

WZH

Ground source heat pumps



R407C



C.O.P. ≥ 5,1



WZH heat pumps are particularly suitable for applications that utilise well water or ground source probes. These units have been designed for use with radiant floor heating systems or those applications where it is necessary to have maximum efficiency when heating. They have been optimized on heating mode and are able to produce water up to 55°C.

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

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

OTHER VERSIONS

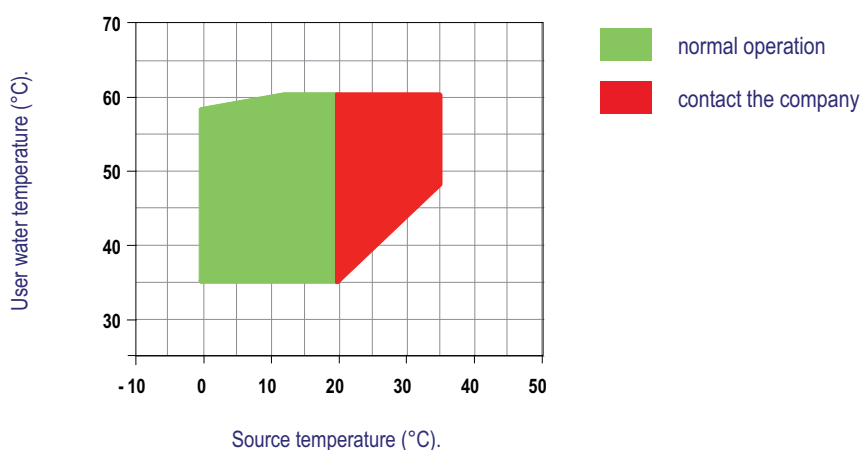
- WZH Standard, heating only.
- WZH/SW5 Heating only + domestic hot water circuit.
- WZH/RV Reversible heating/cooling.
- WZH/RV/SW6 Reversible version heating/cooling with independent DHW circuit.
- FC free cooling version (available in all versions).

ACCESSORIES

- DSSE: Electronic soft starter.
- INSE: Serial interface card RS 485.
- KAVG: Rubber anti-vibration mountings.
- KAVM: Spring anti-vibration mountings.
- MAML: Refrigerant circuit pressure gauges.
- PCRL: Remote control panel.
- VM2D: 2 way modulating valve to reduce source water consumption (4-20 mA; 0-10 V).
- LS00: Low noise version
- Pumps contacts (source, user, domestic hot water pump).

Model WZH		05	07	09	11	13	15	20	30
Heating capacity (EN14511) ⁽¹⁾	kW	7,4	10,0	12,5	14,4	17,8	20,9	27,0	38,0
Input power (EN14511) ⁽¹⁾	kW	1,5	1,9	2,4	2,7	3,2	3,8	5,2	7,1
COP (EN14511) ⁽¹⁾	w/w	4,9	5,3	5,2	5,3	5,6	5,5	5,2	5,4
Source water flow ⁽¹⁾	m³/h	1,3	1,8	2,2	2,5	3,2	3,7	4,8	6,8
Heating capacity (EN14511) ⁽²⁾	kW	5,5	7,6	9,5	11,0	13,4	16,0	20,6	28,6
Input power (EN14511) ⁽²⁾	kW	1,4	1,7	2,3	2,5	3,0	3,5	4,7	6,3
COP (EN14511) ⁽²⁾	w/w	3,9	4,5	4,1	4,4	4,5	4,6	4,4	4,5
Cooling capacity (EN14511) ⁽³⁾	kW	8,2	11,1	13,9	15,9	19,8	22,8	29,0	41,9
Input power (EN14511) ⁽³⁾	kW	1,7	2,0	2,5	2,8	3,5	4,1	5,9	7,9
EER (EN14511) ⁽³⁾	w/w	4,8	5,6	5,6	5,7	5,7	5,6	4,9	5,3
Cooling capacity (EN14511) ⁽⁴⁾	kW	5,6	8,0	10,0	11,6	14,0	16,8	21,2	29,5
Input power (EN14511) ⁽⁴⁾	kW	1,5	1,7	2,3	2,6	3,1	3,7	5,2	6,7
EER (EN14511) ⁽⁴⁾	w/w	3,7	4,7	4,3	4,5	4,5	4,5	4,1	4,4
Power supply		230/1/50					400/3 + N/50		
Peak current	A	42,0	68,0	75,0	82,0	68,0	77,0	102,0	129,0
Maximum input current	A	10,0	13,3	16,5	19,6	12,0	14,1	18,2	21,4
Compressors / Circuits	n°	1 Scroll HP/1							
Evaporator / Number		Plates / 1							
Condenser / Number		Plates / 1							
Sound power ⁽⁵⁾	dB(A)	51	52	52	53	54	54	60	60
Sound pressure ⁽⁶⁾	dB(A)	43	44	44	45	46	46	52	52

OPERATION LIMITS



⁽¹⁾ Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 10/7°C. unit without pressostatic valve.

⁽²⁾ Heating: condenser water temperature in/out 30/35°C; evaporator water temperature in/out 0/-3°C. unit without pressostatic valve.

⁽³⁾ Cooling: data are referred to unit with pressostatic valve. : evaporator water in/out 23/18°C, condenser water temperature in/out 30/35°C.

⁽⁴⁾ Cooling: data are referred to unit with pressostatic valve: evaporator water in/out 12/7°C, condenser water temperature in/out 30/35°C.

⁽⁵⁾ Sound power in accordance with ISO 9614.

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

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FRAME

All WZH units are made from hot-galvanized sheet steel, painted with polyurethane powder enamel and stoved at 180°C to provide maximum protection against corrosion. The frame is self-supporting with removable panels. All screws and rivets used are made from stainless steel. The standard colour of the units is RAL 7035.

REFRIGERANT CIRCUIT

The refrigerant utilised is R407C. The refrigerant circuit is assembled using internationally recognised brand name components with all brazing and welding being performed in accordance with ISO 97/23. Each refrigerant circuit is totally independent from the other with the result that any fault or alarm condition on one circuit does not influence the other. The refrigerant circuit includes: sight glass, filter drier, thermal expansion valve with external equalizer, Schrader valves for maintenance and control and pressure safety device (for compliance with PED regulations).

COMPRESSORS

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

SOURCE SIDE HEAT EXCHANGERS

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

USER SIDE HEAT EXCHANGERS

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

MICROPROCESSORS

All WZH units are supplied as standard with microprocessor controls. The microprocessor controls the following functions: control of the water temperature, antifreeze protection, compressor timing, compressor automatic starting sequence, alarm reset, volt free contact for remote general alarm, alarms and operation LED's. If required (available as an option), the microprocessor can be configured in order for it to connect to a site BMS system thus enabling remote control and management. The Hidros technical department can discuss and evaluate, in conjunction with the customer, solutions using MODBUS protocols.

ELECTRIC ENCLOSURE

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

CONTROL AND PROTECTION DEVICES

All units are supplied with the following control and protection devices: Return and supply user heat exchanger sensors, return and supply source heat exchanger sensors,

high pressure switch with manual reset, low pressure switch with automatic reset, high pressure safety valve, compressor thermal overload protection, pump thermal overload protection (when present), source heat exchanger flow switch.

OTHER VERSIONS

WZH/SW5 UNIT WITH DOMESTIC HOT WATER PRODUCTION

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

WZH/RV REVERSIBLE VERSION HEATING/ COOLING

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

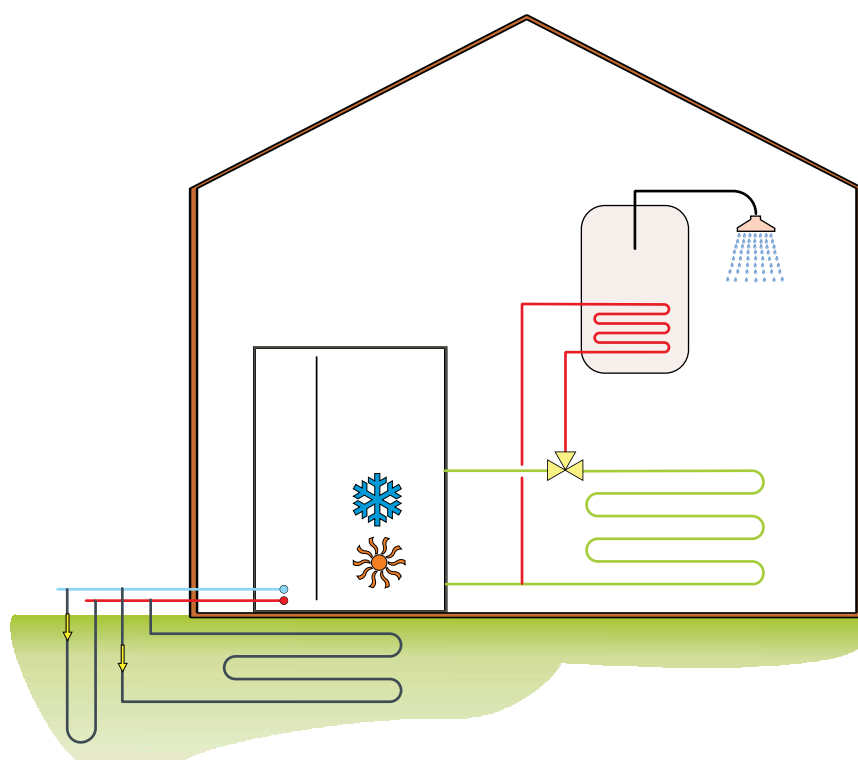
WZH/RV/SW6 REVERSIBLE VERSION HEATING/COOLING WITH INDEPENDENT DHW CIRCUIT

This version has 4 pipes on the user side and is able to produce simultaneously, hot and cold water on 2 independent hydraulic circuits. The domestic hot water production is independent of the operation mode of the unit. This unit is supplied as standard with a reversing valve which enables the production of cold water in summer mode.

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

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

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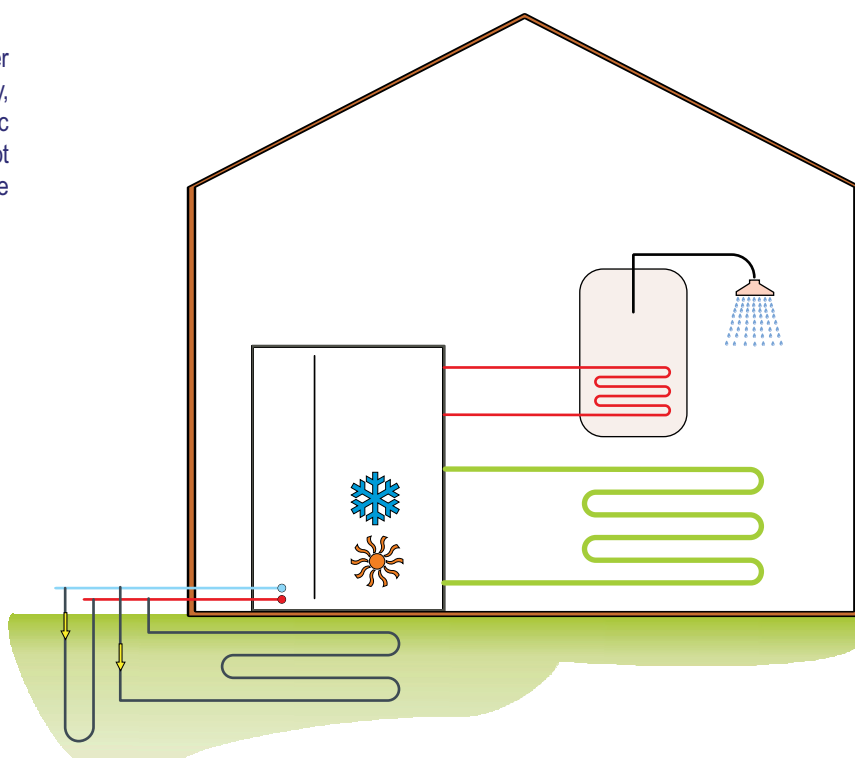


WZH/RV.

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

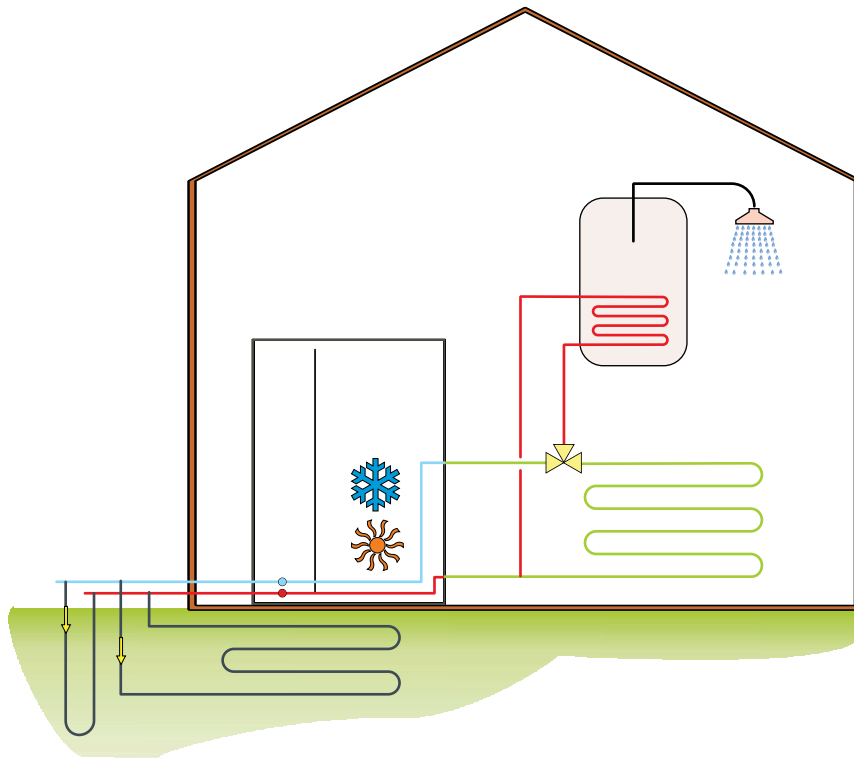
WZH/RV/SW6.

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



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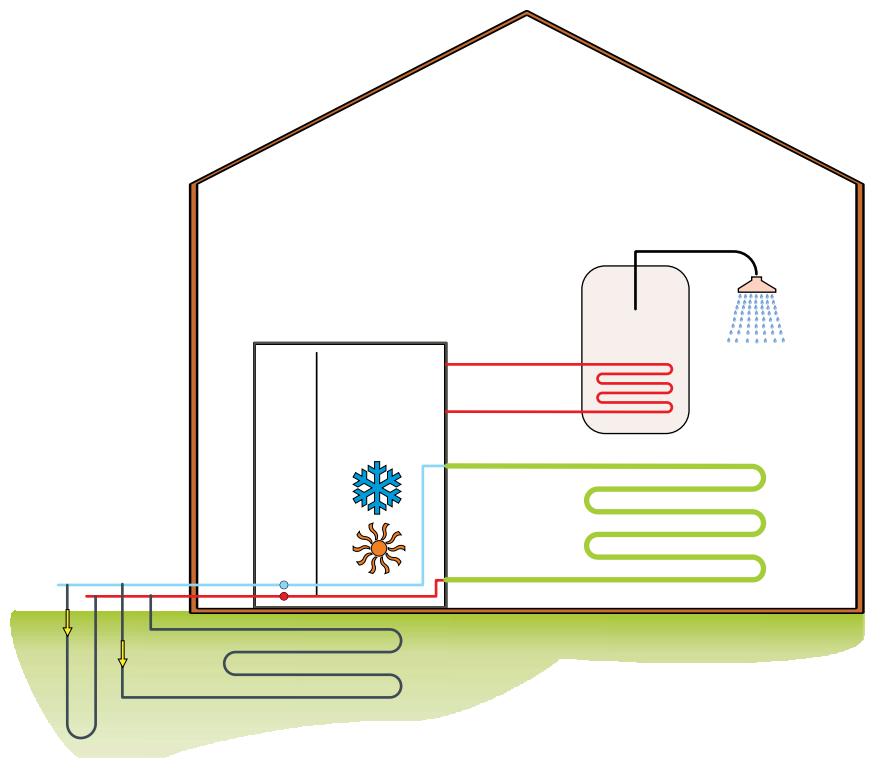
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WZH/FC/RV.

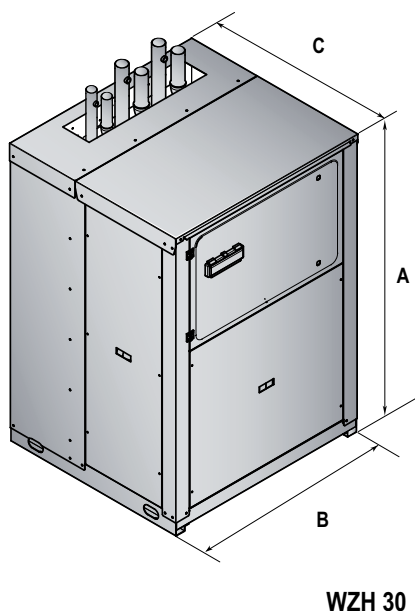
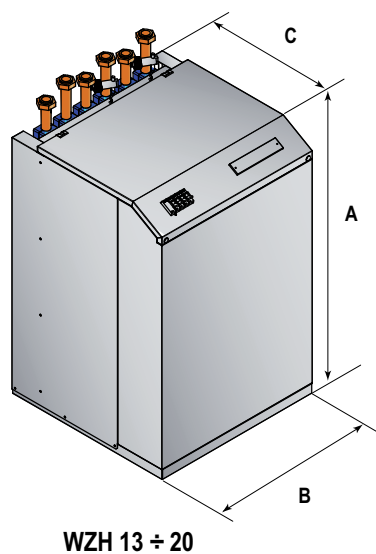
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WZH/FC/RV/SW6.



Model WZH	Code	05	07	09	11	13	15	20	30
Main switch		●	●	●	●	●	●	●	●
Microprocessor control		●	●	●	●	●	●	●	●
Contacts for pumps (source, user, domestic hot water pump)		●	●	●	●	●	●	●	●
Low noise version LS (standard)	LS00	●	●	●	●	●	●	●	●
2 way modulating to control source water consumption (4-20 mA; 0-10 v)	VM2D	○	○	○	○	○	○	○	○
Electronic soft starter	DSSE	○	○	○	○	○	○	○	○
Rubber anti-vibration mountings	KAVG	○	○	○	○	○	○	○	○
Spring anti-vibration mountings	KAVM	○	○	○	○	○	○	○	○
Refrigerant circuit pressure gauges	MAML	○	○	○	○	○	○	○	○
Remote control panel	PCRL	○	○	○	○	○	○	○	○
Serial interface card RS485	INSE	○	○	○	○	○	○	○	○

● Standard, ○ Optional, – Not available.



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