

我们要用最先进的加工设备、最严格的制造管理体系、最专业的技术团队，为我们的客户制造出最可靠的双螺杆蒸汽热泵系统，服务于我们的客户！

We want to use the most advanced processing equipment, the most stringent manufacturing management system, and the most professional technical team to create the most reliable twin-screw steam heat pump system for our customers and serve our customers!

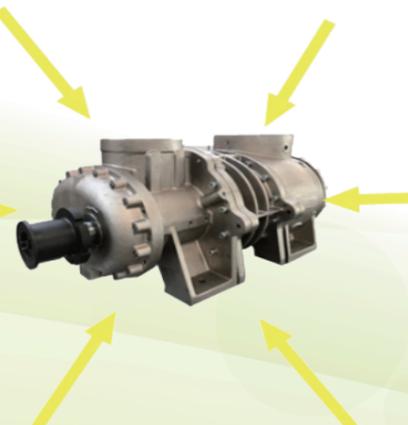
中小流量、高温升蒸汽压缩最佳解决方案之一
One of the best solutions for medium and small flow
high temperature rise vapor compression

LYHP型双螺杆式蒸汽热泵系统

LYHP Type Twin-screw steam heat pump system



Global 121510 CMMS



NGELNBERG P65



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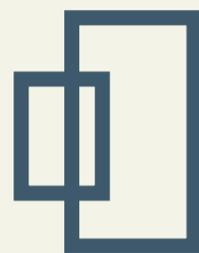
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概述 Overview

工业生产中蒸汽作为一种必不可少的热源动力，在炼化、化工、制药、水处理、食品、印染等行业中被用于精馏、蒸发、浓缩、干燥、动力传递等工艺中，然后会产生与原蒸汽近乎等量的一、二次低品位乏蒸汽。将这些低品位乏蒸汽采用LYHP型双螺杆式蒸汽热泵系统通过机械方式进行加温、加压，在替代新鲜蒸汽的同时也可减少对外排放，实现“节能减排”的低碳生产目标。

As an essential heat source power in industrial production, steam is used in rectification, evaporation, concentration, drying, power transmission and other processes in refining, chemical, pharmaceutical, water treatment, food, printing and dyeing industries, and then The primary or secondary low-grade exhausted steam is almost equal to the original steam. These low-grade exhausted steam are heated and pressurized mechanically by using the LYHP twin-screw steam heat pump system, which can reduce external emissions while replacing fresh steam and achieve the low-carbon production goal of "energy saving and emission reduction".

原理 Principle

LYHP型双螺杆式蒸汽热泵是以无油干式双螺杆压缩机为原型机，并借鉴双螺杆泵的特点，可输送气、液两相态的工艺蒸汽、水蒸汽，能够允许运行时带液压缩、输送，由于具有内压缩过程，且允许在工作腔注水，单级压缩温升可达50°C，单级压缩压比可达5。

The LYHP twin-screw steam heat pump is based on an oil-free dry twin-screw compressor as a prototype, and draws on the characteristics of a twin-screw pump. It can transport gas and liquid two-phase process steam and water vapor, and can allow liquid to be carried during operation. Compression and transportation, due to the internal compression process and the permission to inject water into the working chamber, the single-stage compression temperature rise can reach 50°C, and the single-stage compression pressure ratio can reach 5.

性能 Performance

质量流量/Mass flow	0.2~10 T/h
入口容积流量/Suction volume flow	600~10000 m ³ /h
入口饱和温度/Suction saturation temperature	≥60° C
出口饱和温度/ Discharge saturation temperature	≤220° C
饱和温升/ Saturation temperature rise	20~50° C
轴功率/Shaft power	<300 kW
电机功率/Motor power	<355 kW
入口真空度/Inlet vacuum	<-90 KPa

特点 Characteristic

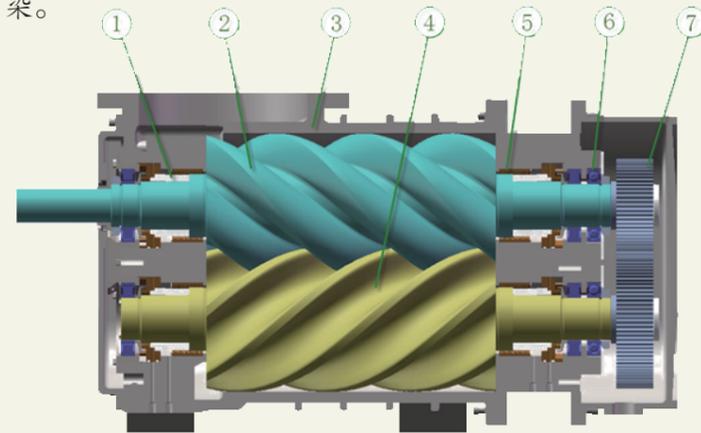
- 1、效率高，能耗低，COP值很高；
High efficiency, low energy consumption, high COP value,
- 2、单级压比5，单级温升50°C；
Single-stage pressure ratio 5, single-stage temperature rise 50°C,
- 3、出口压力与蒸汽入口状态无关，可通过喷冷凝水来控制蒸汽温度和出口蒸汽饱和度；
The outlet pressure has nothing to do with the Steam inlet state,the steam temperature can be controlled by spraying condensate and outlet steam saturation;
- 4、允许进口气量波动或含有少量固体颗粒杂质、液体的工况下；
Under working conditions where the imported gas volume fluctuates or contains a small amount of solid particles, impurities, and liquids;
- 5、能够抽真空，适用于低温蒸发的工况；
It can be vacuumed and is suitable for low-temperature evaporation working conditions;
- 6、整体机组撬装模块化，PLC控制系统操作、维护简单；
The whole unit is skid-mounted and modularized and the PLC control system is easy to operate and maintain;
- 7、变频调节，在20~100%的流量范围内维持高效运行；
Frequency conversion adjustment, maintain efficient operation within the flow range of 20~100%;
- 8、运行稳定可靠，连续运行区间维护期24000--30000小时。
The operation is stable and reliable, and the maintenance period of continuous operation interval is 24000-30000 hours.





结构 Structural features

阴、阳转子相互不接触，转子之间存在一定间隙，阳转子通过同步齿轮带动阴转子高速旋转，在转子与轴承之间采用了密封进行了隔离，杜绝密封质与蒸汽的接触、污染。



- 1 主密封/mechanical seals
- 2 阳转子/male rotor
- 3 机壳/casing
- 4 阴转子/female rotor
- 5 迷宫密封/labyrinth seals
- 6 滚动轴承/rolling bearings
- 7 同步齿轮/trming gears

1、转子：材质采用耐蚀不锈钢，整体锻造，磨削加工，针对不同工况设计最优转子间隙；

Rotors are made of corrosion-resistant stainless steel, rotor clearances are optimized for different conditions.

3、轴承采用高精度滚动轴承，同步齿轮采用整体锻造、磨齿工艺加工，强制润滑，设计寿命不低于50000h。

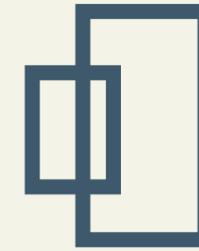
The bearing adopts high-precision rolling bearings, and the synchronous gear adopts integral forging and gear grinding process, forced lubrication, and the design life is not less than 50000h.

2、壳体：材质采用耐蚀不锈钢，针对不同工况设计最优排气孔口；

Casings are made of corrosion-resistant stainless steel, discharge port is optimized for different conditions.

4、密封采用机械密封、迷宫密封、干气密封、碳环密封，油封等多种型式，杜绝蒸汽泄漏，设计寿命不低于24000h；

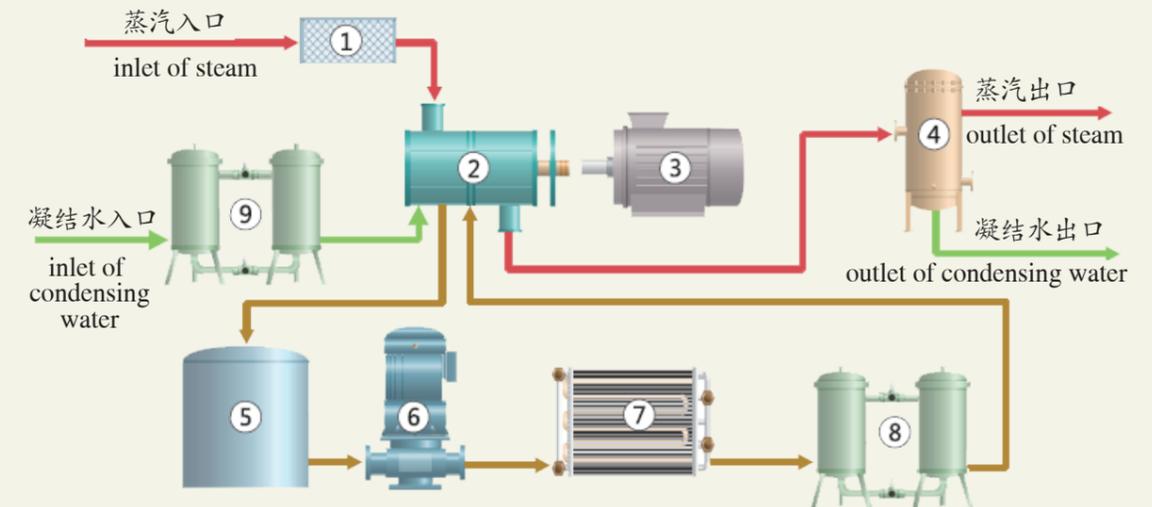
The seal adopts various types such as mechanical seal, labyrinth seal, dry gas seal, oil seal, etc., to prevent steam leakage, and the design life is not less than 24000h.



系统 System description

LYHP型热泵系统由蒸汽压缩机、气路系统、喷液系统、润滑系统与电气控制系统、附属系统组成。

The LYHP heat pump system consists of a steam compressor, a gas circuit system, a liquid injection system, a lubrication system, an electrical control system, and auxiliary systems.



1. 气体过滤器gas filter
2. 螺杆蒸汽压缩机 steam screw compressor
3. 主电机main motor
4. 汽水分离器steam & water separator
5. 油箱oil tank
6. 油泵 oil pump
7. 油冷却器oil cooler
8. 油过滤器oil filter
9. 水过滤器water filter

★气路系统一般包括气体过滤器、汽水分离器、出口单向阀、出口安全阀、卸荷阀等。

The gas system generally includes gas filter, steam & water separator, outlet check valve, outlet safety valve, unloading valve etc.

★喷液系统一般包括喷液过滤器、喷液调节阀、喷液流量计、喷液泵等。

The liquid injection system generally includes liquid filters, liquid injection regulating valve, liquid injection flow meter, pump etc..

★润滑油系统一般包括油箱、油泵、油冷却器、油过滤器等。

The lube oil system generally includes oil tank, oil pump, oil cooler, oil filter.

★电气控制系统一般包括PLC、变频器等。

The electrical control system generally includes PLC, frequency converter, etc.





应用 Application occasions

1、MVR/MVC: 环保水处理和各种溶液蒸发结晶工艺中，如废水处理、制药结晶、提纯、污泥干化、废盐蒸发结晶、垃圾渗滤液蒸发浓缩、电镀废液蒸发等；

MVR/MVC: Environmental water treatment and various solution evaporation and crystallization processes, such as wastewater treatment, pharmaceutical crystallization, purification, sludge drying, waste salt evaporation and crystallization, landfill leachate evaporation and concentration, electroplating waste liquid evaporation, etc.;



上海青浦化工园区污水处理厂污泥干化现场 (2019年)
Shanghai Qingpu Chemical Park Sewage Treatment of sludge drying site Plant
气量 Air volume: 4.5T/h 入口 Inlet :95℃
出口 Outlet: 135℃ 功率 Power: 280Kw



惠州伯恩光学园区硝酸钾、硝酸钠蒸发结晶现场 (2019年)
Bourne Optical Park, Huizhou Potassium acid and sodium nitrate evaporation and crystallization site
气量 Air volume: 1T/h 入口 Inlet: 90℃
出口 Outlet: 115℃ 功率 Power: 75Kw

2、热泵精馏: 化工、精细化工 (如制药等) 行业中各种工艺反应中工艺蒸汽回收、增压与再次利用，如将塔顶蒸汽回收进行加压、加温后给塔釜 (或再沸器) 供热等；

Heat pump distillation: recovery, pressurization and reuse of process steam in various process reactions in the chemical and fine chemical industries (such as pharmaceuticals, etc.), for example, recovery of the top steam of the distillation tower for secondary use;



蓝星山西工厂聚苯醚装置热耦合项目 (2020年)
Bluestar Shanxi Plant Polyphenylene Ether Unit Thermal Coupling Project
气量 Air volume: 2T/h 入口 Inlet: 90℃
出口 Outlet: 125℃ 功率 Power: 110Kw

3、低压蒸汽增压: 各种余热蒸汽、烟气等低品位蒸汽与管道蒸汽末端的增压与输送；
Low-pressure steam pressurization: pressurization and transportation of various waste heat steam, flue gas and other low-grade steam and the end of pipeline steam;



张家港磷酸锰铁锂结晶反应蒸汽增温增压 (2018年)
Zhangjiagang Lithium Iron Manganese Phosphate Crystallization Reaction Steam Warming and Pressure Increasing
气量 Air volume: 5T/h 入口 Inlet: 170℃
出口 Outlet: 220℃ 功率 Power: 315Kw

4、闪蒸汽回收: 化工、印染、造纸、电力、纺织、食品、太阳能利用、建材等行业中产生的各种闪蒸汽的回收、增压、增温、外输。

Flash steam recovery: recovery, pressurization, heating, and export of various flash steam generated in industries such as chemical industry, printing and dyeing, papermaking, electric power, textile, food, solar energy utilization, and building materials.



济南宏济堂药业空气源热泵+闪蒸汽回收增压 (2021年)
Jinan Hongjitang Pharmaceuticals Air Source Heat Pump + Flash Steam Recovery Pressurization
气量 Air volume: 1.5T/h 入口 Inlet: 75℃
出口 Outlet: 155℃ 功率 Power: 185Kw

