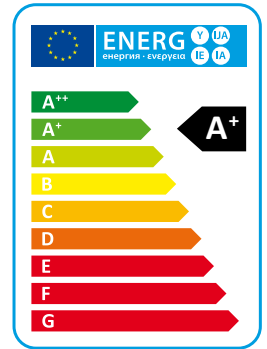


# LSA/HP

## 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) <sup>(1)</sup>	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) <sup>(1)</sup>	kW	1,9	2,5	2,8	4,7	5,7	6,8	8,8	10,5	11,8	13,8
EER (EN14511) <sup>(1)</sup>	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) <sup>(2)</sup>	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) <sup>(2)</sup>	kW	1,5	2,0	2,3	3,9	4,3	5,2	6,8	8,2	9,0	10,7
COP (EN14511) <sup>(2)</sup>	W/W	3,9	3,9	4,0	3,8	4,0	4,3	4,3	4,1	4,1	4,2
Energy Class <sup>(3)</sup>		A+	A+	A+	A+	A+	A+	A+	A+	A+	A+
SCOP <sup>(3)</sup>	kWh/kWh	3,38	3,32	3,40	3,35	3,23	3,38	3,21	3,21	3,21	3,29
$\eta_{s,h}$ <sup>(3)</sup>	%	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 <sup>3</sup> /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 <sub>2</sub> charge	t	6,3	8,8	7,7	7,7	10,4	15,2	16,7	13,6	13,6	16,7
Sound power <sup>(4)</sup>	dB (A)	68	68	68	69	69	74	74	79	79	79
Sound pressure <sup>(5)</sup>	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 <sup>(1)</sup>	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.

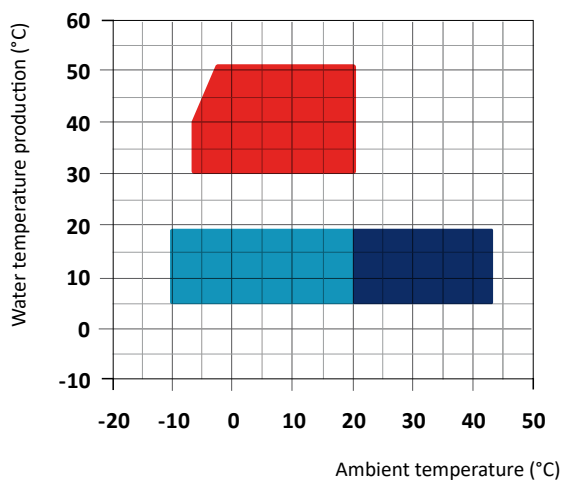
(2)Heating: ambient temperature 7°C (DB), 6°C (WB); water temperature 30/35°C.

(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

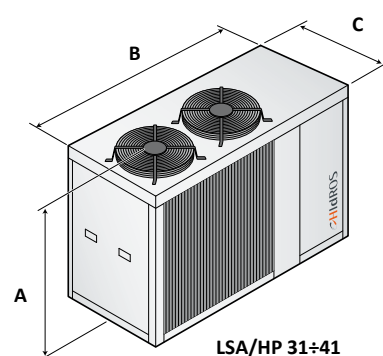
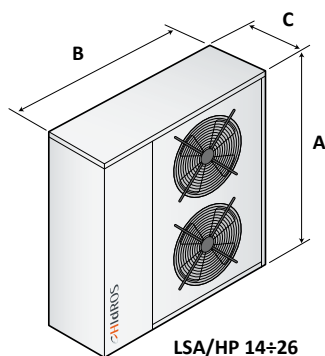
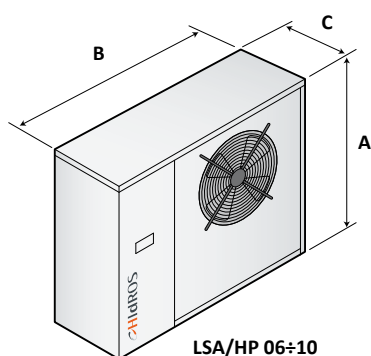
### Reversible version (HP)

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
<b>06/06A</b>	989	1157	380	95/148
<b>08/08A</b>	989	1157	380	104/163
<b>10/10A</b>	989	1157	380	118/179
<b>14/14A</b>	1324	1245	423	127/207
<b>16/16A</b>	1324	1245	423	133/212

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