SRM TEC

Open-Type

Screw Water Source Heat Pump Unit

FUJIAN SNOWMAN CO., LTD

Address: West Dongshan Road, Minjiangkou Industrial District of Fuzhou, Fujian, China
TEL：0086-591-28701111
FAX：0086-591-28709222
Website：www.snowkey.com
Email：info@snowkey.com

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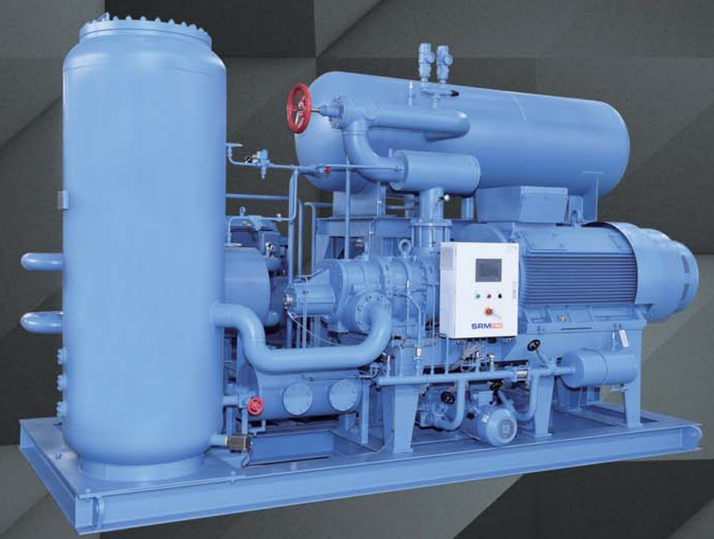
SRM Sweden

Subsidiary 100% owned by Snowman

The inventor and leader of screw compressor
100-year legacy of technical quality & energy efficiency

Fully utilize low-grade energy

Industrial screw compressor,
applicable to various refrigerants including
ammonia and temperature ranges.



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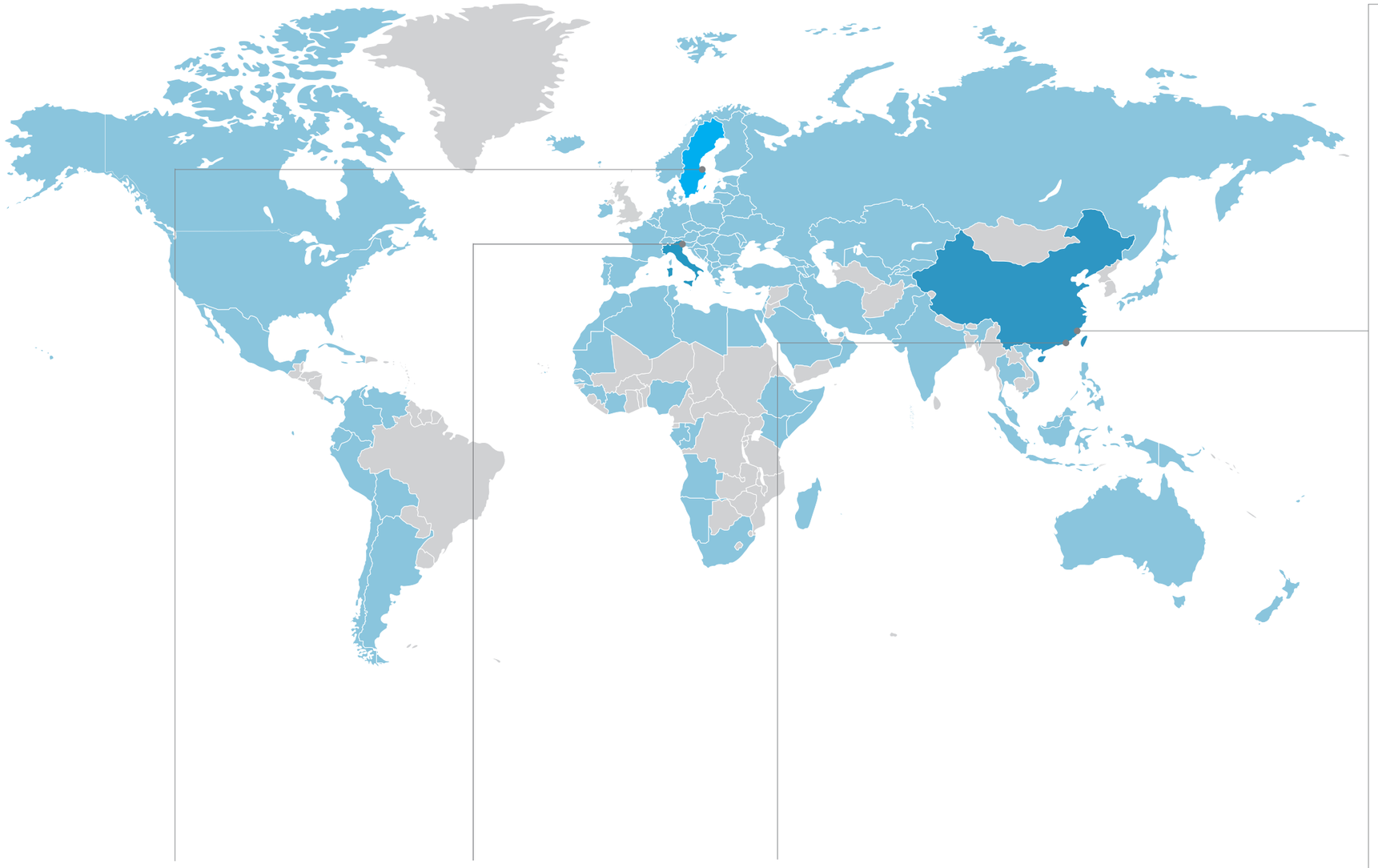
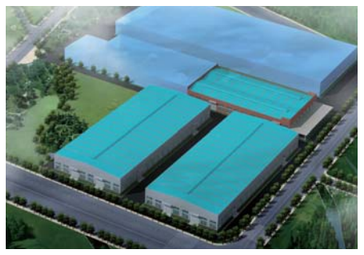


OPCON, Sweden

RefComp, Italy

Greenhalgh, China



Snowman Co., Ltd, China

Based on its advanced SRMTEC open-type screw compressors, Snowman Co., Ltd has optimized the design to launch a full series of standard open-type screw water source heat pump units. A water source heat pump is a unit with water as its cold and heat sources, and can be switched between cooling and heating conditions depending on the actual situations. When inquiring about the units, please tell us the types of heat sources (underground water or surface water) to be used. We will make an optimized design for the application to ensure that the system can run safely and stably under the correct design working conditions.

Snowman’s open-type screw heat pump units can provide heating capacity from low to high temperatures, offering the most economical, efficient and safest heat pump solutions for customers. With easy, safe and reliable operation, the units can be extensively used in variousfields including heat supply, domestic hot water and waste heat recovery in northern China.

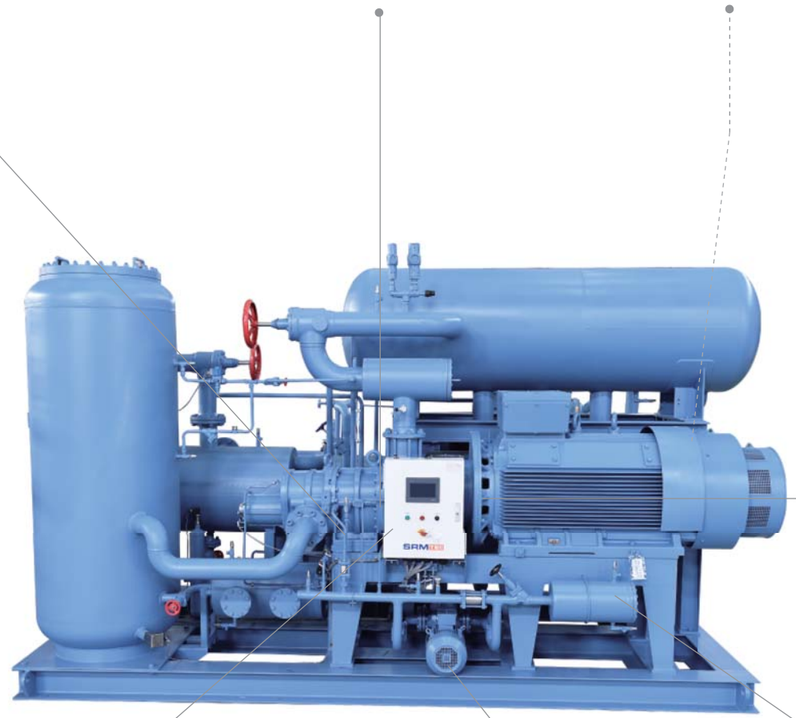
RB series open-type screw water source heat pump unit

Fully automatic control, excellent energy efficiency, reliable and safe design, wide temperature range and highly integrated design.

Original oil injection system

Safe and reliable adapter

Efficient heat exchanger



Intelligent control center

Portable control panel

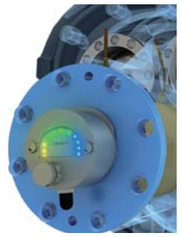
Pre-lubrication oil pump

Large capacity oil filter

Quality forged steel rotor, “i” profile with optimal 5+7 tooth mesh

High strength nodular cast iron housing

Efficient refrigeration compressor



10% -100% step-less capacity control

Variable VI control

High precision, high wear resistance roller bearings

Super wear-resistant shaft seal

Compressor unitfeatures

Advanced intelligent control center

- User-friendly interface, startup with the press of a button, easy operation and intelligent control;
- Real-time monitoring of the unit, touch panel capable of displaying system pressure, powercapacity control position, running time, operational mode, operating condition, etc. in real time and capable of storing historical information;
- The center is equipped with a preventive safety device system which allows unattended operation to be safe and reliable;
- Automatic power control allows the unit to operate effectively under different conditions;
- Automatic control over water temperature, to provide customers with required temperature range;
- Automatic management of oil temperature limits the oil temperature in a certain range, ensuring the efficient and stable operation of the unit;
- Automatic control of pressure ensuring the discharge pressure,suction pressure andetc. is within the preset range;
- With vector frequency conversion control, the unit is capable of adjusting the rotational speed according to the conditions and reasonably distribute motor rotational torque, allowing energyefficient operation and low cost;
- Remote control, local control and other control modes are available for the system to turn on and turn off equipment, it can also be linked to the monitoring center in real time by reserved bus protocol.

Excellent energy efficiency performance

- The unitis equipped with internationally leading SRMTEC open screw compressor. Use “i” patent screw rotor profile, efficient and energy-saving;
- Highly sensitive capacity control unit for 10% -100% step-less capacity control and VI control allows the unitto run efficiently in different working conditions;
- Adopt small oil pump for pre-lubrication first, and then use differential pressure to supply oil, which saves energy;
- High pressure liquid from condenser gains extra cooling power by being injected into compressor after absorbing the sensible heat of the high pressure liquid in economizer. COP can be improved greatly in this way;
- Advanced energy-saving technology allows the unit to have quite high running efficiency and excellent part load performance.

Safe and reliable design

- High standard safety design, such as high pressure resistance compressor design, high standard pressure vessel design, safety valve design and preventive safety protection design;
- SRMTEC compressors fully conform to European industrial product standard and GB/T19410 design standard, ensuring stable and reliable running around the day with design pressure up to 6.3 MPa.

Wide applicable temperature range

RB series open-type screw water source heat pump units, featuring wide applicable temperature range:
High temperature application: Outlet hot water temperature ≥ 85℃;
Medium temperature application: 55℃ ≤outlet hot water temperature < 85℃;
Low temperature application: 45℃≤ outlet hot water temperature < 55℃;
Temperature is subject to special design required by customers.

Highly integrated design

The optimal structural design, highly integrated unit, small occupation, convenient transportation and installation, short engineering installation period.

Efficient oil separator

Through the 4-stage oil separation system, that is, collision, gravity, packing and efficient molecular sieve, the oil separation efficiency is increased to 3-5 ppm, effectively preventing lubrication oil from flowing back to the refrigeration system and improving system running efficiency.

Efficient heat exchanger

- The optimized heat exchange design ensures efficient heat exchange and improves operational efficiency of the unit;
- High fouling factor design allows for long-period running without cleaning.

Fine and removable filter

To ensure the cleanness of system, the unitis equipped with precision large capacity oil filter, suction filter to stop foreign matters which might occur during installation and keep the unitrunning efficiently and stably. Filters are easy to use and can be removed for cleaning.

Reverse flow prevention design

In order to prevent the reverse flow during machine shut down, the unitis equipped with check valves on discharge and suction side. The check valve on discharge side locates on the discharge port of oil separator, and it can also prevent the liquid refrigerant inevaporative condenser from flowing back to oil separator during shut down.

Stable product quality

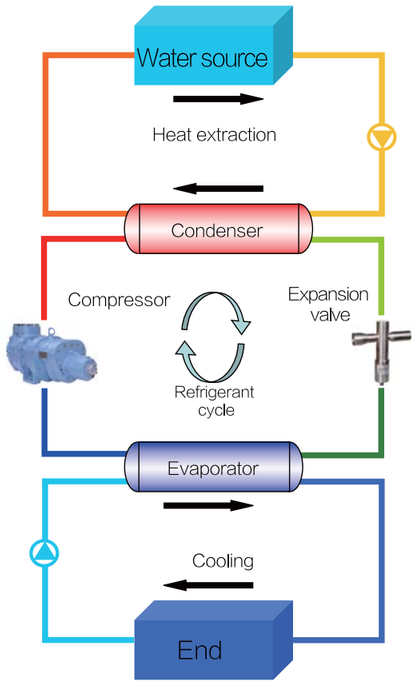
- Swedish hundred years’ technology of SRM has been proved by global applications;
- Full performance test before delivery ensures product stability.

Operation principles of the water source heat pump unit

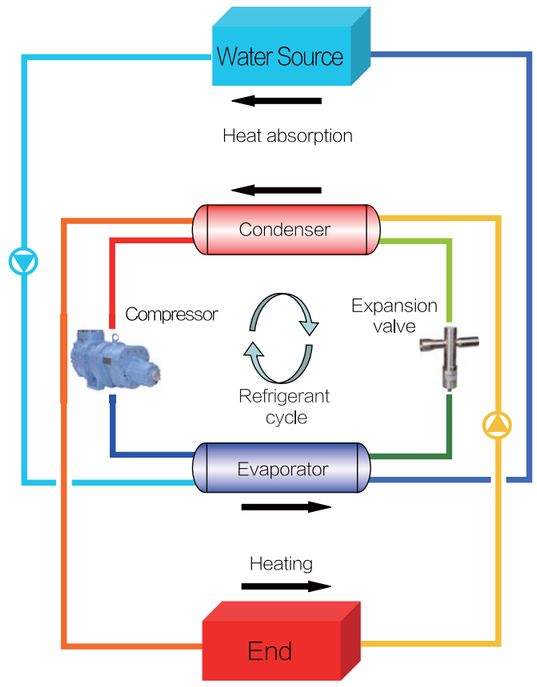
Water source heat pumpstransfer low-grade thermal energy to high-grade thermal energy from shallow waters on earth surface, where the solar energy and geothermal energy that is absorbed, by using a minimal high-grade electric energy.
A water source heat pump unit works on the general principle that heat in buildings is transferred to waters in summer which takes away the heat in an efficient way due to the low temperature while extracting the heat from the waters in winter. Specifically it works as follows:
In the cooling mode, the high-temperature and high-pressure refrigerant gas comes out of a compressor to a condenser, when the refrigerant releases heat to the cooling water turning into high- temperature and high- pressure liquid and increase the temperature of the cooling water. The refrigerant is then expanded into low-temperature and low-pressure liquid via an expansion valve, and enters an evaporator to absorb the heat from the cold water (such as building cooling water) for evaporation turning into low-pressure vapor and reducing in the temperature of the cooling water. Such vapor enters into the compressor to be compressed into high-temperature and high-pressure gas. Chilled water is obtained from the evaporator in such a cycle.
In the heating mode, the high-temperature and high-pressure refrigerant gas comes out of a compressor into a condenser, when the refrigerant releases heat to the warm water (such as building heating water) while being condensed into high-pressure liquid and increases the temperature of the heating water. The refrigerant is then expanded into low- temperature and low-pressure liquid via an expansion valve, and enters an evaporator to absorb the heat from the low-temperature heat source water (such as underground water, river water, lake water, seawater, municipal sewage and industrial wastewater) for evaporation turning into low- pressure vapor and reducing the temperature of the low- temperature heat source water. Such vapor enters into a compressor, to be compressed into high-temperature and high-pressure gas. Warm water is obtained from the condenser in such a cycle.

Basic structure of water source heat pump system

Cooling mode



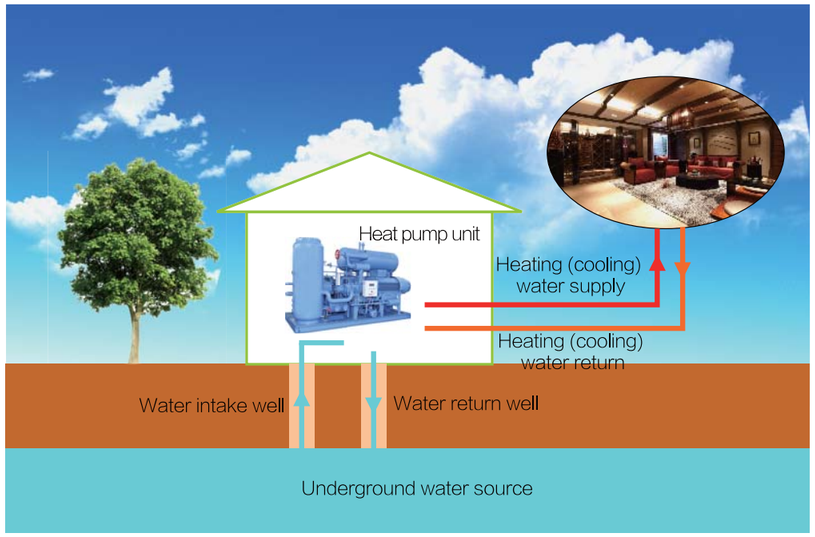
Heating mode



Applications of water source heat pumps

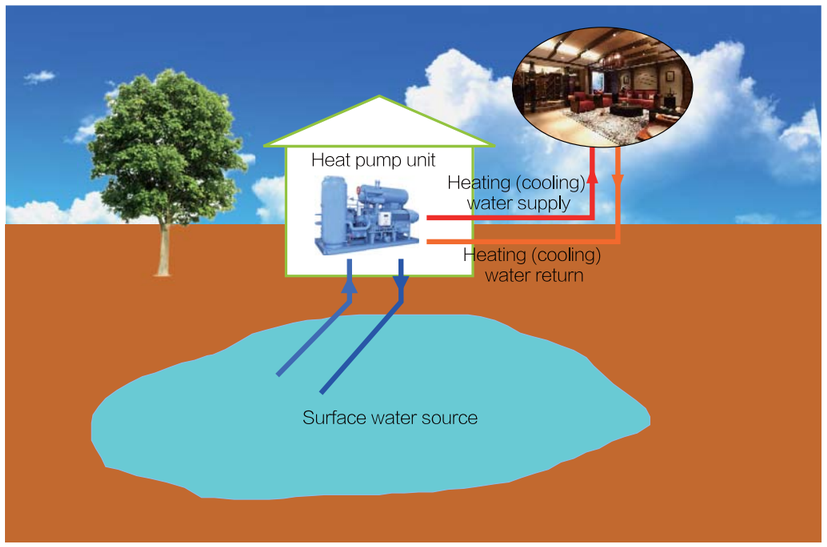
Underground water source heat pump system

Underground water source heat pump system is mainly applied to regional heating in some individual buildings or small and medium areas, such as office buildings and public buildings. Due to short conveying distance, the required supply water temperature is generally at 45℃.



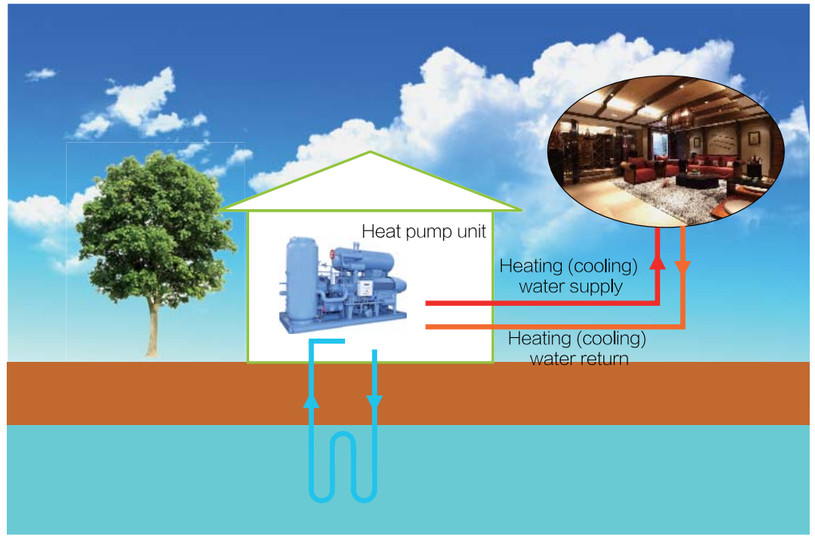
Surface water source heat pump system

If the water in the surface water source heat pump system comes from small waters, such as rivers and lakes, the system is generally used for the heating in winter and cooling in summer for small dwelling houses and public buildings, where the water temperature is 45℃.
If the body of surface water source is huge, such as great rivers and oceans, and is easy to exploit and extract, it is suitable for application of centralized heating and cooling in large areas. The long pipeline of central heating or refrigeration system may lead to the energy loss, so the supply water temperature of the heat pump unit shall be higher than that of common heating system, in general, for above 50℃.



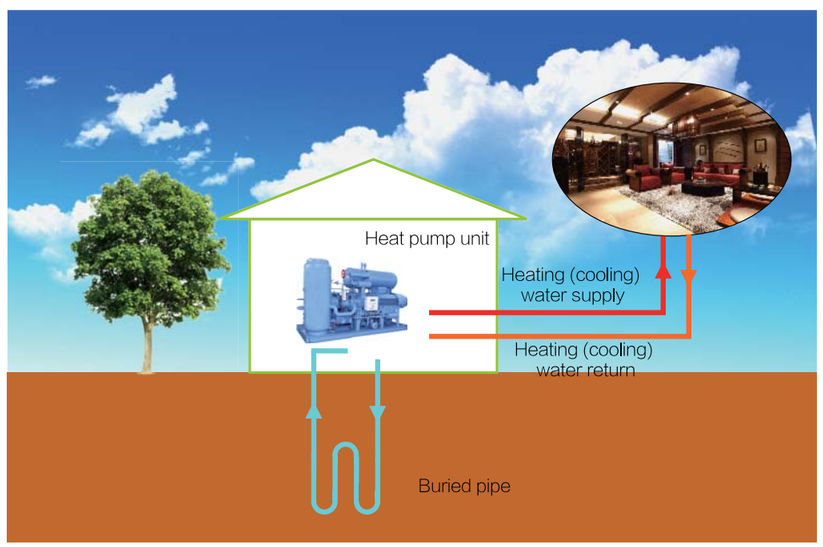
Water ring water source heat pump system

The system is mainly applicable to the areas with poor water quality. The heat exchanger of the unit can be protected by addingheat exchanger between the unit and water loop, where the water temperature of 45℃ may meet the requirements.



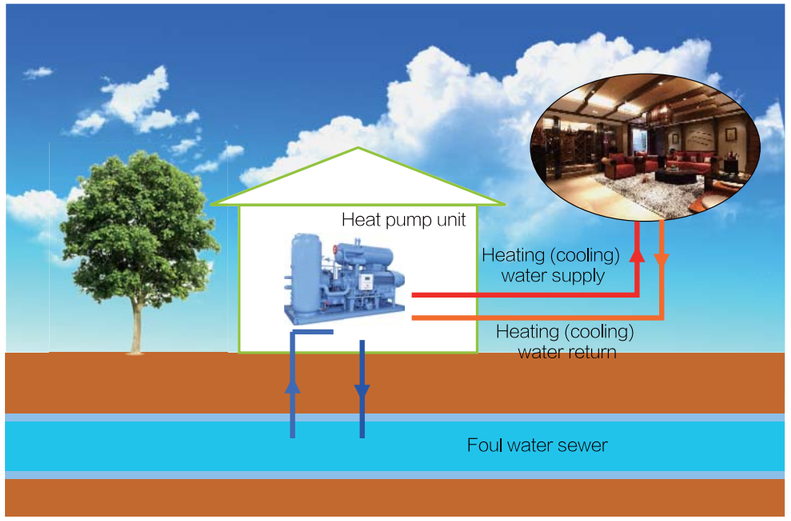
Water source heat pump system with buried pipe

For the small scale, the system is generally used to supply the heating for small and medium-sized commercial buildings, generally, with the hot water temperature of 45℃; if it is directly used to provide the domestic hot water, the temperature should over 50℃.



Sewage source heat pump system

Generally, municipal sewage plants have to treat a large amount of sewage and provide a lot of heat, so it is advisable to build large sewage source heat pump stations near urban sewage plants to place all large heat pump units in a same machine room for preparation of hot water, supplying heat to users of certain areas through city pipe network. Given the energy loss during pipe network transportation, the hot water temperature of the heat pump system is generally high, often above 60℃. Therefore, multi-level heating can be considered.



Introduction to RB series open-type screw water source heat pump unit

Control center

The system adopts international famous brand PLC as control core, equipped with 64 k true color touch screen, the whole operation process can be controlled, historical data can be saved.

Easy Operation

Friendly interactive interface, multiple languages to choose from. One-button operation simplifies the startup process.

Dynamic tracking

- Real-time monitoring of the unit, touch panel capable of displaying system pressure, power capacity control position, running time, operational mode, and operation condition in real time.
- Unit automatically records all fault messages, the fault messages include the detailed description of the abnormal situation and the corresponding solution, makes it convenient for maintenance staff to do rapid diagnosis and troubleshooting.

Safety protection

Equipped with preventive safety protection system, unattended operation is also safe..

Hierarchical password access

Provide the operator with a hierarchical security access password; in case non-professionals input incorrect parameters. There are 3 levels of access, and each level has its own password.

Inverter control

Frequency conversion control can be used, it can rationally distribute motor rotational torque, and enhance the unit efficiency.

Various communication modes

The system adopts remote/local control mode to start or stop; it can also be linked to the monitoring center by reserved bus protocol in real time.

Compressor

Rotor

- SRM “i” patent screw rotor profile, the optimal 5+7 tooth mesh combination, high efficiency, low vibration, running stably;
- Use high quality forged steel material, high wear resistance, high strength, strong liquid impact resistance, applicable to all kinds of refrigerants
- Big shaft dimension, high torque.

Housing

- The body is designed with high-strength ductile iron, with working pressure up to 6.3 Mpa.
- Can change the economizer port according to real conditions.

Bearing

Precision high wear resistant compositie rolling bearings can apply to high density refrigerant load; the design lifetime is 100,000 hours.

Shaft seal

- Innovative shaft seal structure, even stress distribution, stable running, low wear, high sealing, prevent leakage effectively.
- SiC wear-resistant sealing surface, applicable to the rotation speed of 10,000 rpm.

Vi control

- VI control can achieve the optimal working conditions in cold and hot modes and high energy efficiency;
- Compressor is equipped with manual Vi control function, which is independent from capacity control to ensure efficient running under different working conditions;
- The automatic VI control also can be selected to realize the switch between different working conditions.

Capacity control

- 10%-100% step-less capacity control and intelligent controller with accurate positioning;
- Capacity control structure is highly sensitive, the load changes can be achieved in 30 seconds;
- Without electricity, unloading control can be realized byslide valve design;
- World unique explosion-proof device for energy regulation cylinder.

Multi-points oil injection cooling

Multi-points oil injection cooling can ensure efficient and stable running of compressor.

Sealing for whole unit

- Adopt high quality O-ring, super sealing, safe with no leakage.
- Highly precise alignment, the compressor can run smoothly.

Motor

- Open-type synchronous motor is adopted for unit. The motor design is safe and reliable, with high efficiency, low vibration and low noise;
- A LV motor of 380 V, 6 KV, 10 KV motors or other special electrical motors are appropriate.
- For start-up methods, it can select star-delta start-up, soft start-up or variable frequency start-up;
- Motor installation type can be B35 or B3;
- Customers can select motors of different IP grades or explosion-proof motors according to actual working environment.

Adapter

Adaptors may be provided to integrate the compressor and motor, achieving good center alignmentand more stable operation of compressor and motor.

Heat Exchanger

Optimized heat exchange design, which greatly improves the efficiency of heat exchange and ensures the efficient running of unit.

Condenser—Evaporative, water cooled, air cooled and other types of condensers can be selected based on the customers’ requirements to meet the demands in different regions.

Evaporator—Dry, flooded, thermosyphon and other types of heat exchangers can be selected according to the different physical properties of secondary refrigerants, to ensure efficient running of the unit.

Economizer—unit is equipped with economizer under low-temperature working condition, which increases the liquid subcooling before it flowing into the expansion valve before evaporator, thus greatly increasing the refrigeration capacity and refrigeration factor of the unit.

Others

Refrigerant
Suitable for R134a, R22, R717, etc.

Accessories
All the elements in the system are produced by well-known manufacturers and of high reliability and quality assurance.

Preventive protection
- An exhaust non-return valve is configured to prevent reverse during shut-down so as to protect the compressor;
- Function of high and low pressure protection can protect the compressor and system so it can operate in severe working conditions safely;
- Function of water flow protection can prevent the units from running in the case of lack of water to ensure the system in safety;
- Function of water temperature protection can prevent heat exchangers from being damaged by freezing;
- With oil level protection function, compressors can be prevented from being damaged by lack of oil;
- Safety valves are configured to prevent the system from high pressure;
- High and low pressure sides can be automatically isolated during sudden power failure.

Specifications and standards
- TSG R004-2009 Fixed Pressure Vessels Safety and Technical Supervision;
- GB/T 18430.1-2007 Water Chilling (Heat Pump) Units Using the Vapor Compression Cycle—Water Chilling (Heat Pump) Units for Industrial & Commercial and Similar Usage;
- GB 19577-2004 Energy Efficiency Limit and Grade of Water Chilling Units;
- GB/T 10870-2014 Performance Testing Methods for Water Chilling (Heat Pump) Units Using the Vapor Cycle;
- GB 25131-2010 Safety Requirements Water Chilling (Heat Pump) Units Using the Vapor Cycle;
- GB 5226.1-2008 Safety of Machinery -Electrical Equipment of Machines -Part 1: General Requirements;
- JB/T 4330-1999 Measurementof Noise Emitted by Refrigeratingand Air Conditioning Equipment.

Unit model no. explanation

RB L _ - W D H A

Installation type: A -Indoor type
B -Outdoor type

Refrigerant type: H-R22
A-R717
M-R134a
Z-other;

Types of evaporator: D -Dry type
F -Flooded
T -Thermosyphon type
M -Falling-film
A -Air cooling

Type of condenser: W -Water cooled
E -Evaporation type

Compressor type: For example: 20 M stands for using SRM-20 M compressor

Application scope: H -High temperature (outlet hot water temperature ≥ 85℃)
M -Medium temperature (55℃ ≤ outlet hot water temperature < 85℃)
L -Low temperature (45℃≤ outlet hot water temperature < 55℃)

Type of units: RB -Heat pump units

Table of Technical Parameters

Underground water source heat pump (R134a)

Models			RBL16S-WDMA	RBL16M-WDMA	RBL20S-WDMA	RBL20M-WDMA	RBL26S-WDMA	RBL26M-WDMA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	90	90	160	200	280	355
	Power supply		3P/380V/50Hz					
Cooling condition								
Cooling capacity	kW		291.9	367.6	586.5	765.1	1161.9	1469.4
Input power	kW		48.2	59.1	94.2	120.2	183.6	225.7
EER	W/W		6.06	6.22	6.23	6.37	6.33	6.51
Evaporator	Water flow	m^3/h	50.2	63.2	100.9	131.6	199.8	252.7
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	63	68	70	72	73	73
Condenser	Water flow	m^3/h	30.1	37.9	60.4	78.8	119.7	151.3
	Water inlet and outlet pipes	mm	89	89	108	133	159	159
	Water pressure drop	kPa	32	38	41	43	44	45
Heating condition								
Cooling capacity	kW		336.9	411.0	610.0	853.7	1298.8	1633.9
Input power	kW		76.6	83.0	137.9	168.8	257.8	316.9
COP	W/W		4.40	4.95	4.42	5.06	5.04	5.16
Evaporator	Water flow	m^3/h	30.1	37.9	60.4	78.8	119.7	151.3
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	28	31	34	38	42	42
Condenser	Water flow	m^3/h	50.2	63.2	100.9	131.6	199.8	252.7
	Water inlet and outlet pipes	mm	89	89	108	133	159	159
	Water pressure drop	kPa	59	63	64	68	70	71
Outline dimension	Length (L)	mm	3500	3800	4600	4805	5155	5200
	Width (W)	mm	2200	2250	2300	2350	2460	2500
	Height (H)	mm	2450	2550	2700	2800	2930	2950
Unit weight	Net weight	kg	5500	5700	7500	8700	12600	13000
	Operational weight	kg	6600	6850	9000	10450	16000	16500

Note:1. Fluctuation range of voltage: ±10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user's requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

Underground water source heat pump(R22)

Models			RBL16S-WDHA	RBL16M-WDHA	RBL20S-WDHA	RBL20M-WDHA	RBL26S-WDHA	RBL26M-WDHA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	110	132	200	250	400	500
	Power supply		3P/380V/50Hz				3P/6kV、10kV/50Hz	
Cooling condition								
Cooling capacity	kW		478.7	599.3	938.3	1220.0	1854.0	2350.6
Input power	kW		70.5	84.9	136.6	171.0	258.6	317.9
EER	W/W		6.79	7.06	6.87	7.13	7.17	7.39
Evaporator	Water flow	m^3/h	82.3	103.1	161.4	209.8	318.9	404.3
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	66	68	73	76	83	85
Condenser	Water flow	m^3/h	49.3	61.7	96.6	125.7	191.0	242.1
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	30	35	42	43	46	49
Heating condition								
Cooling capacity	kW		528.8	657.6	1036.6	1338.8	2034.6	2566.0
Input power	kW		101.6	122.3	196.9	246.4	372.6	458.1
COP	W/W		5.20	5.38	5.26	5.43	5.46	5.60
Evaporator	Water flow	m^3/h	49.3	61.7	96.6	125.7	191.0	242.1
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	25	30	32	37	41	46
Condenser	Water flow	m^3/h	82.3	103.1	161.4	209.8	318.9	404.3
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	63	67	68	72	75	81
Outline dimension	Length (L)	mm	3800	3910	4650	4800	5200	5250
	Width (W)	mm	2300	2300	2350	2405	2450	2500
	Height (H)	mm	2450	2550	2700	2800	2950	2955
Unit weight	Net weight	kg	5900	6100	7800	8400	14600	15200
	Operational weight	kg	6900	7250	9400	10150	18300	20010

Note:1. Fluctuation range of voltage: ± 10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user’s requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

Underground water source heat pump(R717)

Models			RBL16S-WDAA	RBL16M-WDAA	RBL20S-WDAA	RBL20M-WDAA	RBL26S-WDAA	RBL26M-WDAA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	110	132	220	280	400	500
	Power supply		3P/380V/50Hz				3P/6kV、10kV/50Hz	
Cooling condition								
Cooling capacity	kW		517.8	647.6	1023.4	1331.6	2014.2	2546.8
Input power	kW		74.3	89.5	144.0	180.2	272.5	335.0
EER	W/W		6.97	7.24	7.11	7.39	7.39	7.60
Evaporator	Water flow	m^3/h	89.1	111.4	176.0	229.0	346.4	438.0
	Water inlet and outlet pipes	mm	133	159	159	219	273	273
	Water pressure drop	kPa	43	44	49	51	55	56
Condenser	Water flow	m^3/h	53.3	66.7	105.4	137.2	207.5	262.3
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	7	7	9	10	13	13
Heating condition								
Cooling capacity	kW		599.5	744.9	1182.2	1529.0	2315.9	2915.1
Input power	kW		110.2	132.7	213.5	267.2	404.1	496.7
COP	W/W		5.44	5.61	5.54	5.72	5.73	5.87
Evaporator	Water flow	m^3/h	53.3	66.7	105.4	137.2	207.5	262.3
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	8	9	10	10	12	13
Condenser	Water flow	m^3/h	89.1	111.4	176.0	229.0	346.4	438.0
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	45	46	49	50	53	54
Outline dimension	Length (L)	mm	4400	4400	4900	5100	5255	5300
	Width (W)	mm	2100	2150	2250	2275	2350	2400
	Height (H)	mm	2550	2650	2800	2855	2930	2950
Unit weight	Net weight	kg	5800	5900	8300	8500	13600	14000
	Operational weight	kg	6600	6850	9200	9450	16200	18500

Note:1. Fluctuation range of voltage: ± 10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user’s requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

Water ring water source heat pump(R134a)

Models			RBL16S-WDMA	RBL16M-WDMA	RBL20S-WDMA	RBL20M-WDMA	RBL26S-WDMA	RBL26M-WDMA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	90	90	160	200	280	355
	Power supply		3P/380V/50Hz					
Cooling condition								
Cooling capacity	kW		275.8	347.4	554.5	723.7	1099.3	1390.5
Input power	kW		53.9	66.1	105.4	134.5	205.5	252.6
	W/W		5.12	5.26	5.26	5.38	5.35	5.50
Evaporator	Water flow	m^3/h	47.4	59.8	95.4	124.5	189.1	239.2
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	63	68	70	72	73	73
Condenser	Water flow	m^3/h	59.3	74.7	119.2	155.6	236.3	299.0
	Water inlet and outlet pipes	mm	89	89	108	133	159	159
	Water pressure drop	kPa	31	35	41	42	44	45
Heating condition								
Cooling capacity	kW		357.0	447.6	714.8	929.3	1413.6	1778.6
Input power	kW		71.0	87.2	138.9	177.3	270.8	332.9
	W/W		5.03	5.13	5.15	5.24	5.22	5.34
Evaporator	Water flow	m^3/h	59.3	74.7	119.2	155.6	236.3	299.0
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	27	31	33	37	41	42
Condenser	Water flow	m^3/h	47.4	59.8	95.4	124.5	189.1	239.2
	Water inlet and outlet pipes	mm	89	89	108	133	159	159
	Water pressure drop	kPa	57	60	63	68	72	73
Outline dimension	Length (L)	mm	3500	3800	4600	4805	5155	5200
	Width (W)	mm	2200	2250	2300	2350	2460	2500
	Height (H)	mm	2450	2550	2700	2800	2930	2950
Unit weight	Net weight	kg	5500	5700	7500	8700	12600	13000
	Operational weight	kg	6600	6850	9000	10450	16000	16500

Note:1. Fluctuation range of voltage: ± 10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user’ s requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

Water ring water source heat pump(R22)

Models			RBL16S-WDHA	RBL16M-WDHA	RBL20S-WDHA	RBL20M-WDHA	RBL26S-WDHA	RBL26M-WDHA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	110	132	220	280	400	500
	Power supply		3P/380V/50Hz				3P/6kV、10kV/50Hz	
Cooling condition								
Cooling capacity	kW		444.3	556.4	871.9	1133.9	1724.0	2186.2
Input power	kW		83.0	99.9	160.8	201.2	304.3	374.1
EER	W/W		5.35	5.57	5.42	5.64	5.67	5.84
Evaporator	Water flow	m^3/h	76.4	95.7	150.0	195.0	296.5	376.0
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	67	68	71	75	80	83
Condenser	Water flow	m^3/h	95.5	119.6	187.5	243.8	370.7	470.0
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	29	32	37	41	44	47
Heating condition								
Cooling capacity	kW		568.7	707.3	1114.6	1439.7	2187.6	2759.3
Input power	kW		106.3	128.0	206.0	257.8	389.8	479.2
COP	W/W		5.35	5.53	5.41	5.58	5.61	5.76
Evaporator	Water flow	m^3/h	95.5	119.6	187.5	243.8	370.7	470.0
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	26	30	34	37	40	43
Condenser	Water flow	m^3/h	76.4	95.7	150.0	195.0	296.5	376.0
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	62	65	67	71	73	79
Outline dimension	Length (L)	mm	3800	3910	4650	4800	5200	5250
	Width (W)	mm	2300	2300	2350	2405	2450	2500
	Height (H)	mm	2450	2550	2700	2800	2950	2955
Unit weight	Net weight	kg	5900	6100	7800	8400	14600	15200
	Operational weight	kg	6900	7250	9400	10150	18300	20010

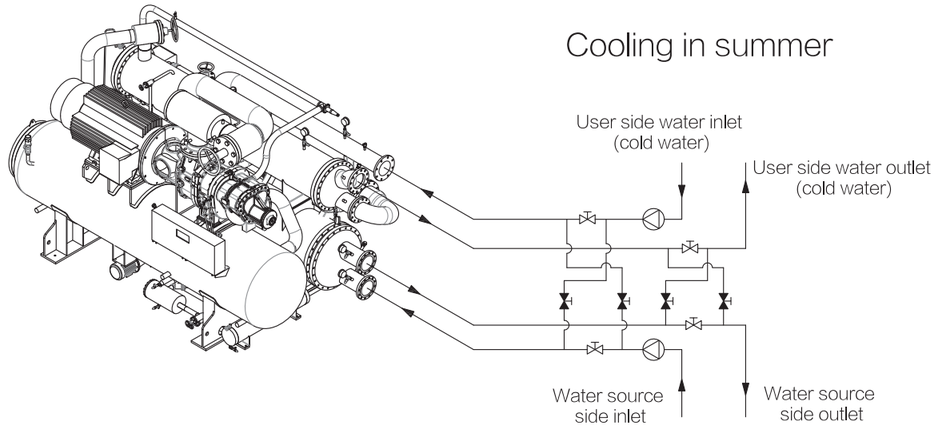
Note:1. Fluctuation range of voltage: ± 10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user’ s requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

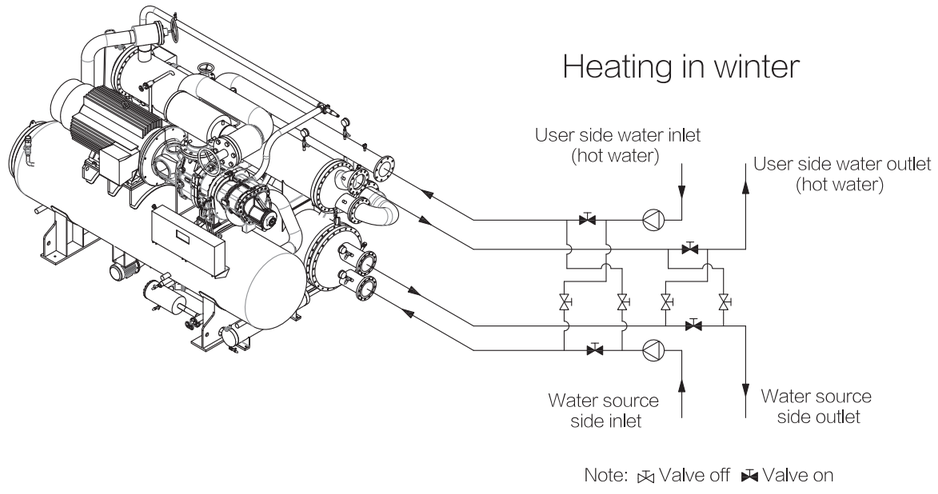
Water ring water source heat pump(R717)

Models			RBL16S-WDAA	RBL16M-WDAA	RBL20S-WDAA	RBL20M-WDAA	RBL26S-WDAA	RBL26M-WDAA
Compressor	Model		SRM-16S	SRM-16M	SRM-20S	SRM-20M	SRM-26S	SRM-26M
	Theoretical displacement	m^3/h	435	544	850	1100	1659	2075
	Capacity control		Stepless regulation: 10 -100%					
	Start method		Y/△					
Main motor	Power	kW	125	160	250	280	450	560
	Power supply		3P/380V/50Hz				3P/6kV、10kV/50Hz	
Cooling condition								
Cooling capacity	kW		492.4	615.9	973.8	1267.6	1918.8	2426.7
Input power	kW		88.4	106.4	171.2	214.2	324.0	398.3
EER	W/W		5.57	5.79	5.69	5.92	5.92	6.09
Evaporator	Water flow	m^3/h	84.7	105.9	167.5	218.0	330.0	417.4
	Water inlet and outlet pipes	mm	133	159	159	219	273	273
	Water pressure drop	kPa	42	43	47	50	54	55
Condenser	Water flow	m^3/h	105.9	132.4	209.4	272.5	412.5	521.7
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	7	7	8	10	12	13
Heating condition								
Cooling capacity	kW		657.4	816.9	1296.4	1676.9	2539.4	3196.7
Input power	kW		116.5	140.2	225.7	282.4	427.1	525.0
COP	W/W		5.64	5.83	5.74	5.94	5.95	6.09
Evaporator	Water flow	m^3/h	105.9	132.4	209.4	272.5	412.5	521.7
	Water inlet and outlet pipes	mm	133	133	159	219	273	273
	Water pressure drop	kPa	8	9	9	10	11	12
Condenser	Water flow	m^3/h	84.7	105.9	167.5	218.0	330.0	417.4
	Water inlet and outlet pipes	mm	108	108	133	159	219	219
	Water pressure drop	kPa	43	45	48	50	52	53
Outline dimension	Length (L)	mm	4400	4400	4900	5100	5255	5300
	Width (W)	mm	2100	2150	2250	2275	2350	2400
	Height (H)	mm	2550	2650	2800	2855	2930	2950
Unit weight	Net weight	kg	5800	5900	8300	8500	13600	14000
	Operational weight	kg	6600	6850	9200	9450	16200	18500

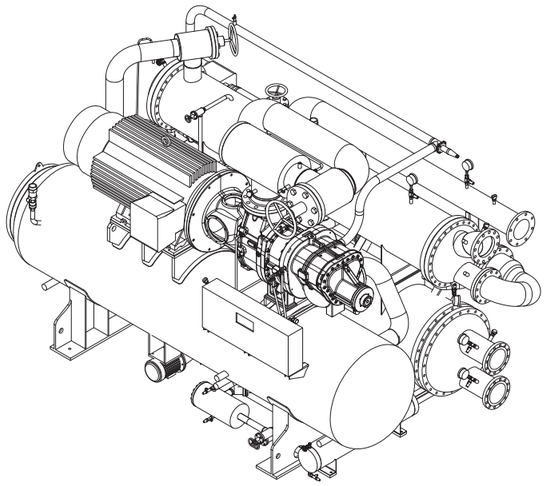
Note:1. Fluctuation range of voltage: ± 10%;
2. Cooling in summer: Water inlet and outlet of evaporator 12/7℃, water inlet and outlet of condenser 18/29℃; heating in summer: Water inlet and outlet of evaporator 15/7℃, water inlet and outlet of condenser 40/45℃;
3. The inlet and outlet of units are connected by flanges. Details should be given in the order if other connection ways are required;
4. Due to technology improvement, the parameters, overall dimension and weight of the units may differs, and the actual design shall prevail;
5. The units mentioned above are the standard ones which can be specially designed based on user’s requirements. If parameters of other types of heat pump units are needed, please feel free to contact us.

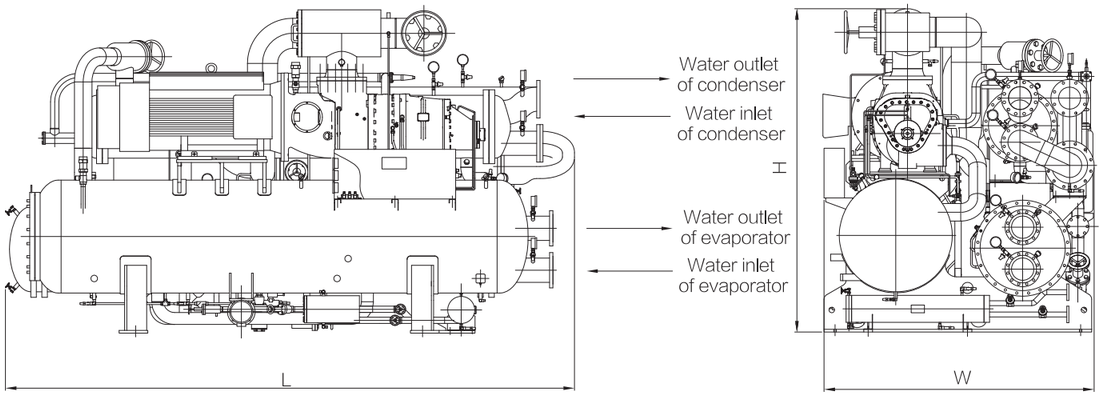
Flow diagram of heat pump units

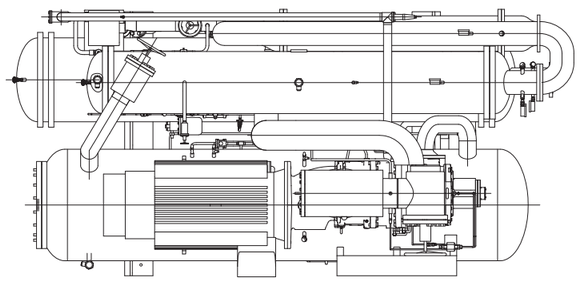




Outline drawing of fluorine heat pump units







Outline drawing of ammonia heat pump units