

LZH

High efficiency air to water heat pumps with HP compressor



R407C



C.O.P. ≥ 4,1



The LZH 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 55°C and can operate down to -10°C ambient temperature. LZH units are available in 2 or 4 pipe (SW6) versions. Both versions can produce domestic hot water, in the standard LZH through the activation of an external 3-way-valve and in the SW6 version by means of a separate heat exchanger and hydraulic circuit for the domestic hot water. All models are supplied as standard with a reversing valve for defrost and cold water production in summer.

OTHER VERSIONS

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

ACCESSORIES

- BRCA: Condensate discharge drip tray with antifreeze heater.
- DSSE: Electronic soft starter.
- INSE: Serial interface card RS 485.
- KAVG: Rubber anti-vibration mountings.
- LS00: Low noise version.
- MAML: Refrigerant circuit pressure gauges.
- PCRL: Remote control panel.
- Pumps contacts (user pump, domestic hot water pump).

Model LZH - LZH/SW6		06	08	10M	10T	14M
Heating capacity (EN14511) ⁽¹⁾	kW	6,6	8,8	11,0	11,1	15,5
Total input power (EN14511) ⁽¹⁾	kW	1,6	2,1	2,5	2,5	3,7
COP (EN14511) ⁽¹⁾	W/W	4,1	4,2	4,4	4,4	4,2
Heating capacity (EN14511) ⁽²⁾	kW	6,4	8,4	10,7	10,7	15,0
Total input power (EN14511) ⁽²⁾	kW	1,9	2,5	3,0	3,0	4,4
COP (EN14511) ⁽²⁾	W/W	3,4	3,4	3,6	3,6	3,4
Heating capacity (EN14511) ⁽³⁾	kW	4,4	5,9	7,6	7,6	10,5
Total input power (EN14511) ⁽³⁾	kW	1,5	1,9	2,3	2,3	3,5
COP (EN14511) ⁽³⁾	W/W	2,9	3,1	3,3	3,3	3,0
Cooling capacity (EN14511) ⁽⁴⁾	kW	6,9	9,6	11,9	11,9	17,2
Total input power (EN14511) ⁽⁴⁾	kW	2,1	2,5	3,1	3,1	4,5
EER (EN14511) ⁽⁴⁾	W/W	3,3	3,8	3,8	3,8	3,8
Cooling capacity (EN14511) ⁽⁵⁾	kW	4,9	7,0	8,8	8,9	12,3
Total input power (EN14511) ⁽⁵⁾	kW	1,9	2,2	2,7	2,7	4,0
EER (EN14511) ⁽⁵⁾	W/W	2,6	3,2	3,6	3,3	3,1
Power supply	V/Ph/Hz	230/1/50			400/3+N/50	230/1/50
Max input current	A	15,1	19,5	21,6	7,8	30,6
Peak current	A	58,6	77	98	47	152
Fans	n°	1	1	1	1	2
Compressors	n°/tipo	1/Scroll HP		1/Scroll HP		
Sound power level ⁽⁶⁾	dB (A)	68	68	69	69	71
Sound pressure level ⁽⁷⁾	dB (A)	40	40	41	41	43
Water pump (optional)	kW	0,13	0,13	0,2	0,2	0,3
Water tank (optional)	l	40	40	40	40	60

Model LZH - LZH/SW6		14T	21	26	36	46
Heating capacity (EN14511) ⁽¹⁾	kW	15,6	18,5	23,4	33,1	40,4
Total input power (EN14511) ⁽¹⁾	kW	3,6	4,1	6,1	7,8	9,5
COP (EN14511) ⁽¹⁾	W/W	4,3	4,5	3,8	4,2	4,3
Heating capacity (EN14511) ⁽²⁾	kW	15,1	17,9	22,0	31,3	38,4
Total input power (EN14511) ⁽²⁾	kW	4,3	4,9	6,8	8,8	10,9
COP (EN14511) ⁽²⁾	W/W	3,5	3,7	3,2	3,6	3,5
Heating capacity (EN14511) ⁽³⁾	kW	10,5	12,6	16,1	22,3	27,7
Total input power (EN14511) ⁽³⁾	kW	3,3	3,8	5,4	6,9	8,4
COP (EN14511) ⁽³⁾	W/W	3,2	3,3	3,0	3,2	3,3
Cooling capacity (EN14511) ⁽⁴⁾	kW	17,2	20,5	25,5	36,5	43,5
Total input power (EN14511) ⁽⁴⁾	kW	4,5	5,3	7,7	10,0	12,0
EER (EN14511) ⁽⁴⁾	W/W	3,8	3,9	3,3	3,7	3,6
Cooling capacity (EN14511) ⁽⁵⁾	kW	12,3	15,0	18,0	25,8	30,9
Total input power (EN14511) ⁽⁵⁾	kW	4,0	4,7	6,7	8,5	10,6
EER (EN14511) ⁽⁵⁾	W/W	3,1	3,2	2,7	3,0	2,9
Power supply	V/Ph/Hz	400/3+N/50				
Max input current	A	12,1	13,6	19,6	23,6	27,6
Peak current	A	66	75,8	101,6	129,6	169,6
Fans	n°	2	2	2	2	2
Compressors	n°/tipo	1/Scroll HP				
Sound power level ⁽⁶⁾	dB (A)	71	75	79	79	79
Sound pressure level ⁽⁷⁾	dB (A)	43	47	51	51	51
Water pump (optional)	kW	0,3	0,45	0,55	0,55	1,0
Water tank (optional)	l	60	60	180	180	300

Performances refer to the following conditions:

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

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

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

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

(2)Heating: Ambient temperature 7°C DB, 6°C WB, water temperature 45/40°C.

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

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

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FRAME

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

REFRIGERANT CIRCUIT

The refrigerant utilised is R407C. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. The refrigerant circuit includes: sight glass, filter drier, two thermal expansion valves (one for cooling mode, one for heating mode) with external equalizer, 4 way reversing valve, check valves, liquid receiver, Schrader valves for maintenance and control, pressure safety device (for compliance with PED regulations).

COMPRESSOR

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

SOURCE HEAT EXCHANGER

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

USER HEAT EXCHANGERS

The user heat exchanger is a braze welded, plate type heat exchanger, manufactured

from AISI 316 stainless steel. Utilisation of this type of exchanger results in a massive reduction of the refrigerant charge of the unit compared to a traditional shell-in-tube type. A further advantage is a reduction in the overall dimensions of the unit. The exchangers are factory insulated with flexible close cell material and can be fitted with an antifreeze heater (accessory). Each exchanger is fitted with a temperature sensor on the discharge water side for antifreeze protection.

FANS

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

MICROPROCESSORS

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

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

ELECTRICS ENCLOSURE

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

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return water temperature sensor, antifreeze protection sensor installed on the user outlet water temperature, high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, fans thermal overload protection, pressure transducer (used to optimize the defrost cycle and the fan speed depending on the ambient conditions), flow switch, weather compensated external air sensor.

OTHER VERSIONS

LZH/SW6 UNIT WITH DOMESTIC HOT WATER PRODUCTION

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

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VERSIONS

LZH / A1 UNIT WITH HYDRAULIC KIT INTEGRATED

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

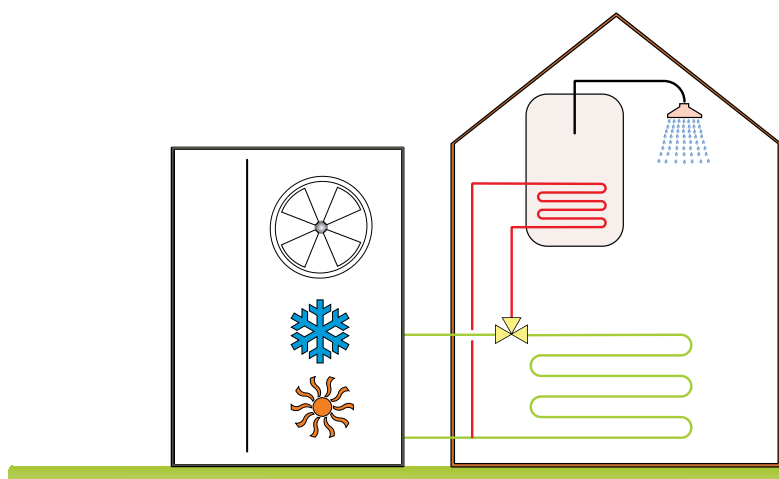
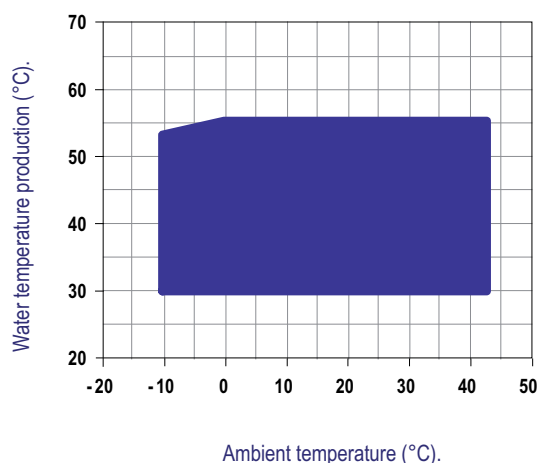
The water tank is installed on the hot water outlet water side in order to minimize fluctuations in the water temperature due to the compressors cycling at part load

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

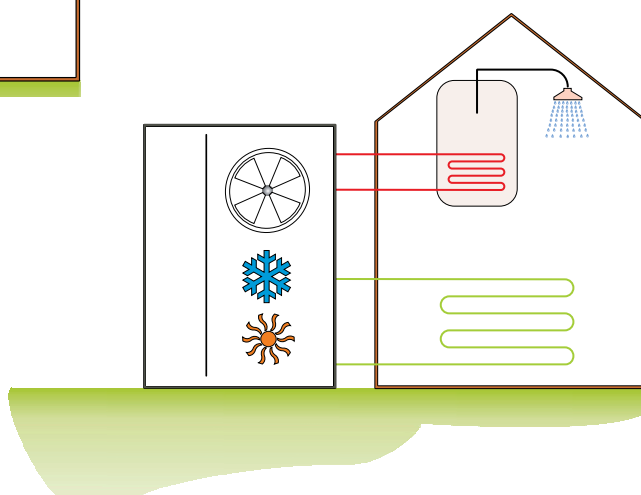
LZH/LS LOW NOISE VERSION

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

OPERATION LIMITS



LZH 2 PIPES VERSION.

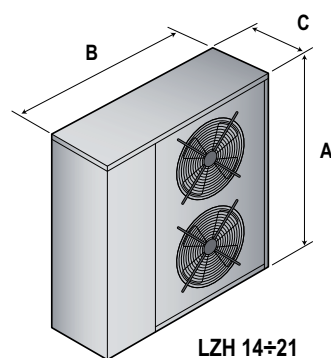
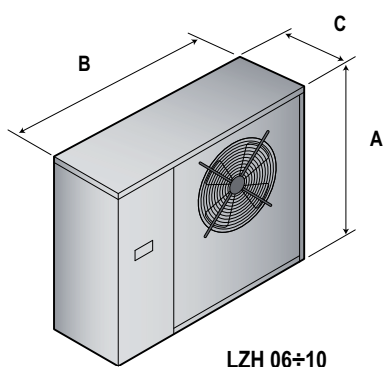


LZH/SW6 4 PIPES VERSION.

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Versions LZH- LZH/SW6	Code	06	08	10M	10T	14M
Main switch		●	●	●	●	●
Compressor automatic switch		●	●	●	●	●
Flow switch		●	●	●	●	●
Evap/condens 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		●	●	●	●	●
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	–	–	–	–	–
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	–	–	–	–	–
A0NP Hydraulic kit (with tank, without pump)	A0NP	–	–	–	–	–
LS Low noise version	LS00	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○
Coil protection mesh with metallic filter	FAMM	–	–	–	–	–
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○

● Standard, ○ Optional, – Not available.

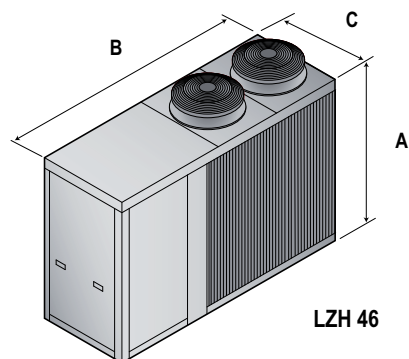
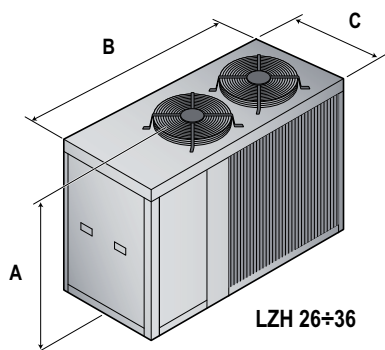


Mod.	A (mm)	B (mm)	C (mm)	Kg
06/06A1	989	1103	380	95/148
08/08A1	989	1103	380	104/163
10M/10MA1	989	1103	380	118/179
10T/10TA1	989	1103	380	120/181

Mod.	A (mm)	B (mm)	C (mm)	Kg
14M/14MA1	1323	1203	423	127/207
14T/14TA1	1323	1203	423	133/212
21/21A1	1424	1453	473	390/550

Versions LZH- LZH/SW6	Code	14T	21	26	36	46
Main switch		●	●	●	●	●
Compressor automatic switch		●	●	●	●	●
Flow switch		●	●	●	●	●
Evap/condens 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		●	●	●	●	●
A1 Hydraulic kit (tank and pump)	A1ZZ	○	○	○	○	○
A2 Hydraulic kit (tank and 2 pumps)	A2ZZ	–	–	–	–	○
A1NT Hydraulic kit (pump only)	A1NT	○	○	○	○	○
A2NT Hydraulic kit (2 pumps only)	A2NT	–	–	–	–	○
A0NP Hydraulic kit (with tank, without pump)	A0NP	–	–	–	–	○
LS Low noise version	LS00	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○
Evaporator antifreeze heater (basic version only)	RAEV	○	○	○	○	○
Antifreeze kit (only for A versions)	RAES	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○
Electronic Soft starter	DSSE	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○
Condensate discharge drip tray with antifreeze heater	BRCA	○	○	○	○	○
Coil protection mesh with metallic filter	FAMM	–	–	○	○	○
Serial interface card RS485 with MODBUS protocol	INSE	○	○	○	○	○

● Standard, ○ Optional, – Not available.



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