input current standard unit	A	13,4	17,7	23,4	8,0
Peak current standard unit	A	60,6	83,6	108,6	52,1
Peak current standard unit with soft starter (optional)	A	36,6	50,6	65,6	32,6
Fans	n°	1	1	1	1
Compressors	n°/scroll	1	1	1	1
Sound power level <sup>(5)</sup>	dB (A)	68	68	69	69
Sound pressure level <sup>(6)</sup>	dB (A)	40	40	41	41
Water tank (optional)	l	40	40	40	40

LZA - LZA/SW6 Models		14M	14T	21	32	42
Heating capacity (EN14511) <sup>(1)</sup>	kW	14,5	14,1	19,2	30,2	38,7
Total input power (EN14511) <sup>(1)</sup>	kW	3,3	3,2	4,3	6,8	8,9
COP (EN14511) <sup>(1)</sup>	W/W	4,4	4,4	4,4	4,4	4,3
Heating capacity (EN14511) <sup>(2)</sup>	kW	10,5	10,1	13,6	21,2	27,4
Total input power (EN14511) <sup>(2)</sup>	kW	3,3	3,1	4,1	6,5	8,3
COP (EN14511) <sup>(2)</sup>	W/W	3,2	3,3	3,3	3,3	3,3
Cooling capacity (EN14511) <sup>(3)</sup>	kW	17,4	17,1	22,6	37,3	45,9
Total input power (EN14511) <sup>(3)</sup>	kW	4,3	4,2	5,6	8,2	11,7
EER (EN14511) <sup>(3)</sup>	W/W	4,1	4,1	4,0	4,5	3,9
Cooling capacity (EN14511) <sup>(4)</sup>	kW	12,8	12,6	16,7	27,0	33,7
Total input power (EN14511) <sup>(4)</sup>	kW	4,0	3,9	5,1	7,9	10,7
EER (EN14511) <sup>(4)</sup>	W/W	3,2	3,2	3,2	3,4	3,1
Power supply	V/Ph/Hz	230/1/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50
Max input current standard unit	A	29,1	10,9	14,9	21,9	28,5
Peak current standard unit	A	131,2	63,2	76,9	74,2	90,5
Peak current standard unit with soft starter (optional)	A	79,3	39,3	46,7	49,2	59,8
Fans	n°	2	2	2	2	2
Compressors	n°/scroll	1	1	1	2	2
Sound power level <sup>(5)</sup>	dB (A)	71	71	75	79	79
Sound pressure level <sup>(6)</sup>	dB (A)	43	43	47	51	51
Water tank (optional)	l	60	60	60	180	180

Performances refer 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 (LS version).

(6)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).

## LZA

### FRAME

All LZA 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, expansion valve bidirectional 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).

### COMPRESSOR

The compressors used are a high performance scroll type that incorporates a special scroll design which enhances the efficiency of the refrigerant cycle at low ambient conditions. 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 via 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.

### 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 LZA 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.

### ELECTRICS 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, 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, weather compensated external air sensor.

### OTHER VERSIONS

#### LZA/SW6 UNIT WITH DOMESTIC HOT WATER PRODUCTION

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.

# LZA

## LZA / A1 UNIT WITH HYDRAULIC KIT INTEGRATED

LZA heat pumps have available, as an option, a built in hydraulic kit that includes: Water tank in different sizes (depending on the size of the unit) factory insulated with flexible close cell material and prepared for the installation of an antifreeze kit (option) and a water pump, centrifugal type, suitable

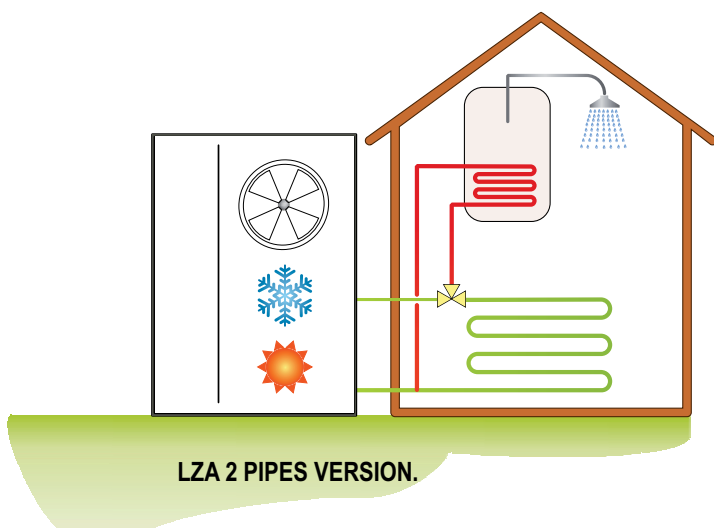
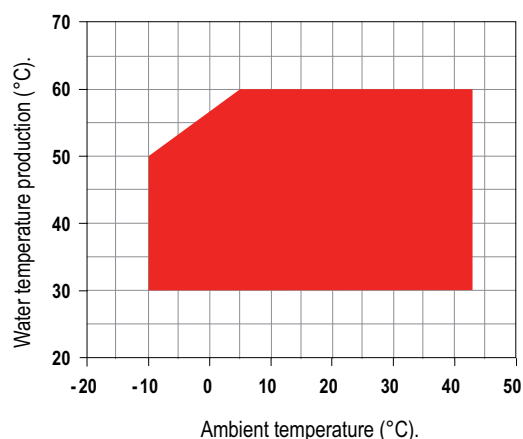
for chilled water operation. The pump is directly controlled by the microprocessor. The water tank is installed on the hot water outlet water side in order to minimize fluctuations in the water temperature due to the compressors cycling at part load conditions. Also provided in the hydraulic circuit are an expansion vessel, pressure relief valve and system isolating valves with fittings.

## LZA/LS LOW NOISE VERSION

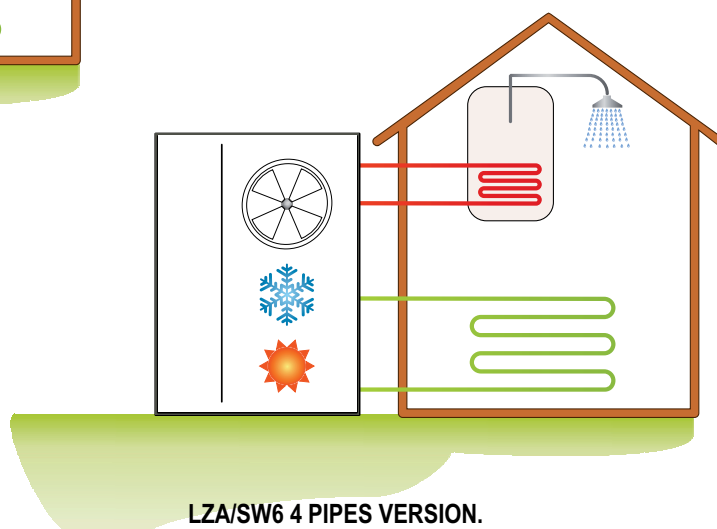
This version has acoustic insulation applied to the unit (both the compressor and its enclosure) in the form of compressor jackets and insulating material made with high density media coated with a heavy bitumen layer.

LZA

## OPERATION LIMITS



LZA 2 PIPES VERSION.

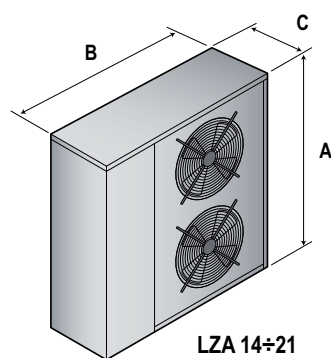
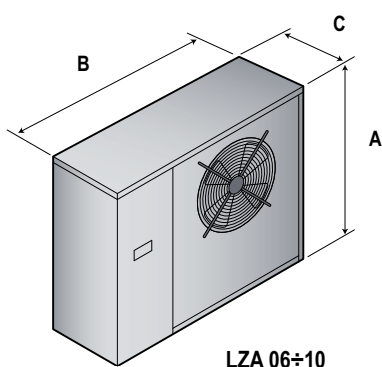


LZA/SW6 4 PIPES VERSION.

## LZA

LZA- LZA/SW6 Versions	Code	06	08	10M	10T	14M
Main switch		●	●	●	●	●
Compressor automatic switch		●	●	●	●	●
Flow switch		●	●	●	●	●
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		●	●	●	●	●
Working pressure visualization on display		●	●	●	●	●
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○
LS Low noise version	LS00	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○

● Standard, ○ Optional, – Not available.

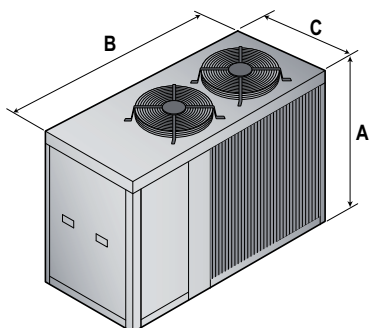


Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A	989	1103	380	95/148
08/08A	989	1103	380	104/163
10M/10MA	989	1103	380	118/179
10T/10TA	989	1103	380	120/181

Mod.	A (mm)	B (mm)	C (mm)	Kg
14M/14MA	1323	1203	423	127/207
14T/14TA	1323	1203	423	133/212
21/21A	1424	1453	473	390/550

LZA- LZA/SW6 Versions	Code	14T	21	32	42
Main switch		●	●	●	●
Compressor automatic switch		●	●	●	●
Flow switch		●	●	●	●
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		●	●	●	●
Working pressure visualization on display		●	●	●	●
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○
LS Low noise version	LS00	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○

● Standard, ○ Optional, – Not available.



LZA 32÷42

Mod.	A (mm)	B (mm)	C (mm)	Kg
32/32A	1406	1870	850	350/510
42/42A	1406	1870	850	390/550

## CZT

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

CZT



The CZT 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.

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

They have been optimized on heating mode, are able to produce water up to 63°C and can operate down to -15°C ambient temperature.

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

Both versions can produce domestic hot water, in the standard CZT 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.

### OTHER VERSIONS

- **CZT 2 pipes reversible standard.**
- **CZT/SW6 4 pipe unit** able to produce hot and cold water at the same time on two independent hydraulic circuits.

### ACCESSORIES

- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **DSSE:** Electronic soft starter.
- **INSE:** Serial interface card RS 485.
- **KAVG:** Rubber anti-vibration mountings.
- **RAEV:** Evaporator antifreeze heater.
- **RAES:** Antifreeze kit.
- **LS00:** Low noise version.
- **MAML:** Refrigerant circuit pressure gauges.
- **PCRL:** Remote control panel.
- **VTEE:** Electronic expansion valve.

CZT - CZT/SW6 Models		06	08	10M	10T	14T
Heating capacity (EN14511) <sup>(1)</sup>	kW	6,6	8,7	9,6	9,6	13,9
Total input power (EN14511) <sup>(1)</sup>	kW	2,0	2,5	2,8	2,8	3,9
COP (EN14511) <sup>(1)</sup>	W/W	3,3	3,5	3,4	3,4	3,6
Heating capacity (EN14511) <sup>(2)</sup>	kW	6,4	8,4	9,6	9,6	14,0
Total input power (EN14511) <sup>(2)</sup>	kW	2,3	2,9	3,0	3,0	3,1
COP (EN14511) <sup>(2)</sup>	W/W	2,8	2,9	3,2	3,2	4,5
Heating capacity (EN14511) <sup>(3)</sup>	kW	4,6	5,9	6,8	6,8	10,0
Total input power (EN14511) <sup>(3)</sup>	kW	1,9	2,3	2,6	2,5	3,7
COP (EN14511) <sup>(3)</sup>	W/W	2,4	2,6	2,6	2,7	2,7
Cooling capacity (EN14511) <sup>(4)</sup>	kW	6,9	9,9	11,3	11,3	15,5
Total input power (EN14511) <sup>(4)</sup>	kW	2,5	3,0	3,4	3,4	4,7
EER (EN14511) <sup>(4)</sup>	W/W	2,8	3,3	3,3	3,3	3,3
Cooling capacity (EN14511) <sup>(5)</sup>	kW	4,8	7,3	8,5	8,7	11,7
Total input power (EN14511) <sup>(5)</sup>	kW	2,3	2,7	3,1	3,0	4,3
EER (EN14511) <sup>(5)</sup>	W/W	2,0	2,7	2,7	2,9	2,7
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Max input current	A	18,3	22,3	23,8	9,8	19
Peak current	A	61,8	79,8	100,8	43,8	73,0
Fans / Available static pressure	n° / Pa	1/50	1/50	1/50	1/50	1/50
Compressors	n° / scroll	1 HP	1 HP	1 E.V.I.	1 E.V.I.	1 E.V.I.
Sound power level <sup>(6)</sup>	dB (A)	71	71	72	72	73
Sound pressure level <sup>(7)</sup>	dB (A)	43	43	44	44	45
Water pump (optional)	kW	0,13	0,13	0,2	0,2	0,3
Water tank (optional)	l	40	40	40	40	60

CZT - CZT/SW6 Models		21	26	36	46	52
Heating capacity (EN14511) <sup>(1)</sup>	kW	19,6	26,5	37,4	44,7	53,1
Total input power (EN14511) <sup>(1)</sup>	kW	5,2	7,4	9,6	11,0	12,8
COP (EN14511) <sup>(1)</sup>	W/W	3,8	3,6	3,9	4,1	4,1
Heating capacity (EN14511) <sup>(2)</sup>	kW	19,3	26,8	36,5	45,4	53,8
Total input power (EN14511) <sup>(2)</sup>	kW	6,0	8,7	11,1	13,0	15,1
COP (EN14511) <sup>(2)</sup>	W/W	3,2	3,1	3,3	3,5	3,6
Heating capacity (EN14511) <sup>(3)</sup>	kW	14,3	19,1	25,2	32,4	38,0
Total input power (EN14511) <sup>(3)</sup>	kW	4,8	6,9	8,7	10,3	11,9
COP (EN14511) <sup>(3)</sup>	W/W	3,0	2,8	2,9	3,1	3,2
Cooling capacity (EN14511) <sup>(4)</sup>	kW	21,4	30,9	42,4	46,6	57,8
Total input power (EN14511) <sup>(4)</sup>	kW	6,3	9,1	12,0	13,5	16,2
EER (EN14511) <sup>(4)</sup>	W/W	3,4	3,4	3,6	3,5	3,6
Cooling capacity (EN14511) <sup>(5)</sup>	kW	16,4	22,8	30,4	37,3	42,4
Total input power (EN14511) <sup>(5)</sup>	kW	5,8	8,2	10,8	13,2	14,5
EER (EN14511) <sup>(5)</sup>	W/W	2,8	2,8	2,9	2,8	2,9
Power supply	V/Ph/Hz	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current	A	16,7	21,1	28,7	29,3	39,2
Peak current	A	103,7	101,8	132,5	169,6	119,9
Fans / Available static pressure	n° / Pa	1/50	1/50	2/50	2/50	2/50
Compressors	n° / scroll	1 E.V.I.	1 E.V.I.	1 E.V.I.	1 E.V.I.	2 E.V.I.
Sound power level <sup>(6)</sup>	dB (A)	77	82	82	86	86
Sound pressure level <sup>(7)</sup>	dB (A)	49	54	54	58	58
Water pump (optional)	kW	0,45	0,55	0,55	1,0	1,3
Water tank (optional)	l	60	180	180	300	300

Performances refer 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, 6°C WB, water temperature 40/45°C.

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

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

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

(6)Sound power level in accordance with ISO 9614 (LS version).

(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).



## CZT

### 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 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. 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). From model size 10 upwards 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

CZT heat pumps from model size 10 upwards 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. From size 46 upwards, 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 via 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. The exchangers can be protected by a metallic filter that is available as an accessory.

### USER HEAT EXCHANGER

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.

### FANS

The fans are made of galvanized steel, centrifugal type, double inlet with forward curved blades. They are connected to the motors via belts and pulleys, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 294. They are fixed to the unit frame via rubber anti-vibration mountings. As standard, all units are fitted with a pressure operated fan speed controller. The electric motors are 4 pole type rotating at approximately 1500 rpm. The motors are fitted with integrated ther-

mal overload protection and have a moisture protection rating of IP 54.

### 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 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 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 controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and

# CZT

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.

## OTHER VERSIONS

### CZT/SW6 UNIT WITH INDEPENDENT DOMESTIC HOT WATER PRODUCTION

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.

### CZT / A1 HIGH EFFICIENCY HEAT PUMP WITH INTEGRATED HYDRAULIC KIT

CZT heat pumps have available, as an option, a built in hydraulic kit that includes: Water tank in different sizes (depending on the size of the unit) factory insulated with flexible close cell material and prepared for the installation of an antifreeze kit (option) and a water pump, centrifugal type, suitable for chilled water operation. The pump is directly controlled by the microprocessor.

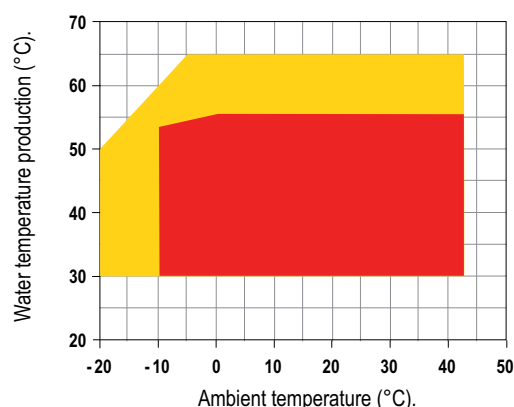
The water tank is installed on the hot water outlet water side in order to minimize fluctuations in the water temperature due to the compressors cycling at part load conditions. Also provided in the hydraulic circuit are an expansion vessel, pressure relief valve and system isolating valves with fittings.



### CZT/LS LOW NOISE VERSION

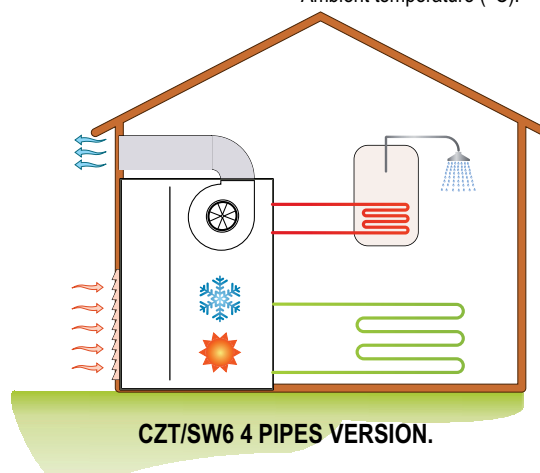
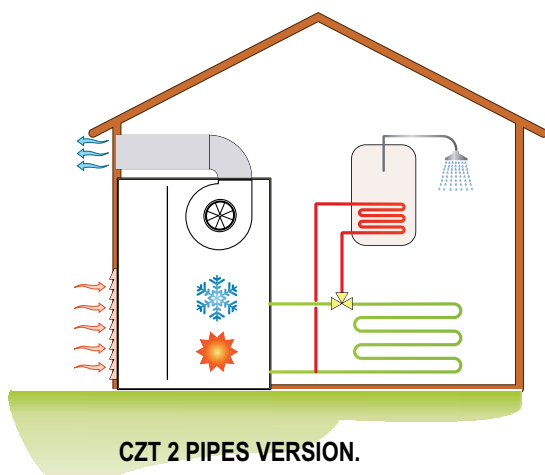
This version has acoustic insulation applied to the unit (both the compressor and its enclosure) in the form of compressor jackets and insulating material made with high density media coated with a heavy bitumen layer.

CZT

## OPERATION LIMITS



Mod. CZT 10 ÷ 52   
Mod. CZT 06 ÷ 08 

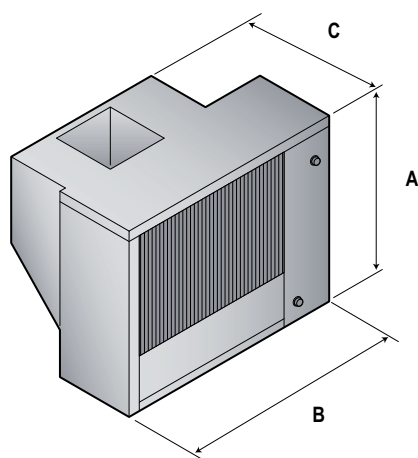


## CZT

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CZT - CZT/SW6 Versions	Code	06	08	10M	10T	14M	14T
Main switch		●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●
Flow switch		●	●	●	●	●	●
Pressure control by transducer and modulating damper	DCCI	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	–	–	–	–	–	–
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	–	–	–	–	–	–
LS Low noise version	LS00	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	●	○
Remote control panel	PCRL	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

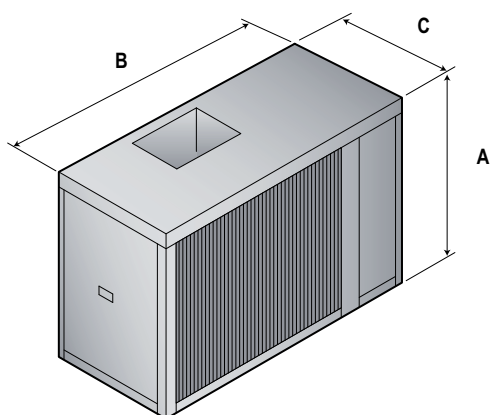


CZT 06 ÷ 21

Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A	989	1103	650	102/155
08/08A	989	1103	650	110/170
10/10A	989	1103	650	128/187
14/14A	1324	1203	694	135/217
21/21A	1424	1453	780	142/222

CZT - CZT/SW6 Versions	Code	21	26	36	46	52
Main switch		●	●	●	●	●
Compressor automatic switch		●	●	●	●	●
Flow switch		●	●	●	●	●
Pressure control by transducer and modulating damper	DCCI	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	–	–	–	○	○
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	–	–	–	○	○
LS Low noise version	LS00	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○

● Standard, ○ Optional, – Not available.



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Mod.	A (mm)	B (mm)	C (mm)	Kg
26/26A	1270	1870	850	329/436
36/36A	1566	2608	1105	343/491
46/46A	1566	2608	1105	356/516
52/52A	1566	2608	1105	375/530

## WZT

### High Efficiency Air to Water Split System Heat Pumps With E.V.I. Compressors



The WZT 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. These units have been designed for those applications where the noise level has to be as low as possible. They are therefore in a split configuration with the compressor(s) being located in the indoor section. The outdoor source exchanger can be located in a position that is not noise critical. Connection between indoor and outdoor sections is by refrigerant lines.

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

Both versions can produce domestic hot water, in the standard WZT 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.

### OTHER VERSIONS

- **WZT 2 pipes reversible standard.**
- **WZT/SW6 4 pipes unit** able to produce hot and cold water at the same time on two independent hydraulic circuits.

### ACCESSORIES

- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **DSSE:** Electronic soft starter.
- **INSE:** Serial interface card RS 485.
- **KAVG:** Rubber anti-vibration mountings.
- **RAEV:** Evaporator antifreeze heater.
- **LS00:** Low noise version.
- **MAML:** Refrigerant circuit pressure gauges.
- **PCRL:** Remote control panel.
- **VTEE:** Electronic thermostatic valve



WZT - WZT/SW6 Models		06	08	10M	10T	14M	14T	21
Heating capacity (EN14511) <sup>(1)</sup>	kW	6,7	8,8	9,6	9,6	13,9	13,9	19,6
Total input power (EN14511) <sup>(1)</sup>	kW	1,6	2,1	2,3	2,3	3,3	3,2	4,5
COP (EN14511) <sup>(1)</sup>	W/W	4,1	4,2	4,2	4,2	4,2	4,3	4,4
Heating capacity (EN14511) <sup>(2)</sup>	kW	6,4	8,4	9,6	9,6	14,1	13,9	19,6
Total input power (EN14511) <sup>(2)</sup>	kW	1,9	2,5	2,7	2,7	4,0	3,8	5,3
COP (EN14511) <sup>(2)</sup>	W/W	3,4	3,4	3,5	3,5	3,5	3,7	3,7
Heating capacity (EN14511) <sup>(3)</sup>	kW	4,5	5,9	6,9	6,8	9,9	9,9	14,3
Total input power (EN14511) <sup>(3)</sup>	kW	1,5	1,9	2,1	2,0	3,1	3,0	4,1
COP (EN14511) <sup>(3)</sup>	W/W	3,0	3,1	3,3	3,4	3,2	3,3	3,5
Cooling capacity (EN14511) <sup>(4)</sup>	kW	6,9	9,6	11,3	11,3	15,4	15,5	21,4
Total input power (EN14511) <sup>(4)</sup>	kW	2,1	2,5	3,0	2,9	4,1	4,0	5,6
EER (EN14511) <sup>(4)</sup>	W/W	3,3	3,8	3,8	3,9	3,8	3,9	3,8
Cooling capacity (EN14511) <sup>(5)</sup>	kW	4,9	7,0	8,5	8,7	11,5	11,6	16,4
Total input power (EN14511) <sup>(5)</sup>	kW	1,8	2,2	2,6	2,5	3,8	3,7	5,1
EER (EN14511) <sup>(5)</sup>	W/W	2,7	3,2	3,3	3,5	3,0	3,1	3,2
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	230/1/50	400/3+N/50	400/3+N/50
Max input current	A	15,1	19,5	21,0	7,0	32,0	12,0	15,8
Peak current	A	58,6	77,0	98,0	41,0	162,0	66,0	102,8
Peak current std unit with soft starter (optional)	A	36,6	50,6	58,8	24,6	97,3	39,7	62,3
Compressors	n° scroll	1 HP	1 HP	1 E.V.I.	1 E.V.I.	1 E.V.I.	1 E.V.I.	1 E.V.I.
Internal unit sound power level <sup>(6)</sup>	dB (A)	51	52	52	52	54	54	60
Internal unit sound pressure level <sup>(7)</sup>	dB (A)	43	44	44	44	46	46	52
Std external unit sound power level <sup>(6)</sup>	dB (A)	63	63	63	63	66	66	66
Std external unit sound pressure level <sup>(8)</sup>	dB (A)	35	35	35	35	38	38	38

WZT - WZT/SW6 Models		26	36	46	52	72	82	92
Heating capacity (EN14511) <sup>(1)</sup>	kW	26,5	37,4	44,7	52,0	74,7	89,4	106,3
Total input power (EN14511) <sup>(1)</sup>	kW	6,4	8,4	10,0	11,8	18,1	22,0	26,2
COP (EN14511) <sup>(1)</sup>	W/W	4,1	4,5	4,5	4,4	4,1	4,1	4,1
Heating capacity (EN14511) <sup>(2)</sup>	kW	26,7	36,5	45,3	52,8	73,0	90,7	106,1
Total input power (EN14511) <sup>(2)</sup>	kW	7,7	9,9	12,2	14,3	21,0	26,5	30,3
COP (EN14511) <sup>(2)</sup>	W/W	3,5	3,7	3,7	3,7	3,5	3,4	3,5
Heating capacity (EN14511) <sup>(3)</sup>	kW	19,1	25,5	32,4	37,3	50,4	64,7	74,6
Total input power (EN14511) <sup>(3)</sup>	kW	5,9	7,5	9,2	10,8	16,4	20,4	24,0
COP (EN14511) <sup>(3)</sup>	W/W	3,2	3,4	3,5	3,5	3,0	3,2	3,1
Cooling capacity (EN14511) <sup>(4)</sup>	kW	30,9	42,2	46,6	57,8	84,4	93,2	117,0
Total input power (EN14511) <sup>(4)</sup>	kW	8,1	10,8	12,5	15,2	23,6	27,0	33,2
EER (EN14511) <sup>(4)</sup>	W/W	3,8	3,9	3,7	3,8	3,6	3,5	3,5
Cooling capacity (EN14511) <sup>(5)</sup>	kW	22,9	30,4	37,3	42,4	61,8	75,0	90,2
Total input power (EN14511) <sup>(5)</sup>	kW	7,1	9,5	12,1	13,3	21,4	26,4	31,1
EER (EN14511) <sup>(5)</sup>	W/W	3,2	3,2	3,1	3,2	2,9	2,8	2,9
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	A	20,9	25,8	29,3	39,2	55,0	62,0	76,9
Peak current	A	101,6	129,6	169,6	119,9	158,8	202,3	242,9
Peak current std unit with soft starter (optional)	A	61,9	78,7	102,7	80,2	106,9	135,5	164,2
Compressors	n° scroll	1 E.V.I.	1 E.V.I.	1 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.
Internal unit sound power level <sup>(6)</sup>	dB (A)	60	60	60	61	62	63	63
Internal unit sound pressure level <sup>(7)</sup>	dB (A)	52	52	52	53	54	55	55
Std external unit sound power level <sup>(6)</sup>	dB (A)	68	68	70	70	71	71	72
Std external unit sound pressure level <sup>(8)</sup>	dB (A)	40	40	42	42	43	43	44

Performance refer 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, 6°C WB, water temperature 40/45°C.

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

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

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

(6)Sound power level according to ISO 9614..

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

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

## WZT

### 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 7035.

### 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. 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). From model size 10 upwards 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

HIDROS WZT heat pumps from model size 10 upwards 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. From size 52 upwards, 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 via 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. The exchangers can be protected by a metallic filter that is available as an accessory. Incorporated into the assembly are the fans that are direct drive axial type with aluminium aerofoil blades, statically and dynamically balanced and 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. As standard, all units are fitted with a pressure operated fan speed controller.

The electric motors are 6 pole type rotating at approximately 900 rpm. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

### 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 ex-

changers 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.

### MICROPROCESSORS

All WZT 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, 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.

# WZT

## 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.

## OTHER VERSIONS

### WZT/SW6 UNIT WITH INDEPENDENT DOMESTIC HOT WATER PRODUCTION

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.

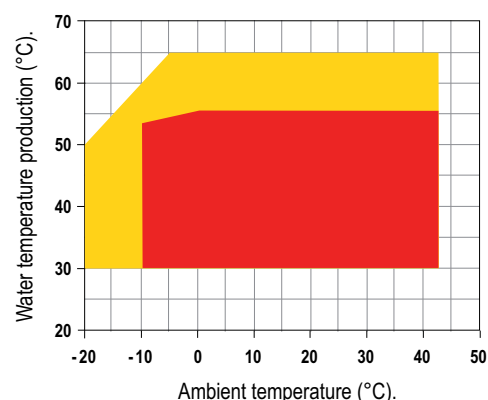
## VERSIONS

### WZT/LS LOW NOISE VERSION

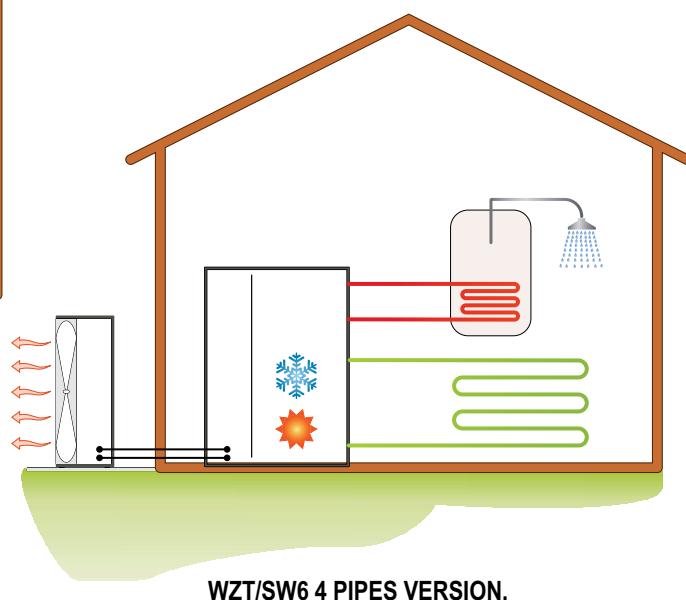
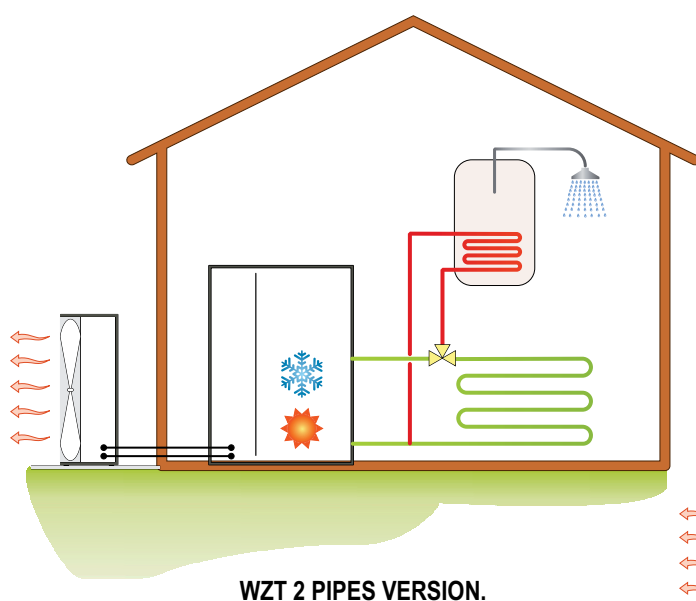
This version has acoustic insulation applied to the unit (both the compressor and its enclosure) in the form of compressor jackets and insulating material made with high density media coated with a heavy bitumen layer.

WZT

## OPERATION LIMITS



## Connections diagrams WZT WZT/SW6



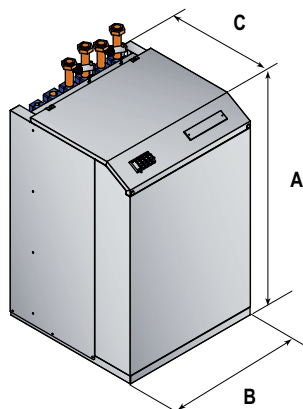
## WZT

WZT

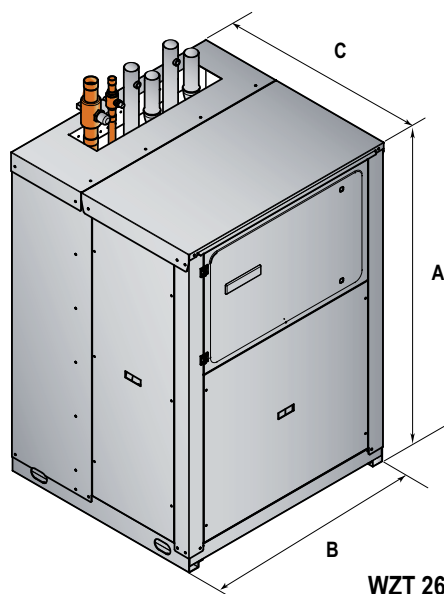
WZT - WZT/SW6 Versions	Code	06	08	10M	10T	14M	14T
Main switch		●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●
Flow switch		●	●	●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation		●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●
LS Low noise version (internal section)	LS00	●	●	●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	●	○
Remote control panel	PCRL	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

### INDOOR UNITS



WZT 06 ÷ 21



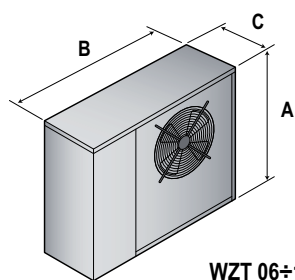
WZT 26 ÷ 92

Mod.	A (mm)	B (mm)	C (mm)	Kg
06	900	600	600	100
08	900	600	600	105
10M	900	600	600	110
10T	900	600	600	110
14M	1255	600	600	130
14T	1255	600	600	130
21	1255	600	600	150
26	1270	850	765	165
36	1270	850	765	175
46	1566	1101	1005	390
52	1566	1101	1005	460
72	1566	1101	1005	480
82	1566	1101	1005	490
92	1566	1101	1005	580

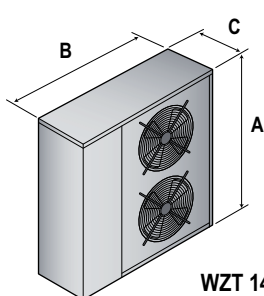
WZT - WZT/SW6 Versions	Code	21	26	36	46	52	72	82	92
Main switch		●	●	●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●	●	●
Flow switch		●	●	●	●	●	●	●	●
Evap/cond pressure control by transducer and fan speed control	DCCF	●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation		●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●
LS Low noise version (internal section)	LS00	●	●	●	●	●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

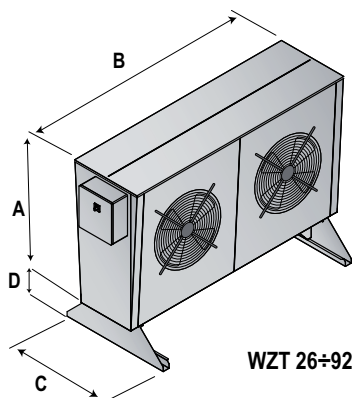
## OUTDOOR UNITS



WZT 06÷10



WZT 14÷21



WZT 26÷92

Mod.	A (mm)	B (mm)	C (mm)	D (mm)	Kg
06	989	1103	380	-	47
08	989	1103	380	-	47
10M	989	1103	380	-	50
10T	989	1103	380	-	50
14M	1323	1203	423	-	56
14T	1323	1203	423	-	56
21	1424	1453	473	-	91
26	1406	1870	850	350	112
36	1406	1870	850	350	148
46	1759	2608	1105	350	215
52	1759	2608	1105	350	230
72	1842	2608	1105	350	378
82	1842	2608	1105	350	470
92	1842	3608	1105	350	517



## WZH

### Ground source heat pumps

WZH



R407C



C.O.P. ≥ 5,1



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 55°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.

### OTHER VERSIONS

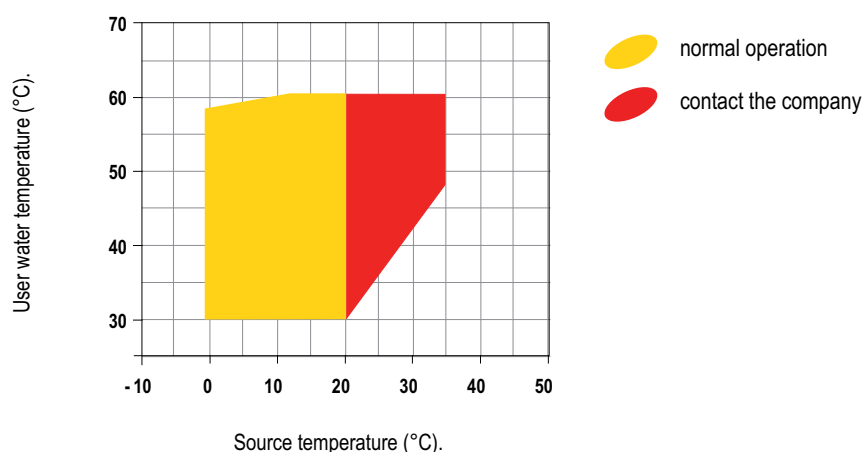
- **WZH** Standard, heating only.
- **WZH/SW5** Heating only + domestic hot water circuit.
- **WZH/RV** Reversible heating/cooling.
- **WZH/RV/SW6** Reversible version heating/cooling with independent DHW circuit.
- **FC free cooling version** (available in all versions).

### ACCESSORIES

- **DSSE**: Electronic soft starter.
- **INSE**: Serial interface card RS 485.
- **KAVG**: Rubber anti-vibration mountings.
- **KAVM**: Spring anti-vibration mountings.
- **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).
- **LS00**: Low noise version.

WZH Models		05	07	09	11	13	15	20	30
Heating capacity (EN14511) <sup>(1)</sup>	kW	7,4	10,0	12,5	14,4	17,8	20,9	27,0	38,0
Input power (EN14511) <sup>(1)</sup>	kW	1,5	1,9	2,4	2,7	3,2	3,8	5,2	7,1
COP (EN14511) <sup>(1)</sup>	w/w	4,9	5,3	5,2	5,3	5,6	5,5	5,2	5,4
Source water flow <sup>(1)</sup>	kW	5,5	7,6	9,5	11,0	13,4	16,0	20,6	28,6
Heating capacity (EN14511) <sup>(2)</sup>	kW	1,4	1,7	2,3	2,5	3,0	3,5	4,7	6,3
COP (EN14511) <sup>(2)</sup>	w/w	3,9	4,5	4,1	4,4	4,5	4,6	4,4	4,5
Cooling capacity (EN14511) <sup>(3)</sup>	kW	8,2	11,1	13,9	15,9	19,8	22,8	29,0	41,9
Input power (EN14511) <sup>(3)</sup>	kW	1,7	2,0	2,5	2,8	3,5	4,1	5,9	7,9
EER (EN14511) <sup>(3)</sup>	w/w	4,8	5,6	5,6	5,7	5,7	5,6	4,9	5,3
Cooling capacity (EN14511) <sup>(4)</sup>	kW	5,6	8,0	10,0	11,6	14,0	16,8	21,2	29,5
Input power (EN14511) <sup>(4)</sup>	kW	1,5	1,7	2,3	2,6	3,1	3,7	5,2	6,7
EER (EN14511) <sup>(4)</sup>	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° scroll	1 HP	1 HP	1 HP	1 HP	1 HP	1 HP	1 HP	1 HP
Sound power <sup>(5)</sup>	dB(A)	51	52	52	53	54	54	60	60
Sound pressure <sup>(6)</sup>	dB(A)	43	44	44	45	46	46	52	52

## OPERATION LIMITS



Performance refer 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.  
 (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 10 mt from the unit in free field conditions direction factor Q=2 in accordance with ISO 9614.

## WZH

### FRAME

All WZH 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 7035.

### 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 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 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 WZH 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, 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.

## OTHER VERSIONS

### WZH/SW5 UNIT WITH DOMESTIC HOT WATER PRODUCTION

This version is able to produce domestic hot water. It is supplied with an ON/OFF 3 way valve that diverts the water flow to a circuit for hot water production. These units are not available in the reversible version (RV) and cannot produce cold water.

### WZH/RV REVERSIBLE VERSION HEATING/ COOLING

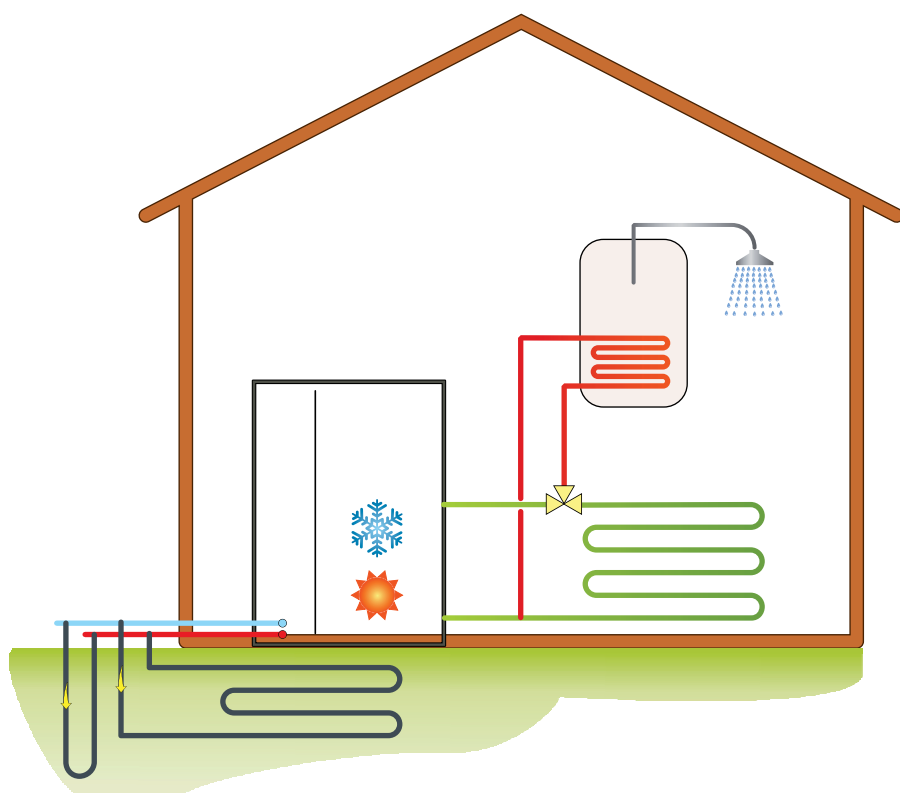
This version can be used for cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit. They are also fitted with a second thermostatic valve and a liquid receiver.

### WZH/RV/SW6 REVERSIBLE VERSION HEATING/COOLING WITH INDEPENDENT DHW CIRCUIT

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. This unit is supplied as standard with a reversing valve which enables the production of cold water in summer mode.

### WZH/FC; WZH/FC/RV; WZH/FC/SW5 WZH/ FC/RV/SW6 FREE COOLING VERSIONS

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 that 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.

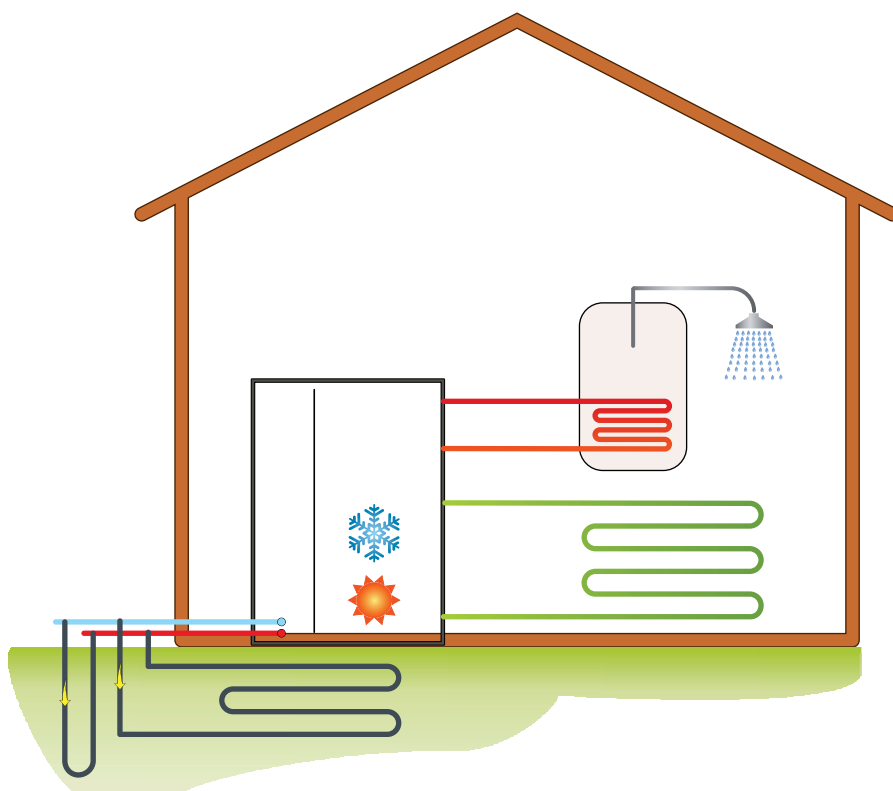


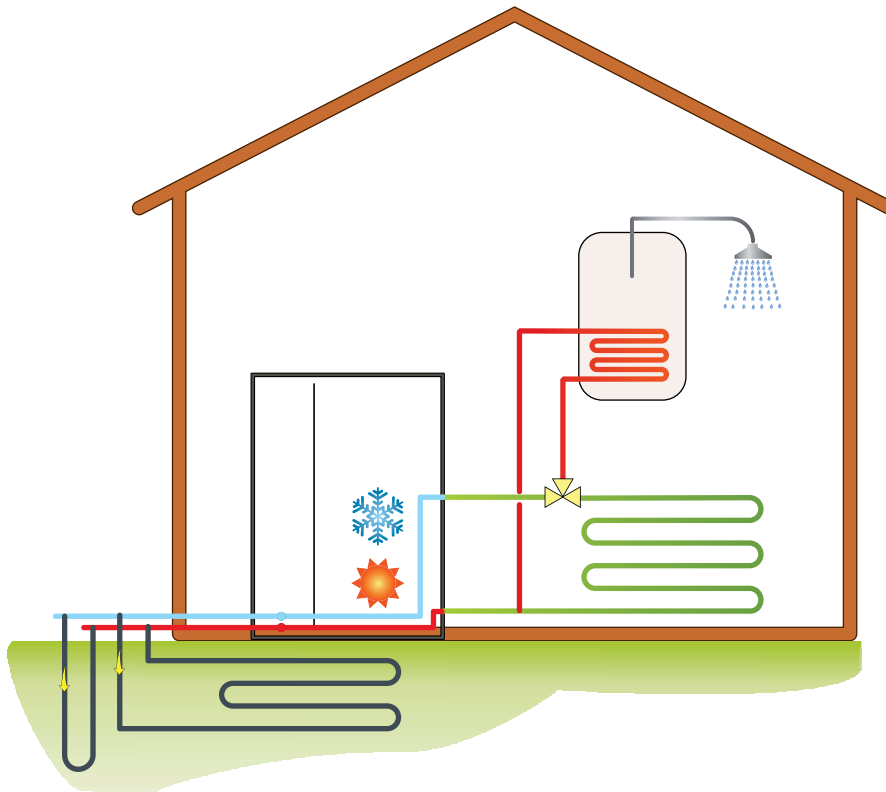
## WZH/RV 2 PIPES VERSION..

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.

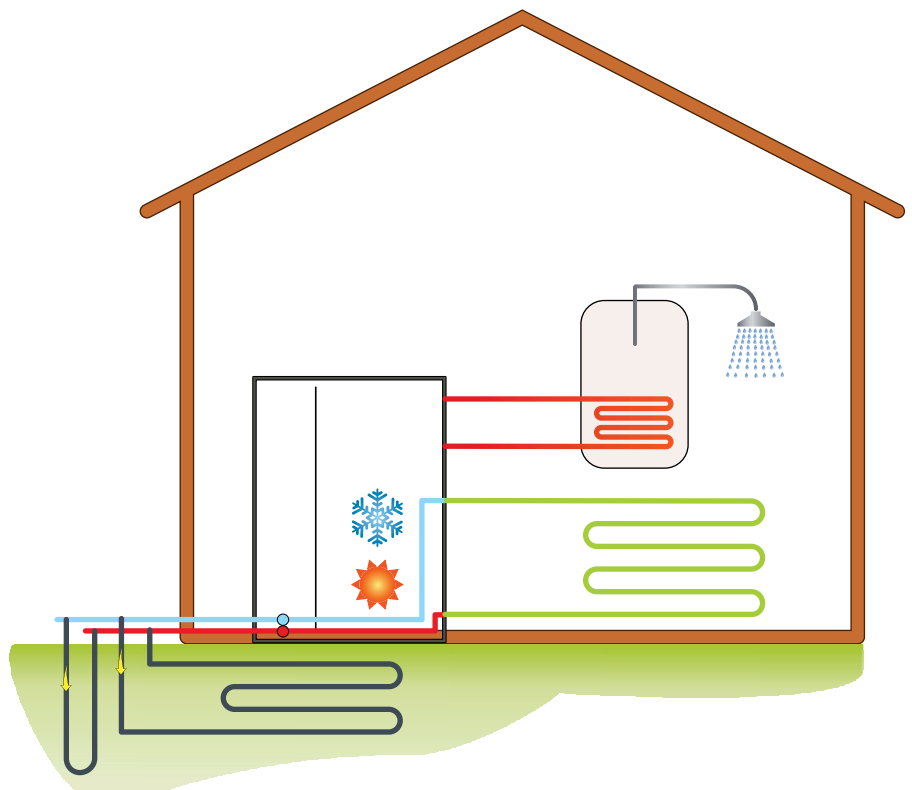




**WZH/FC/RV 2 PIPES VERSION..**

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.

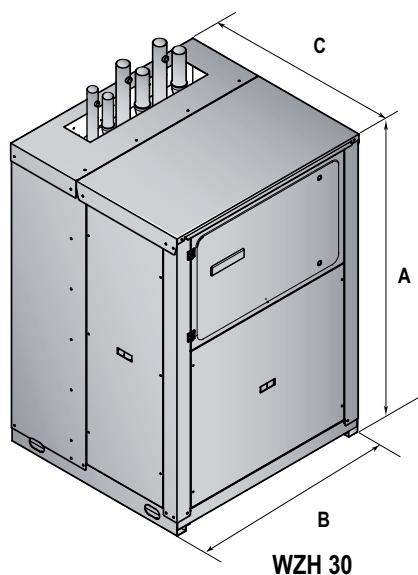
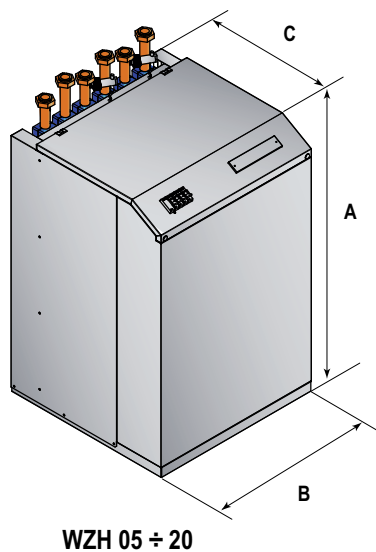
**WZH/FC/RV/SW6 4 PIPES VERSION..**





WZH Versions	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.



Mod.	A (mm)	B (mm)	C (mm)	Kg
05	900	600	600	100
07	900	600	600	105
09	900	600	600	110
11	900	600	600	120
13	1255	600	600	130
15	1255	600	600	140
20	1255	600	600	150
30	1270	850	765	165

## WHA

### Ground source heat pumps



R410A



C.O.P. ≥ 5,1



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 55°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.

### OTHER VERSIONS

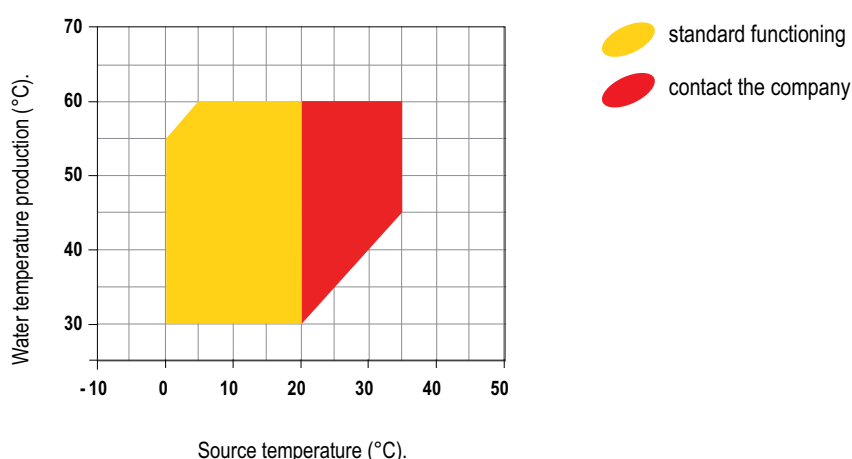
- **WHA** standard, heating only.
- **WHA/SW5** heating only + domestic hot water circuit.
- **WHA/RV** reversible heating/cooling.
- **WHA/RV/SW6** reversible version heating/cooling with independent DHW circuit.
- **FC** free cooling version (available in all versions).

### ACCESSORIES

- **DSSE**: Electronic soft starter.
- **INSE**: Serial interface card RS 485.
- **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).
- **VSLI**: Liquid line solenoid valve.
- **VTEE**: Electronic thermostatic valve.

WHA WHA/SW6 Models		039	045	050	060	070	080	090	110	120	130
Heating capacity (EN14511) <sup>(1)</sup>	kW	51,7	59,0	71,2	80,0	92,5	105,9	120,8	136,1	152,0	169,2
Total input power (EN14511) <sup>(1)</sup>	kW	9,8	11,0	12,5	14,3	16,9	19,4	22,2	24,9	28,3	31,6
COP (EN14511) <sup>(1)</sup>	W/W	5,3	5,4	5,7	5,6	5,5	5,5	5,4	5,5	5,4	5,4
Heating capacity (EN14511) <sup>(2)</sup>	kW	38,9	44,2	53,9	60,3	69,5	79,5	89,9	100,7	112,5	125,6
Total input power (EN14511) <sup>(2)</sup>	kW	9,5	10,8	12,3	14,1	16,4	18,6	21,3	23,9	27,2	30,5
COP (EN14511) <sup>(2)</sup>	W/W	4,1	4,1	4,4	4,3	4,2	4,3	4,2	4,2	4,1	4,1
Cooling capacity (EN14511) <sup>(3)</sup>	kW	59,8	68,1	83,9	94,0	107,8	124,1	142,5	161,8	178,7	198,5
Total input power (EN14511) <sup>(3)</sup>	kW	10,3	11,3	13,1	14,9	17,4	19,6	23,0	26,4	29,8	33,1
EER (EN14511) <sup>(3)</sup>	W/W	5,8	6,0	6,4	6,3	6,2	6,3	6,2	6,1	6,0	6,0
Cooling capacity (EN14511) <sup>(4)</sup>	kW	42,9	49,0	60,3	67,4	77,5	88,9	101,3	114,3	126,9	141,2
Total input power (EN14511) <sup>(4)</sup>	kW	10,0	11,3	12,9	14,7	17,4	19,9	22,7	25,5	29,0	32,3
EER (EN14511) <sup>(4)</sup>	W/W	4,3	4,3	4,7	4,6	4,4	4,5	4,5	4,5	4,4	4,4
Free Cooling capacity <sup>(5)</sup>	kW	22,8	22,9	36,0	36,3	36,6	49,3	71,0	72,4	73,5	74,1
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	400/3/50
Peak current	A	111,0	132,0	140,0	143,0	199,0	208,0	259,0	265,0	312,0	320,5
Maximum input current	A	32,0	42,0	44,0	50,0	59,0	68,0	74,0	80,0	88,5	97,0
Compressors Scroll / n° / Circuits		2/1	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	2
Sound power <sup>(6)</sup>	dB(A)	80	80	81	82	82	83	83	84	84	85
Sound pressure <sup>(7)</sup>	dB(A)	52	52	53	54	54	55	55	56	56	57

## OPERATION LIMITS



Performances refer 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) Cooling: user water temperature 10°C, source water temperature 20°C.

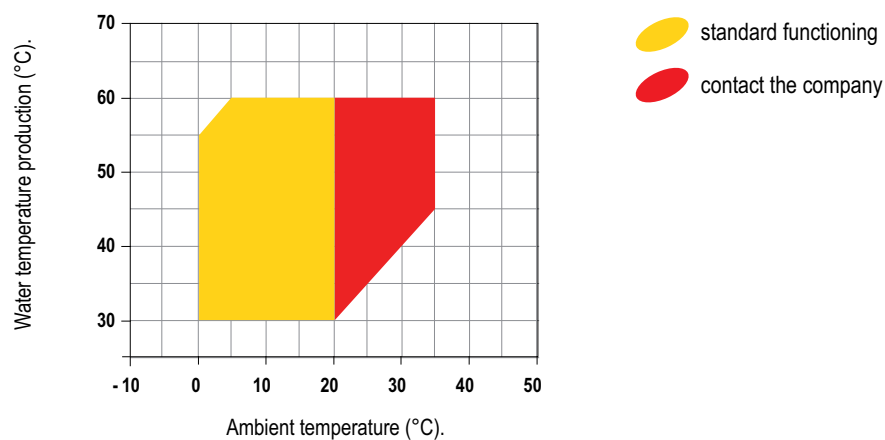
(6) Sound power level in accordance with ISO 9614 (LS version).

(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).

## WHA

WHA WHA/SW6 Models		152	162	190	210	240	260	300	320	380	430	500
Heating capacity (EN14511) <sup>(1)</sup>	kW	195,0	222,1	243,8	271,3	306,9	342,2	390,9	439,4	516,5	585,5	658,2
Total input power (EN14511) <sup>(1)</sup>	kW	36,8	41,0	45,1	51,0	57,3	63,6	72,5	81,4	95,9	109,8	123,2
COP (EN14511) <sup>(1)</sup>	W/W	5,3	5,4	5,4	5,3	5,3	5,4	5,4	5,4	5,4	5,3	5,3
Heating capacity (EN14511) <sup>(2)</sup>	kW	140,4	159,1	177,8	196,0	222,9	249,7	283,3	316,8	372,9	418,5	467,9
Total input power (EN14511) <sup>(2)</sup>	kW	35,1	39,2	43,1	48,7	54,9	61,0	69,4	77,9	92,0	105,1	117,9
COP (EN14511) <sup>(2)</sup>	W/W	4,0	4,0	4,1	4,0	4,1	4,1	4,1	4,1	4,1	4,0	4,0
Cooling capacity (EN14511) <sup>(3)</sup>	kW	231,4	265,2	289,5	321,7	363,7	405,3	462,9	520,1	604,9	681,6	766,1
Total input power (EN14511) <sup>(3)</sup>	kW	38,9	43,7	47,0	54,2	60,5	66,8	76,5	86,2	100,5	115,7	130,3
EER (EN14511) <sup>(3)</sup>	W/W	5,9	6,1	6,1	5,9	6,0	6,1	6,1	6,0	6,0	5,9	5,9
Cooling capacity (EN14511) <sup>(4)</sup>	kW	163,6	187,4	205,1	226,9	257,3	287,4	328,1	368,5	430,2	485,0	545,1
Total input power (EN14511) <sup>(4)</sup>	kW	37,8	42,2	46,3	52,4	58,8	65,2	74,3	83,4	98,3	112,7	126,4
EER (EN14511) <sup>(4)</sup>	W/W	4,3	4,4	4,4	4,3	4,4	4,4	4,4	4,4	4,4	4,3	4,3
Free Cooling capacity <sup>(5)</sup>	kW	93,1	94,0	128,2	129,6	130,9	163,0	164,4	203,0	167,1	168,4	207,1
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	400/3/50	400/3/50
Peak current	A	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2	514,5	586,3	637,0
Maximum input current	A	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6	291,0	341,7	392,4
Compressors Scroll / n° / Circuits		2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Capacity steps	n°	2	2	4	4	4	4	4	4	6	6	6
Sound power <sup>(6)</sup>	dB(A)	85	85	86	88	88	88	90	90	92	92	92
Sound pressure <sup>(7)</sup>	dB(A)	57	57	58	60	60	60	62	62	64	64	64

### OPERATION LIMITS



Performances refer 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) Cooling: user water temperature 10°C, source water temperature 20°C.

(6) Sound power level in accordance with ISO 9614 (LS version).

(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).

## FRAME

All WHA 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 7035.

## 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 fac-

tory 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 WHA 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 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 incor-

rect (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.

## OTHER VERSIONS

### WHA/SW5 ONLY HEATING UNIT WITH DOMESTIC HOT WATER

This version is able to produce domestic hot water. It is supplied with an ON/OFF 3 way valve that diverts the water flow to a circuit for hot water production. These units are not available in the reversible version (RV) and cannot produce cold water.

### WHA/RV REVERSIBLE VERSION HOT/COLD

This version can be used for cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit. They are also fitted with a second thermostatic valve and a liquid receiver.

### WHA/RV/SW6 REVERSIBLE HOT/COLD INDEPENDENT DOMESTIC HOT WATER CIRCUIT

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. This unit is supplied as standard with a reversing valve which enables the production of cold water in summer mode.

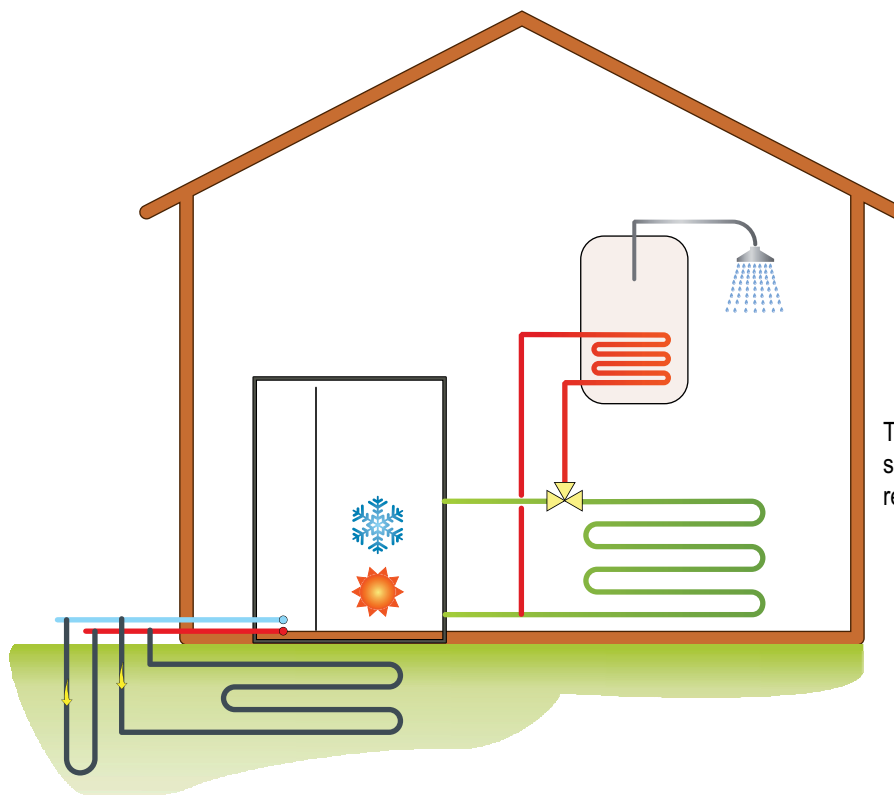
### WHA/FC; WHA/FC /RV; WHA/FC/SW5; WHA/FC/RV/SW6 - FREE COOLING VERSIONS

These versions, in addition to the characteristics described above, can produce

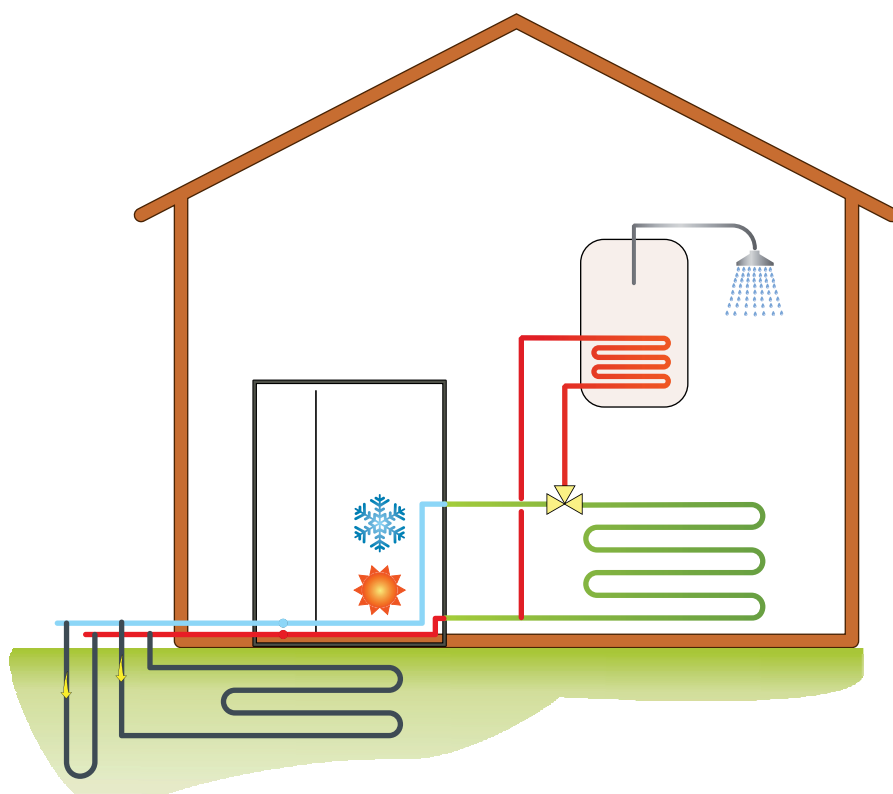


This version has acoustic insulation applied to the unit (both the compressor and its enclosure) in the form of compressor jackets and insulating material made with high density media coated with a heavy bitumen layer.

WHA



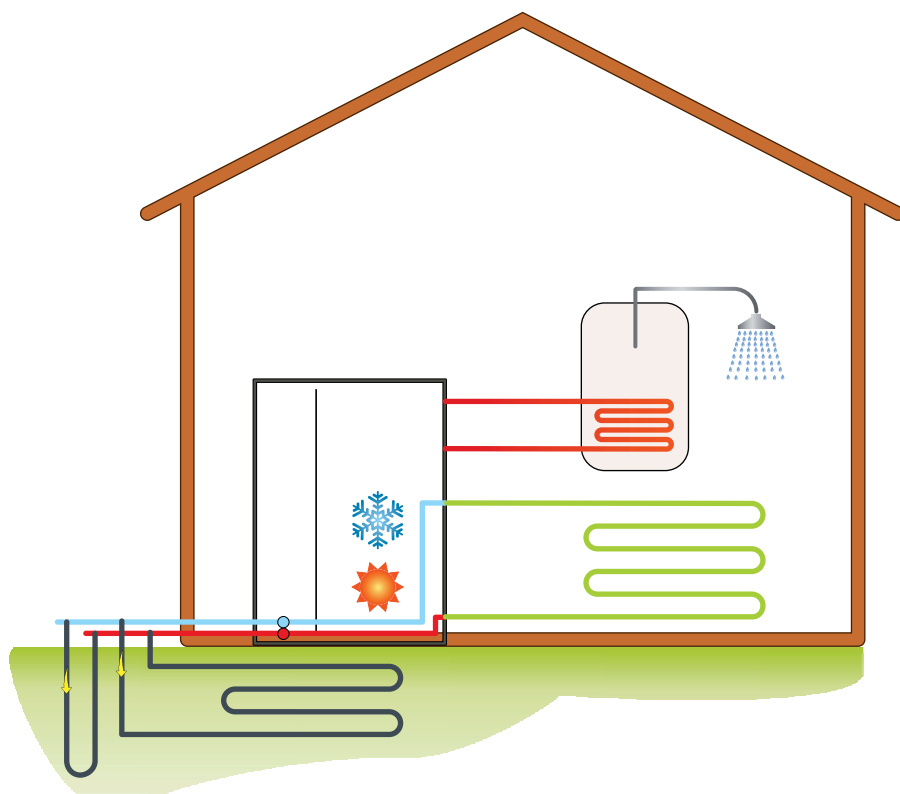
This version is capable of cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit.



**WHA/FC/RV 2 PIPES VERSION.**

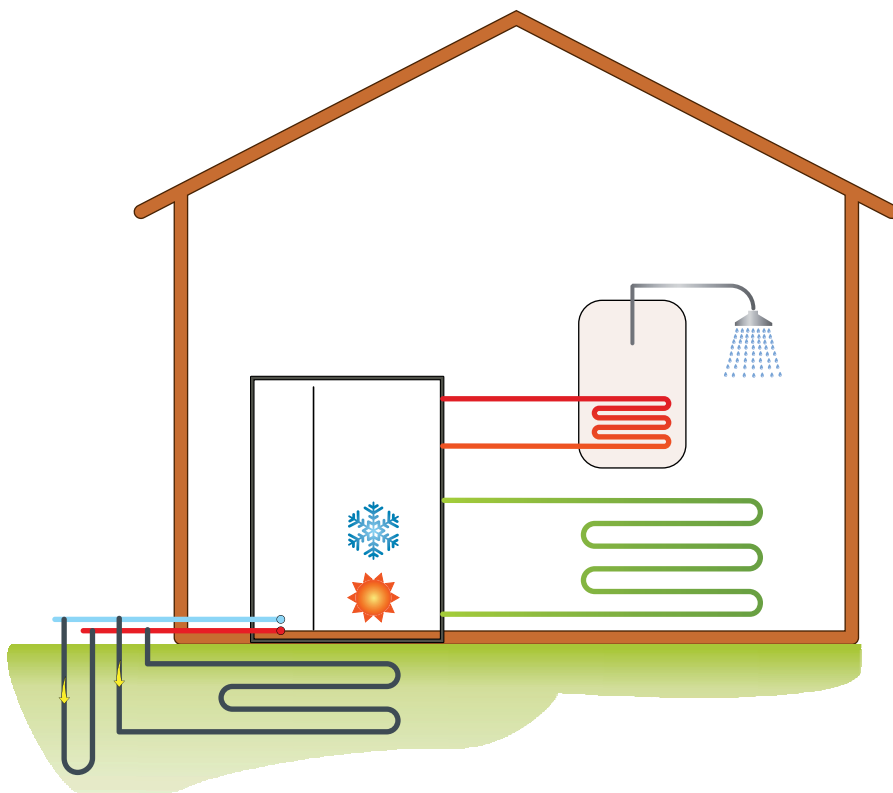
These versions, in addition to the characteristics described above, can produce cold water during summer operation using the cold water available from the source ground probes. All free cooling versions are supplied with an intermediate heat exchanger and a 3 way valve which modulates the water flow 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/FC/RV/SW6 2 PIPES VERSION.**



### WHA/RV/SW6 4 PIPES VERSION.

This unit is supplied with 4 pipes on the user side and is able to produce hot and cold water at the same time on two independent hydraulic circuits. The unit is supplied with an additional heat exchanger that is used as condenser for the domestic hot water production of which is independent of the operational mode of the unit.



WHA Versions	Code	039-045	050-060	070-080	090-110	120-130
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	INSE	○	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○
Source circuit pump kit *	S1NT	○	○	○	○	○

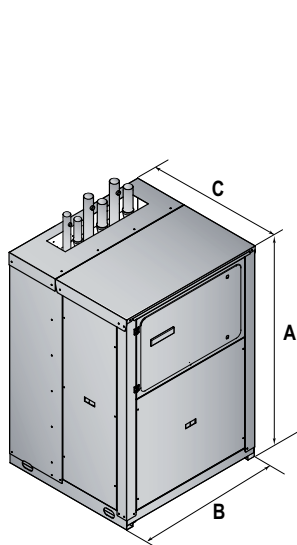
\* Not available with FC version

● Standard, ○ Optional, – Not Available.

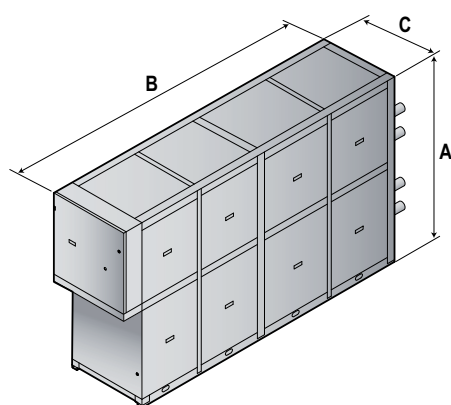
WHA Versions	Code	152-162	190-210	240-260	300-320	380-500
Main switch		●	●	●	●	●
Microprocessor control		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
LS low noise version	LS00	●	●	●	●	●
Electronic soft starter	DSSE	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○
Source circuit pump kit *	S1NT	○	○	○	○	○

\* Not available with FC version

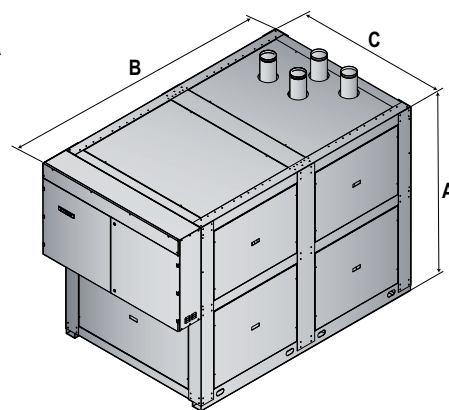
● Standard, ○ Optional, – Not Available.



WHA 039 ÷ 162



WHA 190 ÷ 320



WHA 380 ÷ 500

Mod.	A (mm)	B (mm)	C (mm)	Kg
039	1566	1101	1005	430
045	1566	1101	1005	440
050	1566	1101	1005	460
060	1566	1101	1005	470
070	1566	1101	1005	480
080	1566	1101	1005	490
090	1986	1101	1255	580
110	1986	1101	1255	600
120	1986	1101	1255	630
130	1986	1101	1255	650
152	1986	1101	1255	730
162	1986	1101	1255	760

Mod.	A (mm)	B (mm)	C (mm)	Kg
190	1900	3120*	800	1170
210	1900	3120*	800	1210
240	1900	3120*	800	1270
260	1900	3120*	800	1320
300	1900	3120*	800	1390
320	1900	3120*	800	1430
380	2100	2750	1600	2550
430	2100	2750	1600	2690
500	2100	2750	1600	2750

\* 2170 mm for RV and standard version

## LWZ

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



The LWZ series of high efficiency hybrid 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. LWZ units are available in 2 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard LWZ 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.

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 maximise the operating efficiency of the unit. The COP will be superior to a standard air source heat pump.

### OTHER VERSIONS

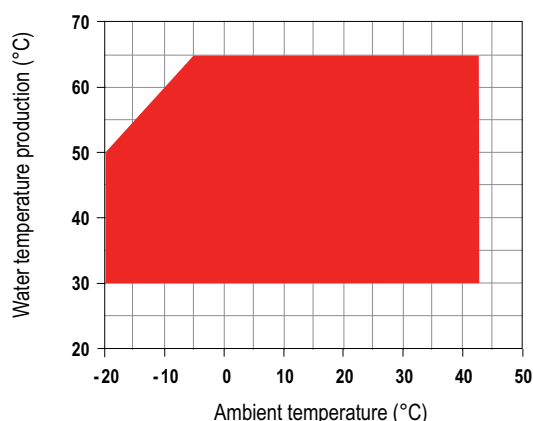
- **LWZ 2 pipes reversible standard.**
- **LWZ/SW6 4 pipes unit** capable of producing hot and cold water simultaneously on two independent hydraulic circuits.

### ACCESSORIES

- **DSSE:** Electronic soft starter.
- **INSE:** Serial interface card RS 485.
- **KAVG:** Rubber anti-vibration mountings.
- **KAVM:** Spring anti-vibration mountings.
- **RAEV:** Evaporator antifreeze heater.
- **RAES:** Antifreeze kit.
- **LS00:** Low noise version.
- **MAML:** Refrigerant circuit pressure gauges.
- **PCRL:** Remote control panel.
- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **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.
- **VECE:** High efficiency E.C. fans.

WWZ - WWZ/SW6 Models		26	36	52	72	82	92
Heating capacity (EN14511) <sup>(1)</sup>	kW	26,5	37,4	52,0	74,7	89,4	106,3
Total input power (EN14511) <sup>(1)</sup>	kW	6,4	8,4	11,8	18,1	22,0	26,2
COP (EN14511) <sup>(1)</sup>	W/W	4,1	4,5	4,4	4,1	4,1	4,1
Heating capacity (EN14511) <sup>(2)</sup>	kW	21,1	29,7	43,5	59,0	75,0	86,3
Total input power (EN14511) <sup>(2)</sup>	kW	6,1	7,9	11,2	17,0	21,2	25,0
COP (EN14511) <sup>(2)</sup>	W/W	3,5	3,8	3,9	3,5	3,5	3,5
Water flow integration <sup>(2)</sup>	l/h	1800	2700	3650	5350	6250	7500
Heating capacity (EN14511) <sup>(3)</sup>	kW	26,9	35,9	53,7	71,9	92,3	106,2
Total input power (EN14511) <sup>(3)</sup>	kW	9,4	12,0	17,8	25,0	31,5	35,3
COP (EN14511) <sup>(3)</sup>	W/W	2,9	3,0	3,0	2,9	2,9	3,0
Heating capacity (EN14511) <sup>(4)</sup>	kW	21,5	29,7	44,6	59,0	77,2	86,4
Total input power (EN14511) <sup>(4)</sup>	kW	8,1	11,2	16,5	23,5	29,7	33,2
COP (EN14511) <sup>(4)</sup>	W/W	2,7	2,7	2,7	2,5	2,6	2,6
Water flow integration <sup>(4)</sup>	l/h	1800	2700	3650	5350	6250	7500
Cooling capacity (EN14511) <sup>(5)</sup>	kW	30,9	42,2	57,8	84,4	93,2	117,0
Total input power (EN14511) <sup>(5)</sup>	kW	8,1	10,8	15,2	23,6	27,0	33,2
EER (EN14511) <sup>(5)</sup>	W/W	3,8	3,9	3,8	3,6	3,5	3,5
Cooling capacity (EN14511) <sup>(6)</sup>	kW	22,9	30,4	42,4	61,8	75,0	90,2
Total input power (EN14511) <sup>(6)</sup>	kW	7,1	9,5	13,3	21,4	26,4	31,1
EER (EN14511) <sup>(6)</sup>	W/W	3,2	3,2	3,2	2,9	2,8	2,9
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	A	20,9	25,8	39,2	55,0	62,0	76,9
Peak current	A	101,6	129,6	119,9	158,8	202,3	242,9
Peak current std unit with soft starter (optional)	A	61,9	78,7	80,2	106,9	135,5	164,2
Compressors	n° Scroll	1 E.V.I.	1 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.
Std external unit sound power level <sup>(7)</sup>	dB (A)	79	79	82	82	82	83
Std external unit sound pressure level <sup>(8)</sup>	dB (A)	51	51	54	54	54	55

## OPERATION LIMITS



Performance refer to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger INACTIVE.

(2)Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)

(3)Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 50/55°C. Water Source Heat Exchanger INACTIVE.

(4)Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 50/55°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)

(5)Cooling: ambient temperature 35°C, water temperature 23/18°C. Water Source Heat Exchanger INACTIVE.

(6)Cooling: ambient temperature 35°C, water temperature 12/7°C. Water Source Heat Exchanger INACTIVE.

(7)Sound power level according to ISO 9614.

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



## LWZ

### FRAME

All LWZ 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. 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.

### COMPRESSOR

HIDROS 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 interstage cooling. The process begins when a portion of the condenser liquid is entrained 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 and 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 via the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

### AIR SOURCE HEAT EXCHANGER

The air 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. The exchangers can be protected by a metallic filter that is available as an accessory.

### WATER SOURCE HEAT EXCHANGER

The water source 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 evaporator. 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 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.

### USER HEAT EXCHANGER

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

### 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 and general alarm.

### MICROPROCESSORS

All LWZ 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.

## 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.

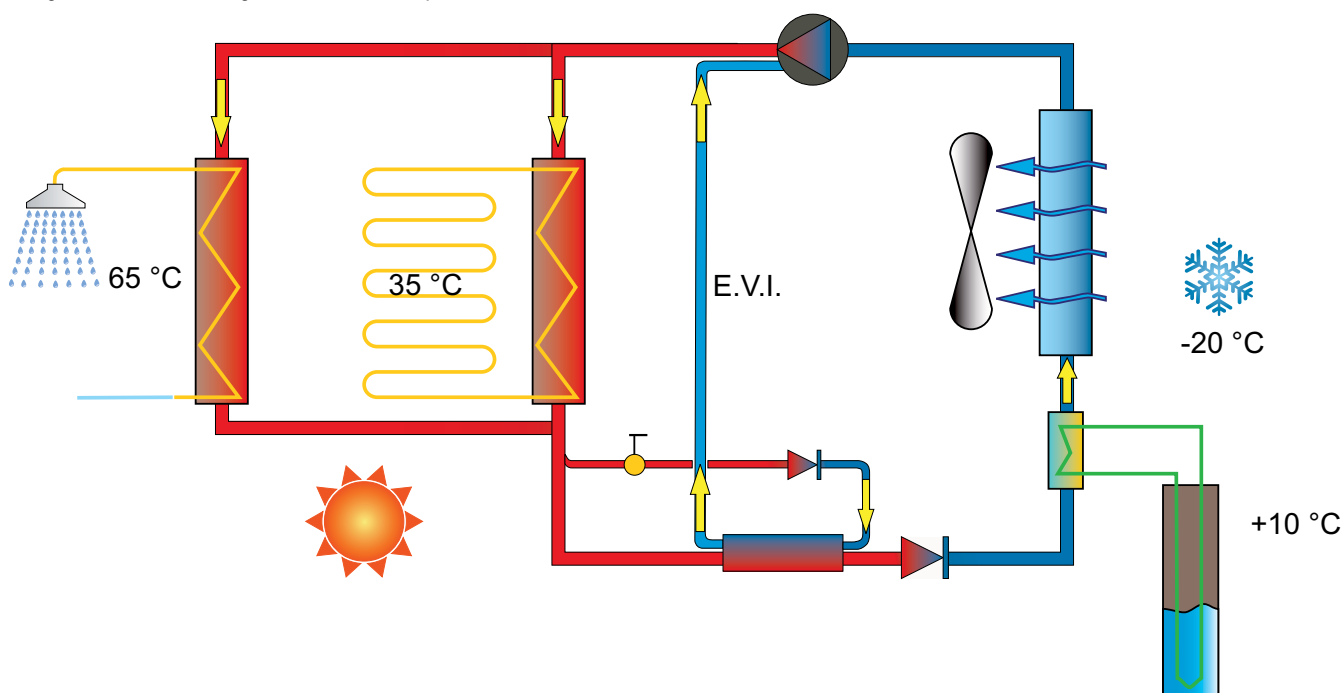
## PRICIPLE OF OPERATION

The use of the water source heat exchanger only in harsh environmental conditions only, 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.

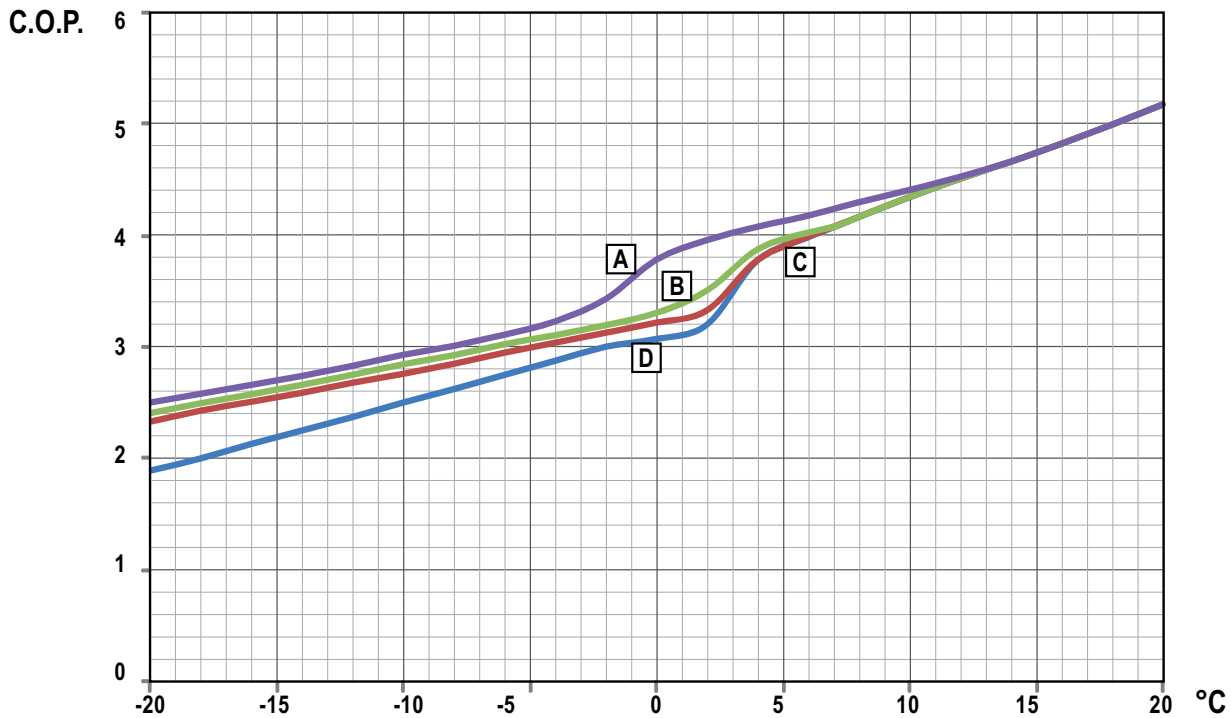
Some water sources used:

- 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.



Refrigerant circuit layout of an LWZ/SW6 hybrid heat pump, supplied with domestic hot water heat exchanger and additional ground source heat exchanger to enhance the efficiency of the unit in case of severe ambient condition and to improve the seasonal C.O.P..

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

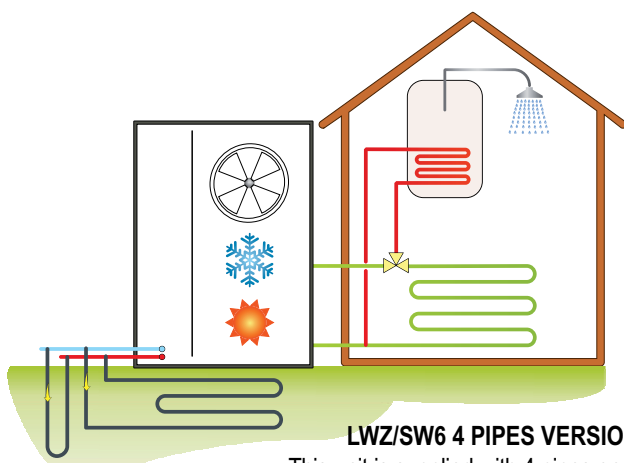


The graph shows the evolution of LWZ units C.O.P. (curves A, B, C) at different external temperatures (with user water produced at 35 °C), compared to a unit of equal power series LZT (curve D).

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.

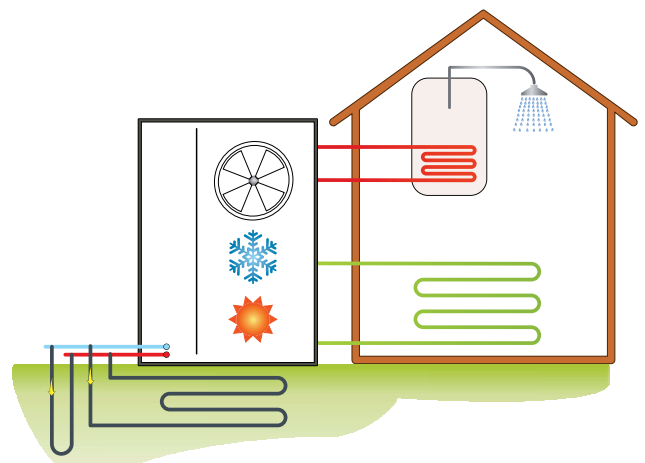


**LWZ/SW6 4 PIPES VERSION.**

This unit is supplied with 4 pipes on the user side and is able to produce hot and cold water at the same time on two independent hydraulic circuits. The unit is supplied with an additional heat exchanger that is used as condenser for the domestic hot water production of which is independent of the operational mode of the unit.

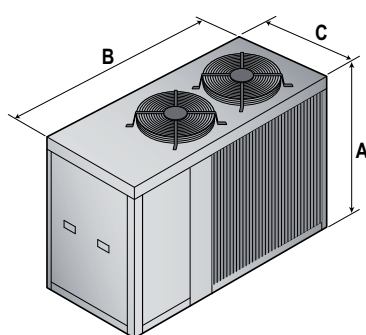
#### LWZ 2 PIPES VERSION.

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

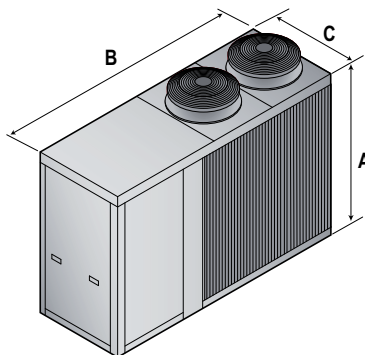


LWZ - LWZ/SW6 Versions	Code	26	36	52	72	82	92
Main switch		●	●	●	●	●	●
Microprocessor control		●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○
LS Low noise version	LS00	●	●	●	●	●	●
S1NT version with one pump, Brine source side, without tank.	S1NT	○	○	○	○	○	○
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	INSE	○	○	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○

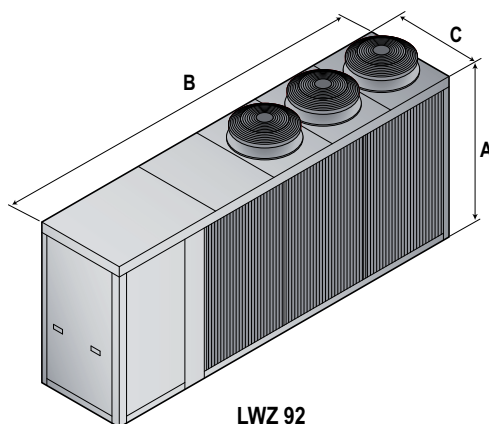
● Standard, ○ Optional, – Not Available.



LWZ 26÷36



LWZ 46÷82



LWZ 92

Mod.	A (mm)	B (mm)	C (mm)	Kg
26/26A1	1406	1870	850	350/510
36/36A1	1406	1870	850	390/550
46/46A1	1759	2608	1105	660/810

Mod.	A (mm)	B (mm)	C (mm)	Kg
52/52A1	1759	2608	1105	710/880
72/72A1	1842	2608	1105	725/895
82/82A1	1842	2608	1105	810/980
92/92A1	1842	3608	1105	1070/1280

## WWZ

High efficiency HYBRID heat pumps  
with E.V.I compressor in two sections



The WWZ series of high efficiency hybrid 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. WWZ units are available in 2 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard WWZ 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.

The main feature of WWZ 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 maximise the operating efficiency of the unit. The COP will be superior to a standard air source heat pump.

### OTHER VERSIONS

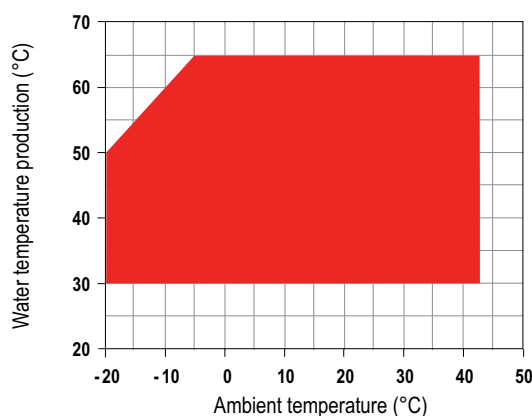
- **WWZ 2 pipes reversible standard.**
- **WWZ/SW6 4 pipes unit** able to produce hot and cold water at the same time on two independent hydraulic circuits.

### ACCESSORIES

- **DSSE:** Electronic soft starter.
- **INSE:** RS485 interface bus card.
- **KAVG:** Rubber anti-vibration mountings.
- **KAVM:** Spring anti-vibration mountings.
- **MAML:** Refrigerant circuit pressure gauges.
- **PCRL:** Remote control panel.
- **BRCA:** Condensate discharge drip tray with antifreeze heater.
- **VTEE:** Electronic thermostatic valve.
- **VSLI:** Liquid line solenoid valve.
- **V2M0:** 2 way modulating valve to reduce source water consumption (4-20 mA; 0-10 V).
- **VECE:** High efficiency E.C. fans.

WWZ - WWZ/SW6 Models		14T	21	26	36
Heating capacity (EN14511) <sup>(1)</sup>	kW	13,9	19,6	26,5	37,4
Total input power (EN14511) <sup>(1)</sup>	kW	3,2	4,5	6,4	8,4
COP (EN14511) <sup>(1)</sup>	W/W	4,3	4,4	4,1	4,5
Heating capacity (EN14511) <sup>(2)</sup>	kW	11,4	16,4	21,1	29,7
Total input power (EN14511) <sup>(2)</sup>	kW	3,1	4,3	6,1	7,9
COP (EN14511) <sup>(2)</sup>	W/W	3,7	3,8	3,5	3,8
Water flow integration <sup>(2)</sup>	l/h	1100	1500	1800	2700
Heating capacity (EN14511) <sup>(3)</sup>	kW	13,9	18,8	26,9	35,9
Total input power (EN14511) <sup>(3)</sup>	kW	4,5	6,3	9,4	12,0
COP (EN14511) <sup>(3)</sup>	W/W	3,1	3,0	2,9	3,0
Heating capacity (EN14511) <sup>(4)</sup>	kW	11,6	15,7	21,5	29,7
Total input power (EN14511) <sup>(4)</sup>	kW	4,3	6,0	8,1	11,2
COP (EN14511) <sup>(4)</sup>	W/W	2,7	2,6	2,7	2,7
Water flow integration <sup>(4)</sup>	l/h	1100	1500	1800	2700
Cooling capacity (EN14511) <sup>(5)</sup>	kW	15,5	21,4	30,9	42,2
Total input power (EN14511) <sup>(5)</sup>	kW	4,0	5,6	8,1	10,8
EER (EN14511) <sup>(5)</sup>	W/W	3,9	3,8	3,8	3,9
Cooling capacity (EN14511) <sup>(6)</sup>	kW	11,6	16,4	22,9	30,4
Total input power (EN14511) <sup>(6)</sup>	kW	3,7	5,1	7,1	9,5
EER (EN14511) <sup>(6)</sup>	W/W	3,1	3,2	3,2	3,2
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current	A	12,0	15,8	20,9	25,8
Peak current	A	66,0	102,8	101,6	129,6
Peak current standard unit with soft starter (optional)	A	39,7	62,3	61,9	78,7
Compressors	n° Scroll	1 E.V.I.	1 E.V.I.	1 E.V.I.	1 E.V.I.
Internal unit sound power level <sup>(7)</sup>	dB (A)	54	60	60	60
Internal unit sound pressure level <sup>(8)</sup>	dB (A)	46	52	52	52
Std external unit sound power level <sup>(7)</sup>	dB (A)	66	66	68	68
Std external unit sound pressure level <sup>(9)</sup>	dB (A)	38	38	40	40

## OPERATION LIMITS



Performance refer to the following conditions:

(1)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger INACTIVE.

(2)Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)

(3)Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 50/55°C. Water Source Heat Exchanger INACTIVE.

(4)Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 50/55°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)

(5)Cooling: ambient temperature 35°C, water temperature 23/18°C. Water Source Heat Exchanger INACTIVE.

(6)Cooling: ambient temperature 35°C, water temperature 12/7°C. Water Source Heat Exchanger INACTIVE.

(7)Sound power level according to ISO 9614.

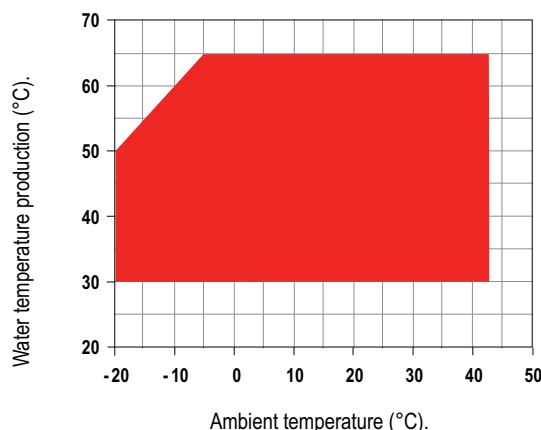
(8)Sound pressure level at 1 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.

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



WWZ - WWZ/SW6 Models		46	52	72	82	92
Heating capacity (EN14511) <sup>(1)</sup>	kW	44,7	52,0	74,7	89,4	106,3
Total input power (EN14511) <sup>(1)</sup>	kW	10,0	11,8	18,1	22,0	26,2
COP (EN14511) <sup>(1)</sup>	W/W	4,5	4,4	4,1	4,1	4,1
Heating capacity (EN14511) <sup>(2)</sup>	kW	37,7	43,5	59,0	75,0	86,3
Total input power (EN14511) <sup>(2)</sup>	kW	9,5	11,2	17,0	21,2	25,0
COP (EN14511) <sup>(2)</sup>	W/W	4,0	3,9	3,5	3,5	3,5
Water flow integration <sup>(2)</sup>	l/h	3200	3650	5350	6250	7500
Heating capacity (EN14511) <sup>(3)</sup>	kW	46,1	53,7	71,9	92,3	106,2
Total input power (EN14511) <sup>(3)</sup>	kW	14,7	17,8	25,0	31,5	35,3
COP (EN14511) <sup>(3)</sup>	W/W	3,1	3,0	2,9	2,9	3,0
Heating capacity (EN14511) <sup>(4)</sup>	kW	38,6	44,6	59,0	77,2	86,4
Total input power (EN14511) <sup>(4)</sup>	kW	13,8	16,5	23,5	29,7	33,2
COP (EN14511) <sup>(4)</sup>	W/W	2,8	2,7	2,5	2,6	2,6
Water flow integration <sup>(4)</sup>	l/h	3200	3650	5350	6250	7500
Cooling capacity (EN14511) <sup>(5)</sup>	kW	46,6	57,8	84,4	93,2	117,0
Total input power (EN14511) <sup>(5)</sup>	kW	12,5	15,2	23,6	27,0	33,2
EER (EN14511) <sup>(5)</sup>	W/W	3,7	3,8	3,6	3,5	3,5
Cooling capacity (EN14511) <sup>(6)</sup>	kW	37,3	42,4	61,8	75,0	90,2
Total input power (EN14511) <sup>(6)</sup>	kW	12,1	13,3	21,4	26,4	31,1
EER (EN14511) <sup>(6)</sup>	W/W	3,1	3,2	2,9	2,8	2,9
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	A	29,3	39,2	55,0	62,0	76,9
Peak current	A	169,6	119,9	158,8	202,3	242,9
Peak current standard unit with soft starter (optional)	A	102,7	80,2	106,9	135,5	164,2
Compressors	n° Scroll	1 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.	2 E.V.I.
Internal unit sound power level <sup>(7)</sup>	dB (A)	60	61	62	63	63
Internal unit sound pressure level <sup>(8)</sup>	dB (A)	52	53	54	55	55
Std external unit sound power level <sup>(7)</sup>	dB (A)	70	70	71	71	72
Std external unit sound pressure level <sup>(9)</sup>	dB (A)	42	42	43	43	44

### OPERATION LIMITS



Performance refer to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger INACTIVE.
- (2) Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 30/35°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)
- (3) Heating: Ambient temperature -7°C DB, 6°C WB, water temperature 50/55°C. Water Source Heat Exchanger INACTIVE.
- (4) Heating: Ambient temperature -7°C DB, -8°C WB, water temperature 50/55°C. Water Source Heat Exchanger ACTIVE. (Fluid temperature 10/7°C)

- (5) Cooling: ambient temperature 35°C, water temperature 23/18°C. Water Source Heat Exchanger INACTIVE.
- (6) Cooling: ambient temperature 35°C, water temperature 12/7°C. Water Source Heat Exchanger INACTIVE.
- (7) Sound power level according to ISO 9614.
- (8) Sound pressure level at 1 mt from the unit in free field conditions direction factor Q=2, calculated in accordance with ISO 9614.
- (9) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q=2, in accordance with ISO 9614.

## FRAME

All WWZ 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. 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.

## COMPRESSOR

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 interstage cooling. The process begins when a portion of the condenser liquid is entrained 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 and 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 via the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

## AIR SOURCE HEAT EXCHANGER

The air 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. The exchangers can be protected by a metallic filter that is available as an accessory.

## WATER SOURCE HEAT EXCHANGER

The water source heat exchanger is a brazed, 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 evaporator. 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 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.

## USER HEAT EXCHANGER

The user heat exchanger is a brazed, 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. Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

## 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 and general alarm.

## MICROPROCESSORS

All WWZ 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

## WWZ

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.

### 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 out-

let 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.

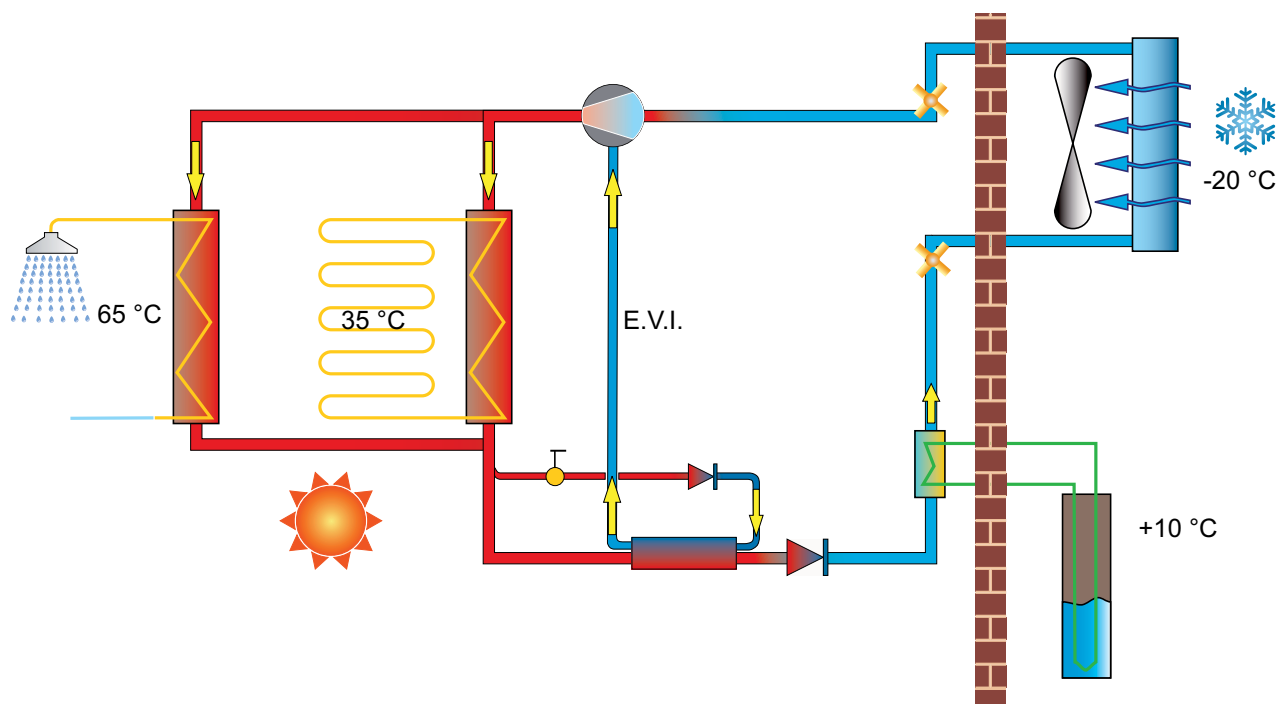
## PRICIPLE OF OPERATION

The use of the water source heat exchanger only in harsh environmental conditions only, 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.

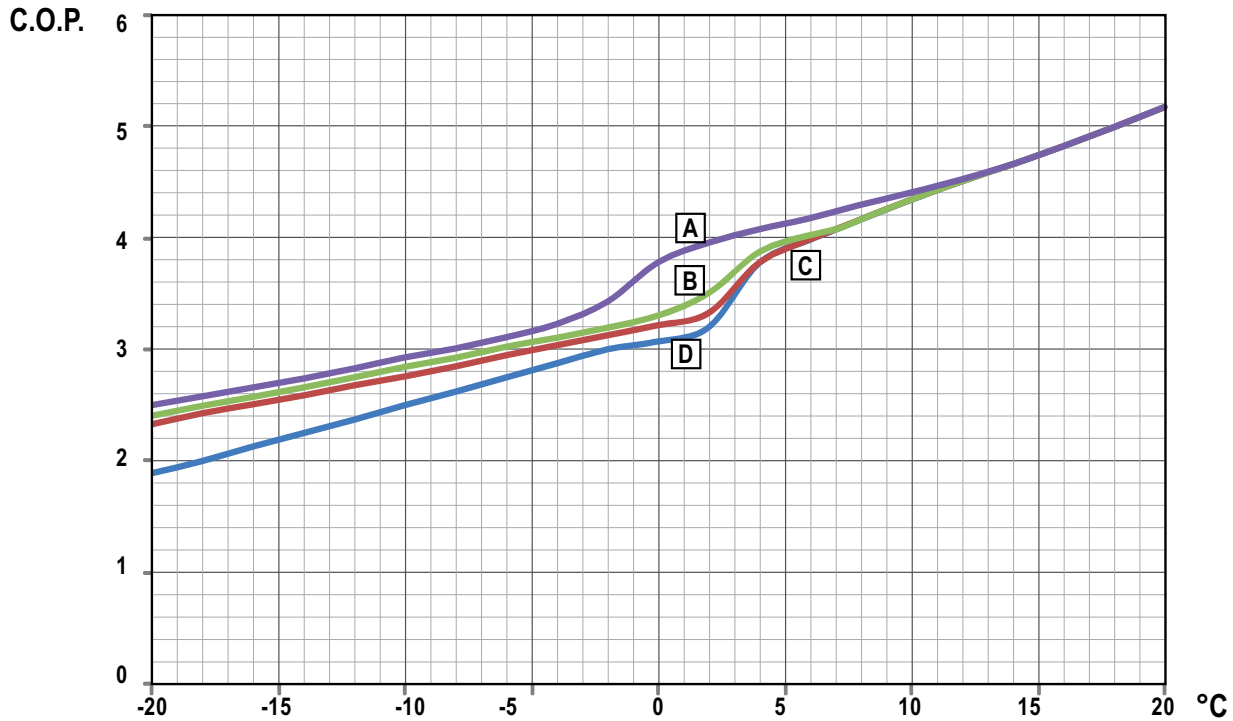
Some water sources used:

- 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.



Refrigerant circuit layout of a WWZ/SW6 hybrid heat pump, supplied with domestic hot water heat exchanger and additional ground source heat exchanger to enhance the efficiency of the unit in case of severe ambient condition and to improve the seasonal C.O.P.

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



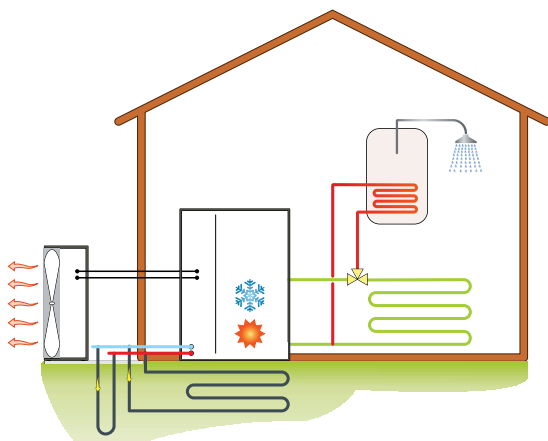
The graph shows the evolution of WWZ units C.O.P. (curves A, B, C) at different external temperatures (with user water produced at 35 °C), compared to a unit of equal power series WZT (curve D).

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

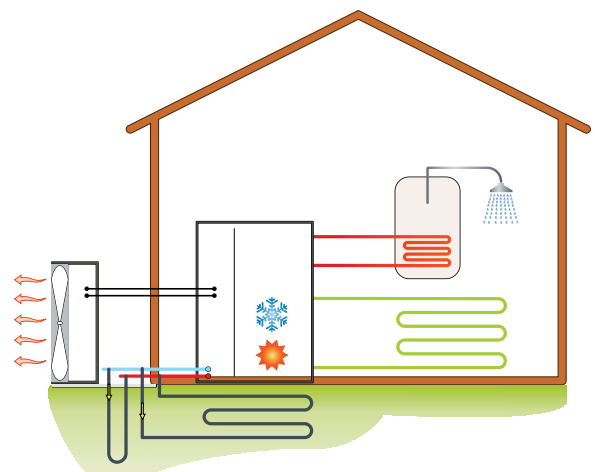
Curve A: 10/7 °C, Curve B: 3/0 °C, Curve C: 0/-3 °C.

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.

### Connections diagrams



WWZ 2 PIPES VERSION.

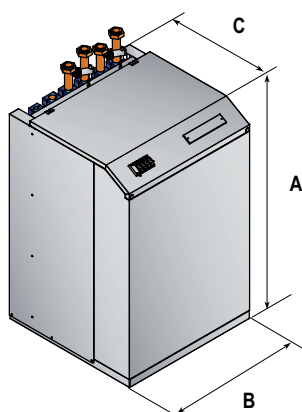


WWZ/SW6 4 PIPES VERSION.

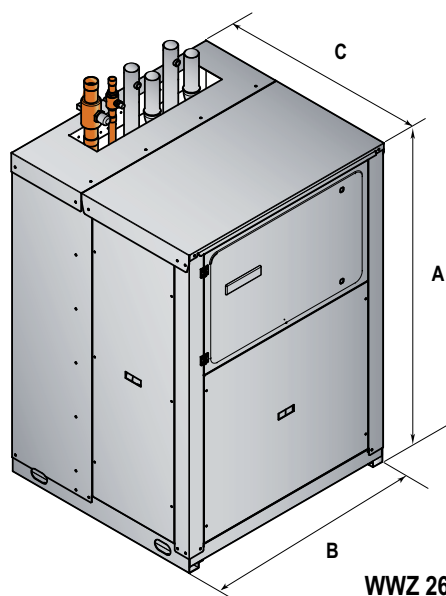
WWZ - WWZ/SW6 Versions	Code	14T	21	26	36
Main switch		●	●	●	●
Microprocessor control		●	●	●	●
Remote ON/OFF digital input		●	●	●	●
Summer/Winter digital input		●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●
LS Low noise version	LS00	●	●	●	●
Electronic soft starter	DSSE	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○
Spring anti-vibration mountings.	KAVM	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○
Remote control panel	PCRL	○	○	○	○
RS485 interface bus card	INSE	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○

● Standard, ○ Optional, – Not Available.

### INDOOR UNITS



WWZ 14 ÷ 21



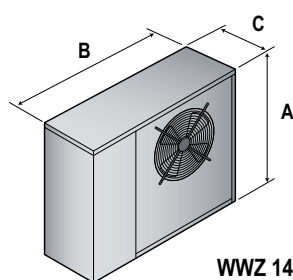
WWZ 26 ÷ 92

Mod.	A (mm)	B (mm)	C (mm)	Kg
14T	1255	600	600	130
21	1255	600	600	150
26	1270	850	765	165
36	1270	850	765	175
46	1566	1101	1005	390
52	1566	1101	1005	460
72	1566	1101	1005	480
82	1566	1101	1005	490
92	1566	1101	1005	580

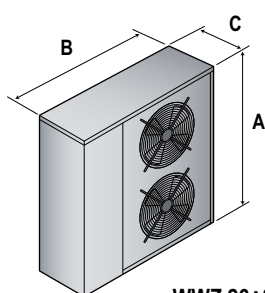
WWZ - WWZ/SW6 Versions	Code	46	52	72	82	92
Main switch		●	●	●	●	●
Microprocessor control		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●	●
LS Low noise version	LS00	●	●	●	●	●
Electronic soft 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	○	○	○	○	○
RS485 interface bus card	INSE	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

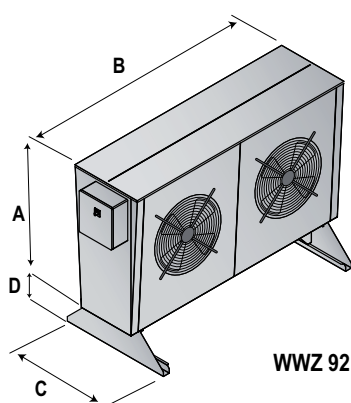
## OUTDOOR UNITS



WWZ 14÷21



WWZ 26÷82



WWZ 92

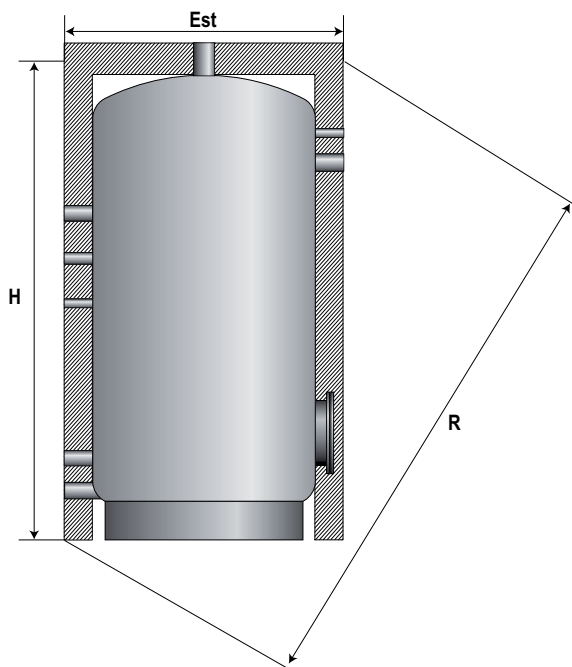
Mod.	A (mm)	B (mm)	C (mm)	D (mm)	Kg
14T	1323	1203	423	-	56
21	1424	1453	473	-	91
26	1406	1870	850	-	112
36	1406	1870	850	-	148
46	1759	2608	1105	-	215
52	1759	2608	1105	-	230
72	1842	2608	1105	-	378
82	1842	2608	1105	-	470
92	1842	3608	1105	350	517



## 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.

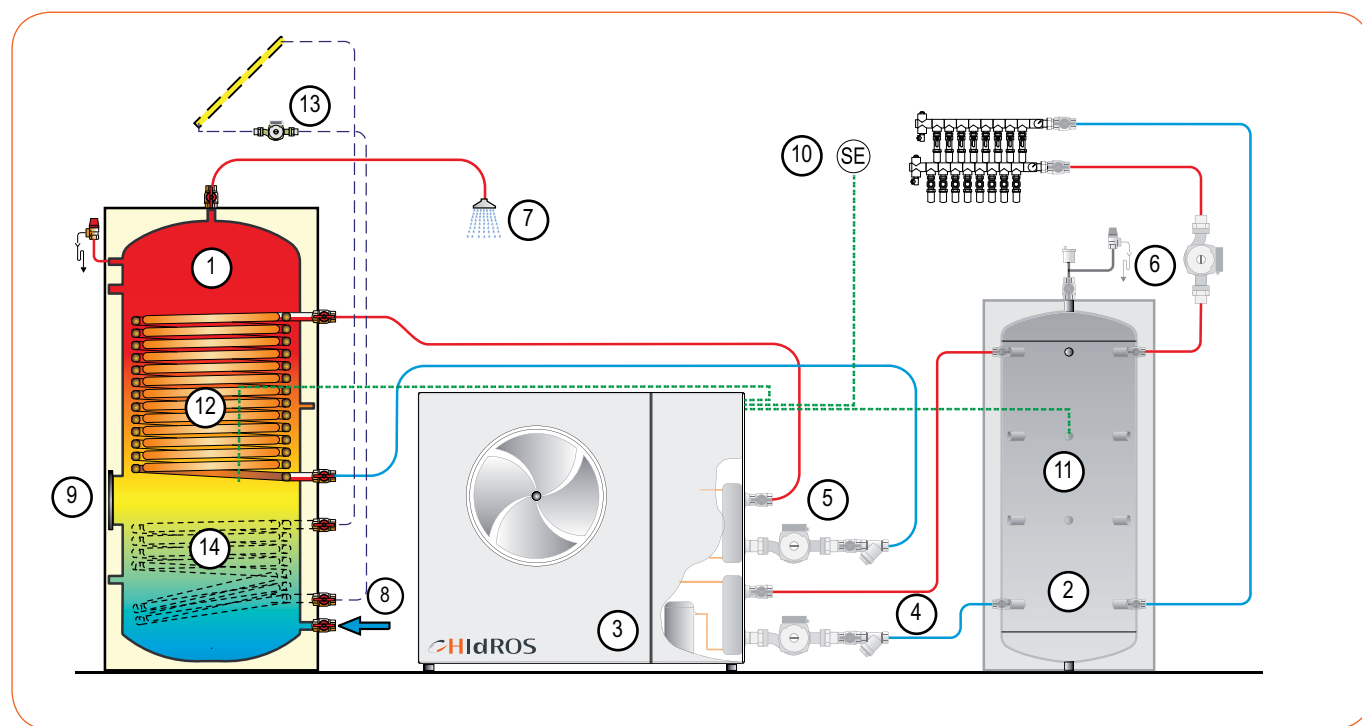
### VERSIONS AND ACCESSORIES

- **TW:** Domestic hot water cylinder.
- **TWS:** Domestic hot water cylinder + solar coil.
- 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.
- Threaded connections (n° 4) diameter 1<sup>1/4"</sup>.
- Threaded connections (n° 3) diameter 1<sup>1/2"</sup>.

## TW - TWS



TW - TWS

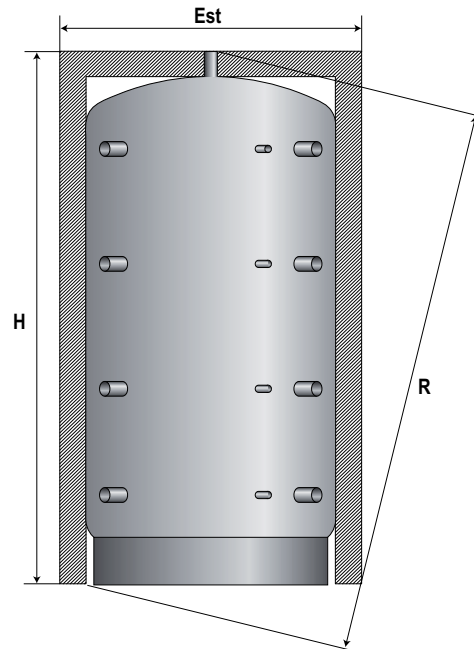
1	Domestic hot water cylinder TW/TWS	8	Cold water inlet
2	Buffer tank TF	9	Back up heater flange
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied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

Model TW - TWS			300	400	500	600	800	1000
Thermal insulation	mm		50	50	50	50	100	100
Coefficient of 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)	m²		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		400	400	400	400	400	400
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)	m²		-	-	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		-	-	400	400	400	400
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.

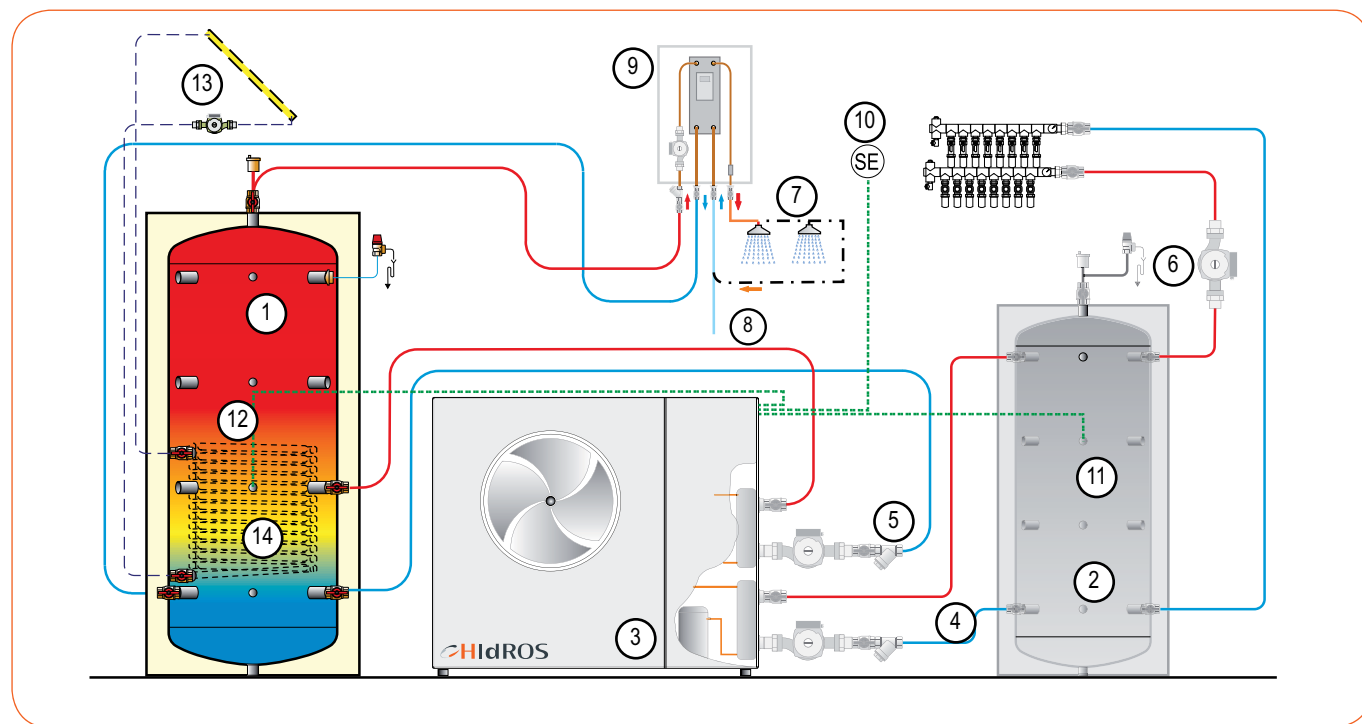
#### VERSIONS AND ACCESSORIES

- **TP:** Hot water storage tank.
- **TPS:** Hot water storage tank + solar coil.
- 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.
- Threaded connections (n° 8) diameter 1 1/2" (mod. 800 to 2000); 2" (mod. 2500 to 5000).

## TP - TPS



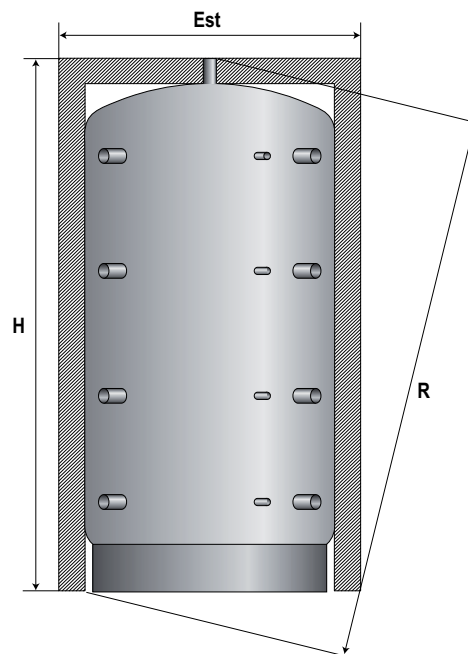
TP - TPS

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)

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 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)	m²	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



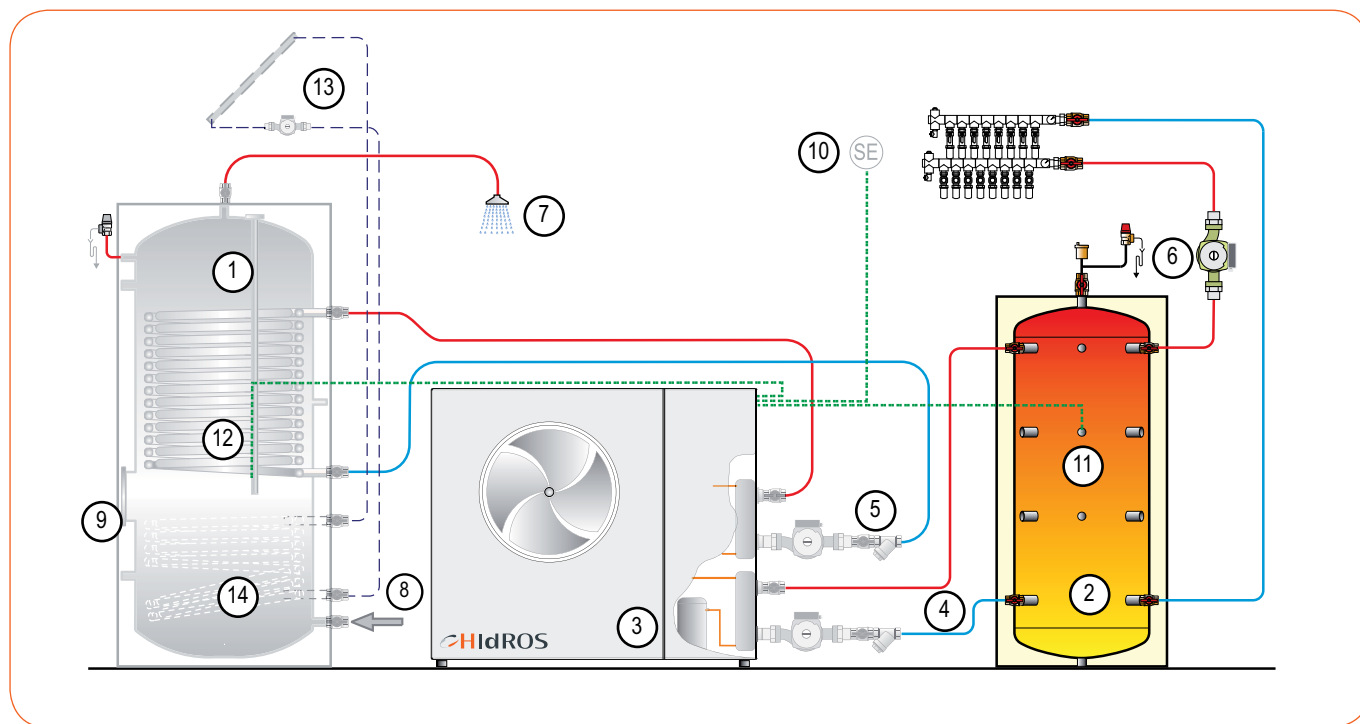
The TF series of hot & cold water storage tanks are designed to provide buffer storage for the heating (cooling) system. They are thermally insulated with a flexible, removable, polyurethane cover (CFC free and self extinguishing). The tanks are supplied with 8 water connections and several probe pockets.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

#### VERSIONS AND ACCESSORIES

- TF hot and cold water storage tank.
- Back up electric heater.

#### PRODUCT SPECIFICATIONS

- Polyurethane 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
- Threaded connections (n° 8) diameter 1<sup>1/2</sup>" (mod. 100 to 2000); 2" (mod.2500 to 5000).
- 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)

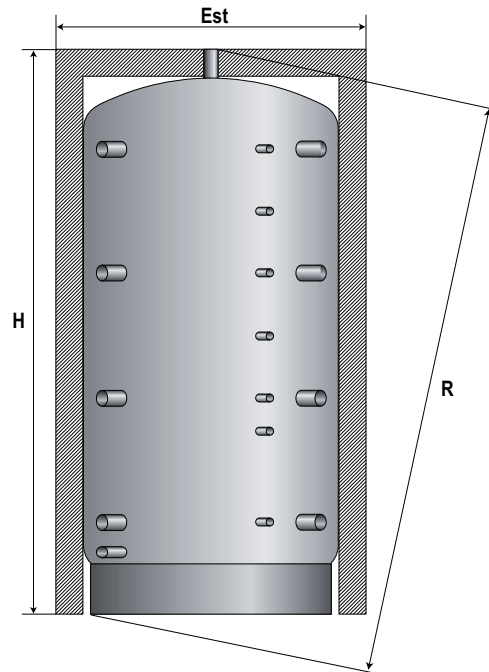
Model TF		100	200	300	500	800	1000	1500	2000	3000	5000
Thermal insulation	mm	50	50	50	50	110	110	110	110	110	110
Coefficient of conductivity	W/mK	0,023	0,023	0,023	0,023	0,040	0,040	0,040	0,040	0,040	0,040
Maximum working pressure	bar	4	4	4	4	4	4	4	4	4	4
Maximum working temperature	°C	95	95	95	95	95	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.

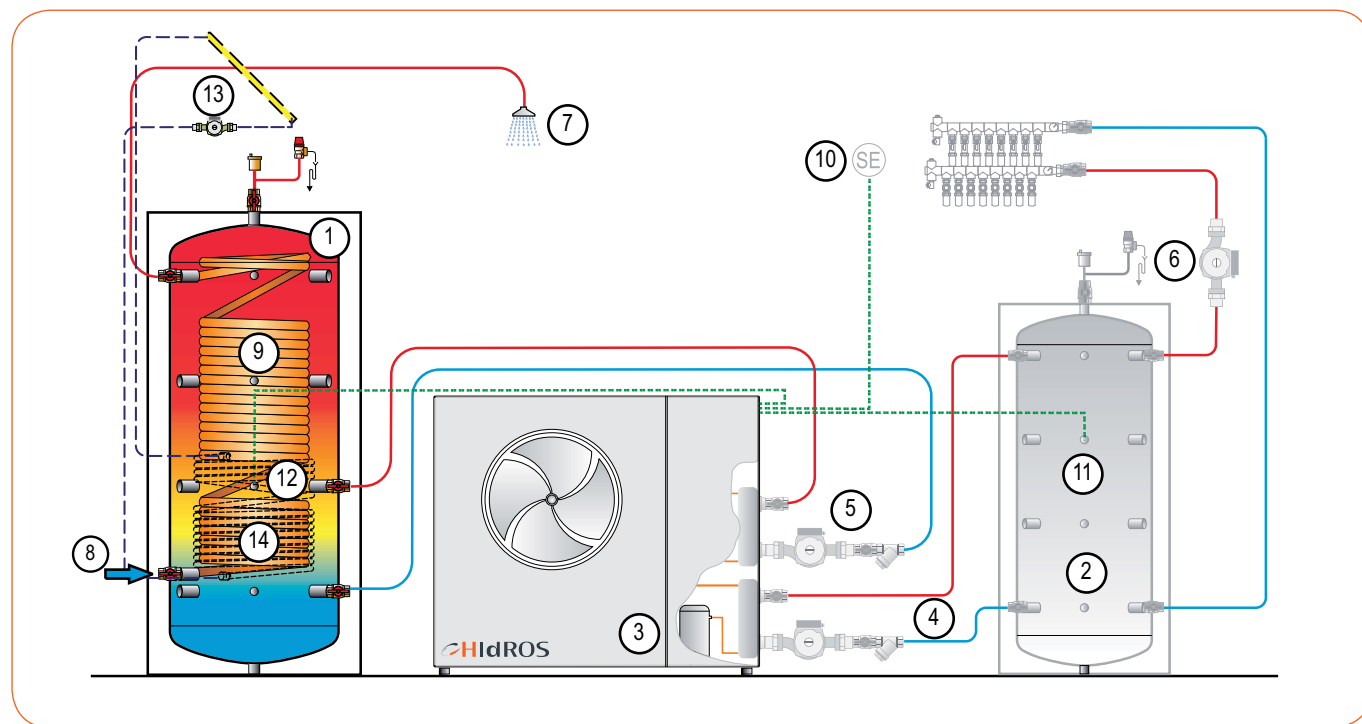
#### VERSIONS AND ACCESSORIES

- **TH:** Domestic hot water generators.
- **THS:** Hot water storage tank + solar coil.
- 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.
- Threaded connections (n° 8) diameter 1<sup>1/2</sup>".

## TH - THS



TH - THS

1	Domestic hot water generator TH
2	Buffer tank TF
3	Heat pump
4	Primary circuit pump (Heating and cooling)
5	Domestic hot water pump
6	Underfloor system water pump
7	Domestic hot water outlet

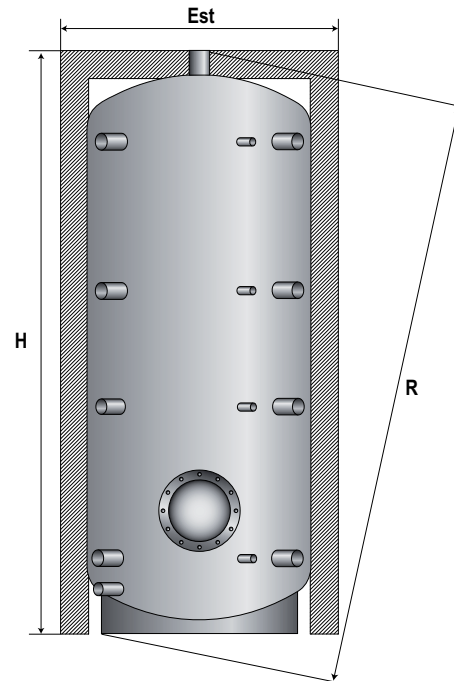
8	Cold water inlet
9	D.H.W. stainless steel heat exchanger
10	External sensor (Supplied with the heat pump)
11	Hot water sensor (Supplied with the heat pump)
12	D.H.W. sensor (Supplied with the heat pump)
13	Solar system
14	Solar coil (THS versions only)

Model TH - THS		650	800	1000	1500	2000
Thermal insulation with rigid polyurethane foam	mm	70	100	100	100	70
Coefficient of 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 <sup>2</sup>	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 <sup>2</sup>	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	1200	1300
Total height	H	mm	1735	1730	2080	2135
Diagonal length	R	mm	1780	1790	2130	2210
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 results 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.
- 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.
- Threaded connections (n° 4) diameter 1<sup>1/4</sup>".

## TA - TAS

TA - TASTA - TAS

TA - TAS

## PI

### Domestic hot water heat stations



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.

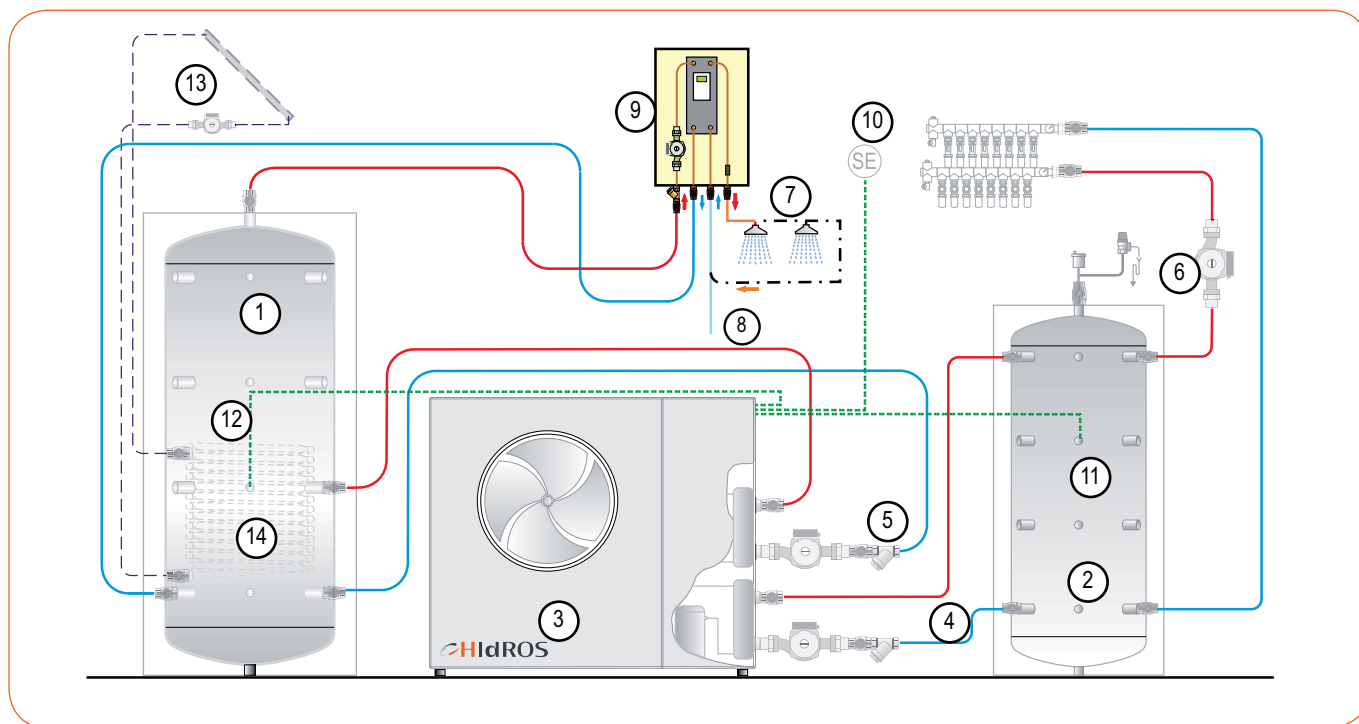
These devices enable the production of domestic hot water with minimal FORMATION OF LIMESTONE due to the very small amount of water present in the secondary water circuit.

#### 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).



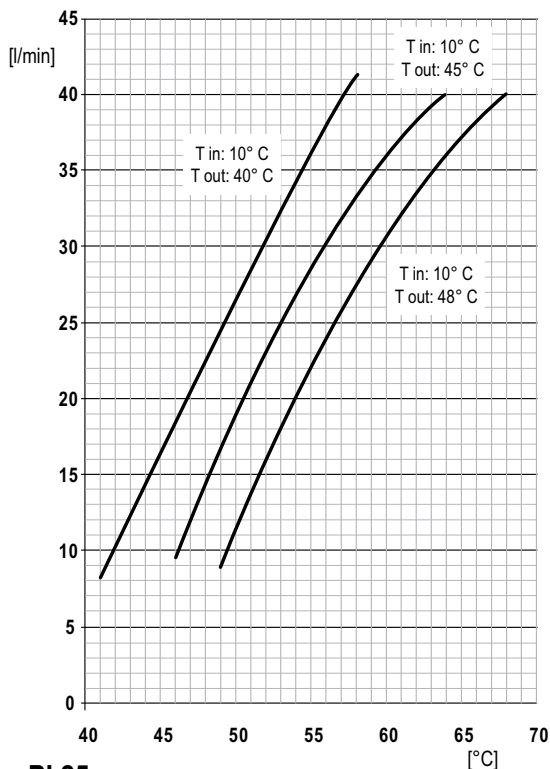
1	Hot water storage tanks TP/TPS
2	Buffer tank TF
3	Heat pump
4	Primary circuit pump (Heating and cooling)
5	Domestic hot water pump
6	Underfloor system water pump
7	Domestic hot water outlet

8	Cold water inlet
9	Domestic hot water station
10	External sensor (Supplied with the heat pump)
11	Hot water sensor (Supplied with the heat pump)
12	D.H.W. sensor (Supplied with the heat pump)
13	Solar system
14	Solar coil (TPS versions 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

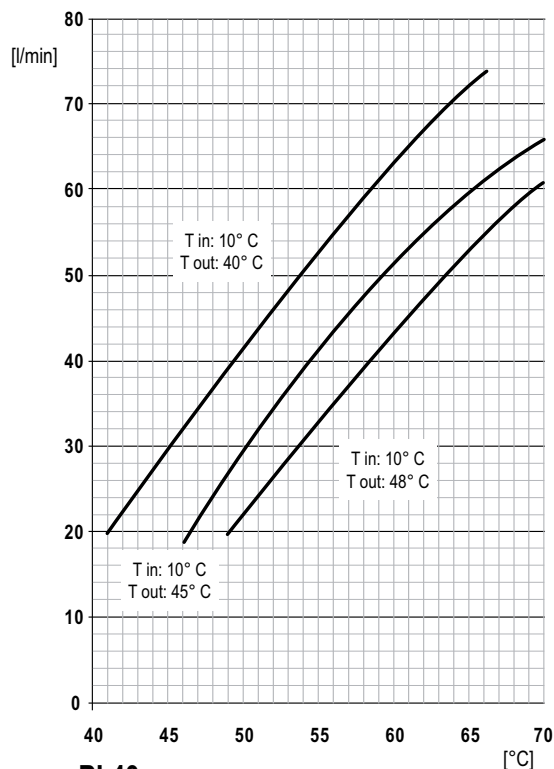


### D.H.W. SUPPLY FLOW RATE



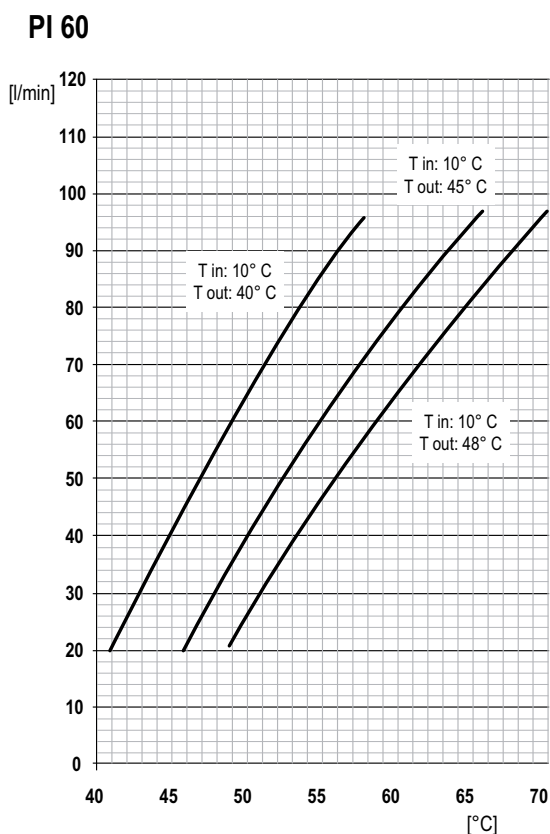
PI 25

Primary input temperature



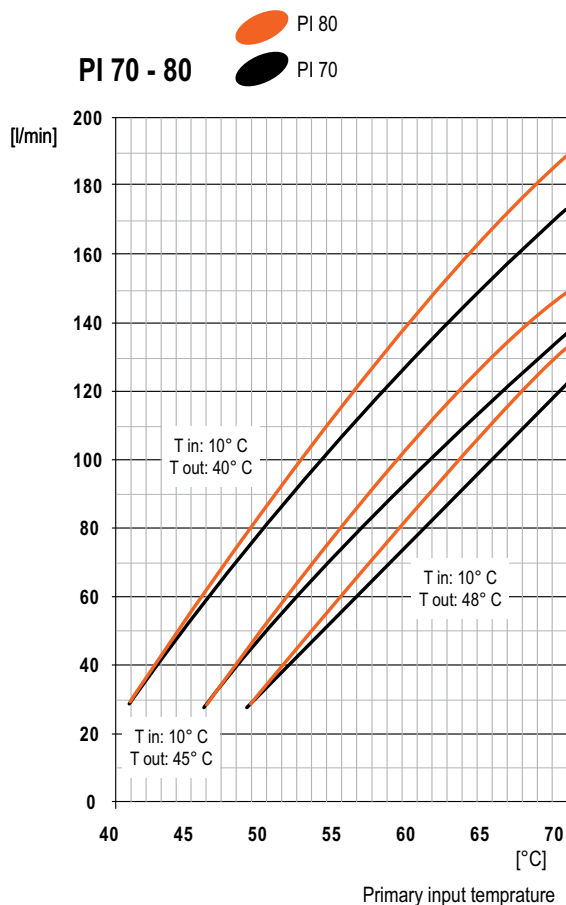
PI 40

Primary input temperature



PI 60

Primary input temperature

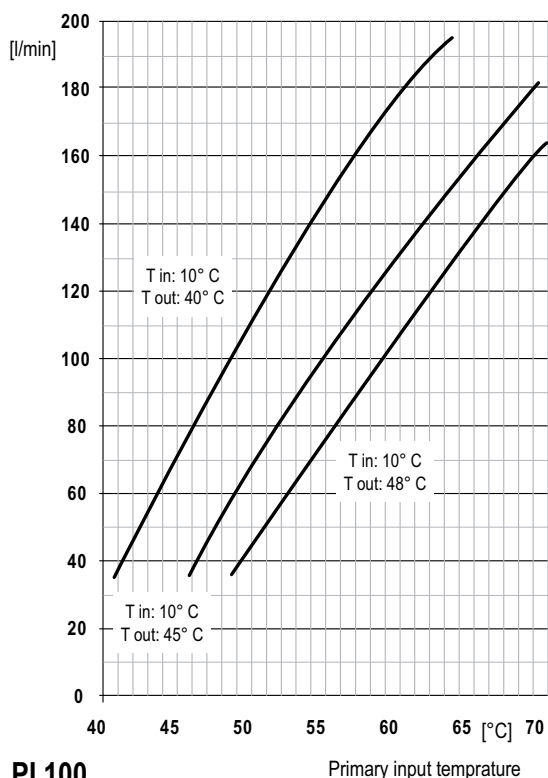


PI 70 - 80

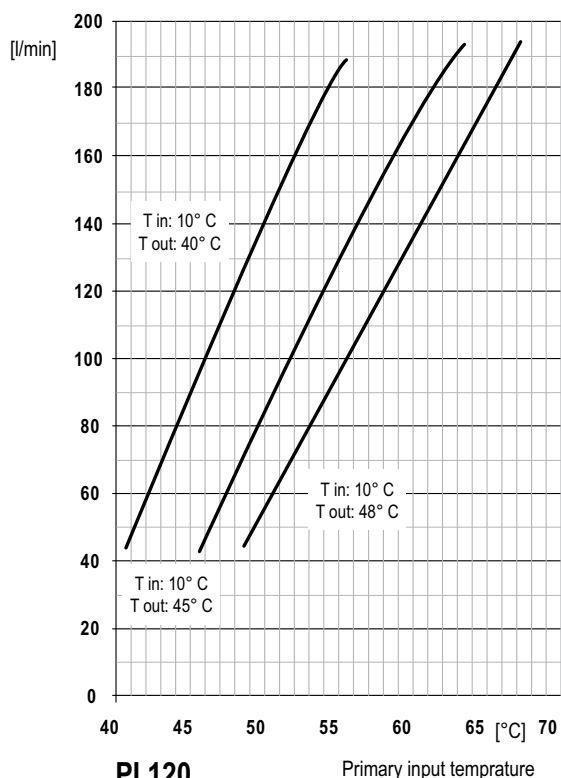
Primary input temperature

PI 80  
PI 70

## D.H.W. SUPPLY FLOW RATE



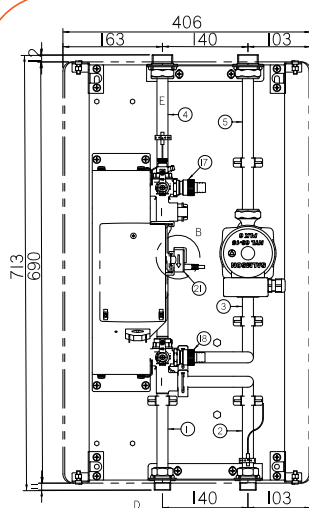
PI 100



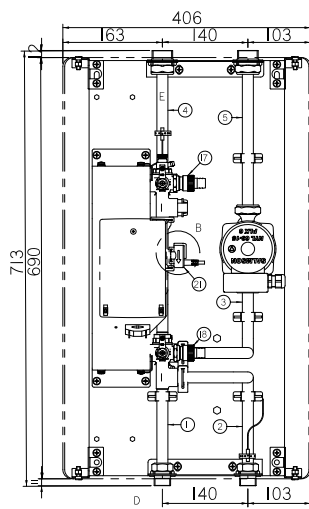
PI 120

- |   |  |
|---|--|
| 1 | Electronic driven water pump (primary circuit) |
| 2 | Temperature sensor (PT1000)                    |
| 3 | Microprocessor control                         |
| 4 | Electric enclosure                             |
| 5 | Plate heat exchanger AISI 316                  |
| 6 | Supply primary water circuit                   |
| 7 | Return primary water circuit                   |

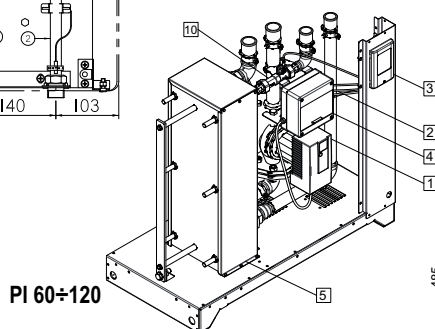
- |    |                           |
|----|---------------------------|
| 8  | Cold water inlet          |
| 9  | Domestic hot water outlet |
| 10 | Flowmeter                 |
| 11 |                           |
| 12 |                           |
| 13 |                           |
| 14 |                           |



PI 25



PI 40



PI 60÷120

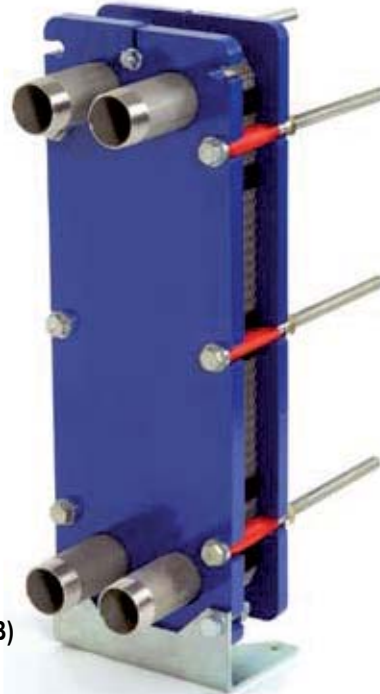
## SCP

### 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.
- Treaded water connections.
- Primary circuit water flows from 1500 l/h to 2800 l/h.



## 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.

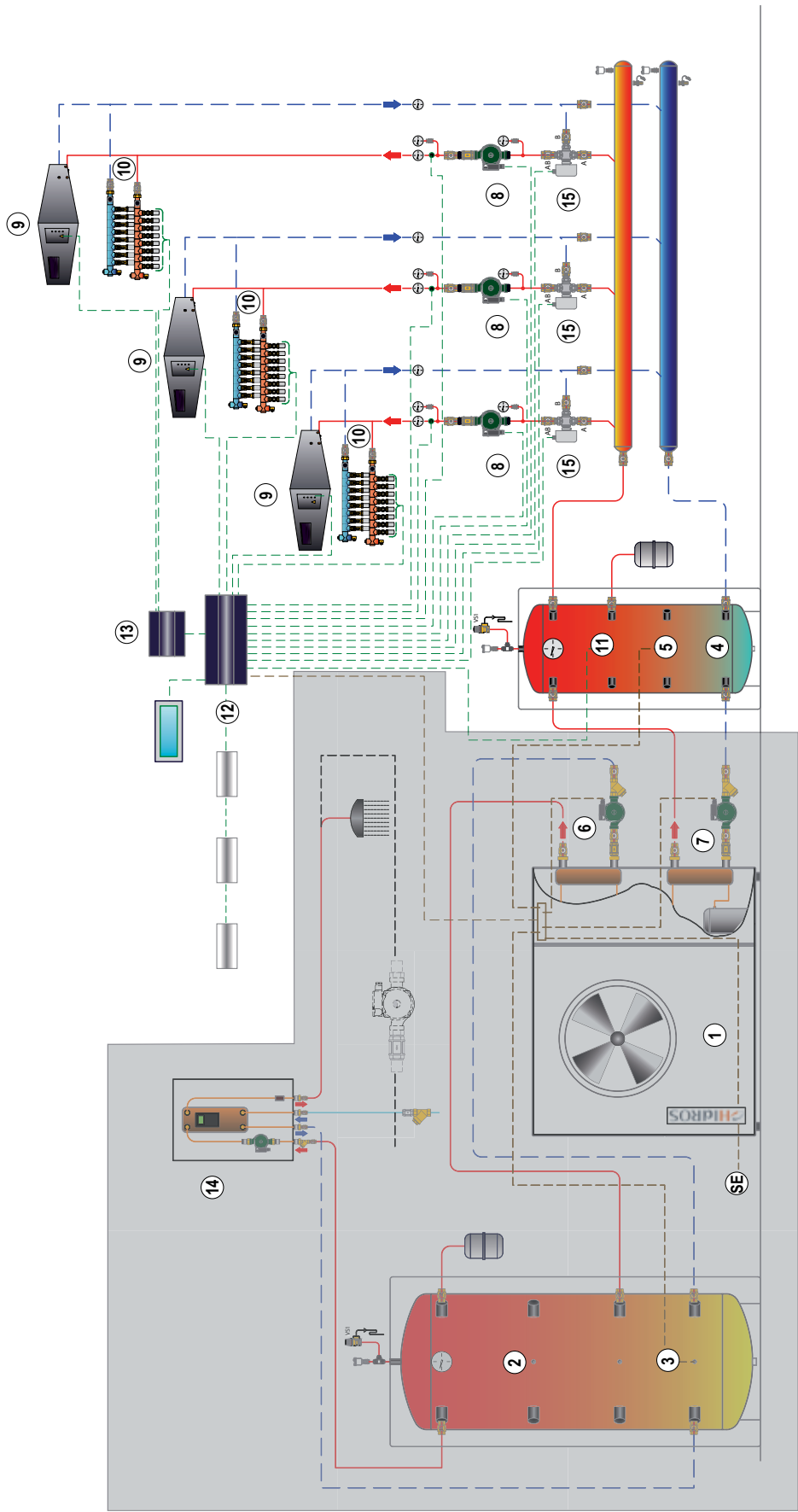
Mod-BUS protocol also enables integration of the system with other home automation products.

#### 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 LZT(LZA)/SW6 version, with DHW circuit priority, equipped with weather -compensated ambient sensor. The **managment 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 mixing valves 0-10V, 3 dehumidifiers, 3 water pumps, boiler, water chiller and heat pump.**

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.



### RBBB.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.



### RGAA.02 EXPANSION MODULE

- Expansion module designed to manage: 6 additional temperature and humidity sensors, 1 additional dehumidifier.
- Power supply 24 V.



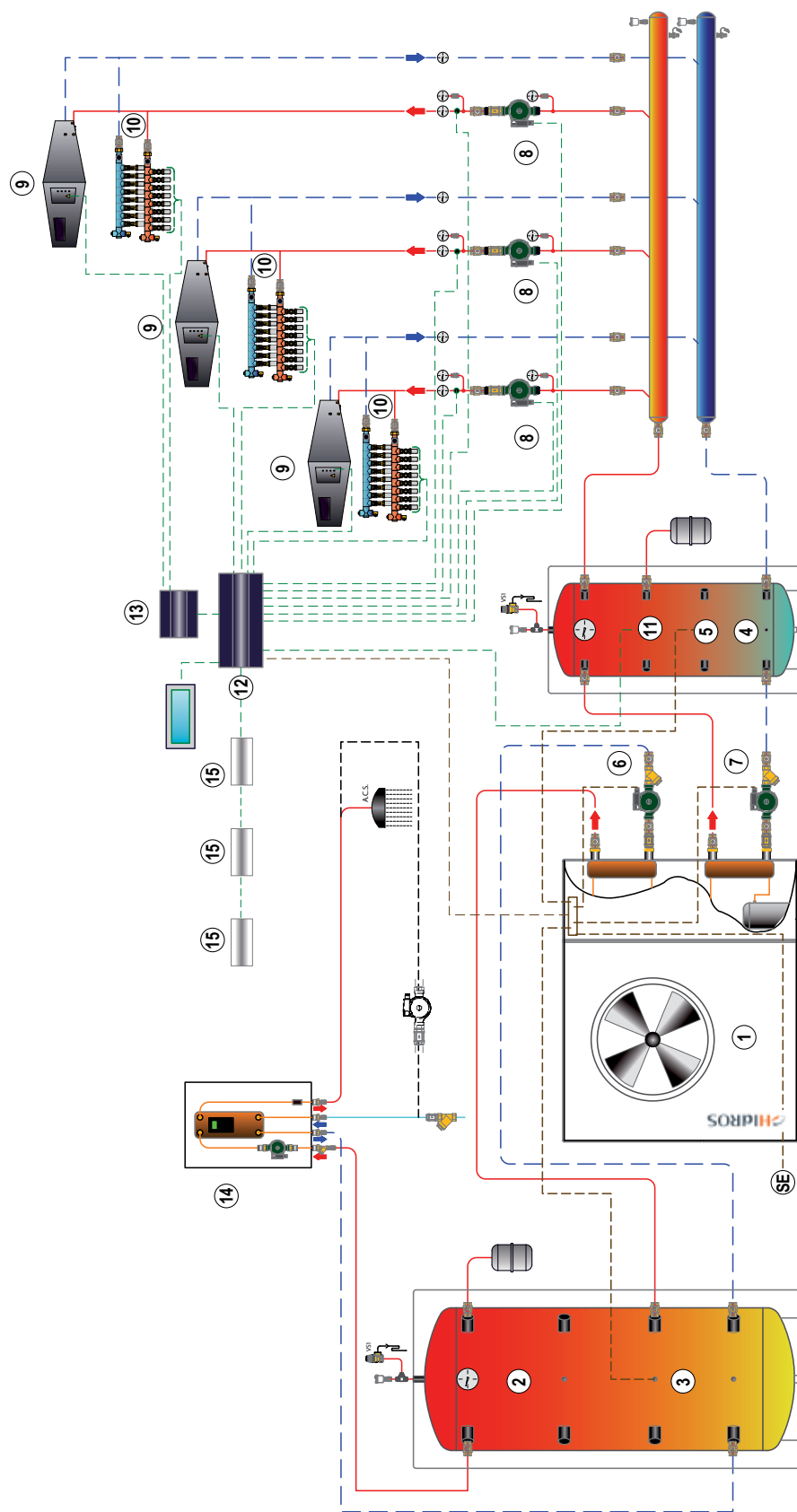
### RGDD.01 TEMPERATURE AND HUMIDITY SENSOR

- 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

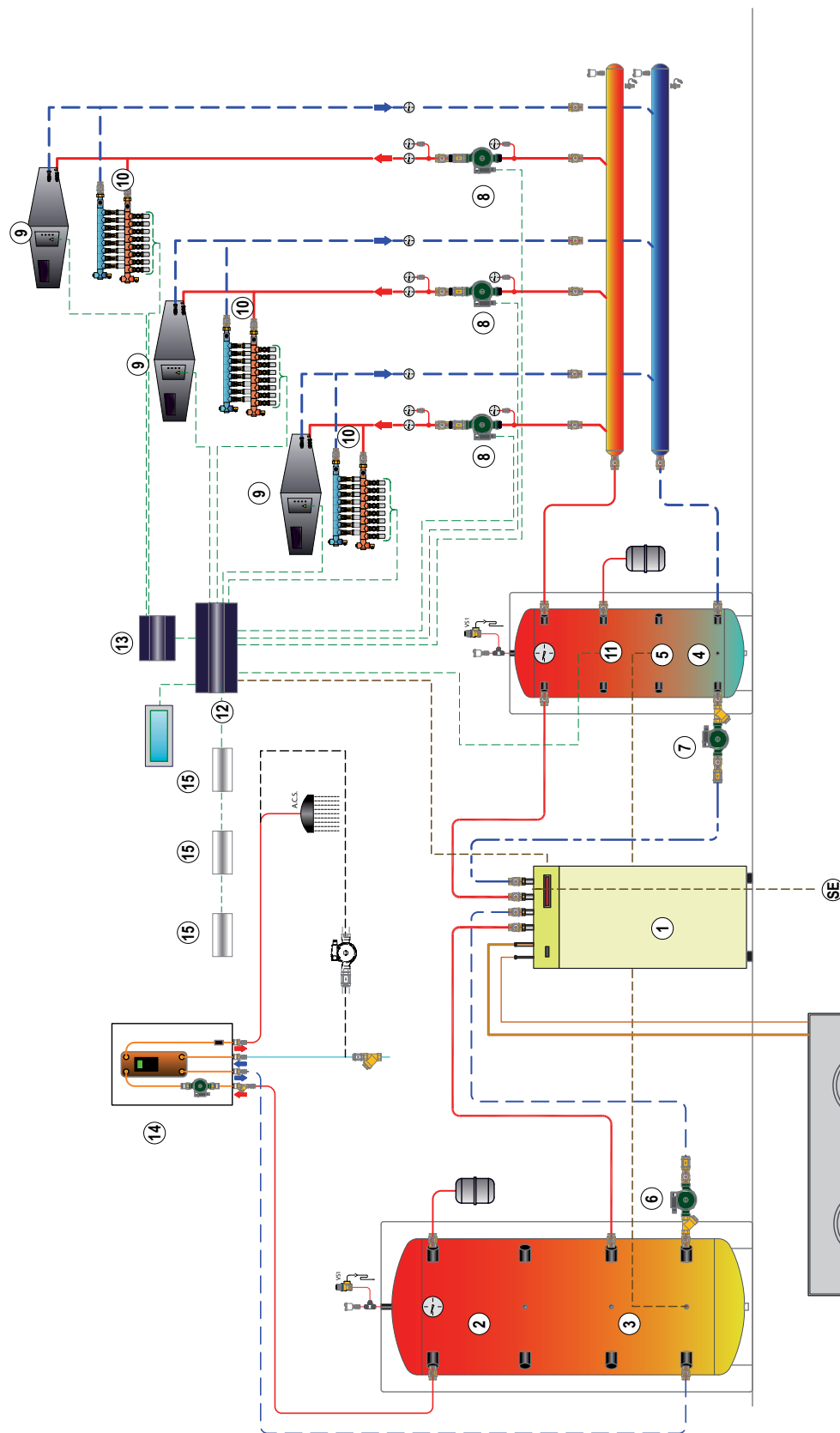
- WEB SERVER for supervision of the parameters;
- Power supply: 230 V AC +/- 10%;
- Internal memory 48 MB;
- Communication protocol modBUS-RTU;
- Output: LAN: x1 - USB: x 2;
- Alarm relays: RS485 x 2, system x 1;
- Ports: RS232 for external modem - RS485 digital input;
- Internal modem: Optional (analogue 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 **LZT(LZA)/SW6 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/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.

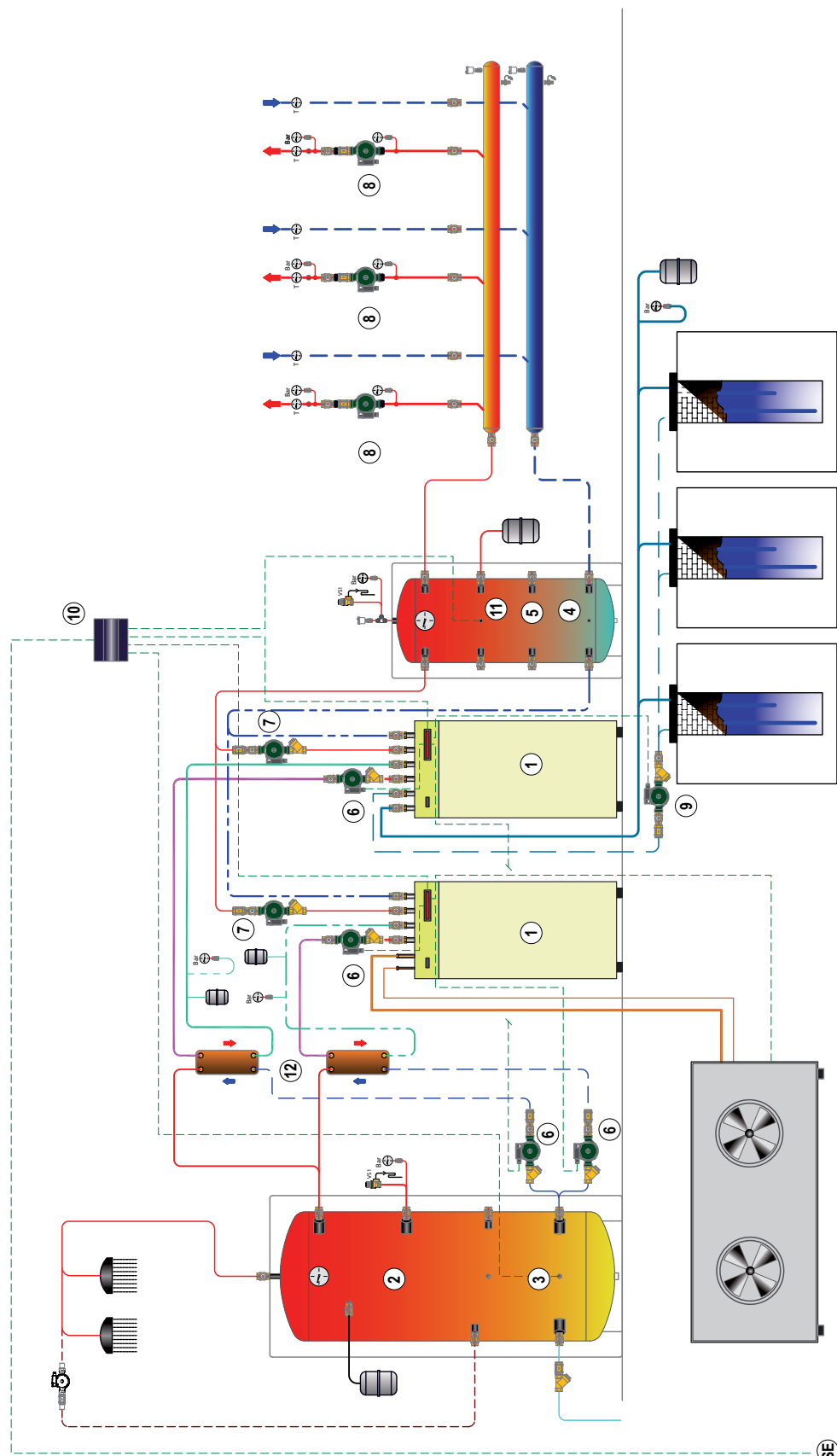
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Expansion Module
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	Heat Station
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	Temperature Sensor



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.

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



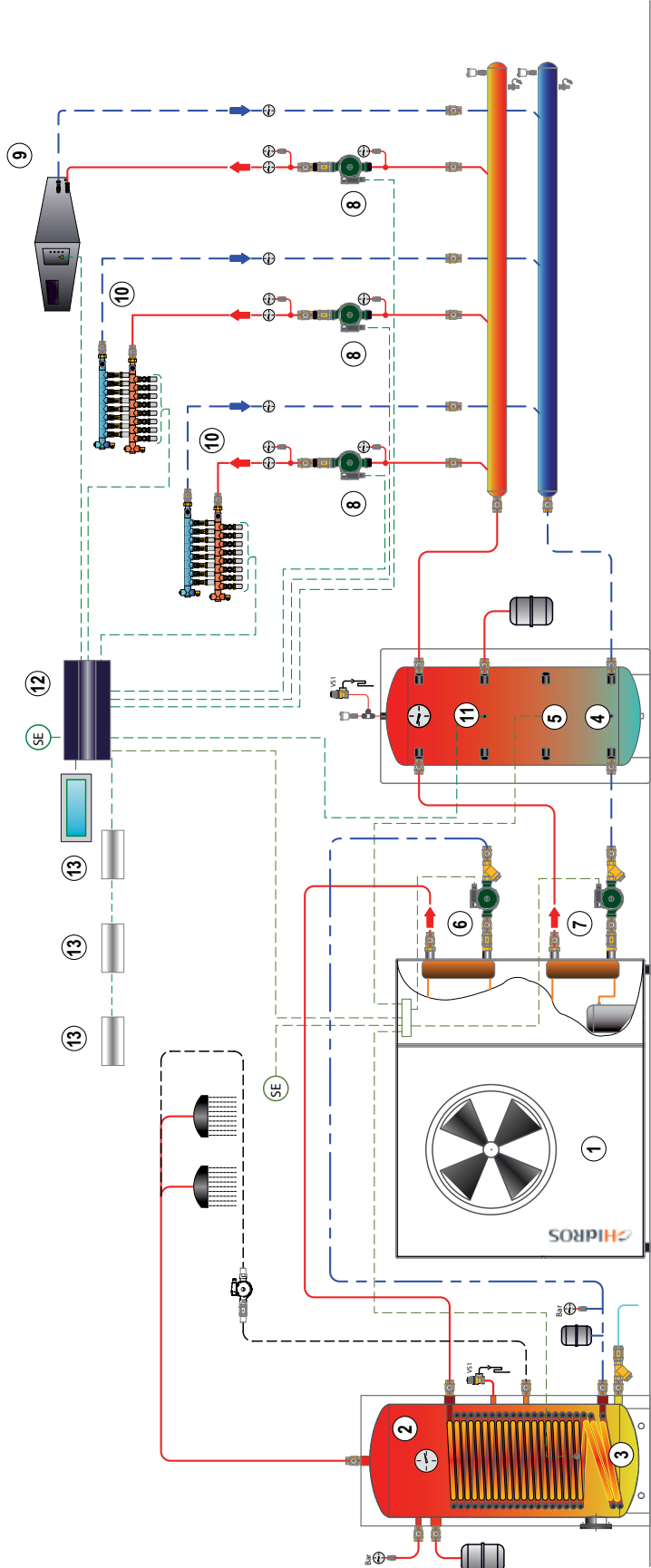
Installation of a heat pump system that is composed of a split type air to water heat pump **WZT/SW6** and a ground source heat pump **WZH/SW6**. They are managed in cascade. The system is equipped with a weather-compensated ambient sensor able to manage both units.

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.

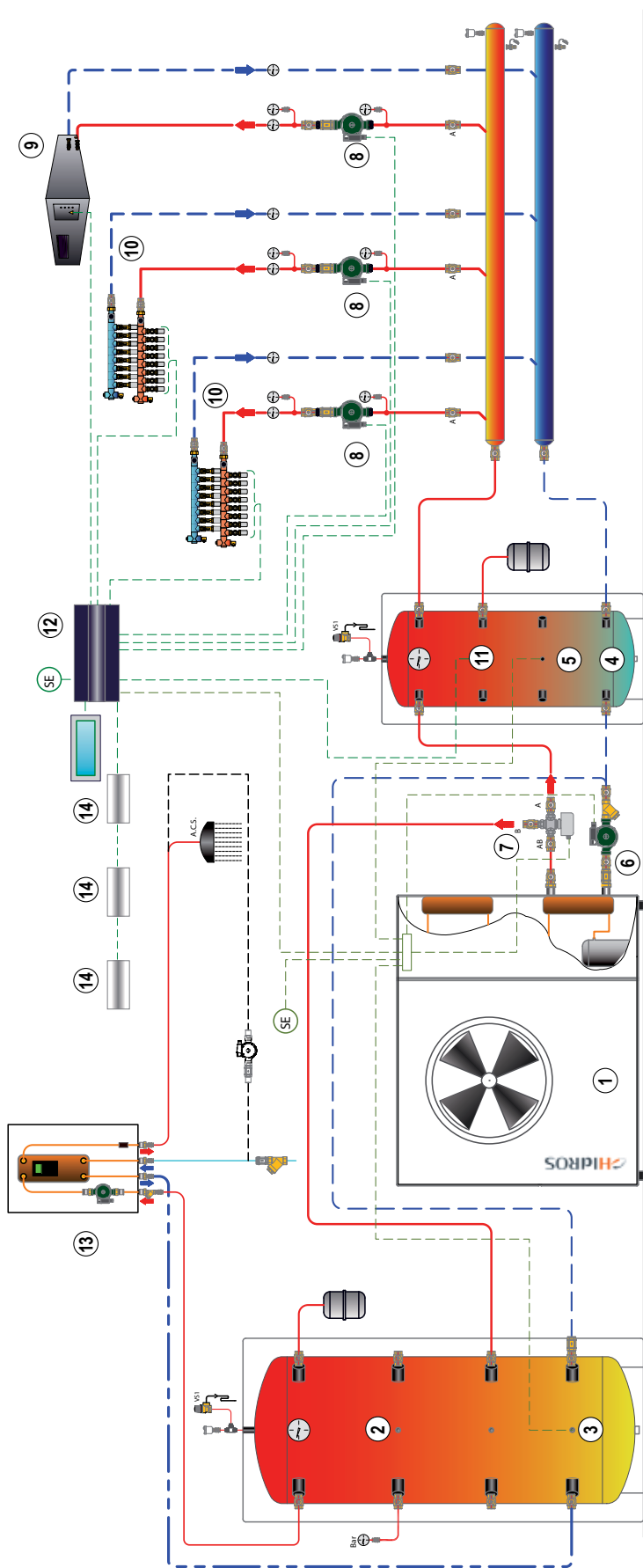
The supervision of the system is made by a cascade controller with Modbus protocol.

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 **LZT(LZA)/SW6**. 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/GHEWZ** 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.

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	



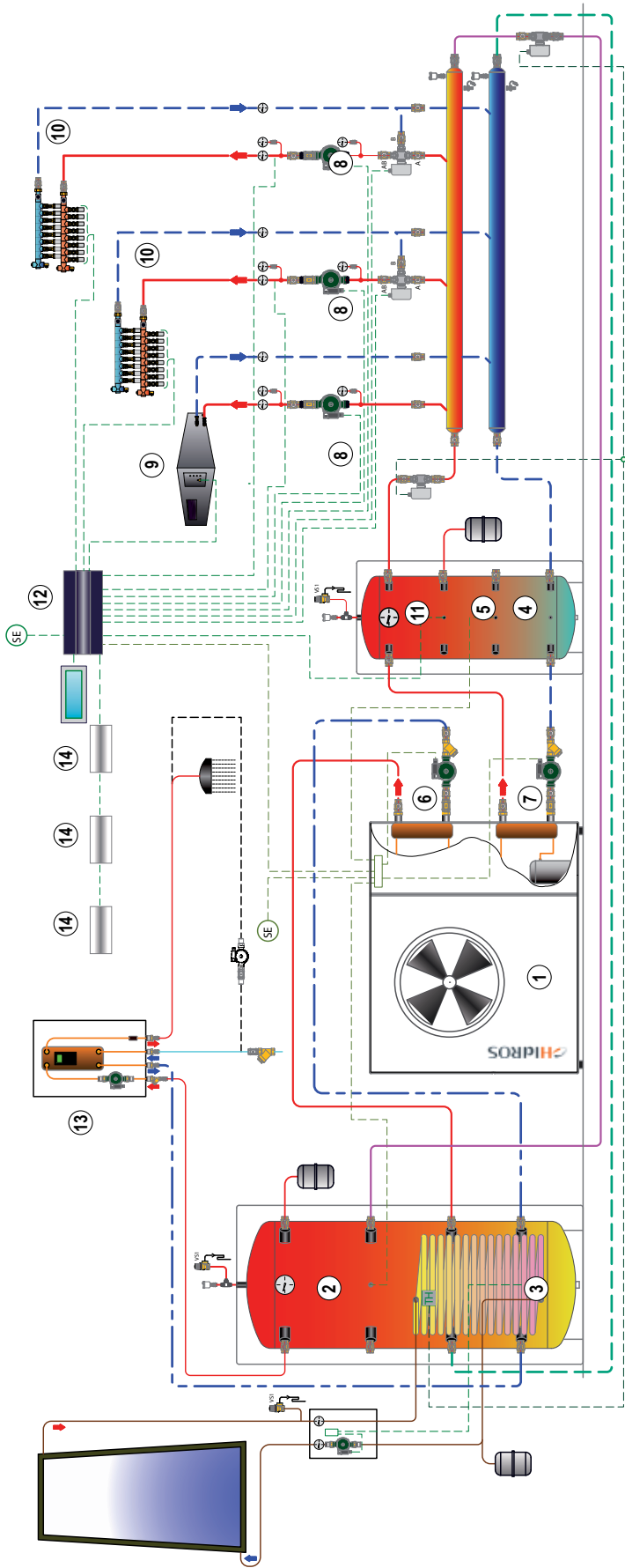
Installation of an air to water heat pump system using a **LZT(LZA)**. The system is equipped with weather-compensated ambient sensor. The Domestic hot water is produced using a 3 way diverging valve ( controlled by the unit microprocessor), a **TP** hot water storage tank and a **PI** hot water station 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 **GHI/GHE/WZ** 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.

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	





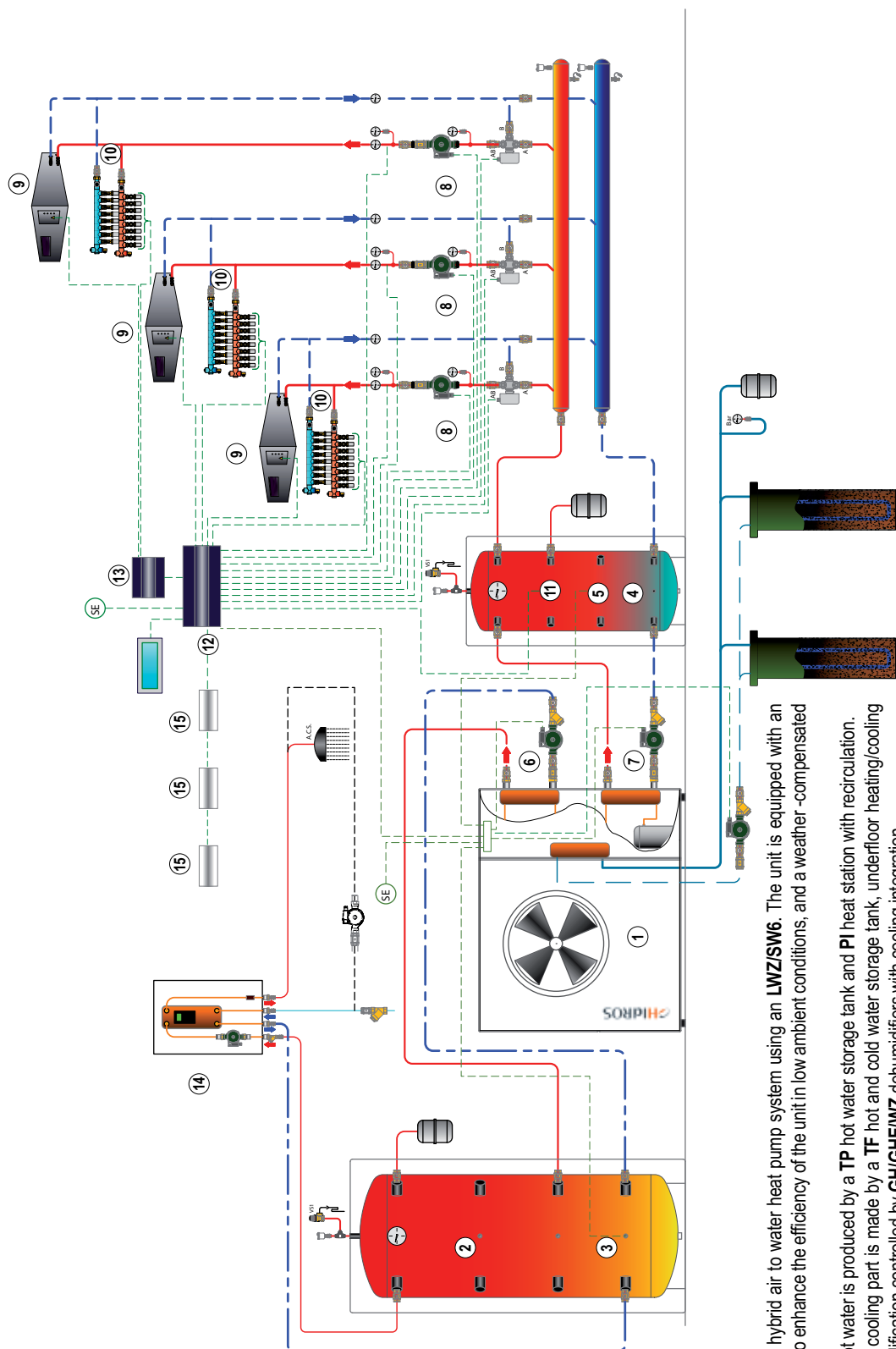
Installation of an air to water heat pump system using a **LZT(LZA)/SW6, 4 pipes version**. The system is equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a **TPS** hot water storage tank with solar coil and a **PI** hot water station with re-circulation. The 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/IGHEWZ** 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.

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/SW6**. 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 **GH/GHE/WZ** 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.

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

## FH - GH

### Dehumidifiers for radiant cooling systems



R134a

R407C

FH



GH



The dehumidifiers FH and GH series are high performance units, equipped with robust galvanised steel frame, properly designed to operate in combination with radiant cooling systems. The FH units have been designed for wall mounting installation while the GH series are suitable for false ceiling and ducted applications. All units are provided with air filter, stainless steel drip tray and built-in microprocessor control. The units are also provided, standard, with pre and post cooling coil to enhance the performances and to control the air supply temperature. FH and GH units, anyway, can operate even without pre and post cooling coils, this option could be very useful in middle seasons when it is necessary to dry but the air conditioning system is not in operation. All the units are fully assembled and wired in the factory, carefully evacuated and dried with after leak tests under pressure and they are charged with environmental friendly refrigerant gases. They are fully tested before shipment; the units are conform to European Directives and are individually marked with CE label and Conformity Declaration.

#### VERSIONS

- Version suitable for swimming pool installation: Supplied with painted frame and heat exchangers suitable for swimming pool
- **WZ version:** Units supplied with double condenser (the first is an air condenser, the second is a water one) and of a logic which allows the dehumidification with neutrum air or with cooled air.

#### ACCESSORIES

- **CTFH:** Galvanized steel template (only FH).
- **GRFH:** Wood return and supply grill (only FH).
- **HYGR:** Remote mechanical hygostat.
- **HYGR:** Remote mechanical hygostat + thermostat (WZ versions only).
- **PMBH:** Delivery and return plenum 90°.
- **SWPK:** Painted frame + heat exchangers suitable for swimming pool.
- **PRPO:** without pre and post cooling waters coils.

## FH - GH

FH - FHWZ Models		25	25WZ
Moisture removed <sup>(1)</sup>	l/24h	20,1	20,1
Cooling capacity <sup>(1)</sup>	W	---	1250
Total power input <sup>(1)</sup>	W	360	360
Max power input	W	440	440
Max input current	A	2,7	2,7
Peak current	A	18,1	18,1
Air flow	m³/h	250	250
Refrigerant		R134a	R134a
Hydraulic circuit	l/h	150	150
	kPa	8	7,8
Sound pressure <sup>(3)</sup>	dB(A)	37	37
Temperature operating range	°C	15-35	15-35
Campo di lavoro umidità	%	40-99	40-99
Weight	Kg	45	38
Power supply	V/Ph/Hz	230/1/50	230/1/50

GH - GHWZ Models		25	25WZ	50	50WZ	100	100WZ	200	200WZ
Moisture removed <sup>(1)</sup>	l/24h	20,1	20,1	48,5	48,5	87,2	87,2	164,0	164,0
Cooling capacity <sup>(1)</sup>	W	---	1250	---	3500	---	6000	---	11300
Total power input <sup>(1)</sup>	W	340	340	700	700	1450	1450	2450	2450
Max power input	W	420	420	830	830	1690	1690	2890	2890
Max input current	A	2,7	2,7	5,0	5,0	8,1	8,1	14,4	14,4
Peak current	A	18,1	18,1	20,7	20,7	35,9	35,9	63,0	63,0
Hydraulic circuit	l/h	150	150	500	500	600	600	900	900
	kPa	8,0	7,8	17,0	42,0	32,0	39,5	48,0	64,0
Air flow	m³/h	250	250	600	600	1000	1000	1850	1850
Available static pressure (max. speed)	Pa	43	43	60	60	75	75	120	120
Refrigerant		R134a	R134a	R407C	R407C	R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	37	37	42	42	49	49	56	56
Temperature operating range	°C	15-35	15-35	15-35	15-35	15-35	15-35	15-35	15-35
Campo di lavoro umidità	%	40-99	40-99	40-99	40-99	40-99	40-99	40-99	40-99
Weight	Kg	35	37	52	55	87	90	115	120
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Performance refer to the following conditions:

(1) Room temperature 26°C; relative humidity 65% with cold water coil water inlet temp. 15°C.

(2) Room temperature 35°C; relative humidity 80%.

(3) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614, minimum fan speed.(Only for FH versions)

## FH - GH

### FRAME

All units FH-GH series are made from hot-galvanised thick sheet metal, to ensure the best resistance against the corruptions. The frame is self-supporting with removable panels. The drip tray is present standard in all units and is made of plastic material for model 25 and in metal material for models 50-100-200.

### REFRIGERANT CIRCUIT

The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in these units is R134a for the model 25 and R407C for the models 50-100-200. The refrigerant circuit includes: filter drier, capillary expansion device, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor (for model 25) is alternative or rotative type (for models 50-100-200), equipped with crankcase heater and thermal overload protection by a klaxon embedded in the motor winding. It's mounted on rubber vibration dampers to reduce the noise.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe. In all units WZ besides these exchangers, there is a third stainless steel INOX AISI 316 plate exchanger used as condenser in cooling modality.

### PRE AND POST WATER COOLING COILS

The pre and post cold water coils are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm.

The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The pre-cooling coil is used to increase the dehumidification capacity of the unit, while the post-cooling coil is used to keep the outlet air temperature at the same inlet value. In WZ version only the pre cooled water coil is present.

### FAN

The supply fan is centrifugal type, double inlet with forwards blades, dynamically and statically balanced and directly connected to a 3 speed fan motor.

### AIR FILTER

For the model GH 25-50 it's supplied standard with the unit and it's built in nylon. It can be removed for differential disposal, class G2, according to EN 779:2002.

Regarding the model GH 100-GH 200 instead, it's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002

### MICROPROCESSOR

All units FH-GH are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit. Ready for the connection to the power and to the consensus control, The terminal board is also supplied with voltage free contacts for remote ON-OFF. The terminal block is also built with a clean contact to allow the operation of single-mode ventilation, while the second for the cooling version (WZ). By closing the first contact, only the fan is able to work, while the dehumidification is disabled.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and

controls its termination (only for GH100-100WZ and GH200-200WZ). Water temperature sensor, that signals to the microprocessor the eventual overcome of the hot water temperature set point in the pre and post water coils during operation. In this condition the compressor is disconnected while the fan always runs and, when the water temperature returns within the operation limits, restarts the compressor. The water sensor stops the compressor when the water temperature is above 35°C. The eventual use of the dehumidifier as heating device during winter season requires an additional remote thermostat with seasonal change over (not supplied). In the all WZ version, it's also supplied a high pressure switch which disables the unit operation when the limit is overcome.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with ecologic refrigerant. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

## FH - GH

FH - FHWZ Versions	Code	25	25WZ
Limit probe		●	●
High pressure switch		–	●
Galvanized steel template	CTFH	○	○
Wood return and supply grill	GRFH	○	○
Remote mechanical hygrostat	HYGR	○	–
Remote mechanical hygrostat + thermostat	HYGR	–	○
Painted frame + heat exchangers suitable for swimming pool	SWPK	○	○

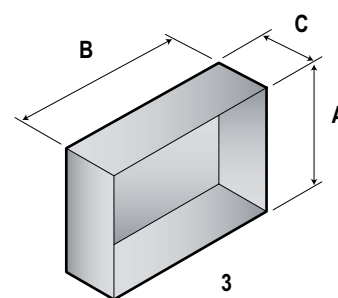
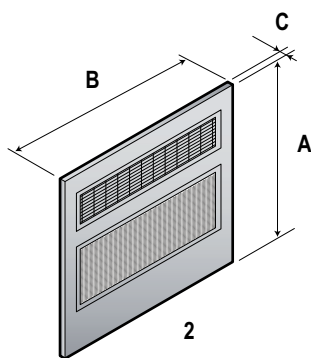
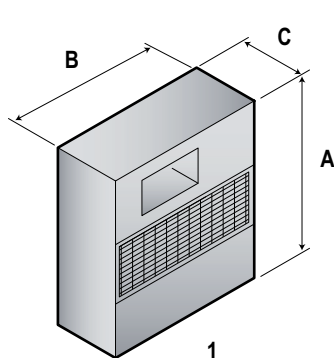
● Standard, ○ Optional, – Not available.

GH - GHWZ Versions	Code	25	25WZ	50	50WZ	100	100WZ	200	200WZ
Limit probe		●	●	●	●	●	●	●	●
High pressure switch		–	●	–	●	–	●	–	●
Defrost thermostat		–	–	–	–	●	●	●	●
Remote mechanical hygrostat	HYGR	○	–	○	–	○	–	○	–
Painted frame + heat exchangers suitable for swimming pool	SWPK	○	○	○	○	○	○	○	○
Units supplied without pre and post cooling waters coils	PRPO	–	–	–	–	○	–	○	–
Remote mechanical hygrostat + thermostat	HYGR	–	○	–	○	–	○	–	○
Delivery and return plenum 90°	PMBH	○	○	○	○	–	–	–	–

● Standard, ○ Optional, – Not available.

FH - GH

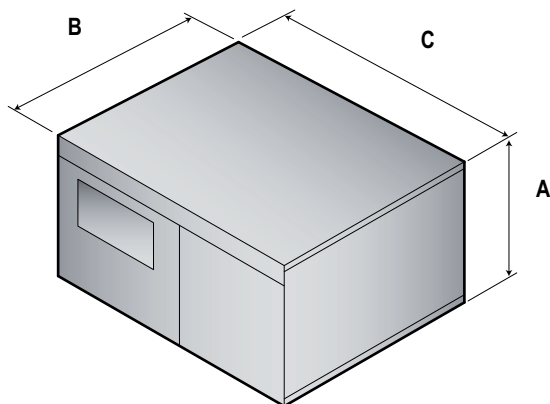
## FH



Mod.	A (mm)	B (mm)	C (mm)
1	680	545	221
2	750	660	20
3	703	605	228



## FH - GH



Mod.	A (mm)	B (mm)	C (mm)
25	250	580	580
50	350	580	580
100	398	750	795
200	398	890	930
25WZ	250	580	580
50WZ	350	580	580
100WZ	398	750	795
200WZ	398	890	930

FH - GH

### REFRIGERANT CIRCUIT STANDARD VERSION

The functioning of the dehumidifier model FH-GH is as follows: the fan takes the air from the ambient (7) and it's made go through the filter (1) and the pre-cooling water coil (2) where it's cooled and brought to a condition closed to saturation. Now it passes through the evaporating coil (3) where it's fatherly cooled and dehumidified. The air passes now through the condensing coil (5) where it's post heated (with a constant humidity) and in the post-cooling coil (6) where it's reported to the required conditions.

All the dehumidifiers model FH-GH can work without the help of the pre and post cooling coils. This function is very useful in case there is the request of dehumidification in middle-season or when the chiller is off. Obviously, if the unit works without the help of the cold water, the air in outlet will be hotter than the air in inlet.

### REFRIGERANT CIRCUIT WZ VERSION

The operation of the dehumidifier model GH is as follows: the fan takes the air from the ambient (7) and it's made go through the filter (1) and the pre-cooling water coil (2) where it's cooled and brought to a condition closed to saturation. Now it passes through the evaporating coil (3) where it's fatherly cooled and dehumidified. At this point there are two possible modalities:

#### Modality with neutrum air.

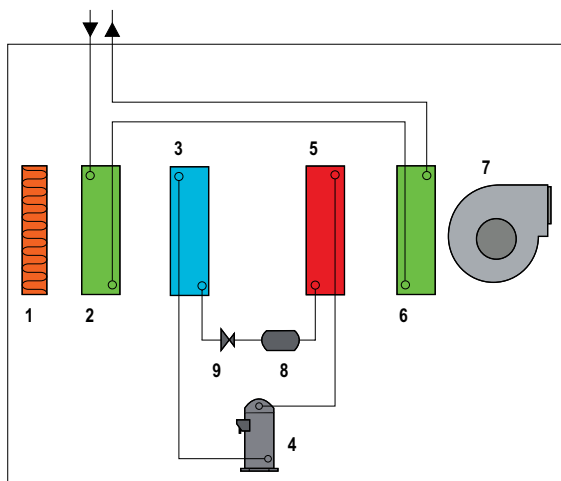
The air passes now through the condensing coil (5) which allows to condensate the 50% of the total gas, (the unit condensate the 50% on air with the heat exchanger (5) and the 50% in water with the heat exchanger (10)) then there is the post-heating so that to avoid to send air in the ambient in neutrum thermic conditions.

#### Modality with cooled air.

The unit condensates the 100% in water through the heat -exchanger (10). The air, then, go through the condenser (5) (disabled) where does not change its characteristics (temperature and humidity).

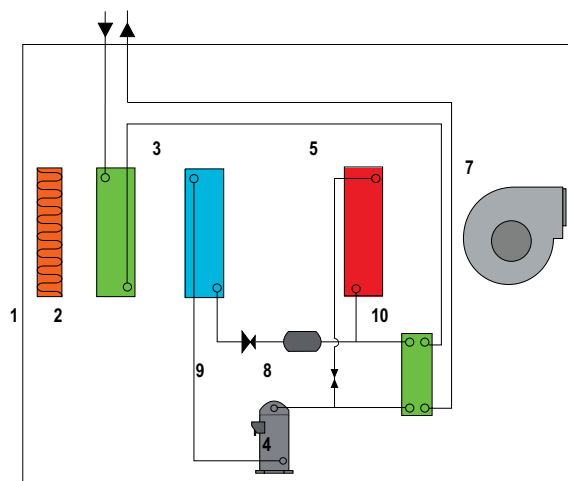
# FH - GH

## STANDARD VERSION



1	Air filter
2	Pre-cooling coil
3	Evaporator
4	Compressor
5	Condenser

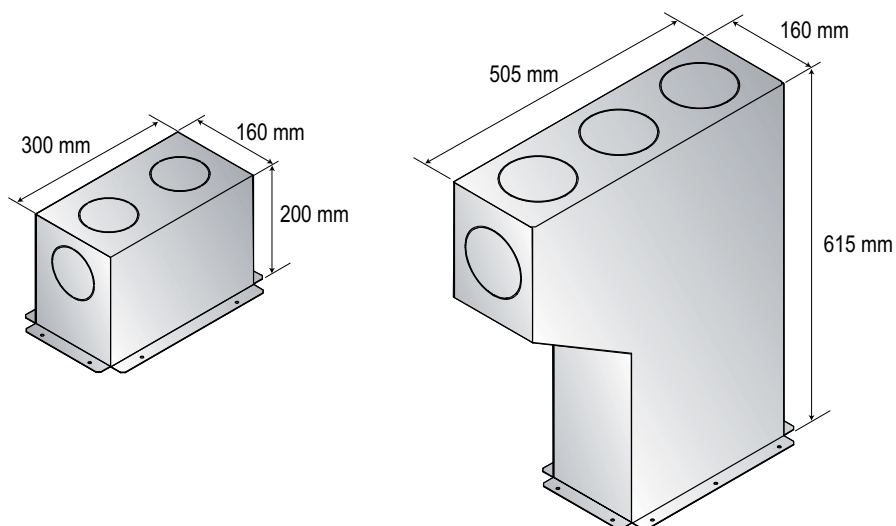
## WZ VERSION



6	Post-cooling coil
7	Fan
8	Dry filter
9	Expansion device
10	Condenser water

FH - GH

## DISCHARGE PLENUM MOD. 25 ÷ 50



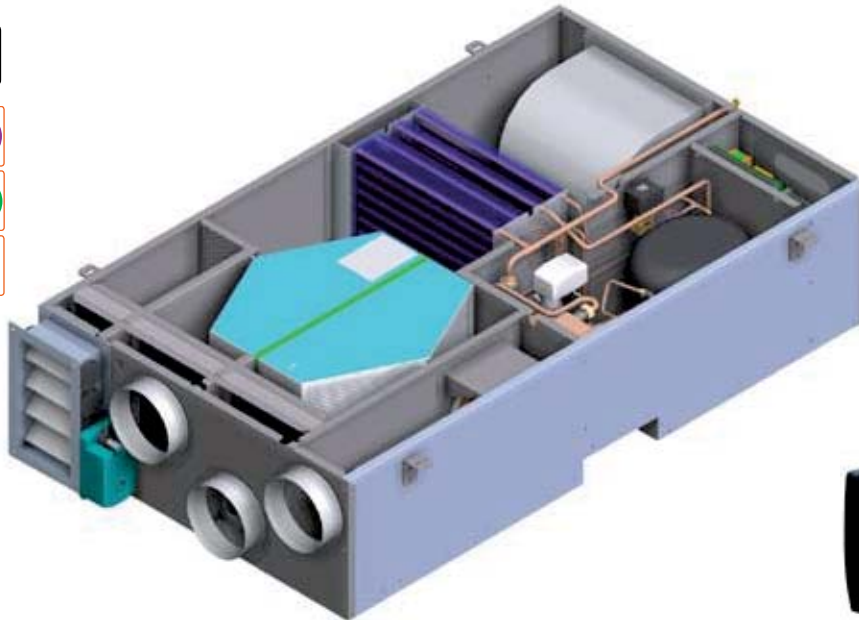
## GHE

Dehumidifiers for radiant cooling systems with heat recovery



R134a

R410A



Display

GHE

The dehumidifiers with heat recovery of high efficiency series GHE were designed to provide dehumidification and fresh air in a residential area with very high energy efficiency, combined with radiant cooling systems.

The units have been designed to grant the dehumidification either under conditions of thermally neutral air or in terms of air-cooled, managing small air flow thus avoiding annoying tiny air currents typical of traditional air conditioning systems.

The units consist of a direct expansion cooling system combined with a cross flow heat exchanger highly efficient, designed for heat recovery and air exchange environment in compliance with applicable regional and national laws.

### VERSIONS

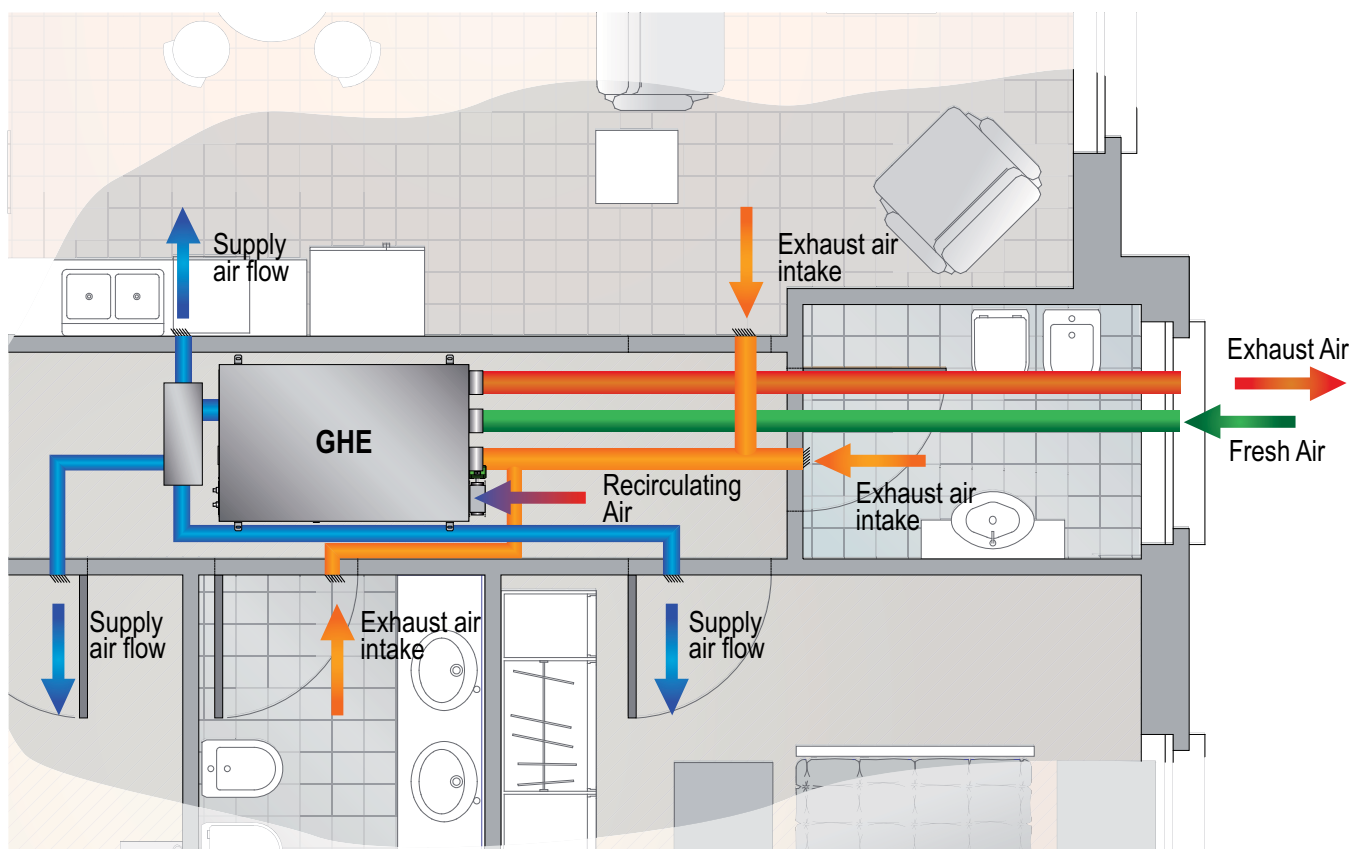
- All units are supplied with double condenser (the first is an air condenser, the second is a water one) and of a logic which allows the dehumidification with neutral air or with cooled air.

### ACCESSORIES

- **HYGR:** Remote mechanical hygrostat + thermostat (WZ versions only).
- **PCRL:** Remote mechanical hygrostat.
- **RGDD:** Built in electronic temperature-humidity sensor.
- **INSE:** Serial interface card RS485.
- **FAEL:** High efficiency electronic air filter H10.

Models GHE		25	50
Useful dehumidification capacity (from the net hygroscopic content of the external air) <sup>(1)</sup>	l/24h	30,1	61,8
Total cooling Power (latent + sensible) <sup>(1)</sup>	W	1380	2820
Recovered winter heating power <sup>(2)</sup>	W	950	1850
Efficiency winter recovery <sup>(2)</sup>	%	90%	90%
Efficiency summer recovery <sup>(1)</sup>	%	70%	70%
Power supply	V/Ph/Hz	230/1/50	230/1/50
Compressor absorbed power <sup>(1)</sup>	W	340	480
Supply fan absorbed power: minimum+nominal+maximum	W	10 ÷ 30 ÷ 86	30 ÷ 60 ÷ 130
Return fan absorbed power	W	11 ÷ 22 ÷ 43	22 ÷ 44 ÷ 68
Supply fan nominal useful prevalence	Pa	50 ÷ 140	50 ÷ 140
Return fan nominal useful prevalence	Pa	50 ÷ 140	50 ÷ 140
Min-max coil water flow	l/h	150 - 250 ÷ 400	200 - 350 ÷ 600
Min-max water pressure drop	kPa	38	35
Outdoor air flow	m <sup>3</sup> /h	80 ÷ 130	140 ÷ 250
Supply air flow	m <sup>3</sup> /h	130 ÷ 260	250 ÷ 500
Coolant type		R134a	R410A
Sound power level <sup>(3)</sup>	dB(A)	47	52
Sound Pressure Level <sup>(4)</sup>	dB(A)	39	44
Weight	Kg	60	80

## TYPICAL INSTALLATION



Performance refer to the following conditions:

(1) Room Temp. 26°C; 65% RU; Ambient Temp. 35°C; 50% RU; Fresh Air System volume 130 m<sup>3</sup>/h; Water IN 15°C; Water Flow 250 l/h.

(2) Ambient Temp. -5°C; 80% RU; Room Temp. 20°C; Fresh Air system at maximum.

(3) Sound Power level according to ISO 9614.

(4) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, at the normal working conditions.

## GHE

### FRAME

All units are made from hot-galvanised thick sheet metal, to ensure the best resistance against the corrosions. The frame is self-supporting with removable panels. The drip tray is present standard in all units.

### REFRIGERANT CIRCUIT

The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in these units is R134a for the model 25 and R407C for the models 50.

### COMPRESSOR

The compressor is alternative for model 25 and rotative type for model 50., equipped and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers to reduce the noise.

### HEAT EXCHANGERS

The heat exchangers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the alu-

minium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FANS

The supply fan is centrifugal type, double inlet with forwards blades, with EC Fan motor directly connected. The exhaust fan is plug fan type with backwards blades, with EC fan motor directly connected.

### AIR FILTER

Comes with the unit is built in removable filter media summary execution for differentiated waste disposal, G4.

### HEAT RECOVERY

Hexagonal cross-flow heat recovery with PVC plates, high efficiency (90%).

### ADJUSTMENT TRIMMERS

Used during calibration of fans air flow depending on the ducts pressure drop.

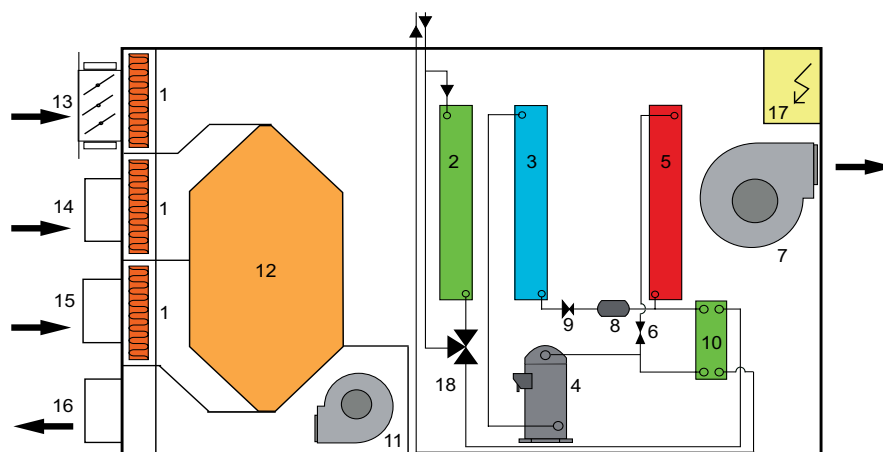
### MICROPROCESSOR

All GHE units are supplied with an advanced software for the complete control of the hydronic and air distribution side.

The software can manage:

- The management of the operation according to a probe of temperature and humidity.
- Activation of the dehumidification based on the pre set humidity conditions.
- Activation of winter or summer sensible load integration, according to the summer or winter set point
- Management of supply air temperature through discharge limit probe sensor (standard).
- Modulating valve for the proper management of the water battery power
- Ventilation Management directly from built-in timer in the microprocessor (optional).
- Management damper
- Machine Allarm display
- Supervisor and BMS connection through serial card RS485 (Optional) a/o XWEB Module (Optional).
- Clogged filters management (optional).
- Antifreeze management.
- Summer/Winter commutation.

### Main components



- 1 Air filter
- 2 Pre-Cooling coil
- 3 Evaporator
- 4 Compressor
- 5 Air Condenser
- 6 Solenoid Valve
- 7 Supply fan with EC
- 8 Dryer Filter
- 9 Body rolling

- 10 Water condenser
- 11 Exhaust fan with EC motor
- 12 High efficiency cross-flow heat recovery
- 13 Return motorized damper
- 14 WC exhaust air
- 15 Fresh air
- 16 Exhaust Air
- 17 Electrical Panel
- 18 Modulating 3-way valve

# GHE

## REFRIGERANT CIRCUIT FUNCTIONING PRINCIPLES

The functioning of the dehumidifier model GHE is as follows: the fan takes the air humid from the ambient through the fan (7) and it's made go through the filter (1) and the cross-flow heat (12) pre-cooling water coil (2) where it's cooled and brought to a condition closed to saturation. Now it passes through the evaporating coil (3) where it's fatherly cooled and dehumidified. At this

time the functionality mode may be. The air passes now through the condensing coil (5) where it's post heated (with a constant humidity) and in cooling, when the solenoid valve (6) open where it's reported to the required conditions.

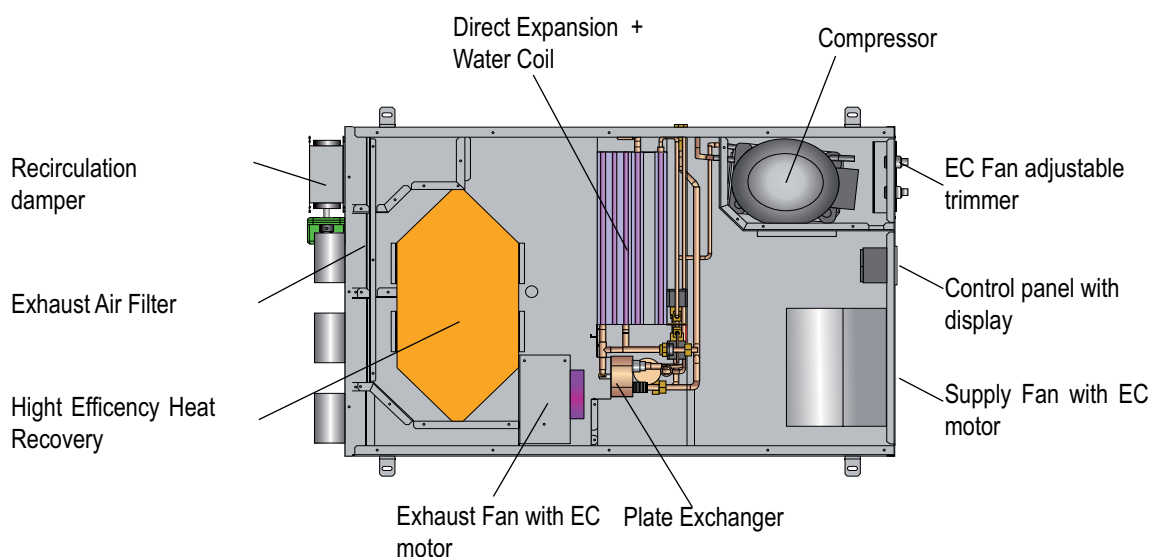
### Dehumidification with neutral air :

The cooling system works partially in the water through the heat exchanger (10) and partially in the air with the heat exchanger (5) which will then make a post-heating at

constant humidity blowing air in in the room in thermally neutral conditions.

### Dehumidification with cooling:

The cooling circuit, in this case, performing works 100% of the condensation in the water through the heat exchanger (10), the heat exchanger (5) is intercepted by the valve (6) and the air supplied in the room is the same as leaving the evaporator coil (3), cold and dried.



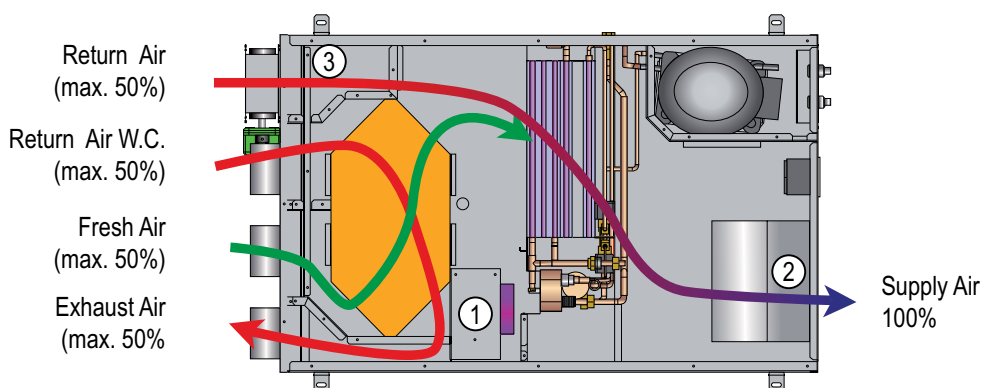
## AERAULIC CIRCUIT FUNCTIONING PRINCIPLES:

GHE 25 units can operate with a flow rate of outdoor air from 80 to 130 m<sup>3</sup>/h (140 to 260 m<sup>3</sup>/h for the model GHE 50), to ensure sufficient supply air changes in the room having a variable volume by 260 m<sup>3</sup> (0.5 vol / h) to 460 m<sup>3</sup> (0.3 vol / h), in compliance with regional and national regulations. The air flow rate of discharge can vary from 80

to 130 m<sup>3</sup>/h (140-260 m<sup>3</sup>/h for the model 50) in the winter mode, and is fixed to 260 m<sup>3</sup>/h (500 m<sup>3</sup>/h for the model 50) in summer mode.

The cross-flow heat exchanger of high efficiency is designed to ensure a recovery rating of 90% in terms of air temperature -5 ° C and air temperature 20 ° C. The stale air is expelled from the environment by the fan (1), while the outside air is sucked through the fan (2).

The proper balance of air flows is ensured by the damper (3) that handles both the balance of flows of air that the air flow recirculation summer.





## GHE

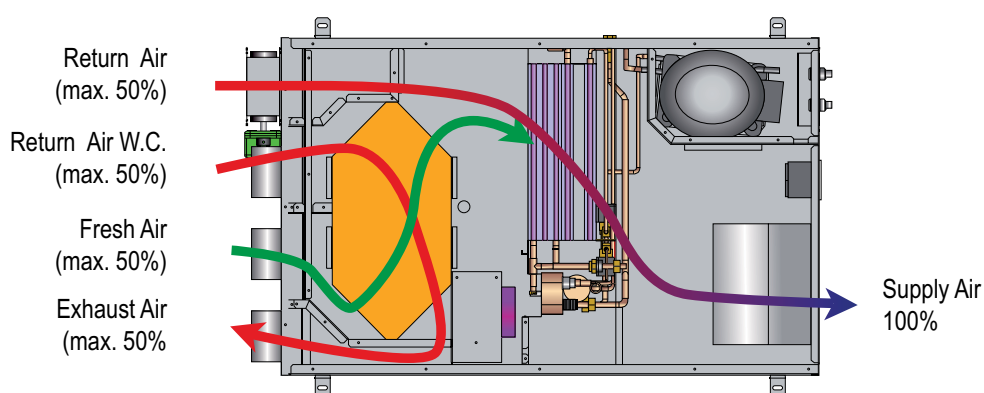
### SUMMER OPERATION (COMPRESSON ON)

Whit this selected mode the unit renews the ambient air with the outside through the heat exchanger for high efficiency, air flow is increased so as to allow operation of refrigerant circuit; for this purpose the r recycling damper will be open, the supply fan is operated at maximum capacity and the unit works with external air and partial recirculation.

#### THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

- Renewal + Air Dryers neutral: The condens-ing unit partially in air and partially in the water through the condenser plate, obtaining dry air and thermally neutral.

- Renewal + Dehumidification with cooling: The unit operates with 100% of the conden-sation water, obtaining dry and cooled air.



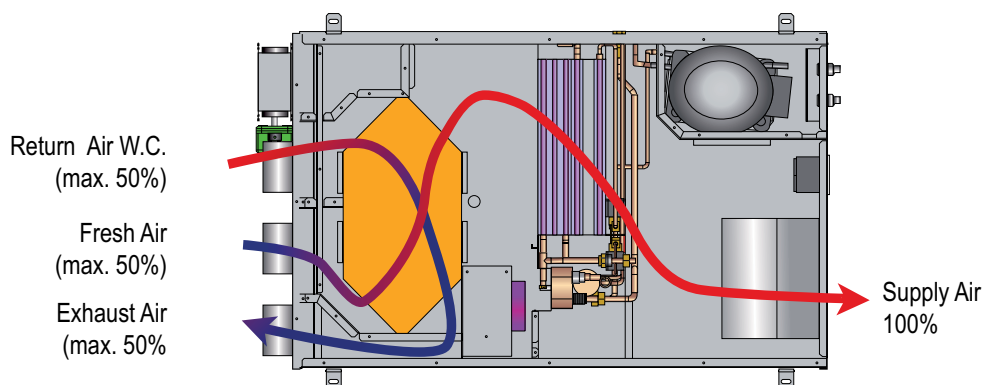
### WINTER OPERATION AND MIDDLE SEASON (COMPRESSON OFF)

Whit this selected mode, the unit renews the ambient air with the outside through the heat exchanger of high efficiency. The air flow is reduced to the value required by the standard ( $0.3 \div 0.5 \text{ vol / h}$ ), the re-circulation damper is closed and the unit operates with 100% fresh air.

#### THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

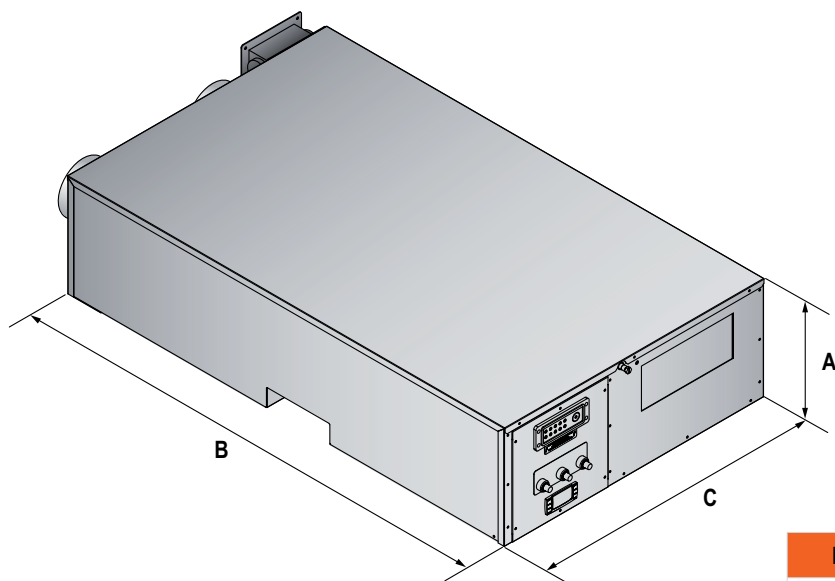
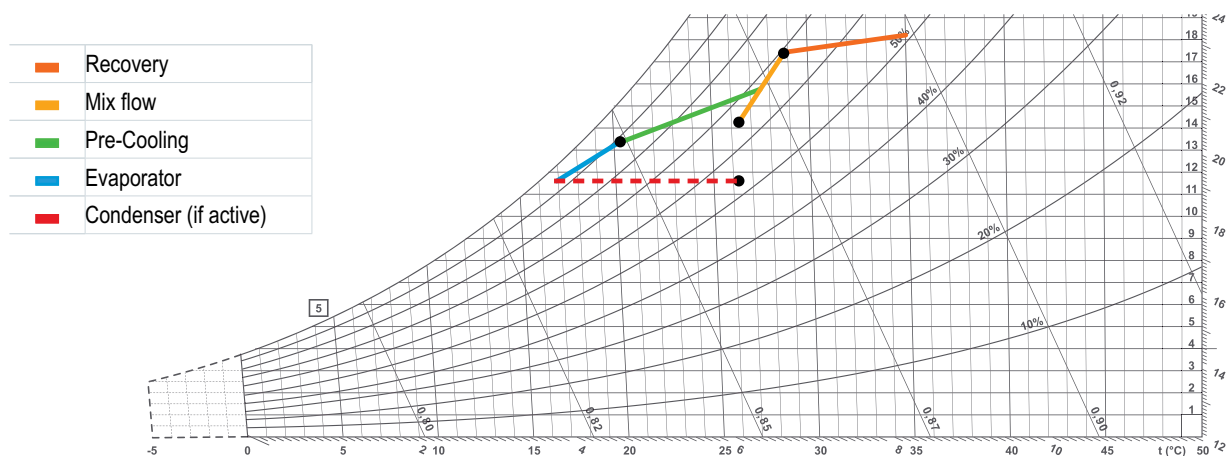
- Renewal with heated air: The compres-sor is switched off, the battery can be sup-plied with hot water from radiant system. (even due to the high efficiency of the heat

exchanger, is able to obtain a supply air temperature  $17^\circ \text{C}$ , without using hot wa-ter and ambient air temperature of  $-5^\circ \text{C}$ ), and behaves like a normal air handling with recovery.



Versions GHE	Code	25	50
Microprocessor control		●	●
Flow meter		●	●
Modulating 3-way valve		●	●
Supply & Return EC fans		●	●
G4 air filter		●	●
Adjustable Trimmers		●	●
High Efficiency Heat Recovery		●	●
Remote control Panel	PCRL	○	○
Thermo- Mechanical remote Hygostat	HYGR	○	○
Umidity and Temperature electronic probe sensor	RGDD	○	○
Serial interface card RS485	INSE	○	○
High efficiency electronic air filter	FAEL	○	○

● Standard, ○ Optional, – Not available.



Mod.	25	50
A (mm)	258	400
B (mm)	1155	1370
C (mm)	732	835

## FHE

Dehumidifiers for radiant cooling systems with heat recovery



Display

FHE

The dehumidifiers with heat recovery of high efficiency series FHE were designed to provide dehumidification and fresh air in a residential area with very high energy efficiency, combined with radiant cooling systems.

The units have been designed to grant the dehumidification either under conditions of thermally neutral air or in terms of air-cooled, managing small air flow thus avoiding annoying tiny air currents typical of traditional air conditioning systems.

The units consist of a direct expansion cooling system combined with a cross flow heat exchanger highly efficient, designed for heat recovery and air exchange environment in compliance with applicable regional and national laws.

### VERSIONS

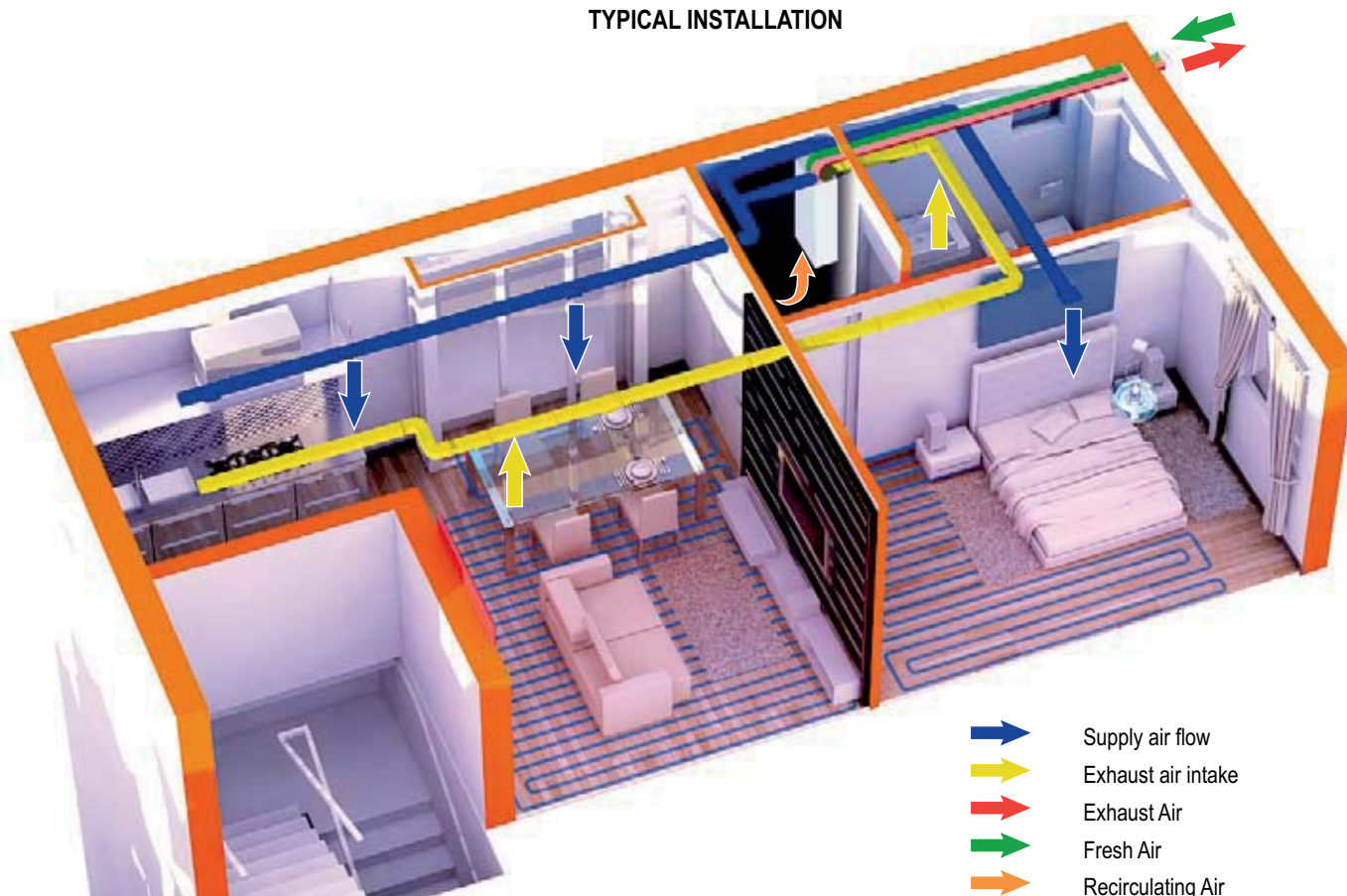
- All units are supplied with double condenser (the first is an air condenser, the second is a water one) and of a logic which allows the dehumidification with neutrum air or with cooled air.

### ACCESSORIES

- **PCRL:** Remote mechanical hygostat.
- **RGDD:** Built in remote electronic temperature-humidity sensor.
- **INSE:** Serial interface card RS485.
- **FAEL:** High efficiency electronic air filter H10.

Models FHE		25
Useful dehumidification capacity (from the net hygroscopic content of the external air) <sup>(1)</sup>	l/24h	30,1
Total cooling Power (latent + sensible) <sup>(1)</sup>	W	1380
Recovered winter heating power <sup>(2)</sup>	W	950
Efficiency winter recovery <sup>(2)</sup>	%	90%
Efficiency summer recovery <sup>(1)</sup>	%	70%
Power supply	V/Ph/Hz	230/1/50
Compressor absorbed power <sup>(1)</sup>	W	340
Supply fan absorbed power: minimum÷nominal÷maximum	W	10 ÷ 30 ÷ 86
Return fan absorbed power	W	11 ÷ 22 ÷ 43
Supply fan nominal useful prevalence	Pa	50 ÷ 140
Return fan nominal useful prevalence	Pa	50 ÷ 140
Min-max coil water flow	l/h	150 - 250 ÷ 400
Min-max water pressure drop	kPa	38
Outdoor air flow	m³/h	80 ÷ 130
Supply air flow	m³/h	80 ÷ 260
Coolant type		R134a
Sound power level <sup>(3)</sup>	dB(A)	47
Sound Pressure Level <sup>(4)</sup>	dB(A)	39
Weight	Kg	80

## TYPICAL INSTALLATION



Performance refer to the following conditions:

(1) Room Temp. 26°C; 65% RU; Ambient Temp. 35°C; 50% RU; Fresh Air System volume 130 m³/h; Water IN 15°C; Water Flow 250 l/h.

(2) Ambient Temp. -5°C; 80% RU; Room Temp. 20°C; Fresh Air system at maximum.

(3) Sound Power level according to ISO 9614.

(4) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, at the normal working conditions.

## FHE

### FRAME

All units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel and stoved at 180°C to ensure the best resistance against the cor-rosions. The frame is self-supporting with removable panels. The drip tray is made in painted galvanized steel and it is present in all units. The standard colour is RAL 9010.

### REFRIGERANT CIRCUIT

The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in is R134a.

### COMPRESSOR

The compressor is alternative type equipped and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers to reduce the noise.

### HEAT EXCHANGERS

The heat exchangers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm.

### FANS

The supply fan is centrifugal type, double inlet with forwards blades, with EC Fan motor directly connected. The exhaust fan is plug fan type with backwards blades, with EC fan motor directly connected.

### AIR FILTER

Comes with the unit is built in removable filter media summary execution for differentiated waste disposal, G4.

### HEAT RECOVERY

Hexagonal cross-flow regenerator with PVC plates, high efficiency (90%).

### ADJUSTMENT TRIMMERS

Used during calibration of fans air flow depending on the ducts pressure drop .

### MICROPROCESSOR

All FHE units are supplied with an advanced software for the complete control of the hydronic and air distribution side.

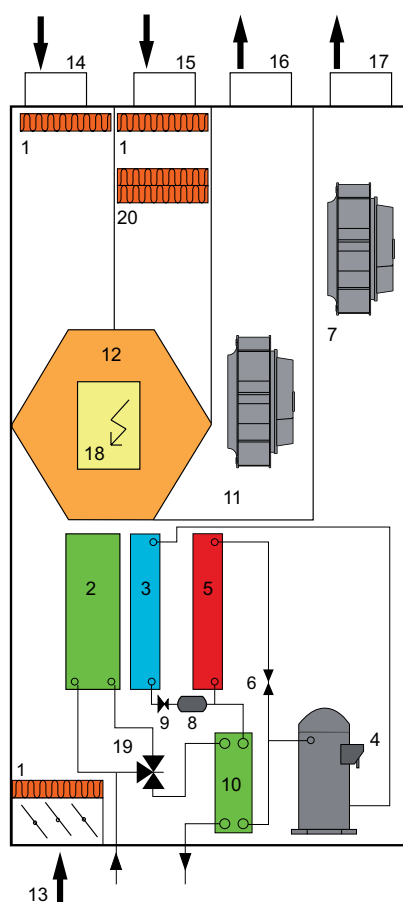
#### The software can manage:

- The management of the operation according to a probe of temperature and humidity.
- Activation of the dehumidification based

on the pre set humidity conditions.

- Activation of winter or summer sensible load integration, according to the summer or winter set point
- Management of supply air temperature through discharge limit probe sensor (standard).
- Modulating valve for the proper management of the water battery power.
- Ventilation Management directly from built-in timer in the microprocessor (optional).
- Management damper
- Machine alarm display
- Supervisor and BMS connection through serial card RS485 (Standard fitted) a/o XWEB Module (Optional).
- Clogged filters management (optional).
- Antifreeze management.
- Summer/Winter commutation.

## Main components



- |    |  |
|----|--|
| 1  | Air filter                               |
| 2  | Pre-Cooling coil                         |
| 3  | Evaporator                               |
| 4  | Compressor                               |
| 5  | Air Condenser                            |
| 6  | Solenoid Valve                           |
| 7  | Supply fan with EC                       |
| 8  | Dryer Filter                             |
| 9  | Body rolling                             |
| 10 | Water condenser                          |
| 11 | Exhaust fan with EC motor                |
| 12 | High efficiency cross-flow heat recovery |
| 13 | Return motorized damper                  |
| 14 | WC exhaust air                           |
| 15 | Fresh air                                |
| 16 | Exhaust Air                              |
| 17 | Supply air flow                          |
| 18 | Electrical Panel                         |
| 19 | Modulating 3-way valve                   |
| 20 | Electronic filter                        |

# FHE

## REFRIGERANT CIRCUIT FUNCTIONING PRINCIPLES

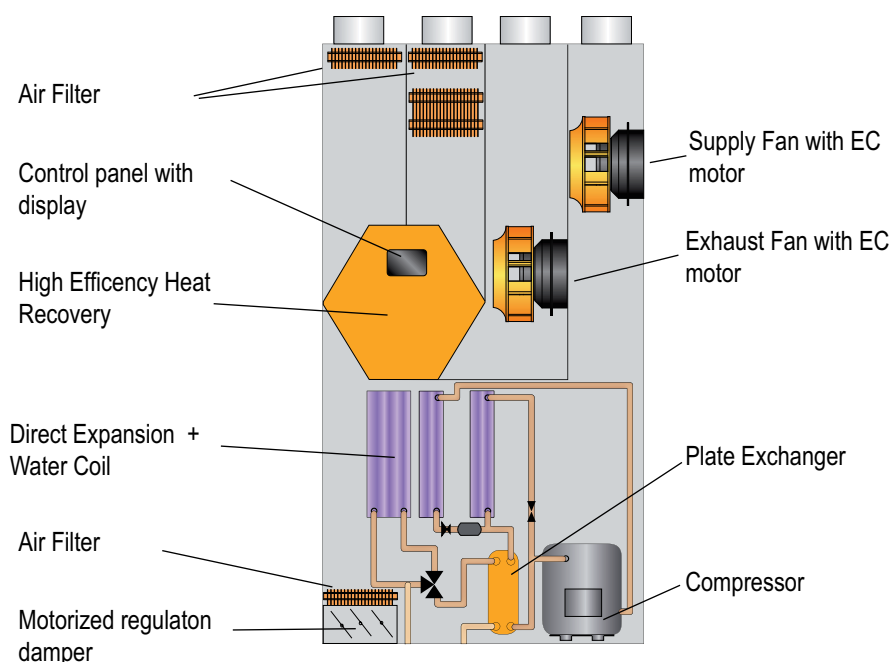
The functioning of the dehumidifier model FHE is as follows: the fan takes the air humid from the ambient through the fan (7) and it's made go through the filter (1), the cross-flow heat (12) and the pre-cooling water coil (2) where it's cooled and brought to a condition closed to saturation. Now it passes through the evaporating coil (3) where it's further cooled and dehumidified. At this time the functionality mode may be:

### Dehumidification with neutral air :

The cooling system works partially in the water through the heat exchanger (10) and partially in the air with the heat exchanger (5) which will then make a post-heating at constant humidity blowing air in the room in thermally neutral conditions.

### Dehumidification with cooling:

The cooling circuit, in this case, works performing 100% of the condensation in the water through the heat exchanger (10). The heat exchanger (5) is intercepted by the valve (6) and the air supplied in the room is the same as leaving the evaporator coil (3), cold and dried.

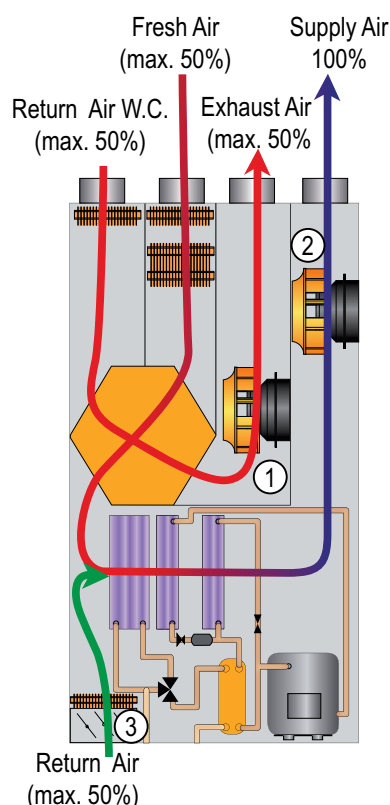


## AERAUIC CIRCUIT FUNCTIONING PRINCIPLE

FHE units can operate with a flow rate of outdoor air from 80 to 130 m<sup>3</sup>/h, to ensure sufficient supply air changes in the room having a variable volume by 430 m<sup>3</sup> (0,3 vol / h) in compliance with regional and national regulations. The air flow rate of discharge can vary from 80 to 130 m<sup>3</sup>/h in the winter mode, and is fixed to 260 m<sup>3</sup>/h in summer mode.

The cross-flow heat exchanger of high efficiency is designed to ensure a recovery rating of 90% in terms of air temperature -5°C and air temperature 20°C. The stale air is expelled from the environment by the fan (1), while the outside air is sucked through the fan (2).

The proper balance of air flows is ensured by the damper (3) that handles both the balance of flows of air and the air flow recirculation summer.





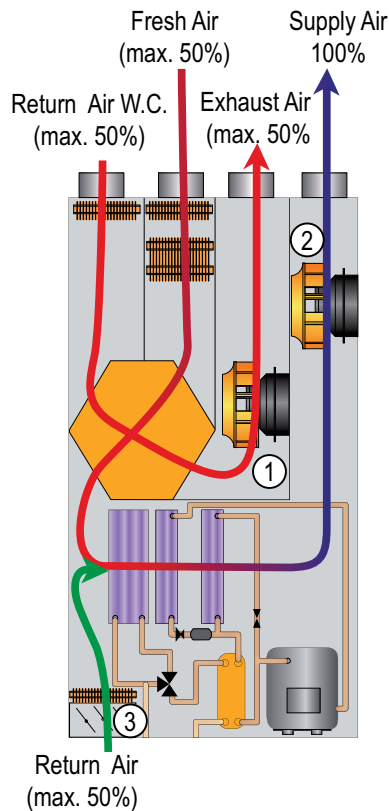
## FHE

### SUMMER OPERATION (COMPRESSOR ON)

Whit this selected mode, the unit renews the ambient air with the outside through the heat exchanger for high efficiency, air flow is increased so as to allow operation of refrigerant circuit; for this purpose the re-cycling damper will be open, the supply fan is operated at the maximum capacity and the unit works with external air and partial recirculation.

### THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

- Renewal + Air Dryers neutral: The condensing unit partially in air and partially in the water through the condenser plate, obtaining dry air and thermally neutral.
- Renewal + Dehumidification with cooling: The unit operates with 100% of the condensation water, obtaining dry and cooled air.



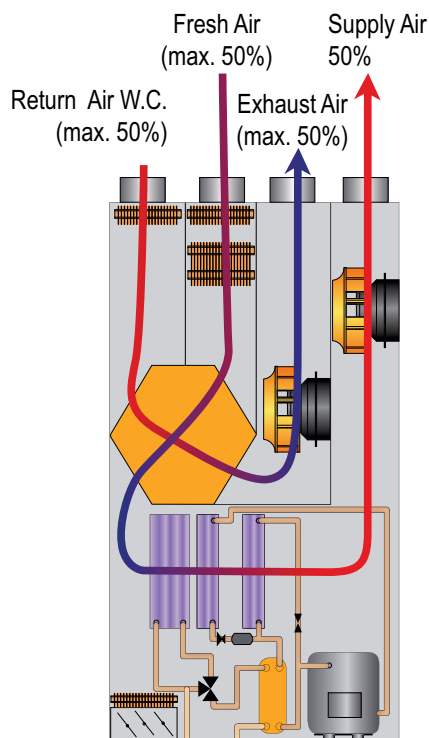
### WINTER OPERATION AND MIDDLE SEASON (COMPRESSOR OFF)

Whit this selected mode, the unit renews the ambient air with the outside through the heat exchanger of high efficiency.

The air flow is reduced to the value required by the standard (0,3 ÷ 0,5 Vol/h), the re-circulation damper is closed and the unit operates with 100% fresh air.

### THE POSSIBLE FUNCTIONS IN THIS CONFIGURATION ARE

- Renewal with heated air: The compressor is switched off, the battery can be supplied with hot water from radiant system. (even due to the high efficiency of the heat exchanger, is able to obtain a supply air temperature 17°C, without using hot water and ambient air temperature of -5°C), and behaves like a normal air handling with recovery.

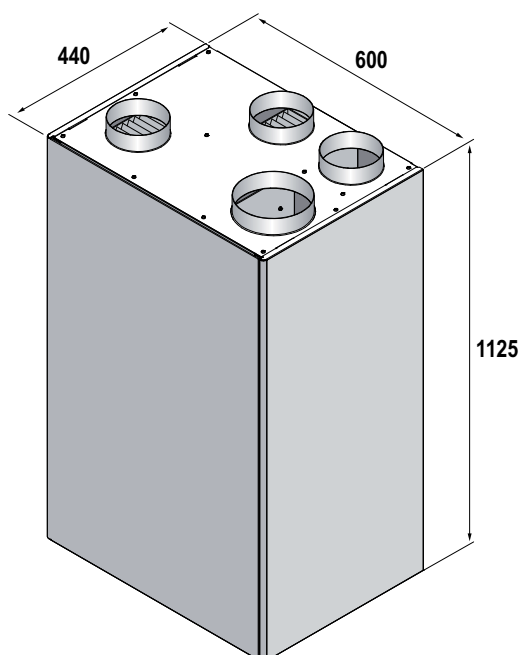
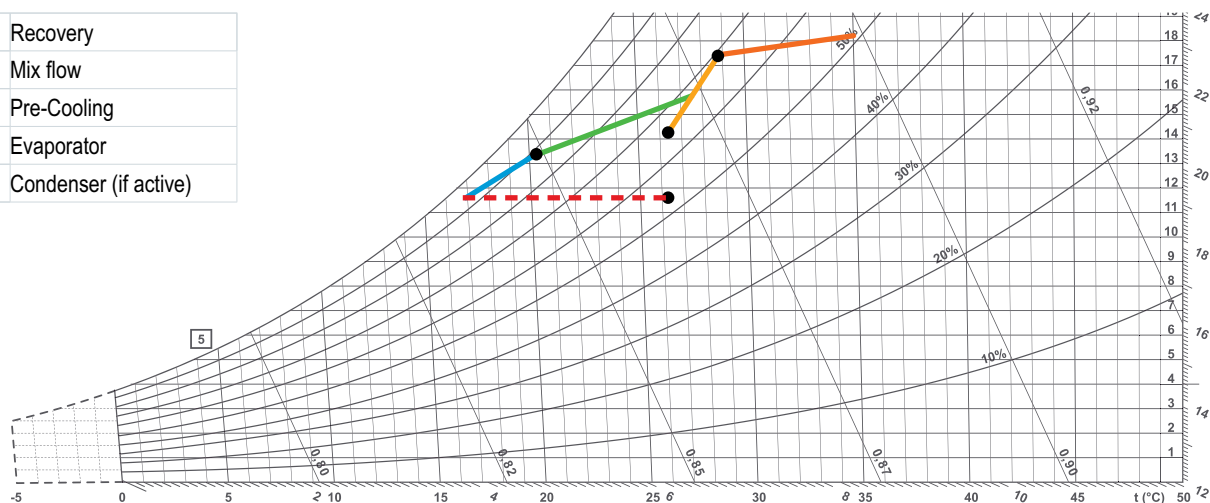


# FHE

Versions FHE	Code	25
Microprocessor control		●
Flow meter		●
Modulating 3-way valve		●
Supply & Return EC fans		●
G4 air filter		●
Adjustable Trimmers		●
High Efficiency Heat Recovery		●
Umidity and Temperature electronic probe sensor	RGDD	●
Remote control Panel	PCRL	○
High efficiency electronic air filter H10	FAEL	○
Serial interface card RS485	INSE	○

● Standard, ○ Optional, – Not available.

Recovery
Mix flow
Pre-Cooling
Evaporator
Condenser (if active)



## DH - DR

### Standard Dehumidifiers



DH

DR



DH dehumidifiers series are high-performances units especially designed for industrial or commercial purposes where humidity level should be controlled or water vapour condensation should be prevented. These units are particularly indicated for archives, ironing rooms, bookstores, cheese factories, underground rooms, cellars and industrial sites where high humidity level is present.

This series comprises 3 basic models which cover a capacity range from 75 to 124 l/24h. DH units are designed for easy maintenance and service, each part being readily accessible.

### VERSIONS

- Standard version available in 3 different sizes
- **Hot gas defrost version (s):** Beside the components of the standard version, the unit is supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions. The hot gas injection allows a faster defrost time and this permits to use this unit in areas with lower temperatures (down to 1°C) compared to the standard version

### ACCESSORIES

- **HYGR:** Integrated mechanical hygrostat.
- **HYGR:** Remote mechanical hygrostat.
- **INOX:** Stainless steel frame.
- **PM:** Available static pressure 200Pa.
- **TROL:** Floor trolley version.

## DH - DR

Models DH		75	75S	100	100S	120	120S
Moisture removed <sup>(1)</sup>	l/24h	75,1	75,1	93,7	93,7	124,0	124,0
Total power input <sup>(1)</sup>	kW	1,3	1,3	1,6	1,6	1,8	1,8
Max power input	kW	1,6	1,6	2,0	2,0	2,2	2,2
Max input current	A	5,9	5,9	6,8	6,8	7,4	7,4
Peak current	A	22,2	22,2	31,2	31,2	35,2	35,2
Air flow	m³/h	1000	1000	1000	1000	1200	1200
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Available static pressure	Pa	50	50	50	50	50	50
Sound Pressure <sup>(2)</sup>	dB(A)	56	56	58	58	59	59
Temperature operating range	°C	15-35	1-35	15-35	1-35	15-35	1-35
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	68	68	75	75	79	79
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Models DR		75	100	120
Moisture removed <sup>(1)</sup>	l/24h	75,1	93,7	124,0
Total power input <sup>(1)</sup>	kW	1,3	1,6	1,8
Max power input	kW	1,6	2,0	2,2
Max input current	A	5,9	6,8	7,4
Peak current	A	22,2	31,2	35,2
Air flow	m³/h	1000	1000	1200
Refrigerant		R407C	R407C	R407C
Available static pressure	Pa	50	50	50
Sound Pressure <sup>(2)</sup>	dB(A)	56	58	59
Temperature operating range	°C	15-35	15-35	15-35
Humidity operating range	%	50-99	50-99	50-99
Weight	Kg	68	75	79
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50

DH - DR

Performance refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

## DH - DR

### FRAME

All DH / DR units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all DH units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is rotative type with crank-case heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory).

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these con-

densers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FAN

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers. The electric motor is at 4 poles (about 1500 rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002

### MICROPROCESSOR

All DH / DR units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility

to the board is possible through the accessories panel. The following components are standard installed: compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

# DH - DR

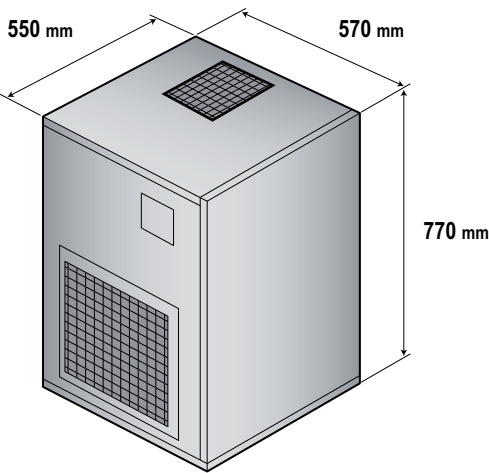
Versions DH	Code	DH75	DH75S	DH100	DH100S	DH120	DH120S
Integrated mechanical hygrostat	HYGR	○	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○	○
Available static pressure 200 Pa	PM	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	○	○	○
Stainless steel frame	INOX	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

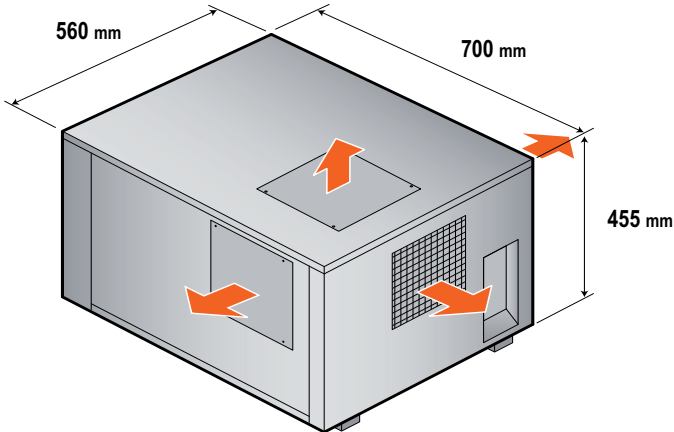
Versions DR	Code	DR75	DR100	DR120
Integrated mechanical hygrostat	HYGR	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○

● Standard, ○ Optional, – Not available.

## DH



## DR





## EH - EHD - EHZ

Standard dehumidifiers



**EH-EHZ**



**EHD**



**Only EHZ**

EH dehumidifiers series are high-performances units especially designed for industrial or commercial purposes where humidity level should be controlled or water vapor condensation should be prevented. These units are particularly indicated for archives, ironing rooms, bookstores, cheese factories, underground rooms, cellars and industrial sites where high humidity level is present. This series comprises three basic models which cover a capacity range from 164 to 194 l/24h. EH units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

### VERSIONS

- **Version with temperature control EHZ:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.

### VERSIONS

- **Hot gas defrost version (s):** Beside the components of the standard version, the unit is supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions. The hot gas injection allows a faster defrost time and this permits to use this unit in areas with lower temperatures (down to 1°C) compared to the standard version.
- **EHD Version:** neutral air dehumidifier: in addition to the base components, the unit is equipped with a partial air condenser, installed on the unit, designed to dissipate the extra heating load so that to ensure air neutral conditions in the ambient which has to be treated.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HYGR:** Integrated mechanical hygrostat.
- **HYGR:** Remote mechanical hygrostat.
- **HYGR:** Remote mechanical hygrostat + thermostat.
- **INOX:** Stainless steel frame.
- **PM:** Available static pressure 200 Pa.
- **TROL:** Floor trolley version.
- **RP00:** Desuperheater.

## EH - EHD - EHZ

Models EH - EHD		160	160S	200	200S
Moisture removed <sup>(1)</sup>	l/24h	164,3	164,3	194,0	194,0
Total power input <sup>(1)</sup>	kW	2,55	2,55	2,95	2,95
Max power input <sup>(2)</sup>	kW	3,2	3,2	3,4	3,4
Max input current <sup>(2)</sup>	A	5,9	5,9	7,6	7,6
Peak current	A	25,7	25,7	34,5	34,5
Air flow	m³/h	1400	1400	1900	1900
Available static pressure	Pa	50	50	50	50
Refrigerant		R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	61	61	62	62
Temperature operating range	°C	5-35	1-35 <sup>(4)</sup>	5-35	1-35 <sup>(4)</sup>
Humidity operating range	%	50-99	50-99	50-99	50-99
Weight	Kg	102	102	108	108
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50

Performance refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Room temperature 35°C; relative humidity 80%.

(3) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

(4) S versions with hot gas defrost only.

Models EHZ		200	200S
Moisture removed <sup>(1)</sup>	l/24h	194,2	194,2
Input power <sup>(1)</sup>	kW	2,95	2,95
Cooling capacity <sup>(3)</sup>	kW	7,4	7,4
Input power <sup>(3)</sup>	kW	2,7	2,7
Maximum input power <sup>(4)</sup>	kW	3,2	3,2
Maximum input current	A	8,4	8,4
Peak current	A	35,3	35,3
Air flow	m³/h	1900	1900
Available static pressure	Pa	50	50
Refrigerant		R407C	R407C
Sound pressure <sup>(2)</sup>	dB(A)	62	62
Temperature operating range	°C	5-35	1-35 <sup>(5)</sup>
Humidity operating range	%	50-99	50-99
Weight	Kg	108	108
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50

Performance refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

(3) Room temperature 30°C; relative humidity 80%; ambient temperature 35°C.

(4) Room temperature 35°C; relative humidity 80%; ambient temperature 35°C.

(5) S versions with hot gas defrost only.

## EH - EHD - EHZ

### FRAME

All EH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all EH units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FAN

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers.

The electric motor is at 4 poles (about 1500 rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All EH units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all EH units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of pumps and fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

### REMOTE CONDENSER (Only EHZ versions)

The remote condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The fans are axial type with aluminium aerofoil blades complete of the safety fan guard. The protection class of the motors is IP 54. Furthermore the remote condenser is supplied of the low ambient condensing pressure control. This device controls the cooling circuit condensing pressure at different ambient temperatures, to keep it correct.

### DESUPERHEATER (Only EHD versions)

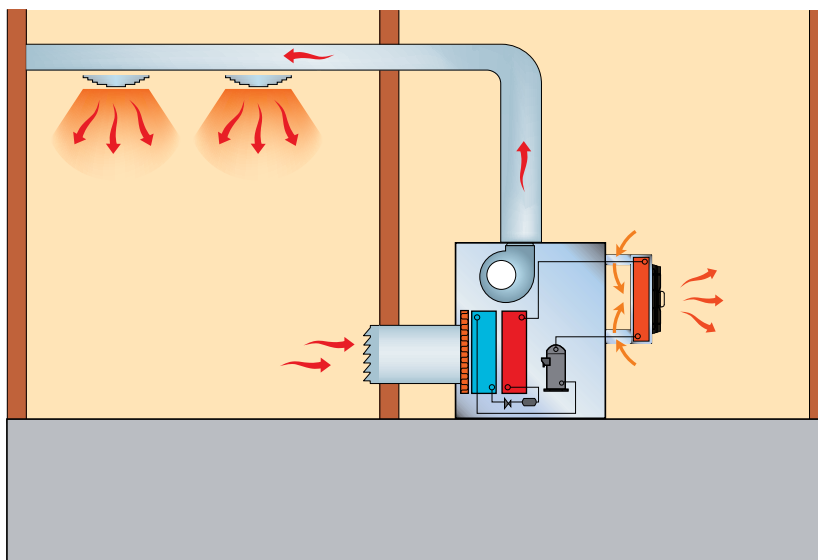
The desuperheater is made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The fan of the desuperheater is axial type with aluminium aerofoil blades. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 60335. It's mounted on the unit frame by interposition of rubber vibration dampers.

## EH - EHD - EHZ

Versions EH - EHD - EHZ	Code	EH160	EH200	EHD160	EHD200	EHZ160	EHZ200
Integrated mechanical hygrostat	HYGR	○	○	○	○	-	-
Remote mechanical hygrostat	HYGR	○	○	○	○	-	-
Remote mechanical hygrostat + thermostat	HYGR	-	-	-	-	○	○
Available static pressure 200 Pa	PM	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	○	-	-
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Built in partial heat recovery version		○	○	●	●	○	○

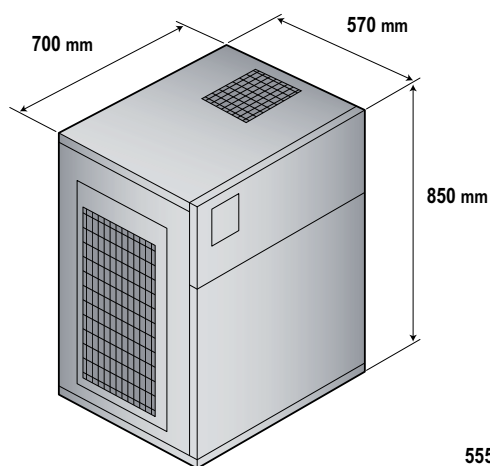
● Standard, ○ Optional, – Not available.

### USE EHD VERSION

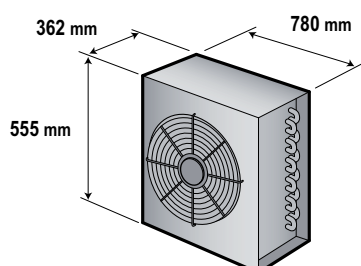
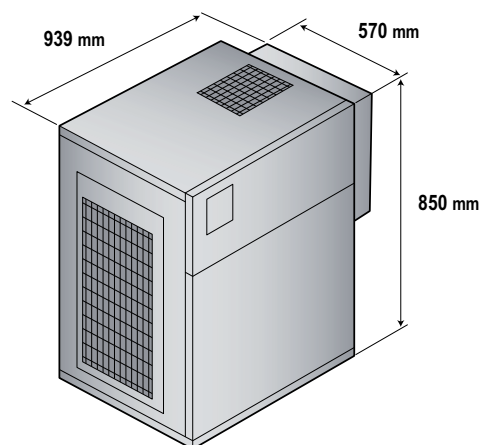


EH - EHD - EHZ

### EH-EHZ



### EHD



Remote condenser (Only Z versions)

## ITM - ITMD - ITMZ

Standard dehumidifiers



ITM-ITMZ



ITMD



Only ITMZ

ITM dehumidifiers series are high-performances units especially designed for industrial or commercial purposes where humidity level should be controlled or water vapour condensation should be prevented. These units are particularly indicated for archives, ironing rooms, bookstores, cheese factories, underground rooms, cellars and industrial sites where high humidity level is present. This series comprises 2 basic models which cover a capacity range from 330 to 415 l/24h. ITM units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

### VERSIONI

- **Hot gas defrost version (s):** Beside the components of the standard version, the unit is supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions. The hot gas injection allows a faster defrost time and this permits to use this unit in areas with lower temperatures (down to 1°C) compared to the standard version.

### VERSIONS

- **Version with temperature control ITMZ:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.
- **ITMD Version:** neutral air dehumidifier: in addition to the base components, the unit is equipped with a partial air condenser, installed on the unit, designed to dissipate the extra heating load so that to ensure air neutral conditions in the ambient which has to be treated.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HYGR:** Integrated mechanical hygrostat.
- **HYGR:** Remote mechanical hygrostat.
- **HYGR:** Remote mechanical hygrostat + thermostat.
- **INOX:** Stainless steel frame.
- **PM:** Available static pressure 200 Pa.
- **TROL:** Floor trolley version.

## ITM - ITMD - ITMZ

Models ITM - ITMD		ITM-ITMD330	ITM-ITMD330S	ITM-ITMD400	ITM-ITMD400S
Moisture removed <sup>(1)</sup>	l/24h	329,9	329,9	414,9	414,9
Total power input <sup>(1)</sup>	kW	5,3	5,3	6,6	6,6
Max power input <sup>(2)</sup>	kW	5,9	5,9	7,4	7,4
Max power input <sup>(2)</sup>	A	11,7	11,7	13,7	13,7
Peak current	A	66,2	66,2	74,7	74,7
Air flow	m³/h	3800	3800	4000	4000
Available static pressure	Pa	50	50	50	50
Refrigerant		R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	66	66	68	68
Temperature operating range	°C	5-35	5-35	5-35	1-35 <sup>(6)</sup>
Humidity operating range	%	50-99	50-99	50-99	50-99
Weight	Kg	175	175	205	205
Power supply	V/Ph/Hz	400/3~+N/50	400/3~+N/50	400/3~+N/50	400/3~+N/50

Models ITMZ		ITMZ330	ITMZ330S	ITMZ400	ITMZ400S
Moisture removed <sup>(1)</sup>	l/24h	329,9	329,9	414,9	414,9
Input power <sup>(1)</sup>	kW	5,3	5,3	6,6	6,6
Cooling capacity <sup>(4)</sup>	kW	15,4	15,4	16,6	16,6
Total power input <sup>(4)</sup>	kW	5,3	5,3	6,6	6,6
Max power input <sup>(5)</sup>	kW	5,9	5,9	7,4	7,4
Max input current <sup>(5)</sup>	A	14,3	14,3	16,3	16,3
Peak current	A	68,8	68,8	77,3	77,3
Air flow	m³/h	3800	3800	4000	4000
Available static pressure	Pa	50	50	50	50
Refrigerant		R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	66	66	68	68
Temperature operating range	°C	5-35	1-35 <sup>(6)</sup>	5-35	1-35 <sup>(6)</sup>
Humidity operating range	%	50-99	50-99	50-99	50-99
Weight	Kg	175	175	205	205
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50

Performance refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Room temperature 35°C; relative humidity 80%.

(3) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

(4) Room temperature 30°C; relative humidity 80%; ambient temperature 35°C.

(5) Room temperature 35°C; relative humidity 80%; ambient temperature 35°C.

(6) S versions with hot gas defrost only.



## ITM - ITMD - ITMZ

### FRAME

All ITM units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all ITM units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FAN

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers. The electric motor is at 4 poles (about 1500

rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All ITM units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles, alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. The moisture protection degree is IP55. In all ITM units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then char-

ged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

### REMOTE CONDENSER

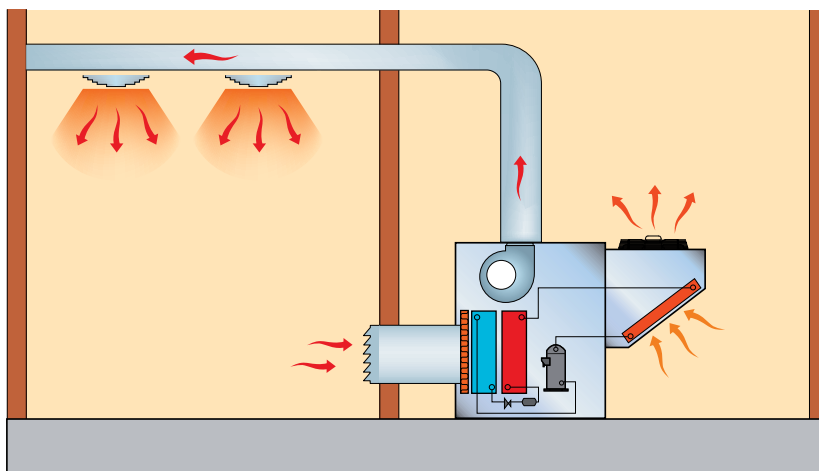
The remote condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The fans are axial type with aluminium aerofoil blades complete of the safety fan guard. The protection class of the motors is IP 54. Furthermore the remote condenser is supplied of the low ambient condensing pressure control. This device controls the cooling circuit condensing pressure at different ambient temperatures, to keep it correct.

## ITM - ITMD - ITMZ

Versions ITM - ITMD - ITMZ	Code	ITM330	ITM400	ITMD330	ITMD400	ITMZ330	ITMZ400
Integrated mechanical hygrostat	HYGR	○	○	○	○	–	–
Remoto mechanical hygrostat	HYGR	○	○	○	○	–	–
Remoto mechanical hygrostat + thermostat	HYGR	–	–	–	–	○	○
Available static pressure 200 Pa	PM	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	○	–	–
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Built in partial heat recovery version		–	–	●	●	–	–

● Standard, ○ Optional, – Not available.

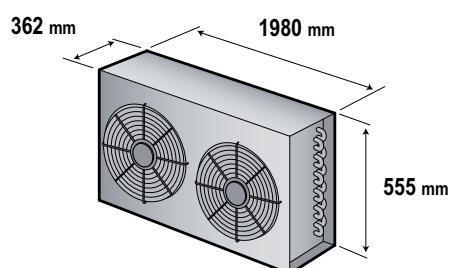
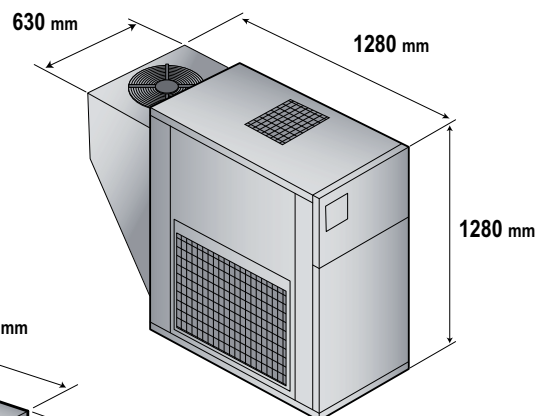
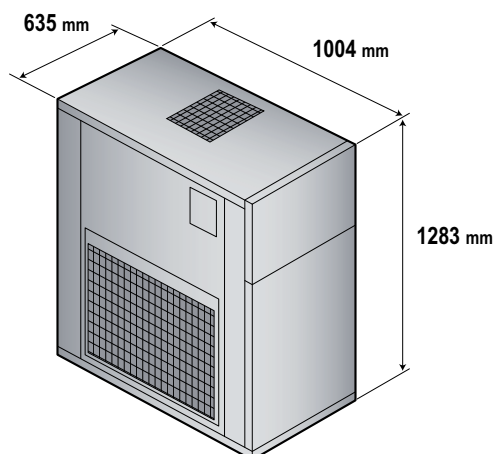
### USE ITMD VERSION



ITM - ITMD - ITMZ

### ITM - ITMZ

### ITMD



Remote condenser (Only Z versions)

## FL - FLD - FLZ

Standard dehumidifiers



FL



FLD



Only FLZ

FL dehumidifiers series are high-performances units especially designed for industrial or commercial purposes where humidity level should be controlled or water vapour condensation should be prevented. These units are particularly indicated for archives, ironing rooms, bookstores, cheese factories, underground rooms, cellars and industrial sites where high humidity level is present. This series comprises 3 basic models which cover a capacity range from 564 to 940 l/24h. FL units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

### VERSIONI

- **Hot gas defrost version (S)** Beside the components of the standard version, the unit is supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions. The hot gas injection allows a faster defrost time and this permits to use this unit in areas with lower temperatures (down to 1°C) compared to the standard version.

### VERSIONS

- **Version with temperature control FLZ:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.
- **FLD Version:** neutral air dehumidifier: in addition to the base components, the unit is equipped with a partial air condenser, installed on the unit, designed to dissipate the extra heating load so that to ensure air neutral conditions in the ambient which has to be treated.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HYGR:** Integrated mechanical hygostat.
- **HYGR:** Remote mechanical hygostat.
- **HYGR:** Remote mechanical hygostat + thermostat.
- **INOX:** Stainless steel frame.
- **PM:** Available static pressure 200 Pa.
- **TROL:** Floor trolley version.

## FL - FLD - FLZ

Models FL - FLD		FL-FLD560	FL-FLD560S	FL-FLD740	FL-FLD740S	FL-FLD940	FL-FLD940S
Moisture removed <sup>(1)</sup>	l/24h	564,1	564,1	736,7	736,7	937,3	937,3
Nominal input power <sup>(1)</sup>	kW	8,7	8,7	11,3	738,5	14,8	14,8
Max input power <sup>(2)</sup>	kW	9,0	9,0	12,9	12,9	17,3	17,3
Nominal input current <sup>(2)</sup>	A	19,3	19,3	25,0	25,0	31,3	31,3
Peak current	A	101,3	101,3	130,0	130,0	171,3	171,3
Air flow	m <sup>3</sup> /h	5150	5150	6850	6850	8200	8200
Available static pressure	Pa	50	50	50	50	50	50
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	72	72	73	73	74	74
Temperature operating range	°C	5-35	1-35 <sup>(6)</sup>	5-35	1-35 <sup>(6)</sup>	5-35	1-35 <sup>(6)</sup>
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	390	390	412	412	439	439
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

Models FLZ		FLZ560	FLZ560S	FLZ740	FLZ740S	FLZ940	FLZ740S
Moisture removed <sup>(1)</sup>	l/24h	564,1	564,1	738,5	738,5	937,3	937,3
Input power <sup>(1)</sup>	kW	8,7	8,7	11,3	11,3	14,8	14,8
Cooling capacity <sup>(4)</sup>	kW	21,3	21,3	28,5	28,5	40,6	40,6
Total power input <sup>(4)</sup>	kW	9,1	9,1	11,7	11,7	15,3	15,3
Max power input <sup>(5)</sup>	kW	10,2	10,2	14,5	14,5	18,7	18,7
Max input current <sup>(5)</sup>	A	21,5	21,5	27,6	27,6	34,8	34,8
Peak current	A	103,5	103,5	132,6	132,6	174,8	174,8
Air flow	m <sup>3</sup> /h	5150	5150	6850	6850	8200	8200
Available static pressure	Pa	50	50	50	50	50	50
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	72	72	73	73	74	74
Temperature operating range	°C	15-35	1-35 <sup>(6)</sup>	15-35	1-35 <sup>(6)</sup>	15-35	1-35 <sup>(6)</sup>
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	390	390	412	412	439	439
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

Performances refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Room temperature 35°C; relative humidity 80%.

(3) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

(4) Room temperature 30°C; relative humidity 80%; ambient temperature 35°C.

(5) Room temperature 35°C; relative humidity 80%; ambient temperature 35°C.

(6) S versions with hot gas defrost only.

## FL - FLD - FLZ

### FRAME

All FL units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all FL units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FANS

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers.

The electric motor is at 4 poles (about 1500 rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All FL units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles, the management of fresh and exhaust air, post heating valve and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all FL units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of the fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration

### REMOTE CONDENSER

The remote condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The fans are axial type with aluminium aerofoil blades complete of the safety fan guard. The protection class of the motors is IP 54. Furthermore the remote condenser is supplied of the low ambient condensing pressure control. This device controls the cooling circuit condensing pressure at different ambient temperatures, to keep it correct.

### DESUPERHEATER

#### (Only FLD versions)

The desuperheater is made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The fan of the desuperheater is axial type with aluminium aerofoil blades. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 60335. It's mounted on the unit frame by interposition of rubber vibration dampers.

## FL - FLD - FLZ

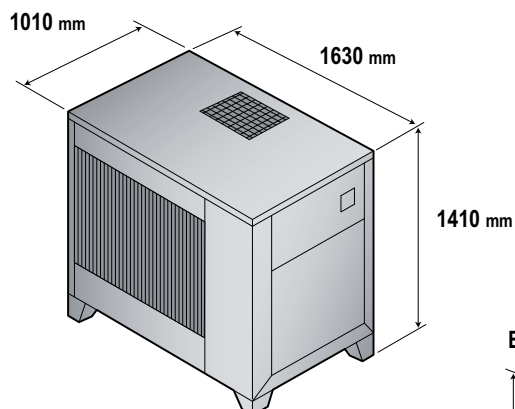
Versions FL - FLD - FLZ	Code	FL560	FL740	FL940	FLZ560	FLZ740	FLZ940
Integrated mechanical hygrostat	HYGR	○	○	○	–	–	–
Remote mechanical hygrostat	HYGR	○	○	○	–	–	–
Remote mechanical hygrostat + thermostat	HYGR	–	–	–	○	○	○
Available static pressure 200 Pa	PM	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	–	–	–
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Condensate discharge pump	POSC	○	○	○	○	○	○
Horizontal air discharge	HORI	○	○	○	○	○	○
Built in partial heat recovery version		–	–	–	–	–	–

Versions FL - FLD - FLZ	Code	FL560	FL740	FL940
Integrated mechanical hygrostat	HYGR	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○
Remote mechanical hygrostat + thermostat	HYGR	–	–	–
Available static pressure 200 Pa	PM	○	○	○
Floor trolley version	TROL	○	○	○
Stainless steel frame	INOX	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○
Condensate discharge pump	POSC	○	○	○
Horizontal air discharge	HORI	○	○	○
Built in partial heat recovery version		●	●	●

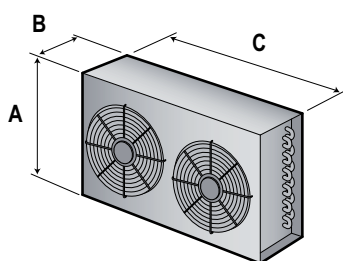
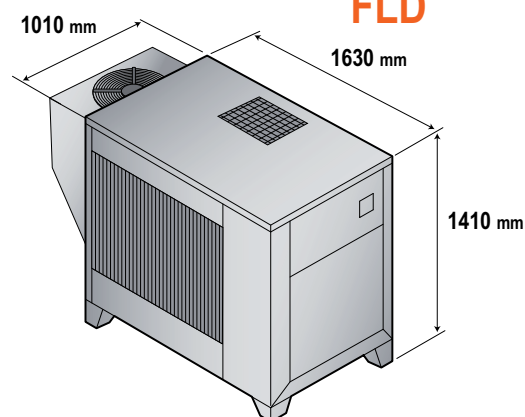
● Standard, ○ Optional, – Not available.

FL - FLD - FLZ

### FL - FLZ



### FLD



Remote condenser (Only Z versions)

Mod.	A (mm)	B (mm)	C (mm)	Kg
560	555	362	1980	65
740	828	428	2015	65
940	828	428	2915	90



## EHBT - EHZBT

Cold rooms dehumidifiers



Only EHZBT

EHBT low temperature dehumidifiers series are high-performances units especially designed for low temperature cold rooms rooms where the humidity level should be controlled during product storage treatment.

This series comprises 1 model which cover a capacity range of 84 l/24h.

EHBT units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

All units are supplied with hot gas defrost system and anti-freeze heater on condensate drip tray, they are fully assembled and wired at the factory.

### VERSIONS

- **Version with temperature control EHZBT:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HYGR:** Integrated mechanical hygostat.
- **HYGR:** Remote mechanical hygostat.
- **HYGR:** Remote mechanical hygostat + thermostat.
- **INOX:** Stainless steel frame.
- **PM:** Available static pressure 200 Pa.
- **TROL:** Floor trolley version.

## EHBT - EHZBT

Models EHBT		EHBT200
Moisture removed <sup>(1)</sup>	l/24h	84,4
Total power input <sup>(1)</sup>	kW	2,5
Max power input <sup>(2)</sup>	kW	2,8
Max input current <sup>(2)</sup>	A	7,6
Peak current	A	34,5
Air flow	m³/h	1900
Available static pressure	Pa	50
Refrigerant		R407C
Sound pressure <sup>(5)</sup>	dB(A)	62
Temperature operating range	°C	-1 +18
Humidity operating range	%	50-99
Weight	Kg	112
Power supply	V/Ph/Hz	400/3~+N/50

Models EHZBT		EHZBT200
Moisture removed <sup>(1)</sup>	l/24h	84,4
Input power <sup>(1)</sup>	kW	2,5
Cooling capacity <sup>(4)</sup>	kW	5,1
Total power input <sup>(4)</sup>	kW	2,2
Max power input	kW	2,9
Max input current	A	8,4
Peak current	A	35,3
Air flow	m³/h	1900
Available static pressure	Pa	50
Refrigerant		R407C
Sound pressure <sup>(3)</sup>	dB(A)	62
Temperature operating range	°C	-1 +18
Humidity operating range	%	50-99
Weight	Kg	112
Power supply	V/Ph/Hz	400/3~+N/50

Performances refer to the following conditions:

(1) Room temperature 15°C; relative humidity 80%.

(2) Room temperature 18°C; relative humidity 80%.

(3) Room temperature 15°C; relative humidity 80%; ambient temperature 35°C.

(4) Room temperature 18°C; relative humidity 80%; ambient temperature 35°C.

(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

## EHBT - EHZBT

### FRAME

All EH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all EH units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FAN

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers. The electric motor is at 4 poles (about 1500 rpm). Con-

nected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All EH units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. The moisture protection degree is IP55. In all EH units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of pumps and fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then

charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

### REMOTE CONDENSER

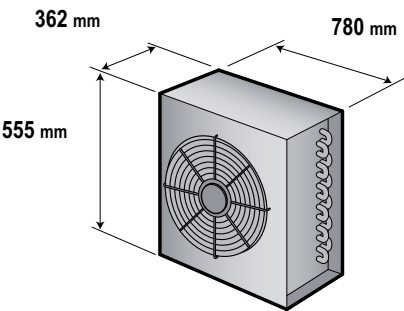
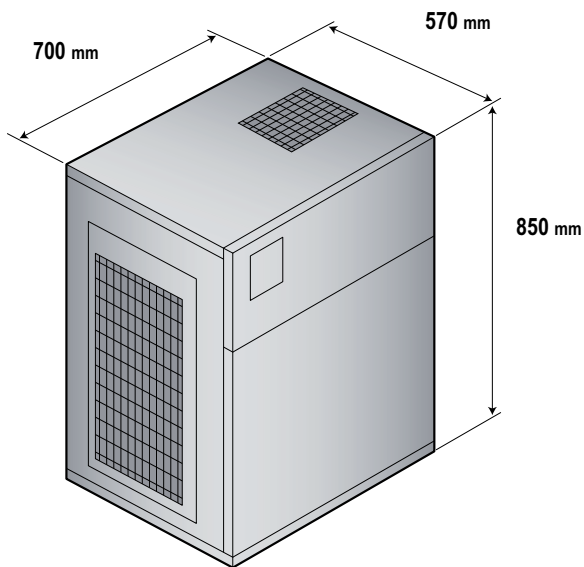
The remote condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The fans are axial type with aluminium aerofoil blades complete of the safety fan guard. The protection class of the motors is IP 54. Furthermore the remote condenser is supplied of the low ambient condensing pressure control. This device controls the cooling circuit condensing pressure at different ambient temperatures, to keep it correct.

# EHBT - EHZBT

Versions EHBT - EHZBT	Code	EHBT200	EHZBT200
Integrated mechanical hygrostat	HYGR	○	-
Remote mechanical hygrostat	HYGR	○	-
Remote mechanical hygrostat + thermostat	HYGR	-	○
Availabale static pressure 200 Pa	PM	○	○
Floor trolley version	TROL	○	-
Stainless steel frame	INOX	○	○
Air filter with frame for ducted installation	FARC	○	○

● Standard, ○ Optional, – Not available.

EHBT - EHZBT



Remote condenser (Only Z versions)

## ITMBT - ITMZBT - FLBT - FLZBT

Cold rooms dehumidifiers



ITMBT - ITMZBT



FLBT - FLZBT



Only ITMZBT -FLZBT

ITMBT low temperature dehumidifiers series are high-performances units especially designed for low temperature cold rooms rooms where the humidity level should be controlled during product storage treatment.

This series comprises 2 model which cover a capacity range from 155 to 190 l/24h. ITMBT units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

All units are supplied with hot gas defrost system and anti-freeze heater on condensate drip tray, they are fully assembled and wired at the factory.

### VERSIONS

- **Version with temperature control ITMZBT/FLZBT:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HYGR:** Integrated mechanical hygostat.
- **HYGR:** Remote mechanical hygostat.
- **HYGR:** Remote mechanical hygostat + thermostat.
- **INOX:** Stainless steel frame.
- **TROL:** Floor trolley version.
- **PM:** Available static pressure 200 Pa.
- **HORI:** Horizontal air discharge.
- **POSC:** Condensate discharge pump .

## ITMBT - ITMZBT - FLBT - FLZBT

Models ITMBT - FLBT		ITMBT330	ITMBT400	FLBT940
Moisture removed <sup>(1)</sup>	l/24h	155,8	189,8	456,9
Total power input <sup>(1)</sup>	kW	4,3	5,4	11,1
Max power input <sup>(2)</sup>	kW	4,5	7,0	13,5
Max input current <sup>(2)</sup>	A	11,7	13,7	30,5
Peak current	A	66,2	74,7	170,5
Air flow	m³/h	3600	4100	8200
Available static pressure	Pa	50	50	50
Refrigerant		R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	66	68	74
Temperature operating range	°C	-1 +18	-1 +18	-1 +18
Humidity operating range	%	50-99	50-99	50-99
Weight	Kg	184	188	451
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50

Models ITMZBT - FLZBT		ITMZBT330	ITMZBT400	FLZBT940
Moisture removed <sup>(1)</sup>	l/24h	155,8	189,8	456,9
Input power <sup>(1)</sup>	kW	4,3	5,4	11,1
Cooling capacity <sup>(3)</sup>	kW	10,9	12,1	24,7
Total power input <sup>(3)</sup>	kW	6,0	7,0	11,1
Max power input <sup>(4)</sup>	kW	4,5	7,0	13,5
Max input current <sup>(4)</sup>	A	13,4	15,4	35,4
Peak current	A	67,9	74,7	173,4
Air flow	m³/h	3600	4100	8200
Available static pressure	Pa	50	50	50
Refrigerant		R407C	R407C	R407C
Sound pressure <sup>(3)</sup>	dB(A)	66	68	74
Temperature operating range	°C	-1 +18	-1 +18	-1 +18
Humidity operating range	%	50-99	50-99	50-99
Weight	Kg	184	220	451
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50

Performances refer to the following conditions:

(1) Room temperature 15°C; relative humidity 80%.

(2) Room temperature 18°C; relative humidity 80%.

(3) Room temperature 15°C; relative humidity 80%; ambient temperature 35°C.

(4) Room temperature 18°C; relative humidity 80%; ambient temperature 35°C.

(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.



## ITMBT - ITMZBT - FLBT - FLZBT

### FRAME

All ITM units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all ITM units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

The condensers and evaporators are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All the units have a stainless steel drip tray. Besides this, each evaporator is supplied of a temperature probe used as automatic antifreeze probe.

### FAN

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by

interposition of rubber vibration dampers. The electric motor is at 4 poles (about 1500 rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All ITM units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles, alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all ITM units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of pumps and fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, who signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

### REMOTE CONDENSER

The remote condensers are made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. The fans are axial type with aluminium aerofoil blades complete of the safety fan guard. The protection class of the motors is IP 54. Furthermore the remote condenser is supplied of the low ambient condensing pressure control. This device controls the cooling circuit condensing pressure at different ambient temperatures, to keep it correct.

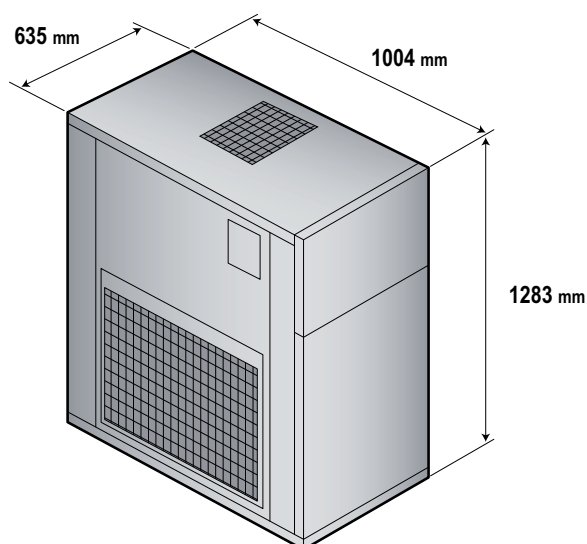
## ITMBT - ITMZBT - FLBT - FLZBT

Versions ITMBT - ITMZBT - FLBT - FLZBT	Code	ITMBT330	ITMBT400	FLBT940	ITMZBT330	ITMZBT400	FLZBT940
Integrated mechanical hygrostat	HYGR	○	○	○	–	–	–
Remote mechanical hygrostat	HYGR	○	○	○	–	–	–
Remote mechanical hygrostat + thermostat	HYGR	–	–	–	○	○	○
Available static pressure 200 Pa	PM	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	–	–	–
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Condensate discharge pump	POSC	–	–	○	–	–	○
Horizontal air discharge	HORI	–	–	○	–	–	○

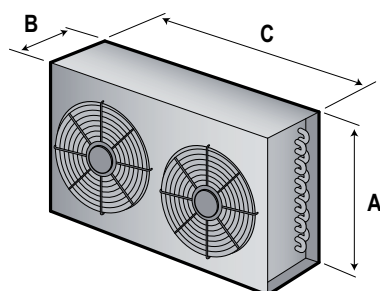
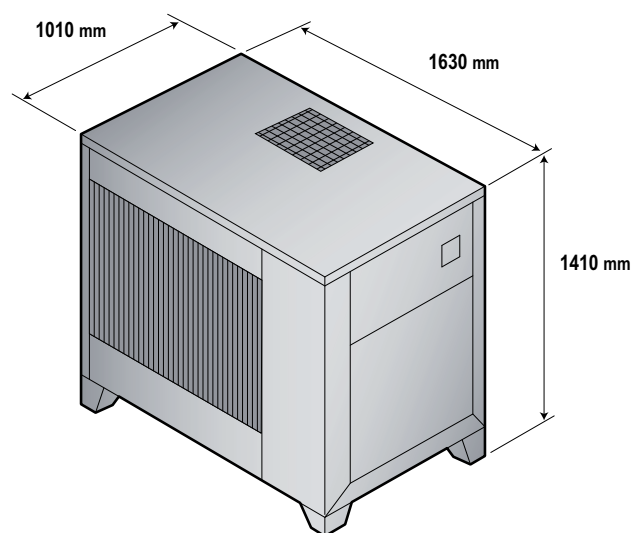
● Standard, ○ Optional, – Not available.

ITMBT - ITMZBT - FLBT - FLZBT

### ITMBT



### FLBT



Remote condenser (Only Z versions)

Mod.	A (mm)	B (mm)	C (mm)
ITMZBT	555	362	1380
FLZBT	828	428	2015

## SBA

### Swimming pool dehumidifiers



**SBA (A)**



Display



**SBA (P)**

Series SBA dehumidifier are expressly designed for use in swimming pools where humidity should be closely controlled in order to guarantee optimal comfort. This series comprises five models which cover a capacity range from 50 to 200 l/24h.

SBA units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

### VERSIONS

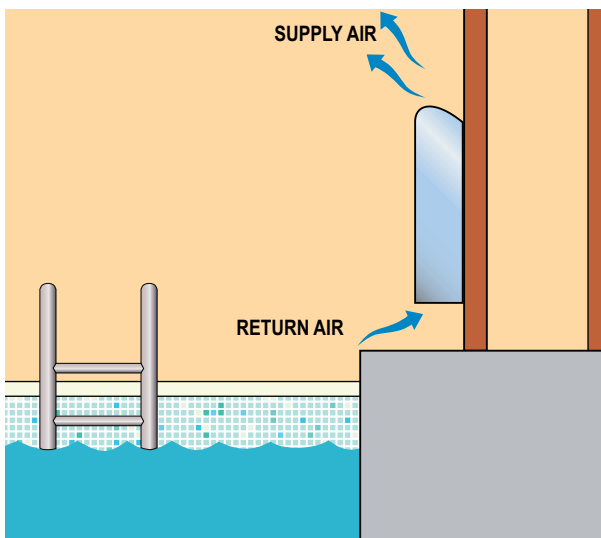
- Version with cabinet (A).
- Ductable units (P).

### ACCESSORIES

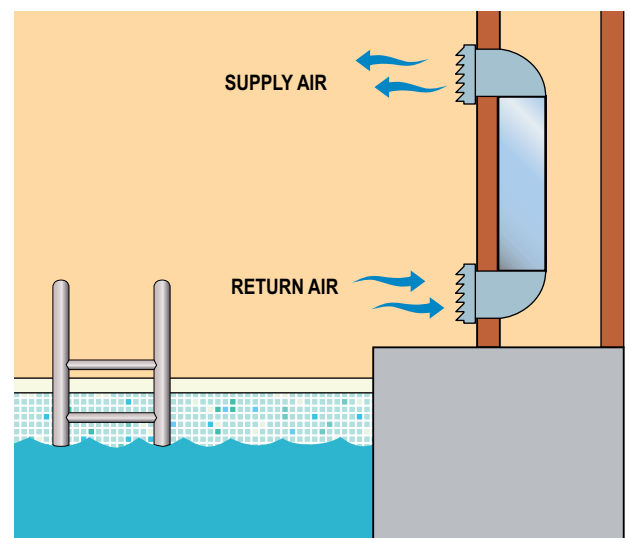
- **HOEL:** Electric heater kit.
- **HOWA:** Hot water coil.
- **HYGR:** Remote mechanical hygrost.
- **HYGR:** Remote mechanical hygrost + thermostat.
- **KGBH:** Louver kit and case for ducted version.
- **KIVA:** On/Off 3 way valve kit installed.
- **PMBH:** Delivery and return plenum 90° (2 pieces).
- **ZOCC:** Feet.
- **SOND:** Built in electronic temperature and humidity probe.

Models SBA/A-P		50	75	100	150	200
Moisture removed at 30°C - 80%	l/24h	49,0	73,0	95,0	155,0	190,0
Moisture removed at 30°C - 60%	l/24h	40,1	56,6	77,3	113,1	143,5
Moisture removed at 27°C - 60%	l/24h	35,6	50,7	68,9	96,6	131,7
Moisture removed at 20°C - 60%	l/24h	25,8	35,6	51,3	71,5	96,6
Nominal input power <sup>(1)</sup>	kW	0,9	1,2	1,6	1,9	2,5
Maximum input power <sup>(1)</sup>	kW	1,2	1,5	2,0	2,3	3,1
Supplementary electric heater	kW	3	3	3	6	6
Maximum input power <sup>(1)</sup>	A	3,9	5,6	8,4	10,5	13,2
Peak current	A	19,1	20,1	38,4	44,7	63,7
Hot water coil <sup>(2)</sup>	kW	3,5	7,0	7,0	11,5	11,8
Air Flow	m³/h	450	700	700	1200	1200
Available static pressure	Pa	40	40	40	40	40
Refrigerant		R410A	R410A	R410A	R410A	R410A
Sound pressure <sup>(3)</sup>	dB(A)	47	50	50	52	54
Temperature operating range	°C	20-36	20-36	20-36	20-36	20-36
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99
Weight	Kg	41	49	55	72	78
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

STANDARD VERSION (A)



DUCTED VERSION (P)



Performances refer to the following conditions:

(1) Without the use of electrical heater.

(2) Room temperature 32°C; water temperature 80/70°C, at compressor OFF

(3) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

## SBA

### FRAME

All SBA units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents and to operate in aggressive environments. The frame is self-supporting with removable panels. A PVC drip tray is installed on all units. The colour of the unit is RAL 9010 both for the base and for the frontal panel.

### REFRIGERANT CIRCUIT

The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in these units is R410A. The refrigerant circuit includes: capillary tube, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressors are rotative type, with thermal overload protection by a klixon embedded in the motor winding. The compressor is mounted on rubber vibration dampers and it is supplied, standard, with sound-proof cover to reduce noise emission. The inspection is possible through the frontal panel of the unit that allows the maintenance of the compressor.

### CONDENSER AND EVAPORATOR

Condensers and evaporators are made of copper pipes and aluminium fins. All evaporators are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,15 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these heat exchangers guarantees a low air side pressure drop and then the use of low rota-

tion (and low noise emission) fans. All units are supplied, standard, with a PVC drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

### FAN

The fans are made of galvanized steel, centrifugal type. It is statically and dynamically balanced and supplied. The electric motors are directly connected to the fan; they are all at 3 speeds, with integrated thermal protection. The protection class of the motors is IP 54.

### AIR FILTER

It is made of synthetic filtering media, ondulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G2, according to EN 779:2002.

### MICROPROCESSOR

All SBA units are supplied standard with microprocessor controls. The microprocessor controls the following functions: regulation of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, potential free contact for remote general alarm, alarms and operation leds.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. If the unit is endowed of cabinet, after its removal.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed

and controls its termination, high pressure switch with automatic reset, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R410A. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

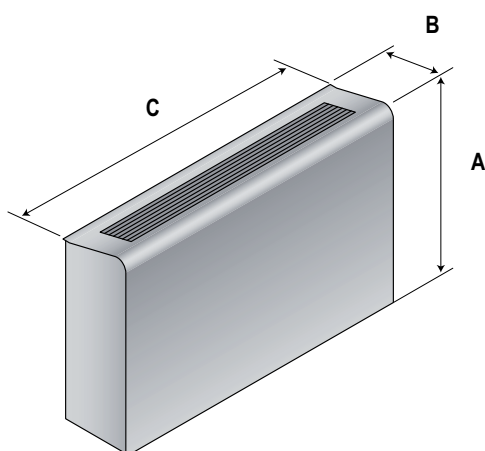
## SBA

Versions SBA/A	Code	50	75	100	150	200
Built-in electronic thermostat + hygrostat control with display		●	●	●	●	●
Hot water coil	HOWA	○	○	○	○	○
Electric heater kit	HOEL	○	○	○	○	○
Built in electronic temperature and humidity probe	SOND	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○
Remote mechanical hygrostat + thermostat	HYGR	○	○	○	○	○
On/Off 3 way valve kit installed	KIVA	○	○	○	○	○
Delivery and return plenum 90° (2 pieces)	PMBH	–	–	–	–	–
Louver kit and case for ducted version	KGBH	–	–	–	–	–
Feet	ZOCC	○	○	○	○	○

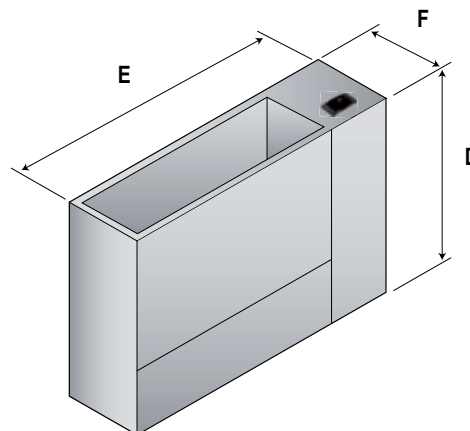
● Standard, ○ Optional, – Not available.

Versions SBA/P	Code	50	75	100	150	200
Built-in electronic thermostat + hygrostat control with display		●	●	●	●	●
Hot water coil	HOWA	○	○	○	○	○
Electric heater kit	HOEL	○	○	○	○	○
Built in electronic temperature and humidity probe	SOND	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○
Remote mechanical hygrostat + thermostat	HYGR	○	○	○	○	○
On/Off 3 way valve kit installed	KIVA	○	○	○	○	○
Delivery and return plenum 90° (2 pieces)	PMBH	○	○	○	○	○
Louver kit and case for ducted version	KGBH	○	○	○	○	○
Feet	ZOCC	–	–	–	–	–

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)
50	750	260	760
75	750	260	1060
100	750	260	1060
150	750	310	1310
200	750	310	1310



Mod.	D (mm)	E (mm)	F (mm)
50	680	706	250
75	680	1006	250
100	680	1006	250
150	770	1255	300
200	770	1255	300



## SDH - SEH

Swimming pool dehumidifiers



### SDH



### SEH



Series SDH dehumidifier are expressly designed for use in swimming pools where humidity should be closely controlled in order to guarantee optimal comfort. These units are intended to be installed in a technical room close to the swimming pool. A centrifugal fan with high available static pressure allows unit connection to ductworks, both for air suction and discharge. This series comprises 2 basic models which cover a capacity range from 94 to 124 l/24h.

### VERSION

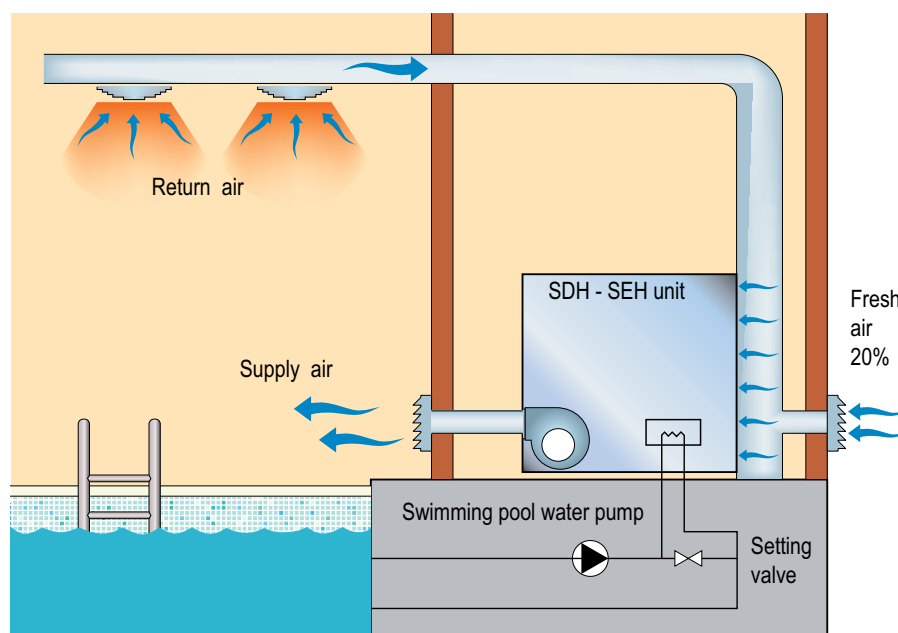
- The series includes 2 models with air flows from 1000 to 1200 m<sup>3</sup>/h.

### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HOEL:** Electric heater kit ( 3kW, 4,5kW, 6kW).
- **HOWA:** Hot water coil.
- **HYGR:** Remote mechanical hygrost.
- **HYGR:** Remote mechanical hygrost + thermostat.
- **KIVA:** On/Off 3 way valve kit installed.
- **LS00:** Low noise version (with insulation of the compressor vane).
- **RP00:** Partial heat recovery.

## SDH - SEH

Models SDH - SEH		SDH100	SDH120	SEH160	SEH200
Moisture removed <sup>(1)</sup>	l/24h	94,1	123,0	164,3	194,1
Total power input <sup>(1)</sup>	kW	1,7	2,2	2,6	3,0
Max power input <sup>(2)</sup>	kW	2,3	2,7	3,2	3,2
Max input current <sup>(2)</sup>	A	8,7	9,3	7,2	8,1
Peak current	A	33,1	37,1	27,0	35,0
Partial heat recovery <sup>(3)</sup>	kW	1,35	1,35	2,0	2,6
Hot water coil <sup>(4)</sup>	kW	8,6	8,6	11,2	14,4
Air flow	m <sup>3</sup> /h	1000	1200	1400	1900
Available static pressure	Pa	200	200	180	180
Refrigerant		R407C	R407C	R407C	R407C
Sound pressure <sup>(5)</sup>	dB(A)	59,5	60,5	61,5	62,5
Temperature operating range	°C	15-36	15-36	15-36	15-36
Humidity operating range	%	50-99	50-99	50-99	50-99
Weight	Kg	133	147	159	169
Power Supply	V/Ph/Hz	230/1/50	230/1/50	400/3+N/50	400/3+N/50



Performances refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Water temperature in/out 25/30°C.

(3) Room temperature 32°C; water temperature 80/70°C.

(4) At 1 mt from the unit in free field conditions according to ISO 9614.

## SDH - SEH

### FRAME

All SDH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets are in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressors are rotary with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. The compressors are mounted on rubber vibration dampers and they can be supplied with sound attenuation jacket to reduce the noise emission (option). The inspection on the compressors is possible only through the unit front panel.

### CONDENSER AND EVAPORATOR

Condensers and evaporators are made of copper pipes and aluminium fins. All evaporators are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these heat exchangers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All units are supplied, standard, with a stainless steel drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

### FAN

The fans are made of galvanized steel, centrifugal type, double inlet with forward curved blades. They are statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. They are mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are 4 poles (about 1500 rpm), three-phase power supply. The motors are connected to the fans by pulleys and belts. The protection class of the motors is IP 54.

### AIR FILTER

It is made of synthetic filtering media, undulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G1, according to EN 779:2002.

### MICROPROCESSOR

All SDH units are supplied standard with microprocessor controls. The microprocessor controls the following functions: regulation of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, potential free contact for remote general alarm, alarms and operation led.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. The following components are also standard installed: main switch, magnetic-thermal switches (as a protection fans and compressors), control circuit automatic breakers, compressor contactors, fan contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF and general alarm.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: antifreeze protection sensor, high pressure switch with manual reset, low pressure switch with

automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all SHH units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of the fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

## SDH - SEH

Versionsi SDH	Code	100	120
Remote mechanical hygrostat	HYGR	○	○
Remote mechanical hygrostat + thermostat	HYGR	○	○
Partial heat recovery	RP00	○	○
Hot water coil	HOWA	○	○
On/Off 3 way valve kit installed	KIVA	○	○
Electric heater kit 3 kW (230/1~/50)	HOEL	○	○
Electric heater kit 4,5 kW (230/1~/50)	HOEL	○	○
Electric heater kit 6 kW (230/1~/50)	HOEL	○	○
Low noise version with insulation of the compressor vane	LS00	○	○

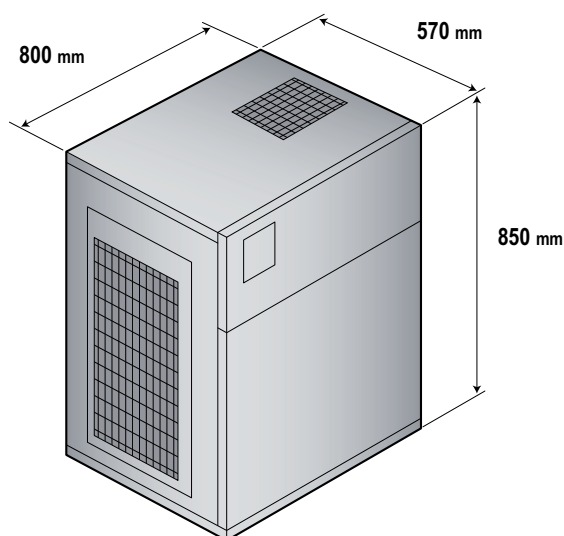
● Standard, ○ Optional, – Not Available.

Versions SEH	Code	160	200
Remote mechanical hygrostat	HYGR	○	○
Remote mechanical hygrostat + thermostat	HYGR	○	○
Partial heat recovery	RP00	○	○
Hot water coil	HOWA	○	○
On/Off 3 way valve kit installed	KIVA	○	○
Electric heater kit 3 kW (230/1~/50)	HOEL	○	○
Electric heater kit 4,5 kW (230/1~/50)	HOEL	○	○
Electric heater kit 6 kW (230/1~/50)	HOEL	○	○
Electric heater kit 6 kW (400/3~+N/50)	HOEL	○	○
Electric heater kit 12 kW (400/3~+N/50)	HOEL	○	○
Low noise version with insulation of the compressor vane	LS00	○	○
Air filter with frame for ducted installation	FARC	○	○

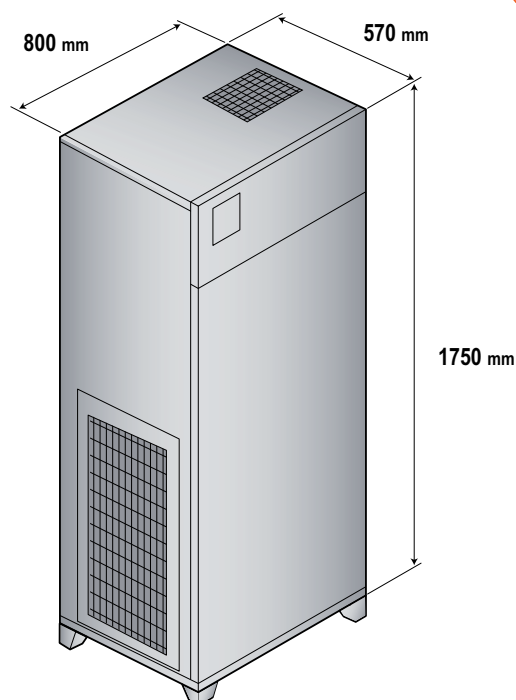
● Standard, ○ Optional, – Not Available.

SDH - SEH

### SDH



### SEH



## SHH

### Swimming pool dehumidifiers



SHH

Series SHH dehumidifier are expressly designed for use in swimming pools where humidity should be closely controlled in order to guarantee optimal comfort. These units are intended to be installed in a technical room close to the swimming pool. A centrifugal fan with high available static pressure allows unit connection to ductworks, both for air suction and discharge. This series comprises 5 basic models which cover a capacity range from 330 to 937 l/24h.

#### VERSIONS

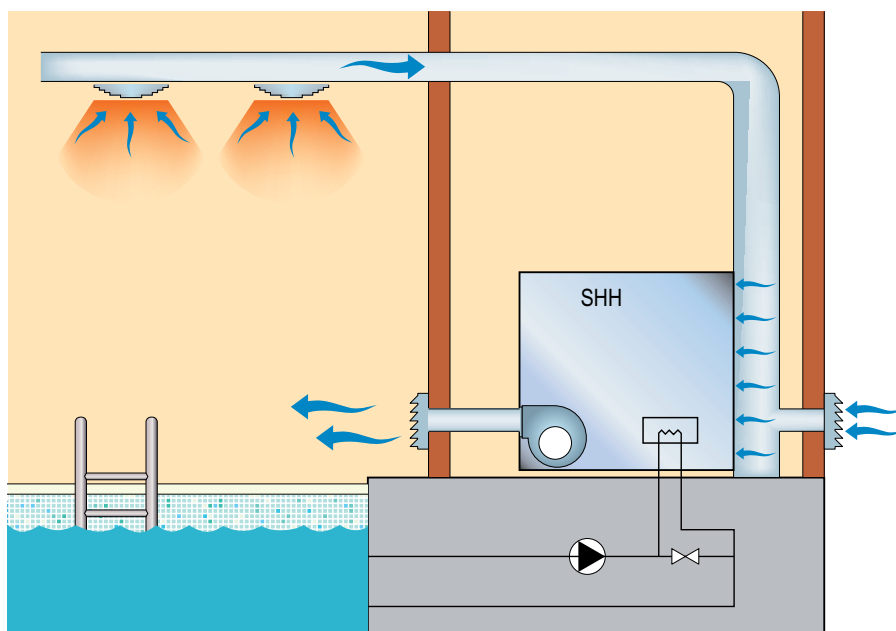
- The series includes 5 models with air flows from 3800 to 8200 m<sup>3</sup>/h.

#### ACCESSORIES

- **FARC:** Air filter with frame for ducted installation.
- **HOEL:** Electric heater kit ( 3kW, 4,5kW, 6kW, 12kW).
- **HOWA:** Hot water coil.
- **HYGR:** Remote mechanical hygostat.
- **HYGR:** Remote mechanical hygostat + thermostat.
- **KIVA:** On/Off 3 way valve kit installed.
- **LS00:** Low noise version with insulation of the compressor vane.
- **POSC:** Condensate discharge pump .
- **RP00:** Partial heat recovery.
- **HORI:** Horizontal air discharge.

# SHH

Models SHH		330	400	560	740	940
Moisture removed <sup>(1)</sup>	l/24h	329,9	414,8	564,1	738,5	937,3
Total power input <sup>(1)</sup>	kW	5,3	6,6	8,7	11,7	15,6
Max power input	kW	6,4	7,9	9,3	13,3	17,9
Max input current	A	17,6	19,6	20,0	26,0	32,3
Peak current	A	72,1	80,6	102,0	131,0	172,3
Partial heat recovery <sup>(3)</sup>	kW	4,8	5,7	7,7	10,2	13,1
Hot water coil <sup>(4)</sup>	kW	21,8	21,8	36,2	46,0	55,7
Air flow	m <sup>3</sup> /h	3800	3800	5150	6850	8200
Available static pressure	Pa	230	230	250	250	250
Refrigerant		R407C	R407C	R407C	R407C	R407C
Sound pressure <sup>(5)</sup>	dB(A)	67	69	72	73	74
Temperature operating range	°C	15-36	15-36	15-36	15-36	15-36
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99
Weight	Kg	195	209	405	421	450
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



Performances refer to the following conditions:

- (1) Room temperature 30°C; relative humidity 80%.
- (2) Room temperature 35°C; relative humidity 80%.
- (3) Water temperature in / out 25-30°C.

(4) Room temperature 32°C; water temperature 80/70°C.

(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.



## SHH

### FRAME

All SHH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. The drip tray is present standard in all SHH units and it's in stainless steel. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. It's mounted on rubber vibration dampers and, by request, it can be supplied with some jackets to reduce the noise (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit.

### CONDENSER AND EVAPORATOR

Condensers and evaporators are made of copper pipes and aluminium fins. All evaporators are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these heat exchangers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All units are supplied, standard, with a stainless steel drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

### FANS

The fan is centrifugal type. It's statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It's mounted on the unit frame by interposition of rubber vibration dampers. The electric motor is at 4 poles (about 1500 rpm). Connected to the fan by belts and pulleys and it's equipped of an integrated thermal overload protection. The protection class of the motors is IP 54.

### AIR FILTER

It's supplied standard with the unit. It's made of filtering material in synthetic fibre without electrostatic charge. It can be removed for differential disposal, class G3, according to EN 779:2002.

### MICROPROCESSOR

All SHH units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles, the management of fresh and exhaust air, post heating valve and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all SHH units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal switches (as a protection of the fans), compressors fuses, control circuit automatic breakers, compressor contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### TEST

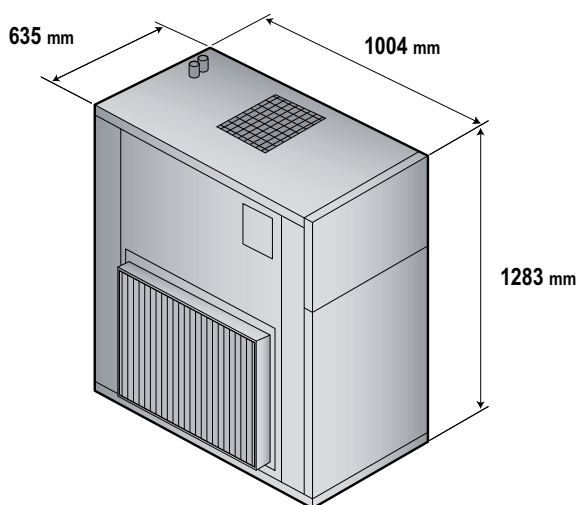
All the units are fully assembled and wired at the factory, carefully evacuated and dried after leak tests under pressure and then charged with refrigerant R407C. They are all fully operational tested before shipment. They all conform to European Directives and are individually marked with the CE label and provided with Conformity Declaration.

# SHH

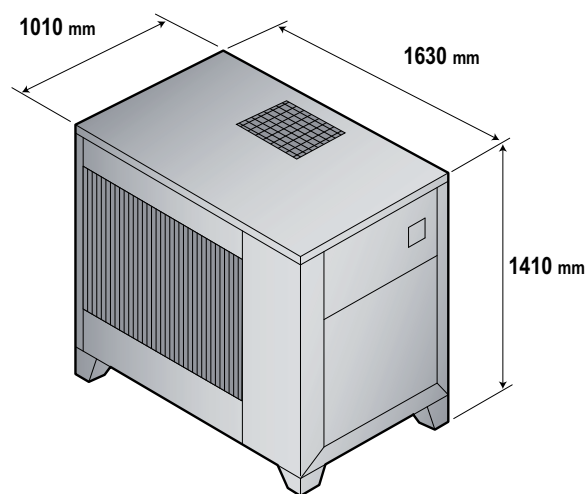
Versions SHH	Code	330	400	560	740	940
Remote mechanical hygrostat	HYGR	○	○	○	○	○
Remote mechanical hygrostat + thermostat	HYGR	○	○	○	○	○
Condensate discharge pump	POSC	–	–	○	○	○
Partial heat recovery	RP00	○	○	○	○	○
Hot water coil	HOWA	○	○	○	○	○
On/Off 3 way valve kit installed	KIVA	○	○	○	○	○
Electric heater kit 6 kW (400/3~+N/50)	HOEL	○	○	○	○	○
Electric heater kit 12 kW (400/3~+N/50)	HOEL	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○
Low noise version with insulation of the compressor vane	LS00	○	○	○	○	○
Horizontal air discharge	HORI	–	–	○	○	○

● Standard, ○ Optional, – Not Available.

SHH



SHH330 / SHH400



SHH560 / SHH740 / SHH940

## SRH

### Swimming pool dehumidifiers



SRH

Series SRH dehumidifier are expressly designed for use in swimming pools where humidity should be closely controlled in order to guarantee optimal comfort. These units are intended to be installed in a technical room close to the swimming pool. A centrifugal fan with high available static pressure allows unit connection to ductworks, both for air suction and discharge. This series comprises 6 basic models which cover a capacity range from 1150 to 3000 l/24h. All the units are fully assembled and wired at the factory.

#### VERSIONS

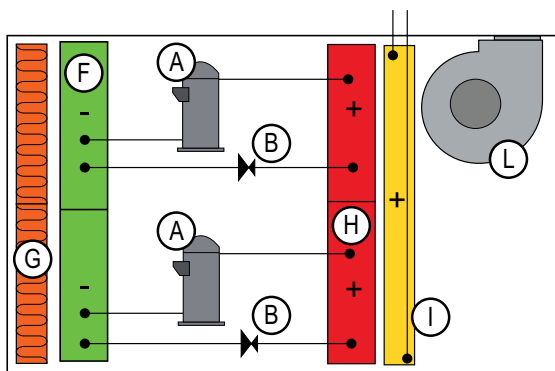
**SRH/WZ unit with heat recovery:** The unit is designed to have one refrigerant circuit condensed by air, the other one condensed both by water and air. If the unit is supplied with the advanced control panel it is possible to set operation priorities (air or water). In the SRH/WZ versions the heat recovery is designed to reject on the water about 50% of the total thermal load generated by the unit. When the heat recovery is activated, the supply air temperature of the unit is, basically, the same of the return air, so, in this case, the dehumidification is performed without air temperature increase. This operation mode is suitable during intermediate seasons when the humidity in the swimming pool has to be controlled but also the room air temperature overheating has to be avoided.

#### ACCESSORIES

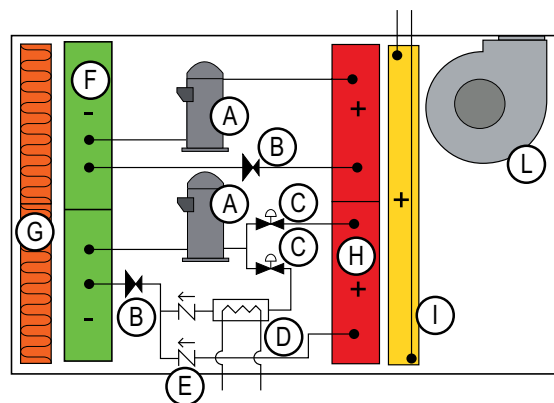
- **CONT:** Advanced control panel (Humidity+ Temperature control).
- **FARC:** Air filter with frame for ducted installation.
- **HORI:** Horizontal air discharge (Opposite side coils).
- **HOWA:** Hot water coil.
- **KIVA:** On/Off 3 way valve kit installed.
- **KIVA:** Modulating 3 way valve kit installed.
- **LS00:** Low noise version.
- **MAML:** Manometers.
- **PM:** Oversized static pressure 400 Pa.

Models SRH		1100	1300	1500	1800	2200	3000
Moisture removed <sup>(1)</sup>	l/24h	1130	1285	1480	1855	2310	3050
Nominal input power <sup>(1)</sup>	kW	14,1	16,5	19,3	23,6	27,6	37,2
Maximum input power <sup>(2)</sup>	kW	19,9	23,6	26,8	36,3	41,8	55,8
Nominal input current <sup>(2)</sup>	A	41,1	47,1	54,6	64,6	74,6	97,9
Maximum input current	A	123,1	150,1	159,6	204,6	240,6	281,9
Hot water coil <sup>(3)</sup>	kW	72	88	94	112	125	155
Air flow	m <sup>3</sup> /h	9500	10500	13000	15000	17000	25000
Available static pressure	Pa	250	250	250	250	250	250
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Sound pressure <sup>(4)</sup>	dB(A)	69	70	72	72	73	74
Temperature operating range	°C	15-36	15-36	15-36	15-36	15-36	15-36
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	580	710	770	830	940	1290
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

STANDARD VERSION



WZ VERSION



A	Compressor	F	Evaporator
B	Expansion valve	G	Air filter
C	Solenoid valve	H	Condenser
D	Heat recovery	I	Hot watercoil (accessory)
E	One way valve	L	Fan

Performances refer to the following conditions:

(1) Room temperature 30°C; relative humidity 80%.

(2) Room temperature 35°C; relative humidity 80%

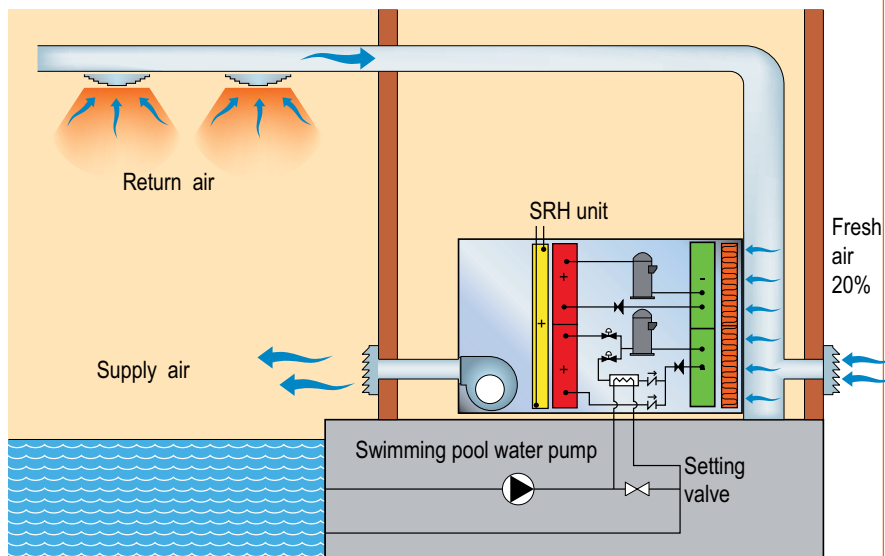
(3) Room temperature 32°C; water temperature 80/70°C.

(4) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

## SRH

### Typical Installation

The picture on the right shows a typical installation of the SRH units; Normally, the unit is installed in the technical room and ducted on both sides (supply and return). In many installations it is installed a fresh air duct designed for 15-20% airflow. Clearly, in this application also an exhaust fan has to be installed in order to avoid over pressure in the swimming pool. The water valve present in the heat recovery hydraulic circuit has to be set in order to guarantee the nominal water flow in the heat recovery.



### FRAME

All SRH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents. The frame is self-supporting with removable panels. All screws and rivets are in stainless steel. The colour of the units is RAL 7035.

### CIRCUITO FRIGORIFERO

The refrigerant gas used in these units is R407C. The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. All units are supplied with two circuits, each refrigerant circuit is totally independent from the other. Any incorrect operation of one circuit does not influence the other circuit. The refrigerant circuit includes: SRH liquid line manual shut-off valve, sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device (according to PED regulation). SRH/WZ. These versions are supplied with one refrigerant circuit identical to the SRH version, the second circuit includes: one way valves, solenoid valves, liquid receiver, water heat recovery, liquid line shut-off valve, sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control, pressure safety device.

### COMPRESSOR

The compressors are scroll type with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. The compressors are mounted on rubber vibration dampers and they can be supplied with sound attenuation jacket to reduce the noise emission (option). The compressor crankcase heater is always powered when the unit is in stand-by. The inspection on the compressors is possible only through the unit front panel.

### CONDENSER AND EVAPORATOR

Condensers and evaporators are made of copper pipes and aluminium fins. All evaporators are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these heat exchangers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All units are supplied, standard, with a Stainless steel drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

### FANS

The fans are made of galvanized steel, centrifugal type, double inlet with forward

curved blades. They are statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. They are mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are 4 poles (about 1500 rpm), three-phase power supply. The motors are connected to the fans by pulleys and belts. The protection class of the motors is IP 54.

### AIR FILTER

Supplied as standard with the unit, it is made of G3 class synthetic fibre filtering media (efficiency 85% by weight), 48 mm thickness.

### MICROPROCESSOR

All SRH units can be supplied with 2 kind of controls:

#### Basic control

it manages the following features: antifreeze protection, compressor timing, compressor automatic starting sequence, defrost cycle, alarm reset, potential free contact for remote general alarm.

#### Advanced control

in addition to the basic control it manages a wider range of features as: setting the priority operation mode (SRH/WZ only), managing of the main and the secondary set points, display of the alarms with historical list, time band operation, integration with hot water coil and modulating valve. Upon request the advanced control can be

## SRH

connected to a BMS system for the remote control and management. The technical department is available to study, together with the customer, different solutions using MODBUS; LONWORKS; BACNET or TREND protocols.

### ELECTRONIC PROBE TEMPERATURE-HUMIDITY

This sensor is supplied standard on the SRH/WZ versions supplied with advanced control.

It can be installed either in the room or in the return duct (to be specified before order) and allow the operation of the unit in the following modes:

Dehumidification

Heating ( by hot water coil)

Dehumidification + heating

Dehumidification + heat recovery

### ELECTRIC BOX

The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all SRH units are installed, standard, the compressors sequence relay who disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard installed: main switch, magnetic-thermal

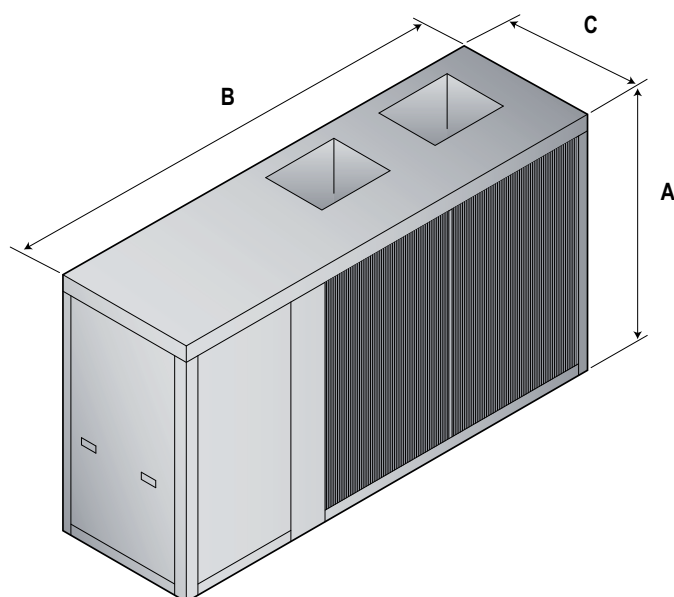
switches (as a protection fans and compressors), control circuit automatic breakers, compressor contactors, fan contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF and general alarm.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: antifreeze protection sensor, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

Versions SRH	Code	1100	1300	1500	1800	2200	300
Advanced control panel (Humidity + temperature control)	CONT	●	●	●	●	●	●
Low noise version (LS)	LS00	○	○	○	○	○	○
Hot water coil	HOWA	○	○	○	○	○	○
On/Off 3 way valve kit installed	KIVA	○	○	○	○	○	○
Modulating 3 way valve kit installed	KIVA	○	○	○	○	○	○
Available static pressure 400 Pa	PM	○	○	○	○	○	○
Horizontal air discharge ( opposite side coils )	HORI	○	○	○	○	○	○
Manometers	MAML	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.



Mod.	A (mm)	B (mm)	C (mm)
1100	1250	1870	850
1300	1250	1870	850
1500	1566	2608	1105
1800	1566	2608	1105
2200	1566	2608	1105
3000	1566	3608	1105

## UTH - UTHZ

Energy recovery high efficiency dehumidifiers



UTH - UTHZ

The energy recovery high efficiency dehumidifiers UTH range have been designed to grant the complete control of temperature, humidity, the energy recovery and the fresh air treatment in the covered swimming pools or in other applications with very high internal loads. The UTH units can operate in environments up to 36°C and are able to manage up to 30% of fresh air.

The range includes 7 models, which covers airflows range from 1500 to 6000 m³/h.

The use of double-passagage-cross-flow energy recovery allows to increase up to 20% the dehumidification capacity in comparison to the traditional dehumidifiers.

The use of the double passage in the energy recovery, in fact, allows the free sensible pre-cooling of the air near to the saturation point, giving so the possibility to the unit to work, basically, in latent load.

### VERSIONS

- **Version with temperature control UTHZ:** These versions are supplied with a remote condenser and are used in those applications where it is necessary the simultaneous control of temperature and humidity: Dehumidification mode: the internal condenser is activated; the unit dehumidifies and heats up the room temperature; Cooling mode: the remote condenser is activated; the unit dehumidifies and cools down the room temperature.

### ACCESSORIES

- **RP00:** Partial heat recovery.
- **DBRC:** Low ambient temperature device with heat recovery.
- **VECE:** High efficiency E.C. fans



## UTH - UTHZ

Models UTH		015	020	028	035	042	052	060
Moisture removed <sup>(1)</sup>	l/24h	89,0	110,3	212,9	251,7	326,0	421,0	516,4
Moisture removed <sup>(2)</sup>	l/24h	182,3	235,2	406,1	501,0	588,2	753,8	909,6
Nominal input power <sup>(1)</sup>	kW	2,5	3,0	4,8	6,1	7,0	9,1	10,4
Maximum input current	A	6,2	7,0	10,4	13,6	15,3	20,4	22,8
Partial heat recovery <sup>(3)</sup> (accessory)	kW	2,2	2,2	3,7	4,5	5,8	6,7	8,1
Hot water coil <sup>(4)</sup>	kW	15,0	18,3	28,4	33,0	44,0	50,8	55,8
Total air flow	m³/h	1500	2000	2800	3500	4200	5200	6000
Available static pressure	Pa	200	200	200	200	200	200	200
Maximum fresh air flow	m³/h	450	600	845	1050	1260	1560	1800
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C	R407C
Sound pression <sup>(5)</sup>	dB (A)	63	63	66	66	68	69	69
Temperature operating range	°C	10-36	10-36	10-36	10-36	10-36	10-36	10-36
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	290	305	400	420	570	590	620
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

Performances refer to the following conditions:

(1) Room temperature 30°C; relative humidity 60%, fresh air 0%.

(2) Room temperature 30°C; relative humidity 60%, fresh air 30% (5°C-80%).

(3) Water temperature in / out 25-30°C.

(4) Room temperature 32°C; water temperature 80/70°C.

(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

Models UTHZ		015	020	028	035	042	052	060
Moisture removed <sup>(1)</sup>	l/24h	91,0	113,7	217,7	256,5	323,1	417,6	509,1
Moisture removed <sup>(2)</sup>	l/24h	182,3	235,2	406,1	501,0	588,2	753,8	909,6
Cooling capacity <sup>(3)</sup>	kW	6,1	7,7	13,1	15,3	19,2	23,9	27,8
Nominal input power <sup>(1)</sup>	kW	2,5	3,0	4,8	6,1	7,0	9,1	10,4
Maximum input current	A	6,5	7,4	13,0	15,3	17,2	22,3	25,3
Partial heat recovery <sup>(4)</sup> (accessory)	kW	2,2	2,2	3,7	4,5	5,8	6,7	8,1
Hot water coil <sup>(5)</sup>	kW	15,0	18,3	28,4	33,0	44,0	50,8	55,8
Total air flow	m³/h	1500	2000	2800	3500	4200	5200	6000
Available static pressure	Pa	200	200	200	200	200	200	200
Maximum fresh air flow	m³/h	450	600	845	1050	1260	1560	1800
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C	R407C
Sound pression <sup>(6)</sup>	dB (A)	63	63	66	66	68	69	69
Temperature operating range	°C	10-36	10-36	10-36	10-36	10-36	10-36	10-36
Humidity operating range	%	50-99	50-99	50-99	50-99	50-99	50-99	50-99
Weight	Kg	290	305	400	420	570	590	620
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

Performances refer to the following conditions:

(1) Room temperature 30°C; relative humidity 60%, fresh air 0%.

(2) Room temperature 30°C; relative humidity 60%, fresh air 30% (5°C-80%).

(3) Room temperature 30°C; relative humidity 60%, fresh air 0% (35°C-50%).

(4) Water temperature in / out 25-30°C.

(5) Room temperature 32°C; water temperature 80/70°C.

(6) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

## UTH - UTHZ

Liquid line refrigerant charge			
Line liquid diameter	Refrigerant charge g/m	Line liquid diameter	Refrigerant charge g/m
7,94 (mm)	30	9,52	50
15,88 (mm)	175	18 (mm)	220
22 (mm)	360	---	---

Cooling capacity correction factors				
Mod.	Refr. line 0 (m)	Refr. line 10 (m)	Refr. line 20 (m)	Refr. line 30 (m)
UTHZ	1	0,98	0,96	0,95

Water temperature	Room temperature / Relative Humidity											
	27 °C		28 °C		29 °C		30 °C		31 °C		32 °C	
	50 %	60 %	50 %	60 %	50 %	60 %	50 %	60 %	50 %	60 %	50 %	60 %
22 °C	0,108	0,057	0,092	0,041	0,075	0,023	0,059	0,008				
23 °C	0,134	0,080	0,117	0,062	0,099	0,044	0,083	0,026	0,065			
24 °C	0,161	0,105	0,144	0,086	0,126	0,068	0,108	0,048	0,090	0,029		
25 °C	0,191	0,134	0,173	0,114	0,155	0,093	0,135	0,074	0,117	0,053	0,098	
26 °C	0,222	0,164	0,204	0,143	0,186	0,122	0,167	0,101	0,147	0,080	0,126	0,057
27 °C	0,258	0,197	0,239	0,176	0,219	0,155	0,200	0,132	0,180	0,110	0,158	0,086
28 °C	0,296	0,233	0,276	0,212	0,257	0,189	0,236	0,165	0,215	0,143	0,194	0,117
29 °C	0,336	0,272	0,317	0,249	0,296	0,227	0,275	0,203	0,254	0,179	0,231	0,153
30 °C	0,378	0,314	0,359	0,291	0,339	0,267	0,317	0,243	0,296	0,218	0,272	0,191

The table reported here above, calculates the quantity of water for m2 of pool. It's possible to estimate approximately the total

pool evaporation multiplying this value for the surface of the pool. The values reported here are to be intended as pure indicative.

In case of use in ambient with hydromassage, it's advisable to multiply the values obtained for 2,5-3.

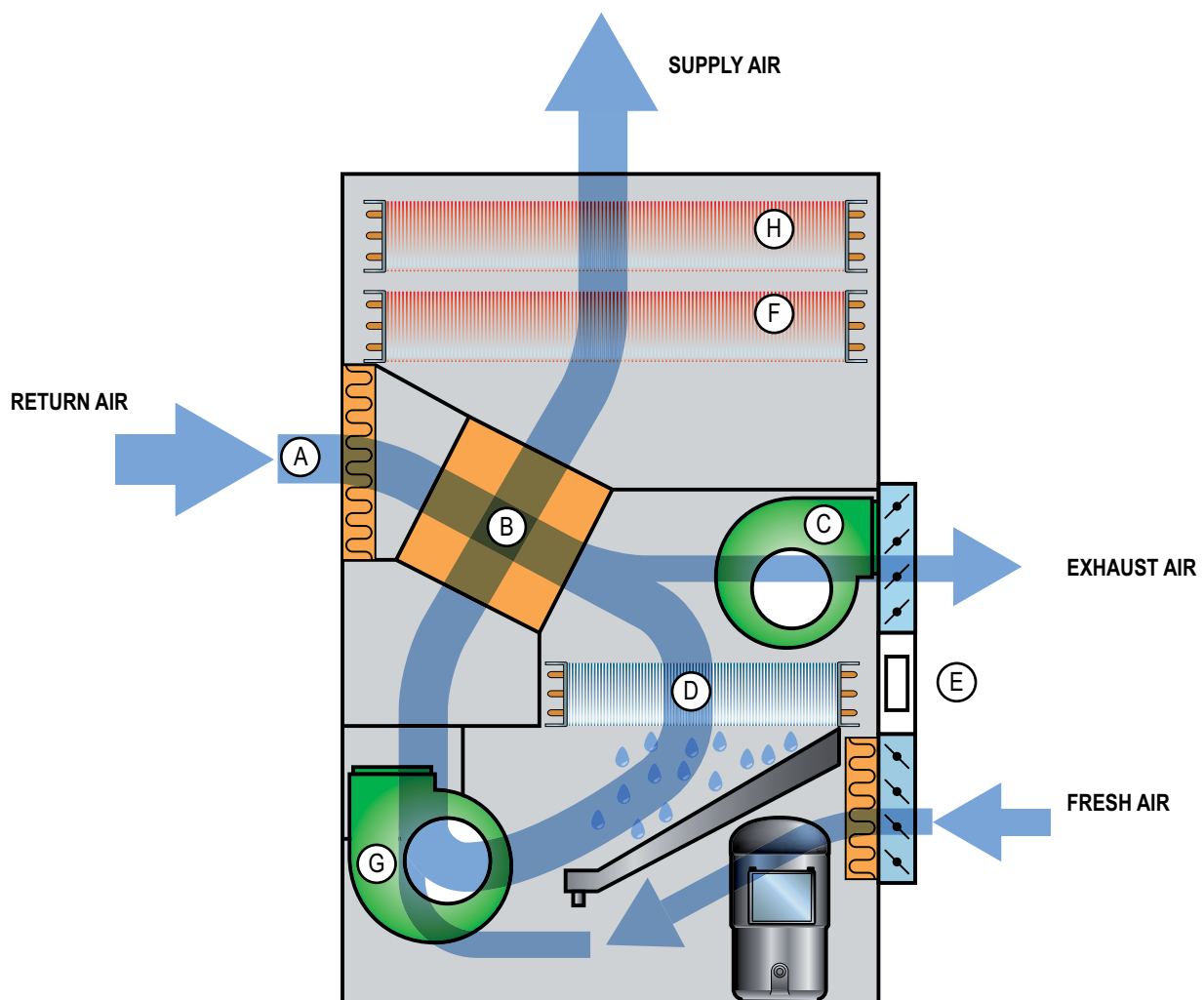
## UTH - UTHZ

### OPERATION PRINCIPLE

The hot and humid return airflow, moved by the fan (G), passes in the return filter (A), then across the first side of the energy recovery (B) where, crossing the cold air present on the other side, leaves part of its enthalpy. At this point part of the treated air (from 0% to 30%) is removed by the exhaust fan (C), while the remaining part passes across the cold evaporating coil (D) where it is dried at the required level. After

the evaporator the cold and dried airflow is mixed with fresh air (from 0% to 30%) entered through the fresh air damper (E) and returned into the energy recovery for the second passage where, crossing the hot air present on the other side, it is warmed up. The airflow then passes across the condensing coil (F) where it is post heated and finally sent into the swimming pool. In case the air discharge temperature is still too cold, the hot water temperature coil H (

accessory) will provide to increase it up to the required level.



UTH - UTHZ

## UTH - UTHZ

### FRESH AIR TRATMENT

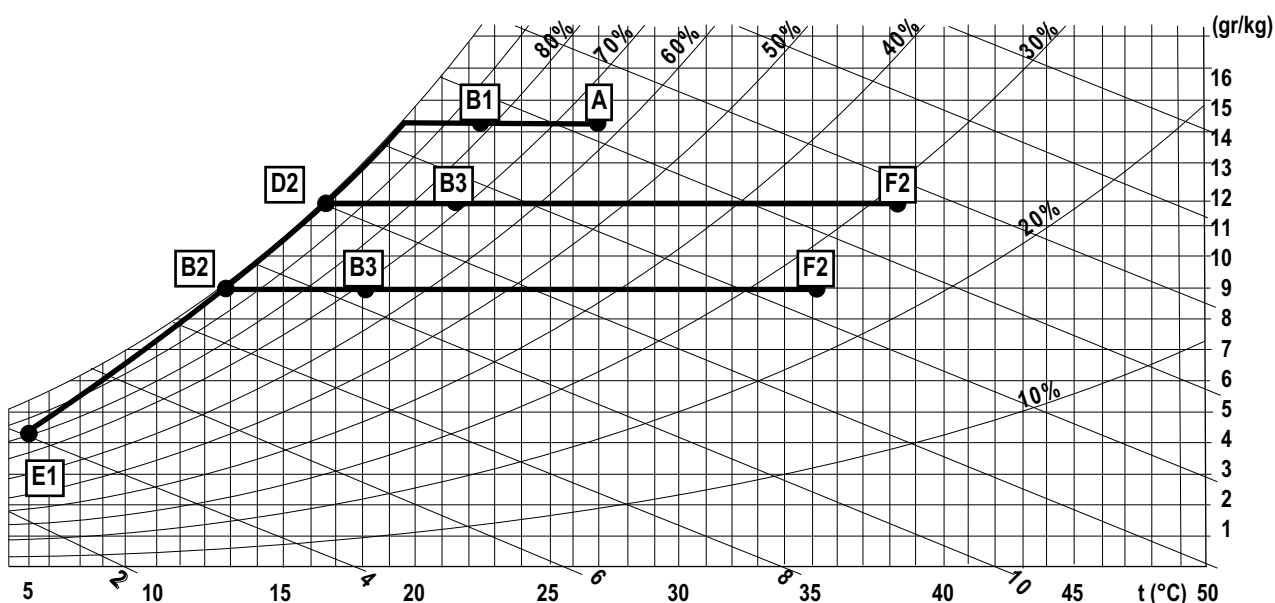
All units can operate with fresh air up to 30% of the total nominal airflow managed by the unit. The fresh air, winter season, has a humidity content that is extremely lower than the indoor air and its use can increase the dehumidification of the unit using the same airflow.

In the below diagram you may note that using fresh air we can supply in the room air with a lower dew point but, obviously, in this case the fresh air will have to be heated before to be supplied in the room with consequent higher thermal load of the heating coil.

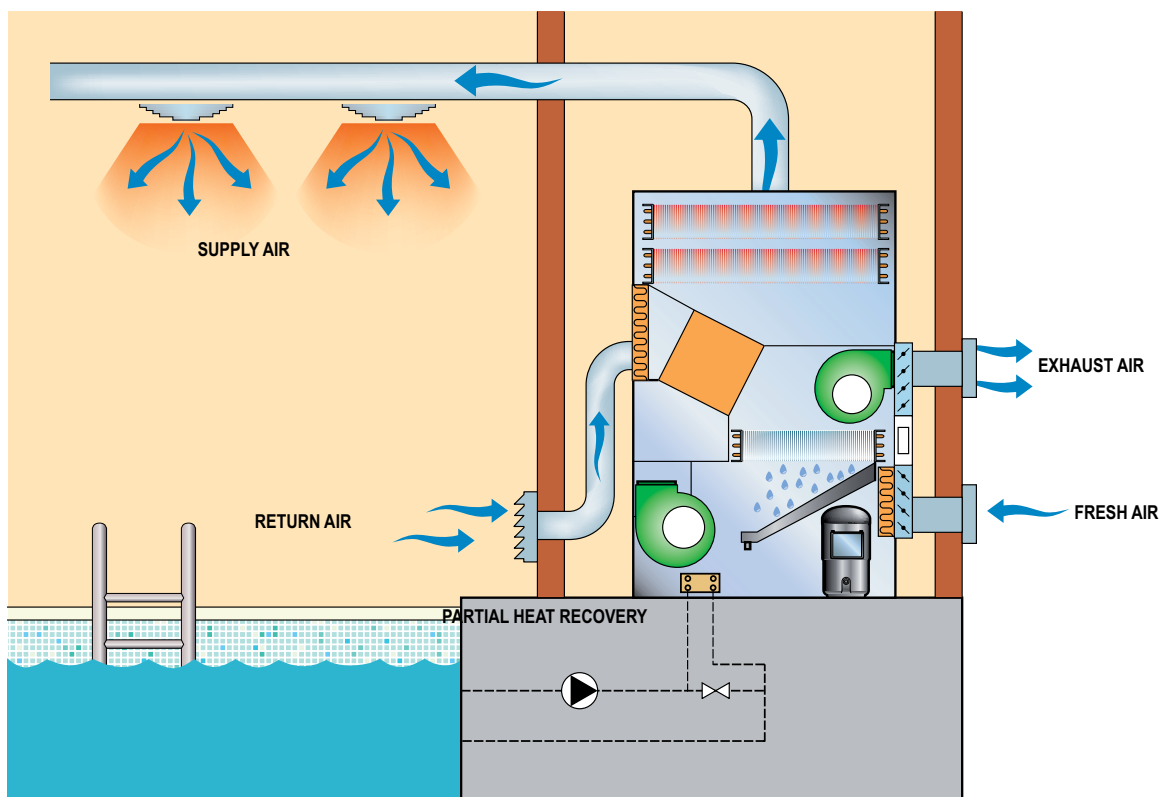
A-B1	Sensible cooling made in the cross flow heat recovery	(27-65% / 23-80%)
B1-D2	Cooling with dehumidification in the evaporator of the unit	(23-80% / 17-95%)
D2-B3	Heating in the cross flow heat recovery (without fresh air)	(17-95% / 22-75%)
B3-F2	Post-heating in the condenser of the unit (without fresh air)	(22-75% / 38-28%)
D2-B2	Mixing with 30% fresh air	(17-95% / 13-100%)
B2-B3	Heating in the cross flow heat recovery (with 30% fresh air)	(13-100% / 18,5-70%)
B3-F2	Post-heating in the condenser of the unit (with 30% fresh air)	(18,5-70% / 35-26%)

The specific dehumidification capacity of the UTH, in total air recirculation (internal conditions 27°C, 65% R.H.) is about 2.5 gr/kg of treated air. In case of using 30% fresh air, at 5°C and 80% R.H., the specific dehumidification capacity of the unit will increase of about 3 gr/kg, doubling practically, the specific dehumidification capacity (5,5 gr/kg).

It is clear that, in case of use of fresh air, the air discharge temperature will be lower (35°C instead of 38°C) and will have to be heated before to be supplied in the room.

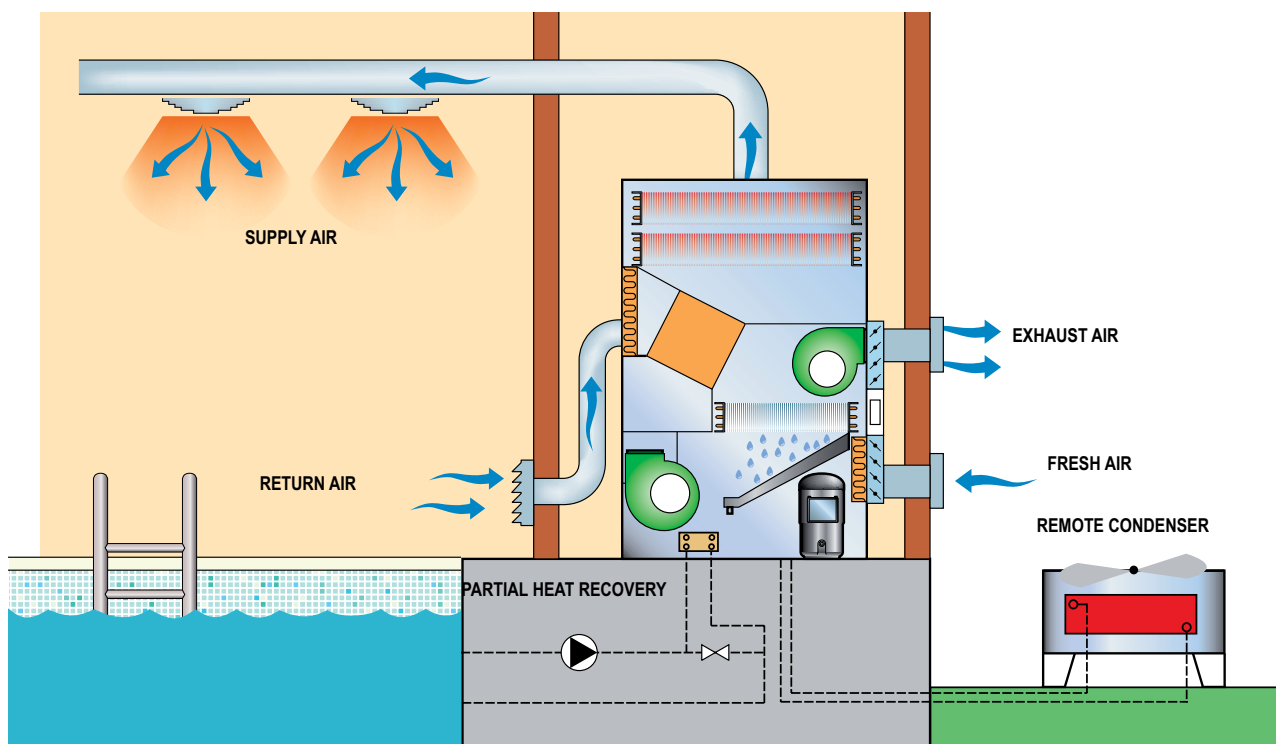


PLANT SCHEME WITH UTH



UTH - UTHZ

PLANT SCHEME WITH UTHZ



## UTH - UTHZ

### FRAME

All UTH units are made from hot-galvanised thick sheet metal, painted with polyurethane powder enamel at 180°C to ensure the best resistance against the atmospheric agents and to operate in aggressive environments. The frame is self-supporting with removable panels. A stainless steel drip tray is installed on all units. The colour of the units is RAL 7035.

### REFRIGERANT CIRCUIT

The refrigerant circuit is made by using international primary brands components and according to ISO 97/23 concerning welding procedures. The refrigerant gas used in these units is R407C. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, liquid line manual shut-off valve, Schrader valves for maintenance and control, pressure safety device (according to PED regulation).

### COMPRESSOR

The compressor is scroll type, with crankcase heater and thermal overload protection by a klixon embedded in the motor winding. The compressor is mounted on rubber vibration dampers and, upon request, can be supplied with sound-proof cover to reduce noise emission (accessory). The crankcase heater, when present, is always powered when the compressor is in stand-by. The inspection is possible through the frontal panel of the unit that allows the maintenance of the compressor.

### CONDENSER AND EVAPORATOR

Condensers and evaporators are made of copper pipes and aluminium fins. All coils are painted with epoxy powders to prevent corrosion problem due to their use in aggressive environments. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. The geometry of these condensers guarantees a low air side pressure drop and then the use of low rotation (and low noise emission) fans. All units are supplied, standard, with a stainless steel drip tray and all evaporators are supplied with a temperature sensor used as automatic defrost probe.

### HAET RECOVERY

The heat recovery is cross flow heat exchanger type, with painted aluminium plates; painted galvanised steel frame with additional tightening of the heat exchange pack, in order to operate in aggressive environments; it has a low pressure drop value and it is always supplied with stainless steel drip tray.

### HOT WATER COIL

The hot water coil is made of copper pipes and aluminium fins. The diameter of the copper pipes is 3/8" and the thickness of the aluminium fins is 0,1 mm. The tubes are mechanically expanded into the aluminium fins to improve the heat exchange factor. All coils are supplied with a built-in 3 way modulating valve, directly managed by the microprocessor of the unit.

### SUPPLY FAN

The supply fan is made of galvanized steel, centrifugal type, double inlet with forward curved blades. It is statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It is mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are 4 poles (about 1500 rpm), three-phase power supply. The motors are connected to the fans by pulleys and belts. The protection class of the motors is IP 54.

### EXHAUST FAN

The exhaust fan is made of galvanized steel, centrifugal type, double inlet with forward curved blades. It is statically and dynamically balanced and supplied complete of the safety fan guard according to EN 294. It is mounted on the unit frame by interposition of rubber vibration dampers. The electric motors are directly connected to the fan; they are all at 3 speeds, with integrated thermal protection. The protection class of the motors is IP 54.

### EXHAUST AND FRESH AIR DAMPERS

The exhaust and fresh air dampers are made of aluminium frame and fins, distance between the fins 150 mm. The BOCCOLE are in nylon; exhaust and fresh air dampers are connected each other and supplied already with servomotor managed by the microprocessor of the unit.

### AIR FILTER

It is made of synthetic filtering media, ondulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G3, according to EN 779:2002.

### MICROPROCESSOR

All UTH units are supplied standard with microprocessor controls. The microprocessor controls the following functions: compressor timing, automatic defrost cycles, the management of fresh and exhaust air, post heating valve and alarms. An appropriate LCD display shows the operation mode of the unit, set point and alarms.

### TEMPERATURE/HUMIDITY ELECTRONIC PROBE

It is installed, standard, on all UTH units. It is installed on the return air side and allows the unit to operate in dehumidification or heating depending on the required parameters. The electronic probe allows the showing of temperature and humidity values with an operating range from 0-50°C, humidity from 10-90%.

## UTH - UTHZ

Versions UTH	Code	015	020	028	035	042	052	060
Partial heat recovery	RP00	○	○	○	○	○	○	○
Low ambient temperature device with heat recovery	DBRC	○	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

Versions UTHZ	Code	015	020	028	035	042	052	060
Partial heat recovery	RP00	○	○	○	○	○	○	○
Low ambient temperature device with heat recovery	DBRC	–	–	–	–	–	–	–
Remote control Panel	PCRL	○	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

### ELECTRIC BOX

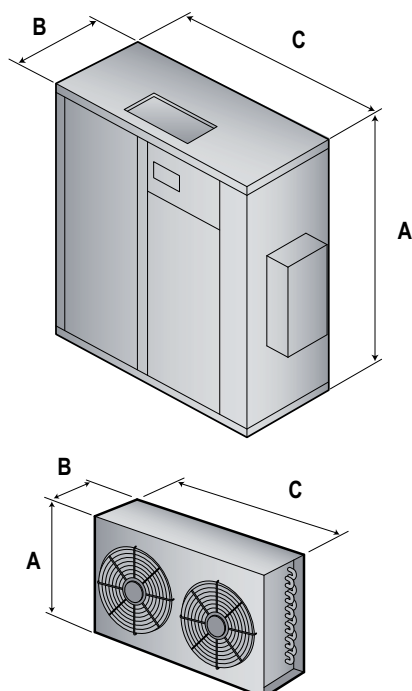
The electric switch board is made according to electromagnetic compatibility norms CEE 73/23 and 89/336. The accessibility to the board is possible after removing the front panel of the unit and the OFF positioning of the main switch. In all UTH units are installed, standard, the compressors sequence relay which disables the operation of the compressor in case the power supply phase sequence is not the correct one (scroll compressors in fact, can be damaged if they rotate reverse wise). The following components are also standard

installed: main switch, magnetic-thermal switches (as a protection of pumps and fans), compressors fuses, control circuit automatic breakers, compressor contactors, fan contactors, pump contactors. The terminal board is also supplied with voltage free contacts for remote ON-OFF.

switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: defrost thermostat, which signals to the microprocessor control that a defrost cycle is needed and controls its termination, high pressure



Mod.	A (mm)	B (mm)	C (mm)
015	1770	640	1000
020	1770	640	1000
028	1850	750	1500
035	1850	750	1500
042	1950	1250	1950
052	1950	1250	1950
060	1950	1250	1950

Mod.	A (mm)	B (mm)	C (mm)
015	555	362	780
020	555	362	1380
028	555	362	1380
035	555	362	1980
042	555	362	1980
052	555	362	1980
060	828	428	2015



## LSA

### Air cooled water chillers with axial fans



The LSA water chiller range has been designed for small and medium residential and commercial applications.

They are suitable for generating chilled water at 7°C, commonly used in applications with fan coils and/or air handling units.

LSA water chillers have high operating efficiencies and are quiet in operation.

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

#### VERSIONS

- **LSA, cooling only versions**, available in 10 different sizes.
- **LSA/HP**, reversible versions, available in 10 different sizes.
- **LSA/CN** condensing unit versions, available in 10 different sizes.

#### ACCESSORIES

- **A1NT**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch
- **A1ZZ**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank
- **BRCA**: Condensate discharge drip tray with antifreeze heater. (only versions HP)
- **DCCF**: Low ambient condensing pressure control
- **KAVG**: Rubber anti-vibration mountings
- **KAVM**: Spring anti-vibration mountings
- **LS00**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges.
- **PCRL**: Remote control panel
- **RAEV**: Evaporator antifreeze heater (basic version only)
- **RP00**: Partial heat recovery.
- **VTEE**: Electronic thermostatic valve.

LSA - LSA/HP Models		06	08	10	14	16
Cooling capacity (EN14511) <sup>(1)</sup>	kW	5,7	7,5	8,5	14,0	15,5
Total input power (EN14511) <sup>(1)</sup>	kW	1,9	2,5	2,8	4,7	5,7
E.E.R. (EN14511) <sup>(1)</sup>	W/W	3,0	3,0	3,0	2,9	2,7
Cooling capacity (EN14511) <sup>(2)</sup>	kW	7,6	9,9	11,2	18,6	20,3
Total input power (EN14511) <sup>(2)</sup>	kW	2,0	2,7	3,0	4,8	6,2
E.E.R. (EN14511) <sup>(3)</sup>	W/W	3,8	3,7	3,7	3,9	3,3
Heating capacity (EN14511) <sup>(4)</sup>	kW	5,9	7,7	9,2	14,9	17,2
Total input power (EN14511) <sup>(4)</sup>	kW	1,5	2,0	2,3	3,9	4,3
C.O.P. (EN14511) <sup>(4)</sup>	W/W	3,9	3,9	4,0	3,8	4,0
Heating capacity (EN14511) <sup>(5)</sup>	kW	5,8	7,6	9,0	14,5	16,9
Total input power (EN14511) <sup>(5)</sup>	kW	1,9	2,4	2,8	4,8	5,3
C.O.P. (EN14511) <sup>(5)</sup>	W/W	3,1	3,2	3,2	3,0	3,2
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Peak current	A	60,6	68,0	99,0	66,0	77,0
Max input current	A	13,4	18,1	23,0	13,3	17,0
Air flow	m³/h	2.800	3.350	3.150	7.200	7.000
Fans	n°/kW	1 x 0,12	1 x 0,2	1 x 0,2	2 x 0,2	2 x 0,2
Compressors	n°/tipo	1/Rotary	1/Rotary	1/Rotary	1/Scroll	1/Scroll
Sound power level <sup>(6)</sup>	dB (A)	68	68	68	69	69
Sound pressure level <sup>(7)</sup>	dB (A)	40	40	40	41	41
Water pump input power	kW	0,2	0,2	0,2	0,5	0,5
Pump available static pressure <sup>(1)</sup>	kPa	56,7	56,5	45,9	109,3	109,3
Water tank volume	l	40	40	40	40	60

LSA/CN Models		06	08	10	14	16
Cooling capacity <sup>(1)</sup>	kW	5,8	7,6	9,0	14,8	16,6
Compressors input power <sup>(1)</sup>	kW	1,9	2,5	2,8	4,7	5,7
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Peak current	A	60,6	68,0	99,0	66,0	77,0
Max input current	A	13,4	18,1	23,0	13,3	17,0
Airflow	m³/h	2.800	3.350	3.150	7.200	7.000
Fans	n°/kW	1 x 0,12	1 x 0,2	1 x 0,2	2 x 0,2	2 x 0,2
Compressors	n°/tipo	1/Rotary	1/Rotary	1/Rotary	1/Scroll	1/Scroll
Sound power level <sup>(3)</sup>	dB (A)	68	68	68	69	69
Sound pression level <sup>(4)</sup>	dB (A)	40	40	40	41	41

Performance refer to the following conditions:

(1) Cooling: ambient temperature 35°C; water temperature 12/7°C.

(2) Cooling: ambient temperature 35°C; water temperature 23/18°C.

(3) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 30/35°C.

(4) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 40/45°C.

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

(6) Sound pressure level at 10m from the unit in free field conditions direction factor Q = 2. in accordance with ISO 9614 (LS-Version).

(7) Cooling: ambient temperature 35°C; evaporating temperature 5°C.

## LSA

LSA - LSA/HP Models		21	26	31	36	41
Cooling capacity (EN14511) <sup>(1)</sup>	kW	20,5	26,6	30,0	33,0	39,0
Total input power (EN14511) <sup>(1)</sup>	kW	6,8	8,8	10,5	11,8	13,8
E.E.R. (EN14511) <sup>(1)</sup>	W/W	3,0	3,0	2,9	2,8	2,8
Cooling capacity (EN14511) <sup>(2)</sup>	kW	26,7	34,6	38,8	42,4	50,5
Total input power (EN14511) <sup>(2)</sup>	kW	7,5	10,2	11,4	12,9	15,2
E.E.R. (EN14511) <sup>(3)</sup>	W/W	3,6	3,4	3,4	3,3	3,3
Heating capacity (EN14511) <sup>(4)</sup>	kW	22,0	29,5	33,5	36,5	44,4
Total input power (EN14511) <sup>(4)</sup>	kW	5,2	6,8	8,2	9,0	10,7
C.O.P. (EN14511) <sup>(4)</sup>	W/W	4,3	4,3	4,1	4,1	4,2
Heating capacity (EN14511) <sup>(5)</sup>	kW	21,6	28,7	32,5	35,6	43,1
Total input power (EN14511) <sup>(5)</sup>	kW	6,4	9,1	10,0	11,0	12,8
C.O.P. (EN14511) <sup>(5)</sup>	W/W	3,4	3,2	3,3	3,2	3,4
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
Peak current	A	96,8	119,8	120,6	142,6	176,6
Max input current	A	17,8	23,8	27,6	33,6	36,6
Air flow	m³/h	8.500	8.500	10.800	10.800	10.800
Fans	n°/kW	2 x 0,2	2 x 0,2	2 x 0,5	2 x 0,5	2 x 0,5
Compressors	n° scroll	1	1	1	1	1
Sound power level <sup>(6)</sup>	dB (A)	74	74	79	79	79
Sound pressure level <sup>(7)</sup>	dB (A)	46	46	51	51	51
Water pump input power	kW	0,6	0,6	0,9	0,9	1,3
Pump available static pressure <sup>(1)</sup>	kPa	136,8	79,2	96,4	41,2	170,1
Water tank volume	l	60	60	180	180	180

LSA/CN Models		21	26	31	36	41
Cooling capacity <sup>(1)</sup>	kW	21,5	29,2	32,6	36,3	44,4
Compressors input power <sup>(1)</sup>	kW	6,9	9,0	10,7	12,2	14,0
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
Peak current	A	96,8	119,8	120,6	142,6	176,6
Max input current	A	17,8	23,8	27,6	33,6	36,6
Airflow	m³/h	8.500	8.500	10.800	10.800	10.800
Fans	n°/kW	2 x 0,2	2 x 0,2	2 x 0,5	2 x 0,5	2 x 0,5
Compressors	n°/scroll	1	1	1	1	1
Sound power level <sup>(3)</sup>	dB (A)	74	74	79	79	79
Sound pressure level <sup>(4)</sup>	dB (A)	46	46	51	51	51

Performance refer to the following conditions:

(1) Cooling: ambient temperature 35°C; water temperature 12/7°C.

(2) Cooling: ambient temperature 35°C; water temperature 23/18°C.

(3) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 30/35°C.

(4) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 40/45°C.

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

(6) Sound pressure level at 10m from the unit in free field conditions direction factor Q = 2. in accordance with ISO 9614 (LS-Version).

(7) Cooling: ambient temperature 35°C; evaporating temperature 5°C.

# LSA

## FRAME

All LSA 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, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

## COMPRESSOR

For models 06 & 08, rotary type compressors are used. For all other models the compressors are of the scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

## CONDENSORS

The condenser 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 condenser design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

## 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. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

## EVAPORATORS

The evaporator 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 evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

## MICROPROCESSOR

All LSA units are supplied with microprocessor controls loaded with ACTIVE auto-adaptive strategy. 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. The autoadaptive control system ACTIVE is an advanced strategy that continuously monitors the temperature of the inlet and outlet water thereby determining the variation of the building thermal load. By then adjusting the outlet water temperature set point the compressor start/stop cycle can be accurately controlled thus optimizing

the unit efficiency and maximizing the operational life of the units component's. Use of ACTIVE auto-adaptive Control enables the minimum water content to be reduced from the traditional 12-15 l/kw to 5 l/kw. A further benefit of the reduced water requirement is that LSA units can be used in installations without a buffer tank thereby reducing the space requirements, thermal losses and costs.

## 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 versions 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 water temperature sensor installed on the return water line from the building, antifreeze protection sensor installed on the outlet water temperature high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

## REVERSIBLE VERSION (HP)

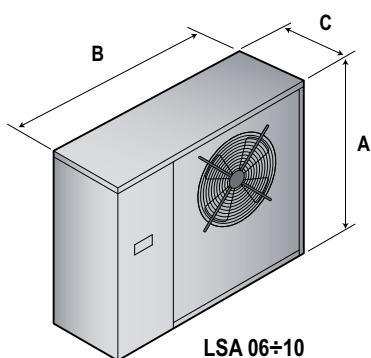
The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 48°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

## LSA

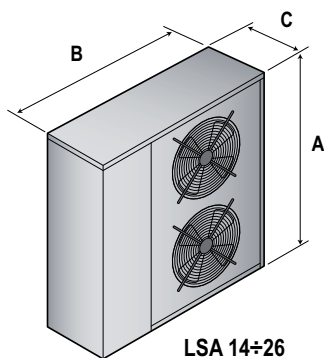
LSA - LSA/HP Versions	Code	06	08	10	14	16	21	26	31	36	41
Main switch	—	—	—	—	●	●	●	●	●	●	●
Flow switch	—	●	●	●	●	●	●	●	●	●	●
Microprocessor control	—	●	●	●	●	●	●	●	●	●	●
General alarm digital output	—	●	●	●	●	●	●	●	●	●	●
Remote on/off digital input	—	●	●	●	●	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	-	-	-	○	○	○	○	○	○	○
Rubber anti-vibration mounts	KAVG	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mounts	KAVM	○	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○	○	○	○	○	○
Antifreeze Kit (only for A version)	RAES	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○
Condensate discharge drip tray *	BRCA	○	○	○	○	○	○	○	○	○	○
Hydraulic kit pump + tank (A1ZZ)	A1ZZ	○	○	○	○	○	○	○	○	○	○
Hydraulic kit pump no tank (A1NT)	A1NT	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○	○	○

\* Condensate discharge drip tray with antifreeze heater (Only for versions HP)

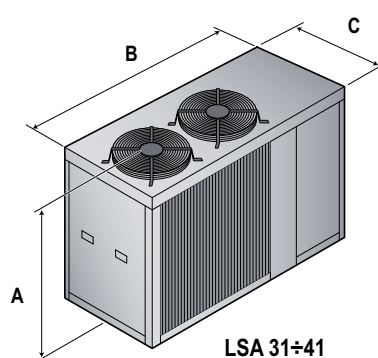
● Standard, ○ Optional, — Not available.



LSA 06÷10



LSA 14÷26



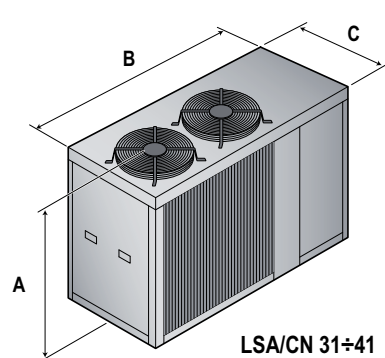
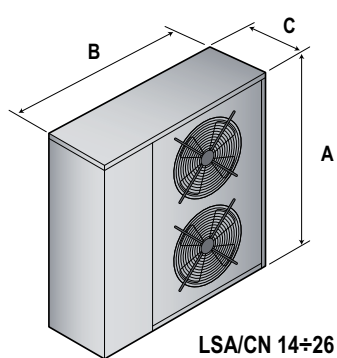
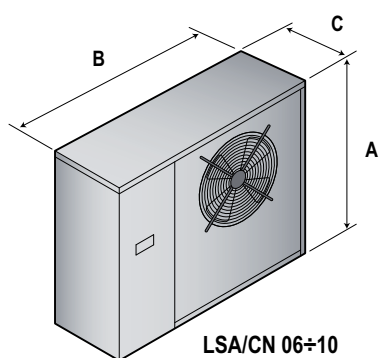
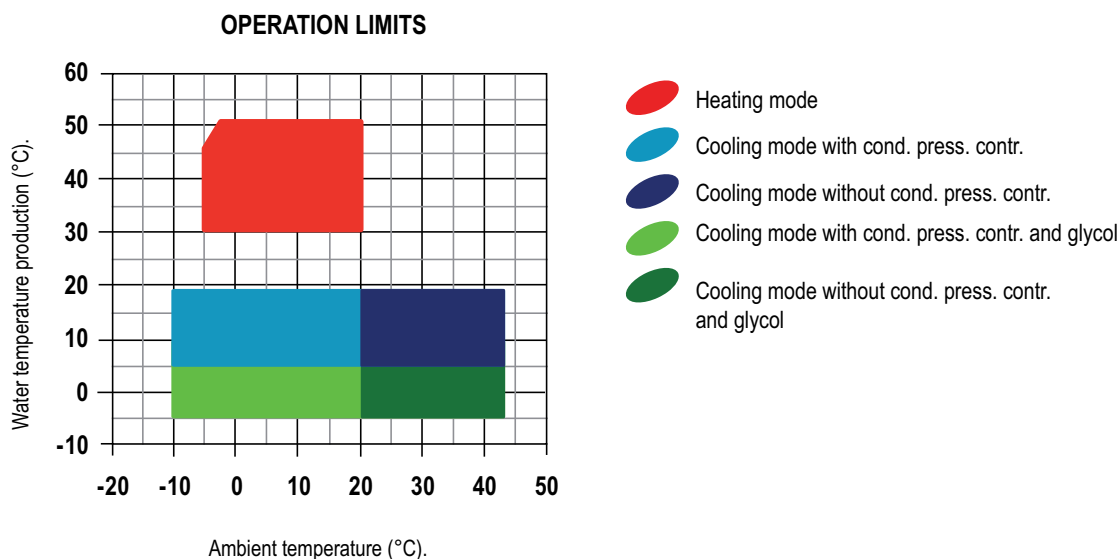
LSA 31÷41

Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A	989	1103	380	95/148
08/08A	989	1103	380	104/163
10/10A	989	1103	380	118/179
14/14A	1324	1203	423	127/207
16/16A	1324	1203	423	133/212

Mod.	A (mm)	B (mm)	C (mm)	Kg
21/21A	1423	1453	473	188/267
26/26A	1423	1453	473	209/286
31/31A	1406	1870	850	330/440
36/36A	1406	1870	850	345/495
41/41A	1406	1870	850	360/520

Version LSA/CN Versions	Code	06	08	10	14	16	21	26	31	36	41
Main switch	–	–	–	●	●	●	●	●	●	●	●
Microprocessor control	–	●	●	●	●	●	●	●	●	●	●
Liquid line solenoid valve	–	●	●	●	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Mechanic expansion valve for CN versions	VTER	○	○	○	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
06	989	1103	380	90
08	989	1103	380	94
10	989	1103	380	108
14	1324	1203	423	115
16	1324	1203	423	120

Mod.	A (mm)	B (mm)	C (mm)	Kg
21	1423	1453	473	172
26	1423	1453	473	193
31	1406	1870	850	310
36	1406	1870	850	325
41	1406	1870	850	340

## CSA

### Air cooled water chillers with centrifugal fans



R410A

Active



The CSA water chiller range has been designed for small and medium residential and commercial applications. They are suitable for generating chilled water at 7°C, commonly used in applications with fan coils and/or air handling units. CSA water chillers have high operating efficiencies, are quiet in operation and are suitable for indoor mounting. Differing versions and a wide range of accessories, enable the optimal solution to be selected.

#### VERSIONS

- **CSA cooling only versions**, available in 10 different sizes.
- **CSA/HP**, reversible versions, available in 10 different sizes.

#### ACCESSORIES

- **A1NT**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch
- **A1ZZ**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch and insulated tank
- **DCCF**: Low ambient condensing pressure control
- **DCCI**: Low ambient inverter condensing pressure control
- **FAMM**: Coil protection mesh with metallic filter
- **FOSP**: Condenser fan motors for high external static pressures
- **INSE**: Serial interface card RS 485
- **KAVG**: Rubber Anti-vibration mountings
- **KAVM**: Spring Anti-vibration mountings
- **LS00**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges.
- **PCRL**: Remote control panel
- **RAES**: Antifreeze kit (for unit with hydraulic kit)
- **RAEV**: Evaporator antifreeze heater (Basic version only)
- **RP00**: Partial heat recovery



CSA - CSA/HP Models		06	08	10	14	16
Cooling capacity (EN 14511) <sup>(1)</sup>	kW	5,7	7,5	8,5	14,0	15,5
Compressor input (EN 14511) <sup>(1)</sup>	kW	2,3	2,9	3,1	5,6	6,6
E.E.R (EN 14511) <sup>(1)</sup>	W/W	2,5	2,6	2,7	2,5	2,3
Cooling capacity (EN 14511) <sup>(2)</sup>	kW	7,6	9,9	11,1	18,5	20,1
Compressor input (EN 14511) <sup>(2)</sup>	kW	2,4	3,1	3,3	5,8	7,2
E.E.R (EN 14511) <sup>(2)</sup>	W/W	3,2	3,2	3,4	3,2	2,8
Heating capacity(EN 14511) <sup>(3)</sup>	kW	6,0	7,7	9,2	14,9	17,2
Compressor input (EN 14511) <sup>(3)</sup>	kW	1,9	2,3	2,6	4,6	5,0
C.O.P (EN 14511) <sup>(3)</sup>	W/W	3,2	3,3	3,5	3,2	3,4
Heating capacity (EN 14511) <sup>(4)</sup>	kW	5,9	7,6	9,0	14,6	16,9
Compressor input (EN 14511) <sup>(4)</sup>	kW	2,3	2,8	3,1	5,5	6,0
C.O.P (EN 14511) <sup>(4)</sup>	W/W	2,6	2,7	2,9	2,7	2,8
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Peak current	A	63,8	70,8	101,8	68,3	79,3
Max input current	A	16,6	20,9	25,8	15,6	19,3
Total airflow	m³/h	2.000	3.000	3.000	5.400	5.400
Fans	n°/kW	1x0,52	1x0,52	1x0,52	1x1,10	1x1,10
Compressors	n°/type	1/Rotative	1/Rotative	1/Rotative	1/Scroll	1/Scroll
Sound power level <sup>(5)</sup>	dB (A)	71	71	71	73	73
Sound pressure level <sup>(6)</sup>	dB (A)	43	43	43	45	45
Water Pump input power	kW	0,1	0,2	0,2	0,5	0,5
Pump available static pressure <sup>(1)</sup>	kPa	23,7	56,6	46,0	112,8	113,5
Water tank volume	l	40	40	40	40	60

CSA - CSA/HP Models		21	26	31	36	41
Cooling capacity (EN 14511) <sup>(1)</sup>	kW	20,5	26,6	30,0	33,0	39,0
Compressor input (EN 14511) <sup>(1)</sup>	kW	7,5	9,5	11,7	13,0	15,0
E.E.R (EN 14511) <sup>(1)</sup>	W/W	2,7	2,8	2,6	2,5	2,6
Cooling capacity (EN 14511) <sup>(2)</sup>	kW	26,7	34,6	38,8	42,4	50,5
Compressor input (EN 14511) <sup>(2)</sup>	kW	8,2	10,3	12,6	14,0	16,4
E.E.R (EN 14511) <sup>(2)</sup>	W/W	3,3	3,4	3,1	3,0	3,1
Heating capacity(EN 14511) <sup>(3)</sup>	kW	22,0	29,5	33,5	36,5	44,4
Compressor input (EN 14511) <sup>(3)</sup>	kW	5,9	7,5	9,4	10,2	11,9
C.O.P (EN 14511) <sup>(3)</sup>	W/W	3,7	3,9	3,6	3,6	3,7
Heating capacity (EN 14511) <sup>(4)</sup>	kW	21,6	28,7	32,5	35,6	43,1
Compressor input (EN 14511) <sup>(4)</sup>	kW	7,1	9,2	11,2	12,2	14,0
C.O.P (EN 14511) <sup>(4)</sup>	W/W	3,0	3,1	2,9	2,9	3,1
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
Peak current	A	97,8	120,8	122,9	144,9	178,9
Max input current	A	18,8	24,8	29,9	35,9	38,9
Total airflow	m³/h	8.500	8.500	10.800	10.800	10.800
Fans	n°/kW	1x1,10	1x1,10	1x2,20	1x2,20	1x2,20
Compressors	n°/type	1/Rotative	1/Rotative	1/Rotative	1/Scroll	1/Scroll
Sound power level <sup>(5)</sup>	dB (A)	77	77	82	82	82
Sound pressure level <sup>(6)</sup>	dB (A)	49	49	54	54	54
Water Pump input power	kW	0,6	0,6	0,9	0,9	1,3
Pump available static pressure <sup>(1)</sup>	kPa	136,8	79,2	96,4	41,2	170,1
Water tank volume	l	60	60	180	180	180

Performance refer to the following conditions:

(1) Cooling: ambient temperature 35°C; water temperature 12/7°C.

(2) Cooling: ambient temperature 35°C; water temperature 23/18°C.

(3) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 30/35°C.

(4) Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 40/45°C.

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

(6) Sound pressure level at 10m from the unit in free field conditions direction factor Q = 2. in accordance with ISO 9614 (LS-Version).

(7) Cooling: ambient temperature 35°C; evaporating temperature 5°C.

## CSA

### FRAME

All CSA 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, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

### COMPRESSOR

For models 06 & 08, rotary type compressors are used. For all other models the compressors are of the scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

### CONDENSERS

The condenser 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 condenser design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

### FANS

The fans are centrifugal type, double inlet with forward curved blades manufactured from galvanized steel. They 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. 4 pole electric motors are used (rotation speed approx 1500 rpm). For models 06,08 & 10 they are directly driven and for all other models the fan drive is via pulleys and belts. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

### EVAPORATORS

The evaporator 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 evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

### MICROPROCESSOR

The autoadaptive control system ACTIVE is an advanced strategy that continuously monitors the temperature of the inlet and outlet water thereby determining the variation of the building thermal load. By then adjusting the outlet water temperature set point the compressor start/stop cycle can be accurately controlled thus optimizing the unit efficiency and maximizing the operational life of the units component's. Use of ACTIVE auto-adaptive Control enables the minimum water content to be reduced from the traditional 12-15 l/kw to 5 l/kw. A further benefit of the reduced water requirement is that LSA units can be used in installations without a buffer tank thereby reducing the space requirements, thermal losses and costs.

### 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 versions 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 water temperature sensor installed on the return water line from the building, antifreeze protection sensor installed on the outlet water temperature, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

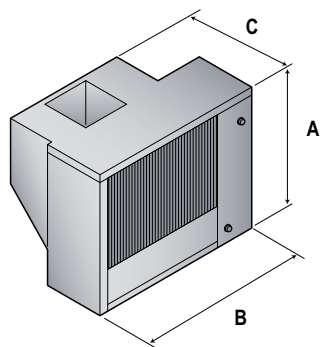
### REVERSIBLE VERSION (HP)

The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 48°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

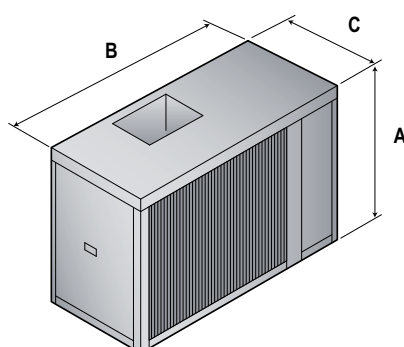
CSA - CSA/HP Versions	Code	06	08	10	14	16	21	26	31	36	41
Main switch	–	–	–	–	●	●	●	●	●	●	●
Flow switch	–	●	●	●	●	●	●	●	●	●	●
Microprocessor control	–	●	●	●	●	●	●	●	●	●	●
General alarm digital output	–	●	●	●	●	●	●	●	●	●	●
Remote on/off digital input	–	●	●	●	●	●	●	●	●	●	●
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
LS low noise version	LS00	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	–	–	–	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	–	–	–	–	–	–	–
Inverter low ambient condensing pressure control	DCCI	–	–	–	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater. (basic version only)	RAEV	○	○	○	○	○	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges.	MAML	○	○	○	○	○	○	○	○	○	○
Condensate discharge drip tray *	BRCA	○	○	○	○	○	○	○	○	○	○
Hydraulic kit pump + tank (A1ZZ)	A1ZZ	○	○	○	○	○	○	○	○	○	○
Hydraulic kit pump no tank (A1NT)	A1NT	○	○	○	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○	○	○	○
High Ext. Static condenser fan motors Max 250 Pa	FOSP	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○

\* Condensate discharge drip tray with antifreeze heater (standard for HP version)

● Standard, ○ Optional, – Not available.



CSA 06÷26



CSA 31÷41

Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A	989	1103	625	102/155
08/08A	989	1103	625	110/170
10/10A	989	1103	625	128/187
14/14A	1324	1203	694	135/217
16/16A	1324	1203	694	142/222
21/21A	1423	1453	780	188/267
26/26A	1423	1453	780	209/286

Mod.	A (mm)	B (mm)	C (mm)	Kg
31/31A	1270	1870	850	329/436
36/36A	1270	1870	850	343/491
41/41A	1270	1870	850	356/516

## LDA

Air cooled water chillers with axial fans



LDA water chillers are efficient, low-noise products designed for medium to large applications.

They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units.

The use of tandem scroll compressors results in high efficiencies (especially at part loads) and low noise levels, making them suitable for use in many applications.

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

### VERSIONS

- **LDA** cooling only version.
- **LDA/XL** extra low noise version.
- **LDA/CN** condensing unit version.
- **LDA/HP** reversible version.
- **LDA/FC** free-cooling version.
- **LDA/FC100** free-cooling 100% version.

### ACCESSORIES

- **A0NP**: Hydraulic kit without tank and pump.
- **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.
- **DCCF**: Low ambient condensing pressure control
- **DSSE**: Electronic soft starter
- **FAMM**: Coil protection mesh with metallic filter
- **LS00**: Low noise version
- **PCRL**: Remote control panel
- **RAES**: Antifreeze kit (for unit with hydraulic kit)
- **RAEV**: Evaporator antifreeze heater (Basic version only)
- **RP00**: Partial heat recovery
- **VSOG**: Liquid line solenoid valve

LDA - LDA/HP Models		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity (EN14511) <sup>(1)</sup>	kW	40,2	45,3	54,6	60,9	67,6	79,3	90,1	99,4	113,0	124,6	150
Compressor input (EN14511) <sup>(1)</sup>	kW	14,2	16,1	18,5	21,1	23,1	27,3	31,3	34,5	38,5	44,2	49,8
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,8	2,8	2,9	2,9	2,9	2,9	2,9	2,9	2,9	2,8	3,0
Cooling capacity (EN14511) <sup>(2)</sup>	kW	51,9	58,7	71,1	79,5	87,8	102,0	117,1	128,8	145,8	160,0	194,0
Compressor input (EN14511) <sup>(2)</sup>	kW	15,4	17,4	19,9	23,1	25,1	30,2	34,2	38,0	42,3	48,5	54,5
E.E.R. (EN14511) <sup>(2)</sup>	W/W	3,3	3,3	3,5	3,4	3,4	3,3	3,4	3,4	3,4	3,3	3,5
Heating capacity (EN14511) <sup>(3)</sup>	kW	44,0	48,9	58,9	67,8	77,2	87,8	104,5	113,5	128,1	139,3	162,8
Compressor input (EN14511) <sup>(3)</sup>	kW	10,8	12,0	14,1	15,8	17,5	20,7	24,1	27,0	30,0	33,0	38,8
C.O.P. (EN14511) <sup>(3)</sup>	W/W	4,1	4,0	4,2	4,3	4,4	4,2	4,3	4,2	4,3	4,2	4,2
Heating capacity (EN14511) <sup>(4)</sup>	kW	43,2	48,0	57,4	66,0	75,2	85,6	101,7	110,7	125,2	136,6	159,0
Compressor input (EN14511) <sup>(4)</sup>	kW	13,1	14,7	17,4	19,4	21,5	24,9	29,0	32,5	36,0	40,0	46,8
C.O.P. (EN14511) <sup>(4)</sup>	W/W	3,3	3,3	3,3	3,4	3,5	3,4	3,5	3,4	3,5	3,4	3,4
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	400/3/50	400/3/50
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	2x0,6	2x0,6	2x0,6	2x0,6	2x0,6	2x0,6	3x0,6	3x0,6	3x0,6	3x0,6	4x0,6
Sound power level <sup>(5)</sup>	dB(A)	77,0	77,0	79,0	79,0	80,0	80,0	82,0	82,5	82,9	83,1	83,5
Sound pressure level <sup>(6)</sup>	dB(A)	49,0	49,0	51,0	51,0	52,0	52,0	54,0	54,5	54,9	55,1	55,5
Water Pump input power	kW	1,3	1,3	1,5	1,5	1,5	1,5	1,5	1,9	1,9	1,9	2,2
Pump available static press. <sup>(1)</sup>	kPa	174	158	196	189	171	162	141	146	136	128	110
Water tank volume	l	180	180	300	300	300	300	500	500	500	500	500

LDA - LDA/HP Models		162	190	210	240	260	300	320	380	430	500
Cooling capacity (EN14511) <sup>(1)</sup>	kW	166,8	184,9	202,2	232,4	260,6	314,7	343,0	383,7	454,0	497,0
Compressor input (EN14511) <sup>(1)</sup>	kW	52,8	67,3	78,3	84,9	92,1	103,1	116,9	140,9	161,2	176,0
E.E.R. (EN14511) <sup>(1)</sup>	W/W	3,1	2,7	2,6	2,7	2,8	3,0	2,9	2,7	2,8	2,8
Cooling capacity (EN14511) <sup>(2)</sup>	kW	214,9	240,8	274,7	303,7	338,3	412,2	445,7	501,2	593,7	644,3
Compressor input (EN14511) <sup>(2)</sup>	kW	60,6	74,6	86,0	93,1	100,9	112,7	128,9	153,3	176,8	195,4
E.E.R. (EN14511) <sup>(2)</sup>	W/W	3,5	3,2	3,2	3,2	3,3	3,6	3,4	3,2	3,3	3,3
Heating capacity (EN14511) <sup>(3)</sup>	kW	176,6	195,6	210	252,6	271,7	331,2	362,9	422,6	488,8	529,3
Compressor input (EN14511) <sup>(3)</sup>	kW	42,8	51,1	55,0	64,0	71,0	87,0	95,0	114,0	126,0	139,0
C.O.P. (EN14511) <sup>(3)</sup>	W/W	4,1	3,8	3,8	3,9	3,8	3,8	3,8	3,7	3,9	3,8
Heating capacity (EN14511) <sup>(4)</sup>	kW	173,3	190,6	206,2	246,5	266,5	323,2	355,2	412,3	476,7	519,0
Compressor input (EN14511) <sup>(4)</sup>	kW	51,8	62,0	66,0	77,0	85,0	105,0	114,0	135,0	151,0	168,0
C.O.P. (EN14511) <sup>(4)</sup>	W/W	3,3	3,1	3,1	3,2	3,1	3,1	3,1	3,1	3,2	3,1
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	400/3/50
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,6	3x2,0	3x2,0	4x2,0	4x2,0	6x2,0	6x2,0	8x2,0	8x2,0	8x2,0
Sound power level <sup>(5)</sup>	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound pressure level <sup>(6)</sup>	dB(A)	56	58	58	61	61	62	62	63	63	63
Water Pump input power	kW	2,2	3,0	3,0	4,0	4,0	5,5	5,5	7,5	7,5	7,5
Pump available static press. <sup>(1)</sup>	kPa	98	172	155	172	143	177	167	174	154	139
Water tank volume	l	500	600	600	600	600	1000	1000	1000	1000	1000

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 23/18 °C.

(3) Heating: condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

(4) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

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

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

## LDA

LDA/XL - LDA/HP/XL Models		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity (EN14511) <sup>(1)</sup>	kW	--	--	--	61,3	68,4	81,0	90,7	100,5	114,8	127,0	146,5
Compressor input (EN14511) <sup>(1)</sup>	kW	--	--	--	21,7	23,3	27,0	31,8	34,7	38,4	43,8	51,7
E.E.R. (EN14511) <sup>(1)</sup>	W/W	--	--	--	2,8	2,9	3,0	2,8	2,9	3,0	2,9	2,8
Cooling capacity (EN14511) <sup>(2)</sup>	kW	--	--	--	82,4	91,8	107,3	120,7	133,7	152,1	167,3	192,9
Compressor input (EN14511) <sup>(2)</sup>	kW	--	--	--	23,7	25,5	30,1	35,2	38,6	42,5	48,4	57,6
E.E.R. (EN14511) <sup>(2)</sup>	W/W	--	--	--	3,3	3,6	3,6	3,4	3,5	3,6	3,5	3,3
Heating capacity (EN14511) <sup>(3)</sup>	kW	--	--	--	68,4	78,4	89,5	105,5	115,1	130,7	142,2	158,1
Compressor input (EN14511) <sup>(3)</sup>	kW	--	--	--	16,4	18,2	21,4	25,0	27,9	31,0	33,9	38,9
C.O.P. (EN14511) <sup>(3)</sup>	W/W	--	--	--	4,1	4,3	4,2	4,2	4,1	4,2	4,2	4,1
Heating capacity (EN14511) <sup>(4)</sup>	kW	--	--	--	66,5	76,2	87,2	102,5	112,0	127,5	139,1	155,1
Compressor input (EN14511) <sup>(4)</sup>	kW	--	--	--	19,9	22,1	25,6	29,8	34,0	37,9	41,0	46,9
C.O.P. (EN14511) <sup>(4)</sup>	W/W	--	--	--	3,3	3,4	3,4	3,4	3,3	3,4	3,4	3,3
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
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x0,98	2x0,98	2x0,98	3x0,98	3x0,98	3x0,98	3x0,98	3x0,98
Sound power level <sup>(5)</sup>	dB(A)	--	--	--	76,0	78,0	78,0	79,5	79,9	80,1	80,5	81,0
Sound pressure level <sup>(6)</sup>	dB(A)	--	--	--	48,0	50,0	50,0	51,5	51,9	52,1	52,5	53,0

## LDA

LDA/XL - LDA/HP/XL Models		162	190	210	240	260	300	320	380	430	500
Cooling capacity (EN14511) <sup>(1)</sup>	kW	162,5	179,5	205,0	219,3	238,8	270,6	300,6	360,4	--	--
Compressor input (EN14511) <sup>(1)</sup>	kW	57,2	65,5	74,2	83,1	95,2	105,3	121,7	139,3	--	--
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,8	2,7	2,8	2,6	2,5	2,6	2,5	2,6	--	--
Cooling capacity (EN14511) <sup>(2)</sup>	kW	212,6	239,3	272,7	290,4	314,2	351,8	390,8	472,9	--	--
Compressor input (EN14511) <sup>(2)</sup>	kW	64,5	73,3	84,3	93,6	106,9	116,7	137,2	153,7	--	--
E.E.R. (EN14511) <sup>(2)</sup>	W/W	3,3	3,3	3,2	3,1	2,9	3,0	2,9	3,1	--	--
Heating capacity (EN14511) <sup>(3)</sup>	kW	171,3	190,1	204,3	253,4	275,4	322,7	353,0	416,3	--	--
Compressor input (EN14511) <sup>(3)</sup>	kW	42,9	47,6	52,8	60,8	67,3	73,1	86,2	102,4	--	--
C.O.P. (EN14511) <sup>(3)</sup>	W/W	4,0	4,0	3,9	3,9	4,1	4,1	4,1	4,1	--	--
Heating capacity (EN14511) <sup>(4)</sup>	kW	168,8	186,6	200,9	248,3	271,2	316,5	347,6	409,2	--	--
Compressor input (EN14511) <sup>(4)</sup>	kW	51,9	56,5	62,8	72,4	80,3	93,6	103,2	121,7	--	--
C.O.P. (EN14511) <sup>(4)</sup>	W/W	3,2	3,3	3,2	3,4	3,4	3,4	3,4	3,4	--	--
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	--	--
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/3	--	--
Fans	n° x kW	3x0,98	4x0,98	4x0,98	4x0,98	4x0,98	6x0,98	6x0,98	8x0,98	--	--
Sound power level <sup>(5)</sup>	dB(A)	81,3	83,0	83,0	83,0	83,0	85,0	85,0	86,0	--	--
Sound pressure level <sup>(6)</sup>	dB(A)	53,3	55,0	55,0	55,0	55,0	57,0	57,0	58,0	--	--

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 23/18 °C.

(3) Heating: condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

(4) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

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

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



LDA/FC Models		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity (EN14511) <sup>(1)</sup>	kW	--	--	--	60,3	66,8	78,5	88,8	97,9	111,1	123,0	148,1
Compressor input (EN14511) <sup>(1)</sup>	kW	--	--	--	21,2	23,0	27,2	31,2	34,3	38,5	44,0	49,6
E.E.R. (EN14511) <sup>(1)</sup>	W/W	--	--	--	2,8	2,9	2,9	2,8	2,9	2,9	2,8	3,0
Free cooling capacity <sup>(5)</sup>	kW	--	--	--	51,3	51,3	51,7	76,0	74,5	75,1	76,6	104,5
Compressors input <sup>(5)</sup>	kW	--	--	--	1,4	1,4	1,4	2,1	2,1	2,1	2,1	2,8
Water flow <sup>(5)</sup>	m <sup>3</sup> /h	--	--	--	10,9	12,1	14,2	16,1	17,8	20,2	22,3	26,9
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
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x0,6	2x0,6	2x0,6	3x0,6	3x0,6	3x0,6	3x0,6	4x0,6
Sound power level <sup>(3)</sup>	dB(A)	--	--	--	79,0	80,0	80,0	82,0	82,5	82,9	83,1	83,5
Sound power level <sup>(4)</sup>	dB(A)	--	--	--	51,0	52,0	52,0	54,0	54,5	54,9	55,1	55,5
Water pump input power	kW	--	--	--	1,5	2,3	2,3	2,2	2,2	3,0	3,0	3,0
Pump available static press. <sup>(1)</sup>	kPa	--	--	--	129	159	139	141	130	160	148	103
Water tank volume	l	--	--	--	300	300	300	500	500	500	500	500

LDA/FC Models		162	190	210	240	260	300	320	380	430	500
Cooling capacity (EN14511) <sup>(1)</sup>	kW	164,6	183,2	200,7	230,1	258,1	311,6	339,2	380,2	449,6	492,3
Compressor input (EN14511) <sup>(1)</sup>	kW	54,6	67,1	77,7	84,5	91,8	102,8	116,5	140,4	160,7	175,4
E.E.R. (EN14511) <sup>(1)</sup>	W/W	3,0	2,7	2,6	2,7	2,8	3,0	2,9	2,7	2,8	2,8
Free cooling capacity <sup>(5)</sup>	kW	106,6	134,1	136,6	164,1	168,0	241,4	246,6	313,9	326,6	332,8
Compressors input <sup>(5)</sup>	kW	2,8	6,0	6,0	8,0	8,0	12,0	12,0	16,0	16,0	16,0
Water flow <sup>(5)</sup>	m <sup>3</sup> /h	29,9	33,3	36,4	41,8	46,9	56,6	61,6	69,0	81,6	89,3
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	400/3/50
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,6	3x2,0	3x2,0	4x2,0	4x2,0	6x2,0	6x2,0	8x2,0	8x2,0	8x2,0
Sound power level <sup>(3)</sup>	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound power level <sup>(4)</sup>	dB(A)	56	58	58	61	61	62	62	63	63	63
Water pump input power	kW	3,0	4,0	4,0	5,5	5,5	5,5	5,5	11,0	11,0	11,0
Pump available static press. <sup>(1)</sup>	kPa	80	182	158	126	92	126	115	111	70	42
Water tank volume	l	500	600	600	600	600	1000	1000	1000	1000	1000

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

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

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

(5) Free Cooling : ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal water flow, compressors switched off.



## LDA

LDA/FC100 Models		060	070	080	090	110	120	130	152	162	190	210	240	260
Cooling capacity (EN14511) <sup>(1)</sup>	kW	63,8	71,5	85,2	93,3	103,6	118,5	132,3	154,1	172,4	191,5	210,4	233,3	260,5
Compressor input(EN14511) <sup>(1)</sup>	kW	22,1	23,3	26,9	32,8	35,1	38,5	43,1	49,6	53,9	65,1	74,6	82,7	90,7
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,9	3,1	3,2	2,8	2,9	3,1	3,1	3,1	3,2	2,9	2,8	2,8	2,9
Free cooling capacity <sup>(5)</sup>	kW	81,9	86,1	92,0	113,4	119,9	127,8	133,8	166,0	170,2	195,8	201,9	208,1	214,2
Compressors input <sup>(5)</sup>	kW	4,0	4,0	4,0	6,0	6,0	6,0	6,0	6,0	6,0	8,0	8,0	8,0	8,0
Water flow <sup>(5)</sup>	m³/h	11,6	13,0	15,5	16,9	18,8	21,5	24,0	28,0	31,3	34,8	38,2	42,4	47,3
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	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2
Fans	n° x kW	2x2	2x2	2x2	3x2	3x2	3x2	3x2	3x2	3x2	4x2	4x2	4x2	4x2
Sound power level <sup>(3)</sup>	dB(A)	79,0	80,0	80,0	82,0	82,5	82,9	83,1	83,5	84	86	86	89	89
Sound power level <sup>(4)</sup>	dB(A)	51,0	52,0	52,0	54,0	54,5	54,9	55,1	55,5	56	58	58	61	61
Water tank volume	l	300	300	300	500	500	500	500	500	500	600	600	600	600

Performance refer to the following conditions:

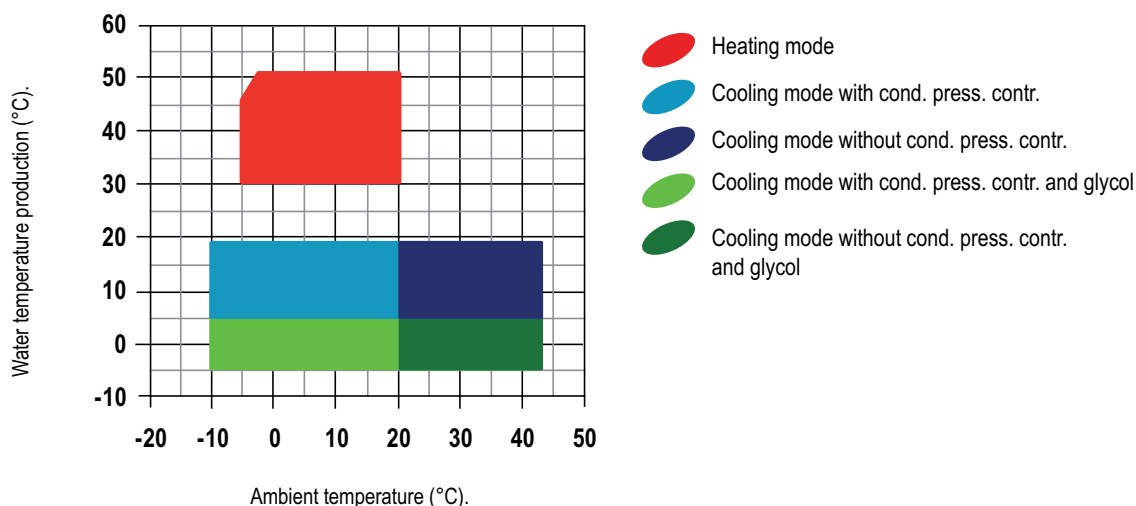
(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

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

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

(5) Free Cooling : ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal water flow, compressors switched off.

### OPERATION LIMITS



# LDA

LDA/CN Models		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity (EN14511) <sup>(1)</sup>	kW	41,7	46,8	57,0	63,4	71,5	83,3	98,3	110,1	124,2	134,9	164,1
Compressor input power (EN14511) <sup>(1)</sup>	kW	14,2	16,0	18,9	21,5	23,4	27,8	32,2	35,8	40,1	45,6	51,3
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,9	2,9	3,0	2,9	3,1	3,0	3,1	3,1	3,1	3,0	3,2
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	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	2x0,6	2x0,6	2x0,6	2x0,6	2x0,6	2x0,6	3x0,6	3x0,6	3x0,6	3x0,6	4x0,6
Sound power level <sup>(3)</sup>	dB(A)	77,0	77,0	79,0	79,0	80,0	80,0	82,0	82,5	82,9	83,1	83,5
Sound pressure level <sup>(4)</sup>	dB(A)	49,0	49,0	51,0	51,0	52,0	52,0	54,0	54,5	54,9	55,1	55,5

LDA/CN Models		162	190	210	240	260	300	320	380	430	500
Cooling capacity (EN14511) <sup>(1)</sup>	kW	180,5	193,8	211,6	244,6	273,6	325,5	359,3	396,4	467,0	513,7
Compressor input power (EN14511) <sup>(1)</sup>	kW	56,3	66,6	77,2	84,6	91,6	104,0	118,6	142,3	162,7	178,1
E.E.R. (EN14511) <sup>(1)</sup>	W/W	3,2	2,9	2,7	2,9	3,0	3,1	3,0	2,8	2,9	2,9
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	400/3/50
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	4x0,6	3x2,0	3x2,0	4x2,0	4x2,0	6x2,0	6x2,0	8x2,0	8x2,0	8x2,0
Sound power level <sup>(3)</sup>	dB(A)	84	86	86	89	89	90	90	91	91	91
Sound pressure level <sup>(4)</sup>	dB(A)	56	58	58	61	61	62	62	63	63	63

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporation temperature 5 °C.

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

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

LDA/CN/XL Models		060	070	080	090	110	120	130	152	162
Cooling capacity (EN14511) <sup>(1)</sup>	kW	64,4	72,6	85,4	99,1	111,6	127,0	138,2	159,5	174,8
Compressor input power (EN14511) <sup>(1)</sup>	kW	21,7	23,7	27,6	32,7	36,0	39,8	45,1	53,4	58,8
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,9	3,1	3,1	3,0	3,1	3,2	3,1	3,0	3,0
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
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	2x0,98	2x0,98	2x0,98	3x0,98	3x0,98	3x0,98	3x0,98	3x0,98	3x0,98
Sound power level <sup>(3)</sup>	dB(A)	76,0	78,0	78,0	79,5	79,9	80,1	80,5	81,0	81,3
Sound pressure level <sup>(4)</sup>	dB(A)	48,0	50,0	50,0	51,5	51,9	52,1	52,5	53,0	53,3

LDA/CN/XL Models		190	210	240	260	300	320	380
Cooling capacity (EN14511) <sup>(1)</sup>	kW	184,1	200,9	225,4	243,9	288,4	315,7	377,6
Compressor input power (EN14511) <sup>(1)</sup>	kW	68,6	80,2	84,1	96,0	107,6	126,3	140,9
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,7	2,5	2,7	2,7	2,5	2,5	2,7
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
Compressors / Circuits	n°	4/2	4/2	4/2	4/2	4/2	4/2	6/2
Fans	n° x kW	4x0,98	4x0,98	4x0,98	4x0,98	6x0,98	6x0,98	8x0,98
Sound power level <sup>(3)</sup>	dB(A)	84,0	84,0	83,0	83,0	85,0	85,0	86,0
Sound pressure level <sup>(4)</sup>	dB(A)	56,0	56,0	55,0	55,0	57,0	57,0	58,0

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporation temperature 5 °C.

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

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

## LDA

### FRAME

All LDA 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. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option).

### COMPRESSORS

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

### CONDENSERS

The condenser 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 condenser design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

### 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 used are 6 pole (about 900 rpm) in the low noise versions and 8 pole (about 750 rpm) in the extra low noise versions. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

### EVAPORATORS

The evaporator is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Models 039 to 162 have a single water side circuit and from size 190 a double circuit "cross flow" type is used. 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 evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

### MICROPROCESSOR

All LDA 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, 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. All LDA units have fitted as standard, 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). 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 versions only) and general alarm.

### CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return water temperature sensor installed on the return water line from the building, antifreeze protection sensor installed on the outlet water temperature, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

### REVERSIBLE VERSIONS (HP)

The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 50°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

### FREE COOLING VERSION FC-FC100%

If there is a requirement for the chiller to operate all year round it is possible to generate the chilled water by free cooling.

## LDA

The free cooling version has an extra coil through which the system water is passed if the ambient temperature is low enough to remove energy from it. This is especially useful with modern, low energy cooling systems such as high temperature fan coils, chilled beams or ceilings. If the return water temperature is, for example, 16°C, and the flow required is 12°C then it can be seen that if the ambient is below 16°C some of the cooling can be performed by free cooling. If the ambient is below 12°C most, if not all, of the cooling can be provided by free cooling. This process makes substantial energy savings and results in correctly designed water systems being among the most energy efficient available.

Free Cooling is available in 2 different versions:

FC; Standard Free Cooling capacity;

FC100; Enhanced Free Cooling capacity that is capable of providing 100% of the chiller capacity at low ambient conditions; Free Cooling versions comprise the following components:

### Thermal exchange coil:

an air to water heat exchanger manufactured from copper tubes with aluminium fins. It is supplied with shut-off valves.

### Microprocessor control:

the "heart" of the system; By measurement of all the critical parameters, the controller ensures that the unit operates at maximum efficiency under all conditions.

### 3 way valve:

this is an ON/OFF 3 way valve which either passes the water into the free cooling coil or sends it directly to the plate exchanger.

### Low ambient pressure control:

control of the condensing pressure of the refrigerant circuit in low external conditions is provided by this device. If free cooling is in operation, the fans must run at full speed for maximum effect. If there is insufficient duty from free cooling then the chiller circuit must also run but with the fans at full speed. This is likely to result in a low condensing pressure as the exchanger capacity is too large.

The control therefore consists of several solenoid valves than can partialise the condenser coil into 1/3rd, 2/3rd's or full coil. This enables the heat transfer surface area to be reduced thereby maintaining the correct condensing pressure.

LDA - LDA/HP Versions	Code	039÷050	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Flow switch	—	●	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump *	A1ZZ	○	○	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank *	A1NT	○	○	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump *	A2ZZ	○	○	○	○	○	○	○
Hydraulic kit A2NT with two pump without tank *	A2NT	○	○	○	○	○	○	○
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○	○
Antifreeze kit **	RAES	○	○	○	○	○	○	○
Liquid line solenoid valve ***	VSOG	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○

\* Not available with XL versions.

\*\* Only for hydraulic kit versions.

\*\*\* Standard for HP versions.

## LDA

LDA/FC - LDA/FC100 Versions	Code	039÷050	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Flow switch	–	●	●	●	●	●	●	●
Low ambient kit with circuit step	DCCF	●	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump	A1ZZ	○	○	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump	A2ZZ	○	○	○	○	○	○	○
Hydraulic kit A2NT with two pump without tank	A2NT	○	○	○	○	○	○	○
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○	○
Antifreeze kit *	RAES	○	○	○	○	○	○	○
Liquid line solenoid valve	VSOG	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	●	●	●	●	●	●	●
Serial interface card RS485	INSE	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○

\* Only for hydraulic kit version

● Standard, ○ Optional, – Not available.

LDA/XL - LDA/HP/XL Versions	Code	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Flow switch	–	●	●	●	●	●	●
LS low noise version	XL00	●	●	●	●	●	●
Low ambient condensing pressure control	DCCF	●	●	●	●	●	●
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○
Antifreeze kit *	RAES	○	○	○	○	○	○
Liquid line solenoid valve **	VSOG	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○

\* Only for hydraulic kit version.

● Standard, ○ Optional, – Not available.

\*\* Standard for HP version.

LDA/CN Versions	Code	039÷050	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Main switch	–	●	●	●	●	●	●	●
Microprocessor control	–	●	●	●	●	●	●	●
Free contacts for remote on/off	–	●	●	●	●	●	●	●
Free contacts for general alarm	–	●	●	●	●	●	●	●
Liquid line solenoid valve	–	●	●	●	●	●	●	●
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○
Expansion valve	VTER	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○
Condensing coil protection mesh	FAMM	○	○	○	○	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○	○	○	○	○

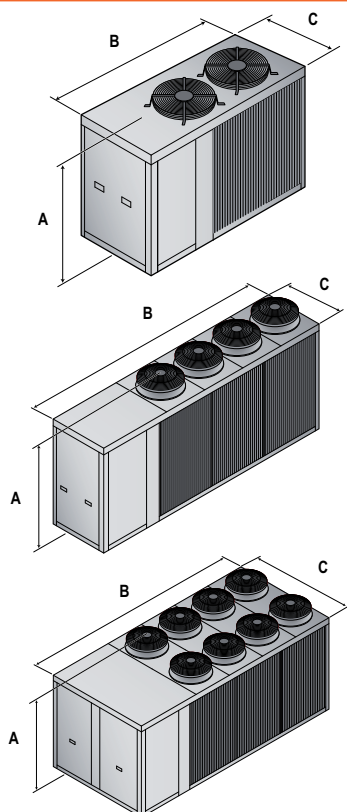
\* Condensing coil protection mesh with metallic filter

● Standard, ○ Optional, – Not available.

LDA/CN Versions	Code	039÷050	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Main switch	–	●	●	●	●	●	●	●
Microprocessor control	–	●	●	●	●	●	●	●
Free contacts for remote on/off	–	●	●	●	●	●	●	●
Free contacts for general alarm	–	●	●	●	●	●	●	●
Low ambient condensing pressure control	DCCF	●	●	●	●	●	●	●
Liquid line solenoid valve	VSOG	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○
Expansion valve	VTER	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○
Condensing coil protection mesh	FAMM	○	○	○	○	○	○	○

\* Condensing coil protection mesh with metallic filter

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
039/039A	1406	1870	850	570/890
045/045A	1406	1870	850	590/910
050/050A	1406	1870	850	600/920
060/060A	1759	2608	1105	725/1045
070/070A	1759	2608	1105	760/1070
080/080A	1759	2608	1105	810/1130
090/090A	1759	3608	1105	1070/1590
110/110A	1759	3608	1105	1150/1670
120/120A	1759	3608	1105	1200/1720
130/120A	1759	3608	1105	1230/1750
152/152A	2179	3608	1105	1390/1910
162/162A	2179	3608	1105	1580/2100
190/190A	2350	4708	1105	1960/2580
210/210A	2350	4708	1105	2050/2670
240/240A	2350	4708	1105	2160/2780
260/260A	2350	4708	1105	2480/3000
300/300A	2350	4108	2210	3150/4300
320/320A	2350	4108	2210	3220/4370
380/380A	2350	4720	2210	3560/4710
430/430A	2350	4720	2210	3650/4800
500/500A	2350	4720	2210	3750/4900



## LDP

Multipurpose air cooled units with axial fans



R410A



The multipurpose units LDP series are hydronic units designed for those applications where both hot and cold water are required. The typical application of LDP units is in the 4 pipe systems where they are able to produce simultaneously or separately cold water for cooling and hot water for heating. The units are supplied with an additional heat exchanger, used as a condenser for hot water, whose production is independent of the operation mode of the unit. The activation of the heat exchanger is provided automatically by the microprocessor control when the hot water temperature on the return is less than the set point. *These units are able to produce hot water and cold water simultaneously and/or separately.* The units are supplied complete with supplied and return water sensors and full of a specific advanced microprocessor control provided with software managing the various priorities.

### VERSIONS

- **LDP/2PS** Standard version 2 pipes + DHW.
- **LDP/4PS** Standard version 4 pipes system.
- **LDP/XL/2PS** Extra low noise version 2 pipes + DHW.
- **LDP/XL/4PS** Extra low noise version 4 pipes system.

### ACCESSORIES

- **A0NP:** Hydraulic kit without tank and pump.
- **A1NT:** Hydraulic kit with: pump, expansion valve, safety valve, flow switch.
- **A1ZZ:** Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank.
- **DSSE:** Electronic soft starter.
- **LS00:** Low noise version.
- **PCRL:** Remote control panel.
- **RAES:** Antifreeze kit (for unit with hydraulic kit).
- **RAEV:** Evaporator antifreeze heater (Basic version only).
- **VTEE:** Electronic expansion valve.
- **VECE:** High efficiency E.C. fans.



LDP Models		060	070	080	090	110	120	130	152	162
Cooling capacity EN14511 <sup>(1)</sup>	kW	60,9	67,6	79,3	90,1	99,5	112,9	124,6	150,0	167,0
Compressor input EN14511 <sup>(1)</sup>	kW	21,3	23,1	27,3	31,3	34,4	38,5	44,2	49,8	54,8
E.E.R. EN14511 <sup>(1)</sup>	W/W	2,9	2,9	2,9	2,9	2,9	2,9	2,8	3,0	3,1
Heating capacity EN14511 <sup>(2)</sup>	kW	66,1	75,2	85,8	101,6	110,8	125,4	136,9	159,2	173,7
Compressor input EN14511 <sup>(2)</sup>	kW	19,4	21,5	24,9	28,9	32,5	36,4	40,4	46,5	51,5
C.O.P. EN14511 <sup>(2)</sup>	W/W	3,4	3,5	3,5	3,5	3,4	3,4	3,4	3,4	3,4
Cooling capacity EN14511 <sup>(3)</sup>	kW	62,2	69,4	84,2	91,7	103,6	118,5	133,7	155,0	176,5
Recovery heating capacity EN14511 <sup>(3)</sup>	kW	81,4	90,2	107,9	120,1	134,0	152,4	171,7	199,7	224,2
Input power EN14511 <sup>(3)</sup>	kW	19,2	20,8	23,7	28,4	30,4	33,9	38,0	44,7	47,7
TER EN14511 <sup>(3)</sup>		7,5	7,7	8,1	7,5	7,8	8,0	8,0	7,9	8,4
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
Compressors / Circuits	n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Fans	n° x kW	2x0,6	2x0,6	2x0,6	3x0,6	3x0,6	3x0,6	3x0,6	4x0,6	4x0,6
Sound power level <sup>(3)</sup>	dB(A)	79,0	80,0	80,0	82,0	82,5	82,9	83,1	83,5	84,0
Sound pressure level <sup>(4)</sup>	dB(A)	51,0	52,0	52,0	54,0	54,5	54,9	55,1	55,5	56,0
Water tank volume	l	300	300	300	500	500	500	500	500	500

LDP Models		190	210	240	260	300	320	380	430	500
Cooling capacity (EN 14511) <sup>(1)</sup>	kW	184,9	211,0	232,3	260,7	314,8	343,1	383,8	454,0	497,0
Compressor input (EN 14511) <sup>(1)</sup>	kW	67,2	77,0	84,8	92,1	103,2	116,7	141,1	161,0	176,3
E.E.R. (EN 14511) <sup>(1)</sup>	W/W	2,7	2,6	2,7	2,8	3,1	2,9	2,7	2,8	2,8
Heating capacity (EN 14511) <sup>(2)</sup>	kW	191,1	206,3	246,8	267,7	323,6	356,1	414,0	478,2	522,0
Compressor input (EN 14511) <sup>(2)</sup>	kW	61,1	65,9	76,9	84,7	104,7	114,5	135,3	151,3	167,8
C.O.P. (EN 14511) <sup>(2)</sup>	W/W	3,1	3,1	3,2	3,2	3,1	3,1	3,1	3,2	3,1
Cooling capacity (EN 14511) <sup>(3)</sup>	kW	193,8	226,0	240,3	275,6	322,5	359,2	393,0	465,4	520,8
Recovery heating capacity (EN 14511) <sup>(3)</sup>	kW	250,8	289,3	313,1	352,8	410,2	456,8	513,4	605,1	669,6
Input power (EN 14511) <sup>(3)</sup>	kW	57,0	63,3	72,8	77,2	87,7	97,6	120,4	139,7	148,8
TER (EN 14511) <sup>(3)</sup>		7,8	8,1	7,6	8,1	8,4	8,4	7,5	7,7	8,0
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
Compressors / Circuits	n°	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Fans	n° x kW	3x2,0	3x2,0	4x2,0	4x2,0	6x2,0	6x2,0	8x2,0	8x2,0	8x2,0
Sound power level <sup>(3)</sup>	dB(A)	86	86	89	89	90	90	91	91	91
Sound pressure level <sup>(4)</sup>	dB(A)	58	58	61	61	62	62	63	63	63
Water tank volume	l	600	600	600	600	1000	1000	1000	1000	1000

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

(3) Cooling and simultaneous heat recovery: Recovered hot water temperature 40/45°C, cold water temperature 12/7°C, ambient air temperature 35°C.

(4) Sound power level in accordance with ISO 9614 (LS-Version).

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

## LDP

LDP/XL Models		060	070	080	090	110	120	130	152
Cooling capacity (EN 14511) <sup>(1)</sup>	kW	61,3	68,4	81,0	90,7	100,4	114,8	127,0	146,5
Compressor input (EN 14511) <sup>(1)</sup>	kW	21,7	23,3	27,0	31,8	34,7	38,4	43,8	51,7
E.E.R. (EN 14511) <sup>(1)</sup>	W/W	2,8	2,9	3,0	2,8	2,9	3,0	2,9	2,8
Heating capacity (EN 14511) <sup>(2)</sup>	kW	66,5	76,2	87,2	102,5	112,0	127,5	139,1	155,1
Compressor input (EN 14511) <sup>(2)</sup>	kW	19,9	22,1	25,6	29,8	34,0	37,9	41,0	46,9
C.O.P. (EN 14511) <sup>(2)</sup>	W/W	3,3	3,4	3,4	3,4	3,3	3,4	3,4	3,3
Cooling capacity (EN 14511) <sup>(3)</sup>	kW	62,2	69,2	84,5	91,6	103,4	118,2	133,5	155,6
Recovery heating capacity (EN 14511) <sup>(3)</sup>	kW	83,4	92,1	110,0	123,0	136,7	155,1	174,4	203,2
Input power (EN 14511) <sup>(3)</sup>	kW	21,2	22,9	25,5	31,4	33,3	36,9	40,9	47,6
TER (EN 14511) <sup>(3)</sup>		6,9	7,0	7,6	6,8	7,2	7,4	7,5	7,5
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
Compressors / Circuits	n°	2/2	2/2	2/2	2/2	2/2	2/2	2/2	2/2
Fans	n°xkW	2x0,98	2x0,98	2x0,98	3x0,98	3x0,98	3x0,98	3x0,98	3x0,98
Sound power level <sup>(4)</sup>	dB(A)	76,0	78,0	78,0	79,5	79,9	80,1	80,5	81,0
Sound pressure level <sup>(5)</sup>	dB(A)	48,0	50,0	50,0	51,5	51,9	52,1	52,5	53,0

LDP/XL Models		162	190	210	240	260	300	320	380
Cooling capacity (EN 14511) <sup>(1)</sup>	kW	162,6	179,5	205,0	219,3	238,8	270,6	300,6	360,4
Compressor input (EN 14511) <sup>(1)</sup>	kW	57,2	65,5	74,2	83,1	95,2	105,3	121,7	139,3
E.E.R. (EN 14511) <sup>(1)</sup>	W/W	2,8	2,7	2,8	2,6	2,5	2,6	2,5	2,6
Heating capacity (EN 14511) <sup>(2)</sup>	kW	168,8	186,6	200,9	248,3	271,2	316,5	347,6	409,0
Compressor input (EN 14511) <sup>(2)</sup>	kW	51,9	57,2	63,8	72,4	80,3	93,6	103,2	121,7
C.O.P. (EN 14511) <sup>(2)</sup>	W/W	3,2	3,3	3,2	3,4	3,4	3,4	3,4	3,4
Cooling capacity (EN 14511) <sup>(3)</sup>	kW	176,9	188,0	219,2	233,7	260,8	287,9	328,1	381,9
Recovery heating capacity (EN 14511) <sup>(3)</sup>	kW	227,6	245,2	282,1	305,3	340,8	378,9	430,2	501,7
Input power (EN 14511) <sup>(3)</sup>	kW	50,7	57,2	62,9	71,6	80,0	91,0	102,1	119,8
TER (EN 14511) <sup>(3)</sup>		8,0	7,6	8,0	7,5	7,5	7,3	7,4	7,4
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
Compressors / Circuits	n°	2/2	4/2	4/2	4/2	4/2	4/2	4/2	6/2
Fans	n°xkW	3x0,98	4x0,98	4x0,98	4x0,98	4x0,98	6x0,98	6x0,98	8x0,98
Sound power level <sup>(4)</sup>	dB(A)	81,3	83,0	83,0	83,0	83,0	85,0	85,0	86,0
Sound pressure level <sup>(5)</sup>	dB(A)	53,3	55,0	55,0	55,0	55,0	57,0	57,0	58,0

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

(3) Cooling and simultaneous heat recovery: Recovered hot water temperature 40/45°C, cold water temperature 12/7°C, ambient air temperature 35°C.

(4) Sound power level in accordance with ISO 9614 (XL-Version).

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

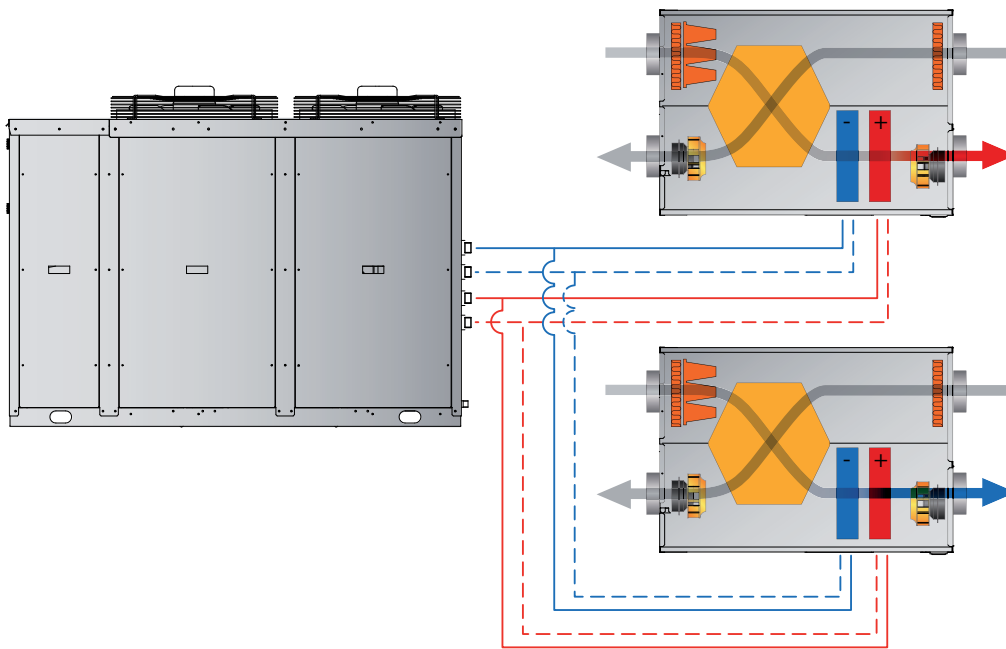
# LDP

## 4 PIPES SYSTEM

In the 4 pipes system the hot and cold water are always separate and just available in the specific hydraulic system.

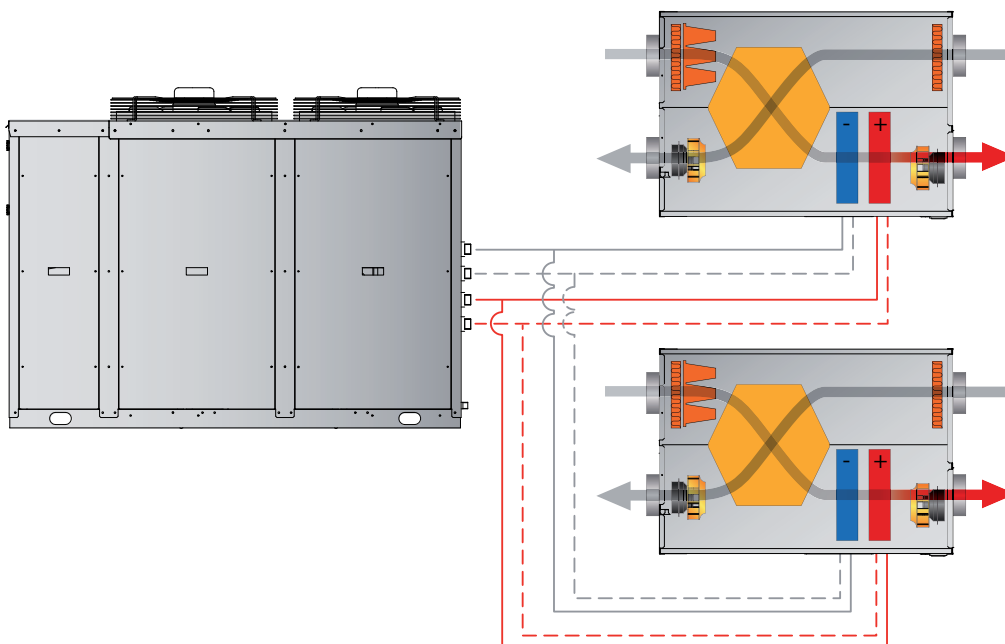
### Operation Mode A - Mid-seasons operation.

Simultaneous production of hot and cold water to supply, as example, hot water to the rooms of a building facing north and cold water to the rooms facing south.



### Operation mode B - Winter operation.

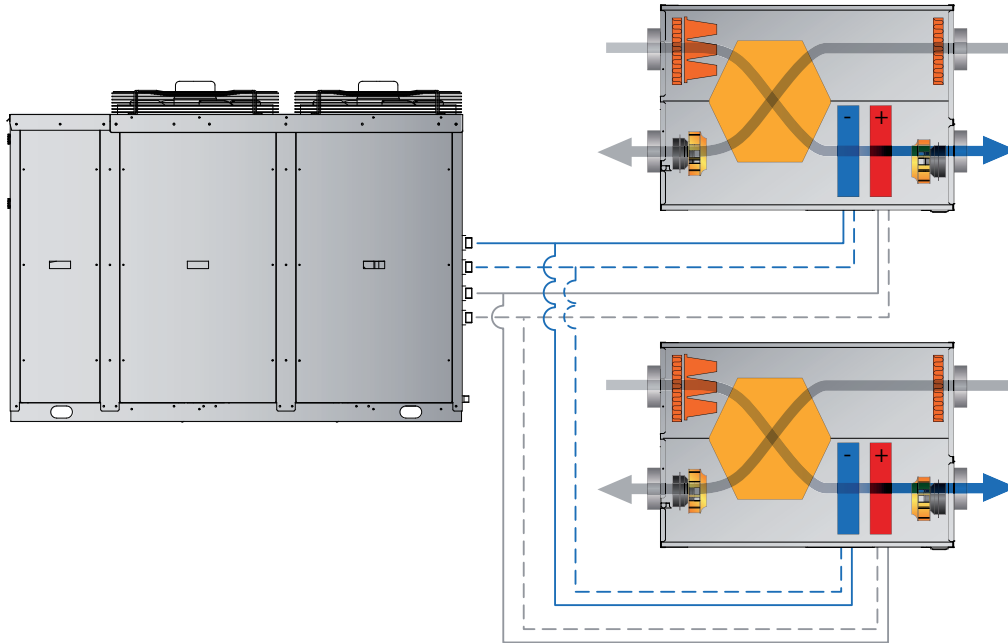
The cold water production is not required; all units are supplied with hot water only.



## LDP

### Operation mode C - Summer operation mode.

The hot water production is not required; all units are supplied with cold water only.

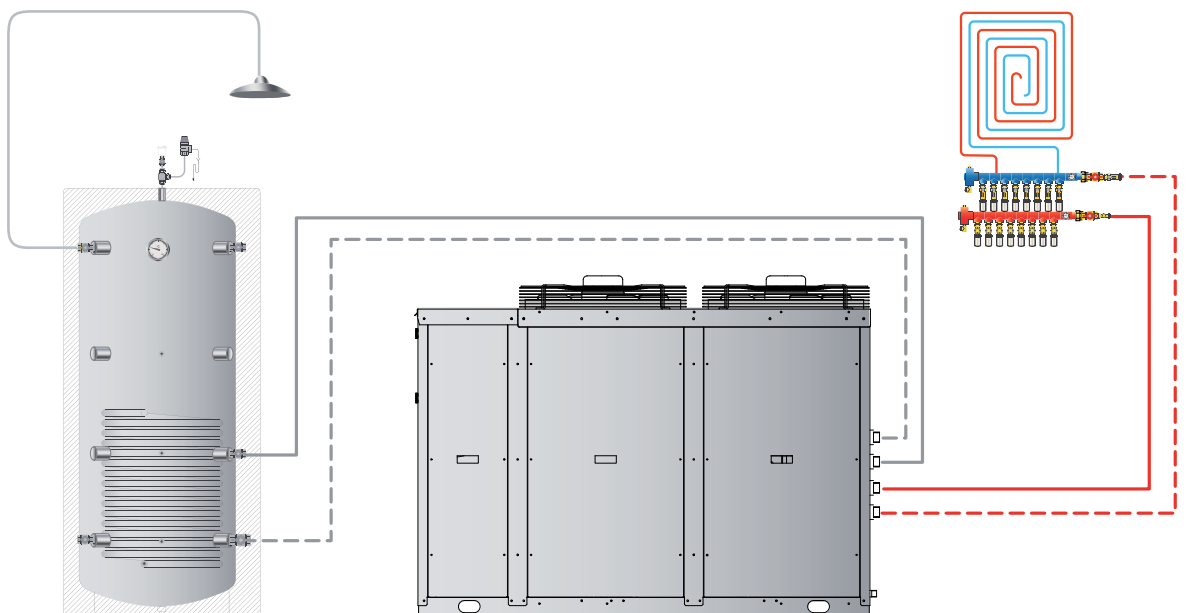


### 2 PIPES SYSTEM + DOMESTIC HOT WATER (D.H.W.)

In the 2 pipes system with DHW circuit, differently from the 4 pipes system, the hot water can be delivered to the DHW circuit and/or to the user circuit, while the cold water is never available for the DHW circuit.

### Operation mode A

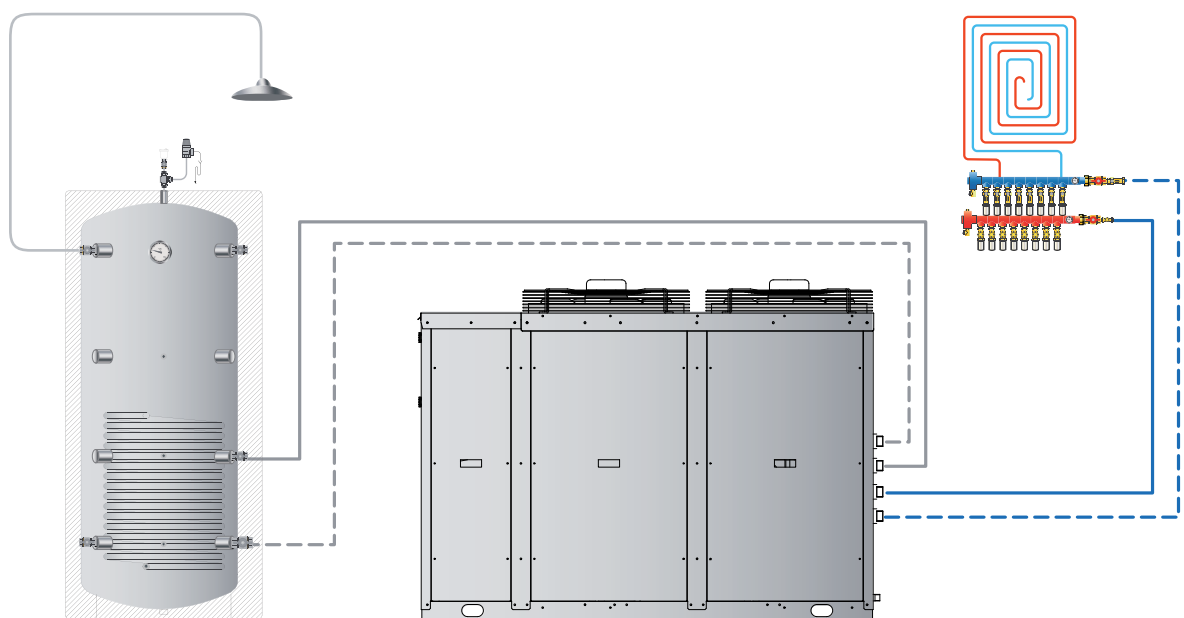
Hot water production for user circuit, only.



# LDP

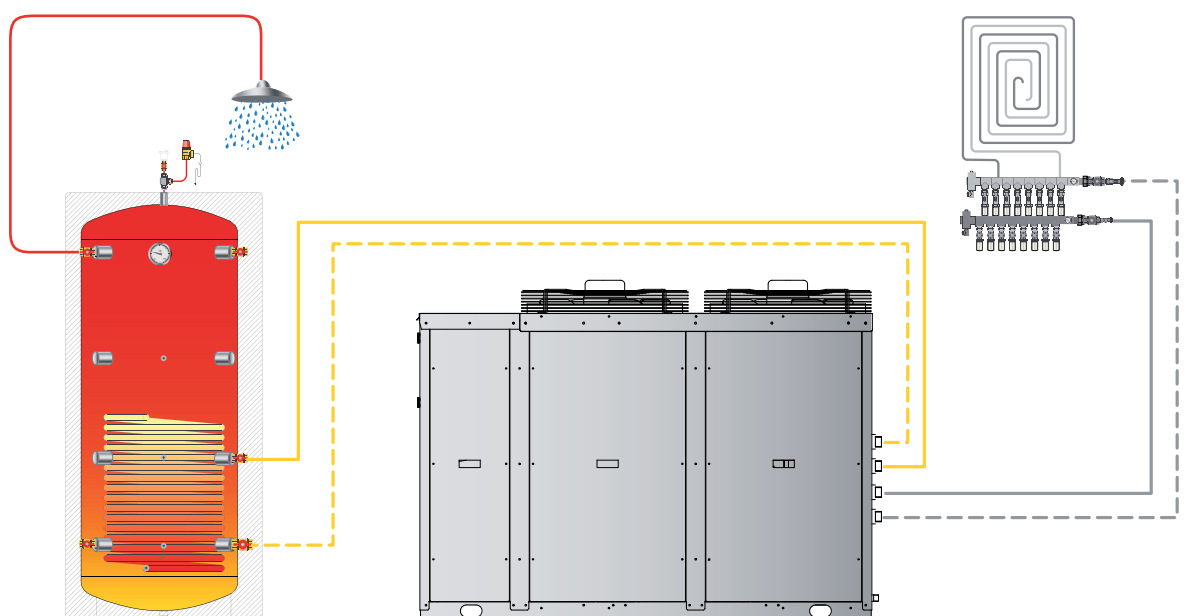
## Operation mode B

Cold water production for user circuit, only.



## Operation mode C

Hot water production for DHW circuit, only.

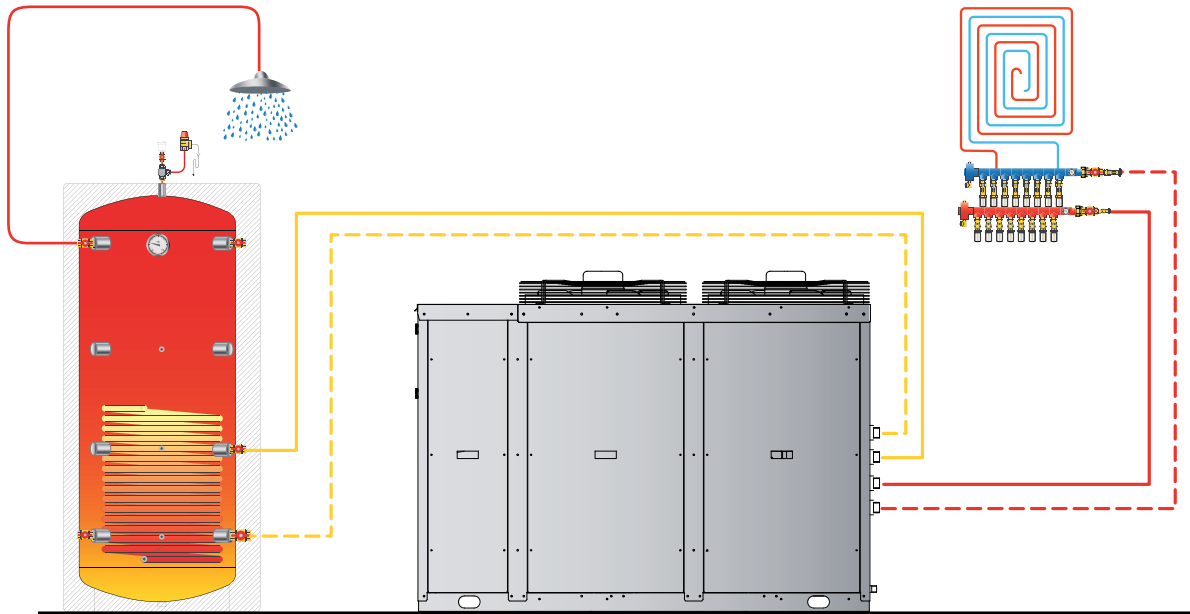


LDP

## LDP

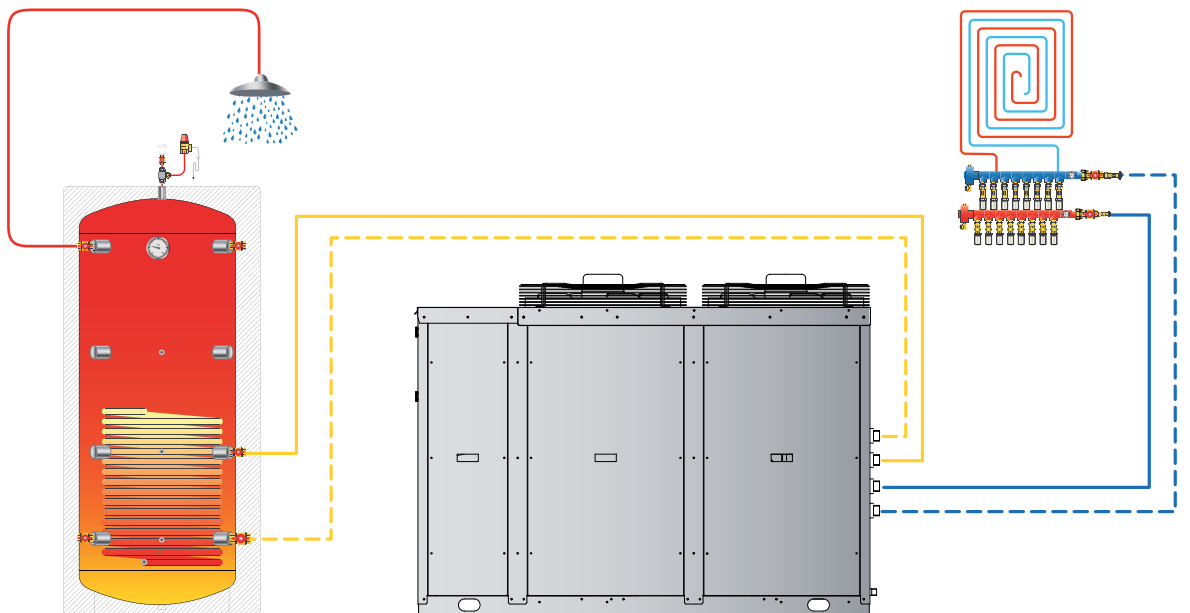
### Operation mode D

Hot water production with priority to the DHW circuit (ex. 50°C) and hot water production to the user circuit (ex. 35°C) with 2 different set points. In this configuration the DHW circuit has generally the priority.



### Operation mode E

Simultaneous production of cold water ( to the user circuit) and hot water ( to the DHW circuit).



## FRAME

All LDP 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). From model size 10 upwards 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

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

## 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. The exchangers can be protected by a metallic filter that is available as an accessory.

## 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 used are 6 pole (about 900 rpm) in the low noise versions and 8 pole (about 750 rpm) in the extra low noise versions. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

## USER HEAT EXCHANGER

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.

## MICROPROCESSOR

All units are equipped with microprocessor control featuring the following functions: regulation of water temperature, antifreeze protection, timing compressors, compressor starting sequence, alarms reset, alarms and LED operation management. The microprocessor is factory pre-set with the automatic defrost function (in case of extreme working conditions) and for summer/winter/hot water mode. Upon request, the microprocessor may be connected to a BMS system. Hidros Information & Control department is available to study together with the customer, different solutions using MODBUS, LonWorks, BACnet and TREND.

## 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. All units have fitted as standard, 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). 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.

## CONTROL AND PROTECTION DEVICES

All units are equipped with the following control and protection: User return cold water probe sensor, antifreeze temperature sensor installed on 'output water users, user supply/return hot water probe sensors, high pressure switch manual reset, automatic reset for low pressure switch, high pressure safety valve, compressor thermal protection, fan thermic 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 the function of "Energy Saving", supplied in a separate plastic box, which can be used to stop the pump during stand-by periods, when the water temperature reaches the set point. In this way reduces the power consumption of the unit.

The probe sensor must be positioned in the hydraulic compensator present at technical room. The user hot circuit utility is already equipped with this probe, meanwhile it is recommended to install it into the cold user circuit.



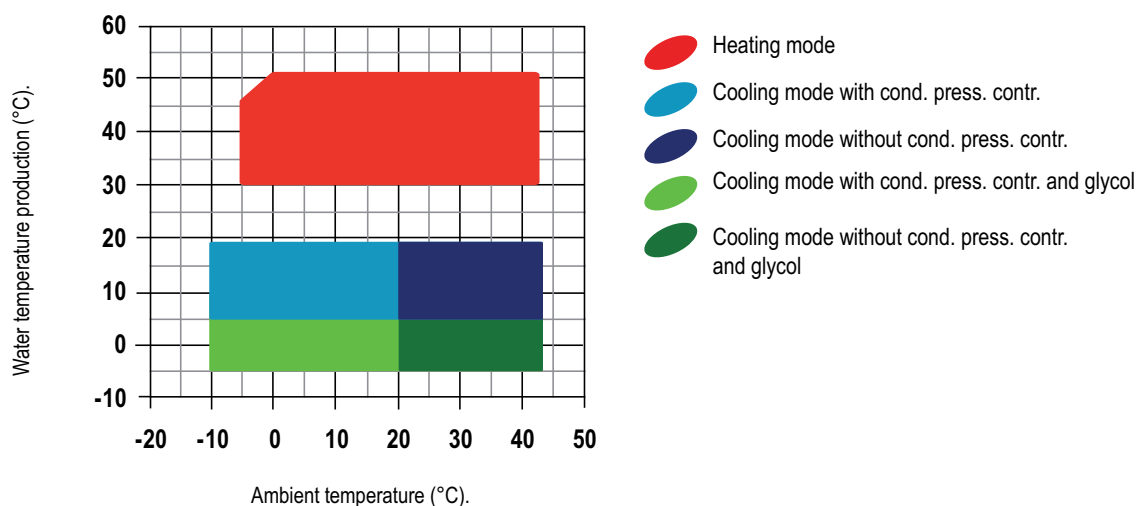
## LDP

LDP Versions	Codice	060÷080	090÷130	152÷162	190÷260	300÷320	380÷500
Flow switch	--	●	●	●	●	●	●
Low ambient condensing pressure control	DCCF	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○	○
Hydraulic kit with tank and one pump on user circuit	A1ZZU	○	○	○	○	○	○
Hydraulic kit with one pump without tank on user circuit	A1NTU	○	○	○	○	○	○
Hydraulic kit with tank and two pump on user circuit	A2ZZU	○	○	○	○	○	○
Hydraulic kit with two pump without tank on user circuit	A2NTU	○	○	○	○	○	○
Hydraulic kit without tank and pump on user circuit	A0NPU	○	○	○	○	○	○
Hydraulic kit with tank and one pump on D.H.W. circuit	A1ZZS	○	○	○	○	○	○
Hydraulic kit with one pump without tank on D.H.W. circuit	A1NTS	○	○	○	○	○	○
Hydraulic kit with tank and two pump on D.H.W. circuit	A2ZZS	○	○	○	○	○	○
Hydraulic kit with two pump without tank on D.H.W. circuit	A2NTS	○	○	○	○	○	○
Hydraulic kit without tank and pump on D.H.W. circuit	A0NPS	○	○	○	○	○	○
Hydraulic kit with two+two pumps (user + D.H.W. circuit), without tank	A4NT	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○
Antifreeze kit *	RAES	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○

\* Only for hydraulic kit versions.

● Standard, ○ Optional, – Not available.

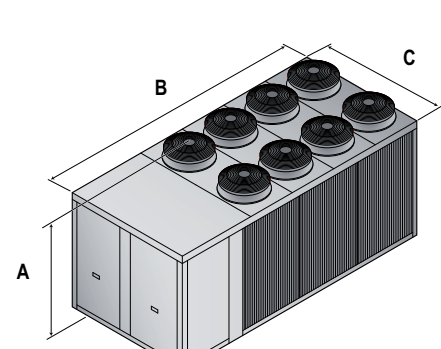
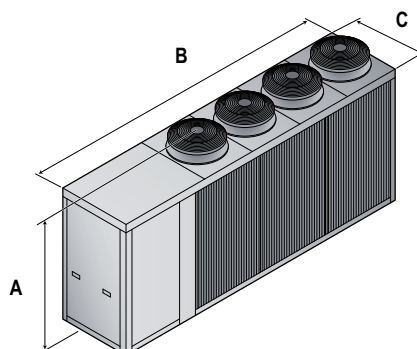
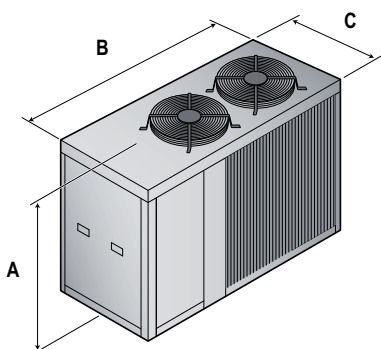
### OPERATION LIMITS



LDP/XL Versions	Code	060÷080	090÷130	152÷162	190÷260	300÷320	380
Flow switch	--	●	●	●	●	●	●
Low ambient condensing pressure control	DCCF	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	●	●	●	●	●	●
Extra low noise version XL	XL00	●	●	●	●	●	●
Hydraulic kit with tank without user pump	A0NPU	○	○	○	○	○	○
Hydraulic kit with tank without D.H.W. pump	A0NPS	○	○	○	○	○	○
Refrigerant pressure gauges	MAML	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○	○
Antifreeze kit *	RAES	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○
High efficiency E.C. fans	VECE	○	○	○	○	○	○

\* Only for hydraulic kit version.

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
060	1759	2608	1105	725
070	1759	2608	1105	760
080	1759	2608	1105	810
090	1759	3608	1105	1070
110	1759	3608	1105	1150
120	1759	3608	1105	1200
130	1759	3608	1105	1230

Mod.	A (mm)	B (mm)	C (mm)	Kg
152	2179	3608	1105	1390
162	2179	3608	1105	1580
190	2350	4708	1105	1960
210	2350	4708	1105	2050
240	2350	4708	1105	2160
260	2350	4708	1105	2480

Mod.	A (mm)	B (mm)	C (mm)	Kg
300	2350	4108	2210	3150
320	2350	4108	2210	3220
380	2350	4720	2210	3560
430	2350	4720	2210	3650
500	2350	4720	2210	3750

## CDA

Air cooled water chillers with centrifugal fans



CDA water chillers are efficient, low-noise products designed for medium to large applications.

They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units.

The use of tandem scroll compressors and the centrifugal fans results in high efficiencies (especially at part loads) low noise levels, making them suitable for use in indoor applications.

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

### VERSIONS

- **CDA**, cooling only version, available in 18 different sizes.
- **CDA/HP**, reversible version, available in 18 different sizes.
- **CDA/FC**, free-cooling version, available in 18 different sizes.

### ACCESSORIES

- **A1ZZ**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank
- **A2ZZ**: Hydraulic kit with tank and two pump
- **DCCI**: Low ambient inverter condensing pressure control
- **FAMM**: Coil protection mesh with metallic filter
- **KAVG**: Rubber anti-vibration mountings
- **KAVM**: Spring anti-vibration mountings
- **LS00**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges
- **PCRL**: Remote control panel
- **RAES**: Antifreeze kit (for unit with hydraulic kit)
- **RAEV**: Evaporator antifreeze heater (Basic version only)
- **RP00**: Partial heat recovery

CDA - CDA/HP Models		039	045	050	060	070	080	090	110
Cooling capacity (EN14511) <sup>(1)</sup>	kW	40,2	45,3	54,6	60,9	67,6	79,3	90,1	99,4
Compressor input (EN14511) <sup>(1)</sup>	kW	15,2	17,1	21,3	22,9	24,7	28,9	33,7	36,9
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,6	2,6	2,6	2,6	2,7	2,7	2,7	2,7
Heating capacity (EN14511) <sup>(2)</sup>	kW	44,0	48,9	58,5	67,9	77,2	87,8	104,7	113,7
Compressor input (EN14511) <sup>(2)</sup>	kW	12,0	13,2	16,7	17,4	19,1	22,3	26,6	29,4
C.O.P. (EN14511) <sup>(2)</sup>	W/W	3,7	3,7	3,5	3,9	4,0	3,9	3,9	3,8
Heating capacity (EN14511) <sup>(3)</sup>	kW	43,2	48,0	57,4	66,0	75,0	85,6	101,7	110,7
Compressor input (EN14511) <sup>(3)</sup>	kW	14,3	15,9	20,0	21,0	23,1	26,5	31,4	35,0
C.O.P. (EN14511) <sup>(3)</sup>	W/W	3,0	3,0	2,9	3,1	3,3	3,2	3,2	3,2
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
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	1x2,2	1x2,2	1x4,0	2x1,5	2x1,5	2x1,5	3x1,5	3x1,5
Airflow / Av. static pressure	m³/h/Pa	10800/50	10800/50	13000/50	19000/50	18000/50	18000/50	30000/50	30000/50
Sound power level <sup>(4)</sup>	dB(A)	86	86	89	89	89	89	92	92
Sound pressure level <sup>(5)</sup>	dB(A)	58	58	61	61	61	61	64	64
Water pump input power	kW	1,3	1,3	1,5	1,5	1,5	1,5	1,5	1,9
Pump available static pressure <sup>(1)</sup>	kPa	174	158	198	189	171	162	140	145
Water tank volume	l	180	180	300	300	300	300	500	500

CDA - CDA/HP Models		120	130	152	162	190	210	240	260
Cooling capacity (EN14511) <sup>(1)</sup>	kW	112,9	124,6	150,0	166,8	184,9	211,1	232,6	260,6
Compressor input (EN14511) <sup>(1)</sup>	kW	41,0	46,7	55,0	60,0	73,4	82,7	88,8	96,0
E.E.R. (EN14511) <sup>(1)</sup>	W/W	2,8	2,7	2,7	2,8	2,5	2,6	2,6	2,7
Heating capacity (EN14511) <sup>(2)</sup>	kW	128,4	139,6	162,8	176,6	196,4	211,1	252,1	272,5
Compressor input (EN14511) <sup>(2)</sup>	kW	32,5	35,5	44,0	48,0	57,0	61,2	68,0	75,0
C.O.P. (EN14511) <sup>(2)</sup>	W/W	4,0	3,9	3,7	3,7	3,4	3,5	3,7	3,6
Heating capacity (EN14511) <sup>(3)</sup>	kW	125,3	136,6	159,0	173,3	191,0	206,3	246,3	267,6
Compressor input (EN14511) <sup>(3)</sup>	kW	38,5	42,5	52,0	57,0	67,0	72,1	81,0	89,0
C.O.P. (EN14511) <sup>(3)</sup>	W/W	3,3	3,1	3,1	3,0	2,9	2,9	3,0	3,0
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
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2
Fans	n° x kW	3x1,5	3x1,5	2x4,0	2x4,0	4x3,0	4x3,0	4x3,0	4x3,0
Airflow / Av. static pressure	m³/h/Pa	30000/50	30000/50	36000/50	36000/50	60000/50	60000/50	60000/50	60000/50
Sound power level <sup>(4)</sup>	dB(A)	92	92	94	94	96	96	96	96
Sound pressure level <sup>(5)</sup>	dB(A)	64	64	66	66	68	68	68	68
Water pump input power	kW	1,9	1,9	2,2	2,2	3,0	3,0	4,0	4,0
Pump available static pressure <sup>(1)</sup>	kPa	133	124	110	98	164	148	175	147
Water tank volume	l	500	500	500	500	600	600	600	600

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Heating: condenser water temperature in/out 30/35 °C, ambient air temperature 7°C DB, 6°C WB.

(3) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

(4) Sound power level in accordance with ISO 9614 (LS-Version).

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

## CDA

CDA/FC Models		039	045	050	060	070	080	090	110
Cooling capacity (EN14511) <sup>(1)</sup>	kW	--	--	--	60,4	66,8	78,9	89,3	99,0
Compressor input (EN14511) <sup>(1)</sup>	kW	--	--	--	22,8	24,6	28,6	33,3	36,1
E.E.R. (EN14511) <sup>(1)</sup>	W/W	--	--	--	2,6	2,7	2,8	2,7	2,7
Free cooling capacity <sup>(5)</sup>	kW	--	--	--	51,6	51,3	53,0	78,7	78,9
Compressors input <sup>(5)</sup>	kW	--	--	--	3,0	3,0	3,0	4,5	4,5
Water flow <sup>(5)</sup>	m³/h	--	--	--	11,0	12,1	14,3	16,2	18,0
Power supply	V/Ph/Hz	--	--	--	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n°	--	--	--	2/1	2/1	2/1	2/1	2/1
Fans	n° x kW	--	--	--	2x1,5	2x1,5	2x1,5	3x1,5	3x1,5
Total airflow	m³/h/Pa	--	--	--	19000/50	18000/50	18000/50	30000/50	30000/50
Sound power level <sup>(3)</sup>	dB(A)	--	--	--	89	89	89	92	92
Sound pressure level <sup>(4)</sup>	dB(A)	--	--	--	61	61	61	64	64
Water pump input power	kW	--	--	--	1,5	2,3	2,3	2,2	2,2
Pump available static pressure <sup>(1)</sup>	kPa	--	--	--	129	159	137	140	127
Water tank volume	l	--	--	--	300	300	300	500	500

CDA/FC Models		120	130	152	162	190	210	240	260
Cooling capacity EN14511 <sup>(1)</sup>	kW	113,0	125,1	148,1	164,6	187,7	205,5	228,0	255,7
Compressor input EN14511 <sup>(1)</sup>	kW	39,9	45,3	54,8	59,8	70,9	81,1	89,6	97,0
E.E.R. EN14511 <sup>(1)</sup>	W/W	2,8	2,8	2,7	2,8	2,6	2,5	2,5	2,6
Free cooling capacity <sup>(5)</sup>	kW	81,6	83,5	104,5	106,6	150,6	153,9	157,2	160,7
Compressors input EN14511 <sup>(5)</sup>	kW	4,5	4,5	8,0	8,0	12,0	12,0	12,0	12,0
Water flow <sup>(5)</sup>	m³/h	20,5	22,7	26,9	29,9	34,1	37,4	41,4	46,4
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
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	4/2	4/2	4/2	4/2
Fans	n° x kW	3x1,5	3x1,5	2x4,0	2x4,0	4x3,0	4x3,0	4x3,0	4x3,0
Total airflow	m³/h/Pa	30000/50	30000/50	36000/50	36000/50	60000/50	60000/50	60000/50	60000/50
Sound power level <sup>(3)</sup>	dB(A)	92	92	94	94	96	96	96	96
Sound pressure level <sup>(4)</sup>	dB(A)	64	64	66	66	68	68	68	68
Water pump input power	kW	3,0	3,0	3,0	3,0	4,0	4,0	5,5	5,5
Pump available static pressure <sup>(1)</sup>	kPa	156	142	103	80	172	146	129	97
Water tank volume	l	500	500	500	500	600	600	600	600

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

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

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

(5) Free Cooling: ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal waterflow, compressors switched off.

**FRAME**

All CDA 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. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option).

**COMPRESSORS**

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in standby. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

**CONDENSERS**

The condenser 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 condenser

design guarantees a low air side pressure drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

**FANS**

The fans are centrifugal type, double inlet with forward curved blades manufactured from galvanized steel. They 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. 4 pole electric motors are used (rotation speed approx 1500 rpm). The fan drive is via pulleys and belts, all motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

**EVAPORATORS**

The evaporator is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. Models 039 to 162 have a single water side circuit and from size 190 a double circuit "cross flow" type is used. 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 evaporator. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each evaporator is fitted with a temperature sensor on the discharge water side for antifreeze protection.

**MICROPROCESSOR**

All CDA 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, 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. All CDA units have fitted as standard, 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). 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 versions only) and general alarm.

**CONTROL AND PROTECTION DEVICES**

All units are supplied with the following control and protection devices: Return water temperature sensor installed on the return water line from the building (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

**REVERSIBLE VERSIONS (HP)**

The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 48°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

**FREE COOLING VERSION FC**

If there is a requirement for the chiller to operate all year round it is possible to generate the chilled water by free cooling. The free cooling version has an extra coil through which the system water is passed if the ambient temperature is low enough



## CDA

to remove energy from it. This is especially useful with modern, low energy cooling systems such as high temperature fan coils, chilled beams or ceilings. If the return water temperature is, for example, 16°C, and the flow required is 12°C then it can be seen that if the ambient is below 16°C some of the cooling can be performed by free cooling. If the ambient is below 12°C most, if not all, of the cooling can be provided by free cooling. This process makes substantial energy savings and results in correctly designed water systems being among the most energy efficient available. Free Cooling versions comprise the following components:

### Thermal exchange coil:

An air to water heat exchanger manufactured from copper tubes with aluminium fins. It is supplied with shut-off valves.

### Microprocessor control:

The “heart” of the system; By measurement of all the critical parameters, the controller ensures that the unit operates at maximum efficiency under all conditions.

### 3 way valve:

This is an ON/OFF 3 way valve which either passes the water into the free cooling coil or sends it directly to the plate exchanger.

### Low ambient pressure control:

Control of the condensing pressure of the refrigerant circuit in low external conditions is provided by this device. If free cooling is in operation, the fans must run at full speed for maximum effect. If there is insufficient duty from free cooling then the chiller circuit must also run but with the fans at full speed. This is likely to result in a low condensing pressure as the exchanger capacity is too large.

The control therefore consists of several solenoid valves than can partialise the condenser coil into 1/3rd, 2/3rd's or full coil. This enables the heat transfer surface area to be reduced thereby maintaining the correct condensing pressure.

CDA - CDA/HP Versions	Code	039÷050	060÷080	090÷130	152÷160	190÷260
Main switch	—	●	●	●	●	●
Flow switch	—	●	●	●	●	●
Microprocessor control	—	●	●	●	●	●
LS low noise versions	LS00	○	○	○	○	○
Partial heat recovery	RP00	○	○	○	○	○
Rubber anti-vibration mounts	KAVG	○	○	○	○	○
Spring anti-vibration mounts	KAVM	○	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump	A2ZZ	○	○	○	○	○
Hydraulic kit A0NP without tank and pump	A0NP	○	○	○	○	○
Inverter condensation control	DCCI	○	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○	○
Antifreeze kit (only for A version)	RAES	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○	○
Oversized condenser fan motors	FOSP	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○
Horizontal air discharge	HORI	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater *	BRCA	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○

\* Standard for HP versions

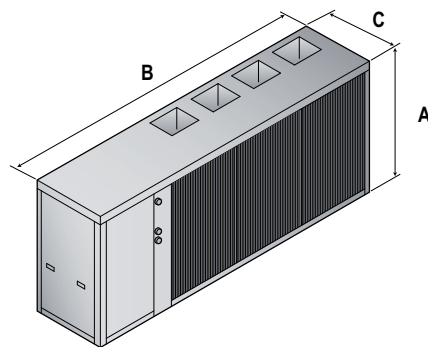
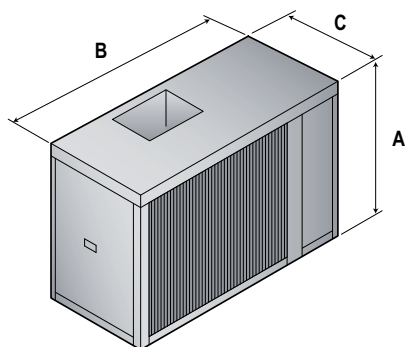
● Standard, ○ Optional, — Not available.



CDA/FC Versions	Code	060÷080	090÷130	152÷160	190÷260
Main switch	–	●	●	●	●
Flow switch	–	●	●	●	●
Microprocessor control	–	●	●	●	●
LS low noise versions	LS00	○	○	○	○
Partial heat recovery	RP00	○	○	○	○
Rubber anti-vibration mounts	KAVG	○	○	○	○
Spring anti-vibration mounts	KAVM	○	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○
Hydraulic kit A2ZZ with tank and two pump	A2ZZ	○	○	○	○
Hydraulic kit A0NP without tank and pump	A0NP	○	○	○	○
Inverter condensation control	DCCI	○	○	○	○
Evaporator antifreeze heater	RAEV	○	○	○	○
Antifreeze kit (only for A version)	RAES	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○	○
Oversized condenser fan motors	FOSP	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○
Horizontal air discharge	HORI	○	○	○	○
Condensate discharge drip tray with antifreeze heater *	BRCA	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○

\* Standard for HP versions

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
039/039A	1270	1870	850	580/900
045/045A	1270	1870	850	600/920
050/050A	1270	1870	850	610/930
060/060A	1566	2608	1105	736/1056
070/070A	1566	2608	1105	770/1090
080/080A	1566	2608	1105	820/1140
090/090A	1566	3608	1105	1110/1630
110/110A	1566	3608	1105	1190/1710
120/120A	1566	3608	1105	1240/1760

Mod.	A (mm)	B (mm)	C (mm)	Kg
130/130A	1566	3608	1105	1270/1790
152/152A	1966	3608	1105	1640/2160
162/162A	1966	3608	1105	1700/2220
190/190A	1966	4708	1105	2070/2690
210/210A	1966	4708	1105	2180/2800
240/240A	1966	4708	1105	2290/2910
260/260A	1966	4708	1105	2590/3210

## LGK

Air cooled water chillers with axial fans



R134a



LGK

LGK water chillers are efficient, low-noise products designed for large applications.

They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units.

The use of semi hermetic screw compressors results in high efficiencies and low noise levels, making suitable for use in most applications.

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

### VERSIONS

- **LGK**, cooling only version, available in 11 different sizes.
- **LGK-HP**, reversible version, available in 11 different sizes.
- **LGK-FC**, free-cooling version, available in 11 different sizes.

### ACCESSORI

- **A1ZZ**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch, insulated tank
- **A2ZZ**: Hydraulic kit as A1ZZ with twin pumps
- **DCCF**: Low ambient condensing pressure control
- **FAMM**: Condensing coil protection mesh with metallic filter
- **INSE**: Serial interface card RS485
- **KAVG**: Rubber anti-vibration mountings
- **KAVM**: Spring anti-vibration mountings
- **LS00**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges
- **MVCS**: Compressors suction manual valves
- **PCRL**: Remote control panel
- **RAES**: Antifreeze kit
- **RAEV**: Evaporator antifreeze heater
- **RP00**: Partial heat recovery
- **VSLI**: Liquid line solenoid valve

LGK - LGK/HP Models		1901	2301	2701	3202	3602
Cooling capacity <sup>(1)</sup>	kW	164,0	210,0	240,0	289,4	328,3
Compressors input power <sup>(1)</sup>	kW	54,9	65,6	77,2	96,2	107,1
Water flow <sup>(1)</sup>	m³/h	28,3	36,2	41,3	49,5	57,2
Heating capacity <sup>(2)</sup>	kW	144,0	180,0	218,0	245,0	287,0
Compressors input power <sup>(2)</sup>	kW	50,3	59,9	66,7	89,2	99,3
Water flow <sup>(2)</sup>	m³/h	24,6	31,1	38,9	42,8	51,1
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	363,9	335,2	335,2	423,8	517,4
Max input current	A	144,9	173,2	199,2	261,8	298,4
Compressors / n° / circuits		Screw / 1 / 1	Screw / 1 / 1	Screw / 1 / 1	Screw / 2 / 2	Screw / 2 / 2
Capacity steps	n°	3	3	3	6	6
Fans	n°x kW	3 x 2,0	4 x 2,0	4 x 2,0	6 x 2,0	6 x 2,0
Airflow	m³/h	49500	66000	66000	99000	99000
Sound power level <sup>(3)</sup>	dB(A)	88	91	91	93	93
Sound pressure level <sup>(4)</sup>	dB(A)	60	63	63	65	65
Water pump input power	kW	3,0	4,0	4,0	5,5	7,5
Water tank valume	l	670	670	670	670	670

LGK - LGK/HP Models		4502	5202	6402	7202	8202	9002
Cooling capacity <sup>(1)</sup>	kW	420,0	479,0	620,7	719,5	820,1	874,7
Compressors input power <sup>(1)</sup>	kW	131,3	153,1	194,6	231,8	233,6	245,7
Water flow <sup>(1)</sup>	m³/h	72,1	81,9	106,3	126,3	142,5	151,9
Heating capacity <sup>(2)</sup>	kW	360,0	436,0	561,0	656,0	740,0	790,0
Compressors input power <sup>(2)</sup>	kW	121,2	136,6	168,4	198,9	225,4	241,2
Water flow <sup>(2)</sup>	m³/h	63,3	77,5	97,3	58,5x2	65,9x2	70,1x2
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	508,4	543,0	640,6	685,6	808,2	921,8
Max input current	A	346,4	407,0	507,6	571,6	650,2	688,8
Compressors / n° / circuits		Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2
Capacity steps	n°	6	6	6	6	6	6
Fans	n°x kW	8 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	16 x 2,0
Airflow	m³/h	132000	165000	198000	198000	231000	260000
Sound power level <sup>(3)</sup>	dB(A)	94	94	97	98	99	100
Sound pressure level <sup>(4)</sup>	dB(A)	66	66	69	70	71	72
Water pump input power	kW	7,5	7,5	11,0	11,0	15,0	15,0
Water tank volume	l	1000	1000	1000	1000	1000	1000

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

(2) Heating: condenser water temperature in/out 40/45 °C, ambient air temperature 7°C DB, 6°C WB.

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

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

## LGK

LGK/FC Models		1901	2301	2701	3202	3602
Cooling capacity <sup>(1)</sup>	kW	162,1	207,6	238,3	285,1	328,0
Compressors input power <sup>(1)</sup>	kW	54,8	65,3	77,0	95,8	106,6
Water flow <sup>(1)</sup>	m³/h	29,5	37,8	42,2	52,9	60,0
Free cooling capacity <sup>(5)</sup>	kW	130,4	159,2	165,3	235,7	303,3
Compressors input power <sup>(5)</sup>	kW	6,0	8,0	8,0	12,0	12,0
Water flow <sup>(5)</sup>	m³/h	29,5	37,8	42,2	52,9	60,0
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	363,9	335,2	335,2	423,8	517,4
Max input current	A	144,9	173,2	199,2	261,8	298,4
Compressors / n° / circuits		Screw / 1 / 1	Screw / 1 / 1	Screw / 1 / 1	Screw / 2 / 2	Screw / 2 / 2
Capacity steps	n°	3	3	3	6	6
Fans	n° x kW	3 x 2,0	4 x 2,0	4 x 2,0	6 x 2,0	6 x 2,0
Airflow	m³/h	49500	66000	66000	99000	99000
Sound power level <sup>(3)</sup>	dB(A)	88	91	91	93	93
Sound pressure level <sup>(4)</sup>	dB(A)	60	63	63	65	65
Water pump input power	kW	3,0	4,0	4,0	5,5	7,5
Water tank volume	l	670	670	670	670	670

LGK/FC Models		4502	5202	6402	7202	8202	9002
Cooling capacity <sup>(1)</sup>	kW	411,9	474,0	613,8	719,8	819,7	865,5
Compressors input power <sup>(1)</sup>	kW	131,3	151,9	193,7	230,7	232,6	244,6
Water flow <sup>(1)</sup>	m³/h	74,8	86,0	113,5	132,4	149,7	158,0
Free cooling capacity <sup>(5)</sup>	kW	319,5	359,4	451,2	466,2	537,6	589,3
Compressors input power <sup>(5)</sup>	kW	16,0	20,0	24,0	24,0	28,0	32,0
Water flow <sup>(5)</sup>	m³/h	74,8	86,0	113,5	132,4	149,7	158,0
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	508,4	543	640,6	685,6	808,2	921,8
Max input current	A	346,4	407	507,6	571,6	650,2	688,8
Compressors / n° / circuits		Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2	Screw / 2 / 2
Capacity steps	n°	6	6	6	6	6	6
Fans	n° x kW	8 x 2,0	10 x 2,0	12 x 2,0	12 x 2,0	14 x 2,0	16 x 2,0
Airflow	m³/h	132000	165000	198000	198000	231000	260000
Sound power level <sup>(3)</sup>	dB(A)	94	94	97	98	99	100
Sound pressure level <sup>(4)</sup>	dB(A)	66	66	69	70	71	72
Water pump input power	kW	7,5	7,5	11,0	11,0	15,0	15,0
Water tank volume	l	1000	1000	1000	1000	1000	1000

Performance refer to the following conditions:

(1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C glycol 20%.

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

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

(5) Free Cooling: ambient air temperature 2°C, water inlet temperature 15°C, glycol 20%, nominal water flow, compressors switched off.

## FRAME

All LGK 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 R134a. 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. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option).

## COMPRESSORS

The compressors are screw type, Star-Delta starting, double rotor with crankcase heater and thermal overload protection by a klaxon embedded in the motor winding. They are mounted in a separate compartment within the casing in order to isolate them from the condenser air stream. The crankcase heater is always energised when the compressor is in stand-by. Each compressor is provided, as standard, with 3 capacity steps. Access to the compressor compartment is by removal of a front panel and, because they are isolated from the main airstream, maintenance of the compressors is possible whilst the unit is operating.

## CONDENSERS

The condenser 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 condenser design guarantees a low air side pressure

drop thus enabling the use of low rotation speed (and hence low noise emission) fans. The condensers can be protected by a metallic filter that is available as an accessory.

## 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 used are 6 pole (about 900 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

## EVAPORATORS

From size 1901 to 4502 they are AISI 316 stainless steel braze-welded plate type; from size 5202 to 9002 they are shell in tube type. Each evaporator is factory insulated with flexible close cell material and can be equipped with an antifreeze heater (optional). As standard, each evaporator is provided with a temperature sensor for antifreeze protection.

## MICROPROCESSORS

All LGK 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, 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. All LGK units have fitted as standard, a sequence relay that disables the power supply in the event that the

phase sequence is incorrect. 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 versions only) and general alarm.

## CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return water temperature sensor installed on the return water line from the building (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

## REVERSIBLE VERSIONS (HP)

The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 48°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

## FREE COOLING VERSION (FC)

If there is a requirement for the chiller to operate all year round it is possible to generate the chilled water by free cooling. The free cooling version has an extra coil through which the system water is passed if the ambient temperature is low enough to remove energy from it. This is especially useful with modern, low energy cooling systems such as high temperature fan coils, chilled beams or ceilings. If the return water temperature is, for example, 16°C, and the flow required is 12°C then it can be seen that if the ambient is below 16°C some of the cooling can be performed by free cooling. If the ambient is below 12°C most, if not all, of the cooling can be provided by free cooling. This process makes substantial energy savings and results in correctly

## LGK

designed water systems being among the most energy efficient available.

Free Cooling is available in 2 different versions:

FC; Standard Free Cooling capacity;

Free Cooling versions comprise the following components:

### Thermal exchange coil:

An air to water heat exchanger manufactured from copper tubes with aluminium fins. It is supplied with shut-off valves.

### Microprocessor control:

The "heart" of the system; By measurement of all the critical parameters, the controller ensures that the unit operates at maximum efficiency under all conditions.

### 3 way valve:

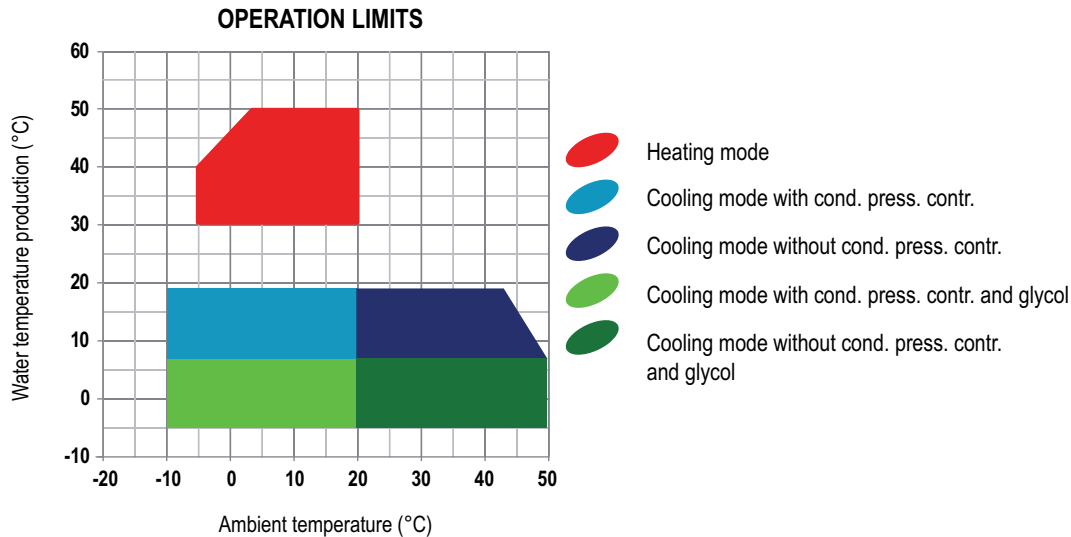
This is an ON/OFF 3 way valve which either passes the water into the free cooling coil or sends it directly to the plate exchanger.

### Low ambient pressure control:

Control of the condensing pressure of the refrigerant circuit in low external conditions

is provided by this device. If free cooling is in operation, the fans must run at full speed for maximum effect. If there is insufficient duty from free cooling then the chiller circuit must also run but with the fans at full speed. This is likely to result in a low condensing pressure as the exchanger capacity is too large.

The control therefore consists of several solenoid valves that can partialise the condenser coil into 1/3rd, 2/3rd's or full coil. This enables the heat transfer surface area to be reduced thereby maintaining the correct condensing pressure.



Axial fans with aerofoil blades

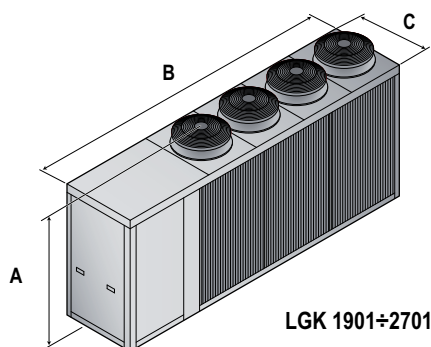


A2ZZ Hydraulic kit

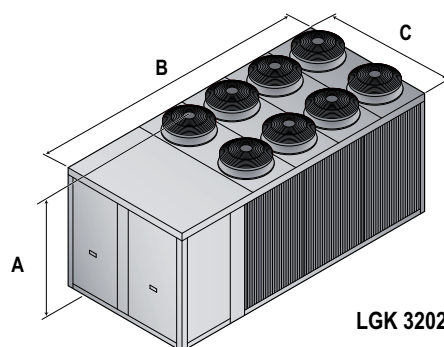


LGK Versions	Code	LGK	LGK/HP	LGK/FC
Main switch	–	●	●	●
Flow switch	–	●	●	●
LS low noise version	LS00	○	○	○
Partial heat recovery	RP00	○	○	○
Hydraulic kit A1ZZ with tank and one pump.	A1ZZ	○	○	○
Hydraulic kit A1NT with one pump without tank.	A1NT	○	○	○
Hydraulic kit A2ZZ with tank and two pump.	A2ZZ	○	○	○
Hydraulic kit A0NP without tank and pump.	A0NP	○	○	○
Low ambient condensing pressure control	DCCF	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○
Evaporator antifreeze heater	RAEV	○	-	-
Antifreeze kit (only for A versions)	RAES	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○
Electronic expansion valve	VTEE	○	○	○
Liquid line solenoid valve	VSLI	○	●	○
Compressors suction manual valves	MVCS	○	○	○
Condensing coil protection mesh with metallic filter	FAMM	○	○	○
Remote control panel	PCRL	○	○	○
Serial interface card RS485	INSE	○	○	○

● Standard, ○ Optional, – Not available.



LGK 1901÷2701



LGK 3202÷9002

Mod.	A (mm)	B (mm)	C (mm)	Kg
1901/1901A	2262	4708	1105	1850/2150
2301/2301A	2262	4708	1105	2290/2590
2701/2701A	2262	4708	1105	2680/2980

Mod.	A (mm)	B (mm)	C (mm)	Kg
3202/3202A	2350	4708	2200	4100/4770
3602/3602A	2350	4708	2200	4500/5240
4502/4502A	2350	5200	2200	4800/5590
5202/5202A	2350	6200	2200	5600/6510
6402/6402A	2350	7200	2200	6200/7200
7202/7202A	2350	7200	2200	6400/7440
8202/8202A	2350	9300	2200	8570/9970
9002/9002A	2350	9800	2200	10200/11800



## WSA

### Water cooled chillers



WSA water chillers have been designed for small and medium residential and commercial applications.

They are designed to operate with water outlet temperatures of 7°C, commonly used in combinations with fan coils or/ and air handling units.

The units are designed for indoor installation and have low noise levels in operation.

Due to the compact dimensions, the versatility in installation and a wide range of accessories, the WRK series are ideal for most applications.

#### VERSIONS

- **WSA**, cooling only version, available in 10 different sizes.
- **WSA/HP**, reversible version, available in 10 different sizes.
- **WSA/EV**, condenserless version, available in 10 different sizes.

#### ACCESSORIES

- **DSSE**: Soft starter elettronico
- **INSE**: Serial interface card RS 485
- **KAVG**: Rubber anti-vibration mountings
- **KAVM**: Spring anti-vibration mountings
- **LS00**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges
- **PCRL**: Remote control panel
- **RP00**: Partial heat recovery
- **V2M0**: Source 4÷20 mA modulating valve
- **VPSF**: Pressostatic valve kit (only cooling version)

WSA - WSA/HP Models		06	08	10	14	16	21	26	31	36	41
Cooling capacity (EN14511) <sup>(1)</sup>	kW	5,9	7,5	9,0	14,9	17,4	22,0	30,3	34,3	38,2	45,0
Input power (EN14511) <sup>(1)</sup>	kW	1,5	1,8	2,2	3,6	4,2	5,1	6,9	7,8	8,7	10,2
EER (EN14511) <sup>(1)</sup>	w/w	3,9	4,2	4,1	4,1	4,1	4,3	4,4	4,4	4,4	4,4
Cooling capacity (EN14511) <sup>(2)</sup>	kW	8,1	10,2	12,2	20,4	23,5	29,5	40,3	45,5	50,7	60,3
Input power (EN14511) <sup>(2)</sup>	kW	1,4	1,8	2,2	3,5	4,3	5,4	7,1	8,0	9,1	10,4
EER (EN14511) <sup>(2)</sup>	w/w	5,8	5,7	5,5	5,8	5,5	5,5	5,7	5,7	5,6	5,8
Heating capacity (EN14511) <sup>(3)</sup>	kW	7,0	8,8	10,6	17,2	20,3	25,3	34,3	42,6	47,9	52,7
Input power (EN14511) <sup>(3)</sup>	kW	1,5	1,8	2,2	3,6	4,2	5,1	6,9	7,9	8,8	10,3
COP (EN14511) <sup>(3)</sup>	w/w	4,7	4,9	4,8	4,8	4,8	5,0	5,0	5,4	5,4	5,1
Heating capacity (EN14511) <sup>(4)</sup>	kW	6,7	8,4	10,2	16,5	19,5	24,4	32,7	40,7	45,8	50,5
Input power (EN14511) <sup>(4)</sup>	kW	1,9	2,3	2,8	4,5	5,2	6,3	8,6	9,9	10,9	12,5
COP (EN14511) <sup>(4)</sup>	w/w	3,5	3,6	3,6	3,7	3,8	3,9	3,8	4,1	4,2	4,0
Power supply	V/Ph/Hz	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	400/3/50	400/3/50	400/3/50
Peak current	A	60	67	98	64	75	95	118	118	140	174
Maximum input current	A	12,8	17,1	22,0	11,3	15,0	16,0	22,0	25,0	31,0	34,0
Compressors / Circuits	n°	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Sound power <sup>(5)</sup>	dB(A)	51	52	52	54	54	60	60	62	64	64
Sound pressure <sup>(6)</sup>	dB(A)	43	44	44	46	46	52	52	54	56	56

Performance refer to the following conditions:

- (1) Cooling: Evaporator water temperature in/out 12/7°C condenser water temperature in/out 30/35°C. Without pressostatic valve.  
 (2) Cooling: Evaporator water temperature in/out 23/18°C condenser water temperature in/out 30/35°C. Without pressostatic valve.  
 (3) Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 10/7°C.

(4) Heating: condenser water temperature in/out 40/45°C; evaporator water temperature in/out 10/7°C.

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

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

WSA/EV Models		06	08	10	14	16	21	26	31	36	41
Cooling capacity <sup>(7)</sup>	kW	5,1	6,5	7,9	13,1	15,3	19,5	26,6	30,0	33,7	39,8
Compressor input power <sup>(7)</sup>	kW	1,9	2,4	2,9	4,6	5,3	6,4	8,9	10,2	11,1	12,7
Water flow <sup>(7)</sup>	m³/h	0,9	1,1	1,4	2,2	2,6	3,3	4,6	5,1	5,8	6,8
Peak current	A	60	67	98	64	75	95	118	118	140	174
Max input current	A	12,8	17,1	22,0	11,3	15,0	16,0	22,0	25,0	31,0	34,0
Power supply	V/Ph/Hz	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	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n°	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
Sound power level <sup>(5)</sup>	dB(A)	51	52	52	54	54	60	60	62	64	64
Sound pressure level <sup>(6)</sup>	dB(A)	43	44	44	46	46	52	52	54	56	56

Performance refer to the following conditions:

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

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

(7) For EV version: condensing temperature 50 °C, water temperature in/out 12/7 °C.

## WSA

### FRAME

All WSA 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, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

### COMPRESSORS

For models 06 & 08, rotary type compressors are used. For all other models the compressors are of the scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. They are mounted within the casing. The crankcase heater is always energised when the compressor is in stand-by. Access to the compressors is by removal of a front panel and maintenance of the compressors is possible whilst the unit is operating.

### CONDENSERS AND EVAPORATORS

The evaporators and the condensers are braze welded, plate type heat exchangers, 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 the traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit. The evaporators are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). In the reversible version, the condensers are factory insulated with flexible close cell material and can be equipped with an antifreeze heater (accessory). Each evaporator

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

### MICROPROCESSOR

All WSA units are supplied with microprocessor controls loaded with ACTIVE auto-adaptive strategy. 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. The autoadaptive control system ACTIVE is an advanced strategy that continuously monitors the temperature of the inlet and outlet water thereby determining the variation of the building thermal load. By then adjusting the outlet water temperature set point the compressor start/stop cycle can be accurately controlled thus optimizing the unit efficiency and maximizing the operational life of the units component's. Use of ACTIVE auto-adaptive Control enables the minimum water content to be reduced from the traditional 12-15 l/kw to 5 l/kw. A further benefit of the reduced water requirement is that WSA units can be used in installations without a buffer tank thereby reducing the space requirements, thermal losses and costs.

### 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 versions 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 water temperature sensor installed on the return water line from the building (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

### CONDENSERLESS VERSIONS EV

This version includes a microprocessor control to manage both the compressor timings and alarms. It is designed to operate with refrigerant R410A but is supplied with a holding charge of nitrogen.

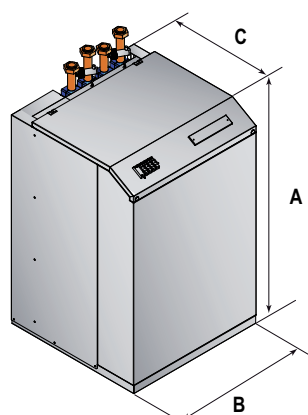
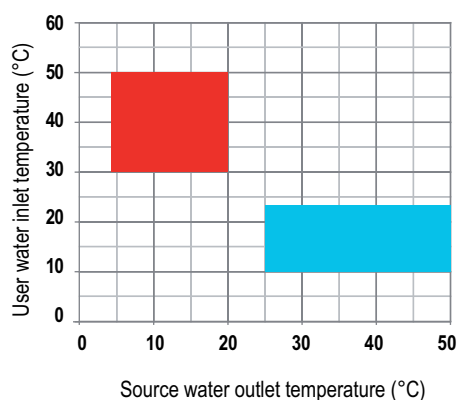
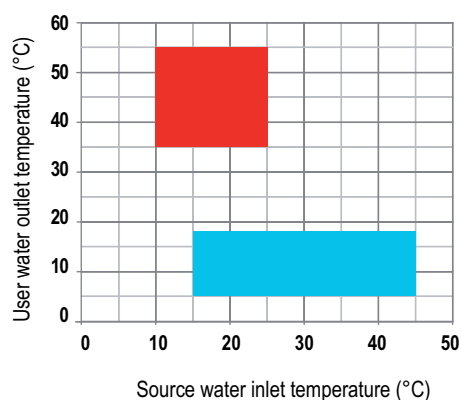
### REVERSIBLE VERSIONS HP

The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 50°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling.

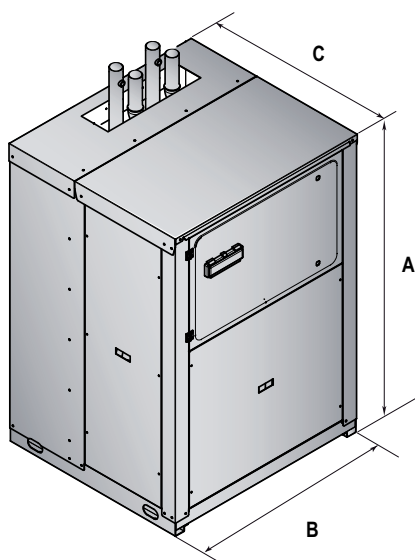
WSA - WSA/EV - WSA/HP Versions	Code	06	08	10	14	16	21	26	31	36	41
Main switch	-	-	-	-	●	●	●	●	●	●	●
Flow switch	-	●	●	●	●	●	●	●	●	●	●
Microprocessor control	-	●	●	●	●	●	●	●	●	●	●
LS low noise basic version	LS00	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	-	-	-	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○
Pressostatic valve kit (only cooling version)	VPSF	○	○	○	○	○	○	○	○	○	○
V2M0: Source 4÷20 mA modulating valve	V2M0	○	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

## OPERATION LIMITS



WSA 06 ÷ 21



WSA 26 ÷ 41

Mod.	A (mm)	B (mm)	C (mm)	Kg
06	900	600	600	100
08	900	600	600	100
10	900	600	600	100
14	1255	600	600	120
16	1255	600	600	120
21	1255	600	600	130
26	1270	850	765	165
31	1270	850	765	175
36	1270	850	765	185
41	1270	850	765	185

## WDA

### Water cooled chillers



WDA water chillers are efficient, low-noise products designed for medium to large applications.

They are suitable for generating chilled water at temperatures in the region of 7°C, commonly used in applications with fan coils and/or air handling units.

The use of tandem scroll compressors results in high efficiencies (especially at part loads) and low noise levels, making them suitable for use in many applications.

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

#### VERSIONS

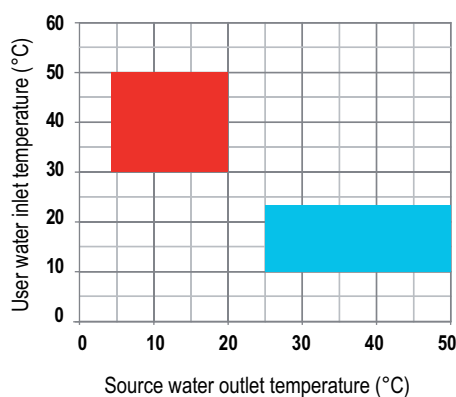
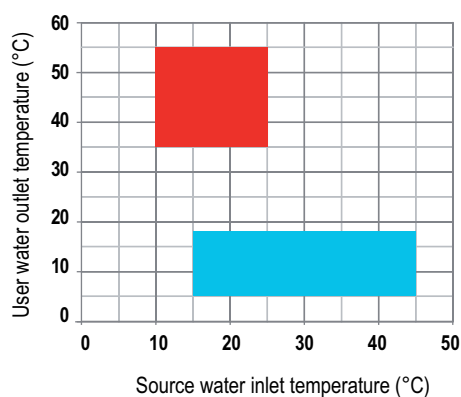
- **WDA**, cooling only version, available in 18 different sizes.
- **WDA/HP**, reversible version, available in 18 different sizes.
- **WDA/EV**, condenserless units version, available in 18 different sizes.

#### ACCESSORIES

- **A1NT**: Hydraulic kit with: pump, expansion valve, safety valve, flow switch
- **DSSE**: Electronic soft starter
- **KAVG**: Rubber anti-vibration mountings
- **KAVM**: Spring anti-vibration mountings
- **LS01**: Low noise version
- **MAML**: Refrigerant circuit pressure gauges
- **PCRL**: Remote control panel
- **RP00**: Partial heat recovery
- **V2M0**: Source 4-20 mA modulating valve
- **VPSF**: Pressostatic valve kit for cooling versions
- **VSLI**: Liquid line solenoid valve

WDA - WDA/HP Models		039	045	050	060	070	080	090	110	120	130
Cooling capacity (EN14511) <sup>(1)</sup>	kW	43,7	49,9	59,3	67,2	75,0	88,5	100,8	112,0	126,5	141,1
Input power (EN14511) <sup>(1)</sup>	kW	10,5	12,1	15,1	16,7	17,7	20,9	23,9	26,9	30,5	34,0
EER (EN14511) <sup>(1)</sup>	w/w	4,2	4,1	3,9	4,0	4,2	4,2	4,2	4,2	4,1	4,2
Cooling capacity (EN14511) <sup>(2)</sup>	kW	58,9	67,4	79,6	90,6	101,1	118,3	135,7	151,6	171,2	189,8
Input power (EN14511) <sup>(2)</sup>	kW	11,1	12,3	15,7	17,5	18,7	21,3	24,7	28,2	31,8	35,3
EER (EN14511) <sup>(2)</sup>	w/w	5,3	5,5	5,1	5,2	5,4	5,6	5,5	5,4	5,4	5,4
Heating capacity (EN14511) <sup>(3)</sup>	kW	48,8	55,9	65,8	74,0	83,8	98,5	118,3	132,8	149,8	166,6
Input power (EN14511) <sup>(3)</sup>	kW	10,6	11,9	13,7	15,6	17,1	20,4	24,1	27,1	30,7	34,1
COP (EN14511) <sup>(3)</sup>	w/w	4,6	4,7	4,8	4,7	4,9	4,8	4,9	4,9	4,9	4,9
Heating capacity (EN14511) <sup>(4)</sup>	kW	46,9	53,7	63,1	70,9	80,1	94,9	113,7	127,4	143,8	160,5
Input power (EN14511) <sup>(4)</sup>	kW	13,0	14,7	17,2	19,4	21,2	24,8	29,3	32,9	37,3	41,5
COP (EN14511) <sup>(4)</sup>	w/w	3,6	3,7	3,7	3,7	3,8	3,8	3,9	3,9	3,9	3,9
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	400/3/50
Peak current	A	111,0	132,0	140,0	162,0	171,0	208,0	259,0	265,0	312,0	320,5
Maximum input current	A	32,0	42,0	44,0	53,0	62,0	68,0	74,0	80,0	88,5	97,0
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Sound power <sup>(5)</sup>	dB(A)	74	74	75	76	76	77	77	78	78	79
Sound pressure <sup>(6)</sup>	dB(A)	46	46	47	48	48	49	49	50	50	51

## OPERATION LIMITS



Performance refer to the following conditions:

- (1) Cooling: Evaporator water temperature in/out 12/7°C condenser water temperature in/out 30/35°C. Without pressostatic valve.
- (2) Cooling: Evaporator water temperature in/out 23/18°C condenser water temperature in/out 30/35°C. Without pressostatic valve.
- (3) Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 10/7°C.

(4) Heating: condenser water temperature in/out 40/45°C; evaporator water temperature in/out 10/7°C.

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

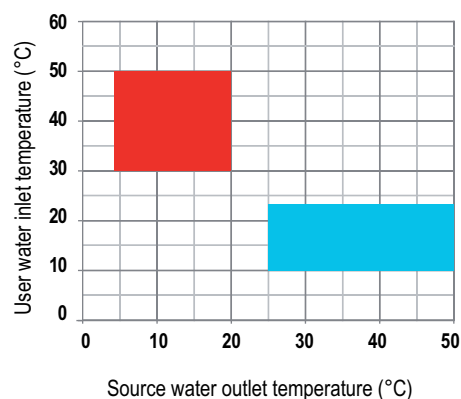
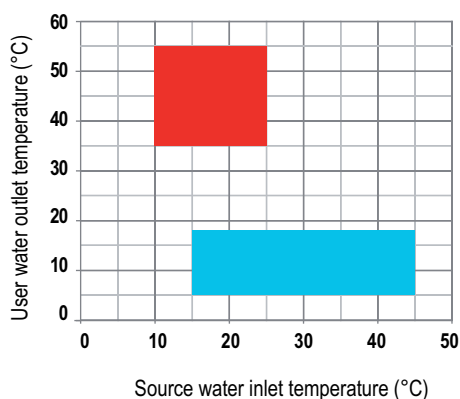
(6) Sound pressure level at 10 mt from the unit in free field conditions direction factor Q = 2 in accordance with ISO 9614 (LS-Version).

## WDA

WDA - WDA/HP Models		152	162	190	210	240	260	300	320	380	430	500
Cooling capacity (EN14511) <sup>(1)</sup>	kW	162,4	182,5	201,6	223,9	257,6	285,7	323,5	365,2	421,1	474,2	535,1
Input power (EN14511) <sup>(1)</sup>	kW	38,7	43,4	47,8	53,8	60,9	68,0	77,4	86,7	101,9	112,2	126,3
EER (EN14511) <sup>(1)</sup>	w/w	4,2	4,2	4,2	4,2	4,2	4,2	4,2	4,2	4,1	4,2	4,2
Cooling capacity (EN14511) <sup>(2)</sup>	kW	218,5	249,3	273,5	305,2	350,7	387,0	437,3	496,1	585,4	658,4	742,9
Input power (EN14511) <sup>(2)</sup>	kW	40,4	45,6	49,5	56,5	64,0	71,1	81,2	91,5	106,5	117,8	133,2
EER (EN14511) <sup>(2)</sup>	w/w	5,4	5,5	5,5	5,4	5,5	5,4	5,4	5,4	5,5	5,6	5,6
Heating capacity (EN14511) <sup>(3)</sup>	kW	190,9	216,5	237,4	266,4	301,4	325,9	367,7	422,4	501,0	567,1	637,2
Input power (EN14511) <sup>(3)</sup>	kW	38,9	43,6	48,2	54,2	61,0	67,9	77,0	86,6	101,5	115,2	128,2
COP (EN14511) <sup>(3)</sup>	w/w	4,9	5,0	4,9	4,9	4,9	4,8	4,8	4,9	4,9	4,9	5,0
Heating capacity (EN14511) <sup>(4)</sup>	kW	186,9	206,6	227,0	254,4	287,7	312,0	352,7	403,8	477,7	540,7	607,4
Input power (EN14511) <sup>(4)</sup>	kW	47,4	53,0	58,6	65,8	74,3	82,7	93,9	105,6	121,2	137,8	153,4
COP (EN14511) <sup>(4)</sup>	w/w	3,9	3,9	3,9	3,9	3,9	3,8	3,8	3,8	3,9	3,9	4,0
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	400/3/50	400/3/50
Peak current	A	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2	514,5	586,3	637,0
Maximum input current	A	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6	291,0	341,7	392,4
Compressors / Circuits	n°	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Sound power <sup>(5)</sup>	dB(A)	79	79	80	82	82	82	84	84	92	92	92
Sound pressure <sup>(6)</sup>	dB(A)	51	51	52	54	54	54	56	56	64	64	64

WDA

### OPERATION LIMITS



Performance refer to the following conditions:

- (1) Cooling: Evaporator water temperature in/out 12/7°C condenser water temperature in/out 30/35°C. Without pressostatic valve.
- (2) Cooling: Evaporator water temperature in/out 23/18°C condenser water temperature in/out 30/35°C. Without pressostatic valve.
- (3) Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 10/7°C.

(4) Heating: condenser water temperature in/out 40/45°C; evaporator water temperature in/out 10/7°C.

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

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



WDA/EV Models		039	045	050	060	070	080	090	110	120	130	152
Cooling capacity <sup>(5)</sup>	kW	38,8	44,3	52,4	59,3	66,0	78,9	90,4	99,7	112,8	125,8	145,0
Compressor input power <sup>(5)</sup>	kW	13,2	15,3	19,4	21,1	22,4	25,9	29,6	33,4	37,7	42,2	48,0
Water flow <sup>(5)</sup>	m <sup>3</sup> /h	6,7	7,6	9,0	10,2	11,3	13,5	15,5	17,1	19,4	21,6	24,9
Peak current	A	111,0	132,0	140,0	162,0	171,0	208,0	259,0	265,0	312,0	320,5	358,5
Max input current	A	32,0	42,0	44,0	53,0	62,0	68,0	74,0	80,0	88,5	97,0	113,9
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	400/3/50	400/3/50
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Sound power level <sup>(3)</sup>	dB(A)	74	74	75	76	76	77	77	78	78	79	79
Sound pressure level <sup>(4)</sup>	dB(A)	46	46	47	48	48	49	49	50	50	51	51

WDA/EV Models		162	190	210	240	260	300	320	380	430	500
Cooling capacity <sup>(5)</sup>	kW	162,6	178,3	197,8	221,4	245,8	277,5	314,0	363,1	416,8	466,8
Compressor input power <sup>(5)</sup>	kW	53,9	59,2	66,5	76,3	85,1	96,9	108,6	126,5	143,8	161,5
Water flow <sup>(5)</sup>	m <sup>3</sup> /h	27,9	30,6	33,9	38,0	42,2	47,6	53,9	62,3	71,5	80,1
Peak current	A	375,4	333,0	345,0	400,5	417,5	472,4	506,2	514,5	586,3	637,0
Max input current	A	130,8	148,0	160,0	177,0	194,0	227,8	261,6	291,0	341,7	392,4
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	400/3/50
Compressors / Circuits	n°	2/1	4/2	4/2	4/2	4/2	4/2	4/2	6/2	6/2	6/2
Sound power level <sup>(3)</sup>	dB(A)	79	80	82	82	82	84	84	92	92	92
Sound pressure level <sup>(4)</sup>	dB(A)	51	52	54	54	54	56	56	64	64	64

Performance refer to the following conditions:

(5) For EV version: condensing temperature 50 °C, water temperature in/out 12/7 °C.

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

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

## WDA

### FRAME

All WDA 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. Failure of one circuit does not influence the other circuit. The refrigerant circuit includes: sight glass, filter drier, reversing valve (for reversible version only), one way valve (for reversible version only), liquid receiver (for reversible version only), Schraeder valves for maintenance and control and pressure safety device (for compliance with PED regulations).

Also available is an electronic expansion valve with electronic control which optimises the efficiency in part load conditions (option),

### COMPRESSORS

The compressors utilised are scroll type. All compressors are fitted with a crankcase heater and each compressor has a klixon embedded in the motor winding for thermal overload protection. The crankcase heater is always energised when the compressor is in stand-by. Access to the compressors is through the front and side panels. The compressors used are all in tandem configuration. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

### CONDENSERS

The condensers are braze welded, plate type heat exchangers, 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 the traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit and an increase in efficiency of the refrigerant cycle

in partial loads.. From size 039 to size 162 they have a single water side circuit, from size 144 upwards they are double circuit "cross flow" type.

### EVAPORATORS

The evaporators are braze welded, plate type heat exchangers, manufactured from AISI 316 stainless steel. From size 039 to size 162 they have a single water side circuit, from size 190 upwards they are double circuit "cross flow" type.

All units are supplied with a sub-cooler to enhance the performance of the refrigerant cycle. The evaporators are factory insulated with flexible close cell material and are supplied with a temperature sensor as anti-freeze protection.

### MICROPROCESSORS

All WDA 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, 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.

### ELECTRICS 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 versions 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 water temperature sensor installed on the return water line from the building (12°C), antifreeze protection sensor installed on the outlet water temperature (7°C), high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection and flow switch.

### CONDENSERLESS VERSIONS EV

This version includes a microprocessor control to manage both the compressor timings and alarms. It is designed to operate with refrigerant R410a but is supplied with a holding charge of nitrogen.

### REVERSIBLE VERSIONS HP

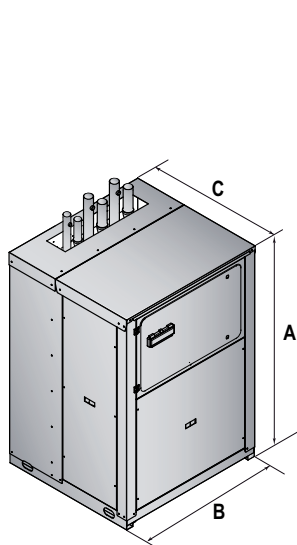
The reversible versions are provided with a 4 way reversing valve and are designed to produce hot water up to a temperature of 50°C. They are always supplied with a liquid receiver and a second thermostatic valve in order to optimize the efficiency of the refrigerant cycle in heating and in cooling. The microprocessor controls defrost automatically (when operating in low ambient conditions) and also the summer/winter change over.

### PARTIAL HEAT RECOVERY RP

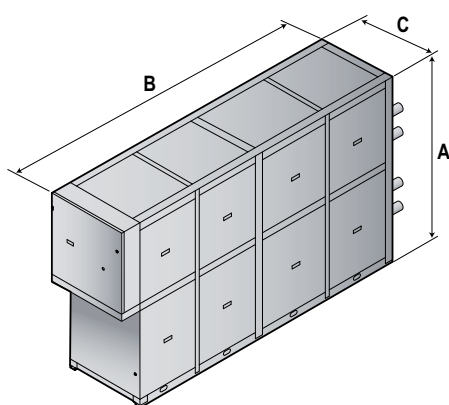
This version is supplied with an auxiliary heat exchanger fitted in series with the unit condenser thereby enabling it to produce hot water when the unit is operating in cooling mode.

WDA - WDA/HP - WDA/EV Versions	Code	039-080	090-162	190-320	380-500
Main switch	–	●	●	●	●
Flow switch	–	●	●	●	●
LS low noise versions	LS01	○	○	○	○
Hydraulic kit A1NT with one pump without tank	A1NT	○	○	○	○
Partial heat recovery	RP00	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○
Pressostatic valve kit for cooling versions	VPSF	○	○	○	○
Remote control panel	PCRL	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○
Source 4÷20 mA modulating valve	V2M0	○	○	○	○

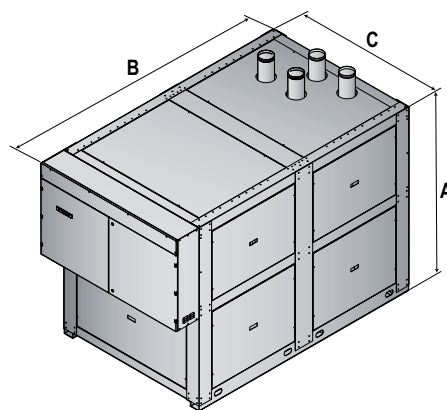
● Standard, ○ Optional, – Not available.



WDA 039 ÷ 162



WDA 190 ÷ 320



WDA 380 ÷ 500

Mod.	A (mm)	B (mm)	C (mm)	Kg
039	1566	1101	1005	430
045	1566	1101	1005	440
050	1566	1101	1005	460
060	1566	1101	1005	470
070	1566	1101	1005	480
080	1566	1101	1005	490
090	1986	1101	1255	580
110	1986	1101	1255	600
120	1986	1101	1255	630
130	1986	1101	1255	650
152	1986	1101	1255	730
162	1986	1101	1255	760

Mod.	A (mm)	B (mm)	C (mm)	Kg
190	1900	2170	800	1170
210	1900	2170	800	1210
240	1900	2170	800	1270
260	1900	2170	800	1320
300	1900	2170	800	1390
320	1900	2170	800	1430
380	2100	2750	1600	2550
430	2100	2750	1600	2690
500	2100	2750	1600	2750















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