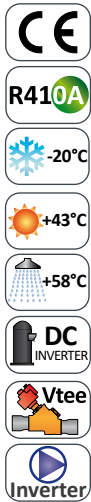
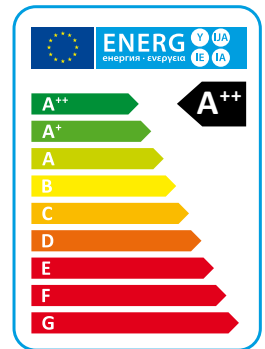


## LRi

### 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) <sup>(1)</sup>	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) <sup>(1)</sup>	kW	1,8	2,2	2,8	3,2	3,4
COP (EN14511) <sup>(1)</sup>	W/W	4,33	4,43	4,19	4,30	4,41
Energy Class in low temperature <sup>(2)</sup>		A++	A++	A++	A++	A++
SCOP low temperature <sup>(2)</sup>	kWh/kWh	3,83	4,24	4,31	4,01	4,07
$\eta_{s,h}$ low temperature <sup>(2)</sup>	%	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 <sub>2</sub> 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 <sup>(4)</sup>	dB (A)	62	63	63	65	66
Max sound pressure level in heating mode <sup>(5)</sup>	dB (A)	31	32	32	34	35

## Reversible heating/cooling version (RV)

HE/XL/RV		08	10	12	14	16
Heating capacity (EN14511) <sup>(1)</sup>	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) <sup>(1)</sup>	kW	1,8	2,2	2,8	3,2	3,4
COP (EN14511) <sup>(1)</sup>	W/W	4,33	4,43	4,19	4,30	4,41
Energy Class in low temperature <sup>(2)</sup>		A++	A++	A++	A++	A++
SCOP low temperature <sup>(2)</sup>	kWh/kWh	3,83	4,24	4,31	4,01	4,07
$\eta_{s,h}$ low temperature <sup>(2)</sup>	%	150,2	166,6	169,4	157,4	159,8
Cooling capacity (EN14511) <sup>(3)</sup>	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) <sup>(3)</sup>	kW	2,1	2,4	2,7	3,7	4,5
EER (EN14511) <sup>(3)</sup>	W/W	2,90	3,11	3,10	3,10	3,24
SEER <sup>(3)</sup>		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 <sub>2</sub> 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 <sup>(4)</sup>	dB (A)	62	63	63	65	66
Max sound pressure level in heating mode <sup>(5)</sup>	dB (A)	31	32	32	34	35
Max sound power level in cooling mode <sup>(4)</sup>	dB (A)	62	63	63	65	66
Max sound pressure level in cooling mode <sup>(5)</sup>	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.

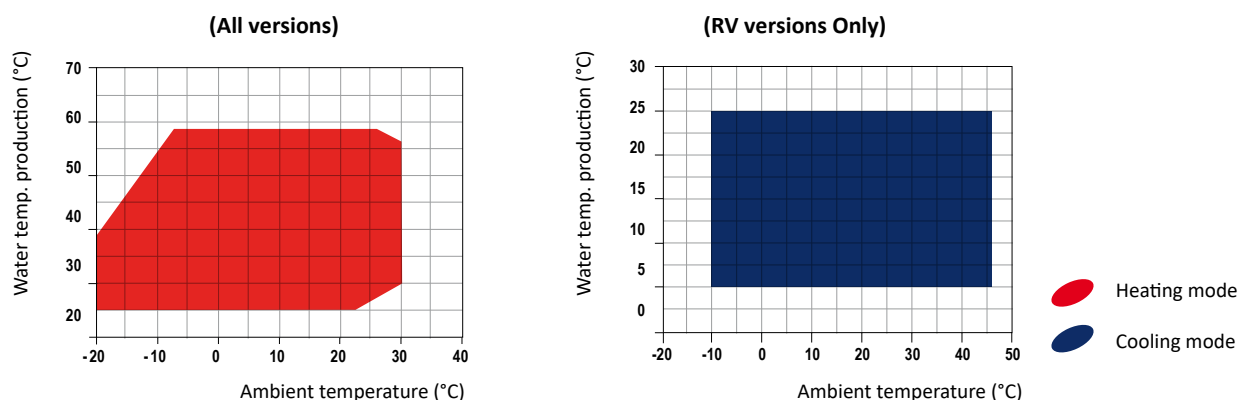
## Control and protection devices

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)

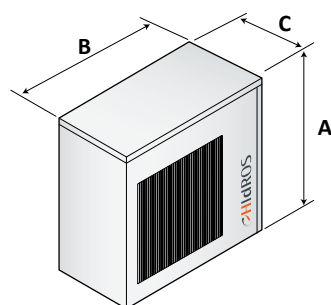
The integrated hydraulic circuit includes: High efficiency brushless pump with variable speed, expansion vessel, flow switch, air vent valve, safety valve (6bar), pressure gauge.

## Operation limits

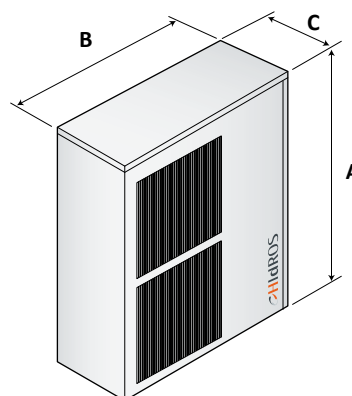


LRI		08	10	12	14	16
Flow switch		●	●	●	●	●
Evap/condens pressure control by transducer and fan speed control	DCCF	●	●	●	●	●
DHW Probe		●	●	●	●	●
Specific software for operation priorities		●	●	●	●	●
Remote ON/OFF digital input		●	●	●	●	●
Summer/Winter digital input		●	●	●	●	●
Condensate discharge drip 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