



YOUR AIR, OUR PASSION

GENERAL CATALOG

2018-2019



Index

The Company	3
Where we are	4
Heat pumps installations	5
Chillers installations	6
Dehumidifiers installations	7

Heat Pump Systems

LSA/HP	High efficiency air to water heat pumps	8
LRI	High efficiency air to water heat pumps with INVERTER compressor	12
LZTi	Heat pumps air/water DC inverter compressor with vapor injection (EVI)	16
LHA	High efficiency air to water heat pumps	20
LZT	High efficiency air to water heat pumps with E.V.I. compressors	32
CZT	High efficiency air to water heat pumps with E.V.I. compressors	42
WZT	High efficiency air to water heat pumps with E.V.I. compressors in two sections	48
XHA	High efficiency air to water heat pumps in two sections	54
LWZ	High efficiency HYBRID heat pumps with E.V.I compressor	64
WSA/HP	Water to water heat pumps	74
WZA	Ground source water to water heat pumps	78
WHA	Ground source water to water heat pumps	82
WHK	Super-high temperature water to water heat pumps	88
LHA/P4	4 pipe systems high efficiency air to water heat pumps	92
LZT/P4	4 pipe systems high efficiency air to water heat pumps with E.V.I. compressors	106
TFW - TFWS	Domestic hot water cylinders	114
TFP - TFPS	Hot water storage tanks	116
TFF	Hot and cold water storage tanks	118
TFH - TFHS	Domestic hot water generators	120
TFA - TFAS	Domestic hot water storage tanks	122
PI	Domestic hot water heat stations	124
SCP	Plate heat exchangers for domestic hot water production	126
RG	Control systems and components	128
S.I.	Heat pump systems	131

Dehumidifiers

FH-GH	Dehumidifiers for radiant cooling systems	138
GHE	Dehumidifiers for radiant cooling systems with heat recovery	144
FHE	Dehumidifiers for radiant cooling systems with heat recovery	150
HBA	Industrial dehumidifiers	156
HHA	Industrial dehumidifiers	160
HDA	Industrial dehumidifiers	164
HMA	Industrial dehumidifiers	168
HMA Z	Industrial dehumidifiers with temperature control	172
HMA BT	Low temperature industrial dehumidifiers	176
SBA	Swimming pool dehumidifiers	180
SHA	Swimming pool dehumidifiers	184
SDA	Swimming pool dehumidifiers	188
SMA	Swimming pool dehumidifiers	192
SRH	Swimming pool dehumidifiers	196
UTA-UTAZ	Energy recovery high efficiency dehumidifiers	200

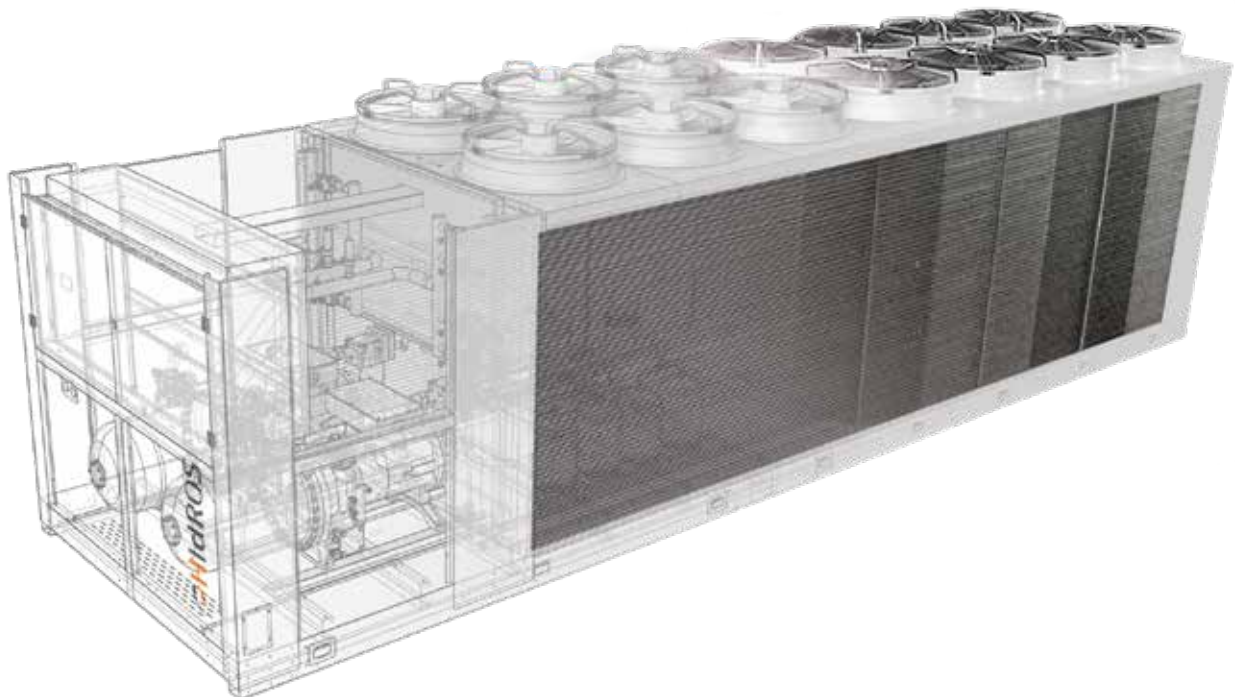
Water Chillers

LDA	Air cooled water chillers with axial fans	206
WDA	Water cooled chillers	216
WTS	Water cooled chillers	220

The Company



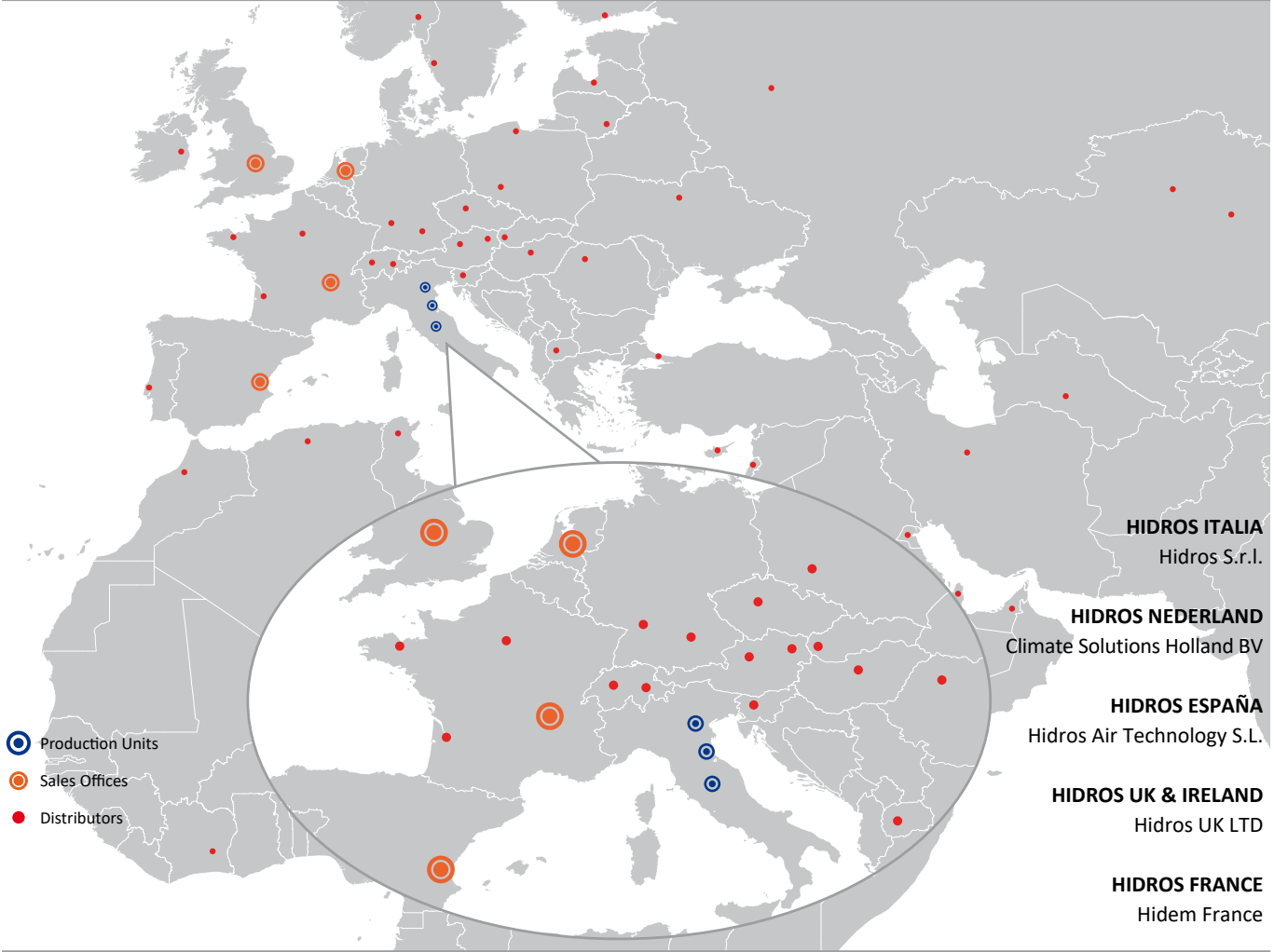
HidROS was formed in 1993 as a distribution company operating in the humidification and dehumidification sector of the air conditioning market. The expansion was rapid and, as the knowledge of the market sector increased, opportunities for the development of specialist products were identified. The decision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



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



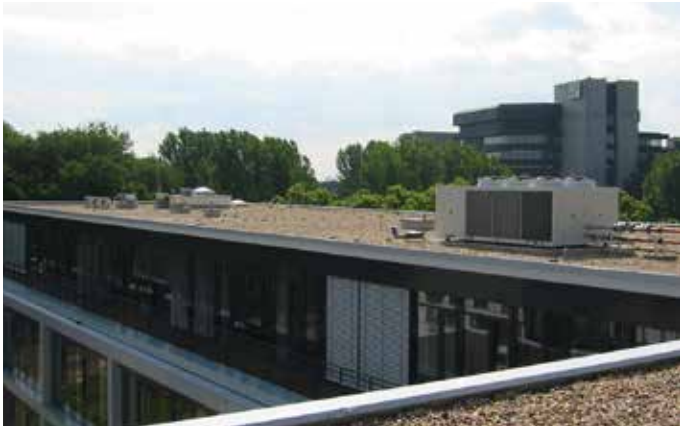
Where we are



Heat pumps installations



Chillers installations

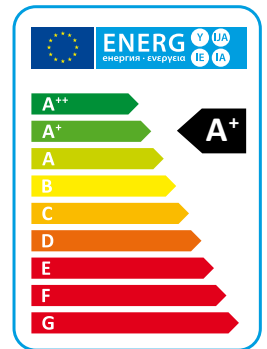


Dehumidifiers installations



LSA/HP

High efficiency air to water heat pumps



The LSA/HP 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/HP 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

HP Reversible versions.

LSA/HP		06	08	10	14	16	21	26	31	36	41
Cooling capacity (EN14511) ⁽¹⁾	kW	5,7	7,5	8,5	14,0	15,5	20,5	26,6	30,0	33,0	39,0
Total input power (EN14511) ⁽¹⁾	kW	1,9	2,5	2,8	4,7	5,7	6,8	8,8	10,5	11,8	13,8
EER (EN14511) ⁽¹⁾	W/W	3,0	3,0	3,0	2,9	2,7	3,0	3,0	2,9	2,8	2,8
Heating capacity (EN14511) ⁽²⁾	kW	5,9	7,7	9,2	14,9	17,2	22,0	29,5	33,5	36,5	44,4
Total input power (EN14511) ⁽²⁾	kW	1,5	2,0	2,3	3,9	4,3	5,2	6,8	8,2	9,0	10,7
COP (EN14511) ⁽²⁾	W/W	3,9	3,9	4,0	3,8	4,0	4,3	4,3	4,1	4,1	4,2
Energy Class ⁽³⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽³⁾	kWh/kWh	3,38	3,32	3,40	3,35	3,23	3,38	3,21	3,21	3,21	3,29
$\eta_{s,h}$ ⁽³⁾	%	132,2	129,8	132,9	131,1	126,2	132,3	125,4	125,4	125,5	128,4
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+N/50	400/3+N/50	400/3+N/50
Peak current	A	60,6	68,0	99,0	66,0	77,0	96,8	119,8	120,6	142,6	176,6
Max input current	A	13,4	18,1	23,0	13,3	17,0	17,8	23,8	27,6	33,6	36,6
Air flow	m ³ /h	2.800	3.350	3.150	7.200	7.000	8.500	8.500	10.800	10.800	10.800
Fans	n°/kW	1 x 0,12	1 x 0,2	1 x 0,2	2 x 0,2	2 x 0,2	2 x 0,2	2 x 0,2	2 x 0,5	2 x 0,5	2 x 0,5
Compressors / Circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	3,0	4,2	3,7	3,7	5,0	7,3	8,0	6,5	6,5	8,0
Equivalent CO ₂ charge	t	6,3	8,8	7,7	7,7	10,4	15,2	16,7	13,6	13,6	16,7
Sound power ⁽⁴⁾	dB (A)	68	68	68	69	69	74	74	79	79	79
Sound pressure ⁽⁵⁾	dB (A)	37	37	37	38	38	43	43	47	47	47
Water pump input power	kW	0,2	0,2	0,2	0,5	0,5	0,6	0,6	0,9	0,9	1,3
Pump available static pressure ⁽¹⁾	kPa	56,7	56,5	45,9	109,3	109,3	136,8	79,2	96,4	41,2	170,1
Water tank volume	l	40	40	40	40	60	60	60	180	180	180

Performances are referred to the following conditions:

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

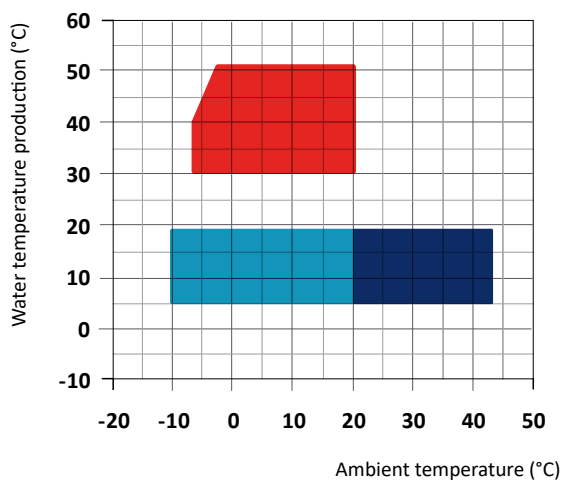
(2)Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 30/35°C.

(3) Average conditions, low temperature, variable - Reg EU 811/2013

(4) Sound power level in accordance with ISO 3744 (LS-Version).

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744. (LS-Version).

Operation limits



Frame

All LSA/HP 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 and 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 stand-by. 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.

Condenser

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 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 se-

quence, 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 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.

Versions

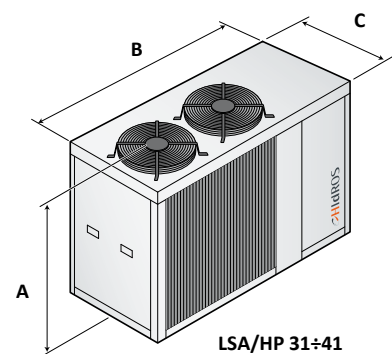
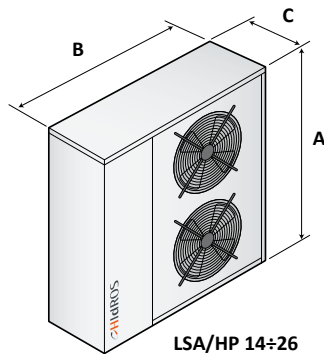
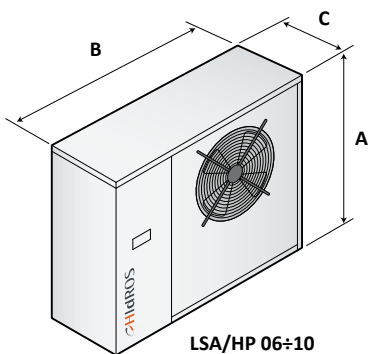
Reversible version (HP)

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/HP		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	-	●	●	●	●	●	●	●	●	●	●
Liquid line solenoid valve	VSLI	○	○	○	○	○	○	○	○	○	○
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.

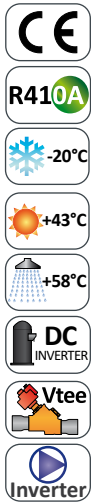
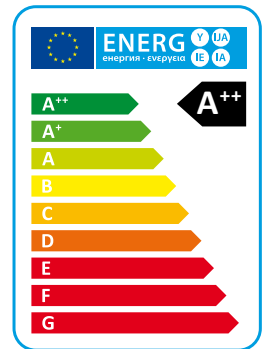


Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A	989	1157	380	95/148
08/08A	989	1157	380	104/163
10/10A	989	1157	380	118/179
14/14A	1324	1245	423	127/207
16/16A	1324	1245	423	133/212

Mod.	A (mm)	B (mm)	C (mm)	Kg
21/21A	1424	1508	473	188/267
26/26A	1424	1508	473	209/286
31/31A	1406	1910	950	330/440
36/36A	1406	1910	950	345/495
41/41A	1406	1910	950	360/520

LRi

High efficiency air to water heat pumps
with DC INVERTER compressor



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

They have been optimized on heating mode, are able to produce water up to 58°C and can operate down to -20°C ambient temperature.

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

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

Versions

HH	Heating only.
RV	Reversible heating/cooling.
HE	High efficiency, EC fans.
XL	Super low noise.
P2U	2 pipe systems without domestic hot water production.
P2S	2 pipe systems with domestic hot water production by external 3 way valve.

Heating only version (HH)

HE/XL/HH		08	10	12	14	16
Heating capacity (EN14511) ⁽¹⁾	kW	3,5 - 8,0	4,7 - 10,0	4,7 - 12,1	5,5 - 13,8	7,1 - 15,2
Total input power (EN14511) ⁽¹⁾	kW	1,8	2,2	2,8	3,2	3,4
COP (EN14511) ⁽¹⁾	W/W	4,33	4,43	4,19	4,30	4,41
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	3,83	4,24	4,31	4,01	4,07
$\eta_{s,h}$ low temperature ⁽²⁾	%	150,2	166,6	169,4	157,4	159,8
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3/50	400/3/50
Max input current standard unit	A	21,2	22,4	26,9	32,8	11,5
Peak current standard unit	A	13,7	14,5	17,4	21,4	7,7
Fans	n°	1	1	1	2	2
Twin rotary DC Inverter Compressors / Circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge	Kg	1,90	3,80	3,80	4,74	5,00
Equivalent CO ₂ charge	t	4,0	7,9	7,9	9,9	10,4
Nominal water flow	l/h	1380	1720	2080	2370	2620
Circulation pump useful prevalence	kPa	34,5	39,4	34,2	63,4	52,9
Max sound power level in heating mode ⁽⁴⁾	dB (A)	62	63	63	65	66
Max sound pressure level in heating mode ⁽⁵⁾	dB (A)	31	32	32	34	35

Reversible heating/cooling version (RV)

HE/XL/RV		08	10	12	14	16
Heating capacity (EN14511) ⁽¹⁾	kW	3,5 - 8,0	4,7 - 10,0	4,7 - 12,1	5,5 - 13,8	7,1 - 15,2
Total input power (EN14511) ⁽¹⁾	kW	1,8	2,2	2,8	3,2	3,4
COP (EN14511) ⁽¹⁾	W/W	4,33	4,43	4,19	4,30	4,41
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	3,83	4,24	4,31	4,01	4,07
$\eta_{s,h}$ low temperature ⁽²⁾	%	150,2	166,6	169,4	157,4	159,8
Cooling capacity (EN14511) ⁽³⁾	kW	2,9 - 6,1	3,3 - 7,6	3,3 - 8,5	5,3 - 11,5	6,3 - 14,5
Total input power (EN14511) ⁽³⁾	kW	2,1	2,4	2,7	3,7	4,5
EER (EN14511) ⁽³⁾	W/W	2,90	3,11	3,10	3,10	3,24
SEER ⁽³⁾		3,61	4,63	4,73	4,51	4,77
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	400/3/50	400/3/50
Max input current standard unit	A	21,2	22,4	26,9	32,8	11,5
Peak current standard unit	A	13,7	14,5	17,4	21,4	7,7
Fans	n°	1	1	1	2	2
Twin rotary DC Inverter Compressors / Circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge	Kg	1,90	3,80	3,80	4,74	5,00
Equivalent CO ₂ charge	t	4,0	7,9	7,9	9,9	10,4
Nominal water flow	l/h	1380	1720	2080	2370	2620
Circulation pump useful prevalence	kPa	34,5	39,4	34,2	63,4	52,9
Max sound power level in heating mode ⁽⁴⁾	dB (A)	62	63	63	65	66
Max sound pressure level in heating mode ⁽⁵⁾	dB (A)	31	32	32	34	35
Max sound power level in cooling mode ⁽⁴⁾	dB (A)	62	63	63	65	66
Max sound pressure level in cooling mode ⁽⁵⁾	dB (A)	31	32	32	34	35

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

Refrigerant circuit

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

The refrigerant used is R410A.

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

Compressors

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

Source heat exchanger

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

User heat exchangers

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

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

E.C. fans

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

Microprocessors

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

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over (heat pumps only) and general alarm.

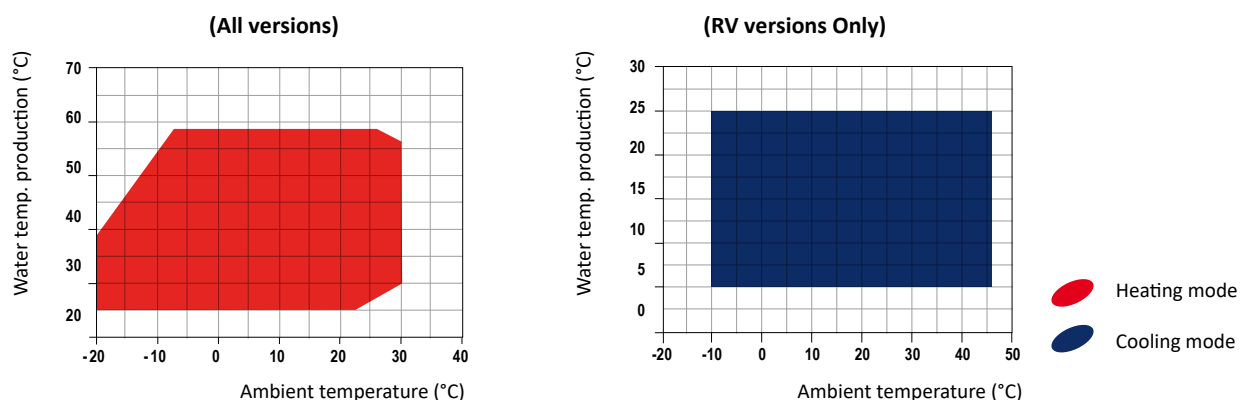
Control and protection devices

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

Integrated hydraulic circuit (E1NT)

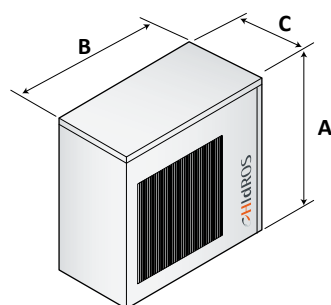
The integrated hydraulic circuit includes: High efficiency brushless pump with variable speed, expansion vessel, flow switch, air vent valve, safety valve (6bar), pressure gauge.

Operation limits

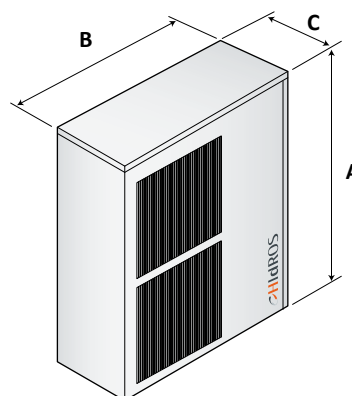


LRI		08	10	12	14	16
Flow switch		●	●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●	●
DHW Probe		●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○
Electronic Expansion Valve	VTEE	●	●	●	●	●
Electronic Soft starter	DSSE	●	●	●	●	●
E1NT Hydraulic kit	E1NT	●	●	●	●	●
Antifreeze kit	RAES	○	○	○	○	○
E.C. fans	VECE	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	○	○	○	○	○
Touch screen remote control panel	PCRL	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○

● Standard, ○ Optional, – Not available.



LRI 08 - 10 - 12



LRI 14 - 16

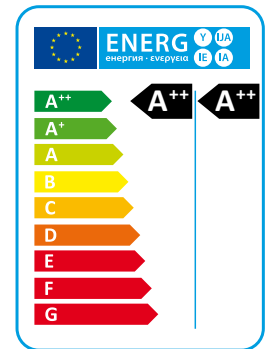
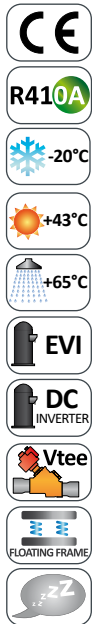
Mod.	A (mm)	B (mm)	C (mm)	Kg
08	785	925	380	63,4
10	913	1047	465	95,5
12	913	1047	465	95,5

Mod.	A (mm)	B (mm)	C (mm)	Kg
14	1405	1060	455	115,5
16	1405	1060	455	126,3

LZTi

Heat pumps air/water

DC inverter compressor with vapor injection (EVI)



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

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

LZTi units are available in 2 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard LZTi through the activation of an external 3-way-valve and in the SW6 version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

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

Versions

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

LZTi - LZTi/SW6		08	10	15	20
Heating capacity (EN14511) ⁽¹⁾	kW	7,7	9,6	15,0	19,0
Total input power (EN14511) ⁽¹⁾	kW	1,8	2,3	3,4	4,5
COP (EN14511) ⁽¹⁾	W/W	4,28	4,17	4,41	4,22
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/ kWh	3,92	3,97	4,01	4,02
$\eta_{s,h}$ low temperature ⁽²⁾	%	153,8	155,8	157,3	157,8
Energy Class in medium temperature ⁽²⁾		A+	A+	A++	A++
SCOP medium temperature ⁽²⁾	kWh/ kWh	3,22	3,32	3,37	3,42
$\eta_{s,h}$ medium temperature ⁽²⁾	%	125,6	129,8	131,6	133,8
Cooling capacity (EN14511) ⁽³⁾	kW	7,1	8,5	13,5	16,0
Total input power (EN14511) ⁽³⁾	kW	2,3	2,8	4,2	5,1
EER (EN14511) ⁽³⁾	W/W	3,10	3,00	3,21	3,13
Power supply	V/Ph/Hz	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	16,0	19,9	13,5	15,0
Peak current standard unit	A	15,6	19,5	14,5	14,9
Fans	n°	1	1	2	2
Compressors	n°	1 E.V.I. DC inverter	1 E.V.I. DC inverter	1 E.V.I. DC inverter	1 E.V.I. DC inverter
Global warming potential (GWP)		2088	2088	2088	2088
Refrigerant charge	Kg	3,3	3,3	4,3	4,3
Equivalent CO ₂ charge	t	6,9	6,9	9,0	9,0
Sound power ⁽⁴⁾	dB (A)	65	65	67	67
Sound pressure ⁽⁵⁾	dB (A)	34	34	36	36,0

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
 (2) Average conditions, low temperature, variable - Reg EU 811/2013.

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

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

The standard colour of the units is RAL9018.

Refrigerant circuit

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

The refrigerant used is R410A.

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

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

Compressors

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

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

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

The compressors are equipped with an innovative electric motor permanent magnet brushless DC inverter-driven, high-efficiency,

are all equipped with electrical resistance and thermal overload protection.

Source heat exchanger

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

User heat exchangers

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

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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 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 EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

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

Noise Reduction

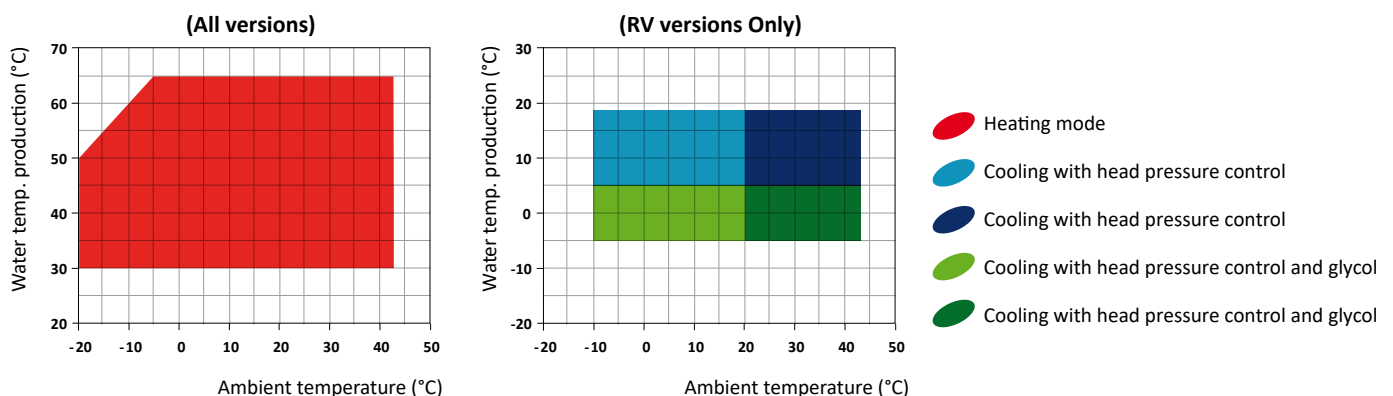
All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate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

Versions

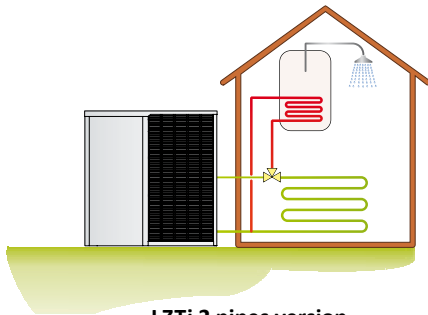
Unit with independent domestic hot water production (SW6)

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

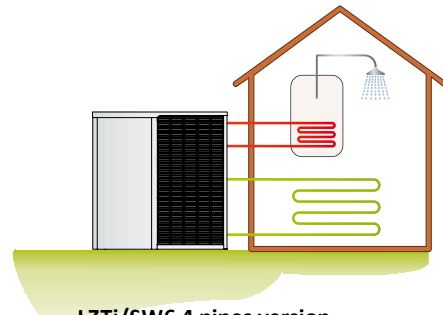
Operation limits



Versions



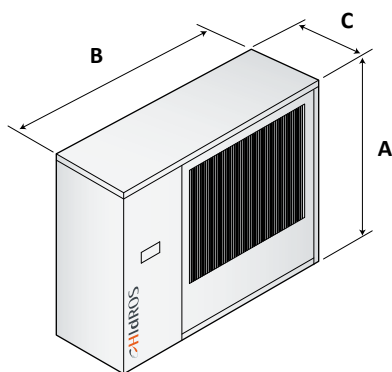
LZTi 2 pipes version



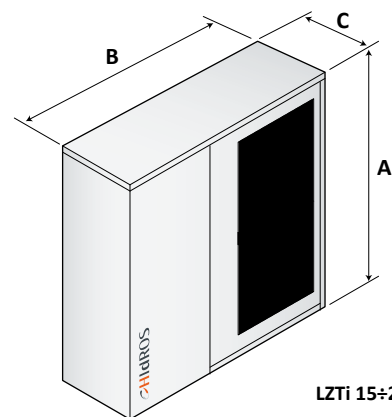
LZTi/SW6 4 pipes version

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

● Standard, ○ Optional, – Not available.



LZTi 08+10



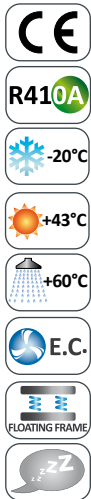
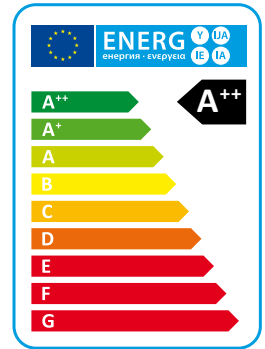
LZTi 15+20

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

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

LHA

High efficiency air to water heat pumps



LHA

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

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

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

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

Versions

- HH** Heating only.
- RV** Reversible heating/cooling.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.

Heating only version (HH)

SA/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	64,9	73,2	80,2	97,0	105,7	122,3
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,0	17,9	20,8	24,3	27,3	30,7
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,06	4,10	3,86	4,00	3,87	3,98
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,43	3,47	3,42	3,50	3,39	3,50
η _{s,h} ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	134,3	135,9	133,7	137,1	132,7	136,9
Sound power ⁽³⁾	dB (A)	75	75	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	45	45	45	46	47	50	51	53
SE/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	64,9	73,1	81,0	97,0	105,6	122,7
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	15,8	17,6	20,9	24,0	27,3	30,5
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,10	4,15	3,88	4,04	3,87	4,02
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,68	3,71	3,63	3,71	3,64	3,73
η _{s,h} ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	144,1	145,4	142,1	145,3	142,5	146,1
Sound power ⁽³⁾	dB (A)	74	74	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁴⁾	dB (A)	42	42	43	43	45	45	45	46	47	50	51	53
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9	17,4	17,4	22,1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1	36,3	36,3	46,1

SA/LS/HH - P2S/P2U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	136,0	157,3	169,0	196,6	215,0	211,8	226,1	258,8	330,6	357,4	393,3	431,7
Total input power (EN14511) ⁽¹⁾	kW	34,6	40,3	43,4	51,5	60,4	58,2	64,8	71,9	85,2	93,8	103,0	116,4
COP (EN14511) ⁽¹⁾	W/W	3,93	3,90	3,89	3,82	3,56	3,64	3,49	3,60	3,88	3,81	3,82	3,71
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,50	3,48	3,46	3,45	3,24	3,25	3,23	3,26	3,25	3,27	3,24	3,34
η _{s,h} ⁽²⁾	%	137,0	136,1	135,5	134,8	126,5	127,1	126,1	127,2	127,0	127,8	126,4	130,4
Sound power ⁽³⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁴⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
SE/LS/HH - P2S/P2U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	137,0	157,8	170,2	197,7	217,6	213,2	227,7	261,7	330,6	357,5	396,6	435,4
Total input power (EN14511) ⁽¹⁾	kW	34,6	38,8	43,3	51,5	60,3	57,9	65,1	71,9	82,9	92,1	102,7	116,7
COP (EN14511) ⁽¹⁾	W/W	3,96	4,07	3,93	3,84	3,61	3,68	3,50	3,64	3,99	3,88	3,86	3,73
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,68	3,77	3,72	3,74	3,63	3,54	3,49	3,46	3,52	3,57	3,63	3,58
η _{s,h} ⁽²⁾	%	144,0	147,8	145,8	146,4	142,1	138,6	136,5	135,2	137,9	139,6	142,3	140,0
Sound power ⁽³⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁴⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	22,3	29,5	29,8	34,9	35,4	41	41,5	47,5	68,7	69,6	80,3	82,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	46,6	61,6	62,2	72,9	73,9	85,6	86,7	99,2	143,4	145,3	167,7	172,7

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
 (2) Average conditions, low temperature, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Heating only version (HH)

HA/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	46,9	50,7	61,2	67,3	72,6	93,1	104,7	114,4	137,2
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	9,0	11,4	12,0	13,6	15,4	17,0	22,1	25,3	28,4	32,4
COP (EN14511) ⁽¹⁾	W/W	4,11	4,12	4,13	4,11	4,22	4,49	4,38	4,27	4,21	4,14	4,03	4,24
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,69	3,53	3,57	3,67	3,97	3,91	3,87	3,70	3,67	3,69	3,70
η _{s,h} ⁽²⁾	%	132,9	144,7	138,0	139,6	143,8	155,7	153,4	151,6	145,1	143,7	144,4	144,8
Sound power ⁽³⁾	dB (A)	75	75	75	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	44	44	45	46	50	51	53	54
HE/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	47,1	50,8	61,2	67,3	74,9	93,2	104,9	114,9	137,1
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	8,8	11,5	11,8	13,3	15,1	17,2	21,2	24,5	27,8	30,9
COP (EN14511) ⁽¹⁾	W/W	4,11	4,16	4,23	4,11	4,32	4,61	4,46	4,36	4,40	4,29	4,13	4,44
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,83	3,86	3,85	3,85	3,92	4,13	4,04	3,97	3,87	3,85	3,83	3,85
η _{s,h} ⁽²⁾	%	150,1	151,4	150,9	151,1	153,6	162,0	158,4	155,8	151,7	150,8	150,2	151,0
Sound power ⁽³⁾	dB (A)	73	74	74	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁴⁾	dB (A)	41	42	42	43	44	44	45	46	50	51	53	54
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5	22,5	22,5	34,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0	47,0	47,0	71,8

HA/LS/HH - P2S/P2U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	150,8	167,2	182,0	209,7	239,2	228,6	270,2	295,6	335,0	363,1	404,5	458,7
Total input power (EN14511) ⁽¹⁾	kW	35,8	41,3	45,4	50,3	55,8	56,7	67,0	74,1	83,5	90,3	105,1	116,4
COP (EN14511) ⁽¹⁾	W/W	4,21	4,05	4,01	4,17	4,29	4,03	4,03	3,99	4,01	4,02	3,85	3,94
Energy Class ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,74	3,69	3,62	3,76	3,83	3,65	3,63	3,65	3,66	3,73	3,61	3,63
η _{s,h} ⁽²⁾	%	146,4	144,7	141,9	147,3	150,3	143,1	142,0	142,9	143,3	146,1	141,4	142,0
Sound power ⁽³⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁴⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
HE/LS/HH - P2S/P2U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	151,0	167,9	182,8	210,6	241,3	229,4	271,4	296,7	339,0	364,9	407,0	463,7
Total input power (EN14511) ⁽¹⁾	kW	34,4	40,2	45,5	49,4	54,8	55,8	63,9	71,5	83,7	88,8	104,1	115,1
COP (EN14511) ⁽¹⁾	W/W	4,39	4,18	4,02	4,26	4,40	4,11	4,25	4,15	4,05	4,11	3,91	4,03
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,86	3,85	3,84	3,92	3,97	3,83	3,85	3,83	3,91	3,89	3,87	3,86
η _{s,h} ⁽²⁾	%	151,3	150,9	150,4	153,6	155,6	150,2	151,1	150,3	153,5	152,4	151,9	151,5
Sound power ⁽³⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁴⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	34,8	35,3	35,3	49,4	57,3	56,7	66,5	67,1	68,0	79,9	81,1	97,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	72,7	73,7	73,7	103,1	119,6	118,4	138,9	140,1	142,0	166,8	169,3	204,0

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

SA/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	64,9	73,2	80,2	97,0	105,7	122,3
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,0	17,9	20,8	24,3	27,3	30,7
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,06	4,10	3,86	4,00	3,87	3,98
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,43	3,47	3,42	3,50	3,39	3,50
$\eta_{s,h}$ ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	134,3	135,9	133,7	137,1	132,7	136,9
Cooling capacity (EN14511) ⁽³⁾	kW	17,8	24,1	28,4	38,8	42,7	48,2	55,2	60,2	69,7	83,3	91,6	102,6
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	11,7	15,0	16,4	19,8	21,9	24,5	29,3	32,7	37,7	42,6
EER (EN14511) ⁽³⁾	W/W	2,52	2,45	2,42	2,58	2,61	2,43	2,52	2,46	2,38	2,55	2,43	2,41
Sound power ⁽⁴⁾	dB (A)	75	75	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁵⁾	dB (A)	43	43	43	43	45	45	45	46	47	50	51	53

SE/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	64,9	73,1	81,0	97,0	105,6	122,7
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	15,8	17,6	20,9	24,0	27,3	30,5
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,10	4,15	3,88	4,04	3,87	4,02
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,68	3,71	3,63	3,71	3,64	3,73
$\eta_{s,h}$ ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	144,1	145,4	142,1	145,3	142,5	146,1
Cooling capacity (EN14511) ⁽³⁾	kW	17,7	24,1	28,2	39,0	43,5	48,9	55,6	61,3	70,3	84,3	92,0	103,5
Total input power (EN14511) ⁽³⁾	kW	7,0	9,8	11,8	14,9	16,0	19,5	21,8	24,0	28,9	32,3	37,4	42,2
EER (EN14511) ⁽³⁾	W/W	2,52	2,47	2,40	2,61	2,72	2,51	2,55	2,55	2,43	2,61	2,46	2,45
Sound power ⁽⁴⁾	dB (A)	74	74	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁵⁾	dB (A)	42	42	43	43	45	45	45	46	47	50	51	53
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9	17,4	17,4	22,1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1	36,3	36,3	46,1

SA/LS/RV - P2S/P2U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	136,0	157,3	169,0	196,6	215,0	211,8	226,1	258,8	330,6	357,4	393,3	431,7
Total input power (EN14511) ⁽¹⁾	kW	34,6	40,3	43,4	51,5	60,4	58,2	64,8	71,9	85,2	93,8	103,0	116,4
COP (EN14511) ⁽¹⁾	W/W	3,93	3,90	3,89	3,82	3,56	3,64	3,49	3,60	3,88	3,81	3,82	3,71
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,50	3,48	3,46	3,45	3,24	3,25	3,23	3,26	3,25	3,27	3,24	3,34
$\eta_{s,h}$ ⁽²⁾	%	137,0	136,1	135,5	134,8	126,5	127,1	126,1	127,2	127,0	127,8	126,4	130,4
Cooling capacity (EN14511) ⁽³⁾	kW	115,6	131,9	143,0	173,0	197,2	192,3	210,8	231,8	286,3	312,9	349,4	401,8
Total input power (EN14511) ⁽³⁾	kW	47,2	53,8	63,6	68,9	76,7	76,0	87,5	97,8	106,0	121,8	138,1	153,4
EER (EN14511) ⁽³⁾	W/W	2,45	2,45	2,25	2,51	2,57	2,53	2,41	2,37	2,70	2,57	2,53	2,62
Sound power ⁽⁴⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁵⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	22,3	29,5	29,8	34,9	35,4	41	41,5	47,5	68,7	69,6	80,3	82,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	46,6	61,6	62,2	72,9	73,9	85,6	86,7	99,2	143,4	145,3	167,7	172,7

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

Refrigerant circuit

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

Compressors

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

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

Source heat exchanger

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

User heat exchangers

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

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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, in LS versions are 6 poles type rotating at approximately 900 rpm. In the XL versions the fans are 8 poles type (approx 600 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

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

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

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P2S), 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 in HA and HE versions 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 P2S) is already equipped with this probe, but it must be installed in the user circuit.

Versions

Version HH

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

Version RV

This version uses 2 hydraulic connections and is able to produce hot water in winter and cold water in summer. The unit is combined with a 2-pipe system.

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

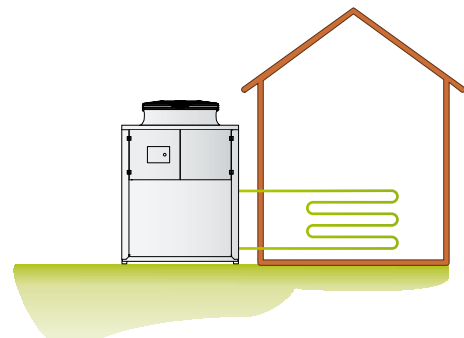
High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

Version LS

This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

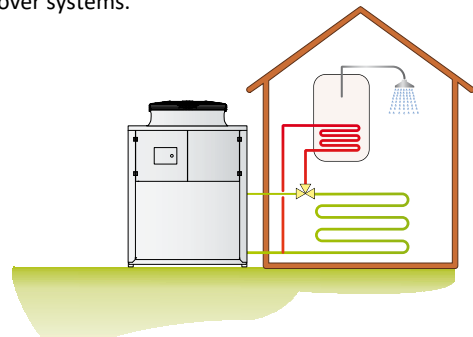
P2U Version

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



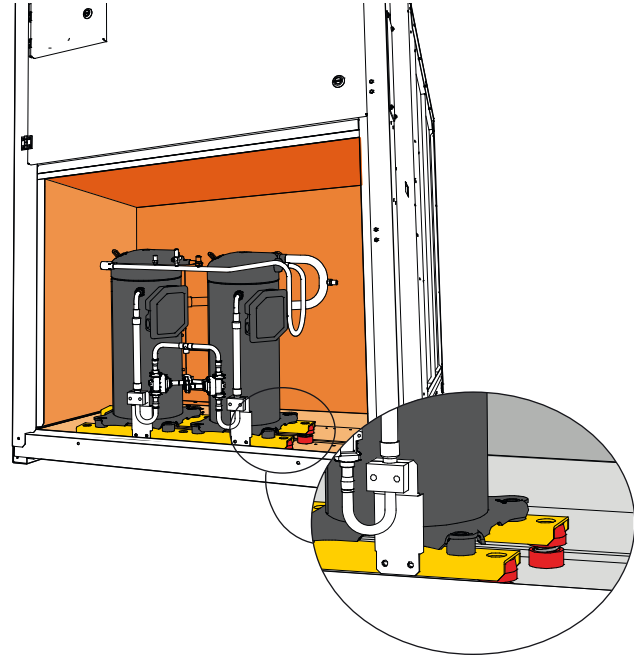
P2S Version

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



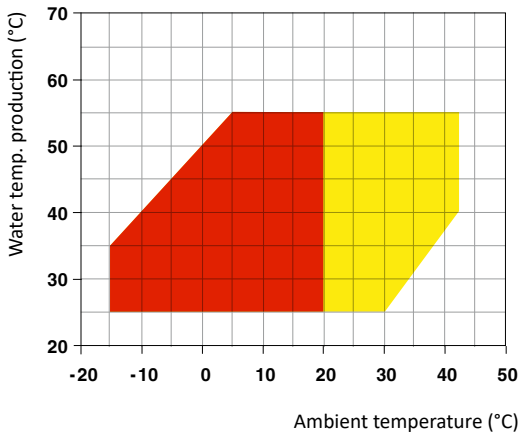
HA/XL HE/XL Super low noise version

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

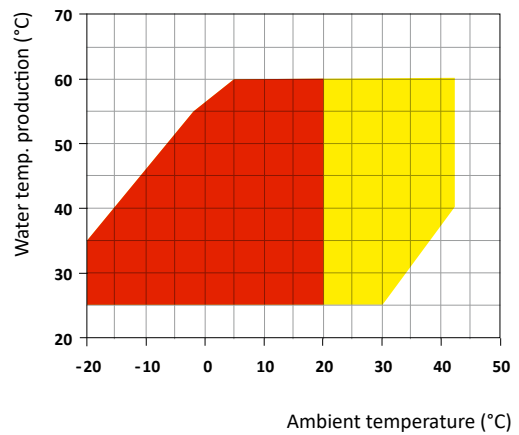


Operation limits

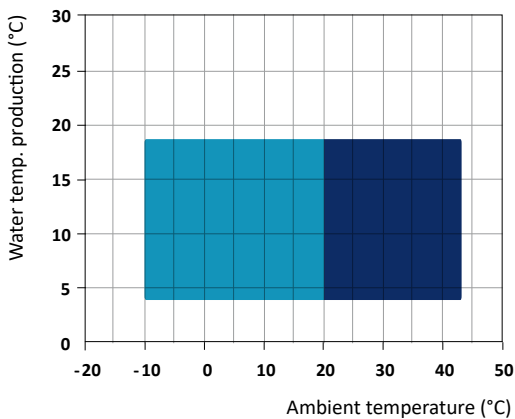
(SA/SE versions)



(HA/HE versions)



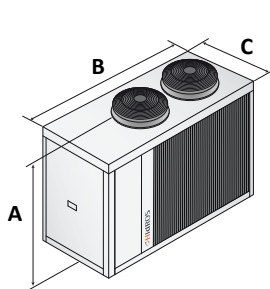
(RV versions Only)



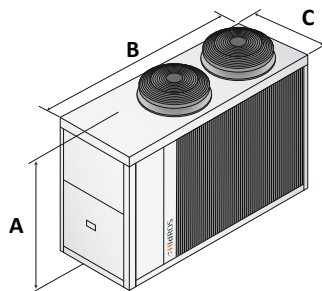
- Heating mode
- Heating mode with head pressure control (DCCF)
- Cooling with head pressure control (DCCF)
- Cooling mode

LHA SA-SE/HH-RV LHA HA-HE /HH-RV	P2S/P2U	252	302	402	452	502	602	702	802
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		-	-	-	-	-	-	-	-
“Floating frame” Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

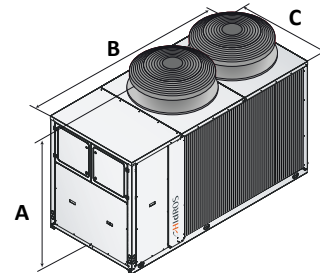
● Standard ○ Optional – Not available



SA/SE 252 - 302 - 402
HA/HE 252 - 302



SA/SE 452 - 502 - 602
HA/HE 402 - 452 - 502

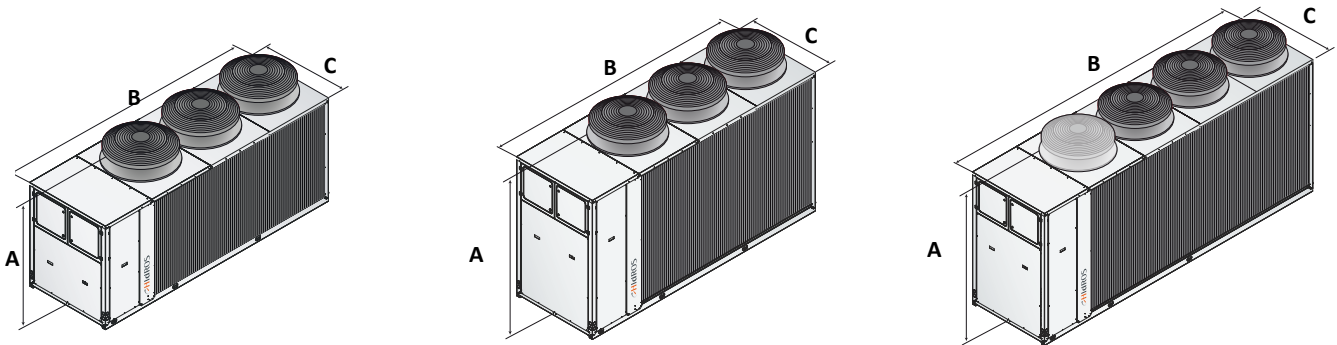


SA/SE 702 - 802 - 902
HA/HE 602 - 702 - 802 - 902 - 1002 - 1202

		252	302	402	452	502	602	702	802
A	SA-SE/LS	1470	1470	1470	1670	1670	1670	1820	1820
B	SA-SE/LS	1910	1910	1910	2200	2200	2200	2905	2905
C	SA-SE/LS	900	900	900	900	900	900	1150	1150
Kg	SA-SE/LS	550	550	560	670	700	760	880	890
A	HA-HE/LS	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/LS	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/LS	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/LS	560	560	670	690	720	1060	1060	1070
A	HA-HE/XL	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/XL	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/XL	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/XL	570	570	680	710	740	1080	1080	1090

LHA SA-SE/HH-RV LHA HA-HE /HH-RV	P2S/P2U	902	1002	1202	1402	1602	1802	2002	2302
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

● Standard ○ Optional – Not available



SA/SE 1002 - 1202 - 1402 - 1602
HA/HE 1402 - 1602 - 1802 - 2002

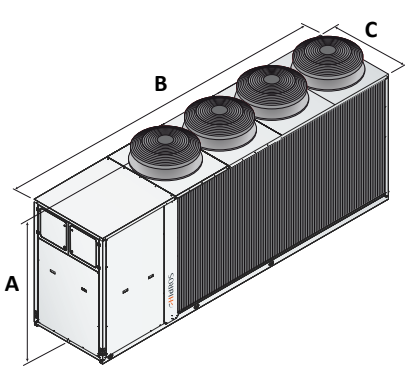
SA/SE 1802 - 2002
HA/HE 2302 - 2502

SA/SE 2302 - 2502

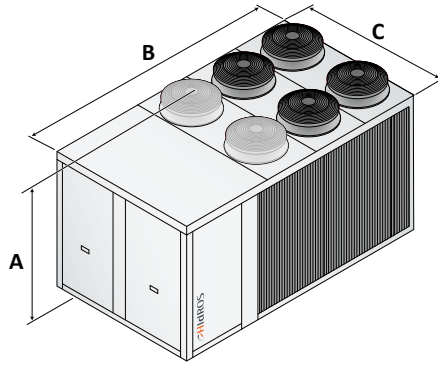
		902	1002	1202	1402	1602	1802	2002	2302
A	SA-SE/LS	1820	1820	1820	1820	1820	2220	2220	2305
B	SA-SE/LS	2905	3965	3965	3965	3965	3965	3965	4505
C	SA-SE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	SA-SE/LS	910	1190	1270	1320	1360	1690	1710	1990
A	HA-HE/LS	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/LS	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/LS	1120	1160	1240	1560	1580	1600	1620	1790
A	HA-HE/XL	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/XL	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/XL	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/XL	1140	1180	1260	1590	1610	1630	1650	1820

LHA SA-SE/HH-RV LHA HA-HE /HH-RV	P2S/P2U	2502	2504	3004	3204	3504	4004	4504	5004
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

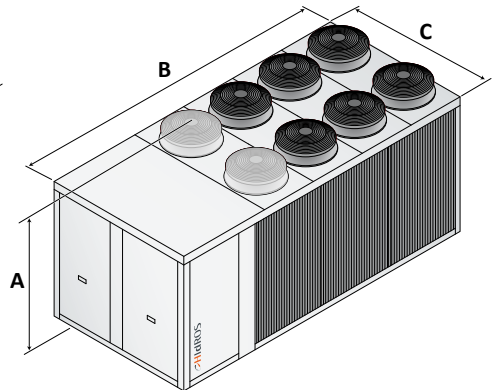
● Standard ○ Optional – Not available



SA/SE 2504 - 3004 - 3204



SA/SE 3504 - 4004
HA/HE 2504 - 3004 - 3204 - 3504

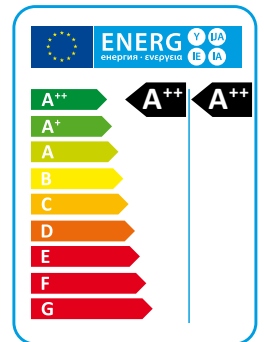


SA/SE 4504 - 5004
HA/HE 4004 - 4504 - 5004

		2502	2504	3004	3204	3504	4004	4504	5004
A	SA-SE/LS	2305	2305	2305	2305	2350	2350	2350	2350
B	SA-SE/LS	4505	5315	5315	5315	4265	4265	4805	4805
C	SA-SE/LS	1150	1150	1150	1150	2210	2210	2210	2210
Kg	SA-SE/LS	2040	2500	2540	2620	3220	3270	3600	3700
A	HA-HE/LS	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/LS	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/LS	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/LS	1820	3170	3220	3270	3320	3660	3720	3780
A	HA-HE/XL	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/XL	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/XL	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/XL	1850	3220	3270	3320	3370	3710	3770	3830

LZT

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



- CE
- R410A
- 20°C
- +43°C
- +65°C
- EVI
- E.C.
- FLOATING FRAME
- ZZ

LZT

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

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

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

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

Versions

- HH** Heating only.
- RV** Reversible heating/cooling.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.
- NN** Ultra low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.

Heating only version (HH)

SA/LS/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,9	55,0	67,8	74,5	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,5	6,8	10,3	12,3	13,4	16,3	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,31	4,16	4,11	4,14	4,12	4,16	4,12	--	--
Energy Class in low temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,75	3,77	3,39	3,33	3,49	3,70	3,62	--	--
η _{s,h} low temperature ⁽²⁾	%	147,1	147,8	132,6	130,1	136,6	145,0	141,7	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,04	3,07	2,89	2,87	2,93	3,06	3,03	--	--
η _{s,h} medium temperature ⁽²⁾	%	118,7	119,6	112,4	111,6	114,2	119,3	118,2	--	--
Sound power ⁽³⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁴⁾	dB (A)	46	46	47	48	48	48	48	--	--
SE/LS/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,5	55,2	67,8	74,7	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,7	9,9	12,8	13,8	16,1	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,47	4,22	4,25	3,95	4,00	4,21	4,13	--	--
Energy Class in low temperature ⁽²⁾		A++	A++	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,95	3,87	3,58	3,45	3,59	3,79	3,68	--	--
η _{s,h} low temperature ⁽²⁾	%	154,8	151,6	140,3	135,1	140,7	148,7	144,2	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,17	3,13	3,02	2,99	3,02	3,13	3,10	--	--
η _{s,h} medium temperature ⁽²⁾	%	123,6	122,3	117,9	116,4	117,6	122,0	120,9	--	--
Sound power ⁽³⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁴⁾	dB (A)	46	46	47	48	48	48	48	--	--
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	--	--
Fans	n°	2	2	2	2	2	2	2	--	--
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	--	--
Refrigerant charge	Kg	5,5	5,7	8,3	8,4	9,3	14,6	14,9	--	--
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	--	--
Equivalent CO ₂ charge	t	11,5	11,8	17,2	17,5	19,5	30,4	31,2	--	--

HA/LS/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,8	29,4	41,6	51,2	58,0	66,7	80,8	88,4	102,5
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,8	9,7	12,4	13,0	15,6	19,6	21,4	25,3
COP (EN14511) ⁽¹⁾	W/W	4,51	4,31	4,29	4,12	4,45	4,29	4,13	4,13	4,05
Energy Class in low temperature ⁽²⁾		A++	A++	A+	A+	A++	A++	A+	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,89	3,63	3,55	3,94	3,95	3,43	3,50	3,48
η _{s,h} low temperature ⁽²⁾	%	155,3	152,5	142,1	139,1	154,6	154,9	134,3	137,1	136,2
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,15	2,99	2,98	3,21	3,16	2,87	2,92	2,94
η _{s,h} medium temperature ⁽²⁾	%	124,3	122,9	116,6	116,2	125,5	123,4	111,9	113,6	114,6
Sound power ⁽³⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁴⁾	dB (A)	46	46	46	47	48	48	51	51	51
HE/LS/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,5	41,8	50,3	58,3	66,9	81,3	88,5	102,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,7	9,5	12,2	12,8	15,3	18,9	20,6	24,6
COP (EN14511) ⁽¹⁾	W/W	4,61	4,38	4,40	4,12	4,56	4,37	4,31	4,31	4,17
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,96	3,87	3,83	4,08	4,06	3,83	3,85	3,84
η _{s,h} low temperature ⁽²⁾	%	160,8	155,5	151,6	150,3	160,1	159,4	150,1	150,8	150,6
Energy Class in medium temperature ⁽²⁾		A++	A++	A+	A+	A++	A++	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,25	3,21	3,12	3,15	3,29	3,23	3,07	3,14	3,13
η _{s,h} medium temperature ⁽²⁾	%	127,0	125,2	121,7	123,0	128,5	126,0	119,7	122,5	122,2
Sound power ⁽³⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁴⁾	dB (A)	46	46	46	47	48	48	51	51	51
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	6,9	6,9	8,7	8,9	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	14,5	14,5	18,1	18,6	31,2	31,7	46,9	46,9	46,9

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Heating only version (HH)

HA/XL/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,6	41,1	48,9	57,4	65,5	80,1	87,3	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,5	7,0	9,5	12,1	12,9	15,2	18,4	20,0	23,8
COP (EN14511) ⁽¹⁾	W/W	4,40	4,24	4,35	4,04	4,46	4,31	4,35	4,37	4,23
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	3,85	3,84	3,84	3,83	4,03	4,01	3,83	3,91	3,84
$\eta_{s,h}$ low temperature ⁽²⁾	%	150,3	150,6	150,5	150,1	158,1	157,5	150,1	153,2	150,7
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A++	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,05	3,13	3,11	3,14	3,27	3,20	3,13	3,21	3,18
$\eta_{s,h}$ medium temperature ⁽²⁾	%	119,0	122,2	121,4	122,4	127,6	124,8	122,0	125,5	124,3
Sound power ⁽³⁾	dB (A)	72	72	73	74	74	74	74	75	75
Sound pressure ⁽⁴⁾	dB (A)	40	40	41	42	42	42	42	43	43
HE/XL/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	30,0	41,2	49,2	57,4	65,6	79,9	87,2	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,8	9,2	11,8	12,6	15,1	17,8	19,4	23,5
COP (EN14511) ⁽¹⁾	W/W	4,64	4,39	4,49	4,16	4,57	4,35	4,49	4,49	4,29
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,87	4,00	3,84	4,21	4,16	4,04	4,06	3,93
$\eta_{s,h}$ low temperature ⁽²⁾	%	161,0	151,8	157,1	150,6	165,4	163,4	158,7	159,5	154,0
Energy Class in medium temperature ⁽²⁾		A++	A+	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,24	3,14	3,24	3,16	3,38	3,29	3,26	3,33	3,25
$\eta_{s,h}$ medium temperature ⁽²⁾	%	126,5	122,7	126,6	123,4	132	128,6	127,3	130,0	126,9
Sound power ⁽³⁾	dB (A)	70	72	73	74	73	73	74	75	75
Sound pressure ⁽⁴⁾	dB (A)	38	40	41	42	41	41	42	43	43
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,9	11,1	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	16,2	22,7	23,2	31,2	31,7	46,9	46,9	46,9

HE/NN/HH - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,4	30,5	41,1	54,2	60,7	70,4	79,5	90,3	104,9
Total input power (EN14511) ⁽¹⁾	kW	5,0	6,4	8,8	11,7	12,4	14,7	17,41	18,6	22,1
COP (EN14511) ⁽¹⁾	W/W	4,69	4,75	4,69	4,64	4,89	4,78	4,56	4,87	4,75
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,30	4,35	4,23	4,10	4,37	4,40	4,22	4,42	4,31
$\eta_{s,h}$ low temperature ⁽²⁾	%	168,8	171,1	166,2	160,8	171,7	172,9	165,6	173,8	169,3
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,34	3,48	3,42	3,34	3,47	3,45	3,38	3,52	3,50
$\eta_{s,h}$ medium temperature ⁽²⁾	%	130,7	138,0	133,7	130,5	135,9	134,9	132,2	137,9	137
Sound power ⁽³⁾	dB (A)	65	68	69	70	70	70	70	71	71
Sound pressure ⁽⁴⁾	dB (A)	33	36	37	38	38	38	38	39	39
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	9,1	11,9	22,0	22,2	22,5	22,5	34,4	34,8
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	18,9	24,8	46,0	46,4	46,9	46,9	71,8	72,7

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

SA/LS/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,9	55,0	67,8	74,5	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,5	6,8	10,3	12,3	13,4	16,3	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,31	4,16	4,11	4,14	4,12	4,16	4,12	--	--
Energy Class in low temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,75	3,77	3,39	3,33	3,49	3,70	3,62	--	--
η _{s,h} low temperature ⁽²⁾	%	147,1	147,8	132,6	130,1	136,6	145,0	141,7	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,04	3,07	2,89	2,87	2,93	3,06	3,03	--	--
η _{s,h} medium temperature ⁽²⁾	%	118,7	119,6	112,4	111,6	114,2	119,3	118,2	--	--
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,0	36,4	44,1	50,6	58,6	66,3	--	--
Total input power (EN14511) ⁽³⁾	kW	7,1	9,9	12,9	16,8	19,5	23,4	27,7	--	--
EER (EN14511) ⁽³⁾	W/W	2,93	2,64	2,82	2,62	2,59	2,50	2,39	--	--
Sound power ⁽⁴⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁵⁾	dB (A)	46	46	47	48	48	48	48	--	--
SE/LS/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,5	55,2	67,8	74,7	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,7	9,9	12,8	13,8	16,1	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,47	4,22	4,25	3,95	4,00	4,21	4,13	--	--
Energy Class in low temperature ⁽²⁾		A++	A++	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,95	3,87	3,58	3,45	3,59	3,79	3,68	--	--
η _{s,h} low temperature ⁽²⁾	%	154,8	151,6	140,3	135,1	140,7	148,7	144,2	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,17	3,13	3,02	2,99	3,02	3,13	3,10	--	--
η _{s,h} medium temperature ⁽²⁾	%	123,6	122,3	117,9	116,4	117,6	122,0	120,9	--	--
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,0	36,5	44,2	50,8	58,9	66,6	--	--
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	12,8	16,7	19,4	22,9	27,4	--	--
EER (EN14511) ⁽³⁾	W/W	2,94	2,65	2,86	2,64	2,62	2,57	2,44	--	--
Sound power ⁽⁴⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁵⁾	dB (A)	46	46	47	48	48	48	48	--	--
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	--	--
Fans	n°	2	2	2	2	2	2	2	--	--
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	--	--
Refrigerant charge	Kg	5,5	5,7	8,3	8,4	9,3	14,6	14,9	--	--
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	--	--
Equivalent CO ₂ charge	t	11,5	11,8	17,2	17,5	19,5	30,4	31,2	--	--
HA/LS/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,8	29,4	41,6	51,2	58,0	66,7	80,8	88,4	102,5
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,8	9,7	12,4	13,0	15,6	19,6	21,4	25,3
COP (EN14511) ⁽¹⁾	W/W	4,51	4,31	4,29	4,12	4,45	4,29	4,13	4,13	4,05
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,89	3,63	3,55	3,94	3,95	3,43	3,50	3,48
η _{s,h} low temperature ⁽²⁾	%	155,3	152,5	142,1	139,1	154,6	154,9	134,3	137,1	136,2
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,15	2,99	2,98	3,21	3,16	2,87	2,92	2,94
η _{s,h} medium temperature ⁽²⁾	%	124,3	122,9	116,6	116,2	125,5	123,4	111,9	113,6	114,6
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,5	37,5	45,4	52,8	60,4	71,6	78,1	90,2
Total input power (EN14511) ⁽³⁾	kW	7,2	9,3	12,7	16,8	18,1	23,2	24,6	26,6	32,2
EER (EN14511) ⁽³⁾	W/W	2,90	2,84	2,97	2,70	2,91	2,61	2,91	2,94	2,80
Sound power ⁽⁴⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁵⁾	dB (A)	46	46	46	47	48	48	51	51	51
HE/LS/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,5	41,8	50,3	58,3	66,9	81,3	88,5	102,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,7	9,5	12,2	12,8	15,3	18,9	20,6	24,6
COP (EN14511) ⁽¹⁾	W/W	4,61	4,38	4,40	4,12	4,56	4,37	4,31	4,31	4,17
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,96	3,87	3,83	4,08	4,06	3,83	3,85	3,84
η _{s,h} low temperature ⁽²⁾	%	160,8	155,5	151,6	150,3	160,1	159,4	150,1	150,8	150,6
Energy Class in medium temperature ⁽²⁾		A++	A++	A+	A+	A++	A++	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,25	3,21	3,12	3,15	3,29	3,23	3,07	3,14	3,13
η _{s,h} medium temperature ⁽²⁾	%	127,0	125,2	121,7	123,0	128,5	126,0	119,7	122,5	122,2
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,3	37,5	45,6	52,9	60,5	71,6	78,2	90,8
Total input power (EN14511) ⁽³⁾	kW	7,1	9,5	12,7	16,7	17,9	23,0	24,4	26,1	31,3
EER (EN14511) ⁽³⁾	W/W	2,94	2,78	2,96	2,73	2,95	2,64	2,94	3,00	2,90
Sound power ⁽⁴⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁵⁾	dB (A)	46	46	46	47	48	48	51	51	51
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	6,9	6,9	8,7	8,9	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	14,5	14,5	18,1	18,6	31,2	31,7	46,9	46,9	46,9

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/XL/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,6	41,1	48,9	57,4	65,5	80,1	87,3	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,5	7,0	9,5	12,1	12,9	15,2	18,4	20,0	23,8
COP (EN14511) ⁽¹⁾	W/W	4,40	4,24	4,35	4,04	4,46	4,31	4,35	4,37	4,23
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	3,85	3,84	3,84	3,83	4,03	4,01	3,83	3,91	3,84
η _{s,h} low temperature ⁽²⁾	%	150,3	150,6	150,5	150,1	158,1	157,5	150,1	153,2	150,7
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A++	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,05	3,13	3,11	3,14	3,27	3,20	3,13	3,21	3,18
η _{s,h} medium temperature ⁽²⁾	%	119,0	122,2	121,4	122,4	127,6	124,8	122,0	125,5	124,3
Cooling capacity (EN14511) ⁽³⁾	kW	21,0	26,3	36,8	44,5	52,1	59,7	71,2	77,1	88,7
Total input power (EN14511) ⁽³⁾	kW	7,2	9,7	13,2	17,3	18,9	24,0	23,7	26,2	32,6
EER (EN14511) ⁽³⁾	W/W	2,90	2,73	2,78	2,57	2,75	2,49	3,00	2,95	2,72
Sound power ⁽⁴⁾	dB (A)	72	72	73	74	74	74	74	75	75
Sound pressure ⁽⁵⁾	dB (A)	40	40	41	42	42	42	42	43	43
HE/XL/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	30,0	41,2	49,2	57,4	65,6	79,9	87,2	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,8	9,2	11,8	12,6	15,1	17,8	19,4	23,5
COP (EN14511) ⁽¹⁾	W/W	4,64	4,39	4,49	4,16	4,57	4,35	4,49	4,49	4,29
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,87	4,00	3,84	4,21	4,16	4,04	4,06	3,93
η _{s,h} low temperature ⁽²⁾	%	161,0	151,8	157,1	150,6	165,4	163,4	158,7	159,5	154,0
Energy Class in medium temperature ⁽²⁾		A++	A+	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,24	3,14	3,24	3,16	3,38	3,29	3,26	3,33	3,25
η _{s,h} medium temperature ⁽²⁾	%	126,5	122,7	126,6	123,4	132	128,6	127,3	130,0	126,9
Cooling capacity (EN14511) ⁽³⁾	kW	21,0	26,9	37,2	44,7	52,0	59,5	70,6	76,9	88,1
Total input power (EN14511) ⁽³⁾	kW	7,0	9,1	12,7	17,0	18,8	24,0	24,2	26,3	32,9
EER (EN14511) ⁽³⁾	W/W	2,98	2,94	2,93	2,63	2,78	2,48	2,92	2,92	2,68
Sound power ⁽⁴⁾	dB (A)	70	72	73	74	73	73	74	75	75
Sound pressure ⁽⁵⁾	dB (A)	38	40	41	42	41	41	42	43	43
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,9	11,1	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	16,2	22,7	23,2	31,2	31,7	46,9	46,9	46,9
HE/NN/RV - P2S/P2U		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,4	30,5	41,1	54,2	60,7	70,4	79,5	90,3	104,9
Total input power (EN14511) ⁽¹⁾	kW	5,0	6,4	8,8	11,7	12,4	14,7	17,41	18,6	22,1
COP (EN14511) ⁽¹⁾	W/W	4,69	4,75	4,69	4,64	4,89	4,78	4,56	4,87	4,75
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,30	4,35	4,23	4,10	4,37	4,40	4,22	4,42	4,31
η _{s,h} low temperature ⁽²⁾	%	168,8	171,1	166,2	160,8	171,7	172,9	165,6	173,8	169,3
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,34	3,48	3,42	3,34	3,47	3,45	3,38	3,52	3,50
η _{s,h} medium temperature ⁽²⁾	%	130,7	138,0	133,7	130,5	135,9	134,9	132,2	137,9	137
Cooling capacity (EN14511) ⁽³⁾	kW	20,1	26,2	36,0	46,4	53,3	61,6	68,9	79,0	91,9
Total input power (EN14511) ⁽³⁾	kW	7,6	9,2	13,6	14,9	16,8	20,9	25,6	24,7	29,8
EER (EN14511) ⁽³⁾	W/W	2,62	2,86	2,64	3,11	3,18	2,95	2,69	3,20	3,08
Sound power ⁽⁴⁾	dB (A)	65	68	69	70	70	70	70	71	71
Sound pressure ⁽⁵⁾	dB (A)	33	36	37	38	38	38	38	39	39
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	9,1	11,9	22,0	22,2	22,5	22,5	34,4	34,8
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	18,9	24,8	46,0	46,4	46,9	46,9	71,8	72,7

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

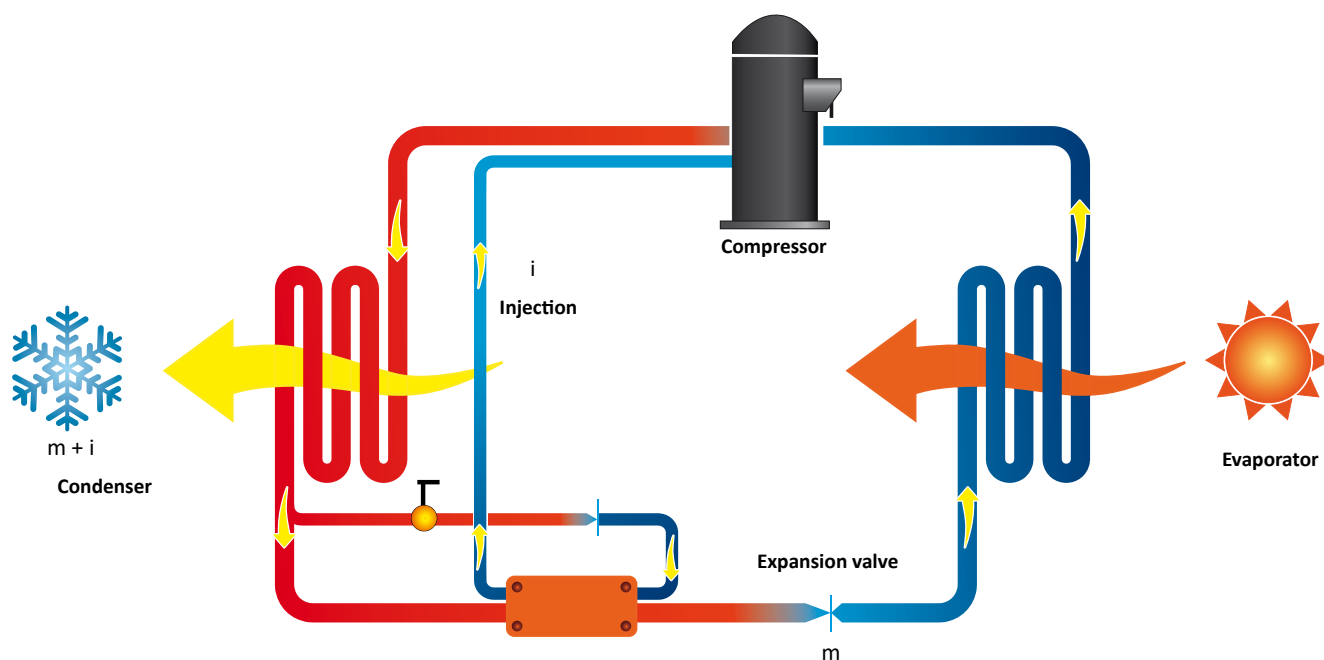
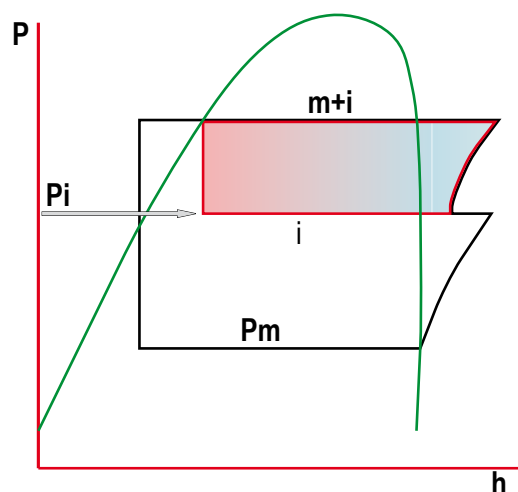
(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

What is the E.V.I. Technology (Enhanced Vapour Injection)?

Heat pumps utilise scroll compressors that are equipped with E.V.I. technology, a versatile method of improving system capacity and efficiency. EVI stands for “Economised Vapour Injection.”

The technology involves injecting refrigerant vapour into the middle of the compression process, a procedure that significantly boosts capacity and efficiency. Each scroll compressor used in these units is similar to a two-stage compressor with built-in inter-stage cooling. The process begins when a portion of the condenser liquid is extracted and expanded through an expansion valve.

The low temperature liquid/gas mixture produced is injected into a heat exchanger that operates as a sub cooler. Any liquid is evaporated and the vapour produced is superheated.



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

improvement. Using this technology enables Hidros units to produce hot water up to 65°C and the ability to operate down to -20°C ambient temperature.

Frame

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

The standard colour of the units is RAL9018.

Refrigerant circuit

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

Compressors

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

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

Source heat exchanger

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

User heat exchangers

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of

this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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 antivibration mountings. In the LS versions the fans are 6 poles type (approx 900 rpm), in the XL versions the fans are 8 poles type (approx 600 rpm), in the NN versions the fans are 12 poles type (approx 450 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), overload switches, control circuit automatic breakers, compressor contactors, automatic switches and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P2S), 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 P2S) is already equipped with this probe, but it must be installed in the user circuit.

Versions

Version HH

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

Version RV

This version uses 2 hydraulic connections and is able to produce hot water in winter and cold water in summer. The unit is combined with a 2-pipe system.

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

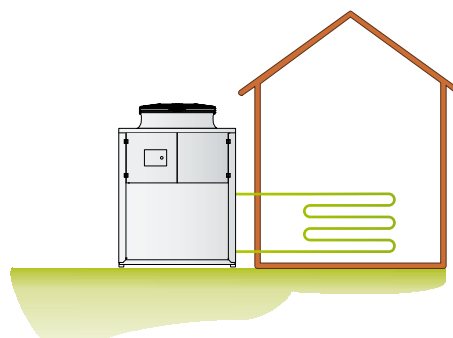
High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

Version LS

This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

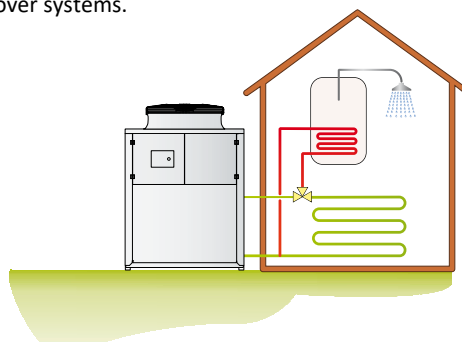
P2U Version

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



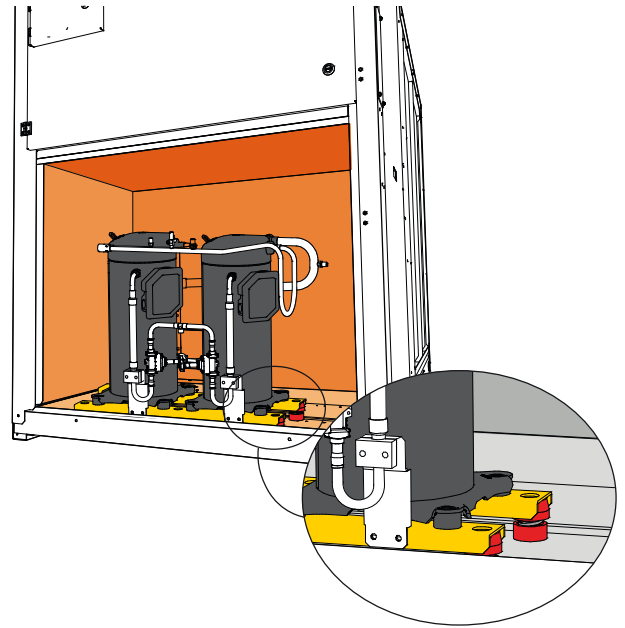
P2S Version

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



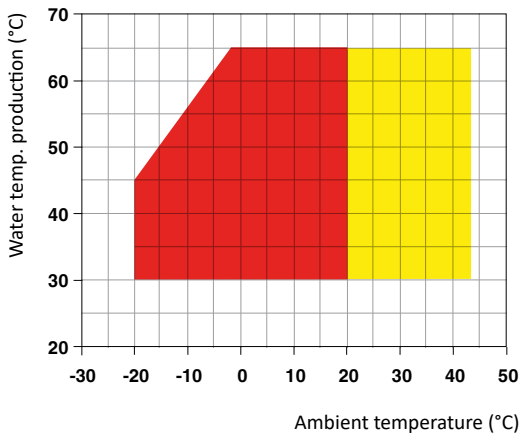
**Super low noise and ultra low noise versions
HA/XL - HE/XL and HE/NN**

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

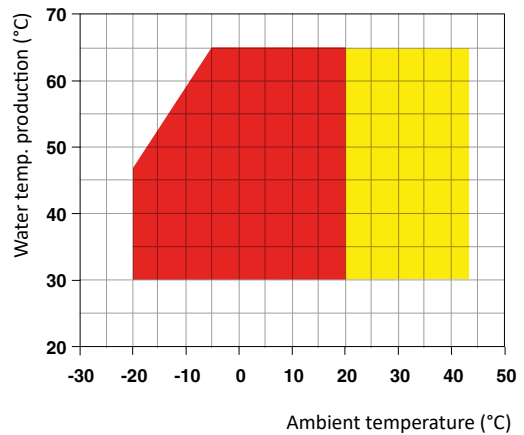


Operation limits

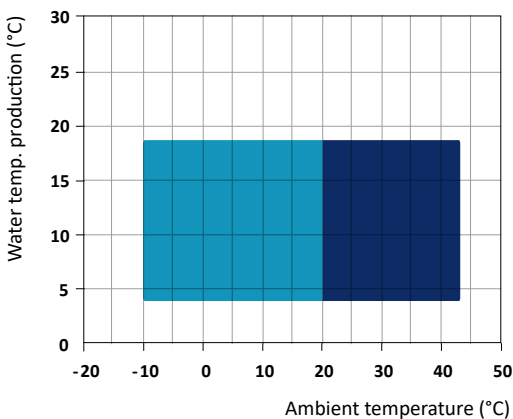
(SA/SE versions)



(HA/HE versions)



(RV versions Only)

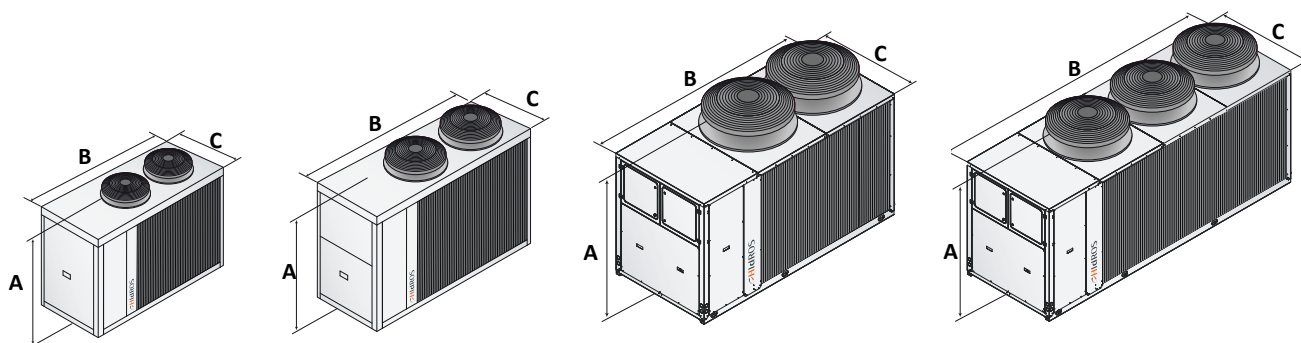


- Heating mode
- Heating mode with head pressure control (DCCF)
- Cooling with head pressure control (DCCF)
- Cooling mode

LZT		252	302	452	502	602	752	852	1002	1202
Flow switch		●	●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		-	-	-	-	-	-	-	-	-
“Floating frame” Technology - XL - NN Version		●	●	●	●	●	●	●	●	●
E.C. fans - SA/LS versions	VECE	-	-	-	-	-	-	-	-	-
E.C. fans - SE/LS versions	VECE	●	●	●	●	●	●	●	●	●
E.C. fans - HA/LS - HA/XL versions	VECE	-	-	-	-	-	-	-	-	-
E.C. fans - HE/LS - HE/XL - HE/NN versions	VECE	●	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○	○
Condensing pressure control by transducer & EC Fans (only for SE and HE)		●	●	●	●	●	●	●	●	●
Evap/cond. press. control by transducer and fan speed control (only SA - HA)DCCF		○	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank *	A1ZZU	○	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank *	A2ZZU	○	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank *	A1NTU	○	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank *	A2NTU	○	○	○	○	○	○	○	○	○

* Not available for NN versions

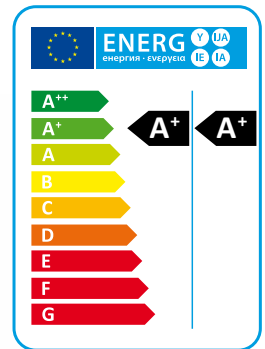
● Standard ○ Optional – Not available



		252	302	452	502	602	752	852	1002	1202
A	SA-SE/LS	1470	1470	1670	1670	1670	1820	1820	--	--
B	SA-SE/LS	1910	1910	2200	2200	2200	2905	2905	--	--
C	SA-SE/LS	900	900	900	900	900	1150	1150	--	--
Kg	SA-SE/LS	550	560	610	650	740	890	910	--	--
A	HA-HE/LS	1470	1470	1670	1670	1820	1820	1820	1820	1820
B	HA-HE/LS	1910	1910	2200	2200	2905	2905	2905	2905	2905
C	HA-HE/LS	900	900	900	900	1150	1150	1150	1150	1150
Kg	HA-HE/LS	560	570	720	680	1060	1070	1120	1160	1240
A	HA-HE/XL	1470	1470	1670	1670	1820	1820	1820	1820	1820
B	HA-HE/XL	1910	1910	2200	2200	2905	2905	2905	2905	2905
C	HA-HE/XL	900	900	900	900	1150	1150	1150	1150	1150
Kg	HA-HE/XL	570	590	720	730	1080	1090	1140	1170	1250
A	HE/NN	1470	1670	1820	1820	1820	1820	1820	1820	1820
B	HE/NN	1910	2200	2905	2905	2905	2905	2905	3965	3965
C	HE/NN	900	900	1150	1150	1150	1150	1150	1150	1150
Kg	HE/NN	570	700	1080	1100	1110	1120	1140	1560	1580

CZT

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



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

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

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

CZT units are available in 2 pipe, 2+2 pipe and 4 pipe versions. Some versions can produce domestic hot water, in the P2S version through the activation of an external 3-way-valve and in the P4S version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water.

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

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

Versions

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

Heating only version (HH)

XL/HH		252	302	452	502	602	752
Heating capacity (EN14511) ⁽¹⁾	kW	25,7	32,2	43,1	54,9	63,0	72,8
Total input power (EN14511) ⁽¹⁾	kW	6,2	7,8	10,5	13,2	15,3	17,7
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,10	4,15	4,12	4,11
Energy Class in low temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,54	3,68	3,46	3,62	3,49	3,60
η _{s,h} low temperature ⁽²⁾	%	138,7	144,2	135,5	141,6	136,7	141,1
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	2,88	3,06	2,91	3,13	2,91	2,99
η _{s,h} medium temperature ⁽²⁾	%	112,2	119,3	113,2	122,1	113,6	116,7
Power supply	V/Ph/Hz	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N
Max input current standard unit	A	20,9	24,6	34,9	40,5	45,5	55,7
Peak current standard unit	A	63,2	83,6	119,0	149,5	143,3	170,5
Peak current standard unit with soft starter (optional)	A	38,1	50,2	71,5	89,7	86,7	102,3
Max air flow in heating mode	m ³ /h	11000	11000	22000	22000	33000	33000
Nominal available static pressure ⁽⁴⁾	Pa	50	50	50	50	50	50
Maximum available static pressure ⁽⁴⁾	Pa	150	150	150	150	150	150
Fans	n°	1	1	2	2	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	10,0	10,0	14,5	14,5	30,0	30,0
Equivalent CO ₂ charge	t	20,9	20,9	30,3	30,3	62,6	62,6
Max sound power level in heating mode ⁽⁵⁾	dB (A)	70	70	73	73	75	75
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	38	38	41	41	43	43

Reversible heating/cooling version (RV)

XL/RV		252	302	452	502	602	752
Heating capacity (EN14511) ⁽¹⁾	kW	25,7	32,2	43,1	54,9	63,0	72,8
Total input power (EN14511) ⁽¹⁾	kW	6,2	7,8	10,5	13,2	15,3	17,7
COP (EN14511) ⁽¹⁾	W/W	4,15	4,12	4,10	4,15	4,12	4,11
Energy Class in low temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,54	3,68	3,46	3,62	3,49	3,60
η _{s,h} low temperature ⁽²⁾	%	138,7	144,2	135,5	141,6	136,7	141,1
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	2,88	3,06	2,91	3,13	2,91	2,99
η _{s,h} medium temperature ⁽²⁾	%	112,2	119,3	113,2	122,1	113,6	116,7
Cooling capacity (EN14511) ⁽³⁾	kW	22,4	27,7	36,5	46,0	54,5	62,5
Total input power (EN14511) ⁽³⁾	kW	7,6	9,7	13,3	17,0	18,5	21,2
EER (EN14511) ⁽³⁾	W/W	2,93	2,85	2,75	2,70	2,95	2,94
Power supply	V/Ph/Hz	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N	400/3/50+N
Max input current standard unit	A	20,0	23,4	35,2	40,4	46,8	56,8
Peak current standard unit	A	62,3	82,5	120,2	149,8	143,8	170,8
Peak current standard unit with soft starter (optional)	A	38,1	50,2	71,5	89,7	86,7	102,3
Max air flow in heating mode	m ³ /h	11000	11000	22000	22000	33000	33000
Nominal available static pressure ⁽⁴⁾	Pa	50	50	50	50	50	50
Maximum available static pressure ⁽⁴⁾	Pa	150	150	150	150	150	150
Fans	n°	1	1	2	2	3	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	10,0	10,0	14,5	14,5	30,0	30,0
Equivalent CO ₂ charge	t	20,9	20,9	30,3	30,3	62,6	62,6
Max sound power level in heating mode ⁽⁵⁾	dB (A)	70	70	73	73	75	75
Max sound pressure level in heating mode ⁽⁶⁾	dB (A)	38	38	41	41	43	43

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

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Cooling: ambient temperature 35°C, water temperature 12/7°C (RV versions Only).
- (3) Average conditions, variable - Reg EU 811/2013

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

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

The standard colour of the units is RAL9018.

Refrigerant circuit

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

Compressors

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

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

Source heat exchanger

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

User heat exchangers

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

A further advantage is a reduction in the overall dimensions of the unit.

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

E.C. ductable fans

Axial fans with High available Static Pressure, supplied with Brushless DC electric motor electronically commutated (E.C. motors), directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanized thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, "burn out" thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU. The maximum available static pressure (ASP) is approximately 150 Pa at nominal air flow rate.

Microprocessors

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P4S and P4U), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be

used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

Versions

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

Version P2U

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

Version P2S

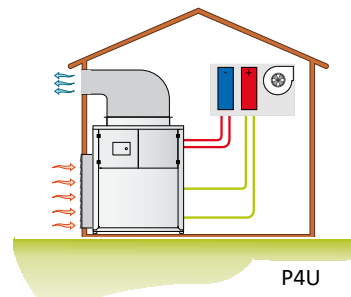
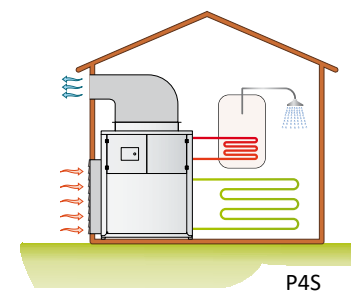
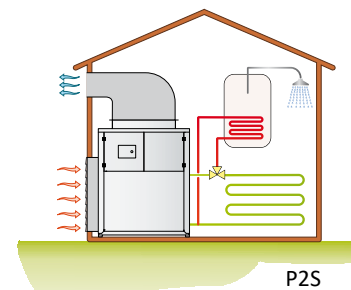
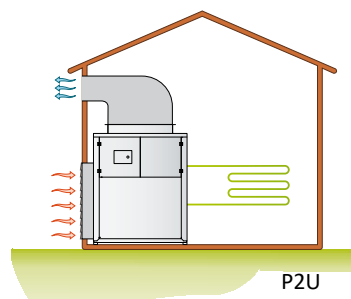
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the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

Version P4S

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

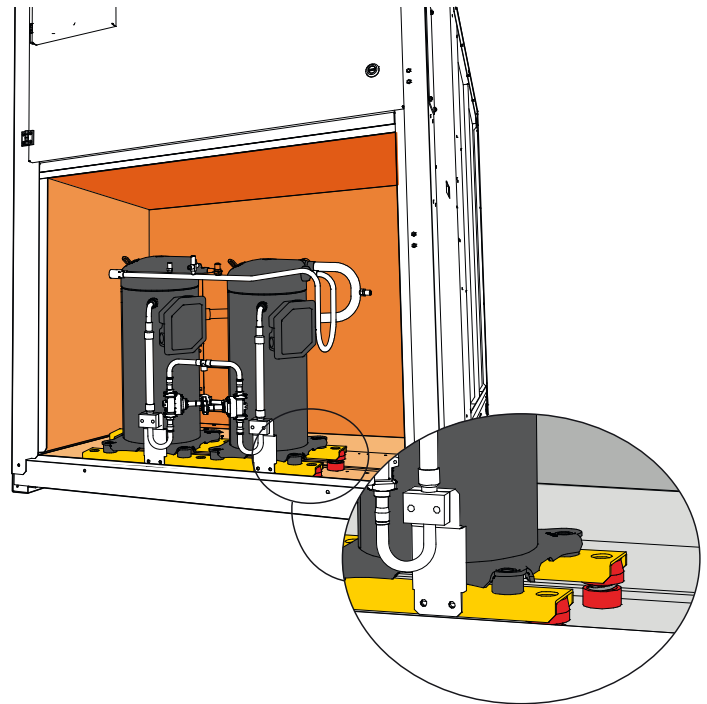
Version P4U

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



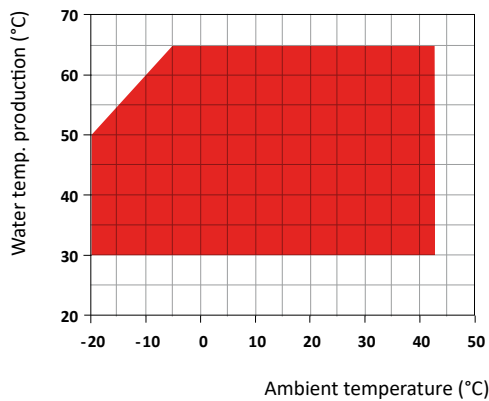
Noise reduction

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

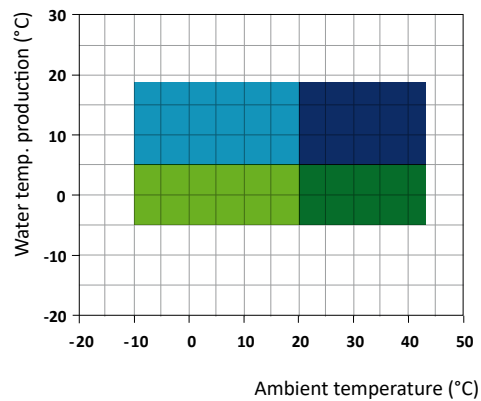


Operation limits

(All versions)



(RV versions Only)

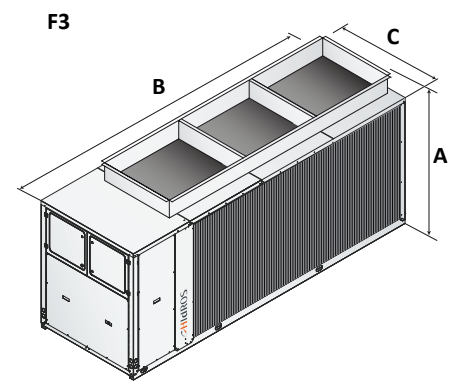
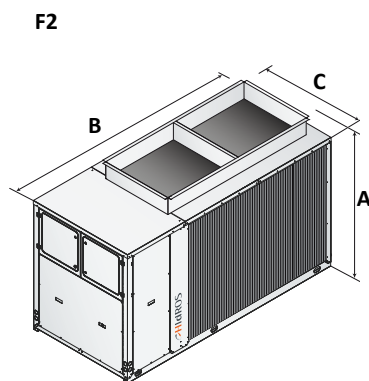
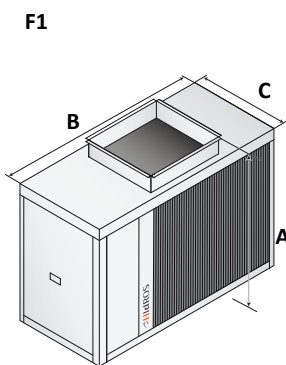


- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control

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

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

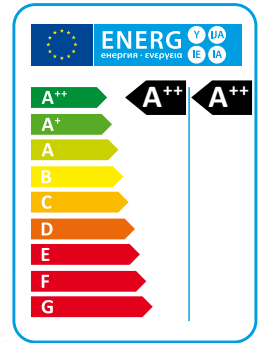
● Standard, ○ Optional, – Not available.



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

WZT

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



WZT

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

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

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

Versions

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

Heating only version (HH)

NN/HH		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ^{(1) *}	kW	24,1	29,9	44,0	53,7	59,7	69,5	80,5	87,8	101,8
Total input power (EN14511) ^{(1) *}	kW	5,0	6,4	9,0	11,9	12,5	15,1	17,4	19,0	22,9
COP (EN14511) ^{(1) *}	W/W	4,86	4,66	4,91	4,50	4,78	4,61	4,63	4,62	4,44
Energy Class in low temperature ^{(2) *}		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ^{(2) *}	kWh/kWh	4,36	4,22	4,17	3,87	4,23	4,19	4,12	4,16	4,06
η _{s,h} low temperature ^{(2) *}	%	171,4	165,6	163,8	151,6	166,1	164,6	161,9	163,3	159,3
Energy Class in medium temperature ^{(2) *}		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ^{(2) *}	kWh/kWh	3,51	3,49	3,45	3,31	3,49	3,45	3,43	3,43	3,42
η _{s,h} medium temperature ^{(2) *}	%	137,50	136,7	134,8	129,4	136,6	134,9	134,1	134,1	133,7
Nominal waterflow	l/h	4150	5148	7573	9228	10267	11951	13853	15095	17510
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
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2	68,0	76,8
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7	209,0	209,0
Outdoor unit with single heat exchanger max airflow	m ³ /h	9000	9000	10000	16000	21000	21000	32000	32000	32000
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge without refrigerant lines content	Kg	8,0	9,0	14,5	19,0	23,0	23,0	34,0	37,0	37,0
Equivalent CO ₂ charge	t	16,7	18,8	30,3	39,7	48,0	48,0	71,0	77,3	77,3
Sound power indoor unit ⁽⁴⁾	dB (A)	61	62	63	63	63	63	65	65	65
Sound pressure indoor unit ⁽⁵⁾	dB (A)	45	46	47	47	47	47	49	49	49
Sound power outdoor unit - single heat exchanger ⁽⁴⁾	dB (A)	55	55	64	67	68	68	70	70	70
Sound pressure outdoor unit - single heat exchanger ⁽⁶⁾	dB (A)	24	24	32	35	36	36	38	38	38

Reversible heating/cooling version (RV)

NN/RV		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ^{(1) *}	kW	24,1	29,9	44,0	53,7	59,7	69,5	80,5	87,8	101,8
Total input power (EN14511) ^{(1) *}	kW	5,0	6,4	9,0	11,9	12,5	15,1	17,4	19,0	22,9
COP (EN14511) ^{(1) *}	W/W	4,86	4,66	4,91	4,50	4,78	4,61	4,63	4,62	4,44
Energy Class in low temperature ^{(2) *}		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ^{(2) *}	kWh/kWh	4,36	4,22	4,17	3,87	4,23	4,19	4,12	4,16	4,06
η _{s,h} low temperature ^{(2) *}	%	171,4	165,6	163,8	151,6	166,1	164,6	161,9	163,3	159,3
Energy Class in medium temperature ^{(2) *}		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ^{(2) *}	kWh/kWh	3,51	3,49	3,45	3,31	3,49	3,45	3,43	3,43	3,42
η _{s,h} medium temperature ^{(2) *}	%	137,50	136,7	134,8	129,4	136,6	134,9	134,1	134,1	133,7
η _{s,h} high temperature ^{(2) *}	l/h	4150	5148	7573	9228	10267	11951	13853	15095	17510
Cooling capacity (EN14511) ^{(3) *}	kW	19,6	24,1	34,8	42,7	49,7	57,6	66,0	73,1	84,4
Total input power (EN14511) ^{(3) *}	kW	6,7	9,3	11,5	14,8	16,6	20,5	23,0	24,8	30,6
EER (EN14511) ^{(3) *}	W/W	2,93	2,59	3,04	2,89	3,00	2,81	2,87	2,95	2,76
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
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2	68,0	76,8
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7	209,0	209,0
Outdoor unit with single heat exchanger max airflow	m ³ /h	9000	9000	10000	16000	21000	21000	32000	32000	32000
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge without refrigerant lines content	Kg	8,0	9,0	14,5	19,0	23,0	23,0	34,0	37,0	37,0
Equivalent CO ₂ charge	t	16,7	18,8	30,3	39,7	48,0	48,0	71,0	77,3	77,3
Sound power indoor unit ⁽⁴⁾	dB (A)	61	62	63	63	63	63	65	65	65
Sound pressure indoor unit ⁽⁵⁾	dB (A)	45	46	47	47	47	47	49	49	49
Sound power outdoor unit - single heat exchanger ⁽⁴⁾	dB (A)	55	55	64	67	68	68	70	70	70
Sound pressure outdoor unit - single heat exchanger ⁽⁶⁾	dB (A)	24	24	32	35	36	36	38	38	38

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 1 mt from the unit in free field conditions, in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions, in accordance with ISO 3744.

* Data referred to outdoor unit with single heat exchanger.

Frame

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

Refrigerant circuit

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

Compressors

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

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. The compressors are connected in tandem, they are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

Source Heat Exchanger

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

User heat exchangers

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

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

E.C. Fans

The fans are axial type with high performance aerofoil blades, the impeller is made of galvanized sheet galvanized, painted with polyurethane powder, to ensure a high protection in aggressive and severe environments. The impeller mounted directly on DC-brushless motor with external rotor, to ensure ideal cooling of the engine and a total absence of losses of the transmission. Impeller dynamically balanced in class 6.3 according to ISO 1940. Engine brushless-DC permanent magnet high efficiency electronic switching unit (driver) separate. Continuous speed variation with voltage signal 0-10 V, PFC integrated protection "burn out" (excessive drop in voltage), fully IP54 driver, serial interface with Modbus RTU communication protocol. The maximum rotation speed of the motor is 450 rpm to guarantee an extremely low noise level.

Microprocessors

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors.

The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over and general alarm. For all three

phase units, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), is fitted as standard.

Control and protection devices

All units are supplied with the following control and protection devices: Return user water temperature sensor, antifreeze protection sensor installed on the user outlet water temperature, return and supply, high pressure switch with manual reset, low

pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection, pressure transducer (used to optimize the defrost cycle and the fan speed depending on the ambient conditions), flow switch.

Versions

Version P2U

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

Version P2S

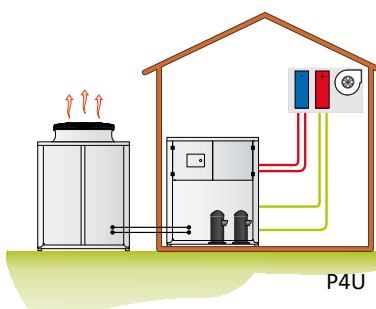
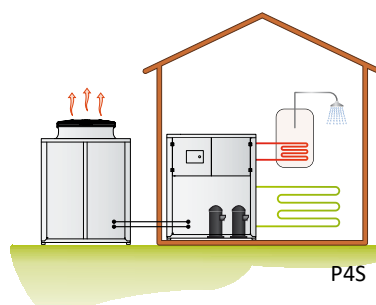
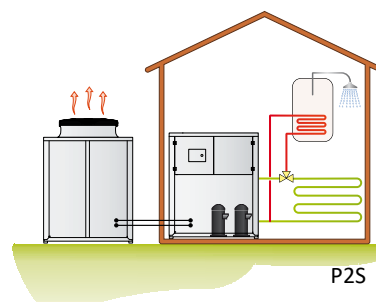
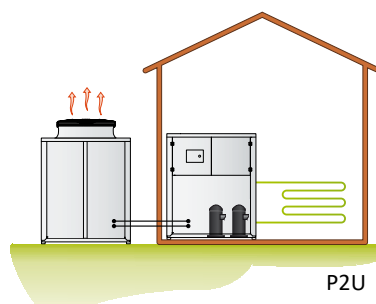
This is a two pipe version that can, in addition to producing hot water for heating and cold water for cooling, also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the DHW to the cylinder. DHW production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

Version P4S

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

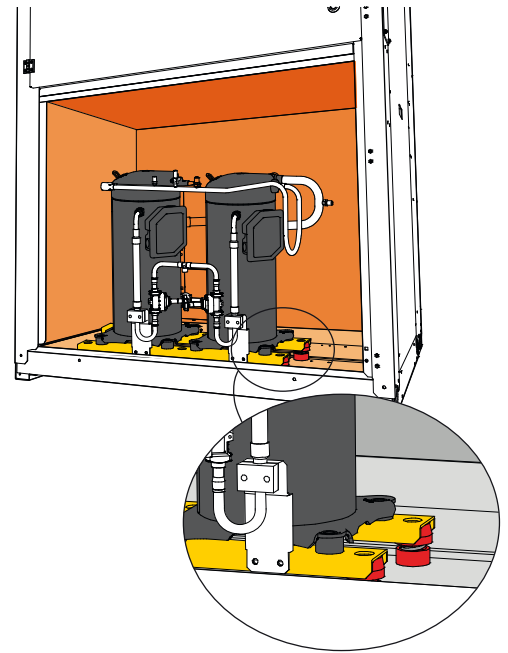
Version P4U

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

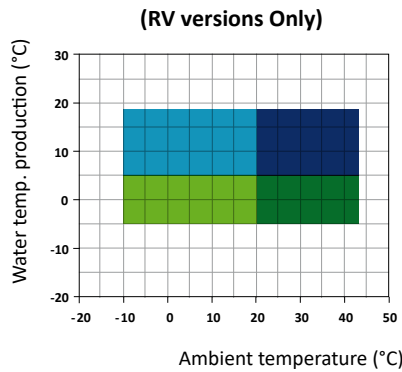
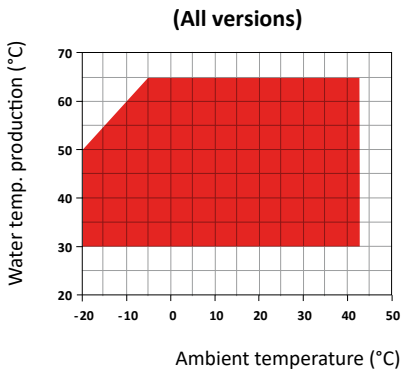


Noise Reduction

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



Operation limits



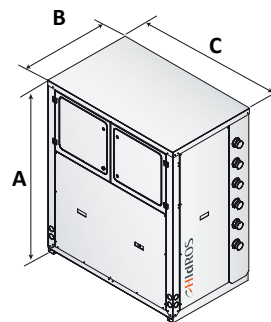
- Heating mode
- Cooling with head pressure control
- Cooling with head pressure control
- Cooling with head pressure control and glycol
- Cooling with head pressure control and glycol

WZT/NN		252	302	452	502	602	752	852	1002	1202
Main switch		●	●	●	●	●	●	●	●	●
Compressor automatic switch		●	●	●	●	●	●	●	●	●
Flow switch		●	●	●	●	●	●	●	●	●
Evap/cond pressure control by transducer and fan speed control		●	●	●	●	●	●	●	●	●
Fresh air temperature probe for set-point compensation		●	●	●	●	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●	●	●	●	●
Floating frame technology		●	●	●	●	●	●	●	●	●
Condensate tray with anti-freeze heater (outdoor section)	BRCA	●	●	●	●	●	●	●	●	●
High efficiency E.C. fans ultra low noise version	VECE	●	●	●	●	●	●	●	●	●
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○
Evaporator antifreeze heater	RAEV2/4	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.

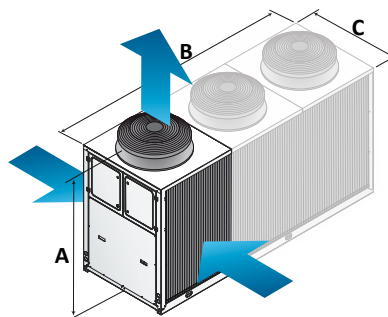
WZT - Indoor unit

Mod.	A(mm)	B(mm)	C(mm)	Kg
252	1600	800	1150	510
302	1600	800	1150	515
452	1600	800	1150	535
502	1600	800	1150	560
602	1600	800	1150	580
752	1600	800	1150	585
852	1600	800	1150	590
1002	1600	800	1150	600
1202	1600	800	1150	600



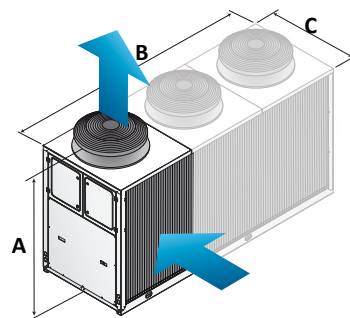
EVR - Outdoor unit with double heat exchanger and vertical airflow

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	--	--	--	--	--
302	--	--	--	--	--
452	1	1820	1450	1150	300
502	2	1820	2150	1150	406
602	2	1820	2150	1150	406
752	2	1820	2150	1150	406
852	3	1820	3150	1150	558
1002	3	1820	3150	1150	558
1202	3	1820	3150	1150	558



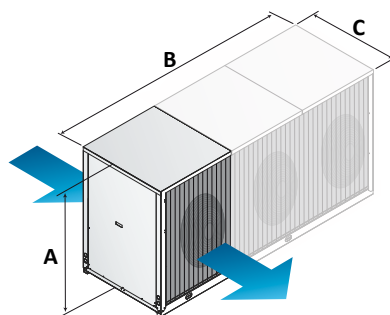
EVV - Outdoor unit with single heat exchanger and vertical airflow

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	1	1820	1450	1150	260
302	1	1820	1450	1150	260
452	2	1820	2150	1150	310
502	3	1820	3150	1150	420
602	3	1820	3150	1150	420
752	3	1820	3150	1150	420
852	4	1820	4150	1150	560
1002	4	1820	4150	1150	560
1202	4	1820	4150	1150	560



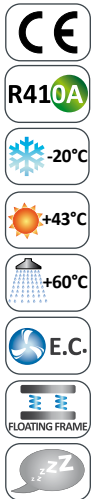
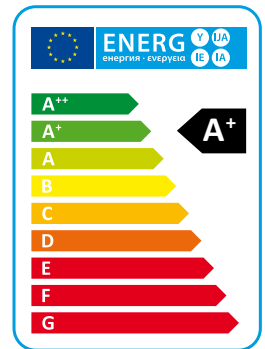
EVH - Outdoor unit with single heat exchanger and horizontal airflow

Mod.	Fans (n°)	A(mm)	B(mm)	C(mm)	Kg
252	1	1600	1450	1150	230
302	1	1600	1450	1150	230
452	2	1600	2150	1150	310
502	3	1600	3150	1150	420
602	3	1600	3150	1150	420
752	3	1600	3150	1150	420
852	4	1600	4150	1150	560
1002	4	1600	4150	1150	560
1202	4	1600	4150	1150	560



XHA

High efficiency air to water split system heat pumps



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

Versions

- HH** Heating only.
- RV** Reversible heating/cooling.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.
- P2U** 2 pipe systems without domestic hot water production.
- P2S** 2 pipe systems with domestic hot water production by external 3 way valve.

Heating only version (HH)

SA/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	64,9	73,2	80,2
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,0	17,9	20,8
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,06	4,10	3,86
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,43	3,47	3,42
$\eta_{s,h}$ ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	134,3	135,9	133,7
Sound power ⁽³⁾	dB (A)	75	75	75	75	77	77	77	78	79
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	45	45	45	46	47
SE/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	64,9	73,1	81,0
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	15,8	17,6	20,9
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,10	4,15	3,88
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,68	3,71	3,63
$\eta_{s,h}$ ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	144,1	145,4	142,1
Sound power ⁽³⁾	dB (A)	74	74	75	75	77	77	77	78	79
Sound pressure ⁽⁴⁾	dB (A)	42	42	43	43	45	45	45	46	47
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1

SA/LS/HH - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	97,0	105,7	122,3	136,0	157,3	169,0	196,6	215,0
Total input power (EN14511) ⁽¹⁾	kW	24,3	27,3	30,7	34,6	40,3	43,4	51,5	60,4
COP (EN14511) ⁽¹⁾	W/W	4,00	3,87	3,98	3,93	3,90	3,89	3,82	3,56
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,50	3,39	3,50	3,50	3,48	3,46	3,45	3,24
$\eta_{s,h}$ ⁽²⁾	%	137,1	132,7	136,9	137,0	136,1	135,5	134,8	126,5
Sound power ⁽³⁾	dB (A)	82	83	85	86	86	86	89	90
Sound pressure ⁽⁴⁾	dB (A)	50	51	53	54	54	54	57	58
SE/LS/HH - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	97,0	105,6	122,7	137,0	157,8	170,2	197,7	217,6
Total input power (EN14511) ⁽¹⁾	kW	24,0	27,3	30,5	34,6	38,8	43,3	51,5	60,3
COP (EN14511) ⁽¹⁾	W/W	4,04	3,87	4,02	3,96	4,07	3,93	3,84	3,61
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,71	3,64	3,73	3,68	3,77	3,72	3,74	3,63
$\eta_{s,h}$ ⁽²⁾	%	145,3	142,5	146,1	144,0	147,8	145,8	146,4	142,1
Sound power ⁽³⁾	dB (A)	82	83	85	86	86	86	89	90
Sound pressure ⁽⁴⁾	dB (A)	50	51	53	54	54	54	57	58
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	3	3	3	4	4	4	3	4
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	17,4	17,4	22,1	22,3	29,5	29,8	34,9	35,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	36,3	36,3	46,1	46,6	61,6	62,2	72,9	73,9

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

(6) Without refrigerant lines content

Heating only version (HH)

HA/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	46,9	50,7	61,2	67,3	72,6	93,1
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	9,0	11,4	12,0	13,6	15,4	17,0	22,1
COP (EN14511) ⁽¹⁾	W/W	4,11	4,12	4,13	4,11	4,22	4,49	4,38	4,27	4,21
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,69	3,53	3,57	3,67	3,97	3,91	3,87	3,70
$\eta_{s,h}$ ⁽²⁾	%	132,9	144,7	138,0	139,6	143,8	155,7	153,4	151,6	145,1
Sound power ⁽³⁾	dB (A)	75	75	75	75	76	76	77	78	82
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	44	44	45	46	50
HE/LS/HH - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	47,1	50,8	61,2	67,3	74,9	93,2
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	8,8	11,5	11,8	13,3	15,1	17,2	21,2
COP (EN14511) ⁽¹⁾	W/W	4,11	4,16	4,23	4,11	4,32	4,61	4,46	4,36	4,40
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,83	3,86	3,85	3,85	3,92	4,13	4,04	3,97	3,87
$\eta_{s,h}$ ⁽²⁾	%	150,1	151,4	150,9	151,1	153,6	162,0	158,4	155,8	151,7
Sound power ⁽³⁾	dB (A)	73	74	74	75	76	76	77	78	82
Sound pressure ⁽⁴⁾	dB (A)	41	42	42	43	44	44	45	46	50
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0

HA/LS/HH - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	104,7	114,4	137,2	150,8	167,2	182,0	209,7	239,2
Total input power (EN14511) ⁽¹⁾	kW	25,3	28,4	32,4	35,8	41,3	45,4	50,3	55,8
COP (EN14511) ⁽¹⁾	W/W	4,14	4,03	4,24	4,21	4,05	4,01	4,17	4,29
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,67	3,69	3,70	3,74	3,69	3,62	3,76	3,83
$\eta_{s,h}$ ⁽²⁾	%	143,7	144,4	144,8	146,4	144,7	141,9	147,3	150,3
Sound power ⁽³⁾	dB (A)	83	85	86	87	87	87	89	91
Sound pressure ⁽⁴⁾	dB (A)	51	53	54	55	55	55	57	59
HE/LS/HH - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	104,9	114,9	137,1	151,0	167,9	182,8	210,6	241,3
Total input power (EN14511) ⁽¹⁾	kW	24,5	27,8	30,9	34,4	40,2	45,5	49,4	54,8
COP (EN14511) ⁽¹⁾	W/W	4,29	4,13	4,44	4,39	4,18	4,02	4,26	4,40
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,85	3,83	3,85	3,86	3,85	3,84	3,92	3,97
$\eta_{s,h}$ ⁽²⁾	%	150,8	150,2	151,0	151,3	150,9	150,4	153,6	155,6
Sound power ⁽³⁾	dB (A)	83	85	86	87	87	87	89	91
Sound pressure ⁽⁴⁾	dB (A)	51	53	54	55	55	55	57	59
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	3	3	3	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	22,5	22,5	34,4	34,8	35,3	35,3	49,4	57,3
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	47,0	47,0	71,8	72,7	73,7	73,7	103,1	119,6

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
 (2) Average conditions, low temperature, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

(6) Without refrigerant lines content

Reversible heating/cooling version (RV)

SA/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	64,9	73,2	80,2
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,0	17,9	20,8
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,06	4,10	3,86
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,43	3,47	3,42
$\eta_{s,h}$ ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	134,3	135,9	133,7
Cooling capacity (EN14511) ⁽³⁾	kW	17,8	24,1	28,4	38,8	42,7	48,2	55,2	60,2	69,7
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	11,7	15,0	16,4	19,8	21,9	24,5	29,3
EER (EN14511) ⁽³⁾	W/W	2,52	2,45	2,42	2,58	2,61	2,43	2,52	2,46	2,38
Sound power ⁽⁴⁾	dB (A)	75	75	75	75	77	77	77	78	79
Sound pressure ⁽⁵⁾	dB (A)	43	43	43	43	45	45	45	46	47
SE/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	64,9	73,1	81,0
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	15,8	17,6	20,9
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,10	4,15	3,88
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,68	3,71	3,63
$\eta_{s,h}$ ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	144,1	145,4	142,1
Cooling capacity (EN14511) ⁽³⁾	kW	17,7	24,1	28,2	39,0	43,5	48,9	55,6	61,3	70,3
Total input power (EN14511) ⁽³⁾	kW	7,0	9,8	11,8	14,9	16,0	19,5	21,8	24,0	28,9
EER (EN14511) ⁽³⁾	W/W	2,52	2,47	2,40	2,61	2,72	2,51	2,55	2,55	2,43
Sound power ⁽⁴⁾	dB (A)	74	74	75	75	77	77	77	78	79
Sound pressure ⁽⁵⁾	dB (A)	42	42	43	43	45	45	45	46	47
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1

SA/LS/RV - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	97,0	105,7	122,3	136,0	157,3	169,0	196,6	215,0
Total input power (EN14511) ⁽¹⁾	kW	24,3	27,3	30,7	34,6	40,3	43,4	51,5	60,4
COP (EN14511) ⁽¹⁾	W/W	4,00	3,87	3,98	3,93	3,90	3,89	3,82	3,56
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,50	3,39	3,50	3,50	3,48	3,46	3,45	3,24
$\eta_{s,h}$ ⁽²⁾	%	137,1	132,7	136,9	137,0	136,1	135,5	134,8	126,5
Cooling capacity (EN14511) ⁽³⁾	kW	83,3	91,6	102,6	115,6	131,9	143,0	173,0	197,2
Total input power (EN14511) ⁽³⁾	kW	32,7	37,7	42,6	47,2	53,8	63,6	68,9	76,7
EER (EN14511) ⁽³⁾	W/W	2,55	2,43	2,41	2,45	2,45	2,25	2,51	2,57
Sound power ⁽⁴⁾	dB (A)	82	83	85	86	86	86	89	90
Sound pressure ⁽⁵⁾	dB (A)	50	51	53	54	54	54	57	58
SE/LS/RV - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	97,0	105,6	122,7	137,0	157,8	170,2	197,7	217,6
Total input power (EN14511) ⁽¹⁾	kW	24,0	27,3	30,5	34,6	38,8	43,3	51,5	60,3
COP (EN14511) ⁽¹⁾	W/W	4,04	3,87	4,02	3,96	4,07	3,93	3,84	3,61
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,71	3,64	3,73	3,68	3,77	3,72	3,74	3,63
$\eta_{s,h}$ ⁽²⁾	%	145,3	142,5	146,1	144,0	147,8	145,8	146,4	142,1
Cooling capacity (EN14511) ⁽³⁾	kW	84,3	92,0	103,5	116,4	132,9	147,1	175,3	200,4
Total input power (EN14511) ⁽³⁾	kW	32,3	37,4	42,2	46,9	53,4	61,0	67,9	75,6
EER (EN14511) ⁽³⁾	W/W	2,61	2,46	2,45	2,48	2,49	2,41	2,58	2,65
Sound power ⁽⁴⁾	dB (A)	82	83	85	86	86	86	89	90
Sound pressure ⁽⁵⁾	dB (A)	50	51	53	54	54	54	57	58
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	3	3	3	4	4	4	3	4
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	17,4	17,4	22,1	22,3	29,5	29,8	34,9	35,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	36,3	36,3	46,1	46,6	61,6	62,2	72,9	73,9

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

(6) Without refrigerant lines content

Reversible heating/cooling version (RV)

HA/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	46,9	50,7	61,2	67,3	72,6	93,1
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	9,0	11,4	12,0	13,6	15,4	17,0	22,1
COP (EN14511) ⁽¹⁾	W/W	4,11	4,12	4,13	4,11	4,22	4,49	4,38	4,27	4,21
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,69	3,53	3,57	3,67	3,97	3,91	3,87	3,70
η _{s,h} ⁽²⁾	%	132,9	144,7	138,0	139,6	143,8	155,7	153,4	151,6	145,1
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,5	30,8	39,9	44,2	52,3	57,4	62,6	79,8
Total input power (EN14511) ⁽³⁾	kW	7,0	9,6	10,9	15,0	16,3	18,4	21,5	24,5	27,2
EER (EN14511) ⁽³⁾	W/W	2,57	2,56	2,84	2,65	2,72	2,84	2,67	2,55	2,93
Sound power ⁽⁴⁾	dB (A)	75	75	75	75	76	76	77	78	82
Sound pressure ⁽⁵⁾	dB (A)	43	43	43	43	44	44	45	46	50
HE/LS/RV - P2S/P2U		252	302	402	452	502	602	702	802	902
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	47,1	50,8	61,2	67,3	74,9	93,2
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	8,8	11,5	11,8	13,3	15,1	17,2	21,2
COP (EN14511) ⁽¹⁾	W/W	4,11	4,16	4,23	4,11	4,32	4,61	4,46	4,36	4,40
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,83	3,86	3,85	3,85	3,92	4,13	4,04	3,97	3,87
η _{s,h} ⁽²⁾	%	150,1	151,4	150,9	151,1	153,6	162,0	158,4	155,8	151,7
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,6	30,5	40,6	44,2	52,4	57,5	63,4	80,5
Total input power (EN14511) ⁽³⁾	kW	6,9	9,5	11,0	14,5	16,1	18,3	21,3	23,9	26,6
EER (EN14511) ⁽³⁾	W/W	2,62	2,59	2,78	2,81	2,74	2,87	2,70	2,65	3,03
Sound power ⁽⁴⁾	dB (A)	73	74	74	75	76	76	77	78	82
Sound pressure ⁽⁵⁾	dB (A)	41	42	42	43	44	44	45	46	50
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0

HA/LS/RV - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	104,7	114,4	137,2	150,8	167,2	182,0	209,7	239,2
Total input power (EN14511) ⁽¹⁾	kW	25,3	28,4	32,4	35,8	41,3	45,4	50,3	55,8
COP (EN14511) ⁽¹⁾	W/W	4,14	4,03	4,24	4,21	4,05	4,01	4,17	4,29
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,67	3,69	3,70	3,74	3,69	3,62	3,76	3,83
η _{s,h} ⁽²⁾	%	143,7	144,4	144,8	146,4	144,7	141,9	147,3	150,3
Cooling capacity (EN14511) ⁽³⁾	kW	89,6	97,8	117,0	129,5	144,5	159,3	180,2	199,7
Total input power (EN14511) ⁽³⁾	kW	31,7	36,5	43,8	44,3	51,8	58,8	66,3	74,5
EER (EN14511) ⁽³⁾	W/W	2,83	2,68	2,67	2,92	2,79	2,71	2,72	2,68
Sound power ⁽⁴⁾	dB (A)	83	85	86	87	87	87	89	91
Sound pressure ⁽⁵⁾	dB (A)	51	53	54	55	55	55	57	59
HE/LS/RV - P2S/P2U		1002	1202	1402	1602	1802	2002	2302	2502
Heating capacity (EN14511) ⁽¹⁾	kW	104,9	114,9	137,1	151,0	167,9	182,8	210,6	241,3
Total input power (EN14511) ⁽¹⁾	kW	24,5	27,8	30,9	34,4	40,2	45,5	49,4	54,8
COP (EN14511) ⁽¹⁾	W/W	4,29	4,13	4,44	4,39	4,18	4,02	4,26	4,40
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,85	3,83	3,85	3,86	3,85	3,84	3,92	3,97
η _{s,h} ⁽²⁾	%	150,8	150,2	151,0	151,3	150,9	150,4	153,6	155,6
Cooling capacity (EN14511) ⁽³⁾	kW	90,2	100,5	117,4	129,5	146,8	159,2	180,4	202,1
Total input power (EN14511) ⁽³⁾	kW	31,2	35,1	38,6	44,0	50,8	58,7	66,1	73,2
EER (EN14511) ⁽³⁾	W/W	2,89	2,86	3,04	2,94	2,89	2,71	2,73	2,76
Sound power ⁽⁴⁾	dB (A)	83	85	86	87	87	87	89	91
Sound pressure ⁽⁵⁾	dB (A)	51	53	54	55	55	55	57	59
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	3	3	3	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge ⁽⁶⁾	Kg	22,5	22,5	34,4	34,8	35,3	35,3	49,4	57,3
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	47,0	47,0	71,8	72,7	73,7	73,7	103,1	119,6

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

(6) Without refrigerant lines content

Frame

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

Refrigerant circuit

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

Compressors

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

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

Source heat exchanger

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

Fans

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

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

Microprocessors

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of

the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence (For multiple compressors), alarm reset.

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

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P2S), 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 in HA and HE versions 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 P2S) is already equipped with this probe, but it must be installed in the user circuit.

Indoor unit

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

The exchangers are factory insulated with flexible close cell material and can be equipped with antifreeze heater (optional). Each heat exchanger is provided with a temperature sensor as antifreeze protection. The P2S versions are also equipped with complete user

circuit circulation pump (single or double) and three-way diverting valve for domestic hot water production.

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

The indoor unit is also supplied with electrical panel with main switch and the display with graphical user interface.

Versioni

Version HH

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

Version RV

This version uses 2 hydraulic connections and is able to produce hot water in winter and cold water in summer. The unit is combined with a 2-pipe system.

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

Version LS

This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

Version P2U

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

Version P2S

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

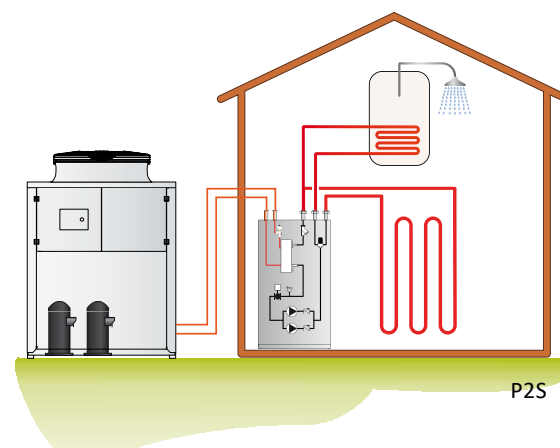
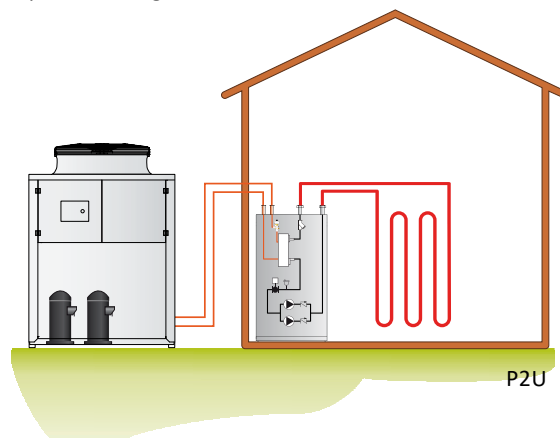
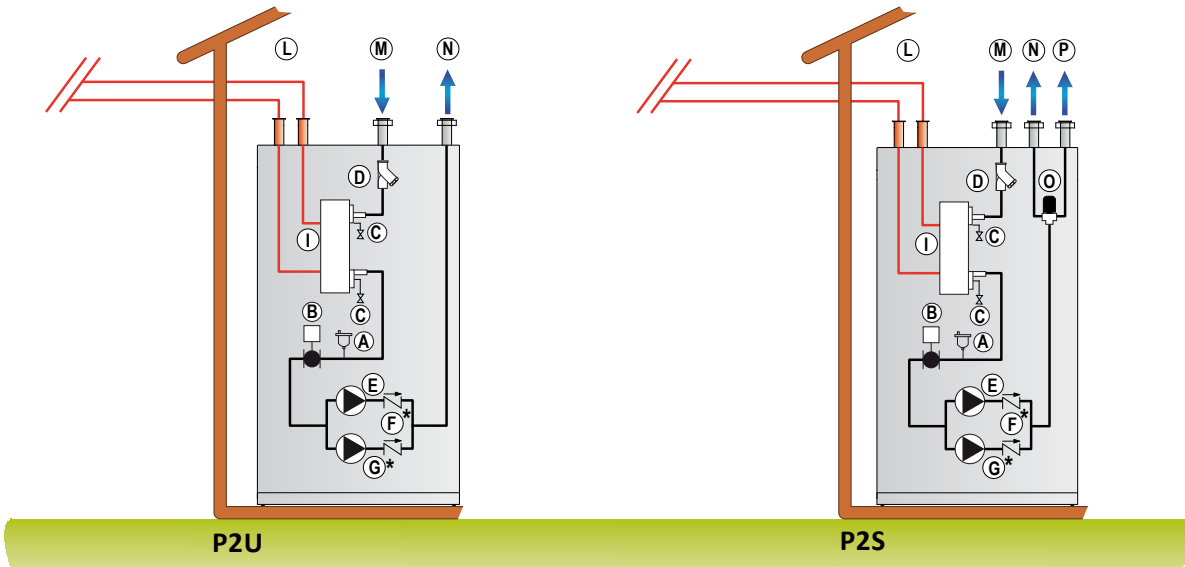


Diagram indoor unit

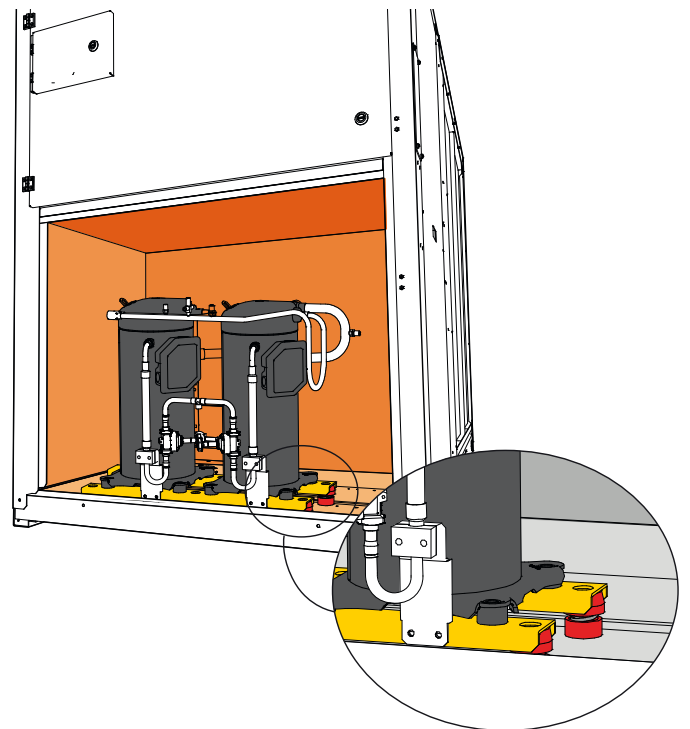


Legend

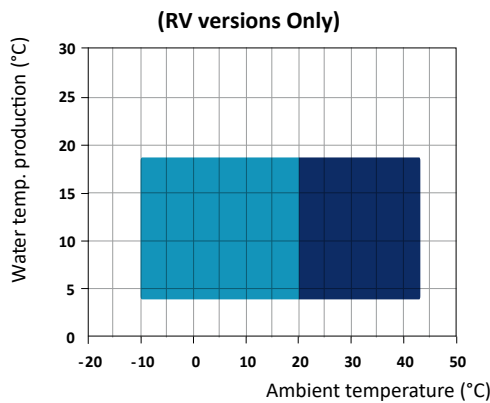
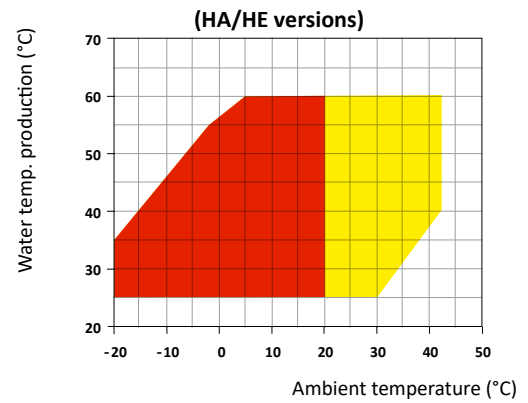
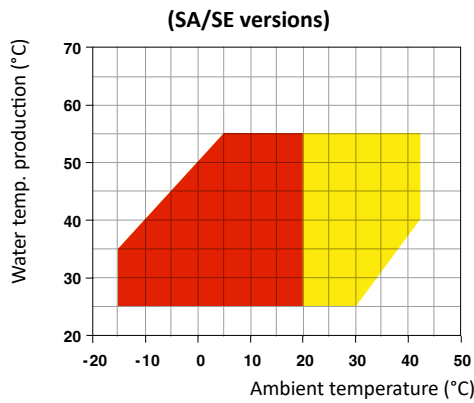
A	Vent Valve	F	One way valve	N	User circuit supply
B	Flow Switch	G	Water Pump	O	Diverting On/Off valve for domestic hot water
C	Drainage valve	I	User heat exchangers	P	Supply Domestic hot water circuit
D	Water Strainer	L	Refrigerant lines	*	Optional
E	Water Pump	M	User circuit return		





Noise Reduction

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



Operation limits



-  Heating mode
-  Heating mode with head pressure control (DCCF)
-  Cooling with head pressure control (DCCF)
-  Cooling mode

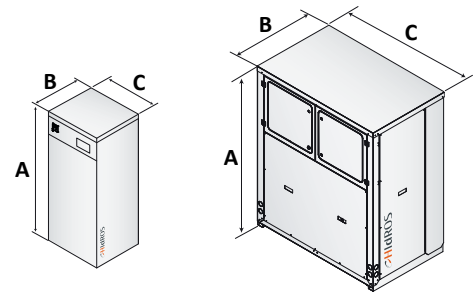
XHA		252-402	452-602	702-1202	1402-2002
Flow switch		●	●	●	●
User water strainer		●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	○	○	○	○
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●
Specific software for operation priorities		●	●	●	●
Remote ON/OFF digital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

● Standard, ○ Optional, – Not available.

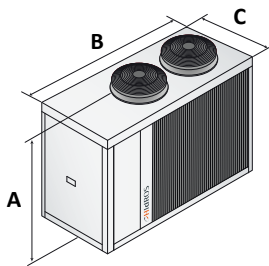
XHA - Indoor unit

Mod.	A(mm)	B(mm)	C(mm)	Kg
252	900	600	600	130
302	900	600	600	137
452	900	600	600	142
502	900	600	600	150
602	1100	750	750	183
702	1100	750	750	222
802	1100	750	750	230

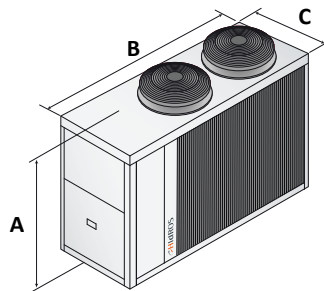
Mod.	A(mm)	B(mm)	C(mm)	Kg
902	1100	750	750	250
1002	1100	750	750	265
1202	1100	750	750	280
1402	1580	800	1150	325
1602	1580	800	1150	340
1802	1580	800	1150	350
2002	1580	800	1150	370



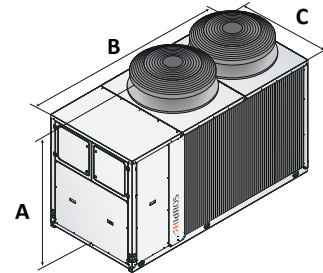
XHA - outdoor unit



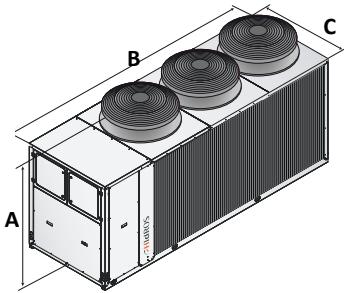
SA/SE 252 - 302 - 402
HA/HE 252 - 302



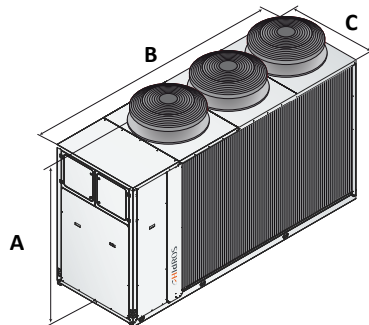
SA/SE 452 - 502 - 602
HA/HE 402 - 452 - 502 - 602



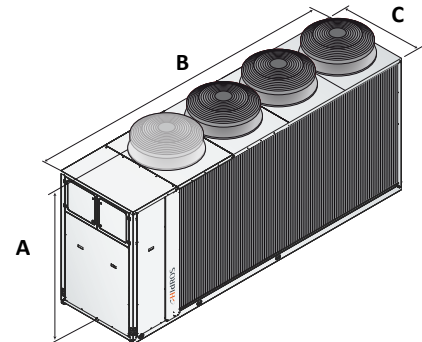
SA/SE 702 - 802 - 902
HA/HE 702 - 802 - 902 - 1002 - 1202



SA/SE 1002 - 1202 - 1402 - 1602
HA/HE 1402 - 1602 - 1802 - 2002



SA/SE 1802 - 2002
HA/HE 2302 - 2502

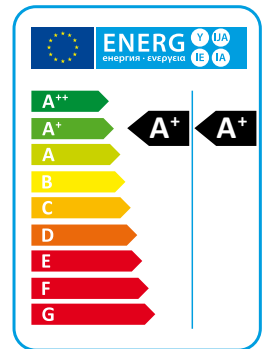


SA/SE 2302 - 2502

		252	302	402	452	502	602	702	802	902	1002	1202	1402	1602	1802	2002	2302	2502	
A	SA-SE/LS	1470	1470	1470	1670	1670	1670	1820	1820	1820	1820	1820	1820	1820	1820	2220	2220	2305	2305
B	SA-SE/LS	1910	1910	1910	2200	2200	2200	2905	2905	2905	2905	2905	2905	2905	2905	3965	3965	4505	4505
C	SA-SE/LS	900	900	900	900	900	900	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150
Kg	SA-SE/LS	550	550	560	670	700	760	792	801	819	1071	1143	1188	1224	1521	1539	1791	1836	
A	HA-HE/LS	1470	1470	1670	1670	1670	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	2220	2220	
B	HA-HE/LS	1910	1910	2200	2200	2200	2905	2905	2905	2905	2905	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/LS	900	900	900	900	900	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/LS	560	560	670	690	720	904	954	963	1008	1044	1116	1404	1422	1440	1458	1611	1638	
A	HA-HE/XL	1470	1470	1670	1670	1670	1820	1820	1820	1820	1820	1820	1820	1820	1820	1820	2220	2220	2220
B	HA-HE/XL	1910	1910	2200	2200	2200	2905	2905	2905	2905	2905	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/XL	900	900	900	900	900	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/XL	570	570	680	710	740	920	972	981	1026	1062	1134	1431	1449	1467	1485	1638	1665	

LWZ

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



- CE
- R410A
- 20°C
- +43°C
- +65°C
- EVI
- E.C.
- FLOATING FRAME
- ZZ

LWZ

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

Versions

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

Heating only version (HH)

XL/HH		252	302	452	502	602	752	852
Heating capacity (EN14511) ⁽¹⁾	kW	16,6	21,2	27,5	34,2	41,9	48,3	53,5
Total input power (EN14511) ⁽¹⁾	kW	6,1	7,7	9,9	12,1	15,2	17,2	19,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,75	2,78	2,82	2,76	2,80	2,68
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,75	3,74	3,71	3,94	3,95	3,43
η _{s,h} low temperature ⁽²⁾	%	155,3	146,8	146,7	145,3	154,6	154,9	134,3
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,03	3,05	3,12	3,21	3,16	2,87
η _{s,h} medium temperature ⁽²⁾	%	124,3	118,2	119,0	121,6	125,5	123,4	111,9
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 standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	7,7	11,6	11,9	14,8	14,9	15,2	22,5
Equivalent CO ₂ charge	t	16,1	24,2	24,8	30,9	31,1	31,7	47,0
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	38	40	40	42	42	42

XL/HH		1002	1202	1504	1704	2004	2404
Heating capacity (EN14511) ⁽¹⁾	kW	61,0	72,3	99,2	106,3	120,9	138,5
Total input power (EN14511) ⁽¹⁾	kW	23,0	26,5	34,9	38,1	42,6	50,2
COP (EN14511) ⁽¹⁾	W/W	2,65	2,73	2,84	2,79	2,84	2,76
Energy Class in low temperature ⁽²⁾		A+	A+	A++	A++	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,34	3,41	3,45	3,43	3,45	3,43
η _{s,h} low temperature ⁽²⁾	%	130,6	133,4	134,9	134,1	134,9	134,1
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	2,85	2,87	2,89	2,88	2,89	2,88
η _{s,h} medium temperature ⁽²⁾	%	111,0	111,8	112,7	112,3	112,7	112,3
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	34,4	34,8	45,2	55,0	61,0	67,0
Equivalent CO ₂ charge	t	71,8	72,7	94,3	114,8	127,3	139,8
Max sound power level in heating mode ⁽³⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	47	47	45	47	48	48

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions, in accordance with ISO 3744.

Heating only version (HH)

NN/HH		252	302	452	502	602	752	852
Heating capacity (EN14511) ⁽¹⁾	kW	15,7	20,0	25,6	34,3	38,9	44,6	51,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,3	11,8	14,0	16,0	18,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,72	2,76	2,90	2,77	2,78	2,74
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,75	3,74	3,71	3,94	3,95	3,43
η _{s,h} low temperature ⁽²⁾	%	155,3	146,8	146,7	145,3	154,6	154,9	134,3
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,03	3,05	3,12	3,21	3,16	2,87
η _{s,h} medium temperature ⁽²⁾	%	124,3	118,2	119,0	121,6	125,5	123,4	111,9
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 standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	7,7	11,6	11,9	14,8	14,9	15,2	22,5
Equivalent CO ₂ charge	t	16,1	24,2	24,8	30,9	31,1	31,7	47,0
Max sound power level in heating mode ⁽³⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	34	34	34	36	36	36	37

NN/HH		1002	1202	1504	1704	2004	2404
Heating capacity (EN14511) ⁽¹⁾	kW	60,6	67,6	93,6	108,6	119,7	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,2	34,0	39,8	44,0	--
COP (EN14511) ⁽¹⁾	W/W	2,87	2,79	2,75	2,73	2,72	--
Energy Class in low temperature ⁽²⁾		A+	A+	A++	A++	A+	
SCOP low temperature ⁽²⁾	kWh/kWh	3,34	3,41	3,45	3,43	3,45	
η _{s,h} low temperature ⁽²⁾	%	130,6	133,4	134,9	134,1	134,9	
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	
SCOP medium temperature ⁽²⁾	kWh/kWh	2,85	2,87	2,89	2,88	2,89	
η _{s,h} medium temperature ⁽²⁾	%	111,0	111,8	112,7	112,3	112,7	
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	--
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	--
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	--
Fans	n°	2	2	4	4	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Global warming potential (GWP)		2088	2088	2088	2088	2088	--
Refrigerant charge	Kg	34,4	34,8	45,2	55,0	61,0	--
Equivalent CO ₂ charge	t	71,8	72,7	94,3	114,8	127,3	--
Max sound power level in heating mode ⁽³⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	37	38	39	40	40	--

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions, in accordance with ISO 3744.

Reversible heating/cooling version (RV)

XL/RV		252	302	452	502	602	752	852
Heating capacity (EN14511) ⁽¹⁾	kW	16,6	21,2	27,5	34,2	41,9	48,3	53,5
Total input power (EN14511) ⁽¹⁾	kW	6,1	7,7	9,9	12,1	15,2	17,2	19,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,75	2,78	2,82	2,76	2,80	2,68
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,75	3,74	3,71	3,94	3,95	3,43
$\eta_{s,h}$ low temperature ⁽²⁾	%	155,3	146,8	146,7	145,3	154,6	154,9	134,3
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,03	3,05	3,12	3,21	3,16	2,87
$\eta_{s,h}$ medium temperature ⁽²⁾	%	124,3	118,2	119,0	121,6	125,5	123,4	111,9
Cooling capacity (EN14511) ⁽³⁾	kW	22,4	27,7	36,7	46,2	54,7	62,8	71,0
Total input power (EN14511) ⁽³⁾	kW	7,3	9,1	11,9	15,1	17,8	20,6	23,2
EER (EN14511) ⁽³⁾	W/W	3,06	3,05	3,07	3,05	3,07	3,05	3,05
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	20,5	24,1	34,1	39,3	46,2	56,2	69,2
Peak current standard unit	A	62,9	83,2	119,1	148,7	143,2	170,2	210,7
Peak current standard unit with soft starter (optional)	A	37,2	48,2	68,6	84,7	84,2	100,2	123,7
Max air flow in heating mode	m ³ /h	10000	10000	16000	16000	32000	32000	32000
Fans	n°	2	2	1	1	2	2	2
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	7,7	11,6	11,9	14,8	14,9	15,2	22,5
Equivalent CO ₂ charge	t	16,1	24,2	24,8	30,9	31,1	31,7	47,0
Max sound power level in heating mode ⁽³⁾	dB (A)	70	70	72	72	74	74	74
Max sound pressure level in heating mode ⁽⁴⁾	dB (A)	38	38	40	40	42	42	42

XL/RV		1002	1202	1504	1704	2004	2404
Heating capacity (EN14511) ⁽¹⁾	kW	61,0	72,3	99,2	106,3	120,9	138,5
Total input power (EN14511) ⁽¹⁾	kW	23,0	26,5	34,9	38,1	42,6	50,2
COP (EN14511) ⁽¹⁾	W/W	2,65	2,73	2,84	2,79	2,84	2,76
Energy Class in low temperature ⁽²⁾		A+	A+	A++	A++	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,34	3,41	3,45	3,43	3,45	3,43
$\eta_{s,h}$ low temperature ⁽²⁾	%	130,6	133,4	134,9	134,1	134,9	134,1
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	2,85	2,87	2,89	2,88	2,89	2,88
$\eta_{s,h}$ medium temperature ⁽²⁾	%	111,0	111,8	112,7	112,3	112,7	112,3
Cooling capacity (EN14511) ⁽³⁾	kW	79,4	90,0	126,0	140,0	165,0	186,0
Total input power (EN14511) ⁽³⁾	kW	26,9	30,7	41,8	49,1	52,5	64,1
EER (EN14511) ⁽³⁾	W/W	2,95	2,93	3,01	2,85	3,14	2,90
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Max input current standard unit	A	74,0	79,0	112,4	138,4	148,0	158,0
Peak current standard unit	A	215,0	225,0	228,0	282,0	287,0	318,0
Peak current standard unit with soft starter (optional)	A	128,0	138,0	132,0	170,0	175,0	190,0
Max air flow in heating mode	m ³ /h	38000	38000	48000	56000	70000	70000
Fans	n°	2	2	4	4	6	6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	34,4	34,8	45,2	55,0	61,0	67,0
Equivalent CO ₂ charge	t	71,8	72,7	94,3	114,8	127,3	139,8
Max sound power level in heating mode ⁽⁴⁾	dB (A)	79	79	77	79	80	80
Max sound pressure level in heating mode ⁽⁵⁾	dB (A)	47	47	45	47	48	48

Performances are referred to the following conditions:

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

(2) Average conditions, high temperature, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 10 mt from the unit in free field conditions, in accordance with ISO 3744.

Reversible heating/cooling version (RV)

NN/RV		252	302	452	502	602	752	852
Heating capacity (EN14511) ⁽¹⁾	kW	15,7	20,0	25,6	34,3	38,9	44,6	51,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,3	11,8	14,0	16,0	18,9
COP (EN14511) ⁽¹⁾	W/W	2,71	2,72	2,76	2,90	2,77	2,78	2,74
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,75	3,74	3,71	3,94	3,95	3,43
$\eta_{s,h}$ low temperature ⁽²⁾	%	155,3	146,8	146,7	145,3	154,6	154,9	134,3
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,03	3,05	3,12	3,21	3,16	2,87
$\eta_{s,h}$ medium temperature ⁽²⁾	%	124,3	118,2	119,0	121,6	125,5	123,4	111,9
Cooling capacity (EN14511) ⁽³⁾	kW	21,4	26,5	35,6	45,7	53,5	61,1	69,0
Total input power (EN14511) ⁽³⁾	kW	8,1	10,5	14,1	16,2	18,6	22,5	22,9
EER (EN14511) ⁽³⁾	W/W	2,64	2,51	2,52	2,82	2,87	2,71	3,01
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50
Max input current standard unit	A	18,7	22,3	32,5	38,3	43,1	53,2	66,2
Peak current standard unit	A	61,1	81,4	117,5	147,7	140,2	167,2	207,7
Peak current standard unit with soft starter (optional)	A	35,4	46,4	67,1	83,8	81,2	97,2	120,7
Max air flow in heating mode	m ³ /h	9000	9000	9000	18000	18000	18000	27000
Fans	n°	1	1	1	2	2	2	3
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	7,7	11,6	11,9	14,8	14,9	15,2	22,5
Equivalent CO ₂ charge	t	16,1	24,2	24,8	30,9	31,1	31,7	47,0
Max sound power level in heating mode ⁽⁴⁾	dB (A)	66	66	66	68	68	68	69
Max sound pressure level in heating mode ⁽⁵⁾	dB (A)	34	34	34	36	36	36	37

NN/RV		1002	1202	1504	1704	2004	2404
Heating capacity (EN14511) ⁽¹⁾	kW	60,6	67,6	93,6	108,6	119,7	--
Total input power (EN14511) ⁽¹⁾	kW	21,1	24,2	34,0	39,8	44,0	--
COP (EN14511) ⁽¹⁾	W/W	2,87	2,79	2,75	2,73	2,72	--
Energy Class in low temperature ⁽²⁾		A+	A+	A++	A++	A+	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,34	3,41	3,45	3,43	3,45	--
$\eta_{s,h}$ low temperature ⁽²⁾	%	130,6	133,4	134,9	134,1	134,9	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	--
SCOP medium temperature ⁽²⁾	kWh/kWh	2,85	2,87	2,89	2,88	2,89	--
$\eta_{s,h}$ medium temperature ⁽²⁾	%	111,0	111,8	112,7	112,3	112,7	--
Cooling capacity (EN14511) ⁽³⁾	kW	79,3	88,0	120,0	132,0	155,0	--
Total input power (EN14511) ⁽³⁾	kW	26,0	32,2	42,1	46,3	58,5	--
EER (EN14511) ⁽³⁾	W/W	3,05	2,73	2,85	2,85	2,65	--
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	400/3+N/50	--
Max input current standard unit	A	68,0	70,0	113,0	136,0	146,0	--
Peak current standard unit	A	209,0	225,0	228,0	282,0	287,0	--
Peak current standard unit with soft starter (optional)	A	123,7	138,0	132,0	170,0	175,0	--
Max air flow in heating mode	m ³ /h	27000	29000	44000	48000	60000	--
Fans	n°	3	3	4	6	6	--
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	--
Global warming potential (GWP)		2088	2088	2088	2088	2088	--
Refrigerant charge	Kg	34,4	34,8	45,2	55,0	61,0	--
Equivalent CO ₂ charge	t	71,8	72,7	94,3	114,8	127,3	--
Max sound power level in heating mode ⁽⁴⁾	dB (A)	69	70	71	72	72	--
Max sound pressure level in heating mode ⁽⁵⁾	dB (A)	37	38	39	40	40	--

Performances are referred to the following conditions:

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

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

(3) Average conditions, high temperature, variable - Reg EU 811/2013

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 10 mt from the unit in free field conditions, in accordance with ISO 3744.

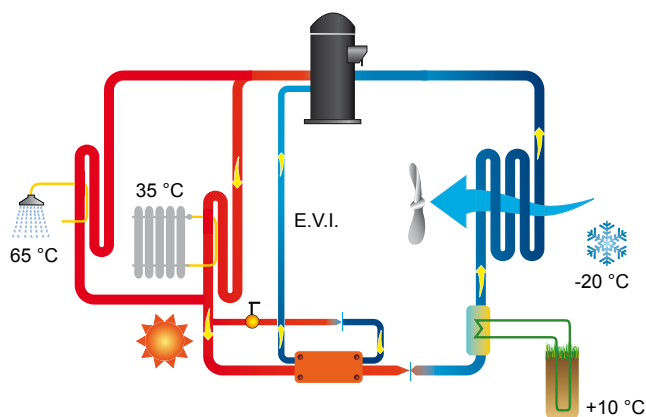
Principle of operation

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

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

Some water sources used:

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

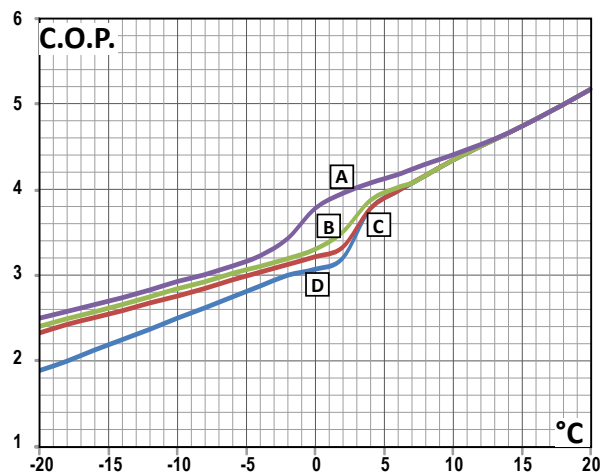


Performance comparison C.O.P. In hybrid LWZ units and in LZT unit

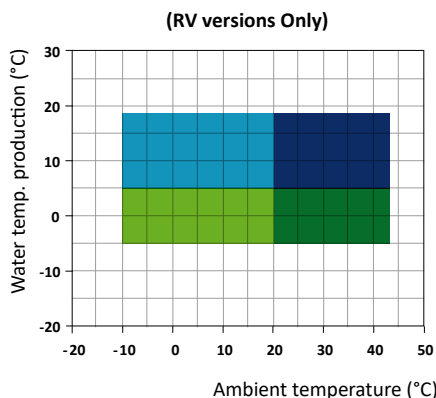
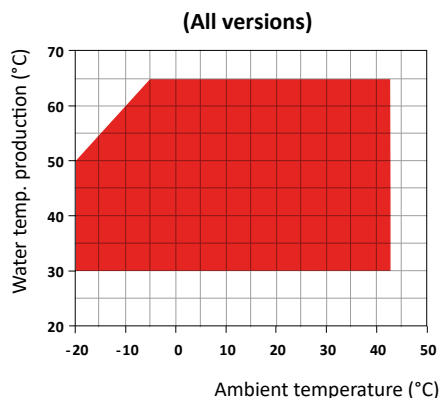
The graph shows the evolution of LWZ units C.O.P. (curves A, B, C) at different external temperatures (with user water produced at 35 °C), compared to a unit of equal power series LZT (curve D).

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

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



Operation limits



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

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

Frame

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

The standard colour of the units is RAL9018.

Refrigerant circuit

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

Compressors

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

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

Source heat exchanger

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

User heat exchangers + integration

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

type. A further advantage is a reduction in the overall dimensions of the unit.

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

Fans

The fans are direct drive axial type with aluminium aerofoil blades, are statically and dynamically balanced and are supplied complete with a safety fan guard complying with the requirements of EN 60335. They are fixed to the unit frame via rubber anti-vibration mountings. The electric motors are 8 poles type rotating at approximately 900 rpm. In the NN versions the fans are 12 poles type (approx 450 rpm). As standard, all units are fitted with a pressure operated fan speed controller. The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P4S and P4U), high pressure manual reset, low pressure automatic reset, compressor thermal protection, air fan, thermal protection, pressure transducer (used to optimize the defrost cycle and to adjust the fan speed depending on ambient conditions), flow switch. All units are also fitted with a temperature probe sensor with "Energy Saving" function, supplied in a separate plastic box, which can be

used to stop the pump use during periods of stand-by, when the water temperature reaches the set point. Doing this the power consumption of the unit is strongly reduced. The probe sensor must be positioned in the hydraulic compensator present at the screening technique. The domestic hot water circuit (only versions P4S and P4U) is already equipped with this probe, but it must be installed in the user circuit.

Noise Reduction

All units are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping system that consists of a base plate and acoustic enclosure that houses the compressors. The base plate is separated

from the supporting frame of the unit by soft steel springs that have a high damping power. Within the enclosure, the compressors are mounted on rubber shock absorbers on the floating base plate. The enclosure is manufactured from galvanized steel sandwich panels that have a micro-perforated inner skin and a core of 50 mm thick, high density (40 kg/m³) mineral wool. The entire arrangement provides a double damping system and acoustic attenuation. The compressor refrigerant pipes are connected to the refrigerant circuit through "anaconda" flexible connections. Flexible connections are also used on the water pipework within the unit. The combination of these systems results in an overall noise reduction in the region of 10-12 dB(A).

Versions

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

Version P2U

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

Version P2S

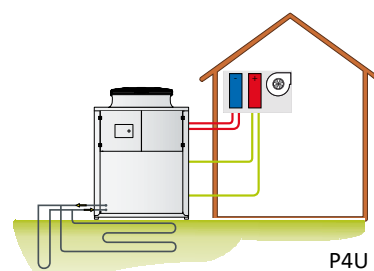
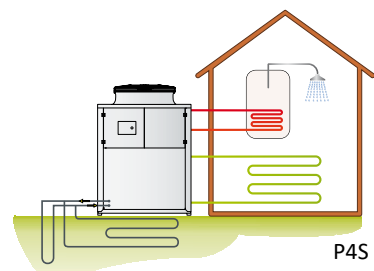
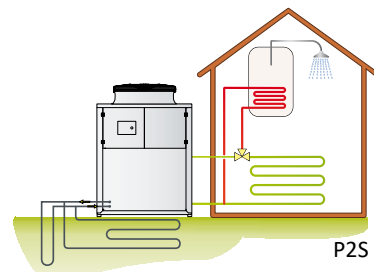
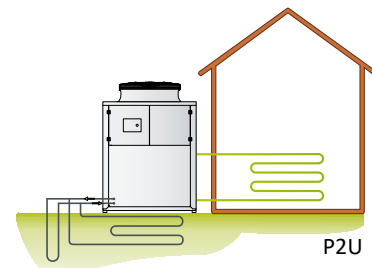
This is a two pipe version that can, in addition to producing hot water for heating (HH version) and hot and cold water in the RV version can also generate domestic hot water. The controller has dual heating set points (heating and DHW) and can also control a three port diverting valve that directs the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

Version P4S

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

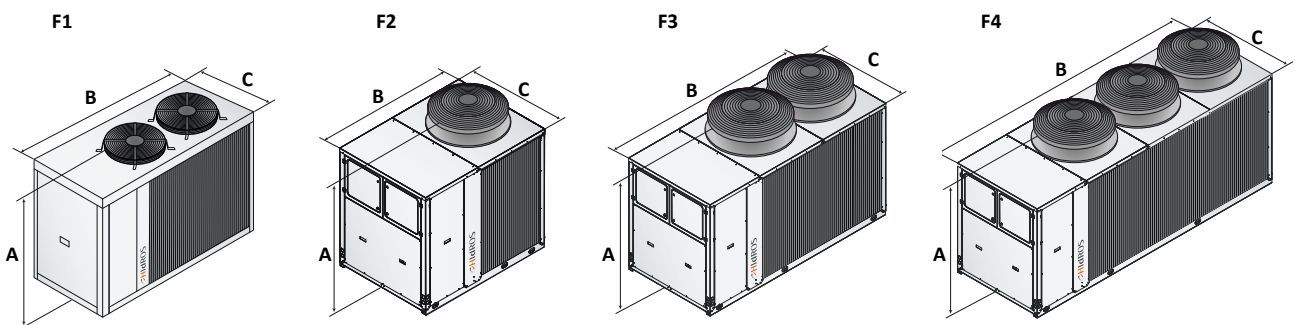
Version P4U

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



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

● Standard, ○ Optional, – Not available.



Frame XL Version

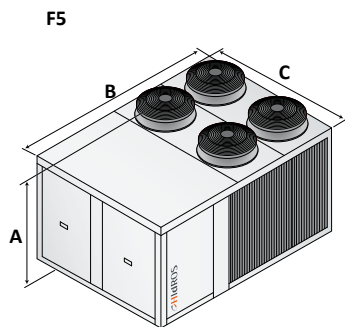
Mod.	Frame	Fans	A (mm)	B (mm)	C (mm)	Kg
252/XL	F1	2	1470	1900	880	330
302/XL	F1	2	1470	1900	880	340
452/XL	F2	1	1820	2200	1150	450
502/XL	F2	1	1820	2200	1150	490
602/XL	F3	2	1820	2900	1150	700
752/XL	F3	2	1820	2900	1150	760
852/XL	F3	2	1820	2900	1150	810
1002/XL	F3	2	1820	2900	1150	850
1202/XL	F3	2	1820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

Frame NN Version

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

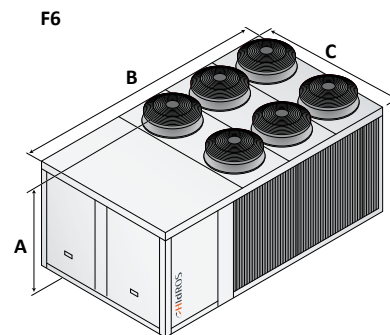
LWZ		1202	1504	1704	2004	2404
Flow switch		●	●	●	●	●
User water strainer		●	●	●	●	●
Evap/cond.press. control by transducer and fan speed control	DCCF	●	●	●	●	●
Fresh air temperature probe for set-point compensation	SOND	●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital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

● Standard, ○ Optional, – Not available.



Frame XL Version

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

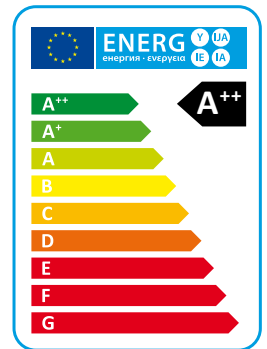


Frame NN Version

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

WSA/HP

Water to water heat pumps



WSA/HP 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 WSA/HP series are ideal for most applications.

Versions

HP Reversible version.

WSA/HP		06	08	10	14	16	21	26	31	36	41
Cooling capacity (EN14511) ⁽¹⁾	kW	5,9	7,5	9,0	14,9	17,4	22,0	30,3	34,3	38,2	45,0
Total input power (EN14511) ⁽¹⁾	kW	1,5	1,8	2,2	3,6	4,2	5,1	6,9	7,8	8,7	10,2
EER (EN14511) ⁽¹⁾	W/W	3,93	4,16	4,10	4,13	4,14	4,31	4,39	4,39	4,39	4,41
Cooling capacity (EN14511) ⁽²⁾	kW	8,1	10,2	12,2	20,4	23,5	29,5	40,3	45,5	50,7	60,3
Total input power (EN14511) ⁽²⁾	kW	1,4	1,8	2,2	3,5	4,3	5,4	7,1	8,0	9,1	10,4
EER (EN14511) ⁽²⁾	W/W	5,78	5,66	5,54	5,82	5,46	5,46	5,67	5,68	5,57	5,79
Heating capacity (EN14511) ⁽³⁾	kW	7,0	8,8	10,6	17,2	20,3	25,3	34,3	42,6	47,9	52,7
Total input power (EN14511) ⁽³⁾	kW	1,5	1,8	2,2	3,6	4,2	5,1	6,9	7,9	8,8	10,3
COP (EN14511) ⁽³⁾	W/W	4,66	4,88	4,81	4,77	4,83	4,96	4,97	5,39	5,44	5,11
Heating capacity (EN14511) ⁽⁴⁾	kW	6,7	8,4	10,2	16,5	19,5	24,4	32,7	40,7	45,8	50,5
Total input power (EN14511) ⁽⁴⁾	kW	1,9	2,3	2,8	4,5	5,2	6,3	8,6	9,9	10,9	12,5
COP (EN14511) ⁽⁴⁾	W/W	3,52	3,65	3,64	3,66	3,75	3,87	3,80	4,11	4,20	4,04
Energy Class ⁽⁵⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
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+N/50	400/3+N/50	400/3+N/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
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	1,0	1,0	1,1	1,2	1,3	1,9	2,5	3,1	3,9	4,4
Equivalent CO ₂ charge	t	2,1	2,1	2,3	2,5	2,7	4,0	5,2	6,5	8,1	9,2
Sound power ⁽⁶⁾	dB(A)	57	58	58	61	61	67	67	69	71	71
Sound pressure ⁽⁷⁾	dB(A)	43	44	44	46	46	52	52	54	56	56

Performances are referred to the following conditions:

- (1) Cooling: Evaporator water temp. 12/7°C condenser water temp. 30/35°C. Without pressostatic valve.
(2) Cooling: Evaporator water temp. 23/18°C condenser water temp. 30/35°C. Without pressostatic valve.
(3) Heating: condenser water temperature 30/35°C; evaporator water temperature 10/7°C.

(4) Heating: condenser water temperature 40/45°C; evaporator water temperature 10/7°C.

(5) Average conditions, low temperature, variable - Reg EU 811/2013

(6) Sound power level in accordance with ISO 3744 (LS versions).

(7) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744. (LS versions).

WSA/EV		06	08	10	14	16	21	26	31	36	41
Cooling capacity ⁽⁸⁾	kW	5,1	6,5	7,9	13,1	15,3	19,5	26,6	30,0	33,7	39,8
Total input power ⁽⁸⁾	kW	1,9	2,4	2,9	4,6	5,3	6,4	8,9	10,2	11,1	12,7
Water flow ⁽⁸⁾	m ³ 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+N/50	400/3+N/50	400/3+N/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 ⁽⁶⁾	dB(A)	57	58	58	61	61	67	67	69	71	71
Sound pressure ⁽⁷⁾	dB(A)	43	44	44	46	46	52	52	54	56	56

Performances are referred to the following conditions:

- (6) Sound power level in accordance with ISO 3744 (LS versions).

(7) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744 (LS versions).

(8) For EV version: condensing temperature 50 °C, water temperature in/out 12/7 °C.

Frame

All WSA/HP 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 06,08,10 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/HP 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/HP 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.

Versions

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.

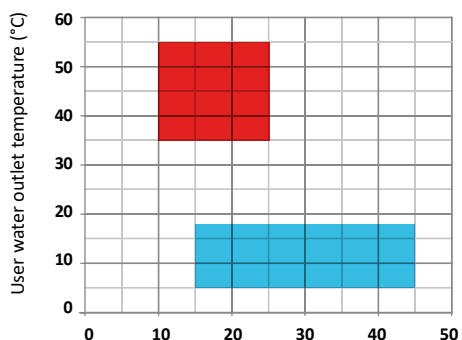
Condenserless versions (EV)

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.

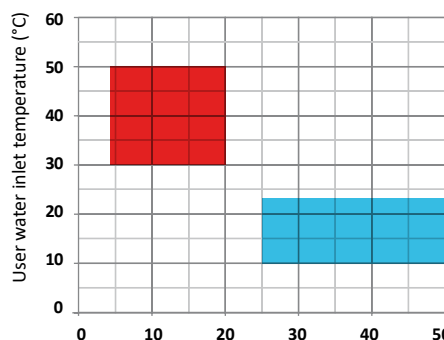
WSA/HP - WSA/EV		06	08	10	14	16	21	26	31	36	41
Main switch	-	-	-	-	●	●	●	●	●	●	●
Flow switch	-	●	●	●	●	●	●	●	●	●	●
Microprocessor control	-	●	●	●	●	●	●	●	●	●	●
LS low noise basic version	LS00	○	○	○	○	○	○	○	○	○	○
Partial heat recovery	RP00	-	-	-	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○
Pressostatic valve kit (only cooling version)	VPSF	○	○	○	○	○	○	○	○	○	○
Source 4÷20 mA modulating valve	V2M0	○	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

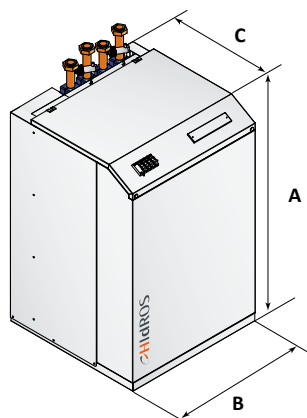
Operation limits



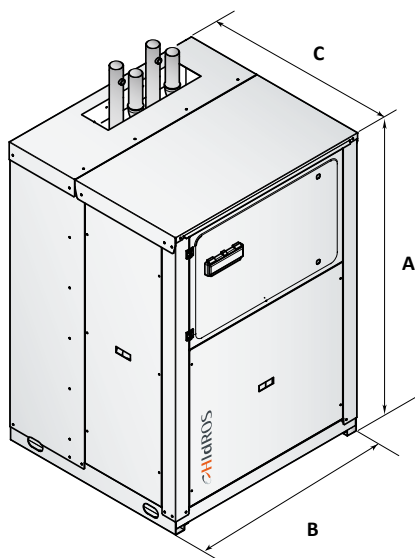
Source water inlet temperature (°C)



Source water outlet temperature (°C)



WSA/HP 06 ÷ 21

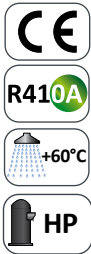
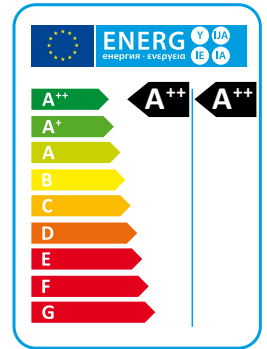


WSA/HP 26 ÷ 41

Mod.	A (mm)	B (mm)	C (mm)	Kg
06	900	600	600	130
08	900	600	600	135
10	900	600	600	138
14	1255	600	600	140
16	1255	600	600	170
21	1255	600	600	175
26	1270	850	765	180
31	1270	850	765	340
36	1270	850	765	350
41	1270	850	765	360

WZA

Ground source water to water heat pumps



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

WZA 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.

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

Versions

- HH** Standard, heating only.
- RV** Reversible heating/cooling.
- P2U** 2 pipe systems without domestic hot water production.
- P4S** 2+2 pipe systems with domestic hot water production.
- PO** Unit designed for well water.
- GE** Unit designed for geothermal probe.

WZA - WZA/RV		06	08	12	16	20	24	33	40
Heating capacity (EN14511) ⁽¹⁾	kW	7,7	9,9	13,6	17,2	22,8	26,9	34,0	44,7
Input power (EN14511) ⁽¹⁾	kW	1,3	1,6	2,1	2,7	3,8	4,3	5,6	7,7
COP (EN14511) ⁽¹⁾	W/W	5,89	6,06	6,26	6,18	6,014	6,13	6,06	5,77
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,41	5,68	5,66	5,67	5,69	6,07	6,03	5,79
$\eta_{s,h}$ low temperature ⁽²⁾	%	208,4	219,2	218,3	218,8	219,7	234,8	233,0	223,4
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,21	4,31	4,38	4,44	4,39	4,80	4,82	4,69
$\eta_{s,h}$ medium temperature ⁽²⁾	%	160,5	164,4	167,1	169,6	167,6	184,1	184,9	179,4
Cooling capacity (EN14511) ⁽³⁾	kW	5,5	7,1	9,9	12,6	16,7	19,8	25,3	33,4
Input power (EN14511) ⁽³⁾	kW	1,4	1,8	2,4	3,0	4,1	4,8	6,0	8,2
EER (EN14511) ⁽³⁾	W/W	3,78	3,88	4,14	4,16	4,06	4,13	4,16	4,04
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+N/50
Peak current	A	60,0	83,0	51,5	62,0	75,0	58,9	71,7	88,0
Maximum input current	A	12,8	17,1	7,4	9,7	13,0	14,8	19,4	26,0
Compressors / Circuits	n° / n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	2 / 1	2 / 1	2 / 1
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	2,2	2,2	2,9	2,9	4,6	4,6	5,0	5,5
Equivalent CO ₂ charge	t	4,6	4,6	6,0	6,0	9,6	9,6	10,4	11,4
Sound power ⁽⁴⁾	dB(A)	62	63	65	67	69	71	75	77
Sound pressure ⁽⁵⁾	dB(A)	48	49	50	52	54	56	60	62

Performances are referred to the following conditions:

(1) Heating: User water temperature 30/35°C; Source water temperature 10/7°C.

(2) Variable - Reg EU 811/2013

(3) Cooling: User water temperature 12/7°C; Source water temperature 30/35°C.

(4) Sound power level in accordance with ISO 3744.

(5) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

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, electronic expansion valve, 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 al-

ways powered when the compressor is in stand-by.

Source side heat exchangers

The source side heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. It has a single water side circuit. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type and increases the efficiency of the refrigerant cycle at part loads. The source heat exchangers are factory insulated with flexible close cell material and are provided with a temperature sensor for antifreeze protection.

User side heat exchangers

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

Microprocessors

All units are supplied as standard with 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 EN60204. 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), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pumps 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, high and low pressure transducers, differential pressure switch on source and user circuit.

Hydraulic kit

All units are supplied as standard with built-in hydraulic kit so configured:

User circuit: includes the inverter water pump, expansion vessel, filling connection, water drain and the water flow safety device (differential pressure switch). Source circuit: includes the inverter water pump, the water flow safety device (differential pressure switch), filling connection, water drain and expansion vessel. Domestic hot water circuit: includes the inverter water pump controlled by the microprocessor.

Versions

WZA/HH

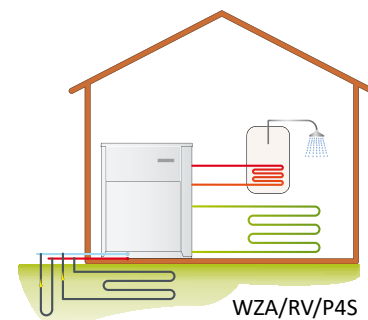
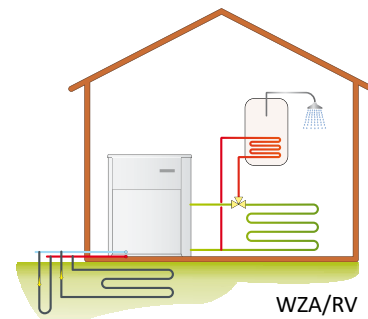
Version for heating only applications.

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/P4S 4 pipes version

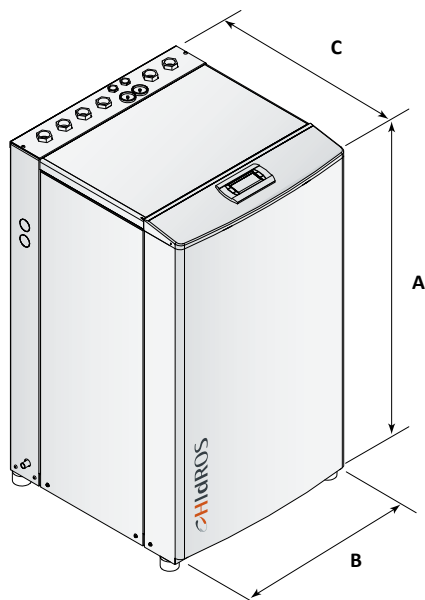
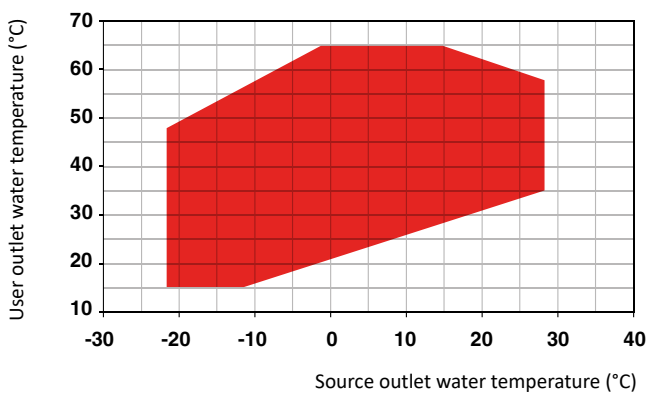
This version is supplied with 4 pipes on the user side and is able to produce simultaneously, hot and cold water on 2 independent hydraulic circuits. On this version, the domestic hot water.



WZA - WZA/RV		06	08	12	16	20	24	33	40
Main switch		●	●	●	●	●	●	●	●
Microprocessor control		●	●	●	●	●	●	●	●
Water pumps (source, user, domestic hot water pump)		●	●	●	●	●	●	●	●
Low noise version LS	LS00	●	●	●	●	●	●	●	●
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

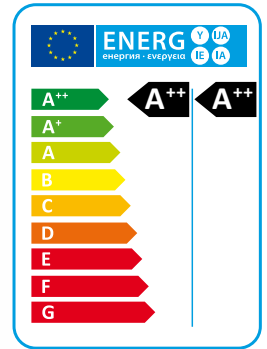
Operation limits



Mod.	A (mm)	B (mm)	C (mm)	Kg
06	970	620	575	146
08	970	620	575	153
12	1050	620	650	169
16	1050	620	650	195
20	1050	620	650	215
24	1040	800	880	262
33	1040	800	880	302
40	1040	800	880	320

WHA

Ground source water to water heat pumps



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

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

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

Versions

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

Heating only version (HH)

HH		039	045	050	060	070	080	090	110	120
Heating capacity (EN14511) ⁽¹⁾	kW	51,7	59,0	71,2	80,0	92,5	105,9	120,8	136,1	152,0
Input power (EN14511) ⁽¹⁾	kW	9,8	11,0	12,5	14,3	16,9	19,4	22,2	24,9	28,3
COP (EN14511) ⁽¹⁾	W/W	5,27	5,36	5,69	5,59	5,47	5,45	5,44	5,46	5,37
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,21	5,52	5,51	5,77	5,60	5,50	5,44	5,44	5,46
η _{s,h} low temperature ⁽²⁾	%	200,4	212,8	212,5	222,9	215,8	212,0	209,4	209,5	210,5
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,32	4,50	4,51	4,67	4,54	4,51	4,45	4,47	4,48
η _{s,h} medium temperature ⁽²⁾	%	164,6	171,8	172,4	178,6	173,4	172,4	170,0	170,8	171,1
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	111,0	132,0	140,0	143,0	199,0	208,0	259,0	265,0	312,0
Max input current	A	32,0	42,0	44,0	50,0	59,0	68,0	74,0	80,0	88,5
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	4,3	4,3	5,0	5,0	6,0	6,5	8,0	11,0	11,0
Equivalent CO ₂ charge	t	9,0	9,0	10,4	10,4	12,5	13,6	16,7	23,0	23,0
Sound power ⁽⁴⁾	dB(A)	82	82	83	84	84	85	86	87	87
Sound pressure ⁽⁵⁾	dB(A)	66	66	67	68	68	69	69	70	70

HH		130	152	162	190	210	240	260	300	320
Heating capacity (EN14511) ⁽¹⁾	kW	169,2	195,0	222,1	243,8	271,3	306,9	342,2	390,9	439,4
Input power (EN14511) ⁽¹⁾	kW	31,6	36,8	41,0	45,1	51,0	57,3	63,6	72,5	81,4
COP (EN14511) ⁽¹⁾	W/W	5,35	5,29	5,41	5,40	5,32	5,35	5,38	5,39	5,39
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,42	5,49	5,64	5,47	5,45	5,47	5,51	5,55	5,49
η _{s,h} low temperature ⁽²⁾	%	208,8	211,7	217,6	210,6	209,9	210,6	212,5	214,1	211,6
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,50	4,53	4,62	4,53	4,54	4,55	4,58	4,60	4,59
η _{s,h} medium temperature ⁽²⁾	%	171,8	173,0	176,7	173,2	173,5	173,9	175,0	175,8	175,4
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
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2
Max input current	A	97,0	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2
Capacity steps	n°	2	2	2	4	4	4	4	4	4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	15,0	15,0	15,0	16,0	16,0	19,0	19,0	30,0	30,0
Equivalent CO ₂ charge	t	31,3	31,3	31,3	33,4	33,4	39,7	39,7	62,6	62,6
Sound power ⁽⁴⁾	dB(A)	88	88	88	89	91	91	91	93	93
Sound pressure ⁽⁵⁾	dB(A)	71	71	71	72	74	74	74	76	76

Performances are referred to the following conditions:

- (1) Heating: user water temperature 30/35°C, source water temperature 10/7°C.
 (2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744 (LS version). Operation mode 1, without water pumps.

(4) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744. (LS version). Operation mode 1, without water pumps.

Reversible heating/cooling version (RV)

RV		039	045	050	060	070	080	090	110	120
Heating capacity (EN14511) ⁽¹⁾	kW	51,7	59,0	71,2	80,0	92,5	105,9	120,8	136,1	152,0
Input power (EN14511) ⁽¹⁾	kW	9,8	11,0	12,5	14,3	16,9	19,4	22,2	24,9	28,3
COP (EN14511) ⁽¹⁾	W/W	5,27	5,36	5,69	5,59	5,47	5,45	5,44	5,46	5,37
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,21	5,52	5,51	5,77	5,60	5,50	5,44	5,44	5,46
η _{s,h} low temperature ⁽²⁾	%	200,4	212,8	212,5	222,9	215,8	212,0	209,4	209,5	210,5
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,32	4,50	4,51	4,67	4,54	4,51	4,45	4,47	4,48
η _{s,h} medium temperature ⁽²⁾	%	164,6	171,8	172,4	178,6	173,4	172,4	170,0	170,8	171,1
Cooling capacity (EN14511) ⁽³⁾	kW	42,9	49,0	60,3	67,4	77,5	88,9	101,3	114,3	126,9
Total input power (EN14511) ⁽³⁾	kW	10,0	11,3	12,9	14,7	17,4	19,9	22,7	25,5	29,0
EER (EN14511) ⁽³⁾	W/W	4,29	4,33	4,67	4,58	4,45	4,46	4,46	4,48	4,37
Free Cooling capacity ⁽⁴⁾	kW	22,8	22,9	36,0	36,3	36,6	49,3	71,0	72,4	73,5
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	111,0	132,0	140,0	143,0	199,0	208,0	259,0	265,0	312,0
Max input current	A	32,0	42,0	44,0	50,0	59,0	68,0	74,0	80,0	88,5
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Capacity steps	n°	2	2	2	2	2	2	2	2	2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	5,0	5,0	7,0	7,0	7,5	9,0	10,0	15,0	15,0
Equivalent CO ₂ charge	t	10,4	10,4	14,6	14,6	15,7	18,8	20,9	31,3	31,3
Sound power ⁽⁵⁾	dB(A)	82	82	83	84	84	85	86	87	87
Sound pressure ⁽⁶⁾	dB(A)	66	66	67	68	68	69	69	70	70

RV		130	152	162	190	210	240	260	300	320
Heating capacity (EN14511) ⁽¹⁾	kW	169,2	195,0	222,1	243,8	271,3	306,9	342,2	390,9	439,4
Input power (EN14511) ⁽¹⁾	kW	31,6	36,8	41,0	45,1	51,0	57,3	63,6	72,5	81,4
COP (EN14511) ⁽¹⁾	W/W	5,35	5,29	5,41	5,40	5,32	5,35	5,38	5,39	5,39
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,42	5,49	5,64	5,47	5,45	5,47	5,51	5,55	5,49
η _{s,h} low temperature ⁽²⁾	%	208,8	211,7	217,6	210,6	209,9	210,6	212,5	214,1	211,6
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,50	4,53	4,62	4,53	4,54	4,55	4,58	4,60	4,59
η _{s,h} medium temperature ⁽²⁾	%	171,8	173,0	176,7	173,2	173,5	173,9	175,0	175,8	175,4
Cooling capacity (EN14511) ⁽³⁾	kW	141,2	163,6	187,4	205,1	226,9	257,3	287,4	328,1	368,5
Total input power (EN14511) ⁽³⁾	kW	32,3	37,8	42,2	46,3	52,4	58,8	65,2	74,3	83,4
EER (EN14511) ⁽³⁾	W/W	4,37	4,32	4,44	4,43	4,33	4,37	4,40	4,41	4,41
Free Cooling capacity ⁽⁴⁾	kW	74,1	93,1	94,0	128,2	129,6	130,9	163,0	164,4	203,0
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
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2
Max input current	A	97,0	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2
Capacity steps	n°	2	2	2	4	4	4	4	4	4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	15,0	15,0	15,0	20,0	20,0	30,0	30,0	34,0	34,0
Equivalent CO ₂ charge	t	31,3	31,3	31,3	41,8	41,8	62,6	62,6	71,0	71,0
Sound power ⁽⁵⁾	dB(A)	88	88	88	89	91	91	91	93	93
Sound pressure ⁽⁶⁾	dB(A)	71	71	71	72	74	74	74	76	76

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

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

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

(5) Sound power level in accordance with ISO 3744 (LS version). Operation mode 1, without water pumps.

(6) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744 (LS version). Operation mode 1, without water pumps.

Frame

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

Refrigerant circuit

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

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

Compressors

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

Source heat exchanger

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

User exchanger

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

Microprocessors

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, 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 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 EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/Winter change over (reversible type only) and general alarm. For all three phase units, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), is fitted as standard.

Control and protection devices

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



Hydraulic kit

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

Versions

WHA/RV 2 Pipe version

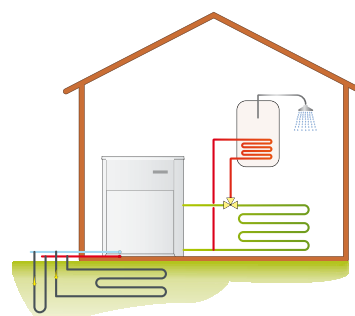
This version is capable of cooling during summer operation by using a 4 way reversing valve in the refrigerant circuit.

WHA/RV/SW6 4 Pipe version

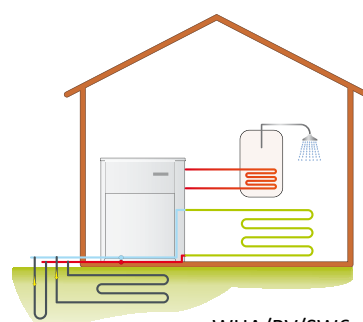
This version has 4 pipes on the user side and is able to produce simultaneously, hot and cold water on 2 independent hydraulic circuits. The domestic hot water production is independent of the operation mode of the unit.

Versione free cooling

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



WHA/RV



WHA/RV/SW6

Configurations

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

Legend

P2 2 pipe system

P4 4 pipe system

P2+FC 2 pipe system with Free Cooling

P4+FC 4 pipe system with Free Cooling

P2+A 2 pipe system with hydraulic kit

P4+A 4 pipe system with hydraulic kit

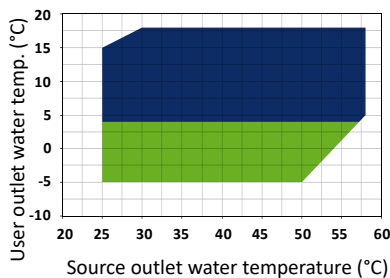
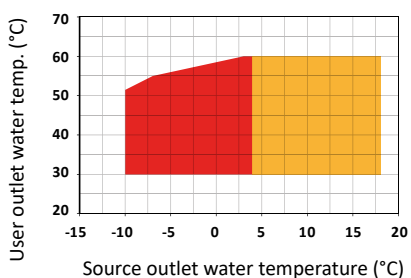
P2+FC+A 2 pipe system with Free Cooling and hydraulic kit

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

WHA		039÷080	090÷110	120÷162	190÷260	300÷320
Main switch		●	●	●	●	●
Microprocessor control		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
LS low noise version	LS00	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
2 way modulating to control source water consumption	V2M0	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○
Hydraulic kit with one pump without tank - user circuit	A1NTU	○	○	○	○	○
Hydraulic kit with one pump without tank - source circuit	A1NTS	○	○	○	○	○
Hydraulic kit with one pump without tank - recovery circuit	A1NTR	○	○	○	○	○
Hydraulic kit with two pumps without tank - user circuit	A2NTU	○	○	○	○	○
Hydraulic kit with two pumps without tank - source circuit	A2NTS	○	○	○	○	○
Hydraulic kit with two pumps without tank - recovery circuit	A2NTR	○	○	○	○	○

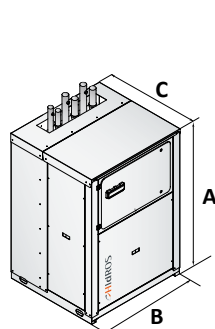
● Standard, ○ Optional, – Not available.

Operation limits

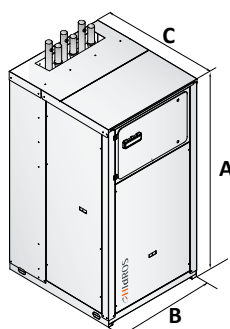


- Heating
- Heating with glycol source circuit
- Cooling
- Cooling with glycol user circuit

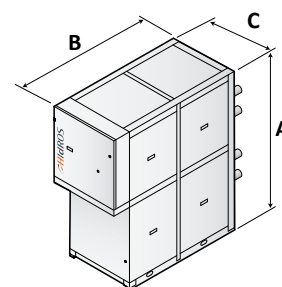
Operating limits with 5°C Δt



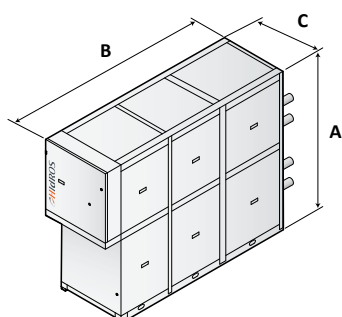
Frame 1



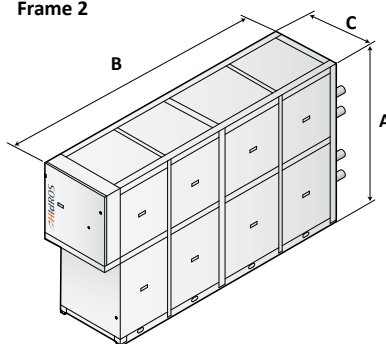
Frame 2



Frame 3



Frame 4

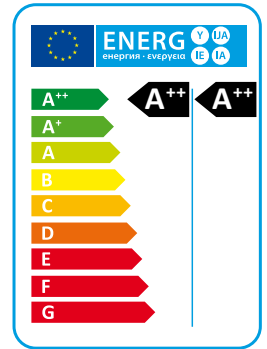


Frame 5

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

WHK

Super-high temperature water to water heat pumps



WHK heat pumps are particularly suitable for applications that use source energy at medium or high temperatures. These units have been designed to produce water at high or very high temperature for applications where it is necessary to have maximum efficiency in heating. The units are available in heating only mode and can produce water up to 78°C (HT version). A wide range of accessories allows you to choose the optimal solution.

Versions

- HH** Standard, heating only.
- LT** Low source/user temperature.
- HT** High source/user temperature.
- LS** Low noise.
- XL** Super low noise.
- P2U** 2 pipe systems without domestic hot water production.

WHK LT/XL/HH - P2U		302	402	602	702	902	1202	1402	1804	2304	2604
Heating capacity (EN14511) ⁽¹⁾	kW	38,8	46,0	58,4	70,3	88,4	109,9	136,5	176,9	219,5	273,2
Input power (EN14511) ⁽¹⁾	kW	8,2	9,4	11,8	14,8	18,8	23,1	27,9	37,2	45,7	55,3
COP (EN14511) ⁽¹⁾	W/W	4,73	4,85	4,93	4,76	4,70	4,75	4,88	4,75	4,80	4,94
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,85	5,00	5,16	5,00	5,08	5,17	5,36	5,29	5,38	5,56
η _{s,h} low temperature ⁽²⁾	%	185,9	192,1	198,2	191,8	195,3	198,9	206,3	203,4	207,0	214,4
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,07	4,19	4,28	4,18	4,16	4,22	4,35	4,27	4,34	4,47
η _{s,h} medium temperature ⁽²⁾	%	154,8	159,6	163,0	159,0	158,3	160,9	165,9	162,8	165,6	170,7
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	400/3/50	400/3/50	400/3/50
Maximum input current	A	128,7	137,6	168,0	209,0	266,0	324,0	372,5	348,0	428,0	497,5
Peak current	A	35,4	39,2	56,0	70,0	82,0	104,0	125,0	164,0	208,0	250,0
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Capacity steps	n°	2	2	2	2	2	2	2	4	4	4
Refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Global warming potential (GWP)		1430	1430	1430	1430	1430	1430	1430	1430	1430	1430
Refrigerant charge	Kg	2,0	2,0	3,0	3,0	4,0	5,0	6,0	8,5	10,5	13,0
Equivalent CO ₂ charge	t	2,9	2,9	4,3	4,3	5,7	7,2	8,6	12,2	15,0	18,6
Sound power LS version ⁽³⁾	dB(A)	75	75	80	83	84	86	88	88	89	91
Sound pressure LS version ⁽⁴⁾	dB(A)	59	59	64	67	68	70	72	72	73	75
Sound power XL version ⁽³⁾	dB(A)	65	65	70	73	74	76	78	--	--	--
Sound pressure XL version ⁽⁴⁾	dB(A)	49	49	54	57	58	60	62	--	--	--

WHK HT/XL/HH - P2U		302	402	602	702	902	1202	1402	1804	2304	2604
Heating capacity (EN14511) ⁽¹⁾	kW	37,6	43,6	64,1	75,1	97,8	121,7	150,5	195,6	243,9	301,2
Input power (EN14511) ⁽¹⁾	kW	6,7	7,5	11,1	13,7	17,6	21,7	26,2	35,0	43,1	52,2
COP (EN14511) ⁽¹⁾	W/W	5,65	5,83	5,79	5,48	5,56	5,62	5,74	5,59	5,65	5,77
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	5,71	5,83	5,91	5,81	5,85	5,94	6,09	5,95	6,01	6,20
η _{s,h} low temperature ⁽²⁾	%	220,2	225,3	228,2	224,5	226,0	229,4	235,6	230	232,4	239,9
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	4,62	4,73	4,78	4,76	4,67	4,74	4,85	4,73	4,79	4,91
η _{s,h} medium temperature ⁽²⁾	%	176,9	181,1	183,2	182,2	178,7	181,5	186,1	181	183,6	188,3
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
Maximum input current	A	111,4	128,7	167,1	208,3	267,9	324,8	372,9	353,7	430,4	498,7
Peak current	A	32,8	35,4	54,2	68,6	85,8	105,6	125,8	171,6	211,2	251,6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	4/2	4/2	4/2
Capacity steps	n°	2	2	2	2	2	2	2	4	4	4
Refrigerant		R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Global warming potential (GWP)		1430	1430	1430	1430	1430	1430	1430	1430	1430	1430
Refrigerant charge	Kg	4,0	4,0	5,0	6,0	8,0	10,0	10,0	21,0	26,0	33,0
Equivalent CO ₂ charge	t	5,7	5,7	7,2	8,6	11,4	14,3	14,3	30,0	37,2	47,2
Sound power LS version ⁽³⁾	dB(A)	75	75	80	83	84	86	88	88	89	91
Sound pressure LS version ⁽⁴⁾	dB(A)	59	59	64	67	68	70	72	72	73	75
Sound power XL version ⁽³⁾	dB(A)	65	65	70	73	74	76	78	--	--	--
Sound pressure XL version ⁽⁴⁾	dB(A)	49	49	54	57	58	60	62	--	--	--

Performances are referred to the following conditions:

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

(2) Average conditions, variable - Reg EU 811/2013

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

Refrigerant circuit

The refrigerant utilised is 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 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.

The use of this type of exchangers greatly reduces the refrigerant charge of the unit compared to the conventional shell and tube evaporators, and increases the efficiency of the refrigerant loads. The heat exchangers are factory insulated with flexible close cell material and are protected by a temperature sensor used as antifreeze protection kit.

User exchanger

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

All units are supplied with a sub-cooler to enhance the performance of the refrigerant cycle. The user heat exchangers are factory insulated with flexible close cell material.

Microprocessors

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions:

control of the water temperature, 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 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 EN60204. Access to the enclosure is achieved by removing the

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

Control and protection devices

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

Versions

WHK/HH

These units have been designed to produce water at high or very high temperature by using a source water temperature of 12°C with possibility to produce hot water up to 70°C or more.

WHK/HH/HT

This version is equipped with special compressors that allow the cooling circuit to manage high source water temperature, up to 45°C, with the consequent possibility of producing very high water temperatures on the user side up to 78°C.

WHK/HH/LT

This version is equipped with special compressors that allow the cooling circuit to manage medium source water temperature, up to 20°C, with the consequent possibility of producing very high water temperatures on the user side up to 70°C.

Version LS

This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

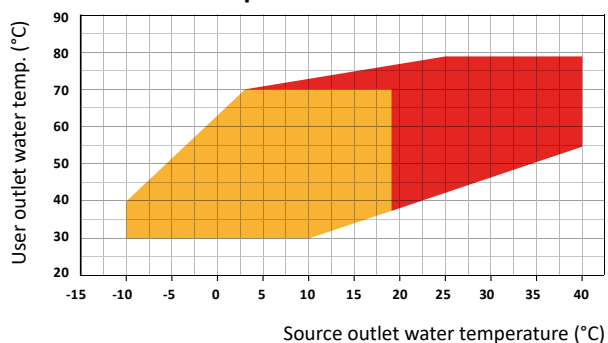
Super low noise version XL

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

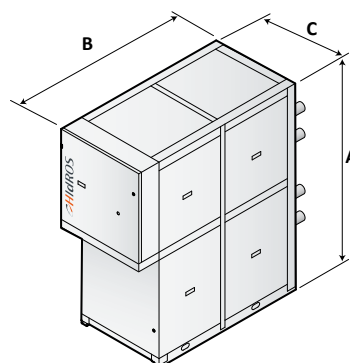
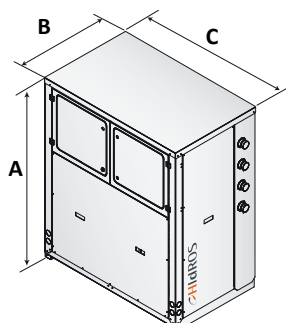
WHK		302	402	602	702	902	1202	1402	1804	2304	2604
XL Super low noise version	XL00	●	●	●	●	●	●	●	-	-	-
LS low noise version	LS00	○	○	○	○	○	○	○	●	●	●
Electronic Soft starter	DSSE	○	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○	○	○
Liquid line solenoid valve	VSLI	○	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○	○	○	○	○	○
2 way modulating valve - source	V2M0	○	○	○	○	○	○	○	○	○	○
Electronic thermostatic valve	VTEE	○	○	○	○	○	○	○	○	○	○
Hydraulic kit with 1 pump - user circuit	A1NTU	-	-	-	-	-	-	-	○	○	○
Hydraulic kit with 1 pump - source circuit	A1NTS	-	-	-	-	-	-	-	○	○	○
Hydraulic kit with 1 pump - recovery circuit	A1NTR	-	-	-	-	-	-	-	○	○	○
Hydraulic kit with 2 pumps - user circuit	A2NTU	-	-	-	-	-	-	-	○	○	○
Hydraulic kit with 2 pumps - source circuit	A2NTS	-	-	-	-	-	-	-	○	○	○
Hydraulic kit with 2 pumps - recovery circuit	A2NTR	-	-	-	-	-	-	-	○	○	○

● Standard, ○ Optional, - Not available.

Operation limits



● Heating
● Heating with HT version

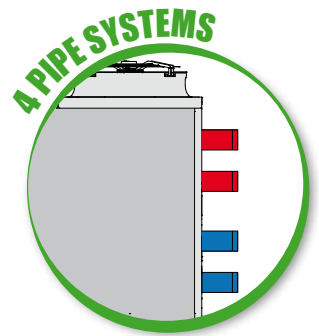
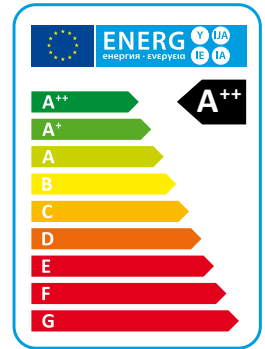
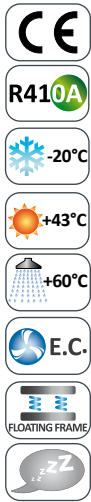


Mod.	A (mm)	B (mm)	C (mm)	Kg
302	1600	800	1150	660
402	1600	800	1150	680
602	1600	800	1150	700
702	1600	800	1150	730
902	1600	800	1150	740
1202	1600	800	1150	760
1402	1600	800	1150	790

Mod.	A (mm)	B (mm)	C (mm)	Kg
1804	1900	2170	800	1320
2304	1900	2170	800	1390
2604	1900	2170	800	1430

LHA/P4

4 pipe systems high efficiency air to water heat pumps



The high efficiency air / water heat pumps of the LHA series are units designed for 4-pipe air conditioning and heating systems, which allow the production of cold water for cooling and hot water for heating at the same time or separately. The units are supplied with an additional exchanger, used as a condenser for hot water, the production of which is independent of the operation mode of the unit. Activation of the exchanger takes place automatically via the microprocessor control when the hot water temperature on the return is lower than the set point. These units are able to produce hot water and cold water simultaneously and / or separately with very high energy efficiencies. They are all supplied complete with a specific advanced microprocessor control provided with software for managing the various priorities. The XL versions also have an extremely low noise level thanks to the use of a special floating vibration damping system that allows a noise reduction of about 10-12 dB (A) (optional).

Versions

- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with D.H.W. production.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.

Reversible heating/cooling version (RV)

SA/LS/RV - P4S		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	64,9	73,2	80,2	97,0	105,7	122,3
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,0	17,9	20,8	24,3	27,3	30,7
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,06	4,10	3,86	4,00	3,87	3,98
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,43	3,47	3,42	3,50	3,39	3,50
$\eta_{s,h}$ ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	134,3	135,9	133,7	137,1	132,7	136,9
Cooling capacity (EN14511) ⁽³⁾	kW	17,8	24,1	28,4	38,8	42,7	48,2	55,2	60,2	69,7	83,3	91,6	102,6
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	11,7	15,0	16,4	19,8	21,9	24,5	29,3	32,7	37,7	42,6
EER (EN14511) ⁽³⁾	W/W	2,52	2,45	2,42	2,58	2,61	2,43	2,52	2,46	2,38	2,55	2,43	2,41
TER (EN14511) ⁽⁴⁾	W/W	8,76	9,43	9,02	8,58	9,28	9,55	9,58	9,29	9,13	9,34	9,14	9,23
Sound power ⁽⁵⁾	dB (A)	75	75	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁶⁾	dB (A)	43	43	43	43	45	45	45	46	47	50	51	53
SE/LS/RV - P4S		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	64,9	73,1	81,0	97,0	105,6	122,7
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	15,8	17,6	20,9	24,0	27,3	30,5
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,10	4,15	3,88	4,04	3,87	4,02
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,68	3,71	3,63	3,71	3,64	3,73
$\eta_{s,h}$ ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	144,1	145,4	142,1	145,3	142,5	146,1
Cooling capacity (EN14511) ⁽³⁾	kW	17,7	24,1	28,2	39,0	43,5	48,9	55,6	61,3	70,3	84,3	92,0	103,5
Total input power (EN14511) ⁽³⁾	kW	7,0	9,8	11,8	14,9	16,0	19,5	21,8	24,0	28,9	32,3	37,4	42,2
EER (EN14511) ⁽³⁾	W/W	2,52	2,47	2,40	2,61	2,72	2,51	2,55	2,55	2,43	2,61	2,46	2,45
TER (EN14511) ⁽⁴⁾	W/W	8,76	9,43	9,02	8,58	9,28	9,55	9,58	9,29	9,13	9,34	9,14	9,23
Sound power ⁽⁵⁾	dB (A)	74	74	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁶⁾	dB (A)	42	42	43	43	45	45	45	46	47	50	51	53
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9	17,4	17,4	22,1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1	36,3	36,3	46,1

SA/LS/RV - P4S		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	136,0	157,3	169,0	196,6	215,0	211,8	226,1	258,8	330,6	357,4	393,3	431,7
Total input power (EN14511) ⁽¹⁾	kW	34,6	40,3	43,4	51,5	60,4	58,2	64,8	71,9	85,2	93,8	103,0	116,4
COP (EN14511) ⁽¹⁾	W/W	3,93	3,90	3,89	3,82	3,56	3,64	3,49	3,60	3,88	3,81	3,82	3,71
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,50	3,48	3,46	3,45	3,24	3,25	3,23	3,26	3,25	3,27	3,24	3,34
$\eta_{s,h}$ ⁽²⁾	%	137,0	136,1	135,5	134,8	126,5	127,1	126,1	127,2	127,0	127,8	126,4	130,4
Cooling capacity (EN14511) ⁽³⁾	kW	115,6	131,9	143,0	173,0	197,2	192,3	210,8	231,8	286,3	312,9	349,4	401,8
Total input power (EN14511) ⁽³⁾	kW	47,2	53,8	63,6	68,9	76,7	76,0	87,5	97,8	106,0	121,8	138,1	153,4
EER (EN14511) ⁽³⁾	W/W	2,45	2,45	2,25	2,51	2,57	2,53	2,41	2,37	2,70	2,57	2,53	2,62
TER (EN14511) ⁽⁴⁾	W/W	9,25	9,33	9,39	9,34	9,40	9,06	8,97	8,94	9,42	9,50	9,24	9,37
Sound power ⁽⁵⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁶⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
SE/LS/RV - P4S		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	137,0	157,8	170,2	197,7	217,6	213,2	227,7	261,7	330,6	357,5	396,6	435,4
Total input power (EN14511) ⁽¹⁾	kW	34,6	38,8	43,3	51,5	60,3	57,9	65,1	71,9	82,9	92,1	102,7	116,7
COP (EN14511) ⁽¹⁾	W/W	3,96	4,07	3,93	3,84	3,61	3,68	3,50	3,64	3,99	3,88	3,86	3,73
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,68	3,77	3,72	3,74	3,63	3,54	3,49	3,46	3,52	3,57	3,63	3,58
$\eta_{s,h}$ ⁽²⁾	%	144,0	147,8	145,8	146,4	142,1	138,6	136,5	135,2	137,9	139,6	142,3	140,0
Cooling capacity (EN14511) ⁽³⁾	kW	116,4	132,9	147,1	175,3	200,4	195,8	212,1	233,3	289,3	321,1	357,3	408,0
Total input power (EN14511) ⁽³⁾	kW	46,9	53,4	61,0	67,9	75,6	74,4	86,9	96,8	104,8	118,1	135,9	150,0
EER (EN14511) ⁽³⁾	W/W	2,48	2,49	2,41	2,58	2,65	2,63	2,44	2,41	2,76	2,72	2,63	2,72
TER (EN14511) ⁽⁴⁾	W/W	9,25	9,33	9,39	9,34	9,40	9,06	8,97	8,94	9,42	9,50	9,24	9,37
Sound power ⁽⁵⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁶⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	22,3	29,5	29,8	34,9	35,4	41	41,5	47,5	68,7	69,6	80,3	82,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	46,6	61,6	62,2	72,9	73,9	85,6	86,7	99,2	143,4	145,3	167,7	172,7

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.

- (4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.
- (5) Sound power level in accordance with ISO 3744.
- (6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

SA/LS/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,0	28,7	34,5	47,2	50,9	56,8	67,0	75,4	82,6	101,0	107,9	125,9
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,3	9,1	12,2	12,6	14,4	16,1	18,0	21,0	24,5	27,5	31,0
COP (EN14511) ⁽¹⁾	W/W	3,83	3,93	3,80	3,86	4,04	3,94	4,17	4,19	3,94	4,12	3,92	4,06
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,27	3,58	3,41	3,34	3,48	3,54	3,50	3,54	3,52	3,58	3,46	3,56
η _{s,h} ⁽²⁾	%	127,9	140,1	133,3	130,4	136,3	138,6	137,1	138,5	137,9	140,0	135,4	139,3
Cooling capacity (EN14511) ⁽³⁾	kW	17,8	24,1	28,4	38,8	42,7	48,2	55,2	60,2	69,7	83,3	91,6	102,6
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	11,7	15,0	16,4	19,8	21,9	24,5	29,3	32,7	37,7	42,6
EER (EN14511) ⁽³⁾	W/W	2,52	2,45	2,42	2,58	2,61	2,43	2,52	2,46	2,38	2,55	2,43	2,41
TER (EN14511) ⁽⁴⁾	W/W	8,76	9,43	9,02	8,58	9,28	9,55	9,58	9,29	9,13	9,34	9,14	9,23
Sound power ⁽⁵⁾	dB (A)	75	75	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁶⁾	dB (A)	43	43	43	43	45	45	45	46	47	50	51	53
SE/LS/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	21,9	28,6	34,2	47,1	51,1	57,1	67,2	75,7	83,5	101,3	108,7	126,6
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,9	12,4	14,4	16,0	17,9	21,0	24,3	27,5	30,9
COP (EN14511) ⁽¹⁾	W/W	3,92	3,95	3,87	3,95	4,13	3,97	4,20	4,23	3,98	4,17	3,96	4,09
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A++	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,40	3,66	3,53	3,46	3,59	3,62	3,77	3,80	3,72	3,79	3,73	3,82
η _{s,h} ⁽²⁾	%	132,8	143,2	138,3	135,5	140,4	141,7	147,7	148,9	145,6	148,6	146,2	149,6
Cooling capacity (EN14511) ⁽³⁾	kW	17,7	24,1	28,2	39,0	43,5	48,9	55,6	61,3	70,3	84,3	92,0	103,5
Total input power (EN14511) ⁽³⁾	kW	7,0	9,8	11,8	14,9	16,0	19,5	21,8	24,0	28,9	32,3	37,4	42,2
EER (EN14511) ⁽³⁾	W/W	2,52	2,47	2,40	2,61	2,72	2,51	2,55	2,55	2,43	2,61	2,46	2,45
TER (EN14511) ⁽⁴⁾	W/W	8,76	9,43	9,02	8,58	9,28	9,55	9,58	9,29	9,13	9,34	9,14	9,23
Sound power ⁽⁵⁾	dB (A)	74	74	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁶⁾	dB (A)	42	42	43	43	45	45	45	46	47	50	51	53
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,5	5,7	6,9	8,3	8,4	9,3	11,9	14,6	14,9	17,4	17,4	22,1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	11,5	11,8	14,5	17,2	17,5	19,5	24,8	30,5	31,1	36,3	36,3	46,1

SA/LS/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	140,0	161,8	173,5	202,7	222,9	218,3	234,8	268,5	341,0	369,9	406,2	444,9
Total input power (EN14511) ⁽¹⁾	kW	35,0	39,4	43,6	51,9	59,1	59,5	66,2	73,6	85,4	93,8	105,2	118,7
COP (EN14511) ⁽¹⁾	W/W	4,00	4,11	3,98	3,90	3,77	3,67	3,55	3,65	3,99	3,94	3,86	3,75
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,57	3,54	3,54	3,51	3,39	3,30	3,27	3,28	3,33	3,34	3,28	3,38
η _{s,h} ⁽²⁾	%	139,6	138,4	138,4	137,4	132,5	128,8	127,7	128,3	130,2	130,6	128,0	132,2
Cooling capacity (EN14511) ⁽³⁾	kW	115,6	131,9	143,0	173,0	197,2	192,3	210,8	231,8	286,3	312,9	349,4	401,8
Total input power (EN14511) ⁽³⁾	kW	47,2	53,8	63,6	68,9	76,7	76,0	87,5	97,8	106,0	121,8	138,1	153,4
EER (EN14511) ⁽³⁾	W/W	2,45	2,45	2,25	2,51	2,57	2,53	2,41	2,37	2,70	2,57	2,53	2,62
TER (EN14511) ⁽⁴⁾	W/W	9,25	9,33	9,39	9,34	9,40	9,06	8,97	8,94	9,42	9,50	9,24	9,37
Sound power ⁽⁵⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁶⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
SE/LS/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	141,2	163,4	175,6	204,4	224,8	219,9	236,7	272,7	339,6	371,9	408,2	449,7
Total input power (EN14511) ⁽¹⁾	kW	35,0	39,3	43,6	52,0	59,1	59,4	66,3	73,8	83,0	92,3	105,1	118,8
COP (EN14511) ⁽¹⁾	W/W	4,04	4,16	4,03	3,93	3,80	3,70	3,57	3,70	4,09	4,03	3,88	3,79
Energy Class ⁽²⁾		A+	A++	A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,77	3,84	3,78	3,82	3,80	3,56	3,51	3,48	3,63	3,66	3,64	3,61
η _{s,h} ⁽²⁾	%	147,6	150,5	148,3	149,9	149,1	139,2	137,4	136,3	142,1	143,3	142,6	141,3
Cooling capacity (EN14511) ⁽³⁾	kW	116,4	132,9	147,1	175,3	200,4	195,8	212,1	233,3	289,3	321,1	357,3	408,0
Total input power (EN14511) ⁽³⁾	kW	46,9	53,4	61,0	67,9	75,6	74,4	86,9	96,8	104,8	118,1	135,9	150,0
EER (EN14511) ⁽³⁾	W/W	2,48	2,49	2,41	2,58	2,65	2,63	2,44	2,41	2,76	2,72	2,63	2,72
TER (EN14511) ⁽⁴⁾	W/W	9,25	9,33	9,39	9,34	9,40	9,06	8,97	8,94	9,42	9,50	9,24	9,37
Sound power ⁽⁵⁾	dB (A)	86	86	86	89	90	87	89	90	90	90	92	93
Sound pressure ⁽⁶⁾	dB (A)	54	54	54	57	58	55	57	58	58	58	60	61
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	22,3	29,5	29,8	34,9	35,4	41	41,5	47,5	68,7	69,6	80,3	82,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	46,6	61,6	62,2	72,9	73,9	85,6	86,7	99,2	143,4	145,3	167,7	172,7

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/LS/RV - P4S													
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	46,9	50,7	61,2	67,3	72,6	93,1	104,7	114,4	137,2
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	9,0	11,4	12,0	13,6	15,4	17,0	22,1	25,3	28,4	32,4
COP (EN14511) ⁽¹⁾	W/W	4,11	4,12	4,13	4,11	4,22	4,49	4,38	4,27	4,21	4,14	4,03	4,24
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,40	3,69	3,53	3,57	3,67	3,97	3,91	3,87	3,70	3,67	3,69	3,70
$\eta_{s,h}$ ⁽²⁾	%	132,9	144,7	138,0	139,6	143,8	155,7	153,4	151,6	145,1	143,7	144,4	144,8
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,5	30,8	39,9	44,2	52,3	57,4	62,6	79,8	89,6	97,8	117,0
Total input power (EN14511) ⁽³⁾	kW	7,0	9,6	10,9	15,0	16,3	18,4	21,5	24,5	27,2	31,7	36,5	43,8
EER (EN14511) ⁽³⁾	W/W	2,57	2,56	2,84	2,65	2,72	2,84	2,67	2,55	2,93	2,83	2,68	2,67
TER (EN14511) ⁽⁴⁾	W/W	9,05	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	75	75	75	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁶⁾	dB (A)	43	43	43	43	44	44	45	46	50	51	53	54
HE/LS/RV - P4S													
Heating capacity (EN14511) ⁽¹⁾	kW	22,2	29,6	37,3	47,1	50,8	61,2	67,3	74,9	93,2	104,9	114,9	137,1
Total input power (EN14511) ⁽¹⁾	kW	5,3	7,1	8,8	11,5	11,8	13,3	15,1	17,2	21,2	24,5	27,8	30,9
COP (EN14511) ⁽¹⁾	W/W	4,11	4,16	4,23	4,11	4,32	4,61	4,46	4,36	4,40	4,29	4,13	4,44
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,83	3,86	3,85	3,85	3,92	4,13	4,04	3,97	3,87	3,85	3,83	3,85
$\eta_{s,h}$ ⁽²⁾	%	150,1	151,4	150,9	151,1	153,6	162,0	158,4	155,8	151,7	150,8	150,2	151,0
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,6	30,5	40,6	44,2	52,4	57,5	63,4	80,5	90,2	100,5	117,4
Total input power (EN14511) ⁽³⁾	kW	6,9	9,5	11,0	14,5	16,1	18,3	21,3	23,9	26,6	31,2	35,1	38,6
EER (EN14511) ⁽³⁾	W/W	2,62	2,59	2,78	2,81	2,74	2,87	2,70	2,65	3,03	2,89	2,86	3,04
TER (EN14511) ⁽⁴⁾	W/W	9,05	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	73	74	74	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁶⁾	dB (A)	41	42	42	43	44	44	45	46	50	51	53	54
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5	22,5	22,5	34,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0	47,0	47,0	71,8

HA/LS/RV - P4S													
Heating capacity (EN14511) ⁽¹⁾	kW	150,8	167,2	182,0	209,7	239,2	228,6	270,2	295,6	335,0	363,1	404,5	458,7
Total input power (EN14511) ⁽¹⁾	kW	35,8	41,3	45,4	50,3	55,8	56,7	67,0	74,1	83,5	90,3	105,1	116,4
COP (EN14511) ⁽¹⁾	W/W	4,21	4,05	4,01	4,17	4,29	4,03	4,03	3,99	4,01	4,02	3,85	3,94
Energy Class ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,74	3,69	3,62	3,76	3,83	3,65	3,63	3,65	3,66	3,73	3,61	3,63
$\eta_{s,h}$ ⁽²⁾	%	146,4	144,7	141,9	147,3	150,3	143,1	142,0	142,9	143,3	146,1	141,4	142,0
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	144,5	159,3	180,2	199,7	197,4	230,1	257,2	288,2	325,6	366,0	405,0
Total input power (EN14511) ⁽³⁾	kW	44,3	51,8	58,8	66,3	74,5	73,1	81,9	91,5	105,6	116,7	136,1	155,2
EER (EN14511) ⁽³⁾	W/W	2,92	2,79	2,71	2,72	2,68	2,70	2,81	2,81	2,73	2,79	2,69	2,61
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁶⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
HE/LS/RV - P4S													
Heating capacity (EN14511) ⁽¹⁾	kW	151,0	167,9	182,8	210,6	241,3	229,4	271,4	296,7	339,0	364,9	407,0	463,7
Total input power (EN14511) ⁽¹⁾	kW	34,4	40,2	45,5	49,4	54,8	55,8	63,9	71,5	83,7	88,8	104,1	115,1
COP (EN14511) ⁽¹⁾	W/W	4,39	4,18	4,02	4,26	4,40	4,11	4,25	4,15	4,05	4,11	3,91	4,03
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,86	3,85	3,84	3,92	3,97	3,83	3,85	3,83	3,91	3,89	3,87	3,86
$\eta_{s,h}$ ⁽²⁾	%	151,3	150,9	150,4	153,6	155,6	150,2	151,1	150,3	153,5	152,4	151,9	151,5
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	146,8	159,2	180,4	202,1	198,5	231,0	259,7	289,4	322,6	368,5	416,0
Total input power (EN14511) ⁽³⁾	kW	44,0	50,8	58,7	66,1	73,2	72,7	80,5	89,2	105,2	118,2	135,0	154,6
EER (EN14511) ⁽³⁾	W/W	2,94	2,89	2,71	2,73	2,76	2,73	2,87	2,91	2,75	2,73	2,73	2,69
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁶⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	34,8	35,3	35,3	49,4	57,3	56,7	66,5	67,1	68,0	79,9	81,1	97,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	72,7	73,7	73,7	103,1	119,6	118,4	138,9	140,1	142,0	166,8	169,3	204,0

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/LS/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	22,9	30,5	37,3	46,9	50,7	63,6	69,6	75,0	96,6	108,3	118,1	142,2
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,3	9,0	11,4	12,0	13,7	15,5	17,1	22,3	25,5	28,7	32,6
COP (EN14511) ⁽¹⁾	W/W	4,11	4,20	4,13	4,11	4,22	4,64	4,50	4,39	4,33	4,24	4,11	4,36
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,47	3,76	3,53	3,57	3,67	4,04	4,00	3,95	3,76	3,73	3,78	3,76
$\eta_{s,h}$ ⁽²⁾	%	135,7	147,4	138,0	139,6	143,8	158,5	156,8	155,0	147,4	146,1	148,3	147,3
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,5	30,8	39,9	44,2	52,3	57,4	62,6	79,8	89,6	97,8	117,0
Total input power (EN14511) ⁽³⁾	kW	7,0	9,6	10,9	15,0	16,3	18,4	21,5	24,5	27,2	31,7	36,5	43,8
EER (EN14511) ⁽³⁾	W/W	2,57	2,56	2,84	2,65	2,72	2,84	2,67	2,55	2,93	2,83	2,68	2,67
TER (EN14511) ⁽⁴⁾	W/W	9,05	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	75	75	75	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁶⁾	dB (A)	43	43	43	43	44	44	45	46	50	51	53	54
HE/LS/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	23,0	30,5	37,3	47,1	50,8	63,5	69,7	75,0	96,8	108,6	118,5	142,1
Total input power (EN14511) ⁽¹⁾	kW	5,4	7,2	8,8	11,5	11,8	13,4	15,2	16,9	21,4	24,8	28,2	31,2
COP (EN14511) ⁽¹⁾	W/W	4,24	4,27	4,23	4,11	4,32	4,75	4,59	4,44	4,53	4,39	4,21	4,55
Energy Class ⁽²⁾		A+	A++	A++	A++	A++	A++	A++	A++	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,92	3,93	3,85	3,85	3,92	4,20	4,12	4,06	3,92	3,91	3,92	3,92
$\eta_{s,h}$ ⁽²⁾	%	153,9	154,2	150,9	151,1	153,6	165,0	161,8	159,2	153,8	153,4	153,8	153,9
Cooling capacity (EN14511) ⁽³⁾	kW	18,1	24,6	30,5	40,6	44,2	52,4	57,5	63,4	80,5	90,2	100,5	117,4
Total input power (EN14511) ⁽³⁾	kW	6,9	9,5	11,0	14,5	16,1	18,3	21,3	23,9	26,6	31,2	35,1	38,6
EER (EN14511) ⁽³⁾	W/W	2,62	2,59	2,78	2,81	2,74	2,87	2,70	2,65	3,03	2,89	2,86	3,04
TER (EN14511) ⁽⁴⁾	W/W	9,05	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	73	74	74	75	76	76	77	78	82	83	85	86
Sound pressure ⁽⁶⁾	dB (A)	41	42	42	43	44	44	45	46	50	51	53	54
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5	22,5	22,5	34,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0	47,0	47,0	71,8

HA/LS/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	156,2	173,5	188,7	216,2	247,7	235,9	279,5	306,4	337,5	372,8	417,0	474,8
Total input power (EN14511) ⁽¹⁾	kW	36,0	40,5	45,3	50,6	56,1	58,1	68,5	74,6	83,5	92,1	107,2	118,9
COP (EN14511) ⁽¹⁾	W/W	4,34	4,28	4,17	4,27	4,41	4,06	4,08	4,11	4,04	4,05	3,89	3,99
Energy Class ⁽²⁾		A+	A++	A+	A++	A++	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,81	3,83	3,77	3,85	3,96	3,68	3,63	3,74	3,74	3,75	3,63	3,66
$\eta_{s,h}$ ⁽²⁾	%	149,2	150,0	147,8	151,0	155,5	144,2	142,2	146,5	146,6	146,8	142,0	143,5
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	144,5	159,3	180,2	199,7	197,4	230,1	257,2	288,2	325,6	366,0	405,0
Total input power (EN14511) ⁽³⁾	kW	44,3	51,8	58,8	66,3	74,5	73,1	81,9	91,5	105,6	116,7	136,1	155,2
EER (EN14511) ⁽³⁾	W/W	2,92	2,79	2,71	2,72	2,68	2,70	2,81	2,81	2,73	2,79	2,69	2,61
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁶⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
HE/LS/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	156,5	174,2	189,4	217,1	248,1	236,9	280,2	307,9	340,6	375,7	419,5	479,1
Total input power (EN14511) ⁽¹⁾	kW	34,8	39,5	44,7	50,0	55,3	57,0	65,6	72,0	81,6	90,9	106,4	117,3
COP (EN14511) ⁽¹⁾	W/W	4,50	4,41	4,24	4,34	4,49	4,15	4,27	4,28	4,17	4,13	3,94	4,08
Energy Class ⁽²⁾		A++	A++	A+	A++	A++	A+	A+	A+	A+	A+	A+	A+
SCOP ⁽²⁾	kWh/kWh	3,92	3,98	3,98	4,00	4,08	3,86	3,91	3,94	4,01	3,89	3,88	3,90
$\eta_{s,h}$ ⁽²⁾	%	153,6	156,1	156,1	156,8	160,3	151,3	153,5	154,5	157,3	152,7	152,2	153,0
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	146,8	159,2	180,4	202,1	198,5	231,0	259,7	289,4	322,6	368,5	416,0
Total input power (EN14511) ⁽³⁾	kW	44,0	50,8	58,7	66,1	73,2	72,7	80,5	89,2	105,2	118,2	135,0	154,6
EER (EN14511) ⁽³⁾	W/W	2,94	2,89	2,71	2,73	2,76	2,73	2,87	2,91	2,75	2,73	2,73	2,69
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	87	87	87	89	91	88	89	90	90	90	92	92
Sound pressure ⁽⁶⁾	dB (A)	55	55	55	57	59	56	57	58	58	58	60	60
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	34,8	35,3	35,3	49,4	57,3	56,7	66,5	67,1	68,0	79,9	81,1	97,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	72,7	73,7	73,7	103,1	119,6	118,4	138,9	140,1	142,0	166,8	169,3	204,0

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
- (4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.
- (5) Sound power level in accordance with ISO 3744.
- (6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/XL/RV - P4S		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	23,1	29,8	36,8	46,2	49,4	60,1	65,9	71,0	91,6	101,7	111,1	134,8
Total input power (EN14511) ⁽¹⁾	kW	5,6	7,2	8,8	11,2	11,7	13,4	15,1	16,7	20,9	23,9	27,0	30,5
COP (EN14511) ⁽¹⁾	W/W	4,12	4,13	4,20	4,12	4,21	4,50	4,35	4,25	4,39	4,26	4,11	4,42
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A++	A++	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,36	3,58	3,68	3,65	3,77	4,04	3,96	3,89	3,88	3,87	3,72	3,95
η _{s,h} ⁽²⁾	%	131,2	140,2	144,0	143,0	147,9	158,6	155,4	152,7	152,2	151,6	145,7	155,1
Cooling capacity (EN14511) ⁽³⁾	kW	19,5	24,7	29,7	38,9	42,8	50,4	55,7	60,3	78,1	86,4	94,1	114,3
Total input power (EN14511) ⁽³⁾	kW	7,2	9,7	11,2	15,4	16,7	19,1	22,0	25,1	26,7	31,5	36,8	39,0
EER (EN14511) ⁽³⁾	W/W	2,72	2,55	2,65	2,54	2,57	2,64	2,53	2,40	2,93	2,74	2,56	2,93
TER (EN14511) ⁽⁴⁾	W/W	9,44	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	70	70	70	70	72	72	72	73	75	76	78	80
Sound pressure ⁽⁶⁾	dB (A)	38	38	38	38	40	40	40	41	43	44	46	48
HE/XL/RV - P4S		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	23,1	29,8	36,9	46,3	49,7	60,0	65,9	71,0	91,4	101,4	111,0	134,5
Total input power (EN14511) ⁽¹⁾	kW	5,5	7,1	8,5	11,1	11,4	13,1	14,9	16,6	20,3	23,4	26,4	29,6
COP (EN14511) ⁽¹⁾	W/W	4,23	4,18	4,34	4,16	4,35	4,59	4,42	4,29	4,51	4,34	4,21	4,55
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,83	3,86	3,92	3,91	3,98	4,19	4,09	4,00	4,05	4,01	3,86	4,13
η _{s,h} ⁽²⁾	%	150,2	151,3	153,8	153,2	156,2	164,5	160,6	156,9	158,8	157,4	151,5	162,3
Cooling capacity (EN14511) ⁽³⁾	kW	19,7	25,4	30,4	39,9	44,1	52,4	57,5	63,4	80,5	90,2	100,5	117,4
Total input power (EN14511) ⁽³⁾	kW	7,0	9,3	10,9	14,9	16,2	18,3	21,3	24,0	26,6	31,2	35,2	38,6
EER (EN14511) ⁽³⁾	W/W	2,83	2,73	2,78	2,67	2,72	2,87	2,70	2,65	3,03	2,89	2,86	3,04
TER (EN14511) ⁽⁴⁾	W/W	9,44	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	64	65	67	69	72	72	72	73	74	76	78	79
Sound pressure ⁽⁶⁾	dB (A)	32	33	35	37	40	40	40	41	42	44	46	47
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5	22,5	22,5	34,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0	47,0	47,0	71,8

HA/XL/RV - P4S		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	148,2	162,5	176,9	204,1	232,2	221,2	265,0	287,3	317,0	349,0	389,3	439,8
Total input power (EN14511) ⁽¹⁾	kW	33,8	39,3	43,9	48,1	53,8	54,0	62,6	69,7	78,3	85,5	97,8	109,1
COP (EN14511) ⁽¹⁾	W/W	4,39	4,13	4,03	4,24	4,32	4,10	4,23	4,12	4,05	4,08	3,98	4,03
Energy Class ⁽²⁾		A++	A++	A+	A++	A++	A+	A+	A+	A+	A++	A++	A+
SCOP ⁽²⁾	kWh/kWh	3,92	3,86	3,76	4,00	3,98	3,74	3,79	3,78	3,82	3,88	3,83	3,81
η _{s,h} ⁽²⁾	%	153,7	151,3	147,3	156,8	156,3	146,5	148,6	148,2	149,8	152,0	150,3	149,2
Cooling capacity (EN14511) ⁽³⁾	kW	124,4	139,3	152,2	174,1	187,4	190,3	223,6	245,3	275,7	306,0	353,1	381,9
Total input power (EN14511) ⁽³⁾	kW	44,4	52,0	59,7	67,0	78,1	73,8	80,1	91,5	106,4	120,5	135,8	155,9
EER (EN14511) ⁽³⁾	W/W	2,80	2,68	2,55	2,60	2,40	2,58	2,79	2,68	2,59	2,54	2,60	2,45
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	81	81	81	83	84	81	83	84	84	84	86	87
Sound pressure ⁽⁶⁾	dB (A)	49	49	49	51	52	49	51	52	52	52	54	55
HE/XL/RV - P4S		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	147,7	162,2	175,5	202,8	230,8	220,5	264,9	287,2	317,0	348,5	407,2	441,7
Total input power (EN14511) ⁽¹⁾	kW	33,0	38,6	43,4	47,6	52,9	53,0	60,9	68,2	77,1	84,6	97,2	108,0
COP (EN14511) ⁽¹⁾	W/W	4,48	4,20	4,04	4,26	4,36	4,16	4,35	4,21	4,11	4,12	4,19	4,09
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	4,06	4,01	3,85	4,10	4,06	3,84	3,97	3,92	3,96	3,97	3,97	3,91
η _{s,h} ⁽²⁾	%	159,5	157,4	151,1	161,0	159,3	150,4	155,9	153,8	155,5	155,9	155,8	153,5
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	146,8	159,2	180,4	202,1	198,5	231,0	259,7	289,4	322,6	368,5	406,9
Total input power (EN14511) ⁽³⁾	kW	44,1	50,8	58,8	66,2	73,3	72,7	80,5	89,2	105,2	118,2	135,0	151,3
EER (EN14511) ⁽³⁾	W/W	2,94	2,89	2,71	2,73	2,76	2,73	2,87	2,91	2,75	2,73	2,73	2,69
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	80	81	81	83	84	81	82	83	84	84	86	87
Sound pressure ⁽⁶⁾	dB (A)	48	49	49	51	52	49	51	52	52	52	54	55
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	34,8	35,3	35,3	49,4	57,3	56,7	66,5	67,1	68,0	79,9	81,1	97,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	72,7	73,7	73,7	103,1	119,6	118,4	138,9	140,1	142,0	166,8	169,3	204,0

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, low temperature, variable - Reg EU 811/2013
- (3) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
- (4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.
- (5) Sound power level in accordance with ISO 3744.
- (6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/XL/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	23,9	30,7	36,8	46,2	49,4	62,2	67,9	72,8	94,9	104,9	114,8	139,7
Total input power (EN14511) ⁽¹⁾	kW	5,8	7,4	8,8	11,2	11,7	13,5	15,2	16,8	21,0	24,1	27,2	30,7
COP (EN14511) ⁽¹⁾	W/W	4,15	4,14	4,20	4,12	4,21	4,62	4,47	4,35	4,52	4,36	4,22	4,55
Energy Class ⁽²⁾		A+	A+	A+	A+	A+	A++	A++	A++	A++	A++	A+	A++
SCOP ⁽²⁾	kWh/kWh	3,45	3,65	3,68	3,65	3,77	4,11	4,06	3,99	3,96	3,94	3,80	4,03
$\eta_{s,h}$ ⁽²⁾	%	134,9	142,8	144,0	143,0	147,9	161,5	159,4	156,7	155,2	154,7	148,8	158,2
Cooling capacity (EN14511) ⁽³⁾	kW	19,5	24,7	29,7	38,9	42,8	50,4	55,7	60,3	78,1	86,4	94,1	114,3
Total input power (EN14511) ⁽³⁾	kW	7,2	9,7	11,2	15,4	16,7	19,1	22,0	25,1	26,7	31,5	36,8	39,0
EER (EN14511) ⁽³⁾	W/W	2,72	2,55	2,65	2,54	2,57	2,64	2,53	2,40	2,93	2,74	2,56	2,93
TER (EN14511) ⁽⁴⁾	W/W	9,44	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	70	70	70	70	72	72	72	73	75	76	78	80
Sound pressure ⁽⁶⁾	dB (A)	38	38	38	38	40	40	40	41	43	44	46	48
HE/XL/RV - P4U		252	302	402	452	502	602	702	802	902	1002	1202	1402
Heating capacity (EN14511) ⁽¹⁾	kW	23,9	30,7	36,9	46,3	49,7	62,0	67,9	72,8	94,7	104,6	113,8	139,4
Total input power (EN14511) ⁽¹⁾	kW	5,5	7,1	8,5	11,1	11,4	13,2	14,9	16,5	20,4	23,6	26,8	29,8
COP (EN14511) ⁽¹⁾	W/W	4,39	4,29	4,34	4,16	4,35	4,71	4,55	4,40	4,64	4,44	4,25	4,68
Energy Class ⁽²⁾		A+	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	3,96	3,93	3,92	3,91	3,98	4,26	4,19	4,10	4,08	4,10	3,92	4,22
$\eta_{s,h}$ ⁽²⁾	%	155,2	154,3	153,8	153,2	156,2	167,5	164,4	161,1	160,1	160,9	153,7	165,8
Cooling capacity (EN14511) ⁽³⁾	kW	19,7	25,4	30,4	39,9	44,1	52,4	57,5	63,4	80,5	90,2	100,5	117,4
Total input power (EN14511) ⁽³⁾	kW	7,0	9,3	10,9	14,9	16,2	18,3	21,3	24,0	26,6	31,2	35,2	38,6
EER (EN14511) ⁽³⁾	W/W	2,83	2,73	2,78	2,67	2,72	2,87	2,70	2,65	3,03	2,89	2,86	3,04
TER (EN14511) ⁽⁴⁾	W/W	9,44	9,43	9,56	9,54	10,41	10,48	10,42	10,43	9,84	9,63	9,46	9,91
Sound power ⁽⁵⁾	dB (A)	64	65	67	69	72	72	72	73	74	76	78	79
Sound pressure ⁽⁶⁾	dB (A)	32	33	35	37	40	40	40	41	42	44	46	47
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,6	10,9	11,1	14,8	14,9	15,2	22,5	22,5	22,5	34,4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,1	16,1	22,1	22,7	23,2	30,9	31,1	31,7	47,0	47,0	47,0	71,8

HA/XL/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	152,4	168,7	183,3	209,6	238,5	228,9	272,9	296,0	327,2	361,2	402,2	452,6
Total input power (EN14511) ⁽¹⁾	kW	34,0	38,3	43,0	48,3	53,8	55,1	64,0	69,8	78,5	86,9	99,7	111,0
COP (EN14511) ⁽¹⁾	W/W	4,49	4,40	4,27	4,34	4,43	4,16	4,26	4,24	4,17	4,16	4,03	4,08
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A+	A+	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	4,00	4,02	3,94	4,08	4,10	3,76	3,80	3,90	3,92	3,89	3,85	3,85
$\eta_{s,h}$ ⁽²⁾	%	157,1	157,9	154,4	160,0	160,9	147,2	149,1	152,9	153,6	152,4	151,1	150,8
Cooling capacity (EN14511) ⁽³⁾	kW	124,4	139,3	152,2	174,1	187,4	190,3	223,6	245,3	275,7	306,0	353,1	381,9
Total input power (EN14511) ⁽³⁾	kW	44,4	52,0	59,7	67,0	78,1	73,8	80,1	91,5	106,4	120,5	135,8	155,9
EER (EN14511) ⁽³⁾	W/W	2,80	2,68	2,55	2,60	2,40	2,58	2,79	2,68	2,59	2,54	2,60	2,45
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	81	81	81	83	84	81	83	84	84	84	86	87
Sound pressure ⁽⁶⁾	dB (A)	49	49	49	51	52	49	51	52	52	52	54	55
HE/XL/RV - P4U		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Heating capacity (EN14511) ⁽¹⁾	kW	151,8	168,2	182,6	208,9	237,7	228,1	272,9	296,0	327,3	358,7	401,0	454,4
Total input power (EN14511) ⁽¹⁾	kW	33,2	37,6	42,4	47,8	53,1	54,3	62,3	68,4	77,4	86,1	98,7	110,1
COP (EN14511) ⁽¹⁾	W/W	4,58	4,47	4,30	4,37	4,47	4,20	4,38	4,33	4,23	4,17	4,06	4,13
Energy Class ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP ⁽²⁾	kWh/kWh	4,15	4,16	4,03	4,17	4,18	3,85	3,98	4,04	4,06	3,99	3,99	3,96
$\eta_{s,h}$ ⁽²⁾	%	163,0	163,4	158,2	163,9	164,0	151,1	156,3	158,5	159,2	156,4	156,6	155,3
Cooling capacity (EN14511) ⁽³⁾	kW	129,5	146,8	159,2	180,4	202,1	198,5	231,0	259,7	289,4	322,6	368,5	406,9
Total input power (EN14511) ⁽³⁾	kW	44,1	50,8	58,8	66,2	73,3	72,7	80,5	89,2	105,2	118,2	135,0	151,3
EER (EN14511) ⁽³⁾	W/W	2,94	2,89	2,71	2,73	2,76	2,73	2,87	2,91	2,75	2,73	2,73	2,69
TER (EN14511) ⁽⁴⁾	W/W	9,87	9,99	9,90	9,79	9,74	9,27	9,18	9,60	9,68	9,71	9,62	9,50
Sound power ⁽⁵⁾	dB (A)	80	81	81	83	84	81	82	83	84	84	86	87
Sound pressure ⁽⁶⁾	dB (A)	48	49	49	51	52	49	51	52	52	52	54	55
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	34,8	35,3	35,3	49,4	57,3	56,7	66,5	67,1	68,0	79,9	81,1	97,7
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	72,7	73,7	73,7	103,1	119,6	118,4	138,9	140,1	142,0	166,8	169,3	204,0

Performances are referred to the following conditions:

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

(2) Average conditions, low temperature, variable - Reg EU 811/2013

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

(4) TER: Total Energy Ratio - cold circuit 12/7°C, hot circuit 30/35°C.

(5) Sound power level in accordance with ISO 3744.

(6) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

Refrigerant circuit

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

Compressors

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

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

Source heat exchanger

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

User heat exchangers

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

The use of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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, in LS versions are 6 poles type rotating at approximately 900 rpm. In the XL versions the fans are 8 poles type (approx 600 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

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

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

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors.

The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors, 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 in HA and HE versions 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 P2S) is already equipped with this probe, but it must be installed in the user circuit.

VERSIONS

P4U version

The P4U units use 4 hydraulic connections and are used in modern 4-pipe systems. In these systems, cold and hot water is always available (in every period of the year) and present in the specific hydraulic circuit.

These systems allow the simultaneous production of cold water and hot water using 4 hydraulic connections, 2 connections are related to the hot water circuit, 2 connections are related to the cold water circuit.

The plant thus conceived is able to heat and, at the same time, if required, to cool with very high energy efficiencies. In this configuration, however, the units are also able to produce hot or cold water separately at any time of the year.

The units are supplied with 2 heat exchangers, one dedicated to the production of cold water and one dedicated to the production of hot water.

The operating modes are:

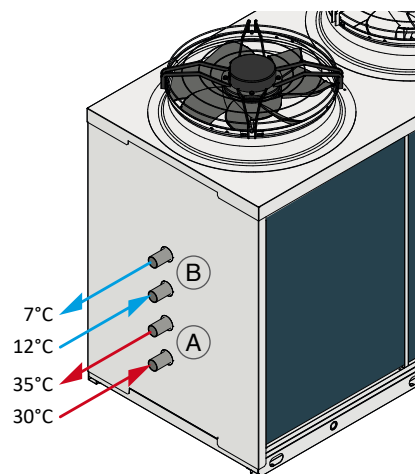
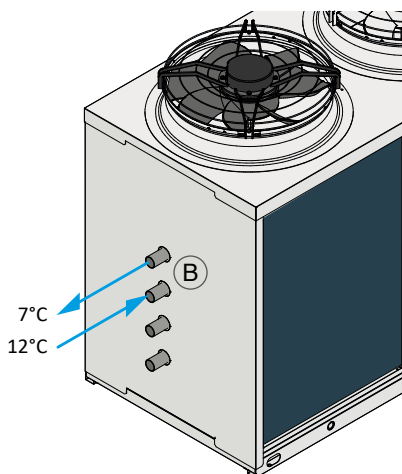
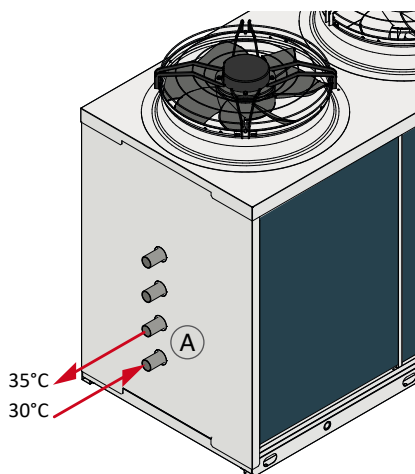
- 1. User water heating:** The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.
- 2. User water cooling:** The unit behaves like a normal air / water chiller in cooling mode, using the finned exchanger as the source and the B plate heat exchanger as user.
- 3. Simultaneous user Cooling + heating:** The unit behaves like a water / water heat pump, using the plate heat exchanger B as the cold user and the plate heat exchanger A as hot user. This version is not able to produce domestic hot water.

P4U version

User water heating

User water cooling

Simultaneous user Cooling + heating



The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

P4S Version

The P4S units have been designed to meet the needs of 2 + 2 pipe systems (2 user side pipes, 2 domestic hot water pipes) throughout the year. The units are supplied with 2 exchangers, one dedicated to the production of the user cold and hot water and one dedicated to the production of domestic hot water only (D.H.W.). The production of domestic hot water always has priority. In winter mode the activation of D.H.W. production temporarily stops the production of the user hot water, which is restored when the D.H.W. accumulation reaches the temperature set. In summer mode the unit will switch to cooling (by activating the reverse cycle valve installed in the refrigerant circuit) and any request for domestic hot water will allow, at the same time, the production of cold water. In this operating mode, the system can simultaneously produce cold water and domestic hot water. Domestic hot water, in summer mode, is produced by heat recovery and therefore free of charge. When the temperature measured by the D.H.W. sensor reaches the set, the D.H.W. water pump is stopped and normal operation is restored in cooling mode.

The operating modes are:

- 1. User water heating:** The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.
- 2. User water cooling:** The unit behaves like a normal air/water chiller in cooling mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.

3. Domestic hot water production (D.H.W.): The unit behaves like a normal air / water heat pump in heating mode, using the finned heat exchanger as the source and as a user the plate heat exchanger B (a special D.H.W. heat exchanger that works with a higher set point).

4. User water cooling + D.H.W. production: The unit behaves like a water / water heat pump, using the plate heat exchanger A as the cold user and the plate heat exchanger B as D.H.W. production).

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

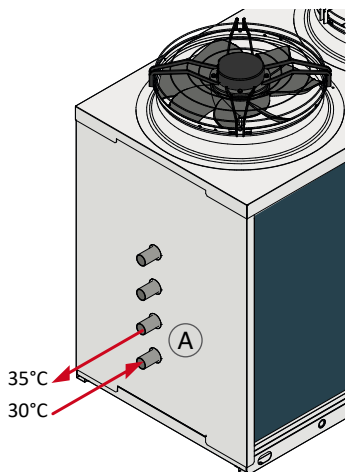
High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

Version LS

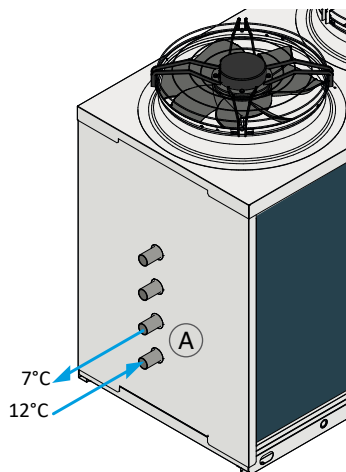
This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

P4S version

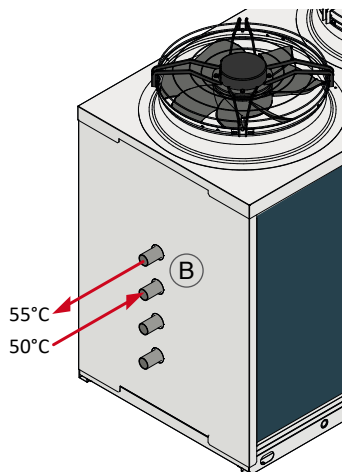
User water heating



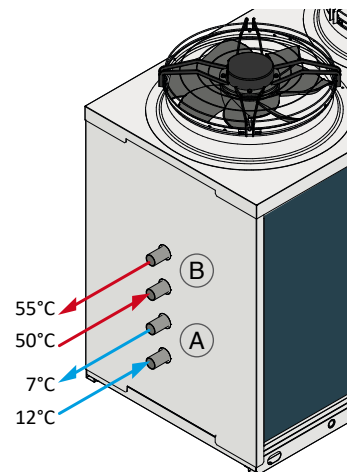
User water cooling



Domestic hot water production (D.H.W.)



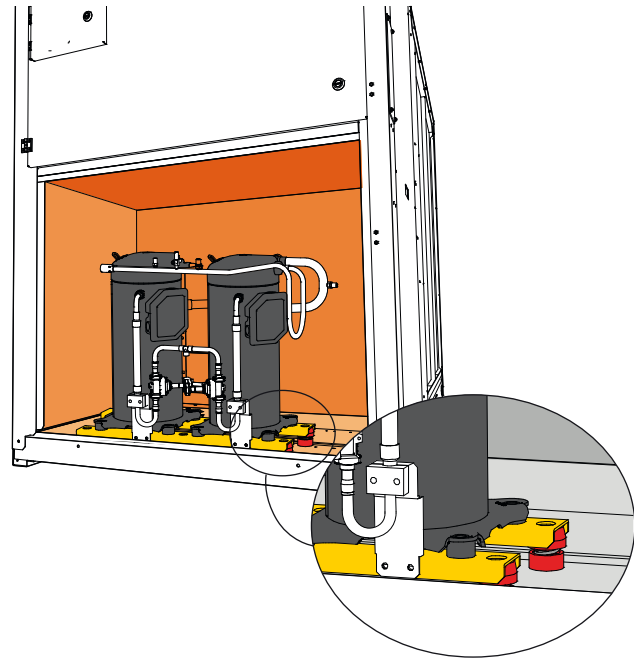
User water cooling + D.H.W. production



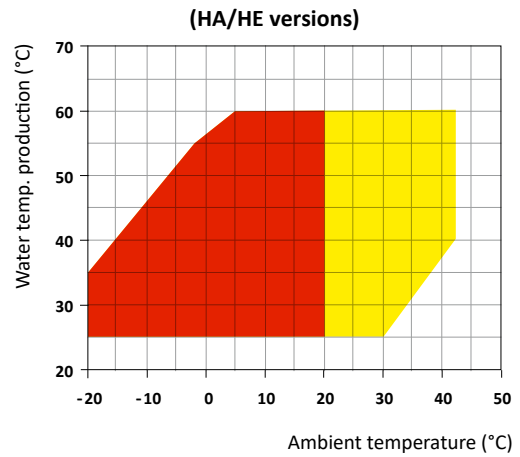
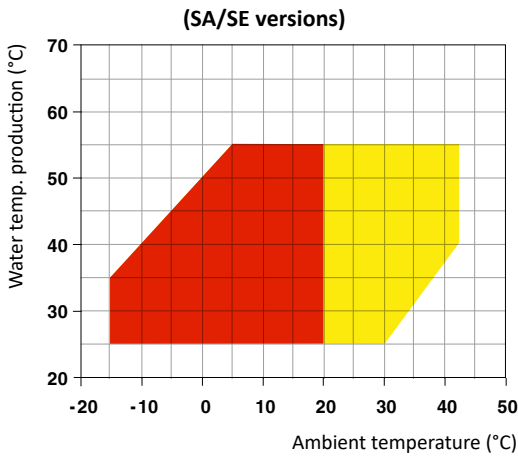
The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

HA/XL HE/XL Super low noise version

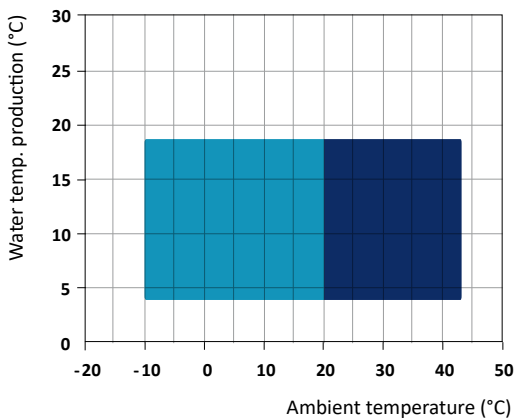
All HA and HE units in XL super low noise version are supplied, as standard, with the latest 'Floating Frame' technology that completely isolates the compressors from the main casing, thereby eliminating vibration and noise from this source. The 'Floating Frame' is a special vibration and acoustic damping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



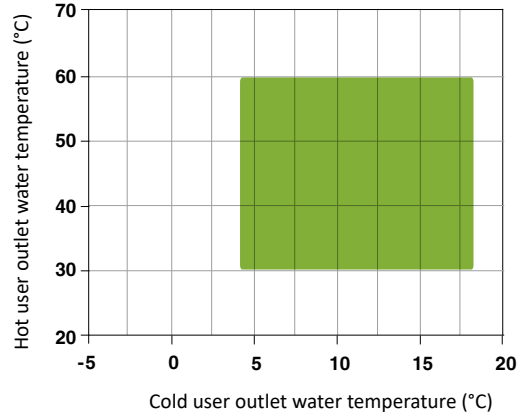
Operation limits in heating mode



Operation limits in cooling mode



Operation limits in combined mode

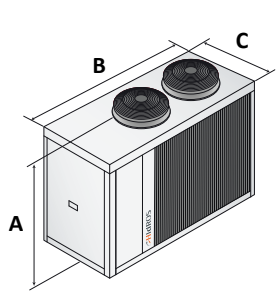


- Heating mode
- Heating mode with head pressure control (DCCF)
- Cooling with head pressure control (DCCF)

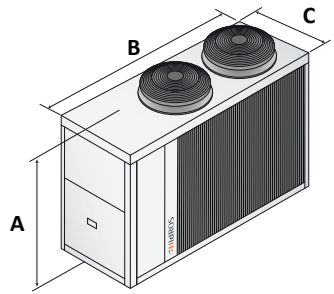
- Cooling mode
- Combined mode

LHA SA-SE/HH-RV	LHA HA-HE/HH-RV	P4S/P4U	252	302	402	452	502	602	702	802
Flow switch			●	●	●	●	●	●	●	●
User circuit water strainer			○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version			–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version			●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE		●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE		●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA		○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF		●	●	●	●	●	●	●	●
Antifreeze kit for 4 pipe units	RAEV4		○	○	○	○	○	○	○	○
Electronic soft starter	DSSE		○	○	○	○	○	○	○	○
Serial interface card RS485	INSE		○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG		○	○	○	○	○	○	○	○
Remote control panel	PCRL		○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE		○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS		○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU		○	○	○	○	○	○	○	○

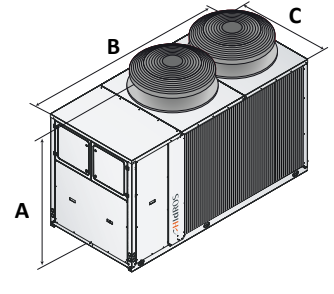
● Standard ○ Optional – Not available



SA/SE 252 - 302 - 402
HA/HE 252 - 302



SA/SE 452 - 502 - 602
HA/HE 402 - 452 - 502

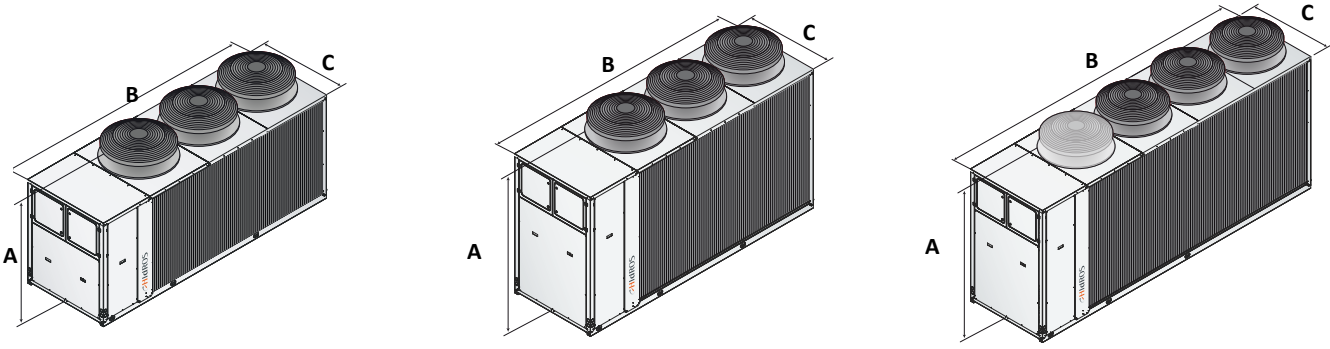


SA/SE 702 - 802 - 902
HA/HE 602 - 702 - 802 - 902 - 1002 - 1202

		252	302	402	452	502	602	702	802
A	SA-SE/LS	1470	1470	1470	1670	1670	1670	1820	1820
B	SA-SE/LS	1910	1910	1910	2200	2200	2200	2905	2905
C	SA-SE/LS	900	900	900	900	900	900	1150	1150
Kg	SA-SE/LS	550	550	560	670	700	760	880	890
A	HA-HE/LS	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/LS	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/LS	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/LS	560	560	670	690	720	1060	1060	1070
A	HA-HE/XL	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/XL	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/XL	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/XL	570	570	680	710	740	1080	1080	1090

LHA SA-SE/HH-RV	LHA HA-HE/HH-RV	P4S/P4U	902	1002	1202	1402	1602	1802	2002	2302
Flow switch			●	●	●	●	●	●	●	●
User circuit water strainer			○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version			–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version			●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE		●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE		●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA		○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF		●	●	●	●	●	●	●	●
Antifreeze kit for 4 pipe units	RAEV4		○	○	○	○	○	○	○	○
Electronic soft starter	DSSE		○	○	○	○	○	○	○	○
Serial interface card RS485	INSE		○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG		○	○	○	○	○	○	○	○
Remote control panel	PCRL		○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE		○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS		○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU		○	○	○	○	○	○	○	○

● Standard ○ Optional – Not available



SA/SE 1002 - 1202 - 1402 - 1602
HA/HE 1402 - 1602 - 1802 - 2002

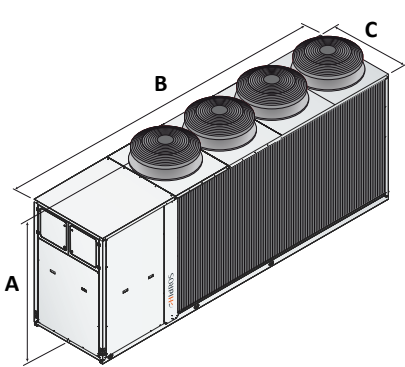
SA/SE 1802 - 2002
HA/HE 2302 - 2502

SA/SE 2302 - 2502

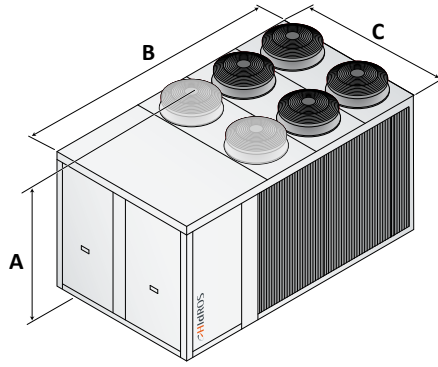
		902	1002	1202	1402	1602	1802	2002	2302
A	SA-SE/LS	1820	1820	1820	1820	1820	2220	2220	2305
B	SA-SE/LS	2905	3965	3965	3965	3965	3965	3965	4505
C	SA-SE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	SA-SE/LS	910	1190	1270	1320	1360	1690	1710	1990
A	HA-HE/LS	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/LS	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/LS	1120	1160	1240	1560	1580	1600	1620	1790
A	HA-HE/XL	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/XL	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/XL	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/XL	1140	1180	1260	1590	1610	1630	1650	1820

LHA SA-SE/HH-RV	LHA HA-HE/HH-RV	P4S/P4U	2502	2504	3004	3204	3504	4004	4504	5004
Flow switch			●	●	●	●	●	●	●	●
User circuit water strainer			○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version			–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version			●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE		●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE		–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE		●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA		○	○	○	○	○	○	○	○
Evap/cond. press. control by transducer and fan speed control	DCCF		●	●	●	●	●	●	●	●
Antifreeze kit for 4 pipe units	RAEV4		○	○	○	○	○	○	○	○
Electronic soft starter	DSSE		○	○	○	○	○	○	○	○
Serial interface card RS485	INSE		○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG		○	○	○	○	○	○	○	○
Remote control panel	PCRL		○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE		○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS		○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU		○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU		○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU		○	○	○	○	○	○	○	○

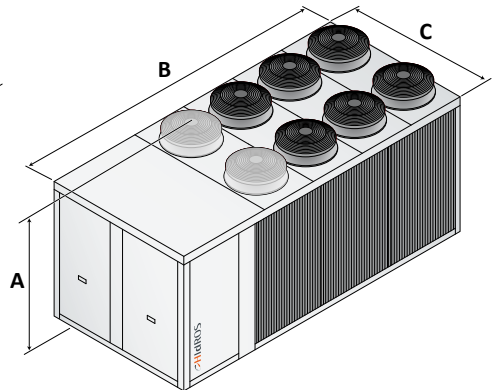
● Standard ○ Optional – Not available



SA/SE 2504 - 3004 - 3204



SA/SE 3504 - 4004
HA/HE 2504 - 3004 - 3204 - 3504

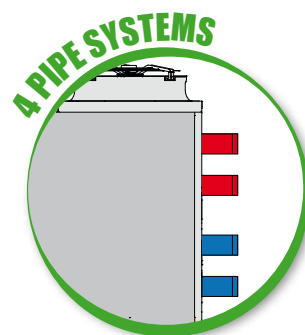
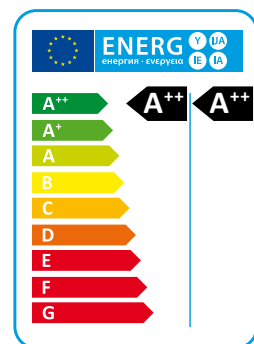
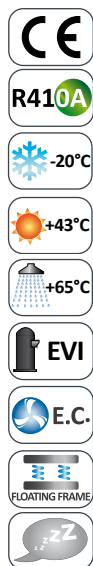


SA/SE 4504 - 5004
HA/HE 4004 - 4504 - 5004

		2502	2504	3004	3204	3504	4004	4504	5004
A	SA-SE/LS	2305	2305	2305	2305	2350	2350	2350	2350
B	SA-SE/LS	4505	5315	5315	5315	4265	4265	4805	4805
C	SA-SE/LS	1150	1150	1150	1150	2210	2210	2210	2210
Kg	SA-SE/LS	2040	2500	2540	2620	3220	3270	3600	3700
A	HA-HE/LS	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/LS	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/LS	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/LS	1820	3170	3220	3270	3320	3660	3720	3780
A	HA-HE/XL	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/XL	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/XL	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/XL	1850	3220	3270	3320	3370	3710	3770	3830

LZT/P4

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



The high efficiency air / water heat pumps of the LZT/P4 series are units designed for 4-pipe air conditioning and heating systems, which allow the production of cold water for cooling and hot water for heating at the same time or separately. The units are supplied with an additional exchanger, used as a condenser for hot water, the production of which is independent of the operation mode of the unit.

Activation of the exchanger takes place automatically via the microprocessor control when the hot water temperature on the return is lower than the set point. These units are able to produce hot water and cold water simultaneously and / or separately with very high energy efficiencies.

They are all supplied complete with a specific advanced microprocessor control provided with software for managing the various priorities.

The XL versions also have an extremely low noise level thanks to the use of a special floating vibration damping system that allows a noise reduction of about 10-12 dB (A) (optional).

Versions

- P4U** 4 pipe systems heating/cooling.
- P4S** 2+2 pipe systems with D.H.W. production.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Super low noise.
- NN** Ultra low noise.

Reversible heating/cooling version (RV)

SA/LS/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,9	55,0	67,8	74,5	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,5	6,8	10,3	12,3	13,4	16,3	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,31	4,16	4,11	4,14	4,12	4,16	4,12	--	--
Energy Class in low temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,75	3,77	3,39	3,33	3,49	3,70	3,62	--	--
η _{s,h} low temperature ⁽²⁾	%	147,1	147,8	132,6	130,1	136,6	145,0	141,7	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,04	3,07	2,89	2,87	2,93	3,06	3,03	--	--
η _{s,h} medium temperature ⁽²⁾	%	118,7	119,6	112,4	111,6	114,2	119,3	118,2	--	--
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,0	36,4	44,1	50,6	58,6	66,3	--	--
Total input power (EN14511) ⁽³⁾	kW	7,1	9,9	12,9	16,8	19,5	23,4	27,7	--	--
EER (EN14511) ⁽³⁾	W/W	2,93	2,64	2,82	2,62	2,59	2,50	2,39	--	--
Sound power ⁽⁴⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁵⁾	dB (A)	46	46	47	48	48	48	48	--	--
SE/LS/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,7	28,3	42,1	50,5	55,2	67,8	74,7	--	--
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,7	9,9	12,8	13,8	16,1	18,1	--	--
COP (EN14511) ⁽¹⁾	W/W	4,47	4,22	4,25	3,95	4,00	4,21	4,13	--	--
Energy Class in low temperature ⁽²⁾		A++	A++	A+	A+	A+	A+	A+	--	--
SCOP low temperature ⁽²⁾	kWh/kWh	3,95	3,87	3,58	3,45	3,59	3,79	3,68	--	--
η _{s,h} low temperature ⁽²⁾	%	154,8	151,6	140,3	135,1	140,7	148,7	144,2	--	--
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A+	A+	A+	--	--
SCOP medium temperature ⁽²⁾	kWh/kWh	3,17	3,13	3,02	2,99	3,02	3,13	3,10	--	--
η _{s,h} medium temperature ⁽²⁾	%	123,6	122,3	117,9	116,4	117,6	122,0	120,9	--	--
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,0	36,5	44,2	50,8	58,9	66,6	--	--
Total input power (EN14511) ⁽³⁾	kW	7,1	9,8	12,8	16,7	19,4	22,9	27,4	--	--
EER (EN14511) ⁽³⁾	W/W	2,94	2,65	2,86	2,64	2,62	2,57	2,44	--	--
Sound power ⁽⁴⁾	dB (A)	78	78	79	80	80	80	80	--	--
Sound pressure ⁽⁵⁾	dB (A)	46	46	47	48	48	48	48	--	--
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	--	--
Fans	n°	2	2	2	2	2	2	2	--	--
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	--	--
Refrigerant charge	Kg	5,5	5,7	8,3	8,4	9,3	14,6	14,9	--	--
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	--	--
Equivalent CO ₂ charge	t	11,5	11,8	17,2	17,5	19,5	30,4	31,2	--	--
HA/LS/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,8	29,4	41,6	51,2	58,0	66,7	80,8	88,4	102,5
Total input power (EN14511) ⁽¹⁾	kW	5,3	6,8	9,7	12,4	13,0	15,6	19,6	21,4	25,3
COP (EN14511) ⁽¹⁾	W/W	4,51	4,31	4,29	4,12	4,45	4,29	4,13	4,13	4,05
Energy Class in low temperature ⁽²⁾		A++	A+	A+	A+	A++	A++	A+	A+	A+
SCOP low temperature ⁽²⁾	kWh/kWh	3,96	3,89	3,63	3,55	3,94	3,95	3,43	3,50	3,48
η _{s,h} low temperature ⁽²⁾	%	155,3	152,5	142,1	139,1	154,6	154,9	134,3	137,1	136,2
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,18	3,15	2,99	2,98	3,21	3,16	2,87	2,92	2,94
η _{s,h} medium temperature ⁽²⁾	%	124,3	122,9	116,6	116,2	125,5	123,4	111,9	113,6	114,6
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,5	37,5	45,4	52,8	60,4	71,6	78,1	90,2
Total input power (EN14511) ⁽³⁾	kW	7,2	9,3	12,7	16,8	18,1	23,2	24,6	26,6	32,2
EER (EN14511) ⁽³⁾	W/W	2,90	2,84	2,97	2,70	2,91	2,61	2,91	2,94	2,80
Sound power ⁽⁴⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁵⁾	dB (A)	46	46	46	47	48	48	51	51	51
HE/LS/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,5	41,8	50,3	58,3	66,9	81,3	88,5	102,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,7	9,5	12,2	12,8	15,3	18,9	20,6	24,6
COP (EN14511) ⁽¹⁾	W/W	4,61	4,38	4,40	4,12	4,56	4,37	4,31	4,31	4,17
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,96	3,87	3,83	4,08	4,06	3,83	3,85	3,84
η _{s,h} low temperature ⁽²⁾	%	160,8	155,5	151,6	150,3	160,1	159,4	150,1	150,8	150,6
Energy Class in medium temperature ⁽²⁾		A++	A++	A+	A+	A++	A++	A+	A+	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,25	3,21	3,12	3,15	3,29	3,23	3,07	3,14	3,13
η _{s,h} medium temperature ⁽²⁾	%	127,0	125,2	121,7	123,0	128,5	126,0	119,7	122,5	122,2
Cooling capacity (EN14511) ⁽³⁾	kW	20,9	26,3	37,5	45,6	52,9	60,5	71,6	78,2	90,8
Total input power (EN14511) ⁽³⁾	kW	7,1	9,5	12,7	16,7	17,9	23,0	24,4	26,1	31,3
EER (EN14511) ⁽³⁾	W/W	2,94	2,78	2,96	2,73	2,95	2,64	2,94	3,00	2,90
Sound power ⁽⁴⁾	dB (A)	78	78	78	79	80	80	83	83	83
Sound pressure ⁽⁵⁾	dB (A)	46	46	46	47	48	48	51	51	51
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	6,9	6,9	8,7	8,9	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	14,5	14,5	18,1	18,6	31,2	31,7	46,9	46,9	46,9

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Reversible heating/cooling version (RV)

HA/XL/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	29,6	41,1	48,9	57,4	65,5	80,1	87,3	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,5	7,0	9,5	12,1	12,9	15,2	18,4	20,0	23,8
COP (EN14511) ⁽¹⁾	W/W	4,40	4,24	4,35	4,04	4,46	4,31	4,35	4,37	4,23
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	3,85	3,84	3,84	3,83	4,03	4,01	3,83	3,91	3,84
ηs,h low temperature ⁽²⁾	%	150,3	150,6	150,5	150,1	158,1	157,5	150,1	153,2	150,7
Energy Class in medium temperature ⁽²⁾		A+	A+	A+	A+	A++	A+	A+	A++	A+
SCOP medium temperature ⁽²⁾	kWh/kWh	3,05	3,13	3,11	3,14	3,27	3,20	3,13	3,21	3,18
ηs,h medium temperature ⁽²⁾	%	119,0	122,2	121,4	122,4	127,6	124,8	122,0	125,5	124,3
Cooling capacity (EN14511) ⁽³⁾	kW	21,0	26,3	36,8	44,5	52,1	59,7	71,2	77,1	88,7
Total input power (EN14511) ⁽³⁾	kW	7,2	9,7	13,2	17,3	18,9	24,0	23,7	26,2	32,6
EER (EN14511) ⁽³⁾	W/W	2,90	2,73	2,78	2,57	2,75	2,49	3,00	2,95	2,72
Sound power ⁽⁴⁾	dB (A)	72	72	73	74	74	74	74	75	75
Sound pressure ⁽⁵⁾	dB (A)	40	40	41	42	42	42	42	43	43
HE/XL/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	24,0	30,0	41,2	49,2	57,4	65,6	79,9	87,2	100,7
Total input power (EN14511) ⁽¹⁾	kW	5,2	6,8	9,2	11,8	12,6	15,1	17,8	19,4	23,5
COP (EN14511) ⁽¹⁾	W/W	4,64	4,39	4,49	4,16	4,57	4,35	4,49	4,49	4,29
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,10	3,87	4,00	3,84	4,21	4,16	4,04	4,06	3,93
ηs,h low temperature ⁽²⁾	%	161,0	151,8	157,1	150,6	165,4	163,4	158,7	159,5	154,0
Energy Class in medium temperature ⁽²⁾		A++	A+	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,24	3,14	3,24	3,16	3,38	3,29	3,26	3,33	3,25
ηs,h medium temperature ⁽²⁾	%	126,5	122,7	126,6	123,4	132	128,6	127,3	130,0	126,9
Cooling capacity (EN14511) ⁽³⁾	kW	21,0	26,9	37,2	44,7	52,0	59,5	70,6	76,9	88,1
Total input power (EN14511) ⁽³⁾	kW	7,0	9,1	12,7	17,0	18,8	24,0	24,2	26,3	32,9
EER (EN14511) ⁽³⁾	W/W	2,98	2,94	2,93	2,63	2,78	2,48	2,92	2,92	2,68
Sound power ⁽⁴⁾	dB (A)	70	72	73	74	73	73	74	75	75
Sound pressure ⁽⁵⁾	dB (A)	38	40	41	42	41	41	42	43	43
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	7,7	10,9	11,1	14,9	15,2	22,5	22,5	22,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	16,2	22,7	23,2	31,2	31,7	46,9	46,9	46,9
HE/NN/RV - P4U/P4S		252	302	452	502	602	752	852	1002	1202
Heating capacity (EN14511) ⁽¹⁾	kW	23,4	30,5	41,1	54,2	60,7	70,4	79,5	90,3	104,9
Total input power (EN14511) ⁽¹⁾	kW	5,0	6,4	8,8	11,7	12,4	14,7	17,41	18,6	22,1
COP (EN14511) ⁽¹⁾	W/W	4,69	4,75	4,69	4,64	4,89	4,78	4,56	4,87	4,75
Energy Class in low temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP low temperature ⁽²⁾	kWh/kWh	4,30	4,35	4,23	4,10	4,37	4,40	4,22	4,42	4,31
ηs,h low temperature ⁽²⁾	%	168,8	171,1	166,2	160,8	171,7	172,9	165,6	173,8	169,3
Energy Class in medium temperature ⁽²⁾		A++	A++	A++	A++	A++	A++	A++	A++	A++
SCOP medium temperature ⁽²⁾	kWh/kWh	3,34	3,48	3,42	3,34	3,47	3,45	3,38	3,52	3,50
ηs,h medium temperature ⁽²⁾	%	130,7	138,0	133,7	130,5	135,9	134,9	132,2	137,9	137
Cooling capacity (EN14511) ⁽³⁾	kW	20,1	26,2	36,0	46,4	53,3	61,6	68,9	79,0	91,9
Total input power (EN14511) ⁽³⁾	kW	7,6	9,2	13,6	14,9	16,8	20,9	25,6	24,7	29,8
EER (EN14511) ⁽³⁾	W/W	2,62	2,86	2,64	3,11	3,18	2,95	2,69	3,20	3,08
Sound power ⁽⁴⁾	dB (A)	65	68	69	70	70	70	70	71	71
Sound pressure ⁽⁵⁾	dB (A)	33	36	37	38	38	38	38	39	39
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° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	7,7	9,1	11,9	22,0	22,2	22,5	22,5	34,4	34,8
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	16,2	18,9	24,8	46,0	46,4	46,9	46,9	71,8	72,7

Performances are referred to the following conditions:

- (1) Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 30/35°C.
- (2) Average conditions, variable - Reg EU 811/2013

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

(4) Sound power level in accordance with ISO 3744..

(5) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

The standard colour of the units is RAL9018.

Refrigerant circuit

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

Compressors

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

The superheated vapour is then injected into an intermediate port in the scroll compressor. This cold vapour reduces the temperature of the compressed gas thus enabling the compressor to raise the pressure to levels (and temperatures) beyond that possible with a single stage scroll. The additional sub cooling of the main volume of liquid refrigerant increases the evaporator capacity. This compressor technology generates a larger pressure ratio between condensing and evaporating pressures, with significant performance improvement. In all units the compressors are connected in tandem. The compressors are all supplied with a crankcase heater and thermal overload protection by a klixon embedded in the motor winding. They are mounted in a separate enclosure in order to be separated from the air stream thus enabling them to be maintained even if the unit is operating. Access to this enclosure is by the front panel of the unit. The crankcase heater is always powered when the compressor is in stand-by.

Source heat exchanger

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

User heat exchangers

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. The use of

this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit.

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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 antivibration mountings. In the LS versions the fans are 6 poles type (approx 900 rpm), in the XL versions the fans are 8 poles type (approx 600 rpm), in the NN versions the fans are 12 poles type (approx 450 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

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

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

Electric enclosure

The enclosure is manufactured in order to comply with the requirements of the electromagnetic compatibility standards CEE EN60204. Access to the enclosure is achieved by removing the front panel of the unit. The following components are supplied as standard on all units: main switch, a sequence relay that disables the power supply in the event that the phase sequence is incorrect (scroll compressors can be damaged if they rotate in the wrong direction), thermal overloads (protection of pumps and fans), overload switches, control circuit automatic breakers, compressor contactors, automatic switches and pump contactors. The terminal board has volt free contacts for remote ON-OFF, Summer/ winter change over (heat pumps only) and general alarm.

Control and protection devices

All units are supplied with the following controls and protections: user water return temperature sensor, antifreeze protection temperature sensor installed on users water output, domestic hot water supply and return temperature sensors (only versions P2S), 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 P2S) is already equipped with this probe, but it must be installed in the user circuit.

Versions

P4U version

The P4U units use 4 hydraulic connections and are used in modern 4-pipe systems. In these systems, cold and hot water is always available (in every period of the year) and present in the specific hydraulic circuit.

These systems allow the simultaneous production of cold water and hot water using 4 hydraulic connections, 2 connections are related to the hot water circuit, 2 connections are related to the cold water circuit.

The plant thus conceived is able to heat and, at the same time, if required, to cool with very high energy efficiencies. In this configuration, however, the units are also able to produce hot or cold water separately at any time of the year.

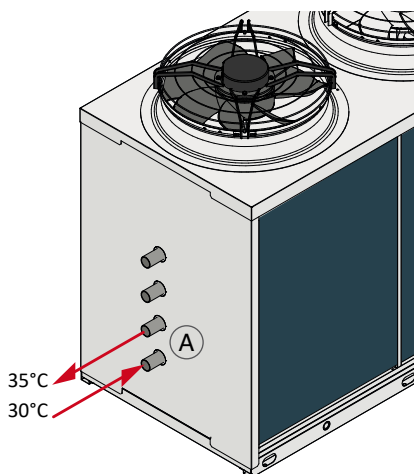
The units are supplied with 2 heat exchangers, one dedicated to the production of cold water and one dedicated to the production of hot water.

The operating modes are:

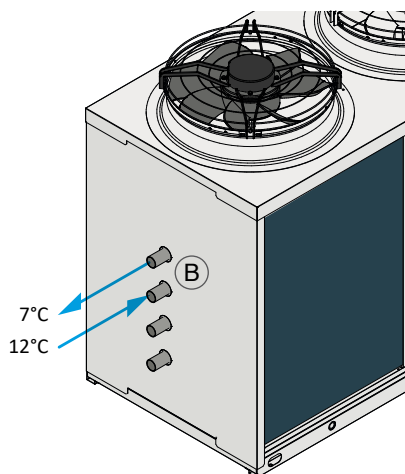
- 1. User water heating:** The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.
- 2. User water cooling:** The unit behaves like a normal air / water chiller in cooling mode, using the finned exchanger as the source and the B plate heat exchanger as user.
- 3. Simultaneous user Cooling + heating:** The unit behaves like a water / water heat pump, using the plate heat exchanger B as the cold user and the plate heat exchanger A as hot user. This version is not able to produce domestic hot water.

P4U version

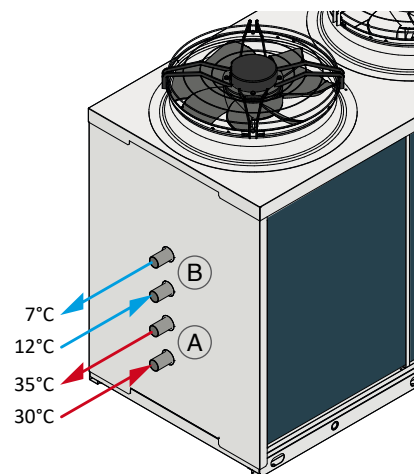
User water heating



User water cooling



Simultaneous user Cooling + heating



The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

P4S Version

The P4S units have been designed to meet the needs of 2 + 2 pipe systems (2 user side pipes, 2 domestic hot water pipes) throughout the year. The units are supplied with 2 exchangers, one dedicated to the production of the user cold and hot water and one dedicated to the production of domestic hot water only (D.H.W.). The production of domestic hot water always has priority. In winter mode the activation of D.H.W. production temporarily stops the production of the user hot water, which is restored when the D.H.W. accumulation reaches the temperature set. In summer mode the unit will switch to cooling (by activating the reverse cycle valve installed in the refrigerant circuit) and any request for domestic hot water will allow, at the same time, the production of cold water. In this operating mode, the system can simultaneously produce cold water and domestic hot water. Domestic hot water, in summer mode, is produced by heat recovery and therefore free of charge. When the temperature measured by the D.H.W. sensor reaches the set, the D.H.W. water pump is stopped and normal operation is restored in cooling mode.

The operating modes are:

- 1. User water heating:** The unit behaves like a normal air/water heat pump in heating mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.
- 2. User water cooling:** The unit behaves like a normal air/water chiller in cooling mode, using the finned heat exchanger as the source and the A plate heat exchanger as user.
- 3. Domestic hot water production (D.H.W.):** The unit behaves like a normal air / water heat pump in heating mode, using the finned heat exchanger as the source and as a user the plate heat

exchanger B (a special D.H.W. heat exchanger that works with a higher set point).

4. User water cooling + D.H.W. production: The unit behaves like a water / water heat pump, using the plate heat exchanger A as the cold user and the plate heat exchanger B as D.H.W. production).

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

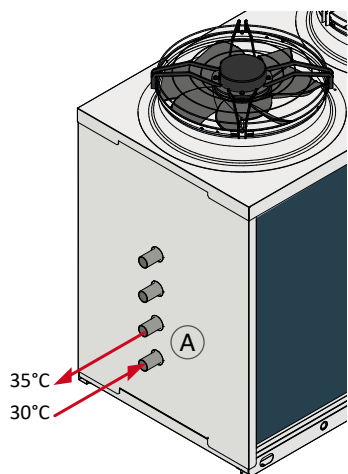
High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

Version LS

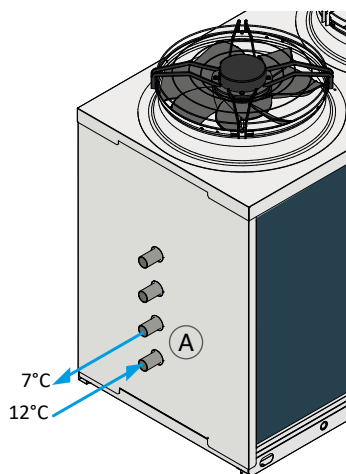
This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

P4S version

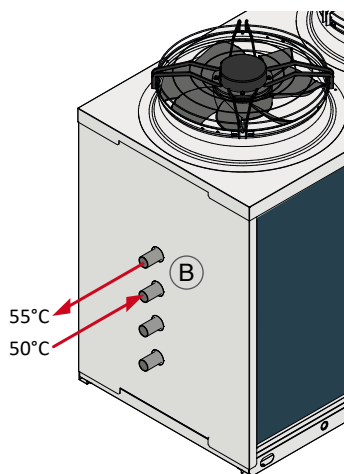
User water heating



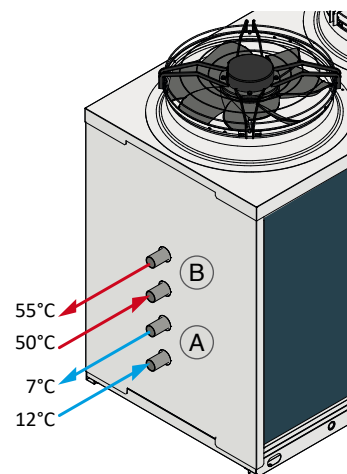
User water cooling



Domestic hot water production (D.H.W.)



User water cooling + D.H.W. production

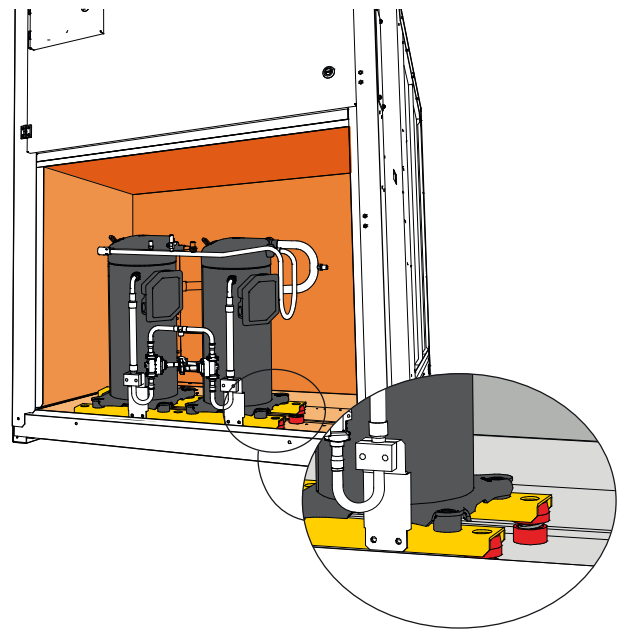


The above scheme is for illustrative purposes only. For the correct pipes placement, please refer to the units technical manual.

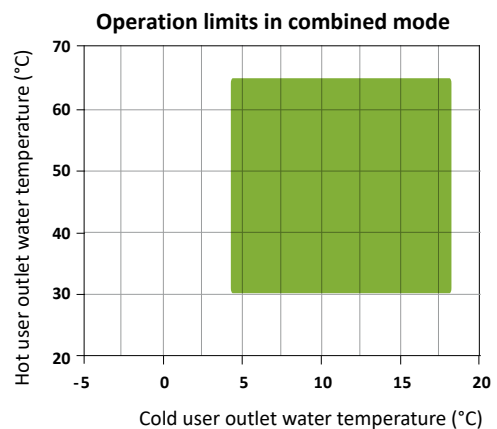
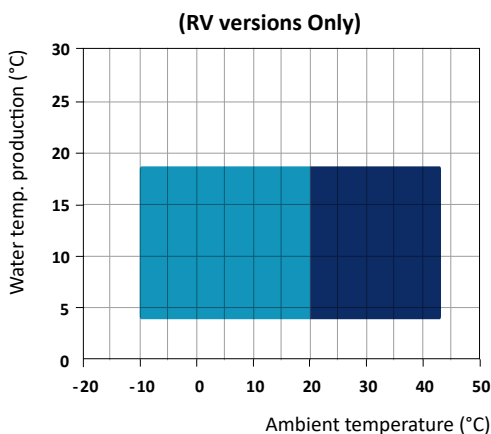
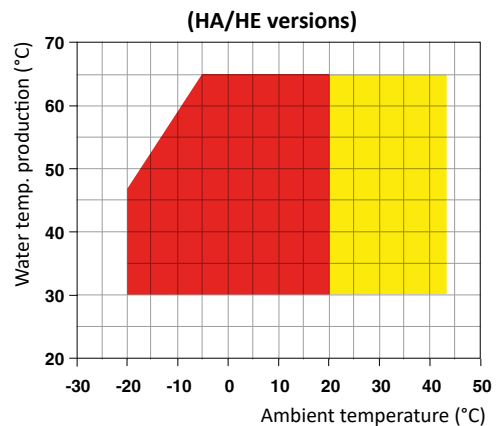
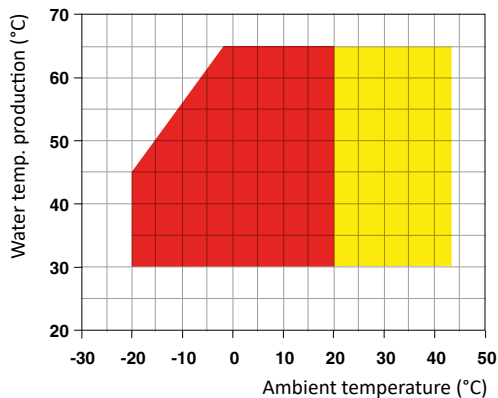
Super low noise and ultra low noise versions

HA/XL - HE/XL and HE/NN

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



Operation limits (SA/SE versions)



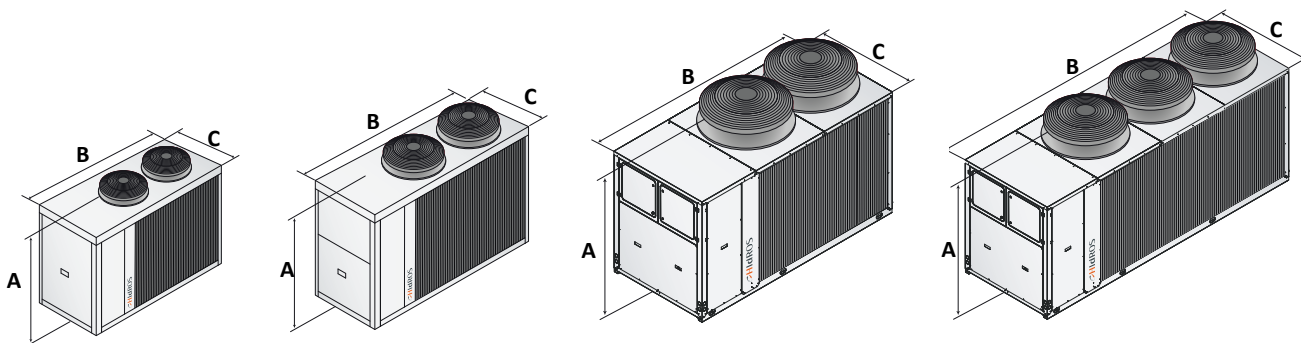
- Heating mode
- Heating mode with head pressure control (DCCF)
- Cooling with head pressure control (DCCF)

- Cooling mode
- Combined mode

LZT		252	302	452	502	602	752	852	1002	1202
Flow switch		●	●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		-	-	-	-	-	-	-	-	-
“Floating frame” Technology - XL - NN Version		●	●	●	●	●	●	●	●	●
E.C. fans - SA/LS versions	VECE	-	-	-	-	-	-	-	-	-
E.C. fans - SE/LS versions	VECE	●	●	●	●	●	●	●	●	●
E.C. fans - HA/LS - HA/XL versions	VECE	-	-	-	-	-	-	-	-	-
E.C. fans - HE/LS - HE/XL - HE/NN versions	VECE	●	●	●	●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○	○	○	○	○
Condensing pressure control by transducer & EC Fans (only for SE and HE)		●	●	●	●	●	●	●	●	●
Evap/cond. press. control by transducer and fan speed control (only SA - HA)DCCF		●	●	●	●	●	●	●	●	●
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank *	A1ZZU	○	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank *	A2ZZU	○	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank *	A1NTU	○	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank *	A2NTU	○	○	○	○	○	○	○	○	○

* Not available for NN versions

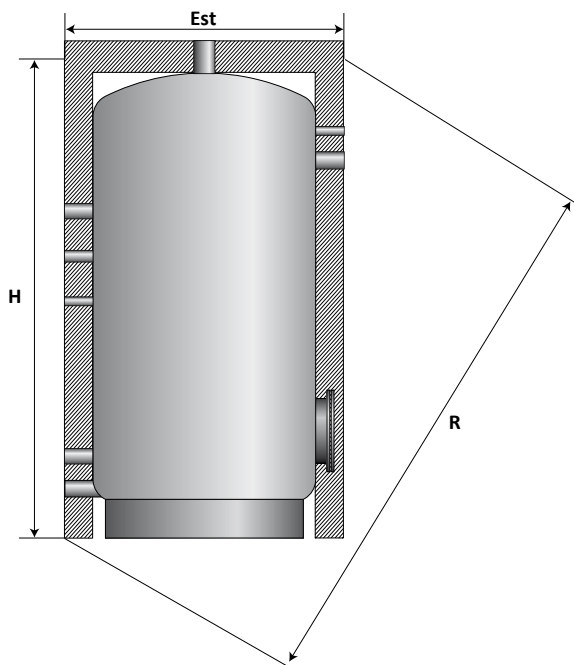
● Standard ○ Optional – Not available



		252	302	452	502	602	752	852	1002	1202
A	SA-SE/LS	1470	1470	1670	1670	1670	1820	1820	--	--
B	SA-SE/LS	1910	1910	2200	2200	2200	2905	2905	--	--
C	SA-SE/LS	900	900	900	900	900	1150	1150	--	--
Kg	SA-SE/LS	550	560	610	650	740	890	910	--	--
A	HA-HE/LS	1470	1470	1670	1670	1820	1820	1820	1820	1820
B	HA-HE/LS	1910	1910	2200	2200	2905	2905	2905	2905	2905
C	HA-HE/LS	900	900	900	900	1150	1150	1150	1150	1150
Kg	HA-HE/LS	560	570	720	680	1060	1070	1120	1160	1240
A	HA-HE/XL	1470	1470	1670	1670	1820	1820	1820	1820	1820
B	HA-HE/XL	1910	1910	2200	2200	2905	2905	2905	2905	2905
C	HA-HE/XL	900	900	900	900	1150	1150	1150	1150	1150
Kg	HA-HE/XL	570	590	720	730	1080	1090	1140	1170	1250
A	HE/NN	1470	1670	1820	1820	1820	1820	1820	1820	1820
B	HE/NN	1910	2200	2905	2905	2905	2905	2905	3965	3965
C	HE/NN	900	900	1150	1150	1150	1150	1150	1150	1150
Kg	HE/NN	570	700	1080	1100	1110	1120	1140	1560	1580

TFW - TFWS

Domestic hot water cylinders



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

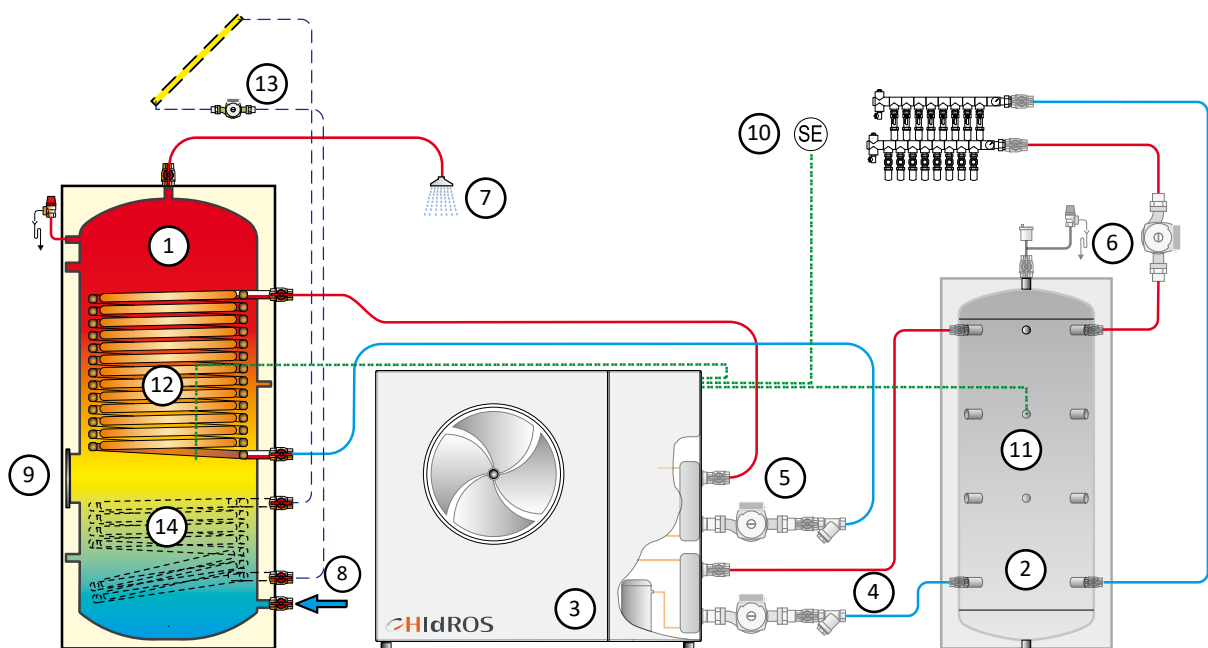
Both versions are supplied complete with magnesium anode, probe holders, inspection flange and backup electric heater flange.

Versions and accessories

- TFW** Domestic hot water cylinder.
- TFWS** Domestic hot water cylinder + solar coil.
- RE** Back up electric heater.

Product specifications

- Thermal insulation in rigid polyurethane + PVC
- Cathodic protection with magnesium anode.
- Thermometer located in sensor pocket.
- Inspection flange.
- Adjustable feet.
- Safety valve.



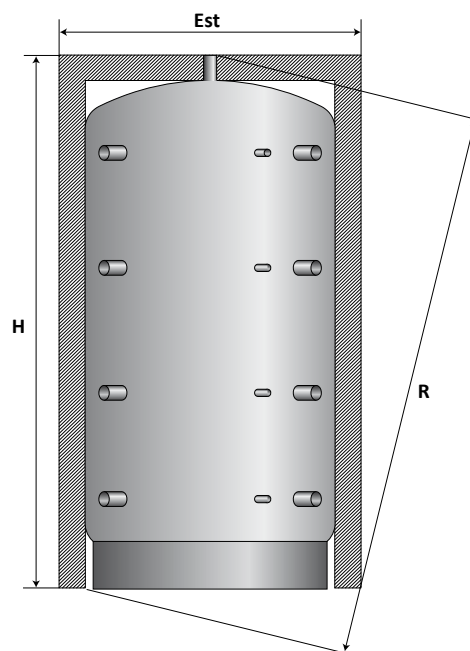
1	Domestic hot water cylinder TFW/TFWS	8	Cold water inlet
2	Buffer tank TFF	9	Back up heater flange
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied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

The above scheme is for illustrative purposes only

TFW - TFWS		300	500	750	1000
Energy class		B	C	C	C
Maximum working pressure	bar	10	10	10	10
Heat pump D.H.W. heat exchanger surface (TFW/TFWS)	m ²	3,8/2,2	6,0/4,8	6,5/6,5	6,5/6,5
D.H.W. exchanger water content	lt	25,0/14,5	39,5/31,5	42,5/42,5	42,5/42,5
D.H.W. exchanger waterflow	l/h	3000	3000	3000	3000
D.H.W. exchanger pressure drops	Kpa	4,8	9,2	9,2	9,2
Solar coil surface (TFWS versions only)	m ²	1,0	1,8	2,2	3,6
Solar coil water content (TFWS versions only)	lt.	6,5	11,5	15,6	25,6
Solar coil waterflow (TFWS versions only)	l/h	1600	1900	4000	4000
Solar coil pressure drops (TFWS versions only)	Kpa	4,0	9,0	9,0	9,0
Diameter with insulation	EST mm	670	700	855	1055
Total height	H mm	1450	1870	2015	2050
Diagonal length	R mm	1598	2019	2207	2306
Weight	Kg	180	260	350	410

TFP - TFPS

Hot water storage tanks



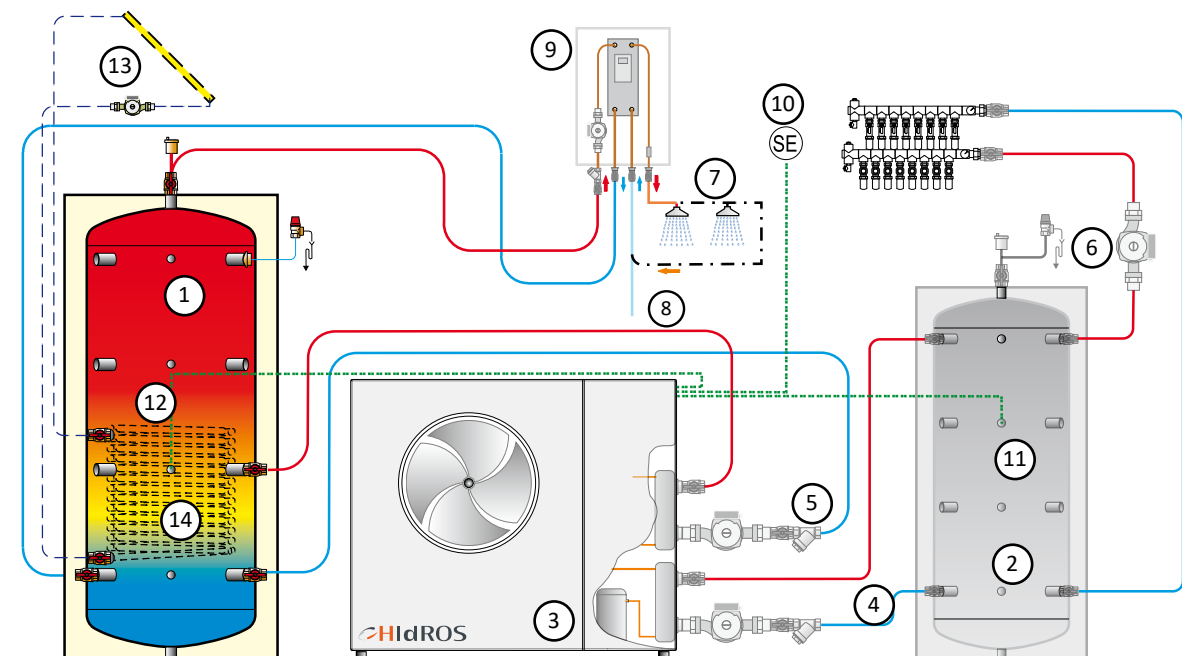
TFP-TFPS Hot water storage tanks are designed for use with heat stations and are connected directly to the heat pump. They are thermally insulated with a flexible, removable polyurethane cover (CFC free and self extinguishing). The tanks are supplied with 8 water connections and several probe pockets. The TFP versions are supplied without any heat exchanger, while the TFPS version incorporates a solar heat exchanger, located in the lower part of the tank to maximise the heating capacity. TFP-TFPS storage tanks are suitable for hot water only, they are not to be used for cold water storage.

Versions and accessories

- TFP** Hot water storage tank.
- TFPS** Hot water storage tank + solar coil.
- RE** Back up electric heater.

Product specifications

- Thermal insulation protective jacket from size 300 to 1000.
- Thermal insulation in flexible polyurethane foam from size 1500.
- External protection with durable enamel coating.
- Manufactured from carbon steel ST235JR.



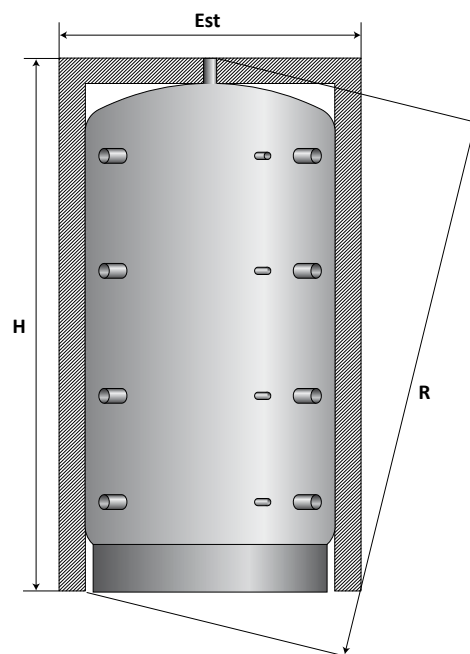
1	Hot water storage tanks TFP/TFPS	8	Cold water inlet
2	Buffer tank TFF	9	Domestic hot water station
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied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

The above scheme is for illustrative purposes only

TFP - TFPS		300	500	800	1000	1500	2000	2500	3000	4000	5000	
Energy class		C	C	B	B	C	C	C	C	C	C	
Maximum working pressure	bar	5	5	5	5	5	5	5	5	5	5	
Maximum working temperature	°C	95	95	95	95	95	95	95	95	95	95	
Solar heat exchanger surface (only TFPS)	m ²	1,0	1,9	2,5	3,1	3,8	4,6	5,0	6,0	7,0	8,0	
Diameter with insulation	EST	mm	610	760	1010	1010	1240	1340	1450	1450	1600	1800
Total height	H	mm	1680	1735	1840	2100	2140	2470	2220	2720	2810	2870
Diagonal dimension	R	mm	1788	1895	2099	2331	2474	2811	2652	3083	3234	3388
Weight	Kg		65	98	137	153	237	315	352	413	571	672

TFF

Hot and cold water storage tanks



The TFF 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).

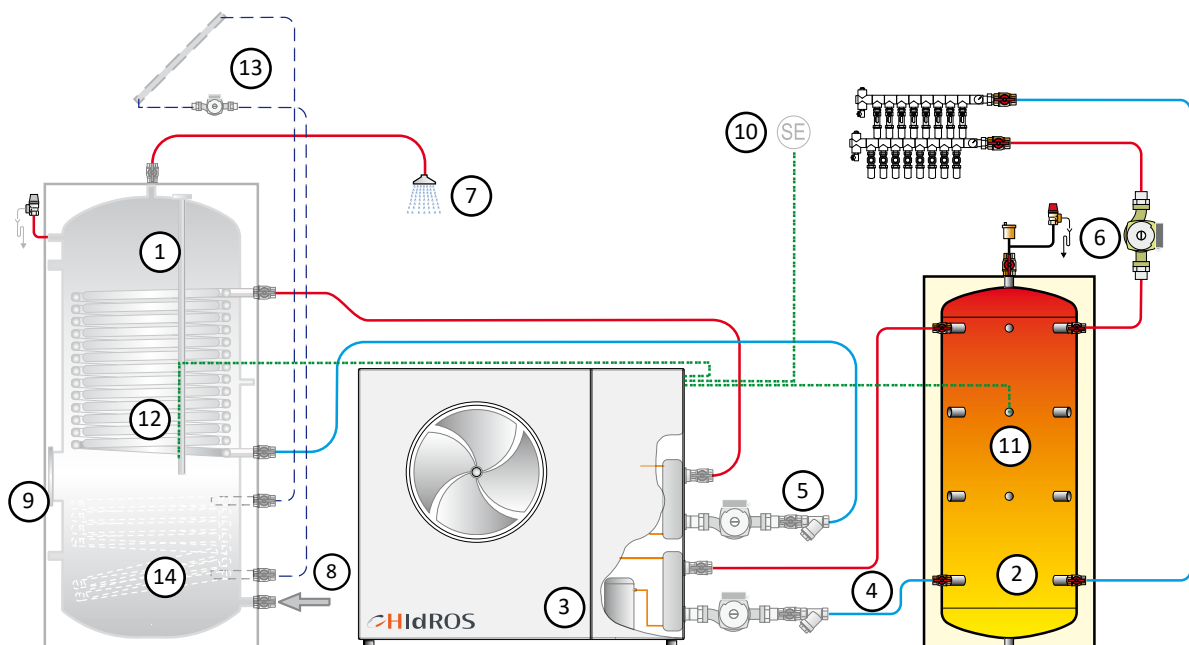
The tanks are supplied with 8 water connections and several probe pockets. They are suitable for either hot or cold water.

Versions and accessories

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

Product specifications

- Poliurethane rigid thermal insulation up to size 1000. Sizes from 1500 are supplied with an additional "anti-condensation elastomer".



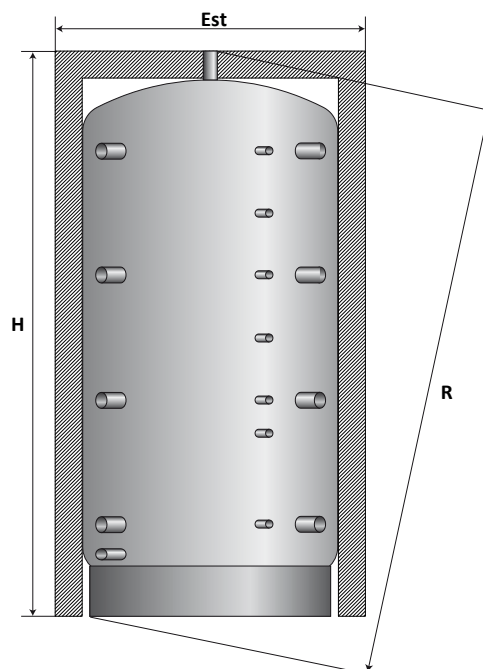
1	Hot and cold water tanksTFW/TFWS	8	Cold water inlet
2	Buffer tank TFF	9	Back up heater flange
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W. sensor (Supplied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

The above scheme is for illustrative purposes only

TFF			100	200	300	500	800	1000	1500	2000
Energy class			B	B	B	C	B	B	C	C
Maximum working pressure	bar		5	5	5	5	5	5	5	5
Maximum working temperature	°C		90	90	90	90	90	90	90	90
Diameter with insulation	EST	mm	460	510	610	760	1010	1010	1240	1340
Total height	H	mm	950	1341	1685	1721	1920	2175	2255	2575
Diagonal length	R	mm	1056	1435	1793	1882	2170	2410	2574	2903
Weight		Kg	25	36	48	80	106	130	218	260

TFH - TFHS

Domestic hot water generators



TFH-TFHS 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.

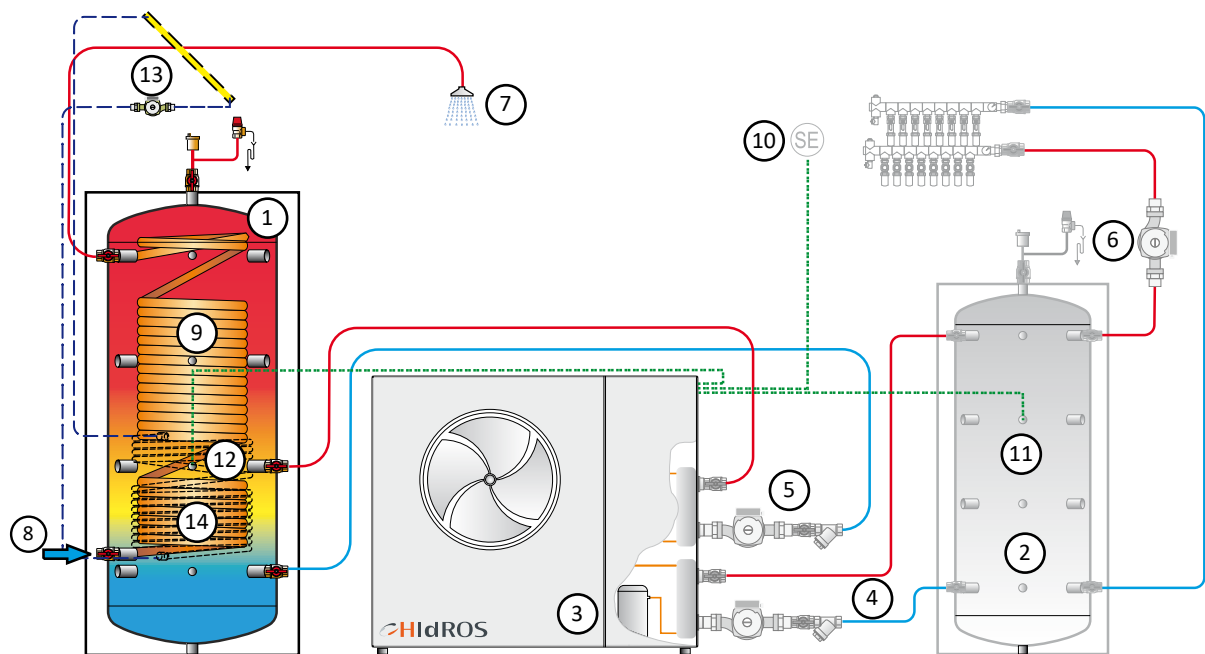
The TFHS versions incorporate an additional solar heat exchanger, located in the lower part to maximise the heating capacity.

Versions and accessories

- TFH** Domestic hot water generators.
- TFHS** Hot water storage tank + solar coil.
- RE** Back up electric heaters.

Product specifications

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



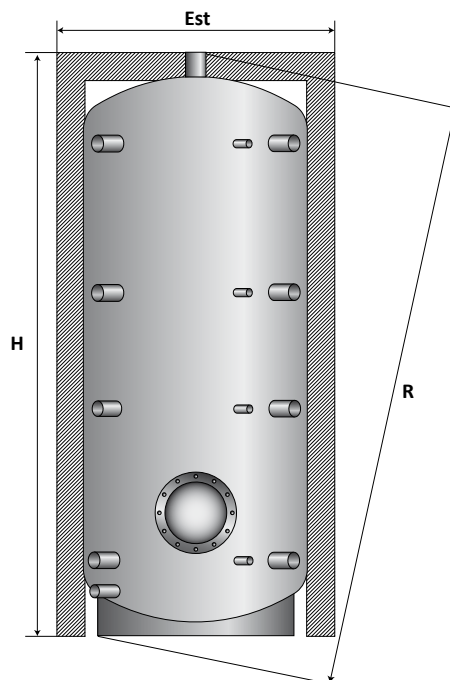
1	Domestic hot water generator TFH	8	Cold water inlet
2	Buffer tank TFF	9	D.H.W. stainless steel heat exchanger
3	Heat pump	10	External sensor (Supplied with the heat pump)
4	Primary circuit pump (Heating and cooling)	11	Hot water sensor (Supplied with the heat pump)
5	Domestic hot water pump	12	D.H.W.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

The above scheme is for illustrative purposes only

TFH - TFHS		600	800	1000	1500	2000	
Energy class		C	C	C	C	C	
Maximum working pressure	bar	3	3	3	3	3	
Maximum working temperature	°C	90	90	90	90	90	
Heat exchanger surface	m ²	5,6	5,6	7,0	7,0	8,0	
Solar heat exchanger surface (only TFHS)	m ²	1,4	1,8	1,8	3,0	4,5	
Diameter with insulation	EST	mm	860	950	950	1100	1300
Total height	H	mm	1930	1900	2305	2665	2475
Diagonal length	R	mm	2113	2125	2494	2884	2796
Weight		Kg	205	232	246	371	404

TFA - TFAS

Domestic hot water storage tanks



TFA - TFAS 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.

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

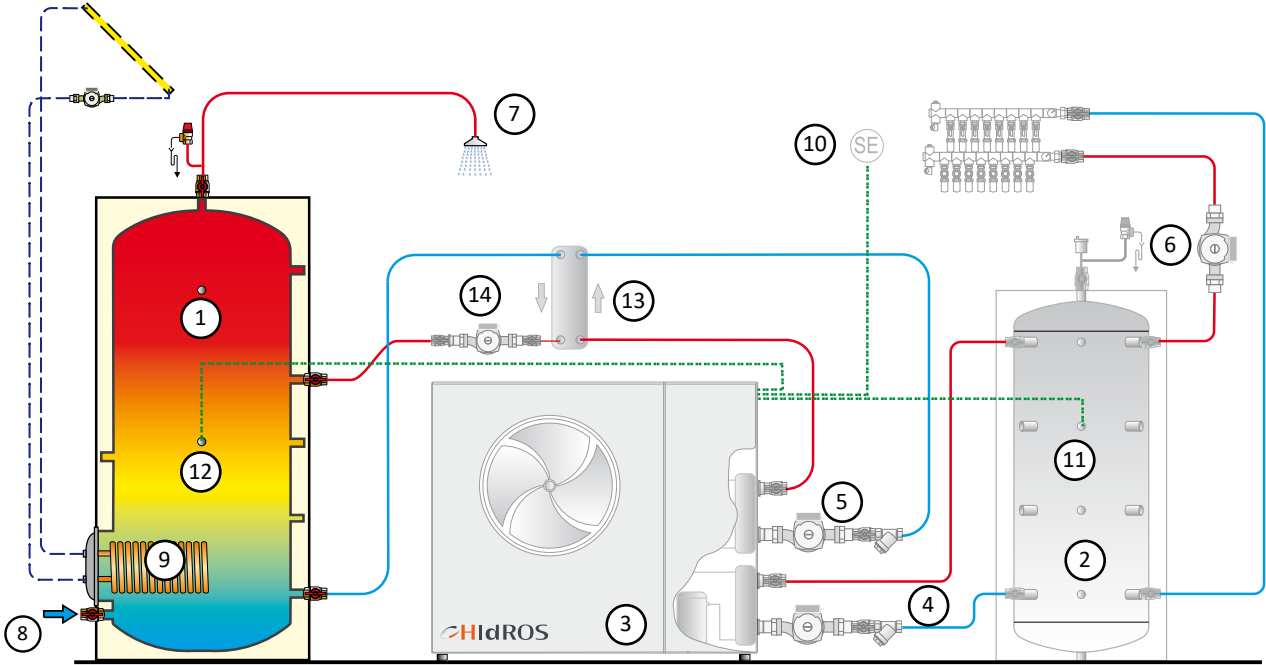
The TFAS versions incorporate an additional solar heat exchanger, located in the lower part to maximise the heating capacity.

Versions and accessories

TFA	Domestic hot water storage tank
TFAS	Hot water storage tank + solar coil.
RE	Back up electric heater.

Product specifications

- Polyurethane rigid thermal insulation up to size 1000.
- Thermal insulation in polyurethane foam from size 1500.
- External protection by high resistance enamel painting.
- Treatment with internal protective glazing inorganic food up to standard DIN 4753.3.
- Cathodic protection with magnesium anode.
- Thermometer with well for probe holder.
- Inspection flange.



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

The above scheme is for illustrative purposes only

TFA - TFAS		200	300	500	800	1000	1500	2000
Energy class		B	B	C	C	C	C	C
Maximum working pressure	bar	10	10	10	10	10	6	6
Maximum working temperature	°C	95	95	95	95	95	80	80
Solar heat exchanger surface (only TFAS) *	m ²	1,0	1,0	1,0	3,0	3,0	3,0	6,0
Diameter with insulation	EST	mm	700	700	760	950	950	1240
Total height	H	mm	1100	1340	1920	1970	2280	2275
Diagonal length	R	mm	1304	1512	2065	2188	2470	2591
Weight	Kg		80	90	124	250	286	316

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

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 TFP-TFPS 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.

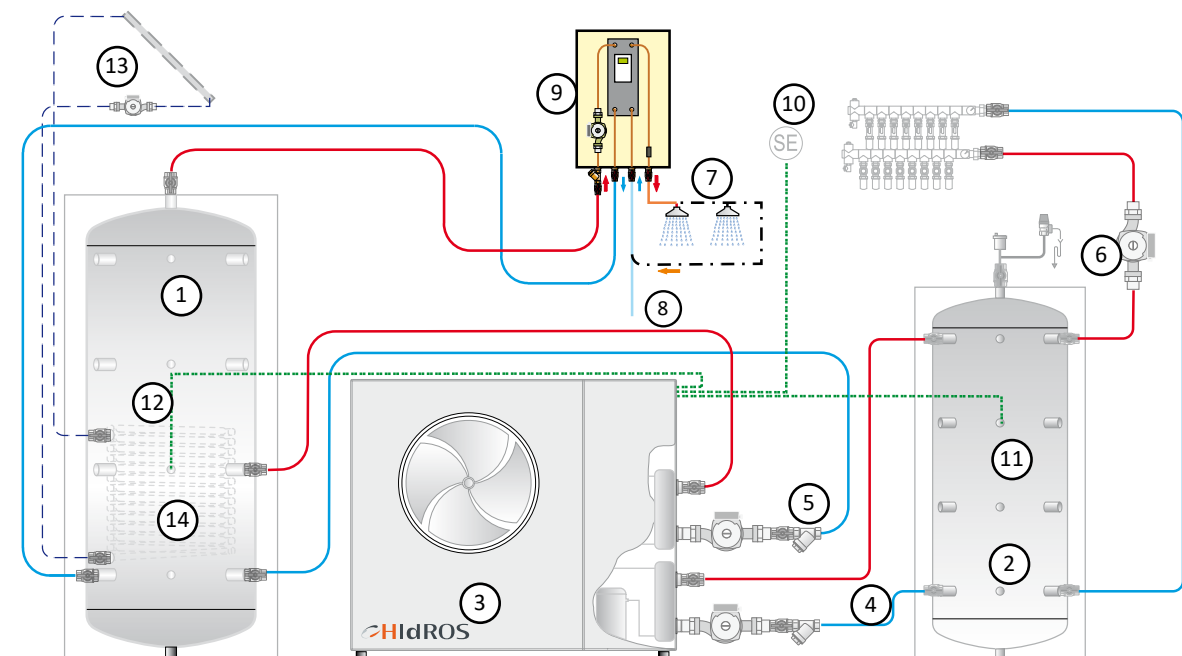
These devices enable the production of domestic hot water with minimal FORMATION OF LIMESTONE due to the very small amount of water present in the secondary water circuit.

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 TFP/TFPS	8	Cold water inlet
2	Buffer tank TFF	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 (TFPS versions only)

The above scheme is for illustrative purposes only

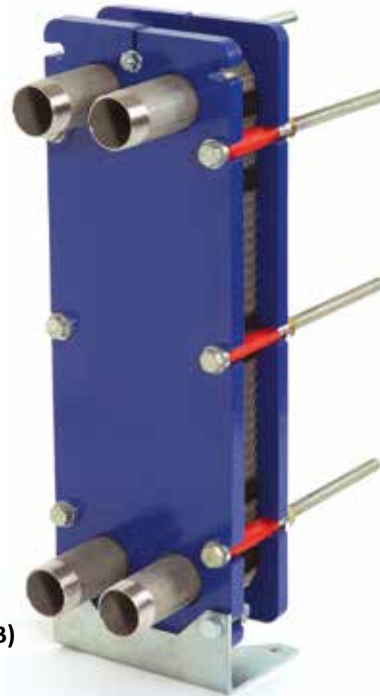
PI		25	35	40	60	70	80	100	120
Power supply	V/PH/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50
Water pump input power	W	40	52	80	310	310	310	450	450
Nominal domestic hot water circuit waterflow	l/min	25	35	40	60	70	80	100	120
Minimum domestic hot water flow	l/min	2	2	4	5	5	10	10	10
Water pump input current	A	0,52	0,52	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	185
Primary circuit waterflow	l/h	2500	2800	2800	6700	8200	9000	11000	14000
Primary circuit available static pressure	KPa	22	25	25	20	40	20	20	40
Weight	Kg	25	28	31	166	168	189	193	198
Height	mm	690	690	690	871	871	871	871	871
Length	mm	406	406	406	1004	1004	1004	1004	1004
Width	mm	270	270	270	484	484	484	484	484
Primary water circuit volume	l	1,1	1,6	1,6	2,7	2,9	3,1	3,9	4,8
Domestic hot water circuit volume	l	0,8	1,7	1,4	2,5	2,1	3,1	3,8	4,7
Max. working pressure	bar	5	5	5	10	10	10	10	10
Protection degree	IP	40	40	40	40	40	40	40	40
Max. working temperature	°C	95	95	95	95	95	95	95	95

SCP

Plate heat exchangers for domestic hot water production



(A)

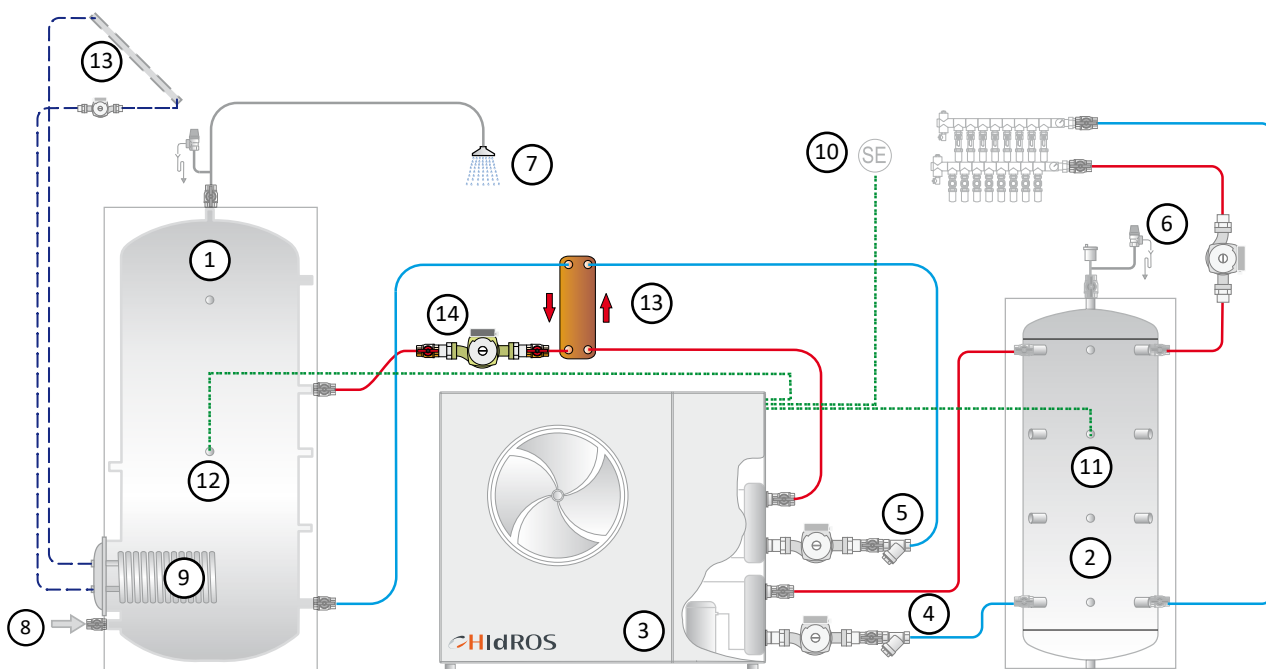


(B)

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.

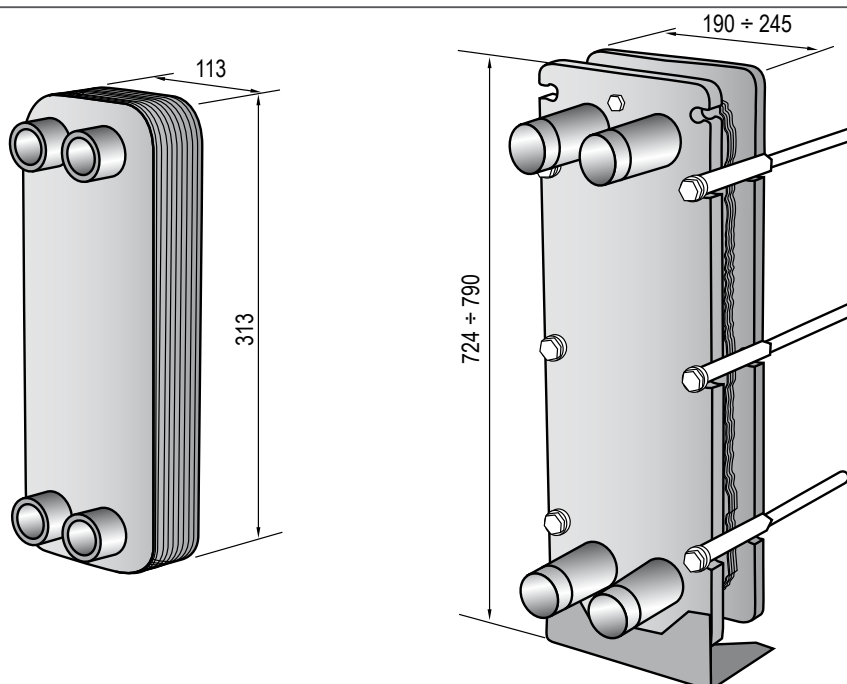
Product specifications

- 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.



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

The above scheme is for illustrative purposes only





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.

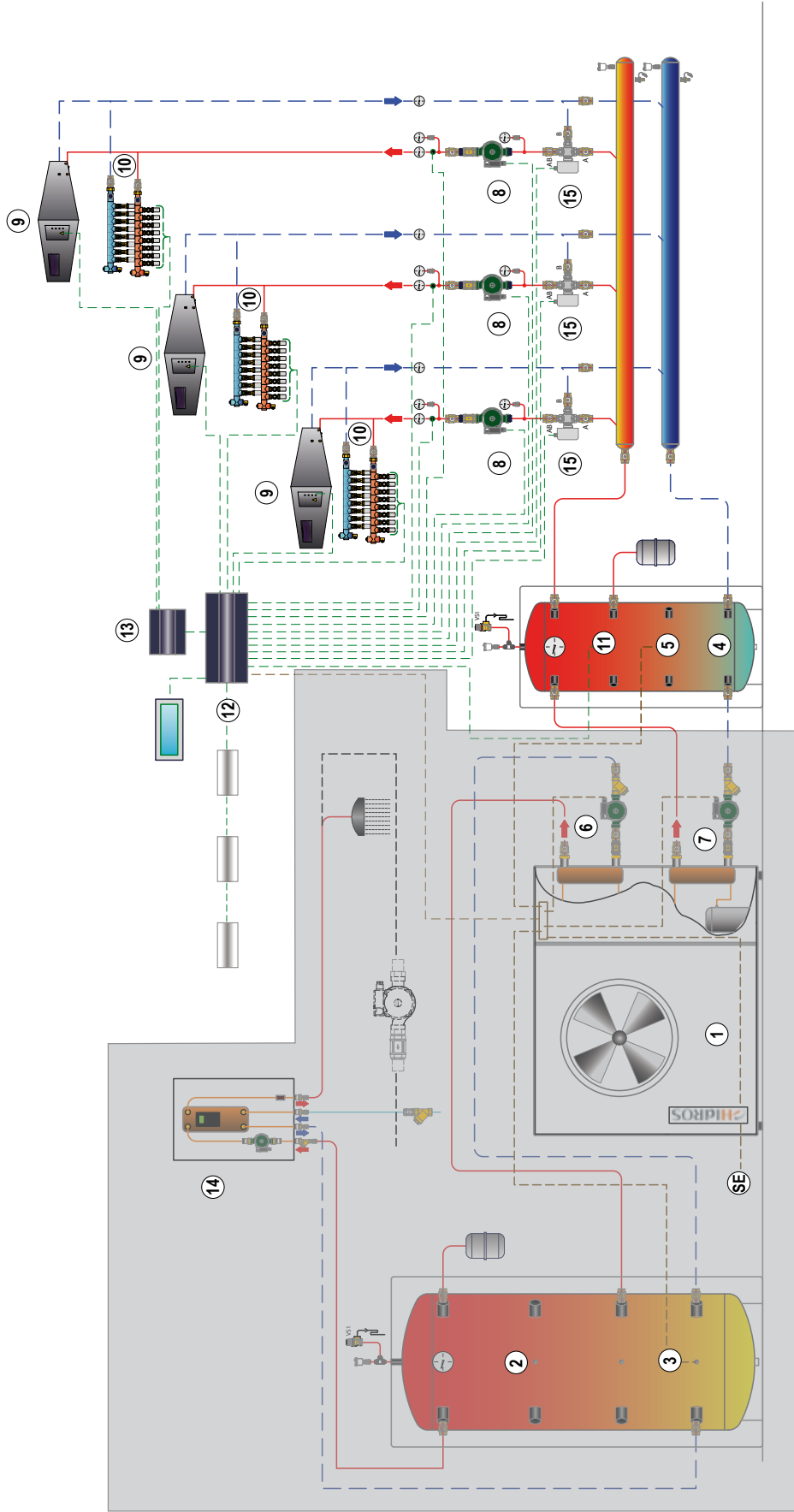
Mod-BUS protocol also enables integration of the system with other home automation products.

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, with DHW circuit priority, equipped with weather -compensated ambient sensor. The management of the system is done by temperature/humidity sensors, connected via BUS line, programmable PLC controller and graphic display for the visualization of all the parameters.

The software allows the control of the temperature and the humidity up to 32 zones, 3 mixing valves 0-10V, 3 dehumidifiers, 3 water pumps, boiler, water chiller and heat pump.

The above scheme is for illustrative purposes only

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



RGAA.01 Programmable controller

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



RGBB.01 Graphic display

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



RGBB.02 Graphic display touch screen (HMI)

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

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



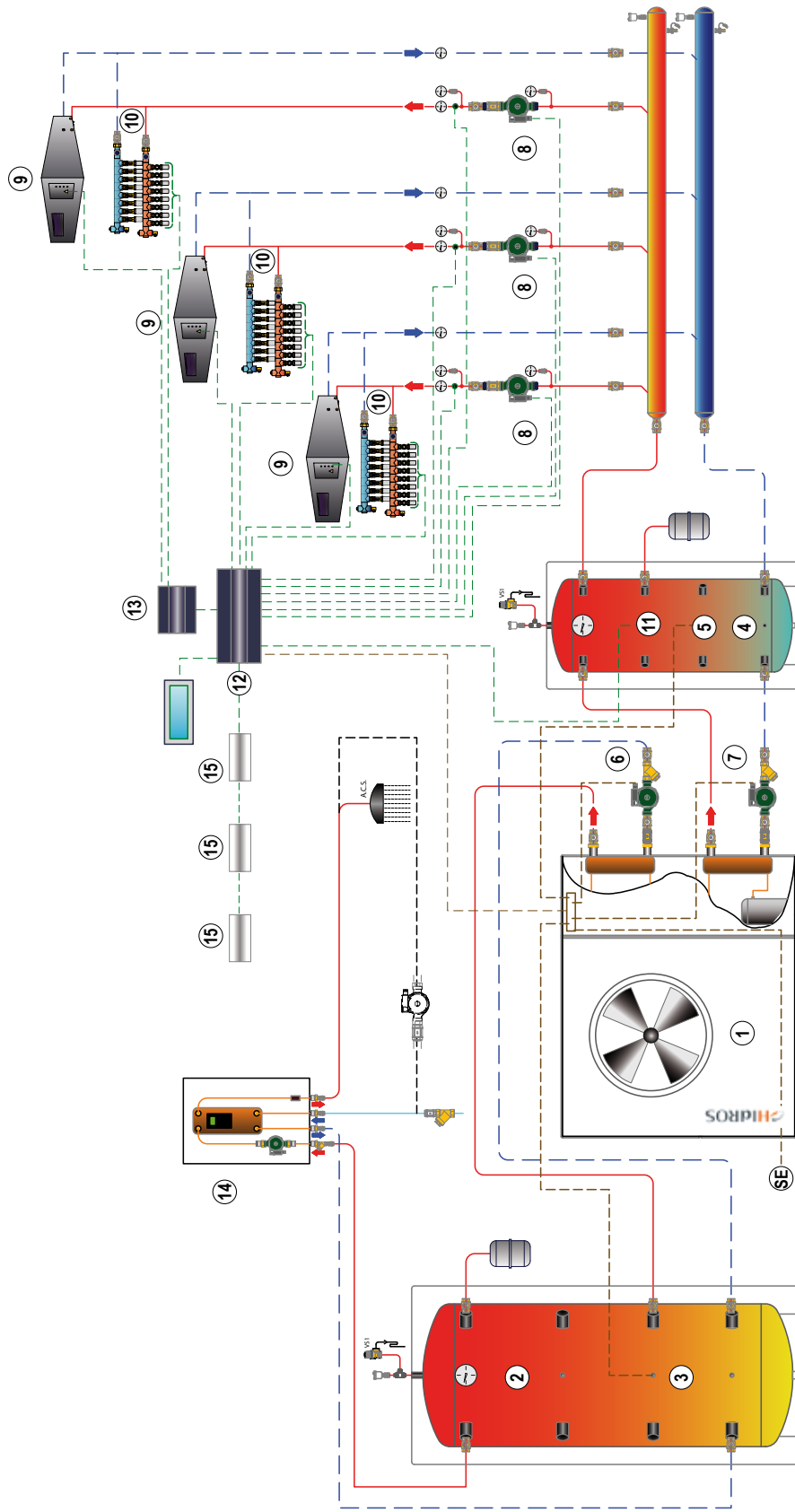
RGDD.01 Temperature and humidity sensor

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



MICR.0540 Web server supervisor module

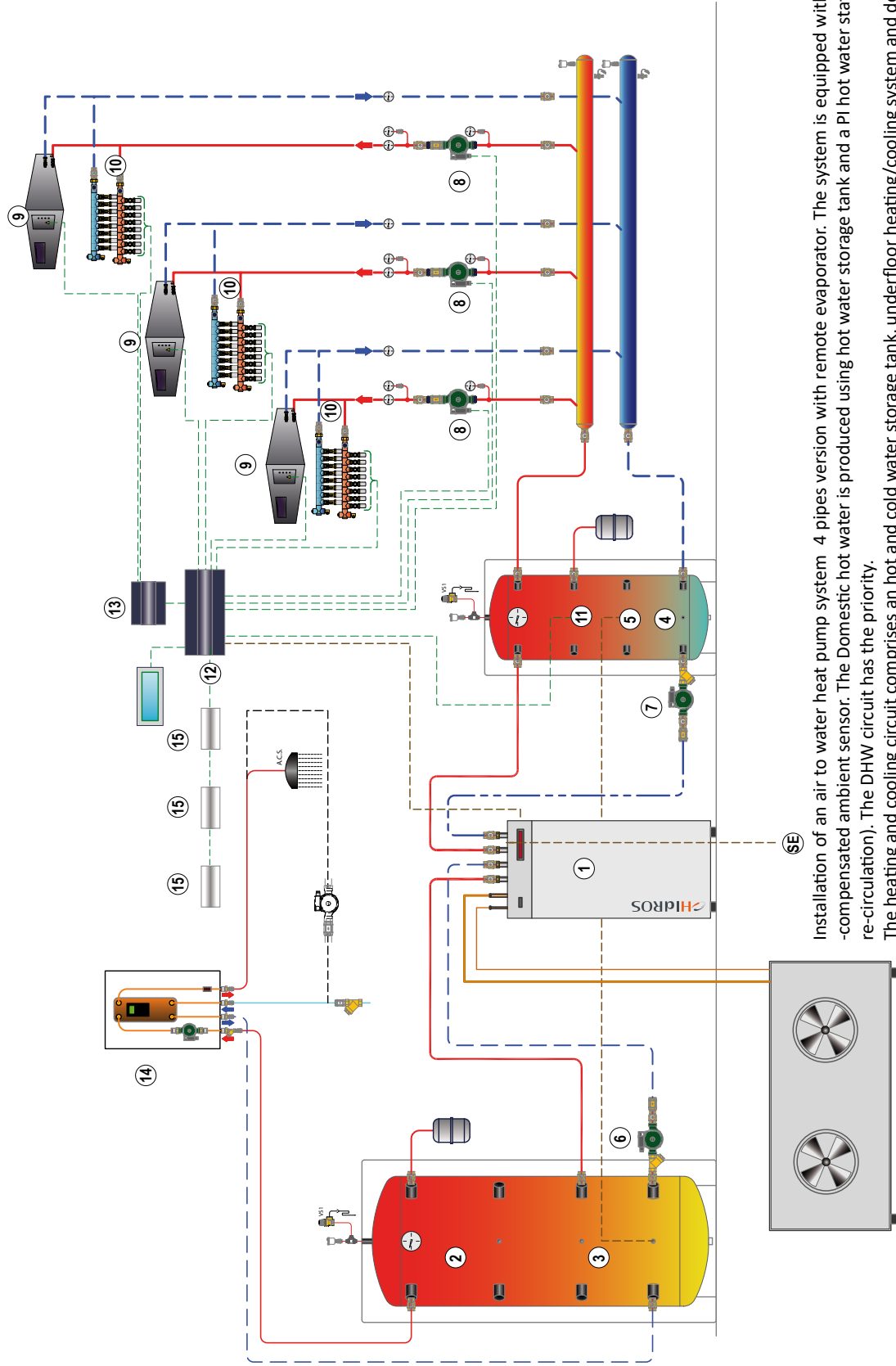
- WEB SERVER for supervision of the parameters;
- Power supply: 230 V AC +/- 10%;
- Internal memory 48 MB;
- Communication protocol modBUS-RTU;
- Output: LAN: x1 - USB: x 2;
- Alarm relays: RS485 x 2, system x 1;
- Ports: RS232 for external modem - RS485 digital input;
- Internal modem: Optional (analogue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



Installation of an air to water heat pump system, 4 pipes version, with DHW circuit priority, equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a hot water storage tank and a hot water station (with re-circulation). The heating and cooling circuit comprises a hot and cold water storage tank, underfloor heating/cooling system and dehumidifiers for radiant cooling systems with heat recovery 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.

The above scheme is for illustrative purposes only

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



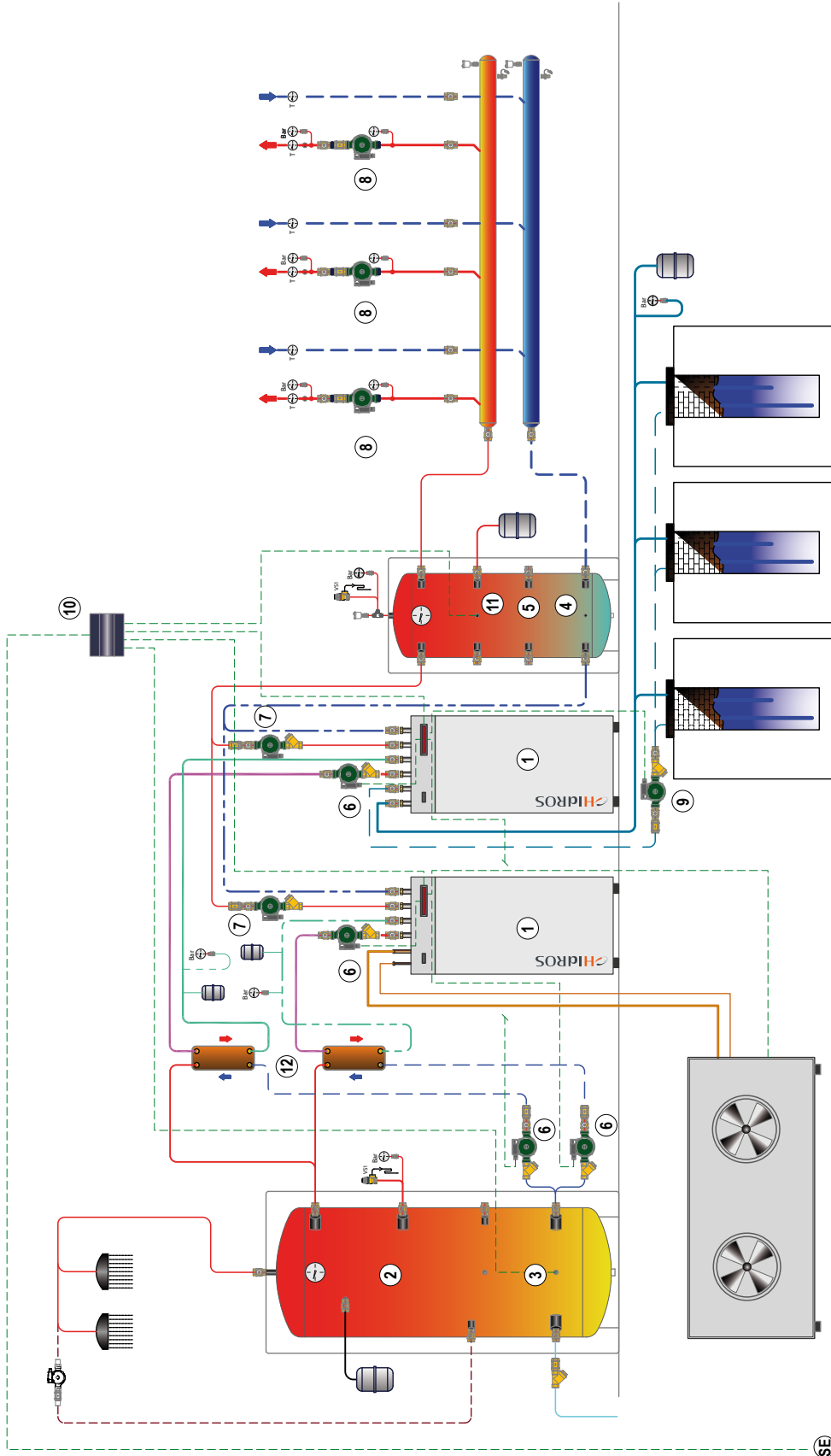
Installation of an air to water heat pump system 4 pipes version with remote evaporator. The system is equipped with weather-compensated ambient sensor. The Domestic hot water is produced using hot water storage tank and a PI hot water station (with re-circulation). The DHW circuit has the priority.

The heating and cooling circuit comprises an hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by Dehumidifiers for radiant cooling systems with heat recovery 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.

The above scheme is for illustrative purposes only

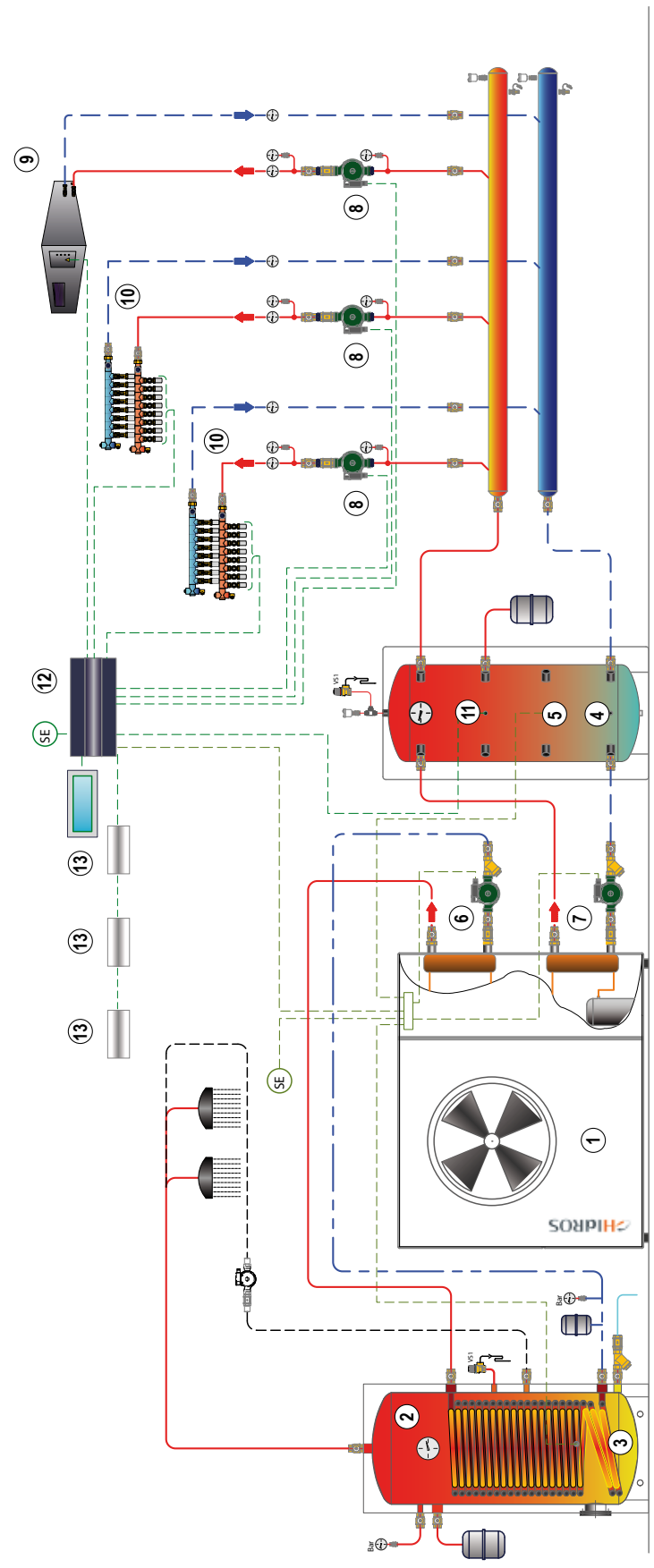
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Expansion Module
2	Hot Water Tank	5	Hot Water Tank	8	Heating Sensor	11	Min Temperature Sensor	14	Heat Station
3	Hot Water Sensor	6	Hot Water Pump	9	Hot Water Pump	12	Dehumidifier	15	Temperature Sensor



Installation of a heat pump system that is composed of a split type air to water heat pump WZT 4 pipes and a ground source heat pump 4 pipes. They are managed in cascade. The system is equipped with a weather-compensated ambient sensor able to manage both units. The Domestic hot water is produced using a domestic hot water storage tank and plate heat exchangers. The heating and cooling circuit comprises a 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.

The above scheme is for illustrative purposes only

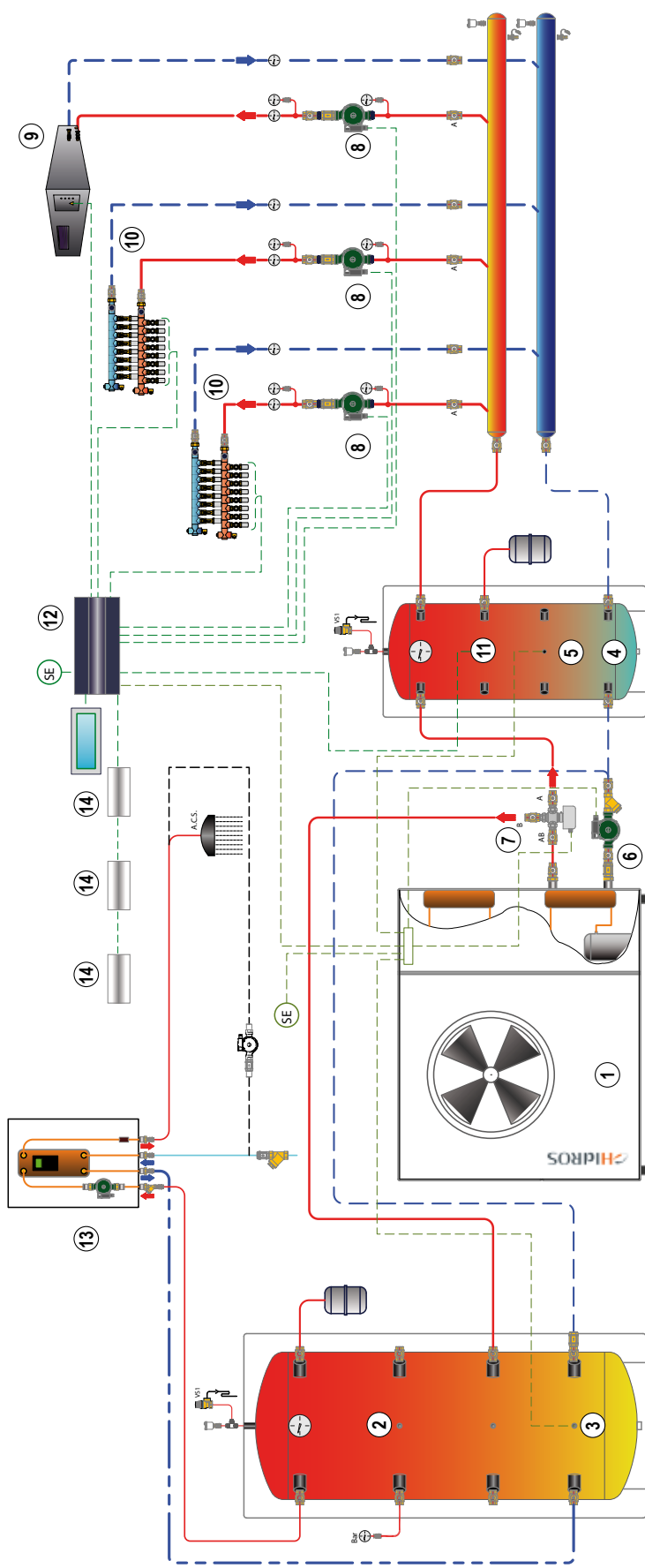
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Cascade Controller	13
2	Hot Water Tank	5	Heating Sensor	8	Zone Exchanger Pump	11	Min Temperature Sensor	14
3	Hot Water Sensor	6	Hot Water Pump	9	Source Exchanger Pump	12	Plate heat Exchanger	15



Installation of an air to water heat pump system 4 pipes version. The system is equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a domestic hot water cylinder. The DHW circuit has the priority. The heating and cooling circuit comprises hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by Dehumidifiers for radiant cooling systems with heat recovery 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.

The above scheme is for illustrative purposes only

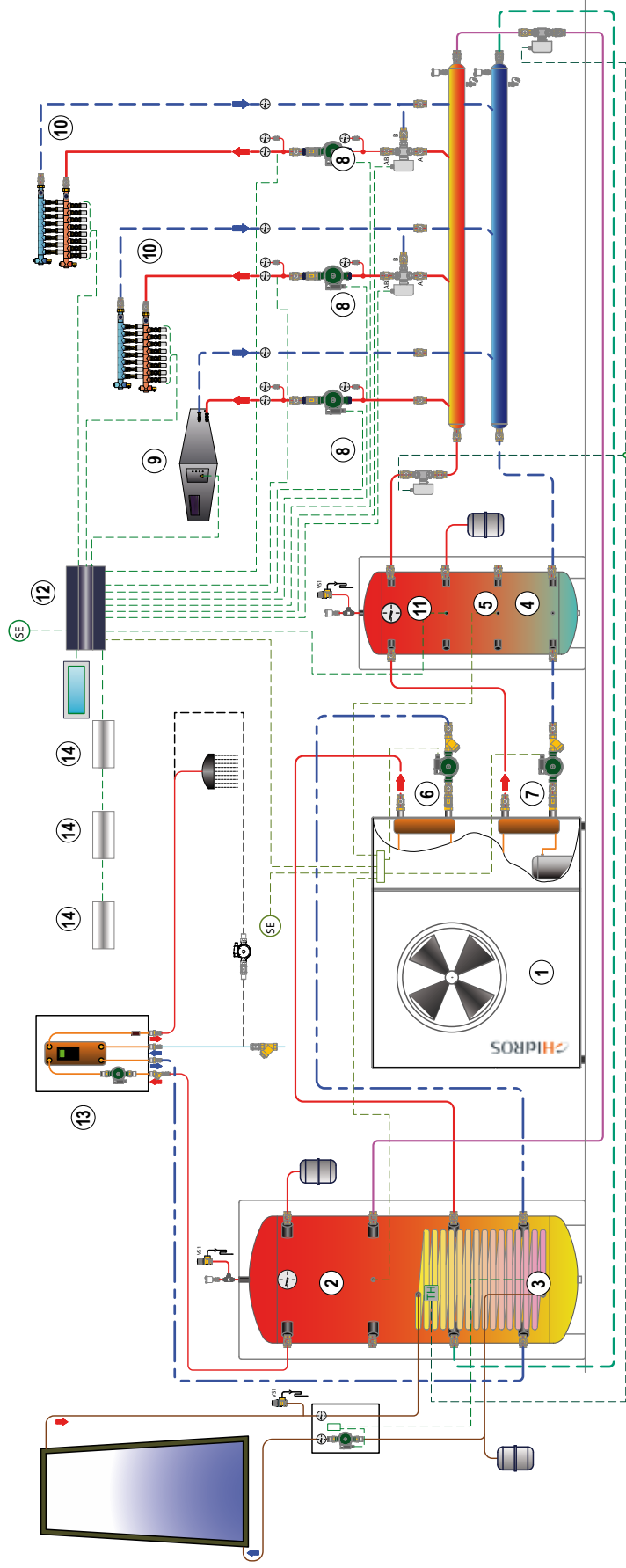
1	Heat Pump	4	Buffer Tank	7	Heating Pump	10	Zone Manifold	13	Temperature Sensor
2	Hot Water Tank	5	Heating Sensor	8	Zone Pump	11	Min Temperature Sensor	14	
3	Hot Water Sensor	6	Hot Water Pump	9	Dehumidifier	12	Controller	15	



Installation of an air to water heat pump system. The system is equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a 3 way diverting valve (controlled by the unit microprocessor), a hot water storage tank and a hot water station with re-circulation. The DHW circuit has the priority. The heating and cooling circuit comprises a hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by Dehumidifiers for radiant cooling systems with heat recovery 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.

The above scheme is for illustrative purposes only

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 4 pipes version. The system is equipped with weather -compensated ambient sensor. The Domestic hot water is produced using a hot water storage tank with solar coil and a hot water station with re-circulation. The DHW circuit has the priority.

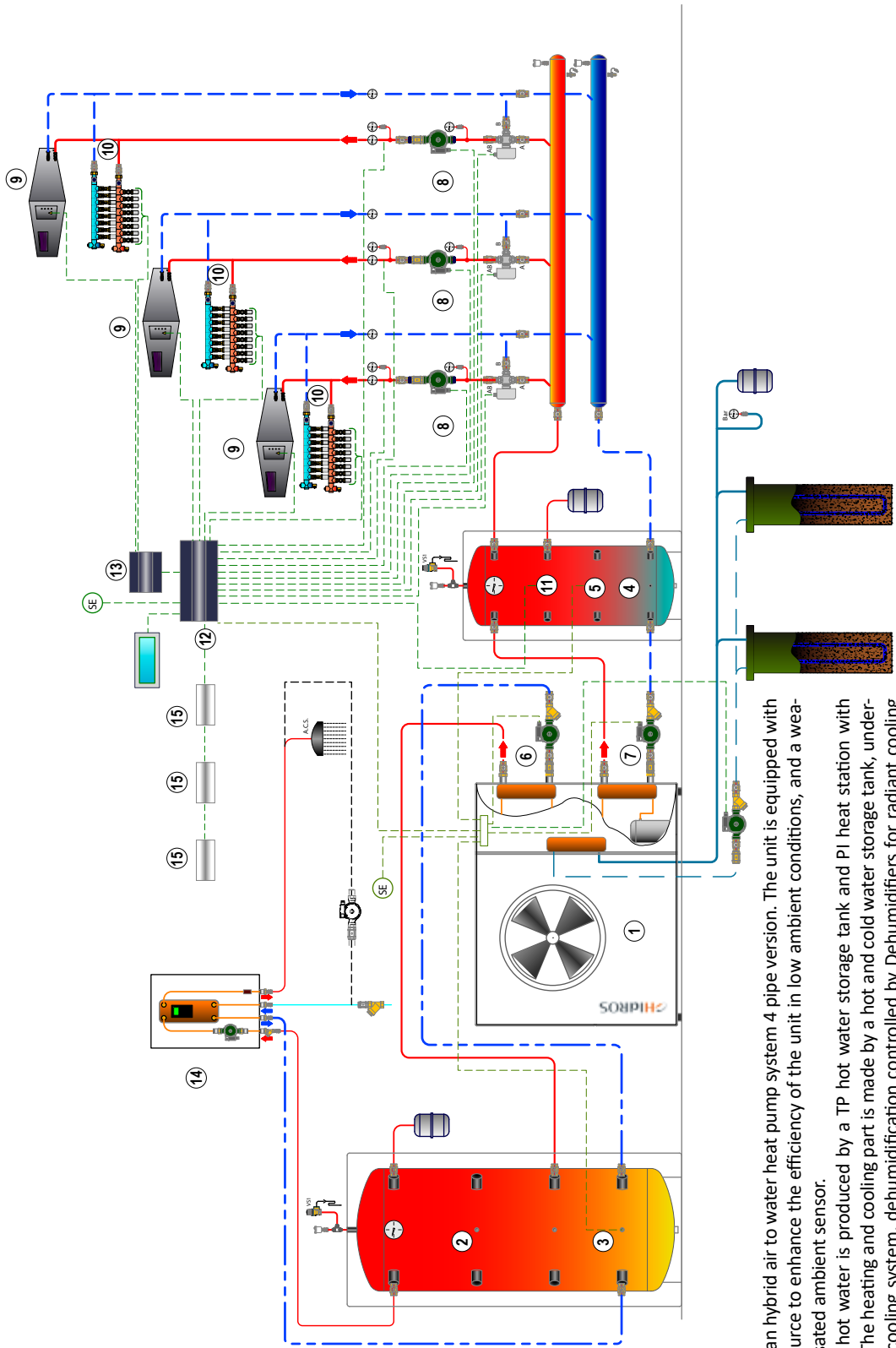
The heating and cooling circuit comprises a hot and cold water storage tank, underfloor heating/cooling system and dehumidification controlled by Dehumidifiers for radiant cooling systems with heat recovery with cooling integration.

Integration of the solar system is possible either on the DHW circuit or the heating circuit, by using a "limit" thermostat to recover the surplus of energy on the DHW circuit.

Supervision of the system is by temperature/humidity sensors with mixing valves for the management of the hot water temperature in winter mode and the cold water temperature in summer with respect to the ambient dew point. The sensors are connected in BUS line, programmable PLC with Modbus protocol and graphic display for visualization of the various parameters.

The above scheme is for illustrative purposes only

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



Installation of an hybrid air to water heat pump system 4 pipe version. 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 hot and cold water storage tank, under floor heating/cooling system, dehumidification controlled by Dehumidifiers for radiant cooling systems with heat recovery 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.

The above scheme is for illustrative purposes only

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

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

- WZ** 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.

FH - FHWZ		25	25WZ
Moisture removed ⁽¹⁾	l/24h	20,1	20,1
Cooling capacity ⁽¹⁾	W	---	1250
Total power input ⁽¹⁾	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	m ³ /h	250	250
Refrigerant		R134a	R134a
Global warming potential (GWP)		1430	1430
Refrigerant charge	Kg	0,2	0,6
Equivalent CO ₂ charge	t	0,36	0,89
Water flow	l/h	150	150
Pressure drop	kPa	8	7,8
Sound power ⁽²⁾	dB(A)	45	45
Sound pressure ⁽³⁾	dB(A)	37	37
Power supply	V/Ph/Hz	230/1/50	230/1/50

GH - GHWZ		25	25WZ	50	50WZ	100	100WZ	200	200WZ
Moisture removed ⁽¹⁾	l/24h	20,1	20,1	48,5	48,5	87,2	87,2	164,0	164,0
Cooling capacity ⁽¹⁾	W	---	1250	---	3500	---	6000	---	11300
Total power input ⁽¹⁾	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
Water flow	l/h	150	150	500	500	600	600	900	900
Pressure drop	kPa	8,0	7,8	17,0	42,0	32,0	39,5	48,0	64,0
Air flow	m ³ /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
Global warming potential (GWP)		1430	1430	1774	1774	1774	1774	1774	1774
Refrigerant charge	Kg	0,2	0,6	0,7	0,9	1,0	1,6	1,7	2,0
Equivalent CO ₂ charge	t	0,36	0,89	1,24	1,57	1,77	2,79	3,02	3,55
Sound power ⁽²⁾	dB(A)	45	45	50	50	57	57	64	64
Sound pressure ⁽³⁾	dB(A)	37	37	42	42	49	49	56	56
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

Performances are referred to the following conditions:

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

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

(2)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)

Frame

All units FH-GH series are made from hot-galvanised thick sheet metal, to ensure the best resistance against the corrossions. 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 klixon 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, powered by the plant water.

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 abled 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 run 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 disable 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.

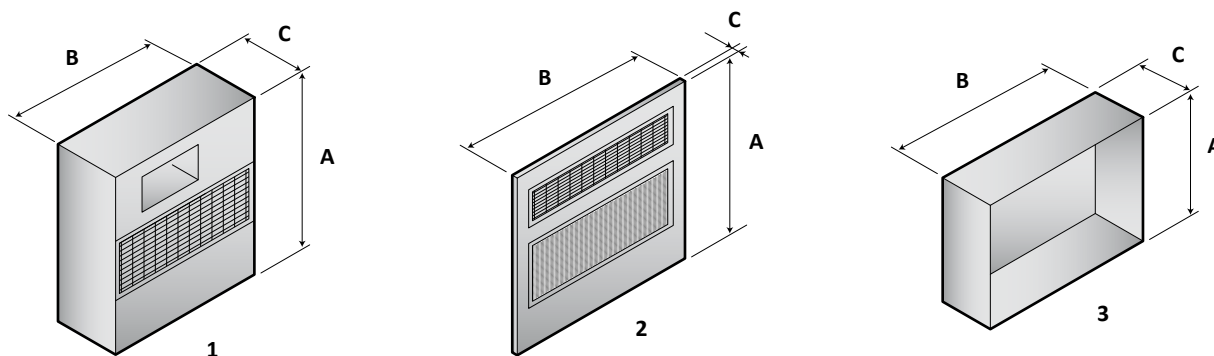
FH - FHWZ		25	25WZ
Limit probe		●	●
High pressure switch		–	●
Galvanized steel template	CTFH	○	○
Wood return and supply grill	GRFH	○	○
Remote mechanical hygrostat	HYGR	○	–
Remote mechanical hygrostat + thermostat	HYGR	–	○

● Standard, ○ Optional, – Not available.

GH - GHWZ		25	25WZ	50	50WZ	100	100WZ	200	200WZ
Limit probe		●	●	●	●	●	●	●	●
High pressure switch		–	●	–	●	–	●	–	●
Defrost thermostat		–	–	–	–	●	●	●	●
Remote mechanical hygrostat	HYGR	○	–	○	–	○	–	○	–
Remote mechanical hygrostat + thermostat	HYGR	–	○	–	○	–	○	–	○
Delivery and return plenum 90°	CANA	○	○	○	○	–	–	–	–

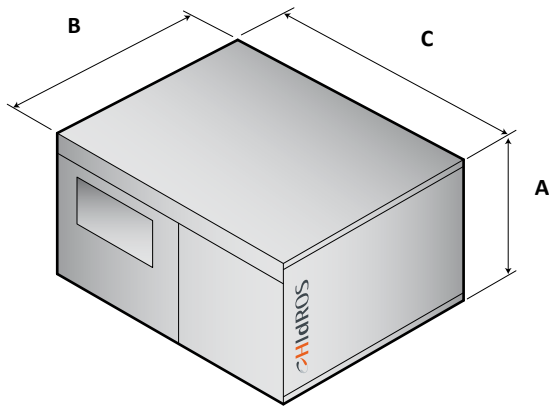
● Standard, ○ Optional, – Not available.

FH



Mod.	A (mm)	B (mm)	C (mm)	Kg
1	681	545	223	38/45 ⁽¹⁾
2	750	660	20	--
3	717,6	632	226,6	--

(1) WZ Version



Mod.	A (mm)	B (mm)	C (mm)	Kg
25	257	582	582	35
50	352	582	582	52
100	392	800	730	87
200	464	888	930	115
25WZ	257	582	582	37
50WZ	352	582	582	55
100WZ	392	800	730	90
200WZ	464	888	930	120

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:

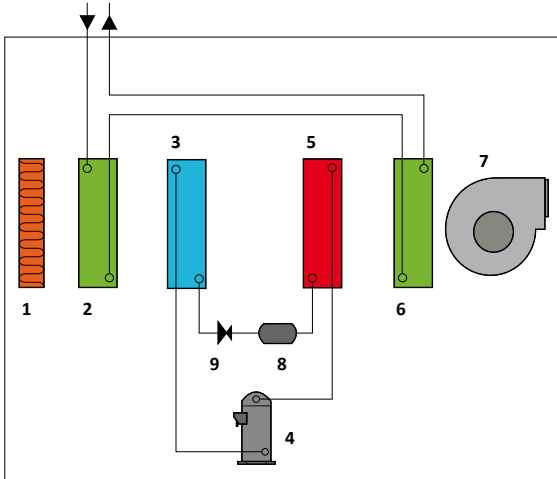
Modality with neutrum air.

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.

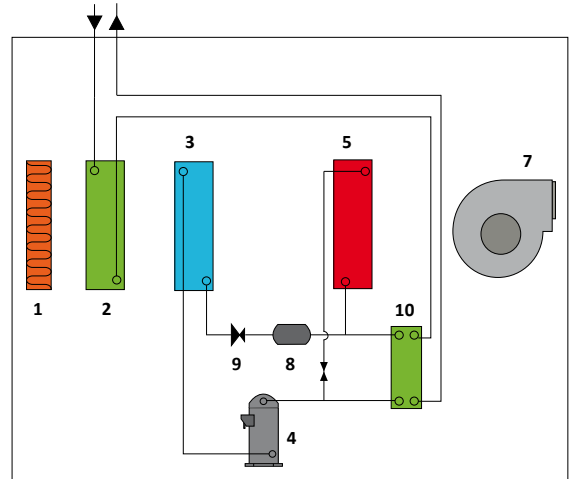
The unit condensates the 100% in water through the heat -exchanger (10). The air, then, go through the condenser (5) (disabled) where does not change its characteristics (temperature and humidity).

Standard version



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

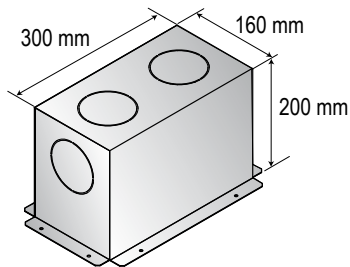
WZ version



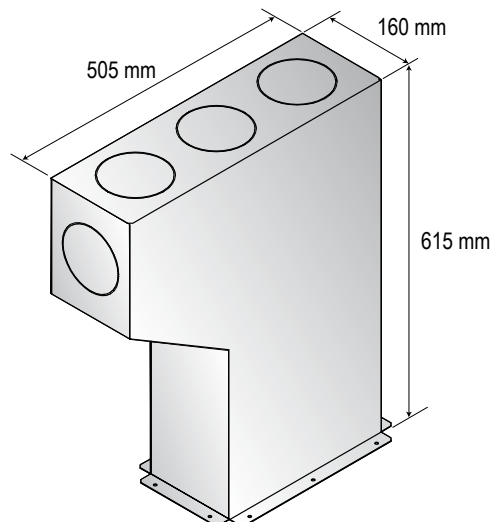
6	Post-cooling coil
7	Fan
8	Dry filter
9	Expansion device
10	Condenser water

Discharge plenum mod. GH 25 ÷ 50

GH 25

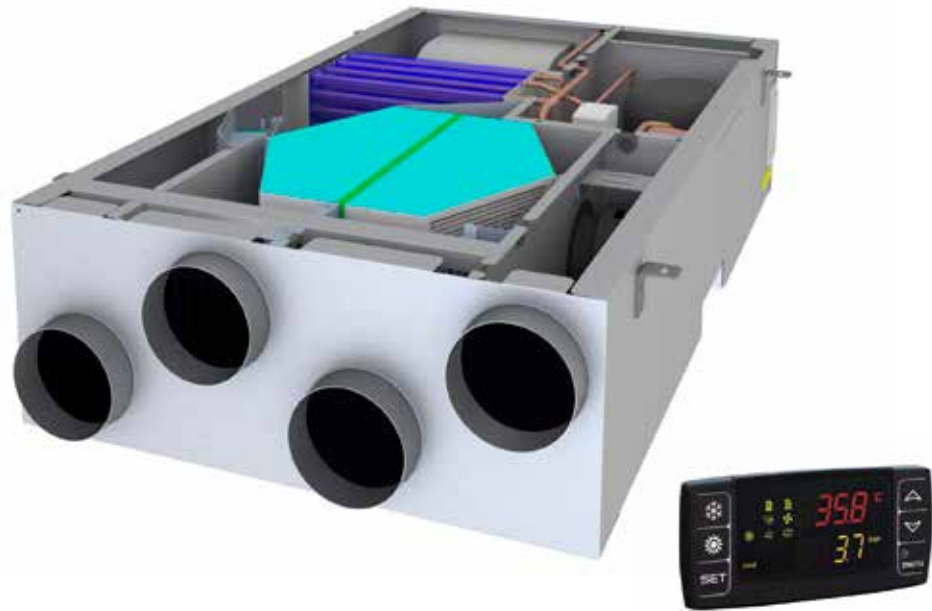


GH 50



GHE

Dehumidifiers for radiant cooling systems with heat recovery



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

- FC Free Cooling:** allows the air to avoid unnecessary switching on the cooling circuit, thus granting excellent environmental conditions with high energy savings. The Free Cooling option is perfect in the middle seasons, when heating or cooling systems are not in use.

GHE		26	51
Useful dehumidification capacity (from the net hygroscopic content of the external air) ⁽¹⁾	l/24h	30,1	61,8
Total cooling Power (latent + sensible) ⁽¹⁾	W	1380	2820
Recovered winter heating power ⁽²⁾	W	950	1850
Efficiency winter recovery ⁽²⁾	%	90	90
Efficiency summer recovery ⁽¹⁾	%	75	72
Power supply	V/Ph/Hz	230/1/50	230/1/50
Compressor absorbed power ⁽¹⁾	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	15	35
Outdoor air flow	m ³ /h	80 ÷ 130	140 ÷ 250
Supply air flow	m ³ /h	130 ÷ 260	250 ÷ 500
Refrigerant		R134a	R410A
Global warming potential (GWP)		1430	2088
Refrigerant charge	Kg	0,64	1,10
Equivalent CO ₂ charge	t	0,92	2,30
Sound power ⁽³⁾	dB(A)	47	52
Sound Pressure ⁽⁴⁾	dB(A)	39	44

Performances are referred to the following conditions:

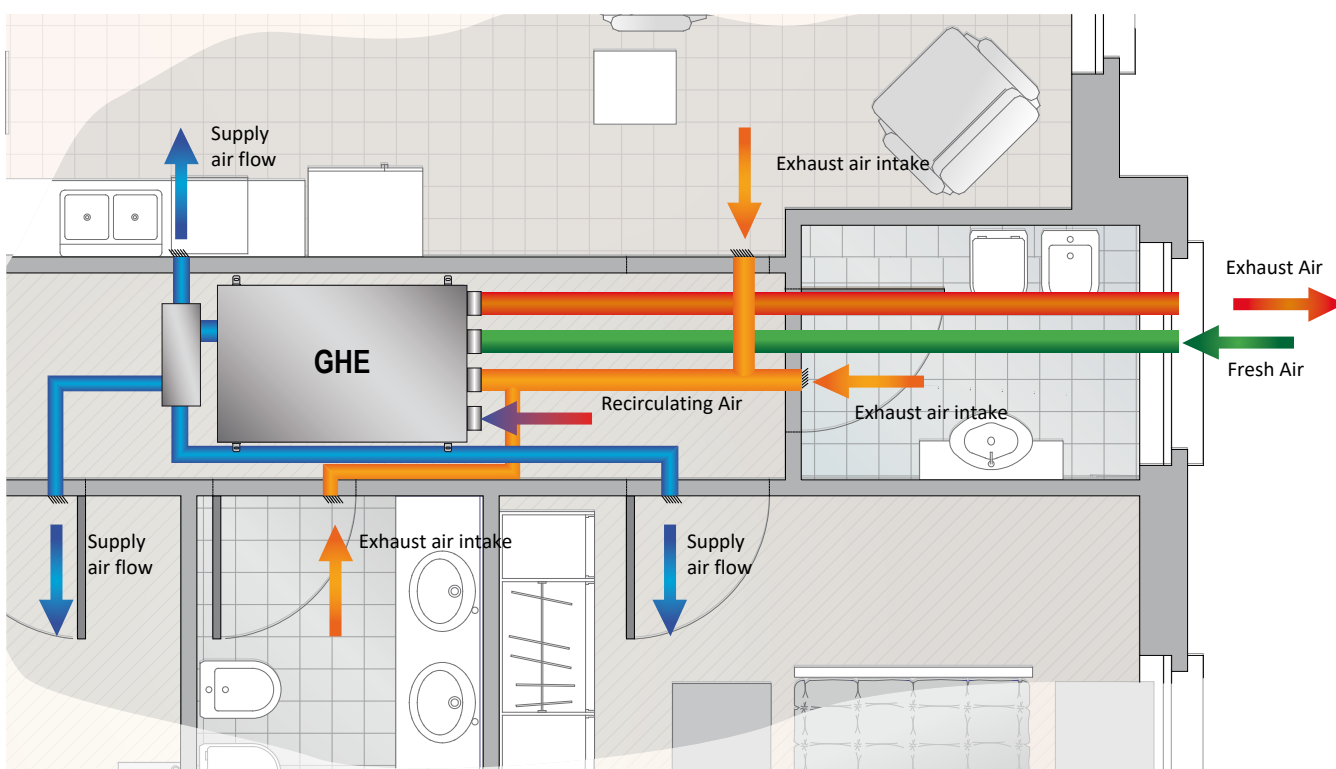
(1) Room Temp. 26°C; 65% RU; Ambient Temp. 35°C; 50% RU; Fresh Air System volume 130 m³/h (GHE26), 250 m³/h (GHE51); Water IN 15°C, Water Flow 250 l/h (GHE26), 350 l/h (GHE51).

(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.

Typical installation



Frame

All units are made from hot-galvanised thick sheet metal, to ensure the best resistance against the corrossions. 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 26 and R407C for the models 51.

Compressor

The compressor is alternative for model 26 and rotative type for model 51, 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 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 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.

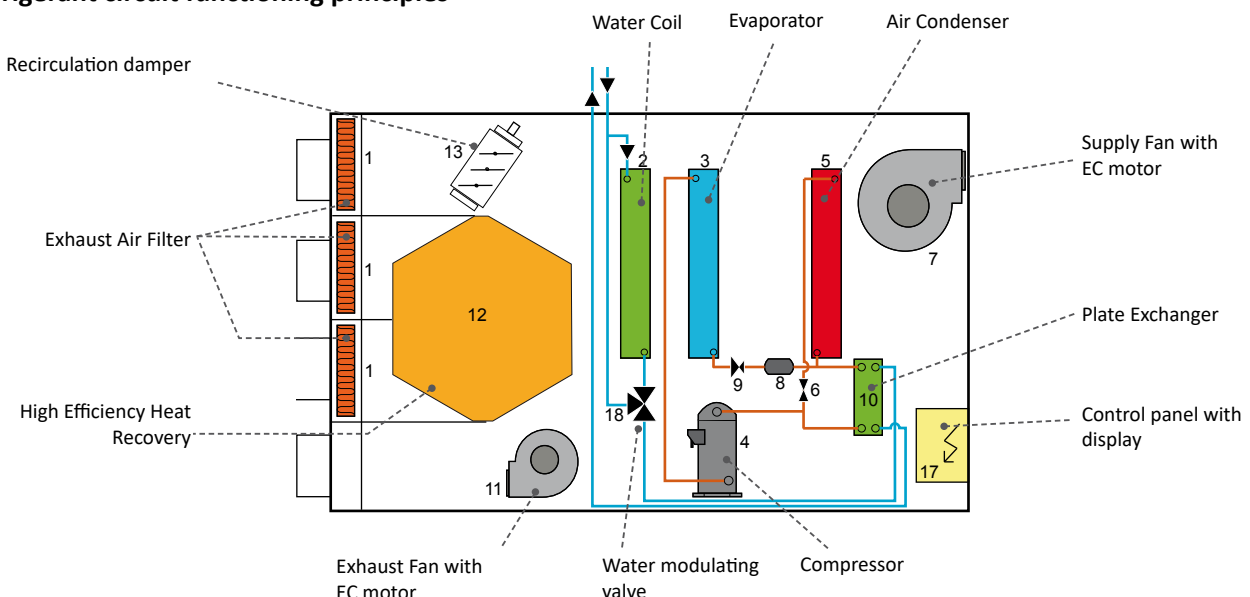
Air filter

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 G5, according to EN 779:2002.

Heat recovery

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

Refrigerant circuit functioning principles



Adjustment micro switches

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 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 micro-processor (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.

Versions

Free Cooling (FC) (only for mod.26)

In these versions, the electronic control mounted on the machine, check the thermo-hygrometric conditions (indoor –outdoor), allows the air to avoid unnecessary switching on of the refrigerating circuit, thus ensuring excellent environmental conditions with high energy savings. The Free Cooling option is perfect in spring and autumn, when heating or cooling is not yet activated, or at night when the summer heat humidity conditions outside are often sufficient to ensure proper ventilation of rooms without the use of the refrigerant system.

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.

which will then make a post-heating at constant humidity blowing air in in the room in thermally neutral conditions.

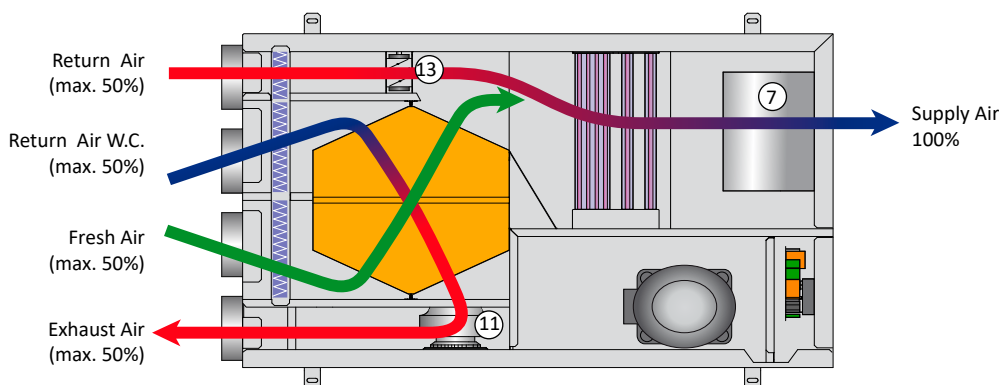
Dehumidification with cooling:

The cooling circuit, in this case, performing works 100% of the condensation in the water through the plate exchanger (10), the air condenser (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.

Dehumidification with neutral air:

The cooling system works partially in the water through the plate exchanger (10) and partially in the air with the air condenser (5)

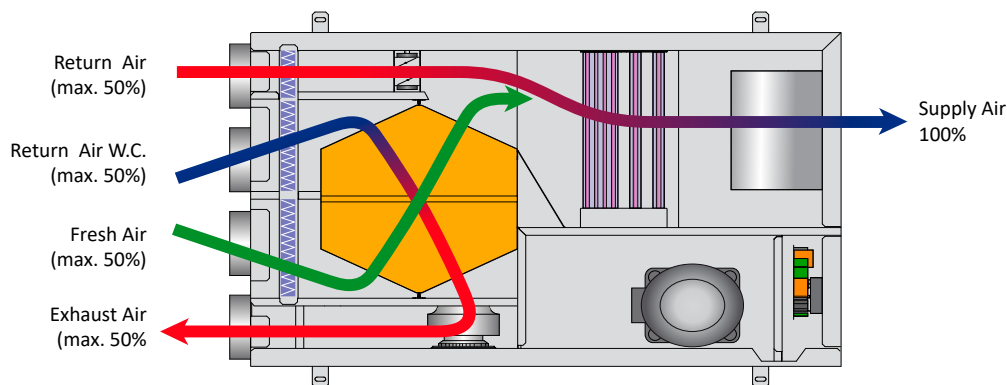
Aeraulic circuit functioning principles:



GHE 26 units can operate with a flow rate of outdoor air from 80 to 130 m³/h (140 to 260 m³/h for the model GHE 51), to ensure sufficient supply air changes in the room having a variable volume by 260 m³ (0.5 vol/h) to 460 m³ (0.3 vol/h), in compliance with regional and national regulations. The air flow rate of discharge can vary from 80 to 130 m³/h (140-260 m³/h for the model 51) in the winter mode, and is fixed to 260 m³/h (500 m³/h for the model 51) 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 (11), while the outside air is sucked through the fan (7). The proper balance of air flows is ensured by the damper (13) that handles both the balance of flows of air that the air flow recirculation summer.

Summer operation (compression on)

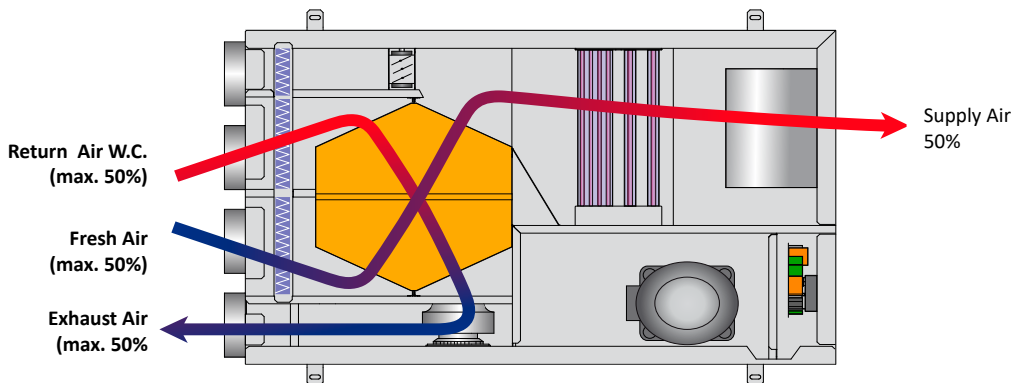


Whit this selected mode the unit renews the ambient air with the outside through the heat exchanger for high efficiency, air flow is increased so as to allow operation of refrigerant circuit; for this purpose the r recycling damper will be open, the supply fan is operated at maximum capacity and the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

The possible functions in this configuration are

- Renewal + Air Dryers neutral: The 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 (compression off)

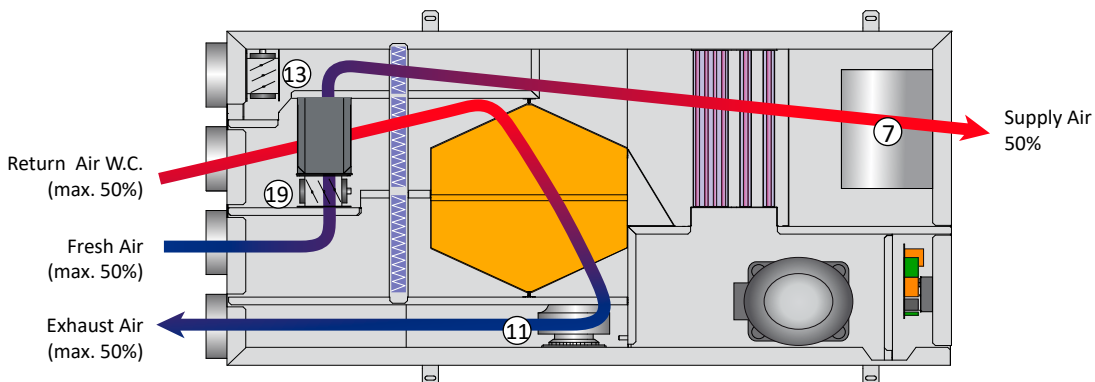


Whit this selected mode, the unit renews the ambient air with the outside through the heat exchanger of high efficiency. The air flow is reduced to the value required by the standard (0.3 ÷ 0.5 vol/h), the recirculation damper is closed and the unit operates with 100% fresh air.

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.

Fresh air with free cooling (only FC version)



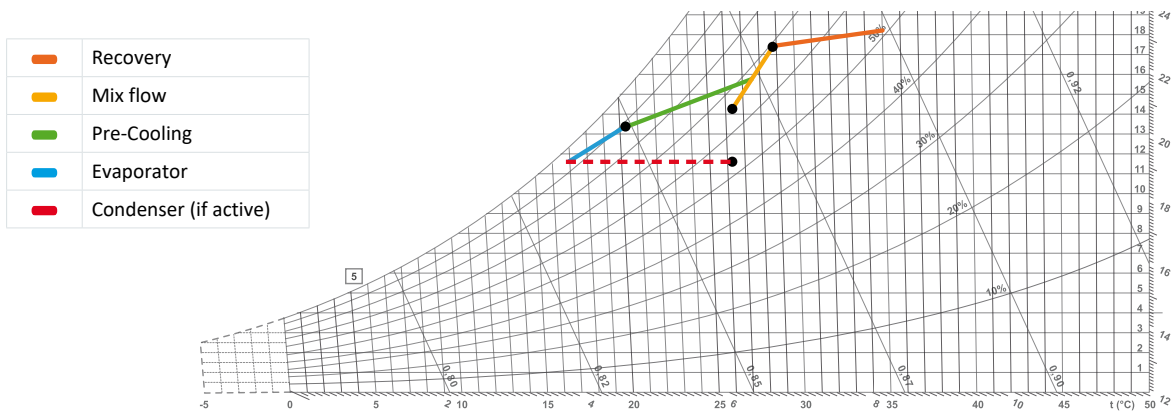
The compressor is off, the water coil is not powered (3-way valve closed), the recirculation damper (13) is closed, the damper bypass of the recuperator (19) is open. The stale air is fully exhausted into the environment by the fan (11) Meanwhile outside air is

sucked by the fan (7) bypasses the heat recovery and comes at the room with temperature and relative humidity without modification. During the free cooling mode the flow rate of outside air is equal to the flow rate of the supply air in the environment.

GHE		26	51
Microprocessor control		●	●
User flow switch		●	●
Modulating 3-way valve		●	●
Supply & Return EC fans		●	●
G4 air filter		●	●
Adjustable Trimmers		●	●
High Efficiency Heat Recovery		●	●
Remote control Panel	PCRL	○	○
Thermo- Mechanical remote Hygrostat	HYGR	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○
Serial interface card RS485	INSE	○	○
High efficiency electronic air filter	FC	○	--

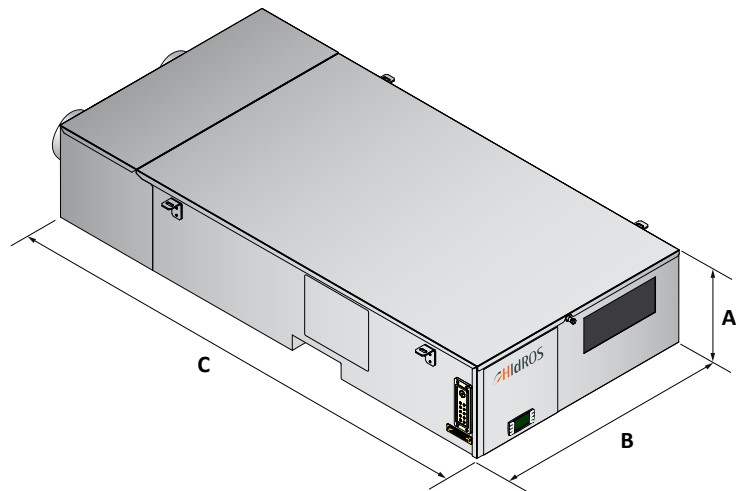
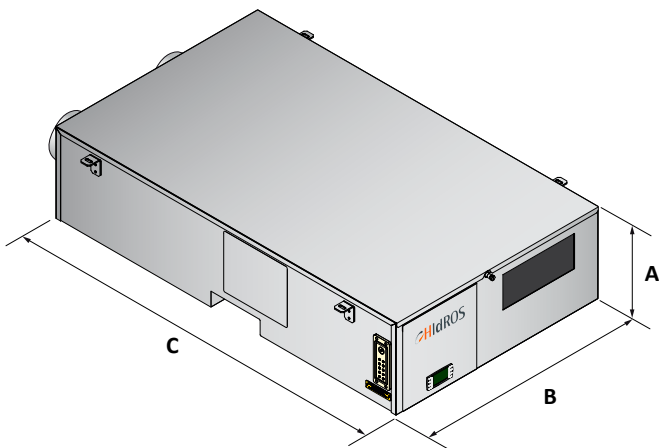
● Standard, ○ Optional, – Not available.

Summer air treatment



Standard version

FC version (only mod. 26)



Mod.	A (mm)	B (mm)	C (mm)	Kg
26	260	732	1105	60
51	400	835	1370	80
26/FC	260	732	1355	95

FHE

Dehumidifiers for radiant cooling systems with heat recovery



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.

FHE		26
Useful dehumidification capacity (from the net hygroscopic content of the external air) ⁽¹⁾	l/24h	30,1
Total cooling Power (latent + sensible) ⁽¹⁾	W	1380
Recovered winter heating power ⁽²⁾	W	950
Efficiency winter recovery ⁽²⁾	%	90
Efficiency summer recovery ⁽¹⁾	%	70
Power supply	V/Ph/Hz	230/1/50
Compressor absorbed power ⁽¹⁾	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	15
Outdoor air flow	m ³ /h	80 ÷ 130
Supply air flow	m ³ /h	130 ÷ 260
Refrigerant		R134a
Global warming potential (GWP)		1430
Refrigerant charge	Kg	0,59
Equivalent CO ₂ charge	t	0,84
Sound power ⁽³⁾	dB(A)	47
Sound Pressure ⁽⁴⁾	dB(A)	39

Performances are referred to the following conditions:

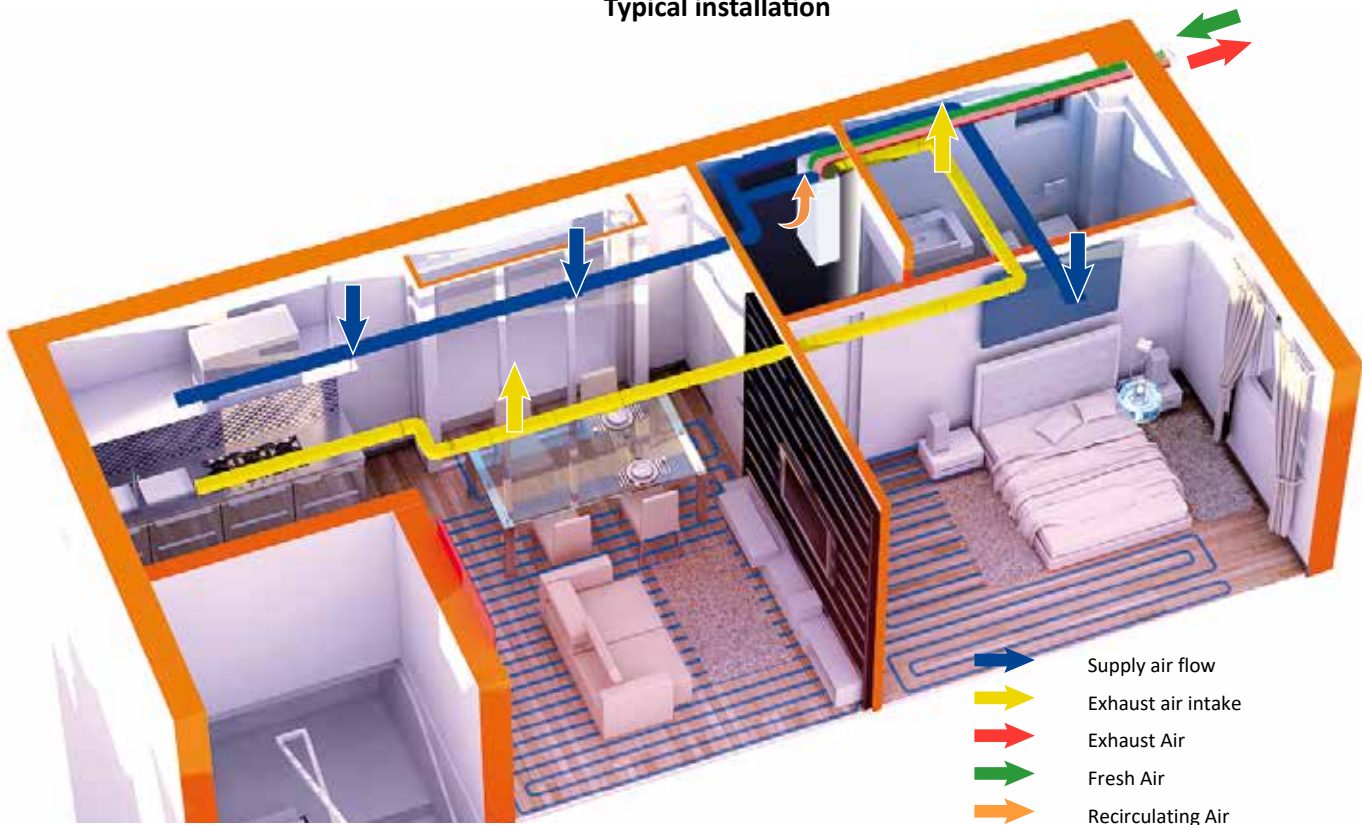
(1) Room Temp. 26°C; 65% RU; Ambient Temp. 35°C; 50% RU; Fresh Air System volume 130 m³/h; Water IN 15°C, Water Flow 250 l/h.

(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.

Typical installation



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 corrosions. 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

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 G4, according to EN 779:2002.

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 .

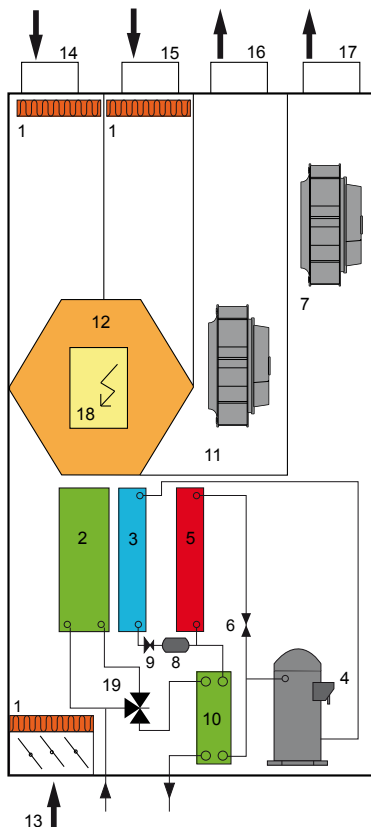
Microprocessor

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 micro-processor (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

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 fatherly cooled and dehumidified.

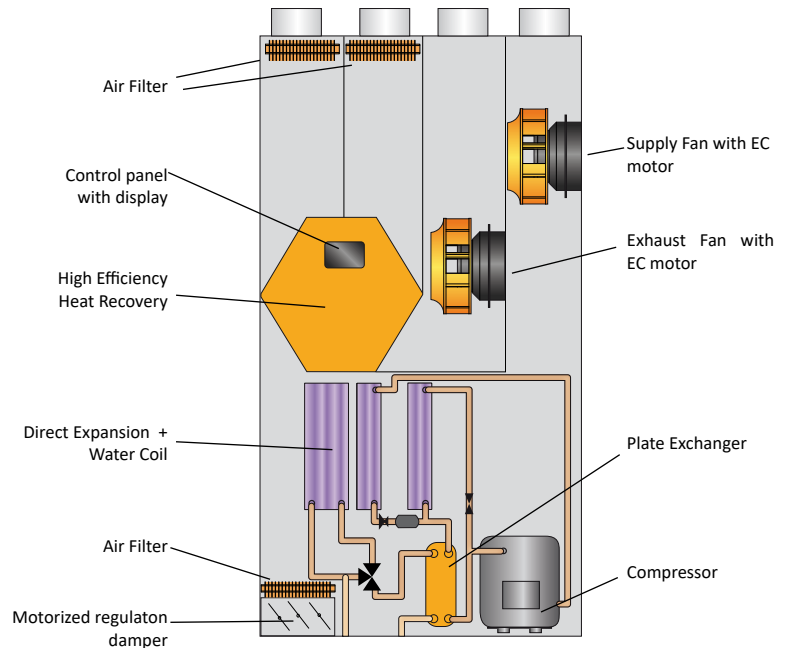
At this time the functionality mode may be:

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.

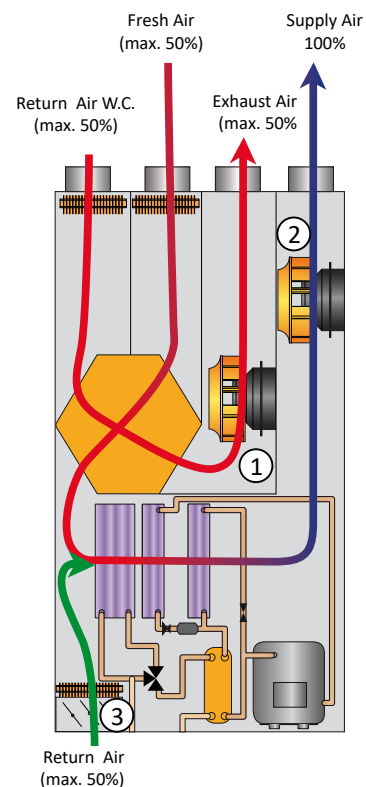


Aeraulic circuit functioning principle

FHE units can operate with a flow rate of outdoor air from 80 to 130 m³/h, to ensure sufficient supply air changes in the room having a variable volume by 430 m³ (0,3 vol/h) in compliance with regional and national regulations. The air flow rate of discharge can vary from 80 to 130 m³/h in the winter mode, and is fixed to 260 m³/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.

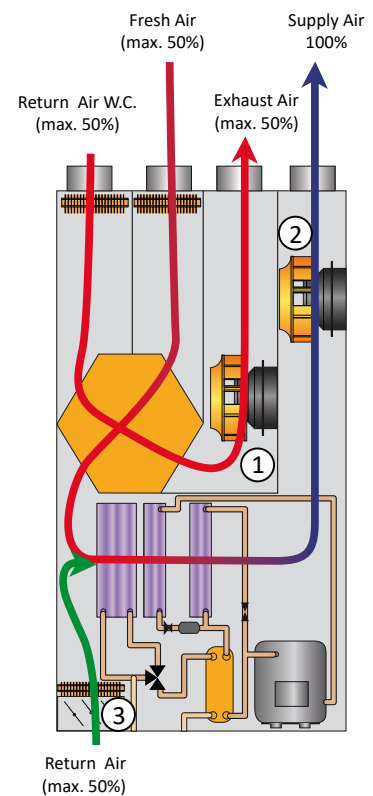


Summer operation (Compressor on)

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 recycling 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.

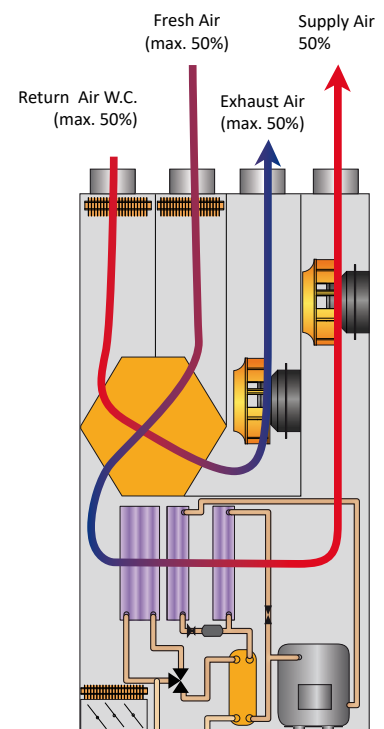


Winter operation and middle season (Compressor off)

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 recirculation 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.

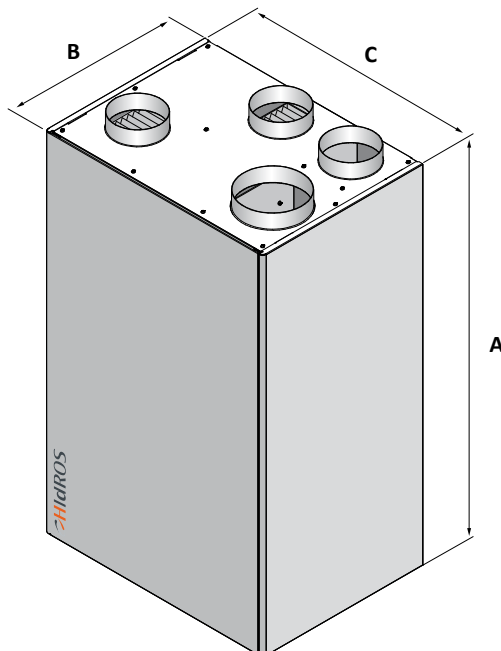
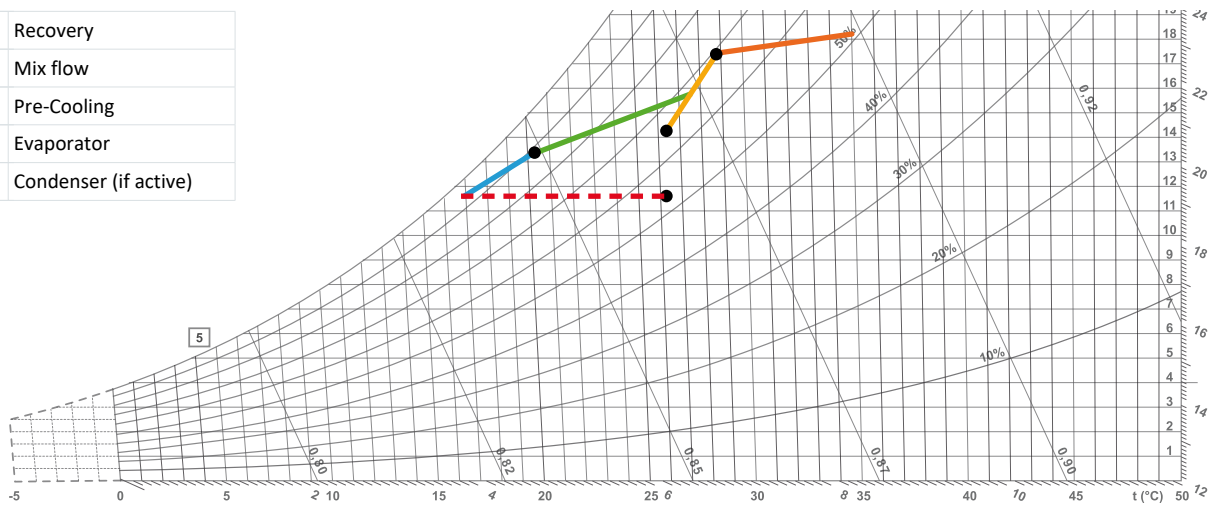


FHE		26
Microprocessor control		●
User flow switch		●
Modulating 3-way valve		●
Supply & Return EC fans		●
G4 air filter		●
Adjustable Trimmers		●
High Efficiency Heat Recovery		●
Humidity and Temperature electronic probe sensor	RGDD	●
Remote control Panel	PCRL	○
Serial interface card RS485	INSE	○

● Standard, ○ Optional, – Not available.

Summer air treatment

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



Mod.	A (mm)	B (mm)	C (mm)	Kg
26	1125	440	600	90

HBA

Industrial dehumidifiers



HBA (A)



HBA (P)



HBA 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 5 models which cover a capacity range from 50 to 200 l/24h. HBA units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

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

The units are supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions.

Versions

- A Version with cabinet
- P Ductable units.

HBA/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	kW	0,9	1,2	1,6	1,9	2,5
Maximum input power	kW	1,2	1,5	2,0	2,3	3,1
Maximum input current ⁽¹⁾	A	3,9	5,6	8,4	10,5	13,2
Peak current	A	19,1	20,1	38,4	44,7	63,7
Air Flow	m ³ /h	500	800	1000	1400	1650
Available static pressure	Pa	40	40	40	40	40
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge	Kg	0,47	0,60	0,70	1,20	1,20
Equivalent CO ₂ charge	t	0,98	1,25	1,46	2,51	2,51
Sound power ⁽³⁾	dB(A)	54	57	57	59	61
Sound pressure ⁽⁴⁾	dB(A)	47	50	50	52	54
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Performances are referred to the following conditions:

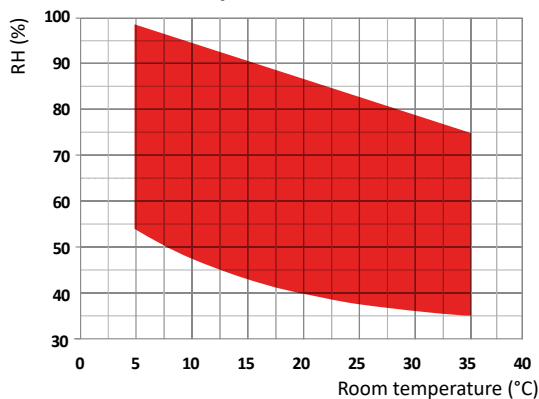
(1) Temperature 30°C; Humidity 80%

(2) Room temperature 30°C; water temperature 80/70°C, at compressor OFF

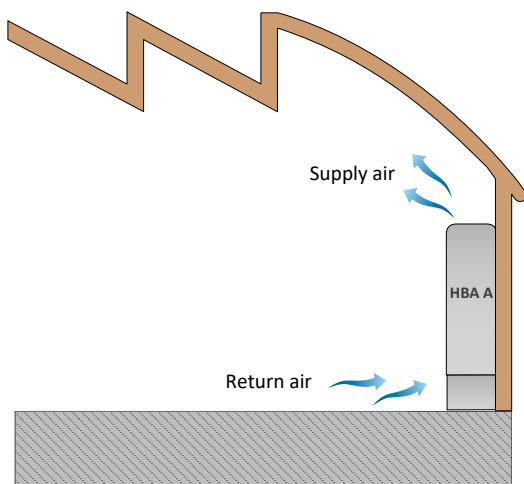
(3) Sound power level calculated according to ISO 9614.

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

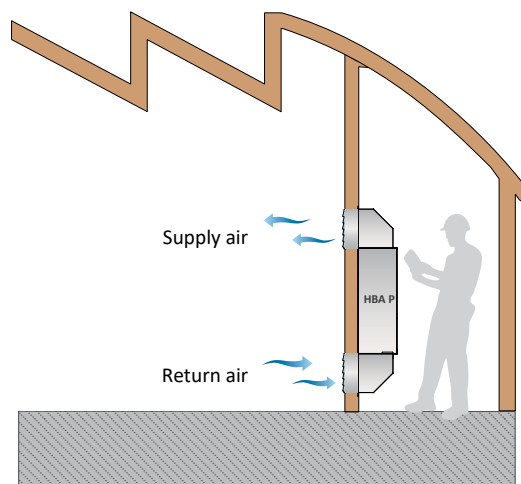
Operation limits



Standard version (A)



Ducted version (P)



Frame

All 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. The colour of the unit is RAL 9010 both for the base and for the frontal panel.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). All the units are supplied with injection valves kit for hot gas defrost cycle.

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 0,1 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 powder coated 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. 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 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. 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: 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 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.

Accessories

HYGR - Remote mechanical hygrostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

KGBH - Louver kit and case for ducted version

Air grille double row adjustable brushed aluminium fins, equipped for wall mounting with subframe.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PMBH - Delivery and return plenum 90° (2 pieces)

To be used for "P" version to direct inlet/outlet air from/to swimming pool and vice versa. Galvanized steel made, coated with polyurethane powder to grant best resistance to weathering and operation in harsh environments.

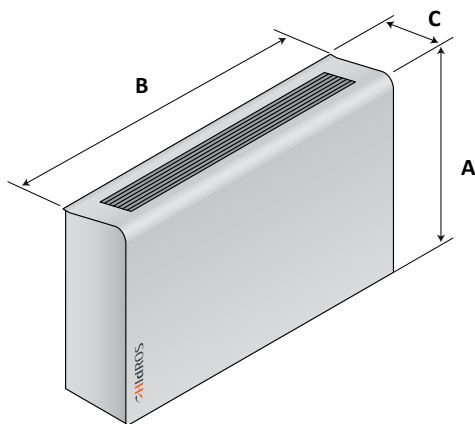
ZOCC- Feet

Metallic galvanized steel feet, painted, used to install the unit on unsuitable walls. The feet can not be used in case the supply and return plenums are present.

HBA		50/A	50/P	75/A	75/P	100/A	100/P	150/A	150/P	200/A	200/P
A.C. fans ≤ 40 Pa		●	●	●	●	●	●	●	●	●	●
Hot gas defrost		●	●	●	●	●	●	●	●	●	●
Thermostatic valve		●	●	●	●	●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●	●	●	●	●
Main switch		●	●	●	●	●	●	●	●	●	●
Remote mechanical hygrostat	HYGR	○	○	○	○	○	○	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○
Delivery and return plenum 90° (2 pieces)	PMBH	○	○	○	○	○	○	○	○	○	○
Feet	ZOCC	○	○	○	○	○	○	○	○	○	○
Louver kit and case for ducted version	KGBH	○	○	○	○	○	○	○	○	○	○

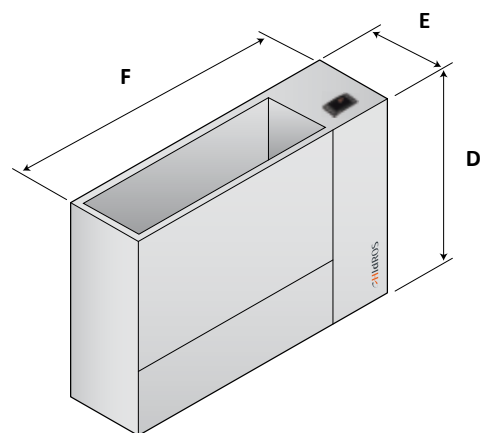
● Standard, ○ Optional, – Not available.

HBA - A



Mod.	A (mm)	B (mm)	C (mm)	Kg
50	750	760	260	50
75	750	1060	260	64
100	750	1060	260	68
150	836	1310	310	99
200	836	1310	310	102

HBA - P



Mod.	D (mm)	E (mm)	F (mm)	Kg
50	680	250	706	41
75	680	250	1006	57
100	680	250	1006	61
150	770	300	1255	82
200	770	300	1255	87

HHA

Industrial dehumidifiers



HHA 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 5 models which cover a capacity range from 50 to 200 l/24h. These units are intended to be ceiling installed in a technical room. A centrifugal fan with high available static pressure allows unit connection to ductworks, both for air suction and discharge.

The units are supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions.

Versions

The series includes 5 models with air flows from 500 to 1650 m³/h.

HHA		50	75	100	150	200
Moisture removed at 30°C - 80%	l/24h	49	73	95	155	190
Moisture removed at 30°C - 60%	l/24h	39,0	56,7	77,4	118,3	146,7
Moisture removed at 27°C - 60%	l/24h	34,9	50,1	69,1	104,4	129,5
Moisture removed at 20°C - 60%	l/24h	25,6	35,4	50,7	75,7	92,5
Nominal input power	kW	0,97	1,29	1,76	2,07	2,74
Maximum input power	kW	1,2	1,5	2,0	2,3	3,1
Maximum input current ⁽¹⁾	A	3,9	5,6	8,4	10,5	13,2
Peak current	A	19,1	20,1	38,4	44,7	63,7
Air Flow	m ³ /h	500	800	1000	1400	1650
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge	Kg	0,36	0,60	0,60	0,90	1,20
Equivalent CO ₂ charge	t	0,75	1,25	1,25	1,88	2,20
Sound power ⁽²⁾	dB(A)	57,0	59,0	61,0	66,5	68,5
Sound pressure ⁽³⁾	dB(A)	50,0	52,0	54,0	59,5	61,5
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

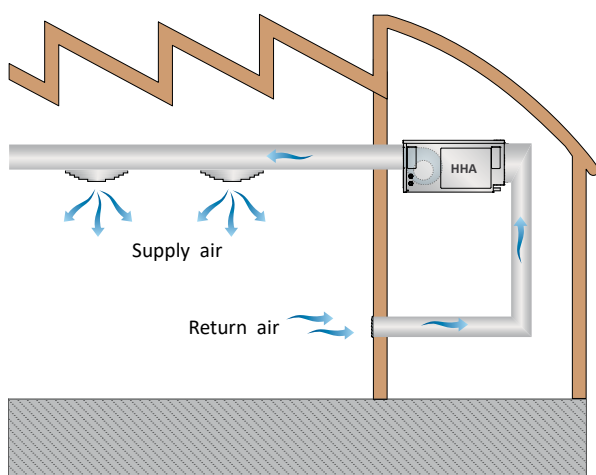
Performances are referred to the following conditions:

(1) Temperature 30°C; Humidity 80%

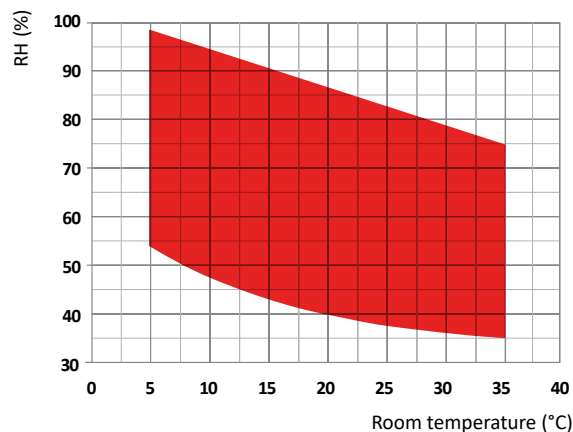
(2) Sound power level calculated according to ISO 9614.

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

Plant scheme



Operation limits



Frame

All 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. The colour of the unit is RAL 9010 both for the base and for the frontal panel.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). All the units are supplied with injection valves kit for hot gas defrost cycle.

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 0,1 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 powder coated 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. 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 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. 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: 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 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.

Accessories

HYGR - Remote mechanical hygostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KGBH - Louver kit and case for ducted version

Air grille double row adjustable brushed aluminium fins, equipped for wall mounting with subframe.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

V1CE - E.C. Supply fan

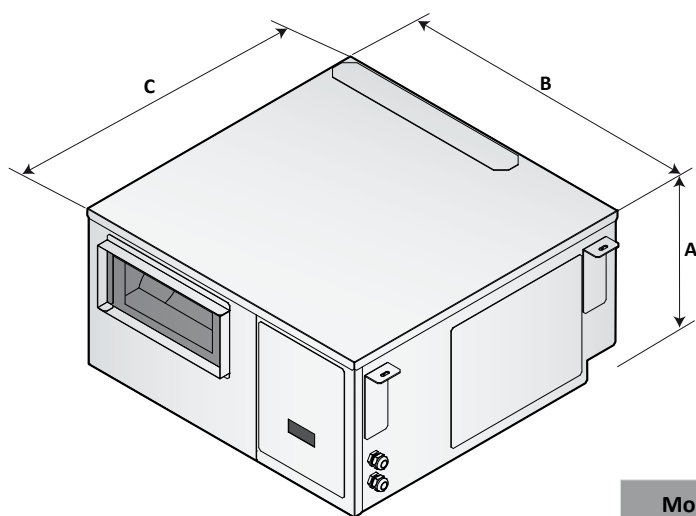
The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments.

The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the ab-

sence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

HHH		50	75	100	150	200
A.C. fans ≤ 150 Pa		●	●	●	●	●
Hot gas defrost		●	●	●	●	●
Thermostatic valve		●	●	●	●	●
Low noise version	LS00	●	●	●	●	●
Main switch		●	●	●	●	●
Supply flange	CANA	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○
Louver kit and case for ducted version	KGBH	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
50	360	700	710	63
75	460	980	900	95
100	460	980	900	122
150	530	1160	1050	131
200	530	1160	1050	140

HDA

Industrial dehumidifiers



HDA 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 4 models which cover a capacity range from 73 to 200 l/24h. HDA units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

The units are supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions.

Versions

The series includes 4 models with air flows from 800 to 1800 m³/h.

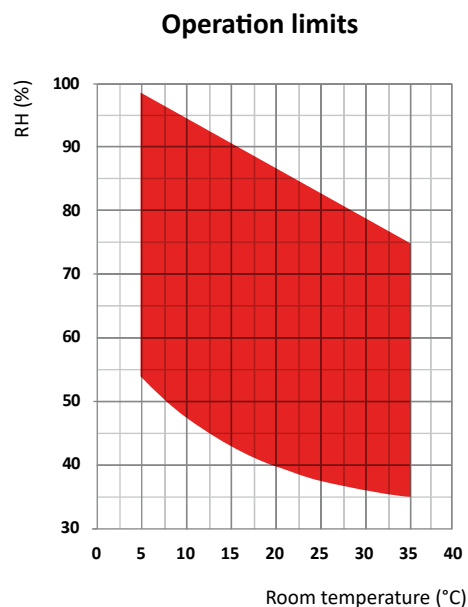
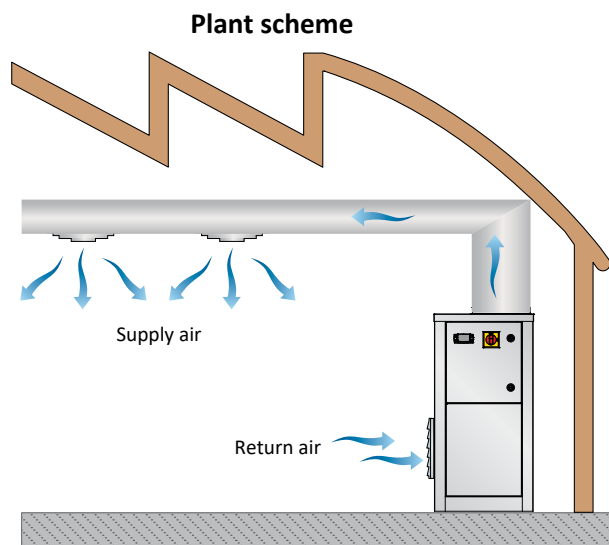
HDA		75	100	150	200
Moisture removed at 30°C - 80%	l/24h	73,0	95,2	157,1	194,3
Moisture removed at 30°C - 60%	l/24h	56,6	76,5	111,0	145,3
Moisture removed at 27°C - 60%	l/24h	49,4	68,5	99,7	127,8
Moisture removed at 20°C - 60%	l/24h	34,5	50,2	66,6	90,6
Moisture removed at 10°C - 70%	l/24h	26,6	33,7	43,9	60,7
Nominal input power at 30°C - 80%	kW	1,40	1,82	2,27	2,90
Maximum input power	kW	1,59	2,05	2,68	3,44
Maximum input current	A	7,8	9,1	12,4	15,7
Peak current	A	21,7	27,0	46,0	65,0
Air Flow	m ³ /h	800	1000	1500	1800
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088
Refrigerant charge	Kg	0,55	0,55	1,10	1,10
Equivalent CO ₂ charge	t	1,15	1,15	2,30	2,30
Sound power ⁽¹⁾	dB(A)	59	61	67	69
Sound pressure ⁽²⁾	dB(A)	52	54	60	62
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50

Performances are referred to the following conditions:

(1) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

(2) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO

9614, fan with available static pressure 50 Pa.



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). All the units are supplied with injection valves kit for hot gas defrost cycle.

Compressor

The compressors are rotative type, with thermal overload protection by a klaxon 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 0,1 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 powder coated 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. 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, pleated type, without electro-static charge; they are all removable for differential disposal. Efficiency class M5, according to EN 779:2012.

Microprocessor

All 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 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 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.

Accessories

FARC - Air filter with frame for ducted installation

Complete with efficiency class G5, according to EN 779:2002 air filter which can be removed by the side and frame for ducted installation.

HYGR - Remote mechanical hygrostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

INOX - Stainless steel frame

It's used to ensure the best resistance against the atmospheric agents and the operation in aggressive environments. The frame is made of stainless steel AISI 304, self-supporting with removable panels to facilitate inspection and maintenance of internal components. All screws and rivets are in stainless steel.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KAVG - Rubber vibration dampers

To be installed beneath the unit base and the ground to avoid the transmission of vibrations (and the noise) to the building.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

TROL - Floor trolley version

To facilitate dehumidifier handling where is placed.

V1CE - E.C. Supply fan

The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments.

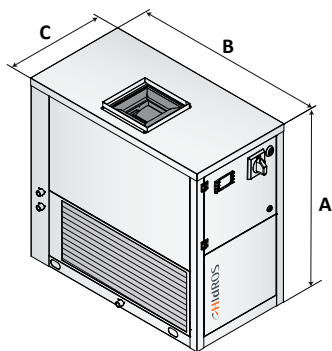
The electric motor is a high efficiency DC brushless type with exter-

nal rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

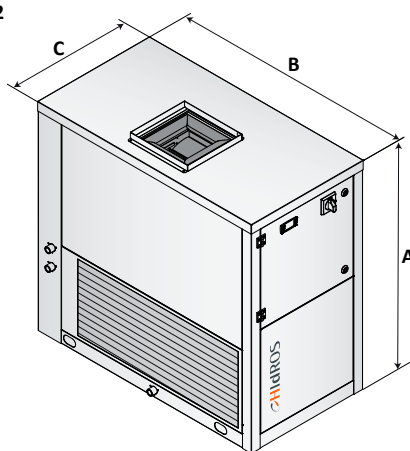
HDA		75	100	150	200
A.C. fans ≤ 150 Pa		●	●	●	●
Supply flange		●	●	●	●
Hot gas defrost		●	●	●	●
Thermostatic valve		●	●	●	●
Low noise version	LS00	●	●	●	●
Main switch		●	●	●	●
Rubber vibration dampers	KAVG	○	○	○	○
Remote mechanical hygostat	HYGR	○	○	○	○
Floor trolley version	TROL	○	○	○	○
Stainless steel frame	INOX	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○
Remote control Panel	PCRL	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○

● Standard, ○ Optional, – Not available.

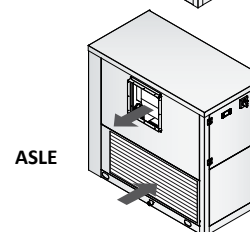
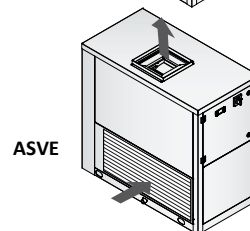
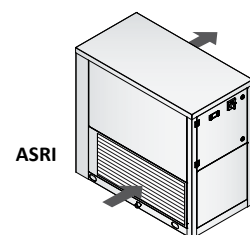
F1



F2



Configurations



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
75	F1	800	800	400	85
100	F1	800	800	400	90
150	F2	1000	1060	550	130
200	F2	1000	1060	550	135

HMA

Industrial dehumidifiers



HMA 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 6 models which cover a capacity range from 263 to 940 l/24h. HMA units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

The units are supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions.

Versions

The series includes 6 models with air flows from 3500 to 8500 m³/h.

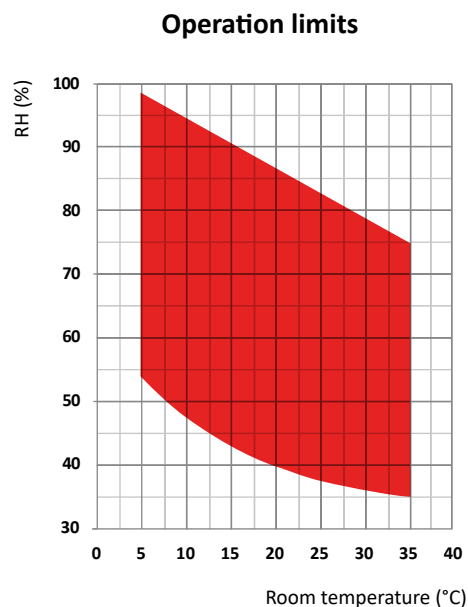
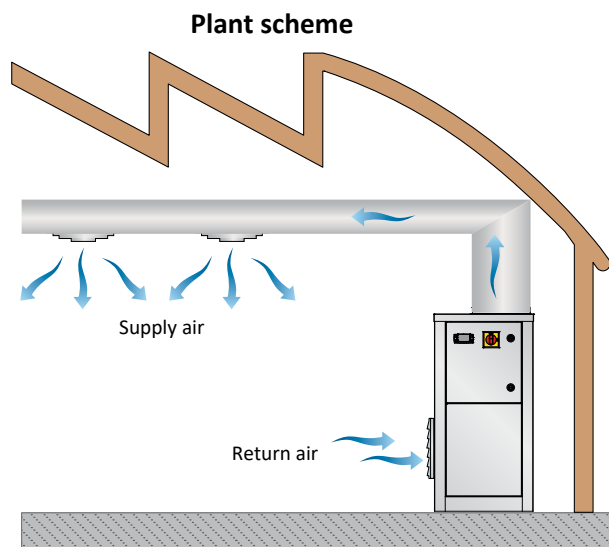
HMA		270	350	450	550	750	950
Moisture removed at 30°C - 80%	l/24h	263,1	340,2	418,8	566,8	751,1	939,3
Moisture removed at 30°C - 60%	l/24h	185,1	262,3	336,3	425,0	596,4	759,7
Moisture removed at 27°C - 60%	l/24h	161,4	233,5	302,0	375,7	534,3	680,3
Moisture removed at 20°C - 60%	l/24h	111,4	168,5	223,9	267,1	391,0	501,0
Moisture removed at 10°C - 70%	l/24h	75,6	118,3	160,9	180,2	269,8	349,6
Nominal input power at 30°C - 80%	kW	4,90	6,26	8,59	8,00	11,60	15,50
Maximum input power	kW	6,60	7,99	9,85	13,00	16,00	21,00
Maximum input current	A	12,0	14,2	17,9	22,0	27,0	39,0
Peak current	A	53,6	66,9	103,9	97,9	121,3	178,3
Air Flow	m ³ /h	3500	4200	4200	5500	7000	8500
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410a	R410a	R410a	R410a	R410a	R410a
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	3,00	2,50	2,50	9,00	8,00	8,00
Equivalent CO ₂ charge	t	6,26	5,22	5,22	18,79	16,70	16,70
Sound power ⁽¹⁾	dB(A)	70	71	71	73	73	73
Sound pressure ⁽²⁾	dB(A)	63	64	64	66	66	66
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 are referred to the following conditions:

(1)Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

(2)Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO

9614, fan with available static pressure 50 Pa.



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). All the units are supplied with injection valves kit for hot gas defrost cycle.

Compressor

The compressors are Scroll 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 0,1 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 powder coated 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. It is statically and dynamically balanced and supplied.

The electric motors are directly connected to the fan; they are all at 2 speeds, with integrated thermal protection. The protection class of the motors is IP 54.

Air filter

It is made of synthetic filtering media, pleated type, without electro-static charge; they are all removable for differential disposal. Efficiency class M5, according to EN 779:2012.

Microprocessor

All 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 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 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.

Accessories

FARC - Air filter with frame for ducted installation

Complete with efficiency class G5, according to EN 779:2002 air filter which can be removed by the side and frame for ducted installation.

HYGR - Remote mechanical hygrostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

INOX - Stainless steel frame

It's used to ensure the best resistance against the atmospheric agents and the operation in aggressive environments. The frame is made of stainless steel AISI 304, self-supporting with removable panels to facilitate inspection and maintenance of internal components. All screws and rivets are in stainless steel.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KAVG - Rubber vibration dampers

To be installed beneath the unit base and the ground to avoid the transmission of vibrations (and the noise) to the building.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

TROL - Floor trolley version

To facilitate dehumidifier handling where is placed.

V1CE - E.C. supply fan

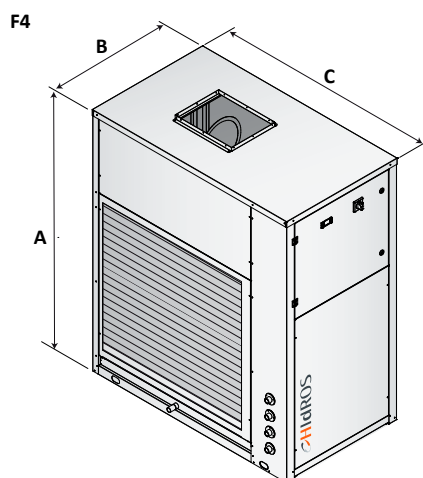
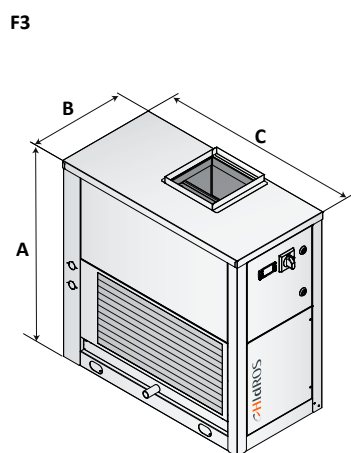
The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best re-

sistance against aggressive environments.

The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

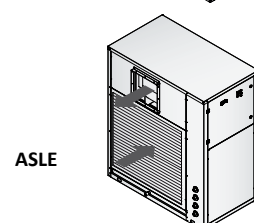
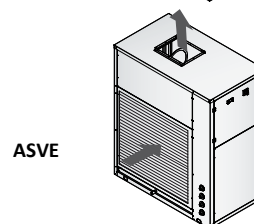
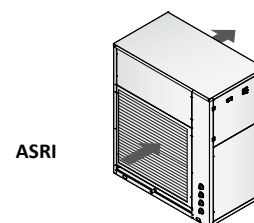
HMA		270	350	450	550	750	950
A.C. fans ≤ 150 Pa		●	●	●	●	●	●
Supply flange		●	●	●	●	●	●
Hot gas defrost		●	●	●	●	●	●
Thermostatic valve		●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●
Main switch		●	●	●	●	●	●
Rubber vibration dampers	KAVG	○	○	○	○	○	○
Remote mechanical hygostat	HYGR	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	○	○	○
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
270	F3	1378	704	1154	207
350	F3	1378	704	1154	211
450	F3	1378	704	1154	215
550	F4	1750	854	1504	415
750	F4	1750	854	1504	423
950	F4	1750	854	1504	430

Configurations



HMA Z

Industrial dehumidifiers with temperature control



Dehumidifiers are high-performances units especially designed for industrial or commercial purposes where it is necessary the simultaneous control of temperature and humidity 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 6 models which cover a capacity range from 263 to 940 l/24h. The units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs. The units are supplied with a solenoid valves set for the hot gas injection used to defrost the evaporator in case of severe working conditions.

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

- Z** The units in (Z) configuration are supplied complete of external remote condenser who needs to be connected to the dehumidifier through refrigerant lines. The use of remote condenser allows the simultaneous control of temperature and humidity, working in cooling or in dehumidification mode. For a correct operation the units have to be connected to a remote thermostat+ hygostat.

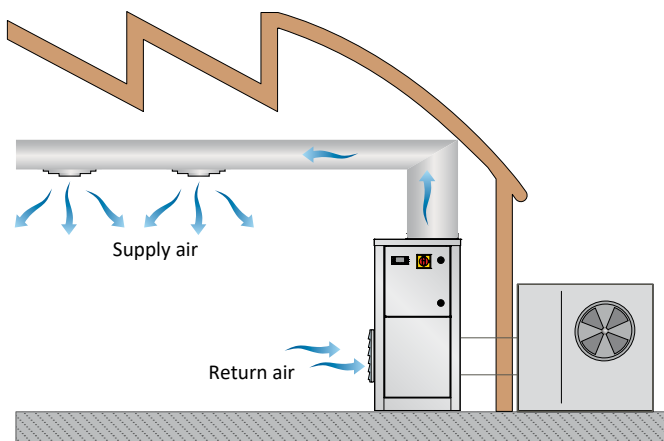
HMA Z		270	350	450	550	750	950
Moisture removed at 30°C - 80%	l/24h	263,1	340,2	418,8	566,8	751,1	939,3
Moisture removed at 30°C - 60%	l/24h	185,1	262,3	336,3	425,0	596,4	759,7
Moisture removed at 27°C - 60%	l/24h	161,4	233,5	302,0	375,7	534,3	680,3
Moisture removed at 20°C - 60%	l/24h	111,4	168,5	223,9	267,1	391,0	501,0
Moisture removed at 10°C - 70%	l/24h	75,6	118,3	160,9	180,2	269,8	349,6
Total cooling cap. (30°C-80% - 35°C ext)	l/24h	12,93	16,96	19,83	25,57	35,56	43,17
Sensible cooling cap. (30°C-80% - 35°C ext)	l/24h	4,48	5,91	7,20	8,80	12,45	15,50
Nominal input power at 30°C-80%	kW	4,90	6,26	8,59	8,00	11,60	15,50
Maximum input power	kW	7,50	7,99	9,85	10,30	15,60	20,10
Maximum input current	A	17,9	14,2	17,9	18,9	28,3	38,3
Peak current	A	53,6	66,9	103,9	97,9	121,3	178,3
Air Flow indoor unit	m ³ /h	3500	4200	4200	5500	7000	8500
Air Flow outdoor unit	m ³ /h	7500	7100	6700	15000	14200	21300
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	3,00	2,50	2,50	9,00	8,00	8,00
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	6,26	5,22	5,22	18,79	16,70	16,70
Sound power ⁽¹⁾	dB(A)	70	71	71	73	73	73
Sound pressure ⁽²⁾	dB(A)	63	64	64	66	66	66
Sound pressure ⁽³⁾	dB(A)	39	41	40	40	42	43
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 are referred to the following conditions:

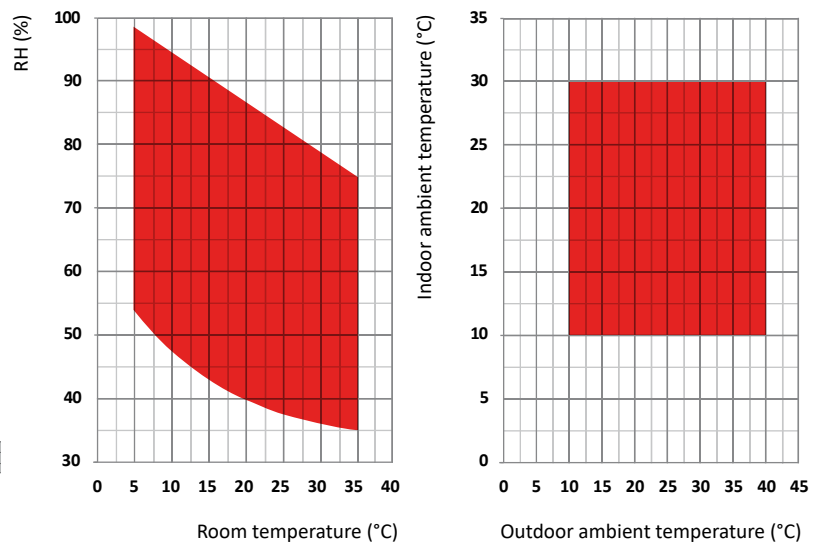
- (1) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.
(2) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, fan with available static pressure 50 Pa.

- (3) Sound pressure level measured at 10 mt from the unit in free field conditions according to ISO 9614, fan with available static pressure 50 Pa.

Plant scheme



Operation limits



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). All the units are supplied with injection valves kit for hot gas defrost cycle.

Compressor

The compressors are Scroll type, with thermal overload protection by a klaxon 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 0,1 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 powder coated 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. 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, pleated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G5, according to EN 779:2002.

Microprocessor

All 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 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.

External remote condenser

The remote condensers are manufactured from 3/8" copper pipes and 0,1 mm 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 fans are direct drive, axial type with aluminium aerofoil blades and are complete with a safety guard. The moisture protection class of the motors is IP 54. The condenser is also fitted with a low ambient condensing pressure control. This device maintains a constant condensing pressure, independent of changes in ambient temperature.

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 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.

Accessories

FARC - Air filter with frame for ducted installation

Complete with efficiency class G5, according to EN 779:2002 air filter which can be removed by the side and frame for ducted installation.

INOX - Stainless steel frame

It's used to ensure the best resistance against the atmospheric agents and the operation in aggressive environments. The frame is made of stainless steel AISI 304, self-supporting with removable panels to facilitate inspection and maintenance of internal components. All screws and rivets are in stainless steel.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KAVG - Rubber vibration dampers

To be installed beneath the unit base and the ground to avoid the transmission of vibrations (and the noise) to the building.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote Control Panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

V1CE - E.C. Supply fan

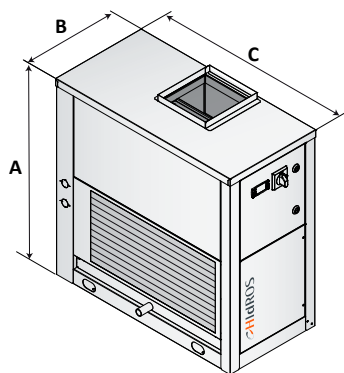
The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments.

The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

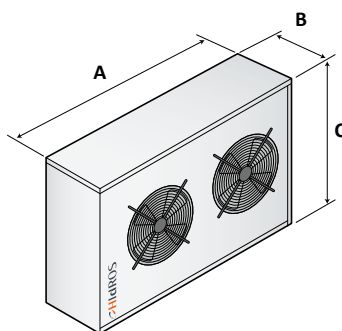
HMA Z		270	350	450	550	750	950
A.C. fans ≤ 150 Pa		●	●	●	●	●	●
Supply flange		●	●	●	●	●	●
Hot gas defrost		●	●	●	●	●	●
Thermostatic valve		●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●
Main switch		●	●	●	●	●	●
Rubber vibration dampers	KAVG	○	○	○	○	○	○
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.

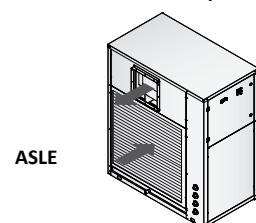
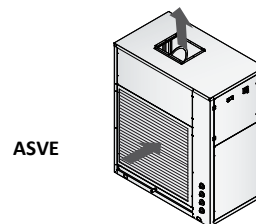
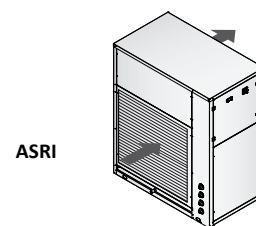
Indoor unit



Outdoor unit



Configurations



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
270	F3	1378	704	1154	207
350	F3	1378	704	1154	211
450	F3	1378	704	1154	215
550	F4	1750	854	1504	415
750	F4	1750	854	1504	423
950	F4	1750	854	1504	430

Mod.	A (mm)	B (mm)	C (mm)
270	1125	870	900
350	1125	870	900
450	1125	870	900
550	2025	870	900
750	2025	870	900
950	2930	870	900

HMA BT

Low temperature industrial dehumidifiers



HMA/BT cold room industrial 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 cold rooms, cellars and industrial sites where humidity has to be controlled at low temperature conditions. This series comprises 6 models which cover a capacity range from 263 to 940 l/24h. Units are designed for easy maintenance and service, each part being readily accessible and, when required, easily replaceable thus reducing service and maintenance costs.

The units are supplied with a specific refrigerant circuit design to operate with a wide range of temperatures, they are also equipped with hot gas injection system (used to defrost the evaporator) and condensate discharge drip tray equipped with antifreeze heater, in case of operation in low ambient temperature conditions.

Versions

The series includes 6 models with air flows from 3500 to 8500 m³/h.

HMA BT		270	350	450	550	750	950
Moisture removed at 30°C - 80%	l/24h	263,1	340,2	418,8	566,8	751,1	939,3
Moisture removed at 30°C - 60%	l/24h	185,1	262,3	336,3	425,0	596,4	759,7
Moisture removed at 27°C - 60%	l/24h	161,4	233,5	302,0	375,7	534,3	680,3
Moisture removed at 20°C - 60%	l/24h	111,4	168,5	223,9	267,1	391,0	501,0
Moisture removed at 10°C - 70%	l/24h	75,6	118,3	160,9	180,2	269,8	349,6
Moisture removed at 5°C - 70%	l/24h	46,7	80,2	112,2	121,9	187,3	246,1
Nominal input power at 30°C - 80%	kW	4,90	6,26	8,59	8,00	11,60	15,50
Maximum input power	kW	7,50	7,99	9,85	10,30	15,60	20,10
Maximum input current	A	17,9	14,2	17,9	18,9	28,3	38,3
Peak current	A	53,6	66,9	103,9	97,9	121,3	178,3
Air Flow	m ³ /h	3500	4200	4200	5500	7000	8500
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	3,00	2,50	2,50	9,20	8,20	8,20
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	6,26	5,22	5,22	19,21	17,12	17,12
Sound power ⁽¹⁾	dB(A)	70	71	71	73	73	73
Sound pressure ⁽²⁾	dB(A)	63	64	64	66	66	66
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

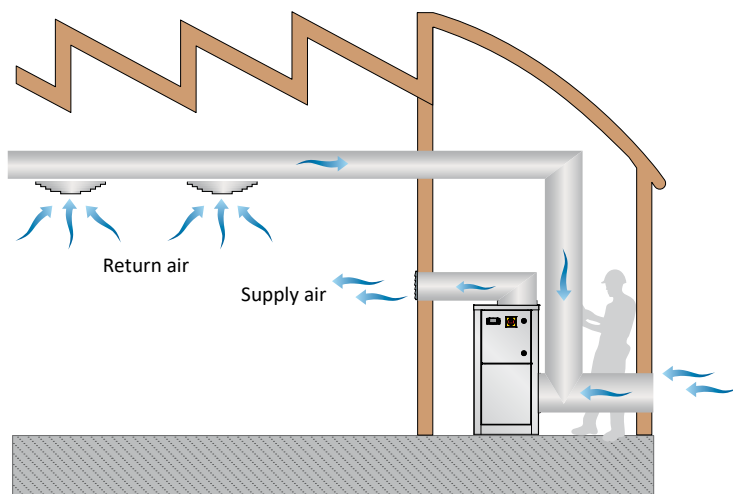
Performances are referred to the following conditions:

(1) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

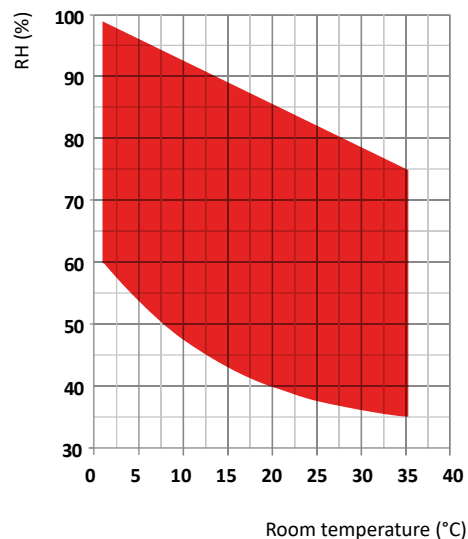
(2) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO

9614, fan with available static pressure 50 Pa.

Plant scheme



Operation limits



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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). The units are supplied with a specific refrigerant circuit design to operate with a wide range of temperatures, they are also equipped with hot gas injection system.

Compressor

The compressors are Scroll 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 0,1 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 powder coated 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. 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, pleated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G5, according to EN 779:2002.

Microprocessor

All 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 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 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.

Accessories

FARC - Air filter with frame for ducted installation

Complete with efficiency class G5, according to EN 779:2002 air filter which can be removed by the side and frame for ducted installation.

HYGR - Remote mechanical hygromat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

INOX - Stainless steel frame

It's used to ensure the best resistance against the atmospheric agents and the operation in aggressive environments. The frame is made of stainless steel AISI 304, self-supporting with removable panels to facilitate inspection and maintenance of internal components. All screws and rivets are in stainless steel.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KAVG - Rubber vibration dampers

To be installed beneath the unit base and the ground to avoid the transmission of vibrations (and the noise) to the building.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor
built-in Electronic temperature and humidity probe.

TROL - Floor trolley version

To facilitate dehumidifier handling where is placed.

V1CE - E.C. Supply fan

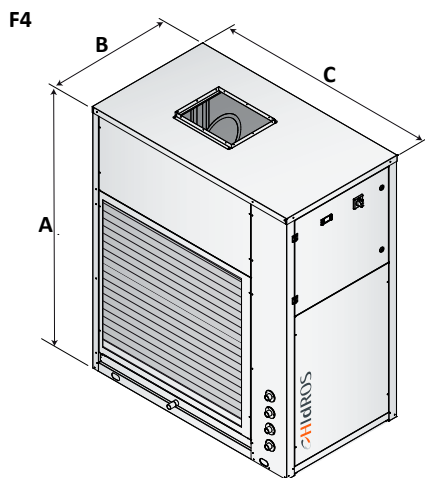
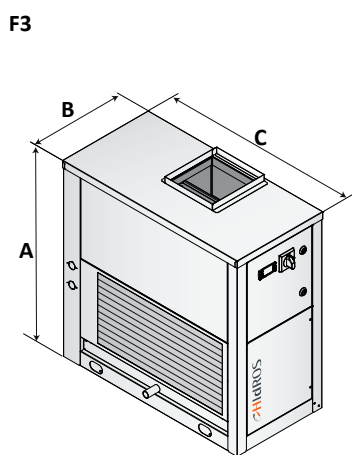
The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best re-

sistance against aggressive environments.

The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

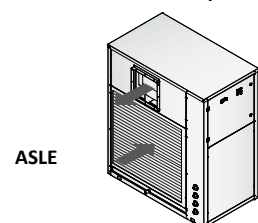
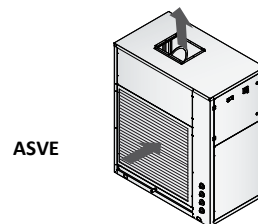
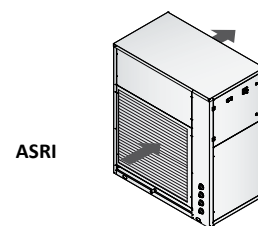
HMA BT		270	350	450	550	750	950
A.C. fans ≤ 150 Pa		●	●	●	●	●	●
Supply flange		●	●	●	●	●	●
Hot gas defrost		●	●	●	●	●	●
Designed for continuous operation in low ambient temperatures		●	●	●	●	●	●
Thermostatic valve		●	●	●	●	●	●
Condensate discharge drip tray with antifreeze heater		●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●
Main switch		●	●	●	●	●	●
Rubber vibration dampers	KAVG	○	○	○	○	○	○
Remote mechanical hygostat	HYGR	○	○	○	○	○	○
Floor trolley version	TROL	○	○	○	○	○	○
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
270	F3	1378	704	1154	207
350	F3	1378	704	1154	211
450	F3	1378	704	1154	215
550	F4	1750	854	1504	415
750	F4	1750	854	1504	423
950	F4	1750	854	1504	430

Configurations



SBA

Swimming pool dehumidifiers



SBA (A)



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

- A Version with cabinet
- P Ductable units.

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 ^{(1) (6)}	kW	0,9	1,2	1,6	1,9	2,5
Maximum input power ^{(1) (6)}	kW	1,2	1,5	2,0	2,3	3,1
Supplementary electric heater	kW	3	3	3	6	6
Maximum input current ^{(2) (6)}	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 ⁽³⁾	kW	3,5	7,0	7,0	11,5	11,8
Air Flow	m ³ /h	500	800	1000	1400	1650
Available static pressure	Pa	40	40	40	40	40
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge		0,47	0,60	0,70	1,20	1,20
Equivalent CO ₂ charge		0,98	1,25	1,46	2,51	2,51
Sound power ⁽⁴⁾	dB(A)	54	57	57	59	61
Sound pressure ⁽⁵⁾	dB(A)	47	50	50	52	54
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Performances are referred to the following conditions:

(1) Unit equipped with E.C. Fans

(2) Temperature 30°C; Humidity 80%

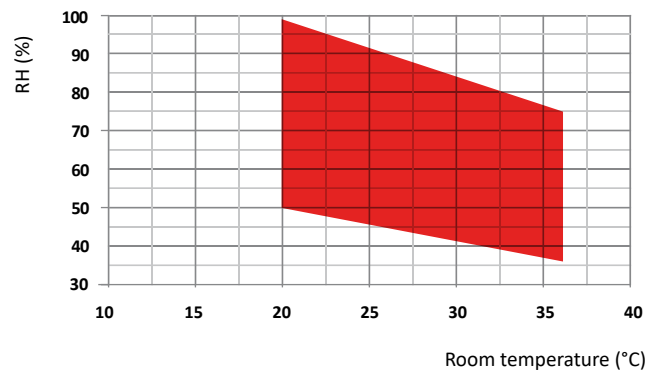
(3) Room temperature 30°C; water temperature 80/70°C, at compressor OFF

(4) Sound power level calculated according to ISO 9614.

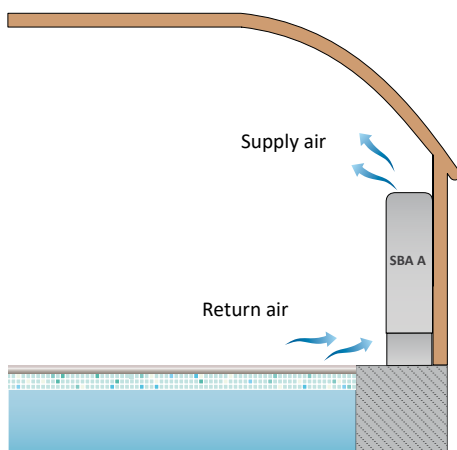
(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

(6) Without electric heater.

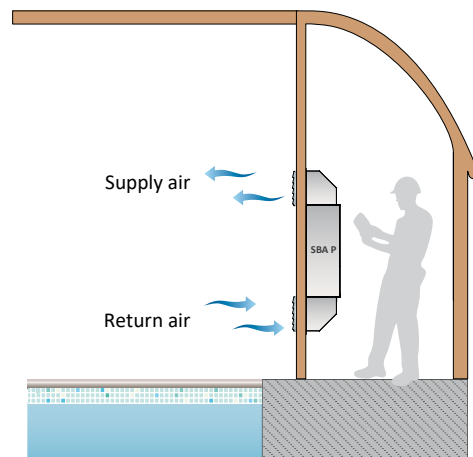
Operation limits



Standard version (A)



Ducted version (P)



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 form 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 rotation (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, undulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G2, according to EN 779:2002.

Microprocessor

All 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. 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.

Accessories

HYGR - Remote mechanical hygostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

HOEL - Electric heater

The electric heater kit is in aluminium and is used to integrate the unit heating capacity. The kit is composed of an on-off double safety thermostat without capacity steps.

HOWA - Hot water coil

The heat exchanger 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.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KGBH - Louver kit and case for ducted version

Air grille double row adjustable brushed aluminium fins, equipped for wall mounting with subframe.

KIVM - 3 way modulating valve kit

It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

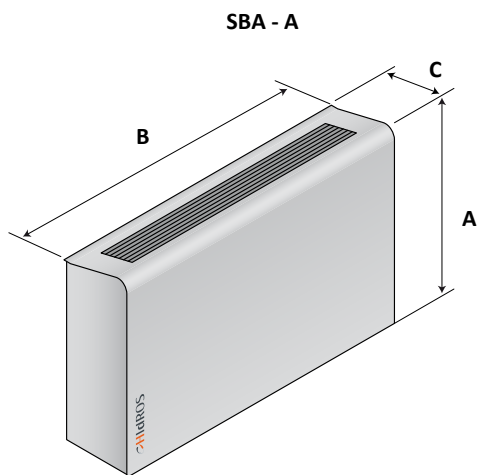
Built-in Electronic temperature and humidity probe.

PMBH - delivery and return plenum 90° (2 pieces)

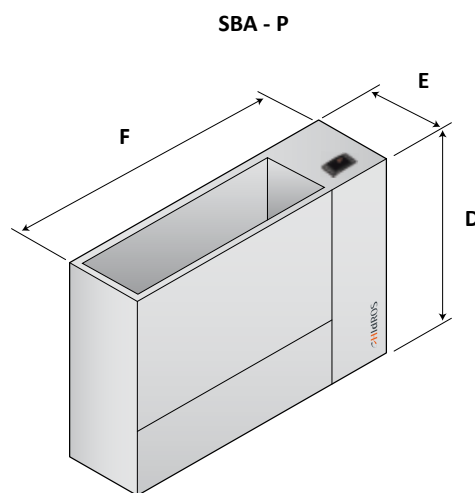
To be used for "P" version to direct inlet/outlet air from/to swimming pool and vice versa. Galvanized steel made, coated with polyurethane powder to grant best resistance to weathering and operation in harsh environments.

SBA		50/A	50/P	75/A	75/P	100/A	100/P	150/A	150/P	200/A	200/P
Built-in electronic thermostat + hygrostat control with display		●	●	●	●	●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●	●	●	●	●
Hot water coil	HOWA	○	○	○	○	○	○	○	○	○	○
Electric heater kit 3 kW	HOEL	○	○	○	○	○	○	-	-	-	-
Electric heater kit 6 kW	HOEL	-	-	-	-	-	-	○	○	○	○
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○	○	○	○	○	○
On/Off 3 way valve kit installed	KIVM	○	○	○	○	○	○	○	○	○	○
Delivery and return plenum 90° (2 pieces)	PMBH	-	○	-	○	-	○	-	○	-	○
Louver kit and case for ducted version	KGBH	-	○	-	○	-	○	-	○	-	○
Feet	ZOCC	○	-	○	-	○	-	○	-	○	-
Remote control Panel	PCRL	○	○	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○	○	○

● Standard, ○ Optional, - Not available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
50	750	760	260	50
75	750	1060	260	64
100	750	1060	260	68
150	836	1310	310	99
200	836	1310	310	102



Mod.	D (mm)	E (mm)	F (mm)	Kg
50	680	250	706	41
75	680	250	1006	57
100	680	250	1006	61
150	770	300	1255	82
200	770	300	1255	87

SHA

Swimming pool dehumidifiers



Series SHA 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 50 to 190 l/24h.

Versions

The series includes 5 models with air flows from 500 to 1900 m³/h.

SHA		50	75	100	150	200
Moisture removed at 30°C - 80%	l/24h	49	73	95	155	190
Moisture removed at 30°C - 60%	l/24h	39,0	56,7	77,4	118,3	146,7
Moisture removed at 27°C - 60%	l/24h	34,9	50,1	69,1	104,4	129,5
Moisture removed at 20°C - 60%	l/24h	25,6	35,4	50,7	75,7	92,5
Nominal input power	kW	0,97	1,29	1,76	2,07	2,74
Maximum input power	kW	1,2	1,5	2,0	2,3	3,1
Supplementary electric heater	kW	3	3	3	6	6
Maximum input current ⁽¹⁾	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 ⁽²⁾	kW	3,5	7,5	8,5	13,0	14,0
Partial heat recovery ⁽³⁾	kW	--	1,1	1,7	2,3	3,0
Air Flow	m ³ /h	500	800	1000	1400	1650
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088
Refrigerant charge	Kg	0,36	0,60	0,60	0,90	1,20
Equivalent CO ₂ charge	t	0,75	1,25	1,25	1,88	2,20
Sound power ⁽⁴⁾	dB(A)	57,0	59,0	61,0	66,5	68,5
Sound pressure ⁽⁵⁾	dB(A)	50,0	52,0	54,0	59,5	61,5
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	230/1/50

Performances are referred to the following conditions:

(1) Temperature 30°C; Humidity 80%

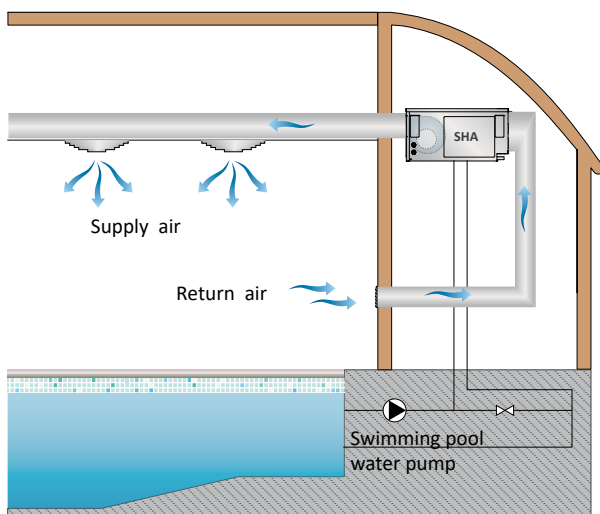
(2) Room temperature 30°C; water temperature 80/70°C, at compressor OFF

(3) Room temperature 30°C/80%; water temperature 27/32°C.

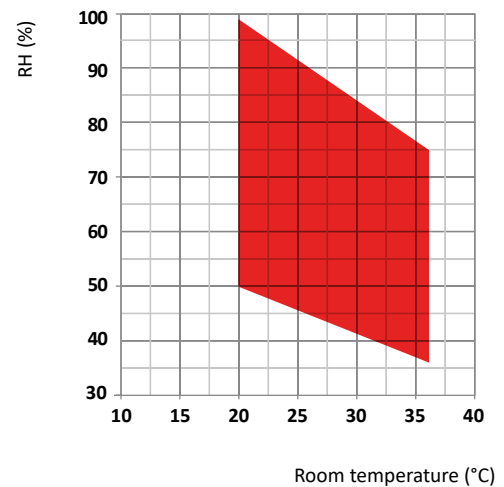
(4) Sound power level calculated according to ISO 9614, fan with available static pressure 50 Pa.

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

Plant scheme



Operation limits



Frame

All SHA 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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, supplied with sound attenuation jacket to reduce the noise emission. 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 painted 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. 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, undulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G5, according to EN 779:2002.

Microprocessor

All 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 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 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.

Accessories

HYGR - Remote mechanical hygostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

HOEL - Electric heater

The electric heater kit is in aluminium and is used to integrate the unit heating capacity. The kit is composed of an on-off double safety thermostat without capacity steps.

HOWA - Hot water coil

The heat exchanger 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.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KGBH - Louver kit and case for ducted version

Air grille double row adjustable brushed aluminium fins, equipped for wall mounting with subframe.

KIVM - 3 way modulating valve kit

It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

RP01 - Partial heat recovery

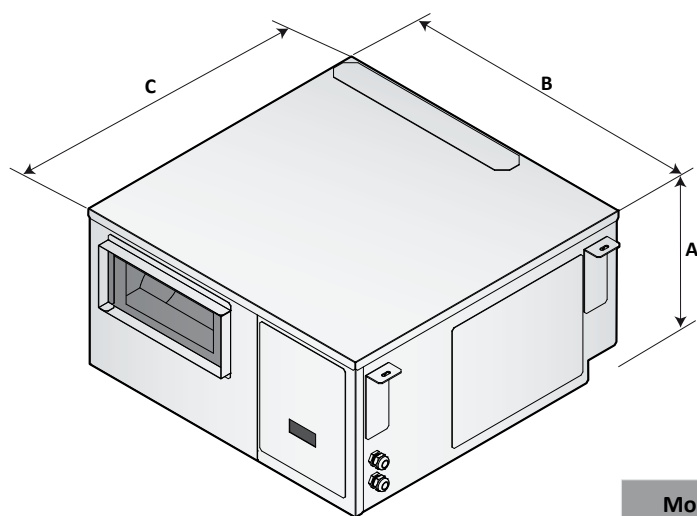
The unit is fitted with a Coaxial type heat exchanger suitable for chlorinated water. The internal pipe is manufactured from Cupronickel with the external pipe being made from Copper. The chlorinated water flows within the internal pipe whilst the refrigerant gas passes through the gap between the internal and external pipes. The Cupro-nickel internal pipe is manufactured with a special profile that generates turbulent flow within the refrigerant gas thus increasing the heat exchange factor, the thermal efficiency and reducing the dimensions. The heat exchanger is designed to recover approx. 20% of the thermal capacity generated by the unit.

VECE - E.C. supply fan

The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

SHA		50	75	100	150	200
Low noise version	LS00	●	●	●	●	●
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○
Partial heat recovery Cu-Ni made	RP01	–	○	○	○	○
Hot water coil	HOWA	○	○	○	○	○
Modulating 3 way valve kit installed	KIVM	○	○	○	○	○
Electric heater kit 3 kW (230/1~/50)	HOEL	○	○	○	○	○
Electric heater kit 6 kW (230/1~/50)	HOEL	○	○	○	○	○
Louver kit and case	KGBH	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○

● Standard, ○ Optional, – Not Available.



Mod.	A (mm)	B (mm)	C (mm)	Kg
50	360	700	710	63
75	460	980	900	95
100	460	980	900	122
150	530	1160	1050	131
200	530	1160	1050	140

SDA

Swimming pool dehumidifiers



Series SDA 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 4 basic models which cover a capacity range from 73 to 240 l/24h.

Versions

The series includes 4 models with air flows from 730 to 2000 m³/h.

SDA		75	100	150	200
Moisture removed at 30°C - 80%	l/24h	73,0	95,2	157,1	194,3
Moisture removed at 30°C - 60%	l/24h	56,6	76,5	111,0	145,3
Moisture removed at 27°C - 60%	l/24h	49,4	68,5	99,7	127,8
Moisture removed at 20°C - 60%	l/24h	34,5	50,2	66,6	90,6
Nominal input power at 30°C - 80% ⁽⁵⁾	kW	1,40	1,82	2,27	2,90
Maximum input power ⁽⁵⁾	kW	1,59	2,05	2,68	3,44
Supplementary electric heater	kW	3,0	3,0	6,0	6,0
Maximum input current ⁽⁵⁾	A	7,8	9,1	12,4	15,7
Peak current	A	21,7	27,0	46,0	65,0
Hot water coil ⁽¹⁾	kW	7,5	8,5	13,9	15,2
Partial heat recovery ⁽²⁾	kW	1,1	1,7	2,3	3,0
Air Flow	m ³ /h	800	1000	1500	1800
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088
Refrigerant charge	Kg	0,55	0,55	1,10	1,10
Equivalent CO ₂ charge	t	1,15	1,15	2,30	2,30
Sound power ⁽³⁾	dB(A)	59	61	67	69
Sound pressure ⁽⁴⁾	dB(A)	52	54	60	62
Power supply	V/Ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50

Performances are referred to the following conditions:

(1) Room temperature 30°C; water temperature 80/70°C, compressor OFF

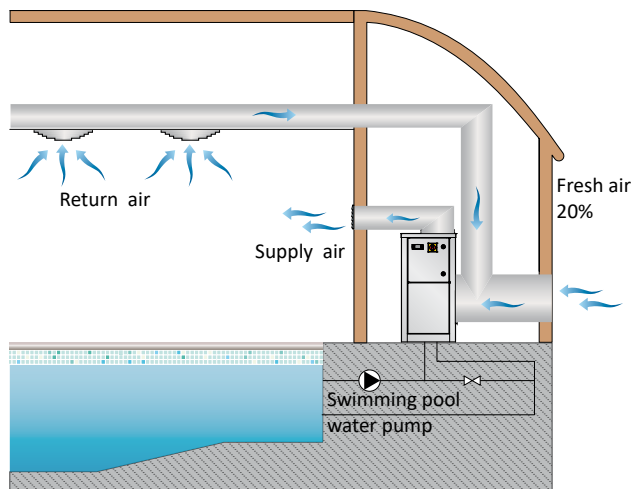
(2) Room temperature 30°C/80%; water temperature 27/32°C, compressor OFF

(3) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

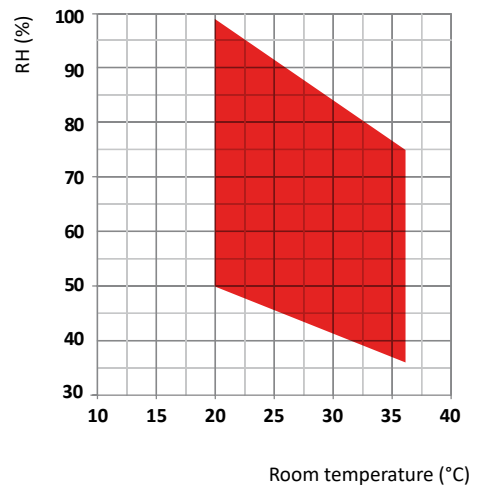
(4) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, fan with available static pressure 50 Pa.

(5) Without electric heater.

Plant scheme



Operation limits



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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 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 0,1 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 powder coated 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. 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, undulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G5, according to EN 779:2002.

Microprocessor

All 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 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 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.

Accessories

HYGR - Remote mechanical hygostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

HOEL - Electric heater

The electric heater kit is in aluminium and is used to integrate the unit heating capacity. The kit is composed of an on-off double safety thermostat without capacity steps.

HOWA - Hot water coil

The heat exchanger 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.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KIVM - 3 Way modulating valve kit

It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

RP01 - Partial heat recovery

The unit is fitted with a Coaxial type heat exchanger suitable for chlorinated water. The internal pipe is manufactured from Cupronickel with the external pipe being made from Copper. The chlorinated water flows within the internal pipe whilst the refrigerant gas passes through the gap between the internal and external pipes.

The Cupronickel internal pipe is manufactured with a special profile that generates turbulent flow within the refrigerant gas thus increasing the heat exchange factor, the thermal efficiency and reducing the dimensions. The heat exchanger is designed to recover approx. 20% of the thermal capacity generated by the unit.

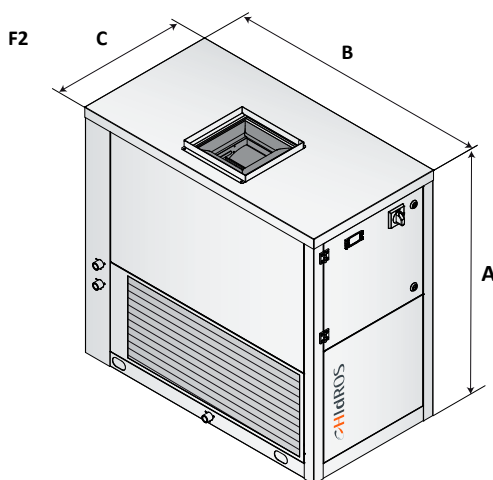
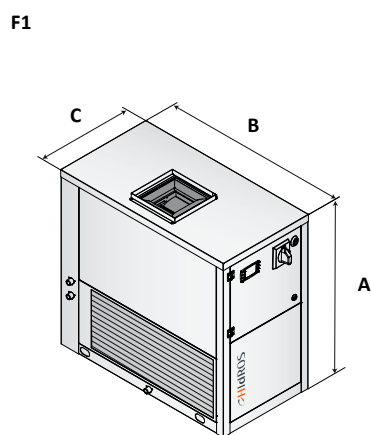
V1CE - E.C. supply fan

The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet

metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

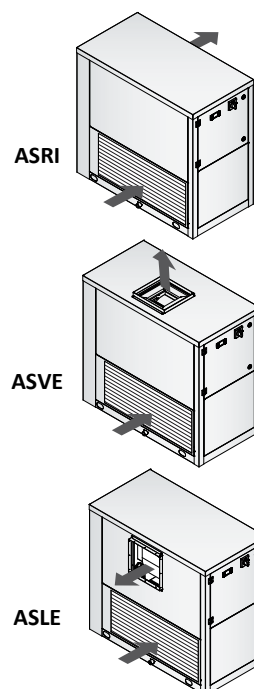
		75	100	150	200
A.C. fans ≤ 150 Pa		●	●	●	●
Supply flange		●	●	●	●
Thermostatic valve		●	●	●	●
Low noise version	LS00	●	●	●	●
Main switch		●	●	●	●
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○
Partial heat recovery Cu-Ni made	RP01	–	○	○	○
Hot water coil	HOWA	○	○	○	○
Modulating 3 way valve kit installed	KIVM	○	○	○	○
Electric heater kit 3 kW (230/1~/50)	HOEL	○	○	○	○
Electric heater kit 6 kW (230/1~/50)	HOEL	–	–	–	○
Stainless steel frame	INOX	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○
Remote control Panel	PCRL	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○
Rubber vibration dampers	KAVG	○	○	○	○

● Standard, ○ Optional, – Not Available.



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
75	F1	800	800	400	85
100	F1	800	800	400	90
150	F2	1000	1060	550	130
200	F2	1000	1060	550	135

Possible configurations



SMA

Swimming pool dehumidifiers



Series SMA 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 263 to 940 l/24h.

Versions

The series includes 6 models with air flows from 2630 to 9400 m³/h.

SMA		270	350	450	550	750	950
Moisture removed at 30°C - 80%	l/24h	263,1	340,2	418,8	566,8	751,1	939,3
Moisture removed at 30°C - 60%	l/24h	185,1	262,3	336,3	425,0	596,4	759,7
Moisture removed at 27°C - 60%	l/24h	161,4	233,5	302,0	375,7	534,3	680,3
Moisture removed at 20°C - 60%	l/24h	111,4	168,5	223,9	267,1	391,0	501,0
Nominal input power at 30°C - 80% ⁽⁵⁾	kW	4,90	6,26	8,59	8,00	11,60	15,50
Maximum input power ⁽⁵⁾	kW	6,60	7,99	9,85	13,00	16,00	21,00
Supplementary electric heater	kW	9,0	9,0	9,0	18,0	18,0	18,0
Maximum input current ⁽⁵⁾	A	12,0	14,2	17,9	22,0	27,0	39,0
Peak current	A	53,6	66,9	103,9	97,9	121,3	178,3
Hot water coil ⁽¹⁾	kW	22,8	24,0	24,0	42,0	49,0	56,0
Partial heat recovery ⁽²⁾	kW	1,8	2,2	2,7	3,5	---	---
Air Flow	m ³ /h	3500	4200	4200	5500	7000	8500
Available static pressure	Pa	50÷150	50÷150	50÷150	50÷150	50÷150	50÷150
Refrigerant		R410a	R410a	R410a	R410a	R410a	R410a
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	3,00	2,50	2,50	9,00	8,00	8,00
Equivalent CO ₂ charge	t	6,26	5,22	5,22	18,79	16,70	16,70
Sound power ⁽³⁾	dB(A)	70	71	71	73	73	73
Sound pressure ⁽⁴⁾	dB(A)	63	64	64	66	66	66
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 are referred to the following conditions:

(1) Room temperature 30°C; water temperature 80/70°C, compressor OFF.

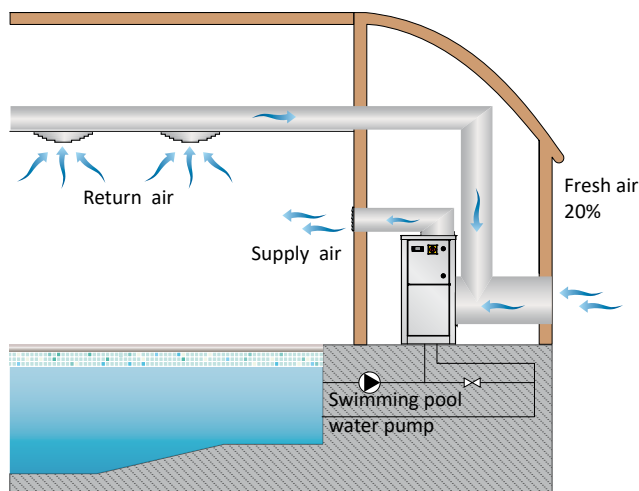
(2) Room temperature 30°C/80%; water temperature 30/35°C.

(3) Sound Power level according to ISO 9614 fan with available static pressure 50 Pa.

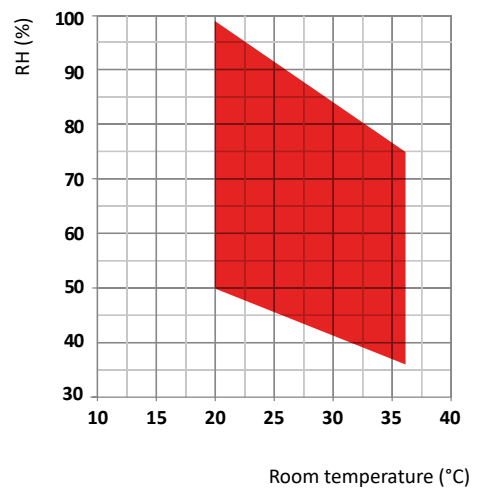
(4) Sound Pressure level measured at 1 mt from the unit in free field conditions according with ISO 9614, fan with available static pressure 50 Pa.

(5) Without electric heater.

Plant scheme



Operation limits



Frame

All 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 9018.

Refrigerant circuit

The refrigerant gas used in these units is R410A. 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 Scroll 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 0,1 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 powder coated 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. 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, undulated type, without electro-static charge; they are all removable for differential disposal. Efficiency class G5, according to EN 779:2002.

Microprocessor

All 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 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 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.

Accessories

HYGR - Remote mechanical hygostat

To be installed on the wall, it is supplied with a regulation knob and working range from 30% to 100% with precision of 3%.

HOEL - Electric heater

The electric heater kit is in aluminium and is used to integrate the unit heating capacity. The kit is composed of an on-off double safety thermostat without capacity steps.

HOWA - Hot water coil

The heat exchanger 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.

INSE - Serial interface card RS485

This interface card enables the controller to communicate with other devices using Modbus protocol.

KIVM - 3 Way modulating valve kit

It is used to control the waterflow in the coil. The valve is directly controlled from the unit microprocessor.

LS00 - Low noise version

This version includes the complete acoustic insulation of the unit (compressor + heat exchangers vanes) with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions. It is connected using a twin cable of 0.5 mm sq section.

RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

RP01 - Partial heat recovery

The unit is fitted with a Coaxial type heat exchanger suitable for chlorinated water. The internal pipe is manufactured from Cupronickel with the external pipe being made from Copper. The chlorinated water flows within the internal pipe whilst the refrigerant gas

passes through the gap between the internal and external pipes. The Cupronickel internal pipe is manufactured with a special profile that generates turbulent flow within the refrigerant gas thus increasing the heat exchange factor, the thermal efficiency and reducing the dimensions. The heat exchanger is designed to recover approx. 20% of the thermal capacity generated by the unit.

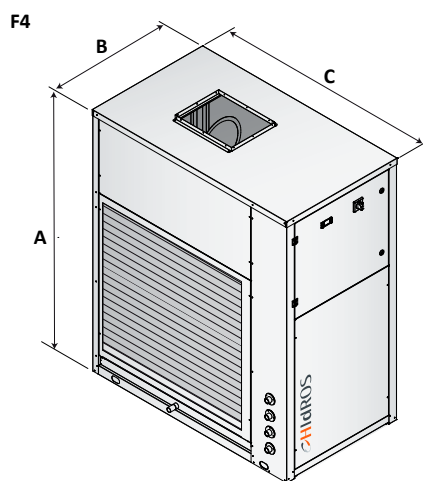
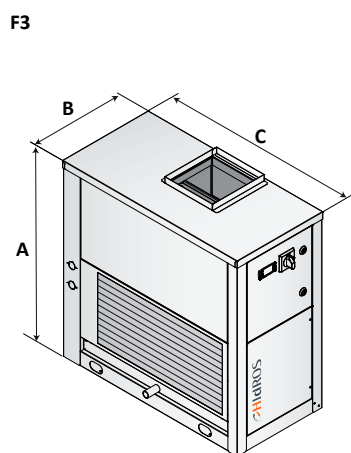
V1CE - E.C. supply fan

The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best re-

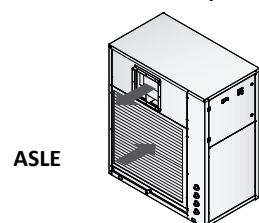
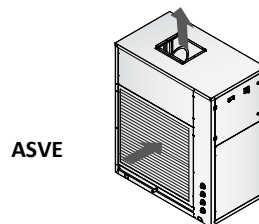
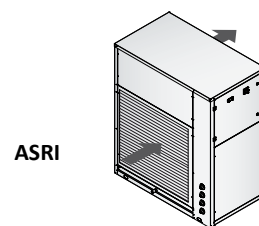
sistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

SMA		270	350	450	550	750	950
A.C. fans ≤ 150 Pa		●	●	●	●	●	●
Supply flange		●	●	●	●	●	●
Thermostatic valve		●	●	●	●	●	●
Low noise version	LS00	●	●	●	●	●	●
Main switch		●	●	●	●	●	●
Humidity and Temperature electronic probe sensor	RGDD	○	○	○	○	○	○
Remote mechanical hygrostat	HYGR	○	○	○	○	○	○
Partial heat recovery Cu-Ni made	RP01	○	○	○	○	○	○
Hot water coil	HOWA	○	○	○	○	○	○
Modulating 3 way valve kit installed	KIVM	○	○	○	○	○	○
Electric heater kit 6 kW (400/3~/50)	HOEL	○	○	○	○	○	○
Electric heater kit 12 kW (400/3~/50)	HOEL	–	–	–	○	○	○
Stainless steel frame	INOX	○	○	○	○	○	○
Air filter with frame for ducted installation	FARC	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	V1CE	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○
Rubber vibration dampers	KAVG	○	○	○	○	○	○

● Standard, ○ Optional, – Not Available.



Possible configurations



Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
270	F3	1378	704	1154	207
350	F3	1378	704	1154	211
450	F3	1378	704	1154	215
550	F4	1750	854	1504	415
750	F4	1750	854	1504	423
950	F4	1750	854	1504	430

SRH

Swimming pool dehumidifiers



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

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.

SRH		1100	1300	1500	1800	2200	3000
Moisture removed ⁽¹⁾	l/24h	1130	1285	1480	1855	2310	3050
Nominal input power ⁽¹⁾	kW	14,1	16,5	19,3	23,6	27,6	37,2
Maximum input power ⁽²⁾	kW	19,9	23,6	26,8	36,3	41,8	55,8
Nominal input current ⁽²⁾	A	41,1	47,1	54,6	64,6	74,6	97,9
Peak current	A	123,1	150,1	159,6	204,6	240,6	281,9
Hot water coil ⁽³⁾	kW	72	88	94	112	125	155
Air flow	m ³ /h	9500	10500	13000	15000	17000	25000
Available static pressure	Pa	250	250	250	250	250	250
Refrigerant		R407C	R407C	R407C	R407C	R407C	R407C
Global warming potential (GWP)		1774	1774	1774	1774	1774	1774
Refrigerant charge	Kg	13,0	14,0	22,0	25,0	25,0	37,5
Equivalent CO ₂ charge	t	23,06	24,84	39,03	44,35	44,35	66,52
Sound pressure ⁽⁴⁾	dB(A)	69	70	72	72	73	74
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 are referred to the following conditions:

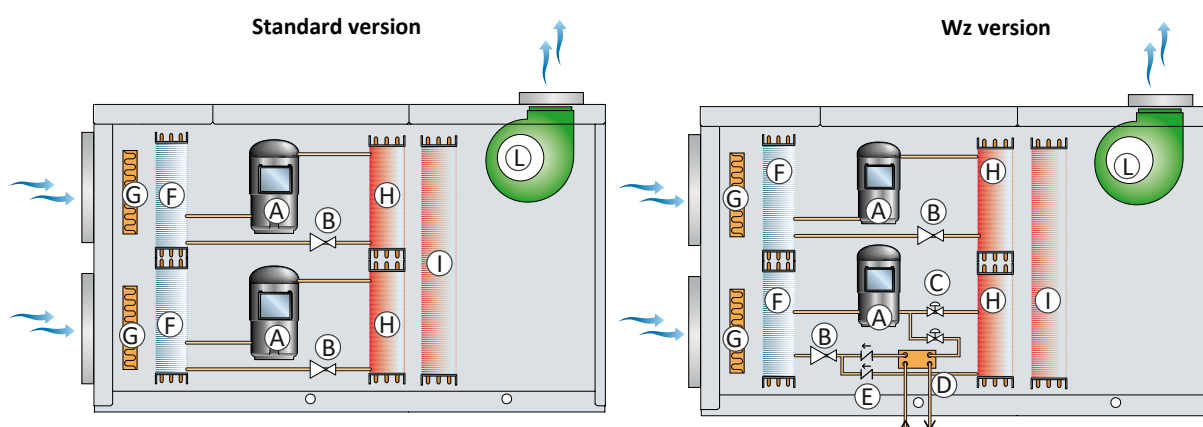
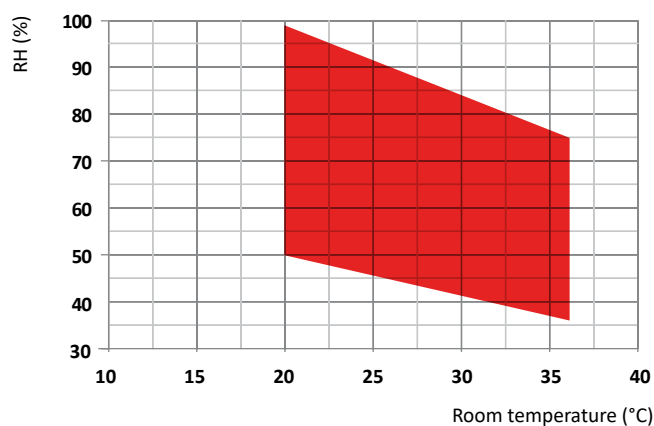
(1) Room temperature 30°C; relative humidity 80%.

(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.

Operation limits



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

Plant scheme

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 9018.

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. 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.

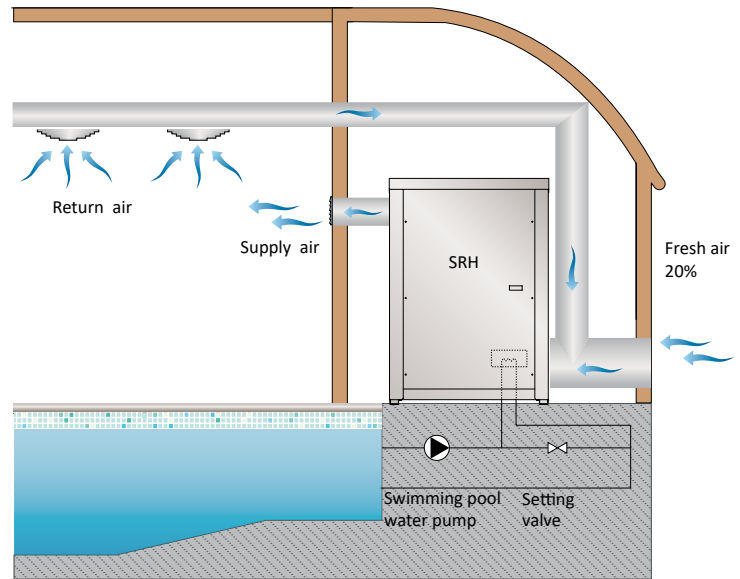
Compressor

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 environ-



ments. 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 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 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.

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).

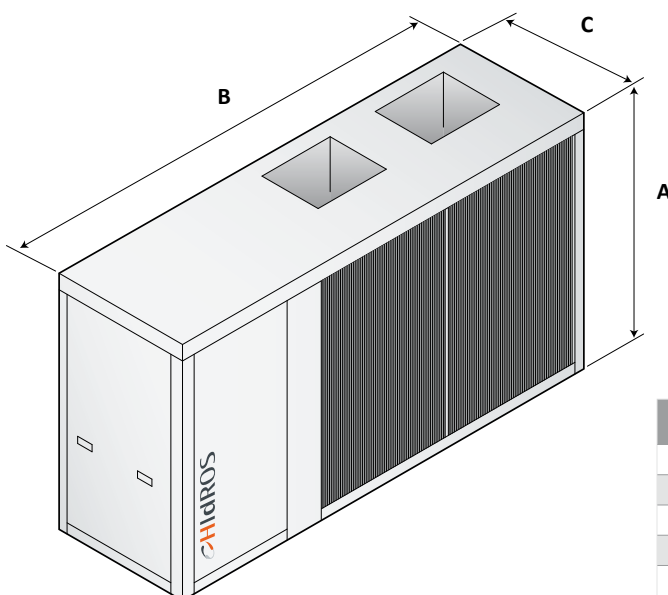
The following components are also standard installed: main switch, magnetic-thermal switches (as a protection fans and compressors), control circuit automatic breakers, compressor contactors, fan contactors. The terminal board is supplied with voltage free contacts for remote ON-OFF and general alarm.

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.

SRH		1100	1300	1500	1800	2200	3000
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)	Kg
1100	1250	1870	850	580
1300	1250	1870	850	710
1500	1566	2608	1105	770
1800	1566	2608	1105	830
2200	1566	2608	1105	940
3000	1566	3608	1105	1290

UTA - UTAZ

Energy recovery high efficiency dehumidifiers



UTAZ (Outdoor Unit)



The energy recovery high efficiency dehumidifiers UTA 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 UTA 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-passage-cross-flow energy recovery allows to increase up to 30% 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

- Z** **Version with temperature control:** 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.

UTA		015	020	028	035	042	052	060
Moisture removed ⁽¹⁾	l/24h	132,7	162,3	248,9	310,7	376,0	464,4	565,2
Moisture removed ⁽²⁾	l/24h	223,0	290,9	444,8	552,2	587,5	746,4	907,5
Nominal input power ⁽¹⁾	kW	1,97	2,54	3,44	5,27	5,86	7,74	9,94
Maximum input current	A	6,8	9,4	12,7	17,7	18,5	20,9	25,8
Peak current	A	52,0	71,0	57,0	69,0	85,0	98,0	111,0
Hot water coil ⁽³⁾	kW	18	23	28	33	53	64	70
Total air flow	m ³ /h	1500	2000	2800	3500	4200	5200	6000
Available static pressure	Pa	200	200	200	200	200	200	200
Maximum fresh air flow	m ³ /h	450	600	845	1050	1260	1560	1800
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	1,6	1,6	2,5	3,0	5,0	5,0	5,0
Equivalent CO ₂ charge	t	3,34	3,34	5,22	6,26	10,44	10,44	10,44
Sound pressure ⁽⁴⁾	dB (A)	63	63	66	66	68	69	69
Compressors / Circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 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	400/3+N/50	400/3+N/50

Performances are referred 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; water temperature 80/70°C, unit compressor in stand-by

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

UTAZ		015	020	028	035	042	052	060
Moisture removed ⁽¹⁾	l/24h	132,7	162,3	248,9	310,7	376,0	464,4	565,2
Moisture removed ⁽²⁾	l/24h	223,0	290,9	444,8	552,2	587,5	746,4	907,5
Cooling capacity ⁽³⁾	kW	3,5	4,7	6,5	8,3	10,0	12,2	14,0
Nominal input power ⁽¹⁾	kW	1,97	2,54	3,44	5,27	5,86	7,74	9,94
Maximum input current	A	6,8	9,4	12,7	17,7	18,5	20,9	25,8
Peak current	A	52,0	71,0	57,0	69,0	85,0	98,0	111,0
Hot water coil ⁽⁴⁾	kW	18	23	28	33	53	64	70
Total air flow	m ³ /h	1500	2000	2800	3500	4200	5200	6000
Available static pressure	Pa	200	200	200	200	200	200	200
Maximum fresh air flow	m ³ /h	450	600	845	1050	1260	1560	1800
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	2,0	2,0	3,0	3,0	5,0	5,0	5,0
Equivalent CO ₂ charge	t	4,17	4,17	6,26	6,26	10,44	10,44	10,44
Sound pressure ⁽⁶⁾	dB (A)	63	63	66	66	68	69	69
Compressors / Circuits	n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 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	400/3+N/50	400/3+N/50

Performances are referred 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%), net sensible cooling capacity in the room.

(4) Room temperature 30°C; water temperature 80/70°C, unit compressor in stand-by

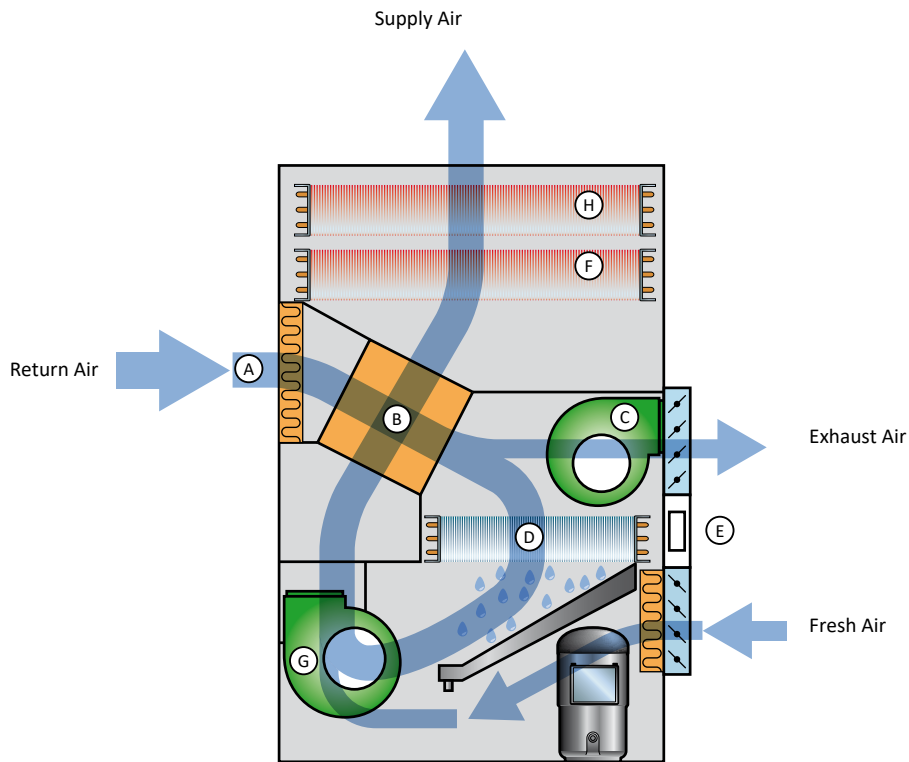
(5) Sound pressure level measured at 1 mt from the unit in free field conditions according to ISO 9614.

Operation principle

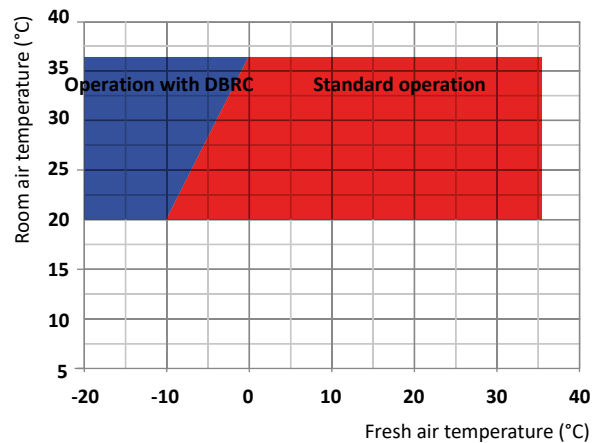
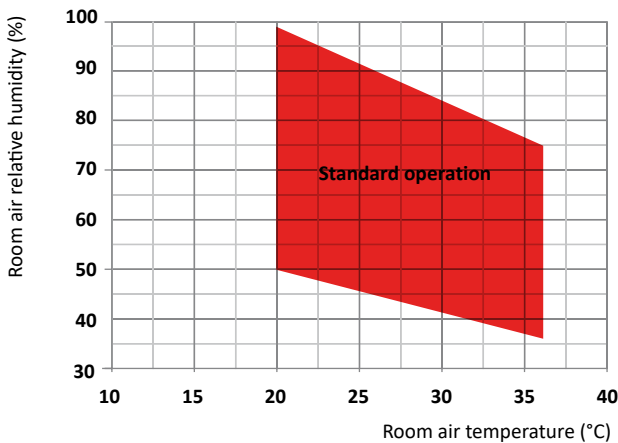
The hot and humid return airflow, moved by the fan (G), passes in the return filter (A), then across the first side of the energy recovery (B) where, crossing the cold air present on the other side, leaves part of its enthalpy. At this point part of the treated air (from 0% to 30%) is removed by the 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

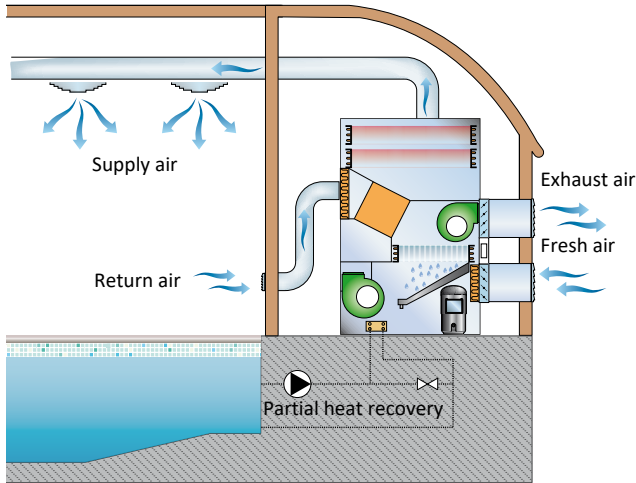
returned into the energy recovery for the second passage where, crossing the hot air present on the other side, it is warmed up. The airflow then passes across the condensing coil (F) where it is post heated and finally sent into the swimming pool. In case the air discharge temperature is still too cold, the hot water temperature coil H (accessory) will provide to increase it up to the required level.



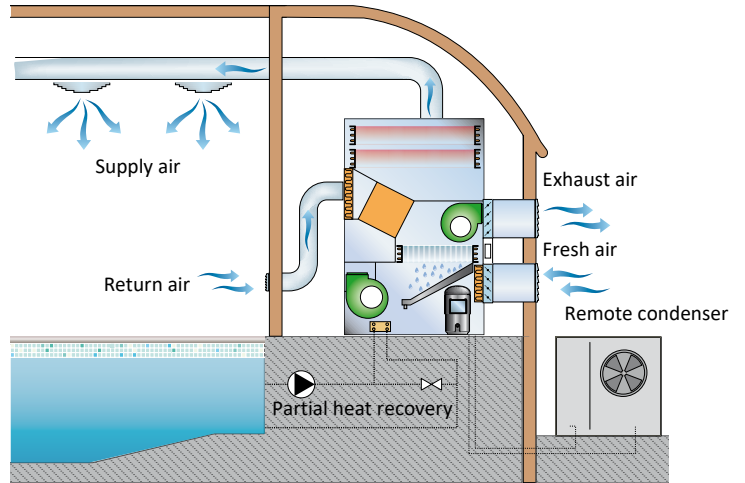
Operation limits



Plant scheme with uta



Plant scheme with utaz



Frame

All UTA 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 R410A. 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.

Heat 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.

E.C. supply fan

The supply fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee

an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

E.C. exhaust fan

The exhaust fan is a high performance centrifugal type, double inlet forward curved blades, directly coupled to the electric motor. The fan wheel and the scroll are made from hot galvanised thick sheet metal, painted with polyurethane powders, to ensure the best resistance against aggressive environments. The electric motor is a high efficiency DC brushless type with external rotor, to guarantee an ideal cooling of the windings and the absence of power lost due to pulleys and belt transmission. The fan is statically and dynamically balanced class 6,3 according to ISO1940. The electric motor has a separate electronic commutator (driver) and a speed modulation 0-10V, integrated PFC, burn out thermal protection (in case of considerable reduction of the power supply), protection degree IP54, serial interface card with modbus protocol RTU.

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 bushes 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'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 G5, according to EN 779:2002.

Microprocessor

All UTA 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.

Built-in temperature/humidity electronic probe

It is installed, standard, on all UTA 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%.

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 UTA 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.

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.

Accessories

DBRC - Low ambient temperature device

The low ambient temperature device is used when the fresh air temperature is lower than -5°C and allows the correct operation of the unit with very low ambient temperatures. The device is made of a heat recovery composed by 2 water+ glycol coils connected with a water pump. The upper coil recovers the thermal load of the exhaust air, the mixture (glycol +water) in the coil is warmed up, then it is moved to the lower coil where the thermal load is transferred to the fresh air that is pre-heated before entering in the unit. The use of this device allows two advantages:- An additional heat recovery on the exhaust air increasing then the unit energy efficiency,- The fresh air inlet is suitable for the correct operation of the internal components.

The device is managed by the unit microprocessor and it is factory set; The operation mode is the following: When the fresh air sensor measures a temperature lower than -5°C it is activated the water pump so the heat recovery function. The device is in operation until the fresh air temperature raises above the minimum set point temperature (set in the microprocessor). The microprocessor, with a compared measures of temperature and humidity sensors, provides to switch off the compressor in case the fresh air conditions are suitable to guarantee the required indoor conditions. In this way it is reduced the energy consumption of the unit that operates in FREE COOLING MODE.

PCRL - Remote control panel

This panel can be mounted up to 50m (maximum) from the unit and replicates all of the control functions.

UTA		015	020	028	035	042	052	060
Partial heat recovery Cu-Ni made	RP01	○	○	○	○	○	○	○
Low ambient temperature device with heat recovery	DBRC	○	○	○	○	○	○	○
Remote control Panel	PCRL	○	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	VECE	●	●	●	●	●	●	●

● Standard, ○ Optional, – Not Available.

UTAZ		015	020	028	035	042	052	060
Partial heat recovery Cu-Ni made	RP01	○	○	○	○	○	○	○
Low ambient temperature device with heat recovery	DBRC	–	–	–	–	–	–	–
Remote control Panel	PCRL	○	○	○	○	○	○	○
High efficiency E.C. fans ≤ 300 Pa	VECE	●	●	●	●	●	●	●
Outdoor unit with condensation pressure control	CN	●	●	●	●	●	●	●

● Standard, ○ Optional, – Not Available.

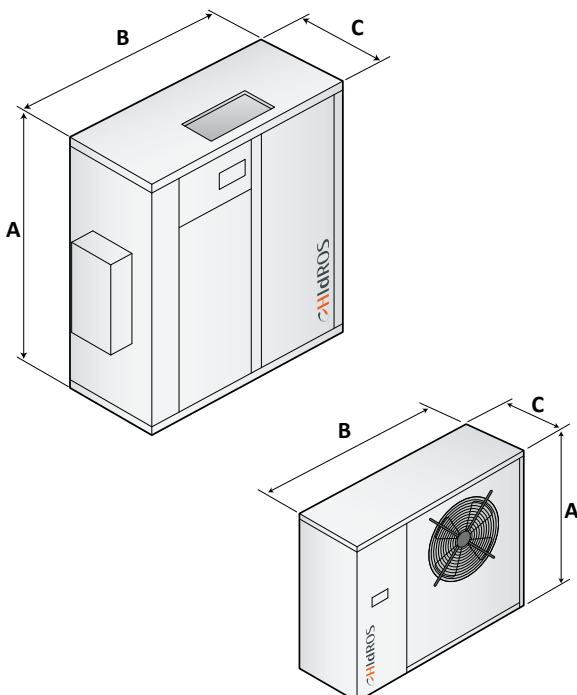
RGDD - Humidity and Temperature electronic probe sensor

Built-in Electronic temperature and humidity probe.

RP01 - Partial heat recovery

The unit is fitted with a Coaxial type heat exchanger suitable for chlorinated water. The internal pipe is manufactured from Cupronickel with the external pipe being made from Copper. The chlorinated water flows within the internal pipe whilst the refrigerant gas passes through the gap between the internal and external pipes.

The Cupronickel internal pipe is manufactured with a special profile that generates turbulent flow within the refrigerant gas thus increasing the heat exchange factor, the thermal efficiency and reducing the dimensions. The heat exchanger is designed to recover approx. 20% of the thermal capacity generated by the unit.



UTA - UTAZ (indoor unit)

Mod.	A (mm)	B (mm)	C (mm)	Kg
015	1770	1000	640	290
020	1770	1000	640	305
028	1850	1500	750	400
035	1850	1500	750	420
042	1950	1950	1250	570
052	1950	1950	1250	590
060	1950	1950	1250	620

Outdoor unit (UTAZ only)

Mod.	A (mm)	B (mm)	C (mm)	Kg
015	989	1103	380	80
020	989	1103	380	80
028	1324	1203	423	92
035	1324	1203	423	92
042	1324	1203	423	92
052	1423	1453	473	130
060	1423	1453	473	130

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

- CO** Cooling only.
- SA** Standard efficiency, AC fans.
- SE** Standard efficiency, EC fans.
- HA** High efficiency, AC fans.
- HE** High efficiency, EC fans.
- LS** Low noise.
- XL** Extra low noise.
- BT** Cooling only for low user water temperature.
- CN** Condensing unit version.
- FC** Free-cooling version.

Cooling only version (CO)

CO/SA/LS		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	18,7	25,3	30,0	40,5	46,1	51,8	57,1	64,4	73,4	87,0	95,0	108,2
Total input power (EN14511) ⁽¹⁾	kW	6,6	9,2	10,8	14,0	16,6	19,6	20,9	22,7	27,6	31,1	36,0	40,1
EER (EN14511) ⁽¹⁾	W/W	2,83	2,76	2,77	2,90	2,77	2,64	2,73	2,84	2,66	2,80	2,64	2,70
SEER ⁽²⁾	kWh/kWh	3,85	3,90	3,83	3,81	3,82	3,84	3,88	3,85	3,80	3,83	3,81	3,85
η _{s,c} ⁽²⁾	%	151,0	153,0	150,2	149,4	149,8	150,6	152,2	151,0	149,0	150,2	149,4	151,0
Sound power ⁽³⁾	dB (A)	75	75	75	75	77	77	77	78	79	82	83	85
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	45	45	45	46	47	50	51	53
CO/SE/LS		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	18,5	25,3	29,8	40,3	46,1	52,1	57,6	65,0	74,0	87,0	95,0	109,1
Total input power (EN14511) ⁽¹⁾	kW	6,6	9,2	10,8	13,8	16,4	19,5	20,7	22,5	27,4	30,6	35,6	39,7
EER (EN14511) ⁽¹⁾	W/W	2,82	2,76	2,77	2,93	2,80	2,68	2,78	2,89	2,70	2,84	2,67	2,75
SEER ⁽²⁾	kWh/kWh	4,02	4,05	4,00	3,95	3,96	3,97	3,97	3,96	3,90	3,95	3,99	4,00
η _{s,c} ⁽²⁾	%	157,8	159,0	157,0	155,0	155,4	155,8	155,8	155,4	153,0	155,0	156,6	157,0
Sound power ⁽³⁾	dB (A)	73	74	74	75	77	77	77	78	79	82	83	84
Sound pressure ⁽⁴⁾	dB (A)	41	42	42	43	45	45	45	46	47	50	51	52
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	3,7	3,9	5,1	6,5	6,6	6,7	7,9	9,8	10,1	11,8	11,8	14,9
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	7,8	8,1	10,7	13,5	13,8	14,1	16,5	20,5	21,1	24,6	24,6	31,1

Cooling only version (CO)

CO/SA/LS		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	121,7	139,1	153,0	182,3	205,3	200,4	220,2	244,6	296,6	326,6	366,7	414,0
Total input power (EN14511) ⁽¹⁾	kW	44,6	50,6	58,8	64,9	73,6	72,3	83,4	92,3	101,2	115,4	130,5	148,4
EER (EN14511) ⁽¹⁾	W/W	2,73	2,75	2,60	2,81	2,79	2,77	2,64	2,65	2,93	2,83	2,81	2,79
SEER ⁽²⁾	kWh/kWh	3,83	3,91	3,90	3,90	3,81	3,80	3,80	3,80	3,81	3,80	3,82	4,10
η _{s,c} ⁽²⁾	%	150,2	153,4	153,0	153,0	149,4	149,0	149,0	149,0	149,4	149,0	149,8	161,0
Sound power ⁽³⁾	dB (A)	86	86	86	89	90	87	89	90	90	91	92	93
Sound pressure ⁽⁴⁾	dB (A)	54	54	54	57	58	55	57	58	58	59	60	61
CO/SE/LS		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	122,5	140,2	154,4	183,3	207,1	201,7	221,8	246,2	297,1	327,8	370,6	417,1
Total input power (EN14511) ⁽¹⁾	kW	44,2	50,3	58,0	64,5	72,9	71,5	82,5	91,2	100,0	115,0	129,6	146,9
EER (EN14511) ⁽¹⁾	W/W	2,77	2,79	2,66	2,84	2,84	2,82	2,69	2,70	2,97	2,85	2,86	2,84
SEER ⁽²⁾	kWh/kWh	3,95	4,00	4,01	4,01	4,01	3,96	3,97	3,98	4,04	4,00	4,01	4,25
η _{s,c} ⁽²⁾	%	155,0	157,0	157,4	157,4	157,4	155,4	155,8	156,2	158,6	157,0	157,4	167,0
Sound power ⁽³⁾	dB (A)	85	85	85	89	90	87	89	90	90	91	92	93
Sound pressure ⁽⁴⁾	dB (A)	53	53	53	57	58	55	57	58	58	59	60	61
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	15,1	19,9	20,2	23,7	24,2	29,8	30,3	36,3	49,5	50,4	61,1	63,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	31,5	41,6	42,2	49,5	50,5	62,2	63,3	75,8	103,4	105,2	127,6	132,6

Performances are referred to the following conditions:

- (1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
 (2) In accordance with (EU) 2016/2281 and relative norms part of this.

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Cooling only version (CO)

CO/HA/LS		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	19,6	26,7	32,3	42,8	46,8	55,0	61,5	68,4	82,6	93,5	104,5	121,4
Total input power (EN14511) ⁽¹⁾	kW	6,3	8,6	10,3	13,8	15,0	17,1	19,6	22,0	26,2	30,0	33,6	38,1
EER (EN14511) ⁽¹⁾	W/W	3,10	3,11	3,13	3,11	3,11	3,22	3,13	3,11	3,15	3,12	3,11	3,19
SEER ⁽²⁾	kWh/kWh	4,00	4,10	4,19	4,00	4,12	4,20	4,19	4,19	4,02	4,01	4,03	4,03
$\eta_{s,c}$ ⁽²⁾	%	157,0	161,0	164,5	157,0	161,9	165,0	164,6	164,6	157,8	157,4	158,2	158,2
Sound power ⁽³⁾	dB (A)	75	75	75	75	77	77	77	78	83	84	85	87
Sound pressure ⁽⁴⁾	dB (A)	43	43	43	43	45	45	45	46	51	52	53	55
CO/HE/LS		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	19,7	26,7	32,0	42,8	46,6	55	61,6	68,6	82,6	93,8	105	121,6
Total input power (EN14511) ⁽¹⁾	kW	6,2	8,4	10,0	13,6	14,8	16,9	19,3	21,8	25,4	29,6	33,2	36,8
EER (EN14511) ⁽¹⁾	W/W	3,16	3,18	3,19	3,15	3,14	3,25	3,19	3,15	3,25	3,17	3,16	3,30
SEER ⁽²⁾	kWh/kWh	4,20	4,25	4,35	4,29	4,26	4,39	4,31	4,24	4,37	4,34	4,25	4,40
$\eta_{s,c}$ ⁽²⁾	%	165,0	167,0	171,0	168,5	167,3	172,6	169,4	166,6	171,8	170,6	167,0	173,0
Sound power ⁽³⁾	dB (A)	71	73	73	75	77	77	77	78	81	84	85	86
Sound pressure ⁽⁴⁾	dB (A)	39	41	41	43	45	45	45	46	49	52	53	54
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,1	5,1	6,6	6,9	7,1	10,0	10,1	10,4	15,3	15,3	15,3	23,2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	10,6	10,6	13,7	14,3	14,9	20,9	21,1	21,7	31,9	31,9	31,9	48,4

Cooling only version (CO)

CO/HA/LS		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	133,3	151,6	168,9	195,0	214,5	208,8	242,5	266,0	301,1	340,5	390,0	433,6
Total input power (EN14511) ⁽¹⁾	kW	42,9	48,7	54,3	62,7	68,8	67,1	77,5	85,3	96,8	109,5	125,4	139,4
EER (EN14511) ⁽¹⁾	W/W	3,11	3,11	3,11	3,11	3,12	3,11	3,13	3,12	3,11	3,11	3,11	3,11
SEER ⁽²⁾	kWh/kWh	4,03	4,13	4,07	4,18	4,13	4,00	4,01	4,03	4,05	4,08	4,06	4,30
$\eta_{s,c}$ ⁽²⁾	%	158,2	162,2	159,8	164,2	162,2	157,0	157,4	158,2	159,0	160,2	159,4	169,0
Sound power ⁽³⁾	dB (A)	88	88	88	89	91	89	90	91	91	91	93	94
Sound pressure ⁽⁴⁾	dB (A)	56	56	56	57	59	57	58	59	59	59	61	62
CO/HE/LS		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	133,3	152,1	169,3	195,6	215,1	210,3	246,8	267,7	303,2	345,3	390	435,5
Total input power (EN14511) ⁽¹⁾	kW	41,8	48,1	53,6	62,7	68,3	66,3	76,2	85,0	95,3	108,2	123,8	138,3
EER (EN14511) ⁽¹⁾	W/W	3,19	3,16	3,16	3,12	3,15	3,17	3,24	3,15	3,18	3,19	3,15	3,15
SEER ⁽²⁾	kWh/kWh	4,42	4,41	4,31	4,40	4,28	4,25	4,36	4,32	4,41	4,28	4,43	4,40
$\eta_{s,c}$ ⁽²⁾	%	173,8	173,4	169,4	173,0	168,2	167,0	171,4	169,8	173,4	168,2	174,2	173,0
Sound power ⁽³⁾	dB (A)	87	88	88	89	91	88	89	90	91	91	93	94
Sound pressure ⁽⁴⁾	dB (A)	55	56	56	57	59	56	57	58	59	59	61	62
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	23,6	24,1	24,1	31,8	39,7	39,1	48,9	49,5	50,4	62,3	63,5	75,3
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	49,3	50,3	50,3	66,4	82,9	81,6	102,1	103,4	105,2	130,1	132,6	157,2

Performances are referred to the following conditions:

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

(2) In accordance with (EU) 2016/2281 and relative norms part of this.

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Cooling only version (CO)

CO/SA/XL		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	18,8	25,5	29,5	39,7	44,3	50,4	55,8	63,0	71,1	85,2	92,7	105,2
Total input power (EN14511) ⁽¹⁾	kW	6,7	9,2	11,0	14,1	15,3	18,6	21,3	23,1	28,3	31,4	36,8	41,1
EER (EN14511) ⁽¹⁾	W/W	2,80	2,76	2,67	2,82	2,89	2,71	2,62	2,73	2,51	2,71	2,52	2,56
SEER ⁽²⁾	kWh/kWh	3,80	3,85	3,87	3,83	3,82	3,90	3,83	3,84	3,80	3,90	3,81	3,92
η _{s,c} ⁽²⁾	%	149,0	151,0	151,8	150,0	149,8	153,0	150,2	150,6	149,0	153,0	149,4	153,8
Sound power ⁽³⁾	dB (A)	71	71	71	71	75	75	75	76	77	80	82	83
Sound pressure ⁽⁴⁾	dB (A)	39	39	39	39	43	43	43	44	45	48	50	51
CO/SE/XL		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	18,5	25,4	29,4	39,7	44,4	50,6	55,8	63,0	71,1	85,2	92,7	105,2
Total input power (EN14511) ⁽¹⁾	kW	6,5	9,1	10,4	13,9	15,0	18,3	21,1	22,9	28,1	31,3	36,8	40,9
EER (EN14511) ⁽¹⁾	W/W	2,84	2,81	2,82	2,87	2,96	2,77	2,64	2,75	2,53	2,72	2,52	2,57
SEER ⁽²⁾	kWh/kWh	4,10	4,12	4,10	4,05	4,06	4,10	4,05	4,06	4,05	4,08	4,05	4,10
η _{s,c} ⁽²⁾	%	161,0	161,8	161,0	159,0	159,4	161,0	159,0	159,4	159,0	160,2	159,0	161,0
Sound power ⁽³⁾	dB (A)	68	69	69	71	75	75	75	76	77	80	82	83
Sound pressure ⁽⁴⁾	dB (A)	36	37	37	39	43	43	43	44	45	48	50	51
Power supply	V/Ph/Hz	400/3+N/50	400/3+N/50	400/3+N/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	3	3	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	3,7	3,9	5,1	6,5	6,6	6,7	7,9	9,8	10,1	11,8	11,8	14,9
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	7,8	8,1	10,7	13,5	13,8	14,1	16,5	20,5	21,1	24,6	24,6	31,1

Cooling only version (CO)

CO/SA/XL		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	118,0	135,5	148,2	175,9	198,0	193,1	210,6	232,2	286,8	314,4	355,2	395,0
Total input power (EN14511) ⁽¹⁾	kW	45,7	51,9	60,0	65,6	73,3	72,3	83,9	94,0	100,6	116,4	131,6	146,3
EER (EN14511) ⁽¹⁾	W/W	2,58	2,61	2,47	2,68	2,70	2,67	2,51	2,47	2,85	2,70	2,70	2,70
SEER ⁽²⁾	kWh/kWh	3,82	3,93	3,82	3,93	3,83	3,81	3,84	3,80	3,92	3,82	3,95	3,94
η _{s,c} ⁽²⁾	%	149,8	154,2	149,8	154,2	150,2	149,4	150,6	149,0	153,8	149,8	155,0	154,6
Sound power ⁽³⁾	dB (A)	85	85	85	87	89	85	87	88	88	88	90	91
Sound pressure ⁽⁴⁾	dB (A)	53	53	53	55	57	53	55	56	56	56	58	59
CO/SE/XL		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	118,0	135,5	148,2	175,9	198,0	193,1	210,6	232,2	286,8	314,4	355,2	395,0
Total input power (EN14511) ⁽¹⁾	kW	44,9	51,5	59,8	65,6	72,8	71,5	83,2	92,5	99,9	115,2	131,6	144,2
EER (EN14511) ⁽¹⁾	W/W	2,63	2,63	2,48	2,68	2,72	2,70	2,53	2,51	2,87	2,73	2,70	2,74
SEER ⁽²⁾	kWh/kWh	4,04	4,10	4,05	4,10	4,06	4,06	4,15	4,05	4,10	4,09	4,08	4,10
η _{s,c} ⁽²⁾	%	158,6	161,0	159,0	161,0	159,4	159,4	163,0	159,0	161,0	160,6	160,2	161,0
Sound power ⁽³⁾	dB (A)	85	85	85	87	89	85	87	88	88	88	90	91
Sound pressure ⁽⁴⁾	dB (A)	53	53	53	55	57	53	55	56	56	56	58	59
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	4	4	4	3	4	4	4	4	6	6	6	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	15,1	19,9	20,2	23,7	24,2	29,8	30,3	36,3	49,5	50,4	61,1	63,5
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	31,5	41,6	42,2	49,5	50,5	62,2	63,3	75,8	103,4	105,2	127,6	132,6

Performances are referred to the following conditions:

- (1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
 (2) In accordance with (EU) 2016/2281 and relative norms part of this.

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Cooling only version (CO)

CO/HA/XL		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	20,5	27,0	31,9	42,6	46,1	54,0	61,2	68,1	80,7	91,2	103,2	118,8
Total input power (EN14511) ⁽¹⁾	kW	6,6	8,7	10,2	13,7	14,9	17,4	19,6	22,0	25,4	29,4	33,3	36,9
EER (EN14511) ⁽¹⁾	W/W	3,11	3,10	3,14	3,11	3,10	3,11	3,12	3,10	3,18	3,10	3,10	3,22
SEER ⁽²⁾	kWh/kWh	4,10	4,11	4,15	4,10	4,05	4,16	4,15	4,10	4,16	4,17	4,10	4,20
$\eta_{s,c}$ ⁽²⁾	%	161,0	161,4	163,0	161,0	159,0	163,4	163,0	161,0	163,4	163,8	161,0	165,0
Sound power ⁽³⁾	dB (A)	70	70	70	70	72	72	72	73	75	77	78	80
Sound pressure ⁽⁴⁾	dB (A)	38	38	38	38	40	40	40	41	43	45	46	48
CO/HE/XL		252	302	402	452	502	602	702	802	902	1002	1202	1402
Cooling capacity (EN14511) ⁽¹⁾	kW	20,5	27,0	31,4	42,6	46,1	54,0	61,2	68,1	80,7	91,2	103,2	118,8
Total input power (EN14511) ⁽¹⁾	kW	6,6	8,7	10,1	13,7	14,8	17,2	19,6	21,9	25,4	29,2	33,2	36,9
EER (EN14511) ⁽¹⁾	W/W	3,12	3,11	3,12	3,11	3,11	3,14	3,13	3,11	3,18	3,12	3,11	3,22
SEER ⁽²⁾	kWh/kWh	4,35	4,32	4,44	4,25	4,30	4,35	4,30	4,25	4,40	4,43	4,30	4,50
$\eta_{s,c}$ ⁽²⁾	%	171,0	169,8	174,6	167,0	169,0	171,0	169,0	167,0	173,0	174,2	169,0	177,0
Sound power ⁽³⁾	dB (A)	64	65	68	70	72	72	72	73	75	77	78	80
Sound pressure ⁽⁴⁾	dB (A)	32	33	36	38	40	40	40	41	43	45	46	48
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	400/3/50
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Fans	n°	2	2	2	2	2	2	2	2	2	2	2	3
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	5,1	5,1	6,6	6,9	7,1	10,0	10,1	10,4	15,3	15,3	15,3	23,2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	10,6	10,6	13,7	14,3	14,9	20,9	21,1	21,7	31,9	31,9	31,9	48,4

Cooling only version (CO)

CO/HA/XL		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	130,1	150,1	166,8	189,1	211,0	208,5	236,0	264,0	297,8	337,4	383,5	426,1
Total input power (EN14511) ⁽¹⁾	kW	42,0	48,1	53,8	60,8	67,8	67,3	75,6	84,9	95,8	108,5	123,7	137,5
EER (EN14511) ⁽¹⁾	W/W	3,10	3,12	3,10	3,11	3,11	3,10	3,12	3,11	3,11	3,11	3,10	3,10
SEER ⁽²⁾	kWh/kWh	4,11	4,25	4,12	4,27	4,15	4,10	4,22	4,20	4,30	4,20	4,25	4,17
$\eta_{s,c}$ ⁽²⁾	%	161,4	167,0	161,8	167,8	163,0	161,0	165,8	165,0	169,0	165,0	167,0	163,8
Sound power ⁽³⁾	dB (A)	81	81	81	83	84	81	83	84	84	84	86	87
Sound pressure ⁽⁴⁾	dB (A)	49	49	49	51	52	49	51	52	52	52	54	55
CO/HE/XL		1602	1802	2002	2302	2502	2504	3004	3204	3504	4004	4504	5004
Cooling capacity (EN14511) ⁽¹⁾	kW	130,1	150,1	166,8	189,1	211,0	208,5	236,0	264,0	297,8	337,4	383,5	426,1
Total input power (EN14511) ⁽¹⁾	kW	42,0	48,1	53,6	60,8	67,8	67,3	75,6	84,9	95,4	108,5	122,9	136,6
EER (EN14511) ⁽¹⁾	W/W	3,10	3,12	3,11	3,11	3,11	3,10	3,12	3,11	3,12	3,11	3,12	3,12
SEER ⁽²⁾	kWh/kWh	4,40	4,45	4,35	4,35	4,28	4,30	4,40	4,35	4,38	4,30	4,40	4,30
$\eta_{s,c}$ ⁽²⁾	%	173,0	175,0	171,0	171,0	168,2	169,0	173,0	171,0	172,2	169,0	173,0	169,0
Sound power ⁽³⁾	dB (A)	81	81	81	83	84	81	83	84	84	84	86	87
Sound pressure ⁽⁴⁾	dB (A)	49	49	49	51	52	49	51	52	52	52	54	55
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
Compressors / Circuits	n° / n°	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2	4 / 2
Fans	n°	3	3	3	3	3	4	6	6	6	6	8	8
Refrigerant		R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A	R410A
Refrigerant charge	Kg	23,6	24,1	24,1	31,8	39,7	39,1	48,9	49,5	50,4	62,3	63,5	75,3
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
Equivalent CO ₂ charge	t	49,3	50,3	50,3	66,4	82,9	81,6	102,1	103,4	105,2	130,1	132,6	157,2

Performances are referred to the following conditions:

- (1) Cooling: ambient air temperature 35°C, evaporator water temperature in/out 12/7 °C.
 (2) In accordance with (EU) 2016/2281 and relative norms part of this

(3) Sound power level in accordance with ISO 3744.

(4) Sound pressure level at 10 mt from the unit in free field conditions in accordance with ISO 3744.

Frame

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

Refrigerant circuit

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

Compressors

The compressors used are a high performance scroll type. In all units the compressors are connected in tandem. This results in much higher efficiencies at part loads compared to units with independent refrigerant circuits.

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

Source heat exchanger

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

User heat exchangers

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

The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for 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, in LS versions are 6 poles type rotating at approximately 900 rpm. In the XL versions the fans are 8 poles type (approx 600 rpm). The motors are fitted with integrated thermal overload protection and have a moisture protection rating of IP 54.

Microprocessors

All units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, 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, 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 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.

Versions

CO Version

Cooling only version, chilled water available down to a minimum temperature of 4°C.

BT Version

Low user water temperature; supplied with a specific cooling circuit allowing the unit to operate with user chilled water between +4°C and -5°C.

SA Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

SE Version

Standard efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

HA Version

High efficiency version, according to ERP2018 standard. Unit equipped with AC fans.

HE Version

High efficiency version, according to ERP2018 standard. Unit equipped with EC fans.

LS Version

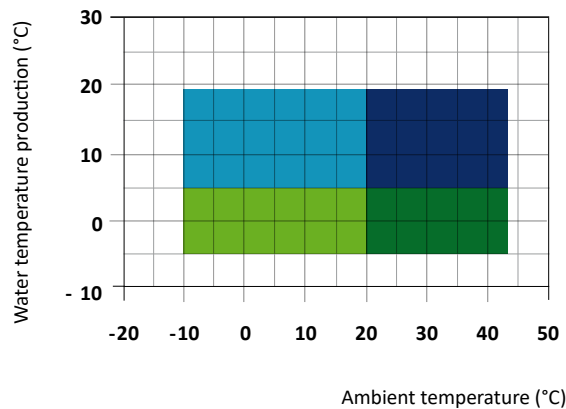
This version includes the complete acoustic insulation of the unit with compressor jackets and insulating material made with high density media and the interposition of heavy bitumen layer.





XL Version

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

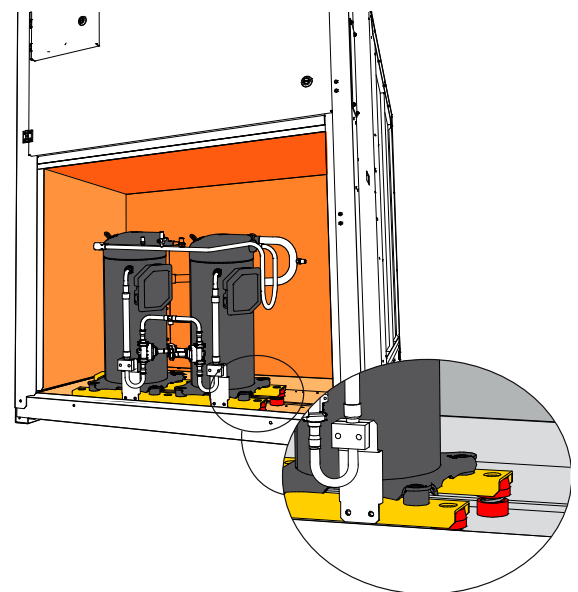
Unit equipped with low rotation speed fans (approx. 600 rpm).

Operation Limits



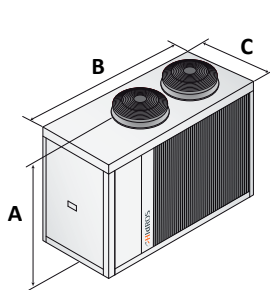
-  Cooling mode with cond. press. contr.
-  Cooling mode without cond. press. contr.
-  Cooling mode with cond. press. contr. and glycol (Only BT versions)
-  Cooling mode without cond. press. contr. and glycol (Only BT versions)

Floating frame - XL Version

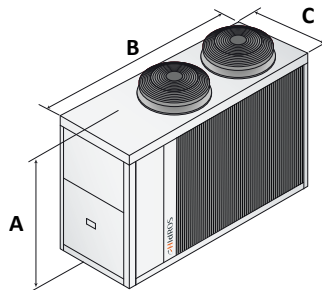


LDA CO/SA-SE CO/HA-HE		252	302	402	452	502	602	702	802
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		-	-	-	-	-	-	-	-
“Floating frame” Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

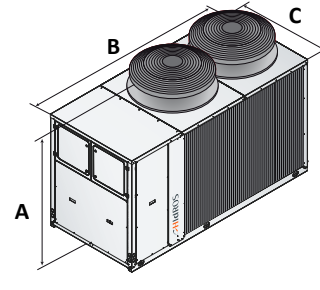
● Standard ○ Optional – Not available



SA/SE 252 - 302 - 402
HA/HE 252 - 302



SA/SE 452 - 502 - 602
HA/HE 402 - 452 - 502

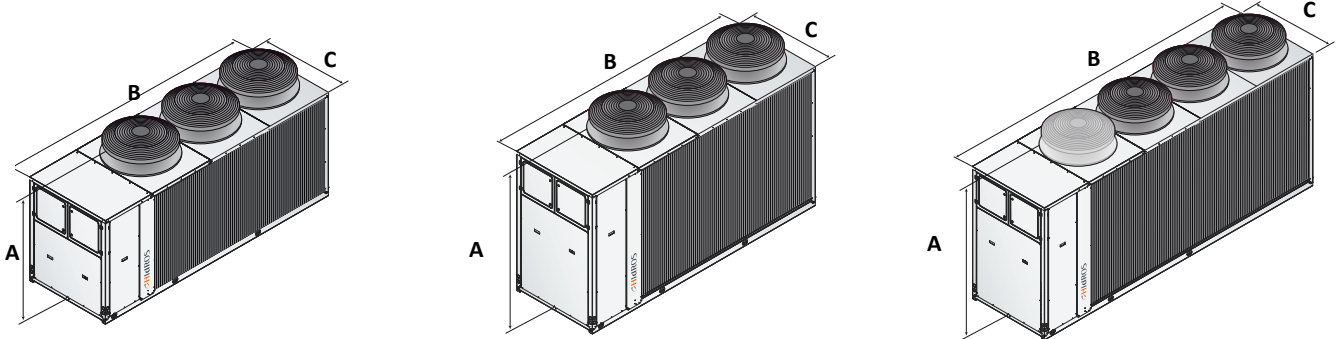


SA/SE 702 - 802 - 902
HA/HE 602 - 702 - 802 - 902 - 1002 - 1202

		252	302	402	452	502	602	702	802
A	SA-SE/LS	1470	1470	1470	1670	1670	1670	1820	1820
B	SA-SE/LS	1910	1910	1910	2200	2200	2200	2905	2905
C	SA-SE/LS	900	900	900	900	900	900	1150	1150
Kg	SA-SE/LS	550	550	560	670	700	760	880	890
A	HA-HE/LS	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/LS	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/LS	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/LS	560	560	670	690	720	1040	1060	1070
A	SA-SE/XL	1470	1470	1470	1670	1670	1670	1820	1820
B	SA-SE/XL	1910	1910	1910	2200	2200	2200	2905	2905
C	SA-SE/XL	900	900	900	900	900	900	1150	1150
Kg	SA-SE/XL	550	550	560	670	700	760	880	890
A	HA-HE/XL	1470	1470	1670	1670	1670	1820	1820	1820
B	HA-HE/XL	1910	1910	2200	2200	2200	2905	2905	2905
C	HA-HE/XL	900	900	900	900	900	1150	1150	1150
Kg	HA-HE/XL	570	570	680	710	740	1060	1080	1090

LDA CO/SA-SE CO/HA-HE		902	1002	1202	1402	1602	1802	2002	2302
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
“Floating frame” Technology - LS Version		–	–	–	–	–	–	–	–
“Floating frame” Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	–	–	–	–	–	–	–	–
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

● Standard ○ Optional – Not available



SA/SE 1002 - 1202 - 1402 - 1602
HA/HE 1402 - 1602 - 1802 - 2002

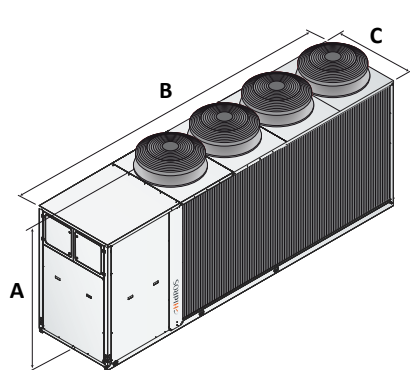
SA/SE 1802 - 2002
HA/HE 2302 - 2502

SA/SE 2302 - 2502

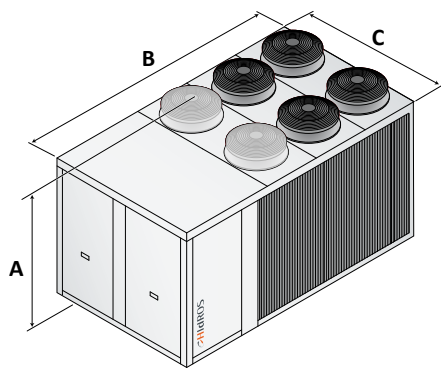
		902	1002	1202	1402	1602	1802	2002	2302
A	SA-SE/LS	1820	1820	1820	1820	1820	2220	2220	2305
B	SA-SE/LS	2905	3965	3965	3965	3965	3965	3965	4505
C	SA-SE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	SA-SE/LS	890	1170	1240	1290	1330	1660	1680	1950
A	HA-HE/LS	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/LS	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/LS	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/LS	1100	1140	1210	1530	1550	1570	1590	1750
A	SA-SE/XL	1820	1820	1820	1820	1820	2220	2220	2305
B	SA-SE/XL	2905	3965	3965	3965	3965	3965	3965	4505
C	SA-SE/XL	1150	1150	1150	1150	1150	1150	1150	1150
Kg	SA-SE/XL	890	1170	1240	1290	1330	1660	1680	1950
A	HA-HE/XL	1820	1820	1820	1820	1820	1820	1820	2220
B	HA-HE/XL	2905	2905	2905	3965	3965	3965	3965	3965
C	HA-HE/XL	1150	1150	1150	1150	1150	1150	1150	1150
Kg	HA-HE/XL	1120	1160	1230	1560	1580	1600	1620	1780

LDA CO/SA-SE CO/HA-HE		2502	2504	3004	3204	3504	4004	4504	5004
Flow switch		●	●	●	●	●	●	●	●
User circuit water strainer		○	○	○	○	○	○	○	○
"Floating frame" Technology - LS Version		-	-	-	-	-	-	-	-
"Floating frame" Technology - XL Version		●	●	●	●	●	●	●	●
E.C. fans - SA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - SE versions	VECE	●	●	●	●	●	●	●	●
E.C. fans - HA versions	VECE	-	-	-	-	-	-	-	-
E.C. fans - HE versions	VECE	●	●	●	●	●	●	●	●
Evap/cond. press. control by transducer and fan speed control	DCCF	○	○	○	○	○	○	○	○
Antifreeze kit for 2 pipe units	RAEV2	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Electronic expansion valve	VTEE	○	○	○	○	○	○	○	○
Cascade control system via RS485	SGRS	○	○	○	○	○	○	○	○
Hydraulic kit with one pump with tank	A1ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps with tank	A2ZZU	○	○	○	○	○	○	○	○
Hydraulic kit with one pump without tank	A1NTU	○	○	○	○	○	○	○	○
Hydraulic kit with two pumps without tank	A2NTU	○	○	○	○	○	○	○	○

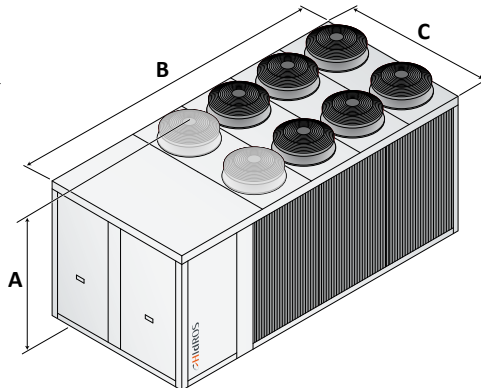
● Standard ○ Optional – Not available



SA/SE 2504 - 3004 - 3204



SA/SE 3504 - 4004
HA/HE 2504 - 3004 - 3204 - 3504



SA/SE 4504 - 5004
HA/HE 4004 - 4504 - 5004

		2502	2504	3004	3204	3504	4004	4504	5004
A	SA-SE/LS	2305	2305	2305	2305	2350	2350	2350	2350
B	SA-SE/LS	4505	5315	5315	5315	4265	4265	4805	4805
C	SA-SE/LS	1150	1150	1150	1150	2210	2210	2210	2210
Kg	SA-SE/LS	2000	2460	2500	2580	3170	3220	3550	3650
A	HA-HE/LS	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/LS	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/LS	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/LS	1780	3120	3170	3220	3270	3610	3670	3720
A	SA-SE/XL	2305	2305	2305	2305	2350	2350	2350	2350
B	SA-SE/XL	4505	5315	5315	5315	4265	4265	4805	4805
C	SA-SE/XL	1150	1150	1150	1150	2210	2210	2210	2210
Kg	SA-SE/XL	2000	2460	2500	2580	3170	3220	3550	3650
A	HA-HE/XL	2220	2350	2350	2350	2350	2350	2350	2350
B	HA-HE/XL	3965	4265	4265	4265	4265	4805	4805	4805
C	HA-HE/XL	1150	2210	2210	2210	2210	2210	2210	2210
Kg	HA-HE/XL	1810	3170	3220	3270	3320	3660	3720	3770

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

- STD** Cooling only version.
- EV** Condenserless version.
- BT** Cooling only version for low user water temperature.
- RP** Cooling only version with partial heat recovery.

WDA		039	045	050	060	070	080	090	110	120
Cooling capacity (EN14511) ⁽¹⁾	kW	43,7	49,9	59,3	67,2	75,0	88,5	100,8	112,0	126,5
Total input power (EN14511) ⁽¹⁾	kW	10,5	12,1	15,1	16,7	17,7	20,9	23,9	26,9	30,5
EER (EN14511) ⁽¹⁾	W/W	4,16	4,12	3,92	4,02	4,23	4,23	4,21	4,16	4,14
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	111,0	132,0	140,0	162,0	171,0	208,0	259,0	265,0	312,0
Maximum input current	A	32,0	42,0	44,0	53,0	62,0	68,0	74,0	80,0	88,5
Compressors / Circuits	n°/n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	5,0	5,0	6,0	6,0	7,0	8,0	14,0	14,0	14,0
Equivalent CO ₂ charge	t	10,4	10,4	12,5	12,5	14,6	16,7	29,2	29,2	29,2
Sound power ⁽⁶⁾	dB(A)	82	82	83	84	84	85	86	87	87
Sound pressure ⁽⁷⁾	dB(A)	66	66	67	68	68	69	69	70	70

WDA		130	152	162	190	210	240	260	300	320
Cooling capacity (EN14511) ⁽¹⁾	kW	141,1	162,4	182,5	201,6	223,9	257,6	285,7	323,5	365,2
Total input power (EN14511) ⁽¹⁾	kW	34,0	38,7	43,4	47,8	53,8	60,9	68,0	77,4	86,7
EER (EN14511) ⁽¹⁾	W/W	4,15	4,19	4,20	4,21	4,16	4,23	4,20	4,18	4,21
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2
Maximum input current	A	97,0	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6
Compressors / Circuits	n°/n°	2/1	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	14,0	18,0	18,0	30,0	30,0	34,0	34,0	36,0	36,0
Equivalent CO ₂ charge	t	29,2	37,6	37,6	62,6	62,6	71,0	71,0	75,2	75,2
Sound power ⁽⁶⁾	dB(A)	88	88	88	89	91	91	91	93	93
Sound pressure ⁽⁷⁾	dB(A)	71	71	71	72	74	74	74	76	76

Performances are referred to the following conditions:

- (1) Cooling: Evaporator water temp. 12/7°C condenser water temp. 30/35°C. Without pressostatic valve.
- (2) Cooling: Evaporator water temp. 23/18°C condenser water temp. 30/35°C. Without pressostatic valve.
- (3) Heating: Condenser water temp. 30/35°C; evaporator water temp. 10/7°C. With pressostatic valve.
- (4) Heating: Condenser water temp. 40/45°C; evaporator water temp. 10/7°C. With pressostatic valve.

(5) Average conditions, low temperature, variable - Reg EU 811/2013

(6) Sound power level in accordance with ISO 3744 (LS-Version).

(7) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744 (LS-Version).

WDA/EV		039	045	050	060	070	080	090	110	120
Cooling capacity ⁽¹⁾	kW	38,8	44,3	52,4	59,3	66,0	78,9	90,4	99,7	112,8
Total input power ⁽¹⁾	kW	13,2	15,3	19,4	21,1	22,4	25,9	29,6	33,4	37,7
Water flow ⁽¹⁾	m ³ /h	6,7	7,6	9,0	10,2	11,3	13,5	15,5	17,1	19,4
Peak current	A	111,0	132,0	140,0	162,0	171,0	208,0	259,0	265,0	312,0
Max input current	A	32,0	42,0	44,0	53,0	62,0	68,0	74,0	80,0	88,5
Power supply	V/Ph/Hz	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Compressors / Circuits	n°	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1	2/1
Sound power ⁽²⁾	dB(A)	74	74	75	76	76	77	77	78	78
Sound pressure ⁽³⁾	dB(A)	46	46	47	48	48	49	49	50	50

WDA/EV		130	152	162	190	210	240	260	300	320
Cooling capacity ⁽¹⁾	kW	125,8	145,0	162,6	178,3	197,8	221,4	245,8	277,5	314,0
Total input power ⁽¹⁾	kW	42,2	48,0	53,9	59,2	66,5	76,3	85,1	96,9	108,6
Water flow ⁽¹⁾	m ³ /h	21,6	24,9	27,9	30,6	33,9	38,0	42,2	47,6	53,9
Peak current	A	320,5	358,5	375,4	333,0	345,0	400,5	417,5	472,4	506,2
Max input current	A	97,0	113,9	130,8	148,0	160,0	177,0	194,0	227,8	261,6
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	4/2	4/2	4/2	4/2	4/2	4/2
Sound power ⁽²⁾	dB(A)	79	79	79	80	82	82	82	84	84
Sound pressure ⁽³⁾	dB(A)	51	51	51	52	54	54	54	56	56

Performances are referred to the following conditions:

- (1) For EV version: condensing temperature 50 °C, water temperature in/out 12/7 °C.
- (2) Sound power level in accordance with ISO 3744. (LS versions).

(3) Sound pressure level at 1 mt from the unit in free field conditions in accordance with ISO 3744 (LS versions)

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 antifreeze 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.

Versions

Cooling only version for low user water temperature (BT)

This version is supplied with a specific refrigerant circuit that allows the operation of the unit with user water outlet conditions between +4°C and -5°C.

Condenserless versions (EV)

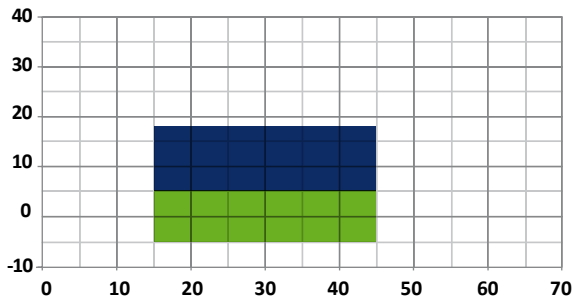
This version includes a microprocessor control to manage both the compressor timings and alarms. It is designed to operate with refrigerant R410A but is supplied with a holding charge of nitrogen.

Partial heat recovery (RP)

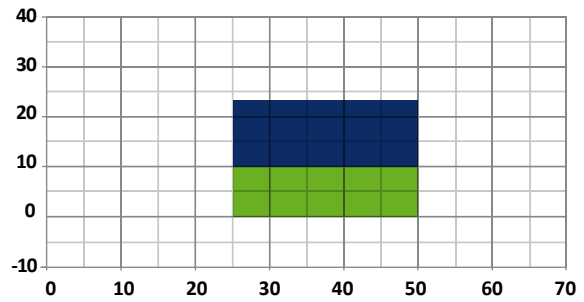
This version is supplied with an auxiliary heat exchanger fitted in series with the unit condenser thereby enabling it to produce hot water when the unit is operating in cooling mode.

WDA - WDA/EV		039-080	090-162	190-320
Main switch	—	●	●	●
Flow switch	—	●	●	●
LS low noise versions	LS01	○	○	○
Hydraulic kit S1NT with only pump source circuit	S1NT	○	○	○
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	○	○	○

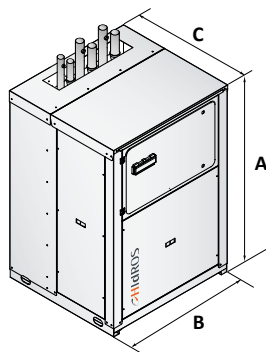
● Standard, ○ Optional, — Not available.



● All versions

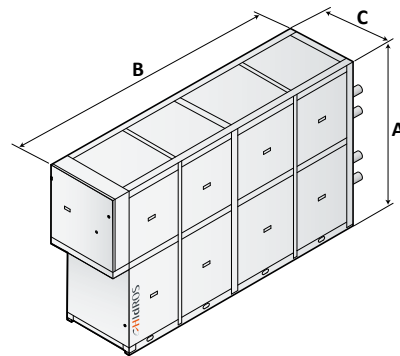


● Only BT version (working mode with glycol)



WDA 039 ÷ 162

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



WDA 190 ÷ 320

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

WTS

Water cooled water chillers



The Water to water chillers WTS range have been specifically designed for the commercial and industrial applications that require a plug and play system; These units are equipped with all the refrigerant and hydraulic components necessary for the connection to the system (User circuit water pumps, source circuit water pumps, buffer tanks, regulating and control valves, etc.) and, only need an external dry cooler for correct operation.

The units have been optimized to guarantee high efficiencies and the use of tandem refrigerant circuits allow an improvement of the ESEER compared to the conventional units with independent refrigerant circuits. The WTS units are available in the standard version and the Free Cooling version(FC) that achieves very high efficiency and significant energy savings all year around.

Versions

- WTS** In this version the units are supplied complete with water tank, primary circuit water pump.
- WTS/FC** In this version the units are supplied complete with water tank, primary circuit water pump, intermediate plate heat exchanger and 3 way valve (used to modulates the water flow to the user circuit following the required load from the plant). During the free cooling mode the compressors are in off.

WTS - WTS/FC		039	045	050	070	080	090	120	130
Cooling capacity (EN14511) ⁽¹⁾	kW	39,4	45,0	55,2	70,3	80,6	92,4	116,4	129,8
Total input power (EN14511) ^{(1) (5)}	kW	11,8	13,5	15,5	20,6	23,1	26,5	34,0	37,9
EER (EN14511) ⁽¹⁾	W/W	3,22	3,19	3,45	3,30	3,38	3,39	3,32	3,32
Free cooling capacity ⁽²⁾	kW	28,0	34,0	43,0	54,8	62,8	72,0	87,0	101,0
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
Peak current	A	111,0	132,0	140,0	199,0	208,0	259,0	312,0	320,5
Maximum input current	A	32,0	42,0	44,0	59,0	68,0	74,0	88,50	97,0
Compressors / Circuits	n°/n°	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
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	4,3	4,3	5,0	6,0	6,5	8,0	11,0	15,0
Equivalent CO ₂ charge	t	9,0	9,0	10,4	12,5	13,6	16,7	23,0	31,3
Sound power ⁽³⁾	dB(A)	82	82	83	84	85	86	87	88
Sound pressure ⁽⁴⁾	dB(A)	66	66	67	68	69	69	70	71
Water tank capacity	l	300	300	300	300	300	500	500	500
Primary circuit water pump nominal input power ⁽⁵⁾	kW	0,9	0,9	1,5	1,5	1,5	1,9	1,9	1,9
User water pump nominal input power ⁽⁵⁾	kW	0,9	0,9	1,5	1,5	1,5	1,9	1,9	1,9
Source water pump nominal input power ⁽⁵⁾	kW	0,9	0,9	1,5	1,5	1,5	1,9	1,9	1,9

WTS - WTS/FC		152	162	190	210	240	260	300	320
Cooling capacity (EN14511) ⁽¹⁾	kW	152,8	175,0	181,1	202,1	232,3	262,9	304,6	341,8
Total input power (EN14511) ^{(1) (5)}	kW	43,3	43,4	52,9	60,2	67,6	75,0	85,6	96,2
EER (EN14511) ⁽¹⁾	W/W	3,39	3,49	3,32	3,25	3,34	3,41	3,45	3,44
Free cooling capacity ⁽²⁾	kW	116,0	130,0	141,3	157,5	172,0	202,0	232,0	255,0
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
Peak current	A	358,9	375,4	333,0	345,0	400,5	194,0	472,4	506,2
Maximum input current	A	113,9	130,8	148,0	160,0	177,0	417,5	227,8	261,6
Compressors / Circuits	n°/n°	2/1	2/1	4/2	4/2	4/2	4/2	4/2	4/2
Capacity steps	n°	2	2	4	4	4	4	4	4
Global warming potential (GWP)		2088	2088	2088	2088	2088	2088	2088	2088
Refrigerant charge	Kg	15,0	15,0	16,0	16,0	19,0	19,0	30,0	30,0
Equivalent CO ₂ charge	t	31,3	31,3	33,4	33,4	39,7	39,7	62,6	62,6
Sound power ⁽³⁾	dB(A)	88	88	89	91	91	91	93	93
Sound pressure ⁽⁴⁾	dB(A)	71	71	72	74	74	74	76	76
Water tank capacity	l	500	500	750	750	750	750	750	750
Primary circuit water pump nominal input power ⁽⁵⁾	kW	2,2	2,2	3,0	3,0	4,0	4,0	5,5	5,5
User water pump nominal input power ⁽⁵⁾	kW	2,2	2,2	3,0	3,0	4,0	4,0	5,5	5,5
Source water pump nominal input power ⁽⁵⁾	kW	2,2	2,2	3,0	3,0	4,0	4,0	5,5	5,5

Performances are referred to the following conditions:

(1) Cooling: User water temperature 12/7°C, source water temperature 36/42°C. With 35% ethylen glycol.

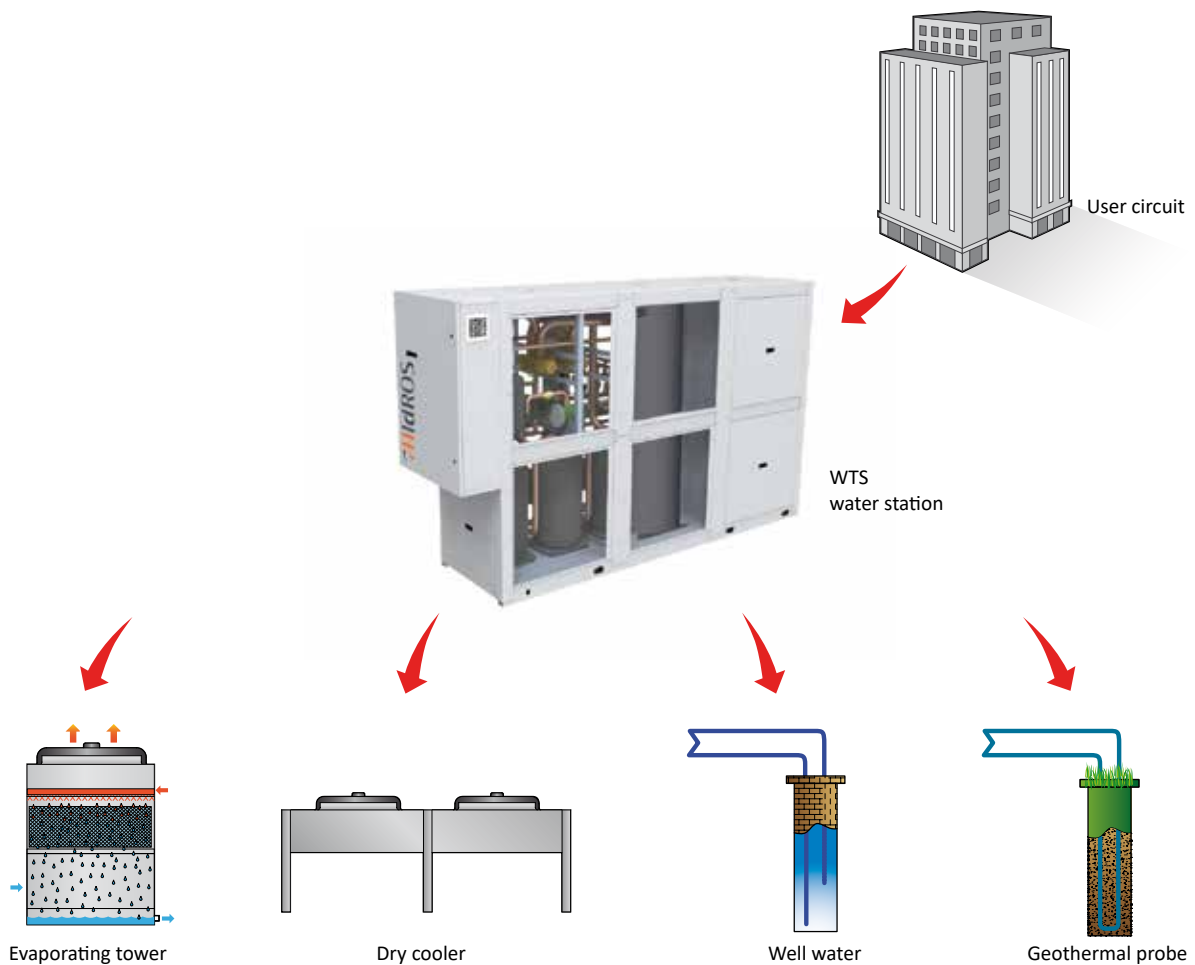
(2) Free Cooling: Source inlet water temperature +2°C, user water temperature in/out 14/9°C.

(3) Sound power level in accordance with ISO 3744 (LS version).

(4) Sound pressure level at 1 mt from the unit in free field conditions, calculated in accordance with ISO 3744 (LS version).

(5) Input power: only compressors (water pumps, dry coolers and other options have to be calculated separately)

Wts applications



Frame

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

Refrigerant circuit

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

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

Compressors

The compressors 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.

Source heat exchanger

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

User exchanger

The user side heat exchanger is a braze welded, plate type heat exchanger, manufactured from AISI 316 stainless steel. From size 039 to size 162 they have a single water side circuit, from the size 190 they are double circuit, "cross flow" type. The user heat exchangers are factory insulated with flexible close cell material. The heat exchangers are protected by a temperature sensor used as antifreeze protection kit.

Microprocessors

All WTS units are supplied as standard with microprocessor con-

trols. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, voltage free contact for remote general alarm, alarms and operation LED's. If required (available as an option), the microprocessor can be configured to be connected to MBS system through MOD-BUS protocol enabling remote control and management.

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), compressor fuses, control circuit automatic breakers, compressor contactors, fan contactors and pump contactors. The terminal board has volt free contacts for remote ON-OFF, and general alarm.

Control and protection devices

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

Versions

Standard version (STD)

In this version the units are supplied complete with water tank, primary circuit water pump.

Free cooling version (FC)

In this version, the units are supplied complete with water tank, primary circuit water pump, intermediate plate heat exchanger

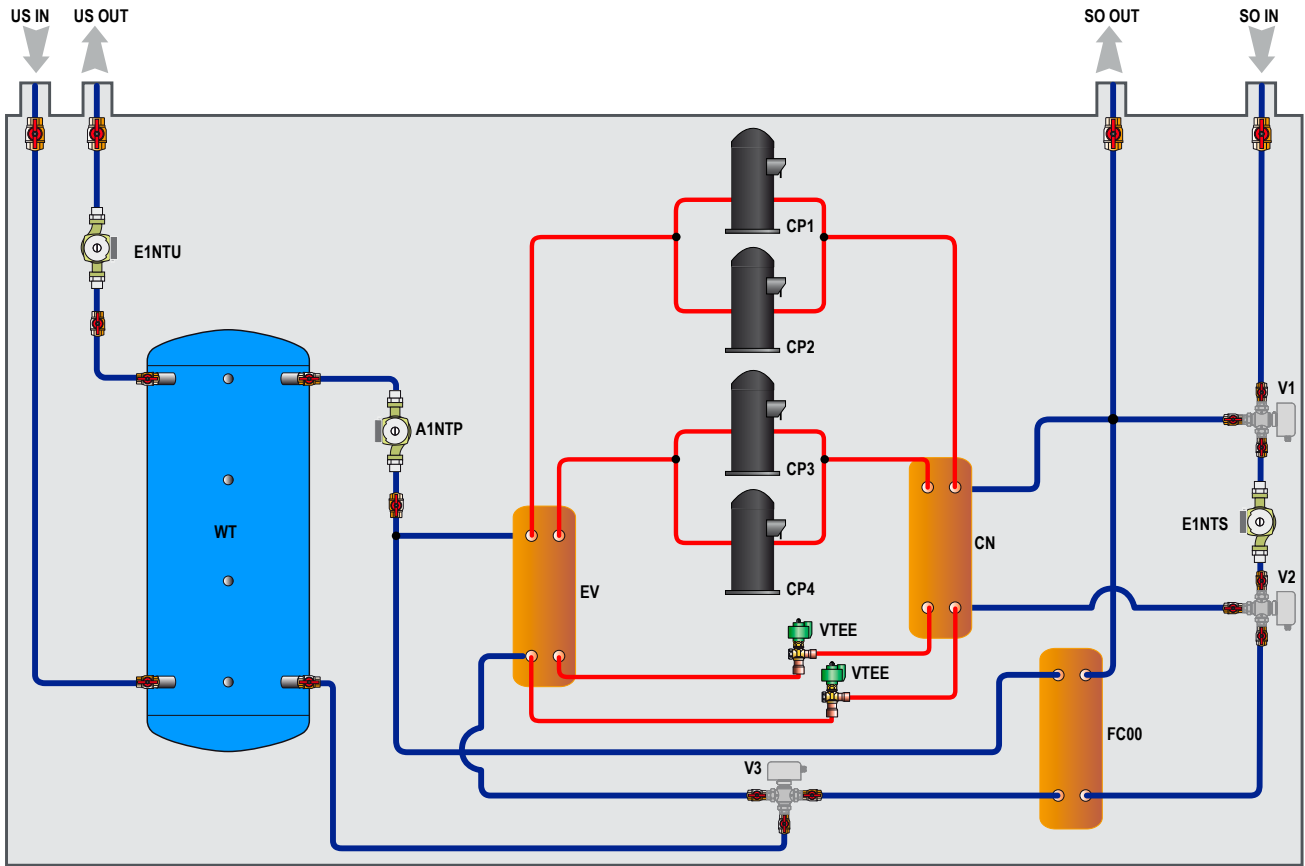
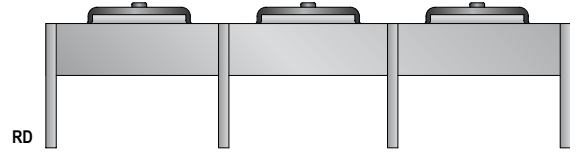
and 3 way valve (used to modulates the water flow to the user circuit following the required load from the plant). During the free cooling mode the compressors are in off. In case of requirement of cooling load all year around, it is possible to generate the chilled water by free cooling system. The free cooling system consists of a remote dry cooler and an additional intermediate plate heat exchanger through which the user circuit cold water flows when the ambient temperature is low. This solution is used in modern cooling systems with low energy consumption in application with fan coils, chilled beams and radiant systems. In fact, in the case in which the return water temperature from the user circuit is 14 °C, and the supply water is required to 9 °C, it can be understood that if the outside air temperature is lower than 14 °C , a part of the cooling load of the system can be satisfied simply by using the remote dry cooler and by step down the compressors of the unit. In the case where the outside air temperature is lower than 12 °C, most (if not all) of the cooling capacity can be supplied from the Free Cooling system. This process allows significant energy savings and can be considered one of the most efficient energy saving systems available on the market.



Hydraulic kit

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

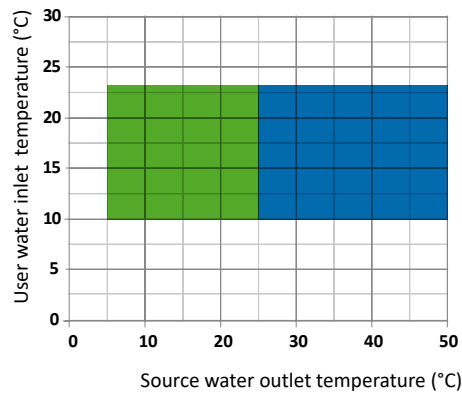
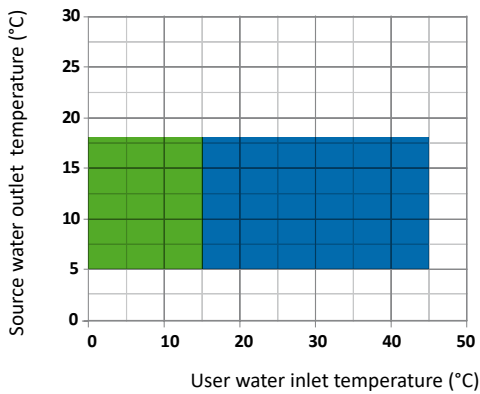
Wts/fc unit LAYOUT



Legend

US IN	User circuit water inlet	VTEE	Electronic expansion valve	FC00	Free cooling heat exchanger
US OUT	User circuit water outlet	CP 1,2,3,4	Compressor	E1NTU	User circuit water pump
SO IN	Source circuit water inlet	EV	User heat exchanger	E1NTS	Source circuit water pump
SO OUT	Source circuit water outlet	CN	Source heat exchanger	A1NTP	Primary circuit water pump
V1, V2, V3	Water valves	WT	Water tank	RD	Remote dry cooler

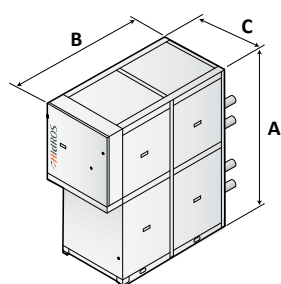
Operation limits



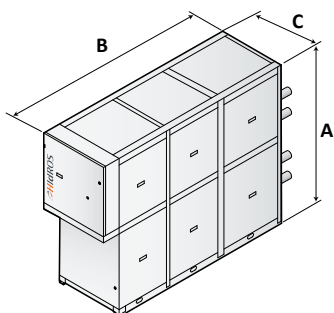
- Free cooling mode with compressor OFF
- Cooling mode with compressors activation

WTS		039÷080	090÷110	120÷162	190÷260	300÷320
Main switch		●	●	●	●	●
Microprocessor control		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Water tank with 4 hydraulic connections		●	●	●	●	●
Primary circuit On-Off water pump	A1NTP	●	●	●	●	●
Stepless fan speed control	DTEE	●	●	●	●	●
Liquid line solenoid valve	VSLI	●	●	●	●	●
Electronic expansion valve	VTEE	●	●	●	●	●
Free Cooling circuit (WTS/FC version)	FC00	●	●	●	●	●
Free Cooling circuit (WTS version)	FC00	--	--	--	--	--
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○
Source circuit On-Off water pump	A1NTS	○	○	○	○	○
User circuit On-Off water pump	A1NTU	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○
Source circuit Inverter water pump	E1NTS	○	○	○	○	○
User circuit Inverter water pump	E1NTU	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○
Low noise version	LS	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Source circuit 2 ways modulating valve	V2M0	○	○	○	○	○
Remote dry cooler	RD	○	○	○	○	○

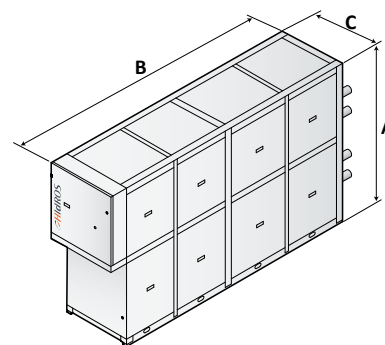
● Standard, ○ Optional, – Not available.



F1



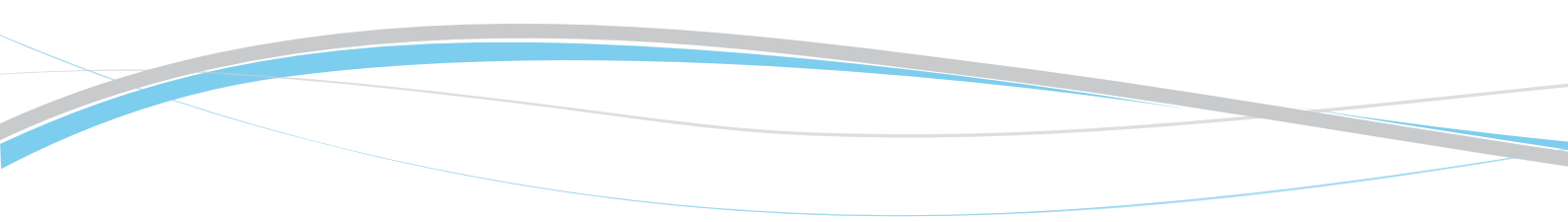
F2

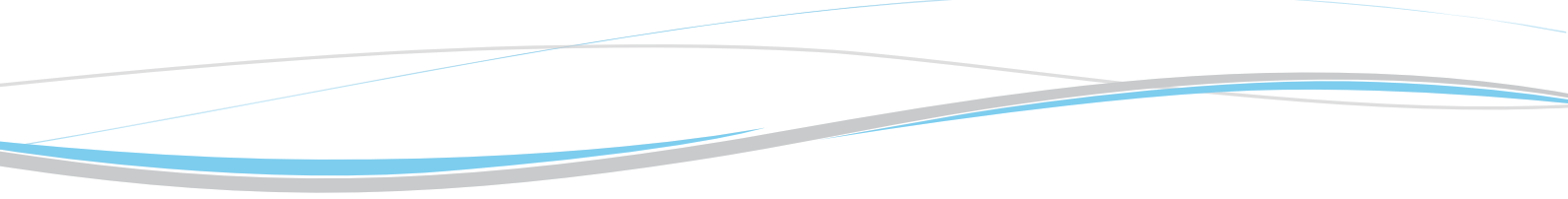


F3

Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
039	F1	1900	2100	800	740
045	F1	1900	2100	800	750
050	F1	1900	2100	800	760
060	F1	1900	2100	800	770
070	F1	1900	2100	800	780
080	F1	1900	2100	800	790
090	F2	1900	3120	800	1460
110	F2	1900	3120	800	1470
120	F2	1900	3120	800	1510

Mod.	Frame	A (mm)	B (mm)	C (mm)	Kg
130	F2	1900	3120	800	1520
152	F2	1900	3120	800	1590
162	F2	1900	3120	800	1640
190	F3	1900	4200	800	1820
210	F3	1900	4200	800	1920
240	F3	1900	4200	800	2500
260	F3	1900	4200	800	2630
300	F3	1900	4200	800	2770
320	F3	1900	4200	800	2910





HIDROS ITALIA

Hidros srl

via E. Mattei, 20
35028 Piove di Sacco - PD - Italy
Tel +39 049 9731022
Fax +39 049 5806928
www.hidros.it • info@hidros.it



HIDROS ESPAÑA

Hidros Air Technology S.L.

Parque Empresarial Táctica
Calle Algepser, 16
46980 Paterna • Valencia • España
Tel +34 963 935 128 • Fax +34 963 134 257
www.hidros.es • info@hidros.es

HIDROS NEDERLAND

Climate Solutions Holland BV

Baileybrugweg 13/D
4941TB • Raamsdonksveer • Nederland
Tel +31 162 511553 • Fax +31 162 511132
www.hidros.nl • info@hidros.nl

HIDROS UK & IRELAND

Hidros UK LTD

EFM, A W House • 6 – 8 Stuart Street, Luton
Bedfordshire, LU1 2 SJ
Tel +44 7714 290969
www.hidros.co.uk • info@hidros.co.uk

HIDROS FRANCE

HIDEM France

EURONANTES GARE
Immeuble SKYLINE
22, Mail Pablo Picasso NANTES
44000 France
www.hidemgroup.com • info@hidemgroup.com