

XINLEI
COMPRESSOR
CO.,LTD.

XLSC SERIES SCREW HEAT PUMP UNIT

XINLEI COMPRESSOR CO.,LTD.

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Please contact the sales person for more product information and service materials. Xinlei reserves the right of final interpretation of this catalog.

- **Energy efficient**
- **Stable and Reliable**
- **Intelligent control**
- **Low carbon and environmental protection**



XINLEI GROUP

SPECIALIZED MANUFACTURER OF INTELLIGENT HVAC EQUIPMENT

Xinlei was founded in Taizhou, Zhejiang Province. On January 19, 2023, Xinlei was listed on the main board of Shenzhen Stock Exchange. As a leading enterprise in the industry, Xinlei independent research and development production of air energy across the piston, screw, magnetic levitation centrifugal all-fluid plate.

Various types of products achieve high energy efficiency breakthroughs under the continuous innovation, access to more than 300 authorized patents. Xinlei has been recognized as a national "Specialized and New" little giant enterprise. Up to now, Xinlei has more than 800 distribution outlets in more than 100 countries and regions around the world. Our energy-saving equipment and smart solutions are widely recognized by the market and our customer partners.

Over the years, Xinlei has been striving to provide customers with a comfortable, energy-efficient, environmentally friendly and convenient indoor environment. With the service tenet of "Innovation reflects Value", we serve every customer with heart and soul. Xinlei has many experienced pre-sales, sales and after-sales service personnel. Our team has a strong technical ability, creating a new world of "energy saving, environmental protection and intelligence" in the field of aerodynamics.

1876

The world's first air conditioner was born in the United States. In the 20 years since the invention of air conditioner, it has always been machines, not people, that have enjoyed it

1996

Xinlei brand was founded in the era of national "Ninth Five-Year Plan" economic take-off

2000

Xinlei's self-developed aerodynamic products enter the European and American markets

2006

Won the first instance decision in the "EU anti-dumping" lawsuit. Daily production of 12,000 units, accounting for more than 56% of customs export data

2017

Comprehensively laid out the air/maglev centrifuge market and gained the first breakthrough

2020

Helped Sinopec to increase production by 30% and save energy by 50%. A major step on the road of "domestic substitution" in the high-end manufacturing of air energy

2022

Xinlei's first magnetic levitation frequency conversion centrifugal chilled water (heat pump) unit was launched, with an energy saving rate of up to 50%, triggering a revolutionary new journey in the industry

2023

Successful listing of Xinlei stock
Stock Code 301317

Xinlei heat pump achieves high energy efficiency breakthrough in continuous innovation

300RT and 1000RT water-cooled chilled water (heat pump) unit test bench certified by the National Testing Center

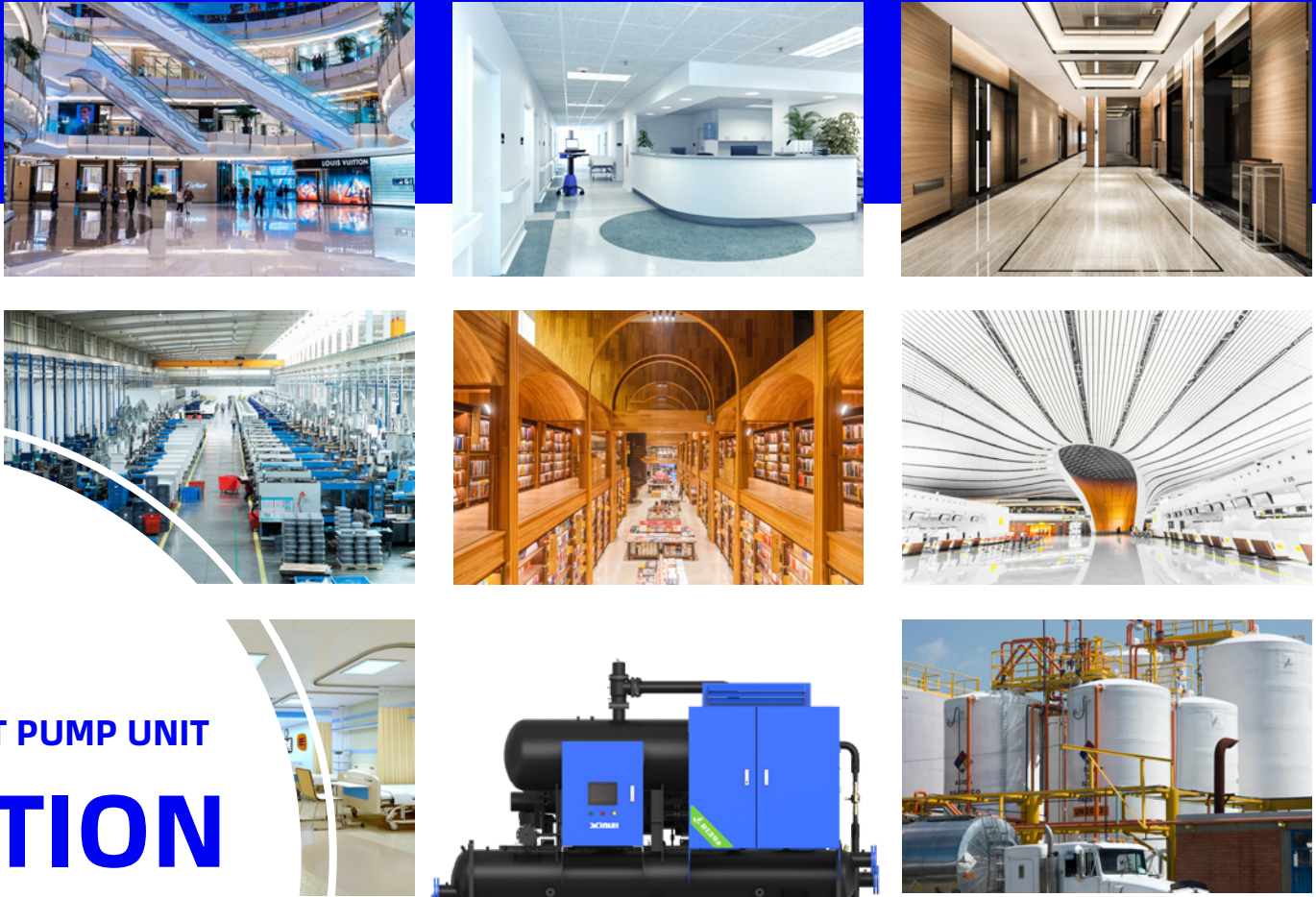
XINLEI

IT IS A HIGH-TECH ENTERPRISE COMMITTED TO PROVIDING HIGH-TECH PRODUCTS AND SMART HVAC SOLUTIONS FOR DEMAND INDUSTRIES, FOCUSING ON PROVIDING SMART HVAC OVERALL SOLUTIONS AND RELATED PRODUCTS AND SERVICES FOR VARIOUS DEMAND INDUSTRIES WITH THE FUNDAMENTAL STARTING POINT OF SOLVING USER NEEDS.

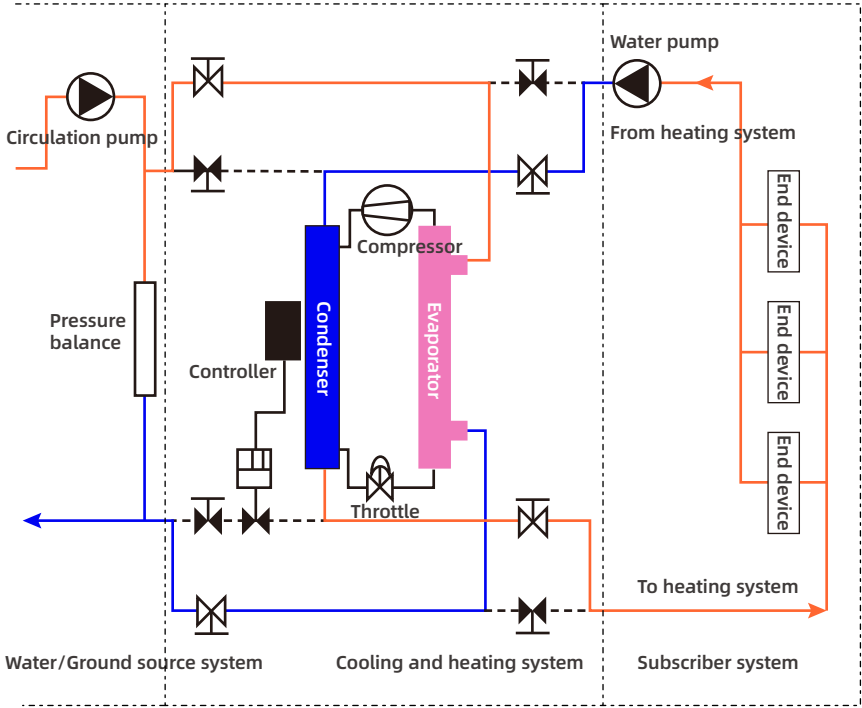
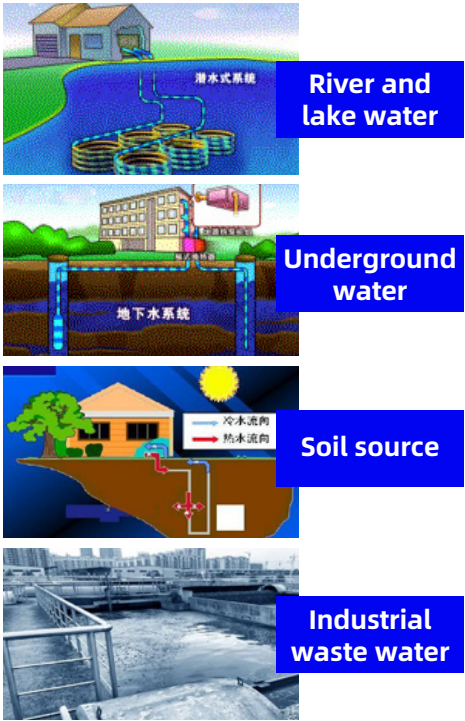
High temperature water (ground) source screw heat pump unit



Low Ambient Temperature Energy Tower Screw Heat Pump Unit



XLSC SERIES SCREW HEAT PUMP UNIT APPLICATION



UNIT COMPOSITION

■ XLSC SERIES SCREW HEAT PUMP UNIT

The system is mainly composed of a single-unit two-stage screw compressor, an evaporator, a condenser, an economizer, adjustable expansion valves, an onboard frequency converter, and an automatic control system. The compressor features a two-stage compression design, offering a high pressure ratio, significant temperature rise, high efficiency, energy savings, and stable and reliable operation.

■ Control Cabinet

- PLC-based Electrical Control System: Real-time monitoring of system operating data and trends, **equipped with multiple protections and pre-warnings**;
- IoT Database Management: Establishes a backend service platform for modular management of equipment energy efficiency.



Integrated Type



Separate Type

■ Intelligent operation panel

- Touch control screen, providing users with an intuitive user interface, simple and convenient operation;
- Cloud based remote monitoring**, automatic fault alarm, convenient for analyzing the cause of faults.



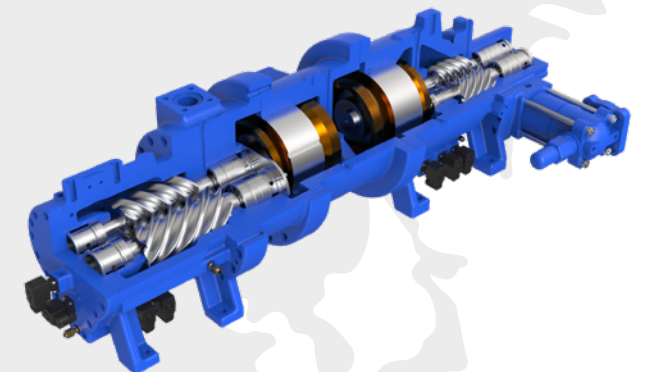
High temperature water (ground) source screw heat pump unit



Low Ambient Temperature Energy Tower Screw Heat Pump Unit

■ Single machine double stage screw compressor

- Adopting a semi enclosed structure, refrigerants, refrigeration oil and other media are completely isolated from the environment, **with no hidden dangers of leakage or pollution**.
- The two-stage compression scheme can enable the system to achieve a higher pressure ratio and operate smoothly in low ambient temperatures.
- The screw and motor adopt a direct connection design, while adopting a two-stage dual motor design. Each stage has its own independent motor, without coupling design, **with a transmission efficiency of 100%**, allowing the system to have more sufficient control space.
- Equipped with dual stage independent adjustable compression ratio control, it can adjust the compressor reasonably according to the actual operation of the unit, making the system energy efficiency a step higher.
- The new double-sided asymmetric 5:7 tooth design fully enhances the volumetric efficiency of the screw unit.



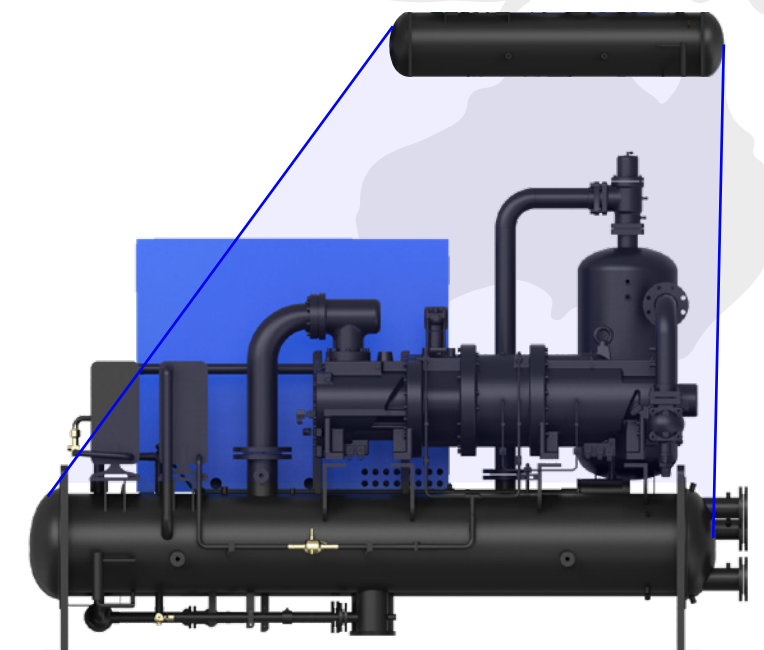
■ Efficient oil separation

- The system adopts a high-efficiency oil separator to enhance system efficiency, extend equipment service life, and ensure long-term stable operation of the unit.



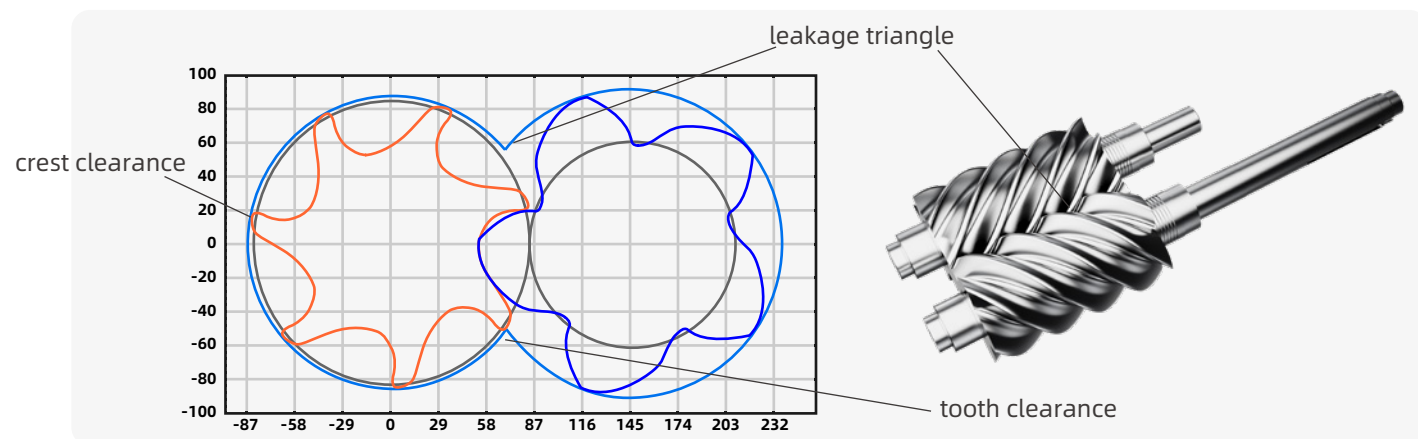
■ Efficient heat exchanger

- The heat exchanger adopts advanced and efficient copper tube bundles for heat exchange, and the inner and outer wall fibers are strengthened for heat transfer to achieve better performance and increase heat exchange efficiency;



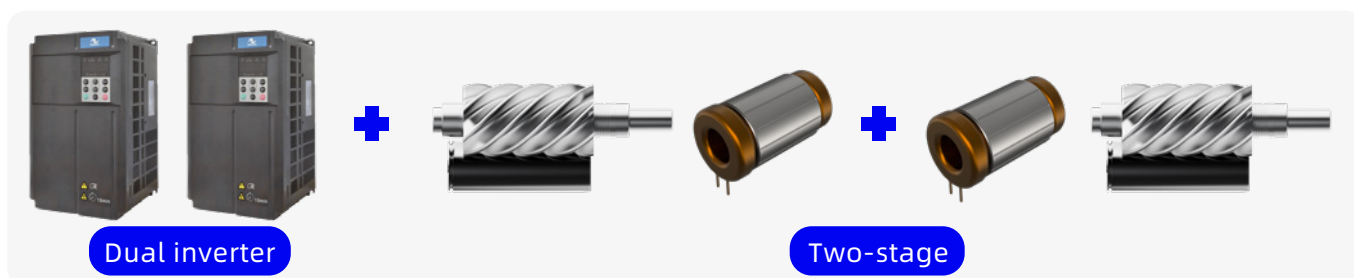
ENERGY EFFICIENT

■ New patented bilateral asymmetric 5:7 profile design



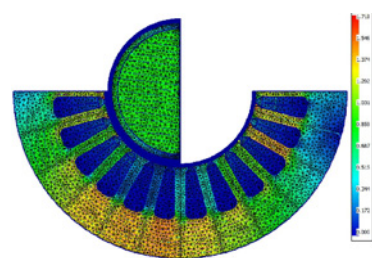
- The new asymmetric profile design significantly reduces the area of the leakage triangle, **reduces** the **leakage** between rotor strokes, ensures volumetric efficiency at low rpm, and achieves **improved performance** under partial load;
- The third generation of rotor profile, bilateral 5:7 profile design, of higher strength, suitable for large **pressure ratio** working conditions.

■ Dual inverter technology and adjustable VI

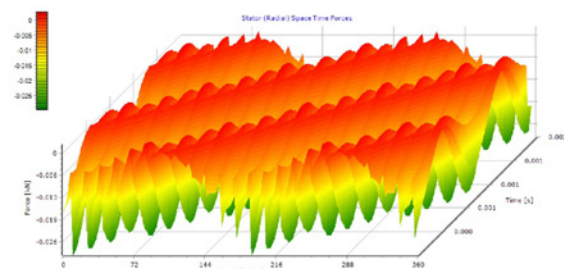


- Dual inverter technology, active and precise control of pressure between high and low pressure stages to achieve **higher energy efficiency**;
- Adjustable VI, combined with dual inverter technology, **the operating range widens**;
- Frequency conversion regulation, **avoiding energy loss** during part-load operation, further improving the operating performance of the unit under part-load conditions.

■ Permanent magnet synchronous motor + frequency conversion regulation technology



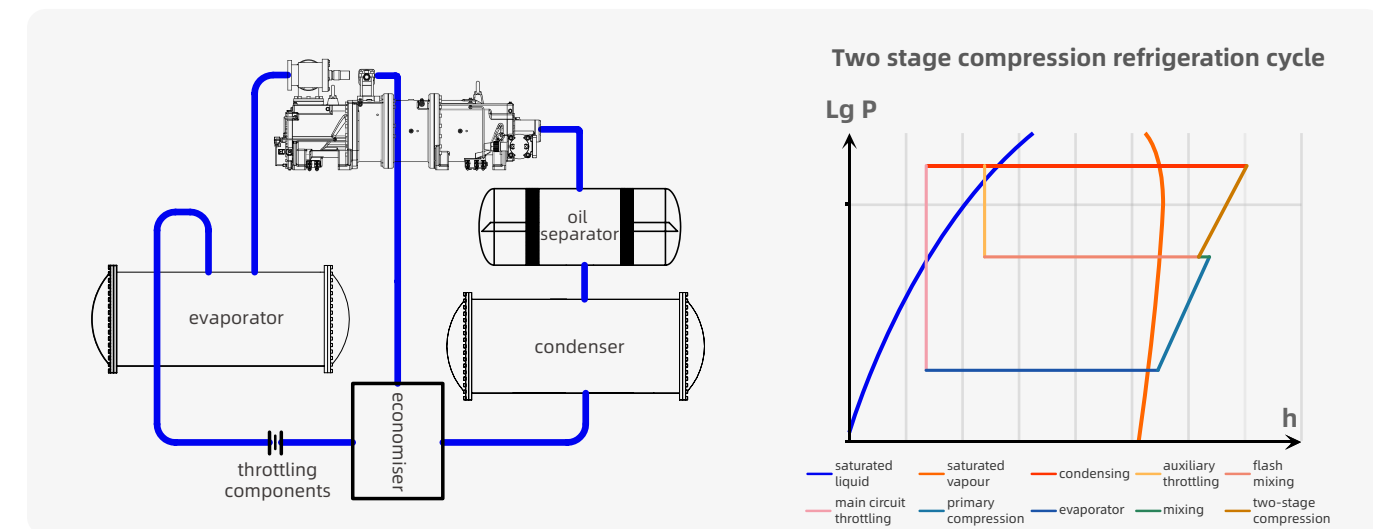
permanent magnet synchronous motor + frequency conversion regulation technology



2D time-domain torque distribution of high-speed permanent magnet motor

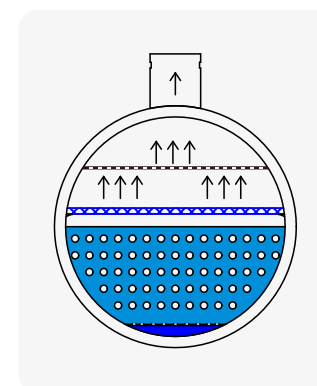
- The permanent magnet synchronous motor of compact structure, and the motor efficiency is $\geq 95\%$ in the full operating range, up to **97.5%**.
- Adopting space vector pulse width modulation technology to achieve energy saving in full load operation range.

■ Double-stage compression of complementary air and increase heat energy, of 6% higher efficiency than single-stage circulation



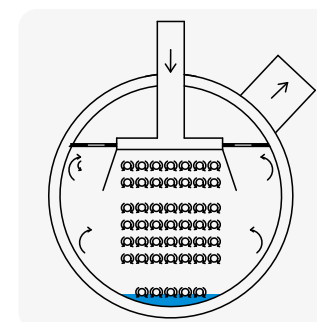
The system adopts a two-stage compression with vapor injection design to improve unit performance under high pressure ratio conditions and reduce energy consumption during compression. Compared to single-stage compression refrigeration cycles,

■ High efficiency evaporator



Full-liquid type (standard)

- The evaporator liquid inlet adopts even liquid distributor, which makes the liquid refrigerant **distribute effectively and evenly** and improves the heat transfer efficiency;
- The upper part of the heat exchanger tube is arranged with a liquid-blocking net, which not only prevents the evaporator from carrying liquid, but also can even the distribution of refrigerant in the heat exchanger and the pressure balance, **avoiding the appearance of dry pipe**, and further improving the heat transfer efficiency of the heat exchanger;
- The heat exchanger tube is equipped with special high-efficiency full-liquid evaporator tube;
- Add the air-blocking plate above the liquid-blocking net, **effectively prevent the evaporator from carrying liquid**, and improve the reliability of the full-liquid evaporator.



Falling film type (optional)

- With falling film evaporator design and manufacturing technology, falling film evaporator has the advantages of **high heat transfer efficiency and low refrigerant charging**.

■ Condensator



- The intake air adopts a baffle with equalizing air exhaust structure, which effectively **reduces the noise and vibration of the condenser**, and evenly distributes the air to the upper part of the heat exchange tube to play the role of washing liquid film, **which makes the heat transfer efficiency** of the condenser higher.
- The special subcooler design technology makes the sub-cooling degree of the unit **up to 5°C**, effectively improving the energy efficiency of the unit.

■ Comprehensive

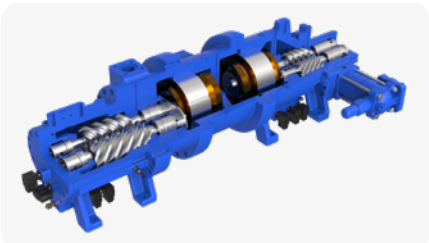
Xinlei XLSC series screw heat pump unit

Traditional screw heat pump unit

12.5%
performance improvement

STABLE AND RELIABLE

■ High efficiency compressor



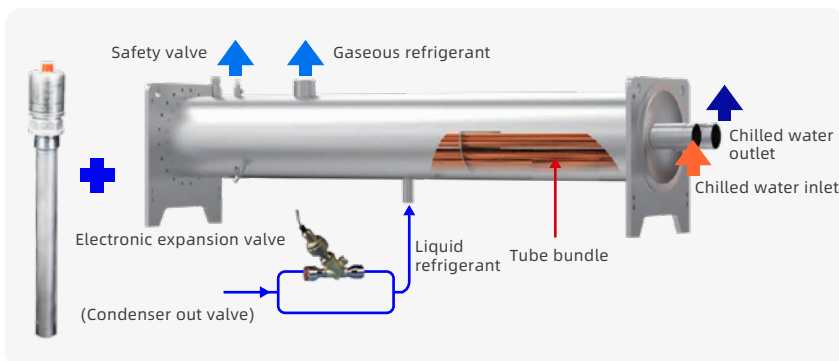
High insulation grade compressor motor

- Insulation **class H**, temperature resistance **180°C**, **one grades higher** than F class.
- Ensure that the compressor still runs reliably and stably under bad working conditions.

Adopt imported famous brand compressor bearings

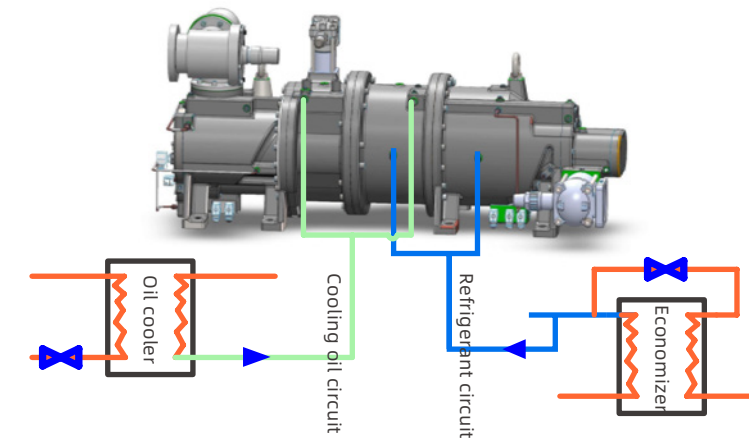
- High precision, smooth operation, using Swedish SKF bearing, continuous operation **≥50000h**.

■ Liquid level sensor



- The liquid level of the evaporator is guaranteed by real-time liquid level control and condenser liquid level area of the best working range;
- When the external load changes, the PID parameters can be optimized in real time through the built-in fuzzy control model of the unit, and the electronic expansion valve can respond quickly to achieve rapid adjustment and accurate control of the water temperature.

■ Double cooling of lubricating oil and refrigerant



- The **lower temperature** lubricating oil obtained by refrigerant **cooling is lubricated** and cooled at the same time to ensure the reliability of compressor operation.
- The high precision temperature sensor detects the motor temperature **in real time**, and starts spraying **refrigerant cooling** at high temperature, so that the compressor is cooled quickly and evenly. Refrigerant and lubricating oil **double cooling**,
- cooling effect is better, the compressor can maintain a lower temperature under harsh working conditions, longer service life.

■ Unit integrated protection function



INTELLIGENT CONTROL

■ IOT technology

Based on the network, it provides monitoring and digital scientific energy-saving management solutions for the operation and use of central air conditioning equipment.

Product function

The cloud platform can record the operating status and operating parameters of the central air conditioner that has been bound to the platform, as well as fault alarm and data recording and analysis. Users can log in to the platform to achieve remote monitoring, energy-saving Settings management, users to achieve real-time device management. At present, the Internet of Things cloud platform provides Android and IOS, PC clients, and open interfaces to achieve links with third-party software such as ERP, providing users with more possibilities.

■ Data Cockpit



Digital data center

● **Data Center Configuration:**
Equipment Operational Status, Alarms

● **Environmental Monitoring:**
Real-time Monitoring, Data Query

Intelligent Control

● **Intelligent Temperature Optimization Control:**
On-demand Cooling

● **Intelligent start/stop Optimization:**
Real-time Dynamic Optimization

Predictive Maintenance

● **Fault Diagnosis:**
System Failures, Hidden Faults, etc.

● **Energy Efficiency Analysis:**
Statistical, Diagnosis, Evaluation

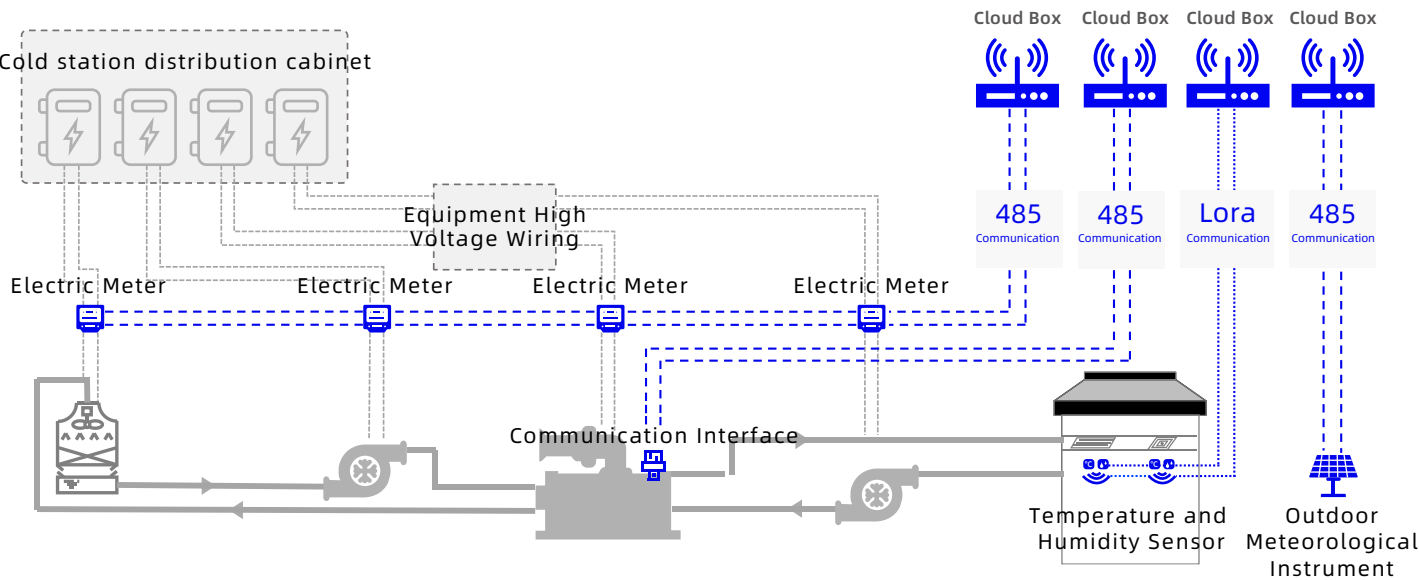
Systematic Energy Saving

● **Energy-saving Control:**
Intelligent Optimization, Reduction of Energy Consumption

● **Energy-saving Management:**
Saving Manpower, Saving Electricity

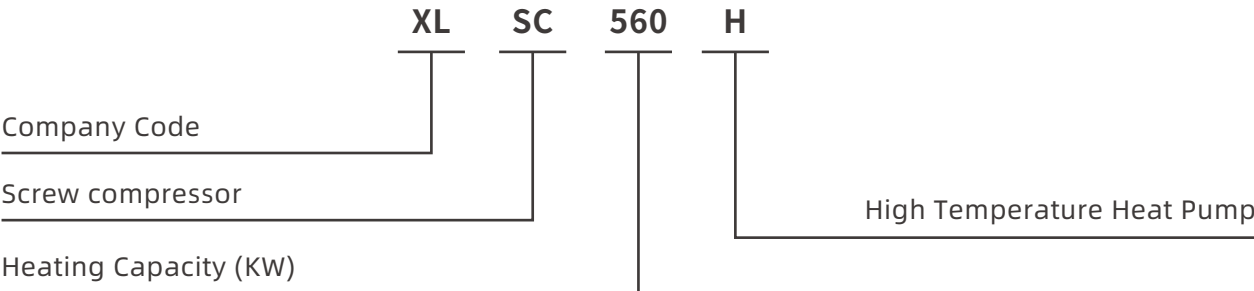
● **Energy-saving Confirmation:**
Cross-comparison Method

■ IoT Technology Schematic

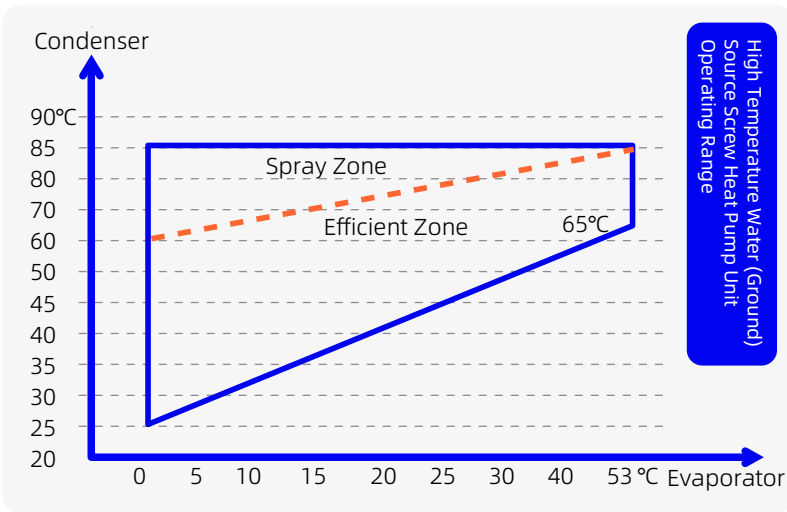


HIGH TEMPERATURE WATER (GROUND) SOURCE SCREW HEAT PUMP UNIT

■ Unit Model Description



■ Wide Range Operation



Water Temperature Category	Customization Range	
Evaporator Water Temperature	Minimum Temperature (°C)	Maximum Temperature (°C)
Operating Outlet Water Temperature	5	53
Full Load Inlet and Outlet Water Temperature Difference	4	20
Condenser Water Temperature	Minimum Temperature (°C)	Maximum Temperature (°C)
Operating Outlet Water Temperature	30	85
Full Load Inlet and Outlet Water Temperature Difference	4	20

■ Single Unit 80°C Temperature Rise



Traditional Heat Pump Unit: The unit has a small temperature rise, and when producing ultra-high temperature hot water of 85°C, the water temperature on the heat source side is required to be higher. Typically, two units are connected in series to incrementally increase the temperature.

Xinlei High Temperature Water (Ground) Source Screw Heat Pump Unit: Adopting a single-unit dual-stage screw compressor, it directly extracts high-temperature hot water up to 85°C using low-grade energy with an inlet water temperature of 10°C on the source side. It has a wide range of applications.