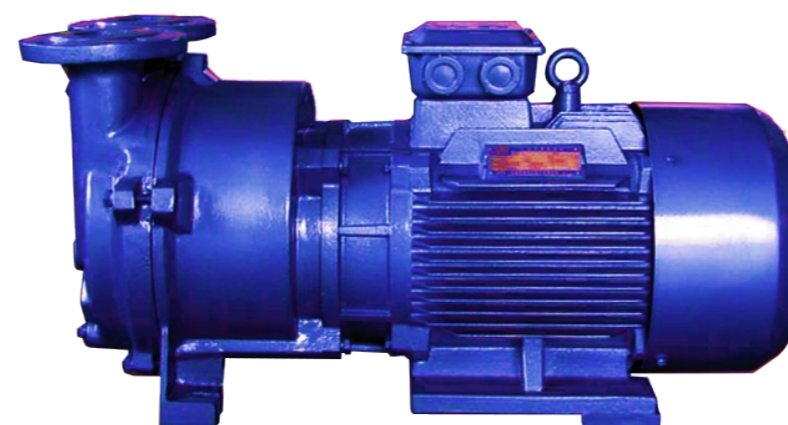
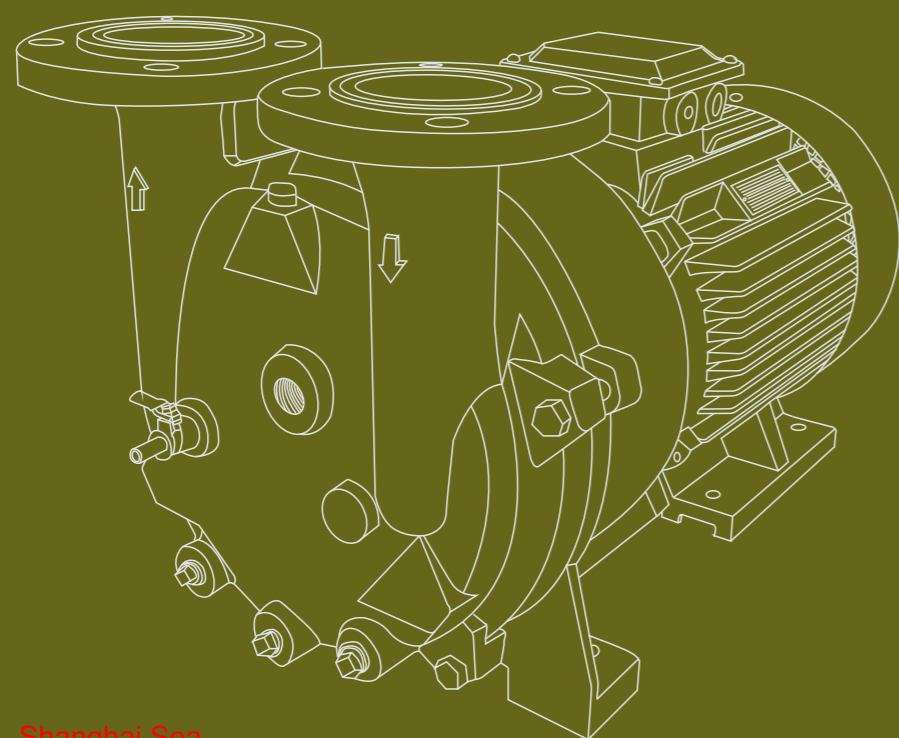
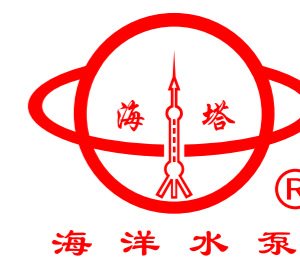


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As we are constantly striving to improve our products, we reserve the right to change the sample data. Please understand.



▶▶▶ **2BV型**
水环式真空泵
Water ring vacuum pump

使用说明书
Operating instructions



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SEAPUMP

上海海洋泵阀制造有限公司
SHANGHAI SEA PUMP & VALVE MFG CO.,LTD



企业简介 + AOBUTS

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“海洋水泵，泵的海洋”，海洋产品在全国各地设有分公司以及售后服务处，产品已应用于工矿企业、城市污水处理、城市供水、石油化工、农业灌溉等行业。本厂资金雄厚，生产设备先进，检测手段完善，并拥有一批高素质的专业人才队伍，同时ISO9001:2015国际质量管理体系的良好动作，为制造出优质、可靠的产品打下坚实基础。

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Shanghai HAIYANG pump & valve Co., Ltd. Is a joint-stock enterprises which specializes in the manufacture of water pumps, fire fighting equipment and pumps intelligent controlling production, sales in one. our company uses advanced software to develop and design products to ensure that customers provide better quality products.

" HAIYANG water pumps, pump of the sea", the HAIYANG products throughout the country with more than 30 branch offices as well as after-sales service, products have been used in industrial and mining enterprises, urban sewage treatment, urban water supply, petrochemicals, agriculture and irrigation sectors. Factory with a strong financial background, advanced production equipment and means of improving the detection and has a number of high-quality professional talent, while ISO9001: 2000 international quality management system of good moves, in order to create high-quality, reliable products to lay a solid foundation.

In this "people-oriented, Industrial Science and Technology; to use for Prudential, the quality of establishing themselves; to open up the courage to strive for progress; the pursuit of excellence, into the future" under the guidance of continuous innovation and development to forge ahead in long-term practice of the formation of a complete set of The quality system and is equipped with an installation of the maintenance of after-sales service team. Radiation sales outlets in major cities nationwide, product marketing provinces, municipalities and autonomous regions, and exports in countries such as South-East Asia. And first-class products, first-class service to win customers at home and abroad trust and praise. The Company take "everything for the customer satisfied" as the purpose, advance with the times, in the service of humanity home.

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用途及适用范围

2BV系列水环真空泵为整体结构-机泵同轴的单级泵。轴封采用机械密封，具有结构简单，安装简捷、元油、安全可靠等物点。

2BV系列水环真空泵适于抽除气体和湿润蒸汽，吸气压力可达到33mbar绝压(97%真空度)，当真空泵在吸气压力低于80mbar的状态下长期工作时，应联接汽蚀保护管以对泵进行保护，如配大气喷射器吸气压力可达10mbar，喷射器可直接安装在真空泵吸气口上，作为压缩机使用时，压力最大至0.26Mpa(绝压)。

2BV系列水环真空泵及压缩机被广泛用于石油、化工、制药、食品、制糖工业等领域。由于在工作过程中，气体的压缩过程是等温的，所以在压缩和抽吸易燃易爆气体时，不易发生爆炸，所以其应用更加广泛。

工作原理

如图(1)所示叶轮3偏心地安装在泵体之内，启动时向泵内注入一定高度的水，因此当叶轮3旋转时，水受离心力的作用而在泵体内壁形成一旋转水环1，水环下部内表面与轮毂相切，沿箭头方向旋转，在前半转过程中，水环内表面逐渐缩小，空间气体压力升高，高于排气口压力时，叶片间的气体自圆盘排气口被排出。如此叶轮每转动一周，叶片间的空间吸排气一次，许多空间不停地工作，泵就连续不断地抽吸或压送气体。

由于在工作过程中，做功产生热量，会使工作水环发热，同时一部分水和气体一起被排出，因此，在工作过程中，必须不断地给泵供水，以冷却和补充泵内消耗的水，满足泵的工作要求。

当泵排出的气体不再利用时，在泵排气口上接有气水分离器，废气和所带的部分水排入气水分离器后，气水分离，气体由排气管排出，留下的水经回水管供至泵内继续使用。随着工作时间的延长，工作水温度会不断地升高，这时需从供水管给冷水，以降低工作水的温度，保证泵能达到所要求的技术要求和性能指标。

当作为压缩机使用时，泵排气口接有气水分离器，气水混合物进入气水分离器后自动分惠，气体由排气管输送到所需系统而工作水经过分离器进入泵内。压缩气体时，工作水极易热，水由泵排气口排出，温度会变的较高，要由供水管不断地供给冷水，以补充被放走的水，同时起冷却作用，使工作水温度不致过高，从而保证压缩机性能，达到技术指标，满足工艺要求。

Purpose and scope of application

2BV series water ring vacuum pump is a single-stage pump with an integral structure of coaxial pump. The shaft seal adopts mechanical seal, which has simple structure, simple installation, primary oil, safety and reliability.

2BV series water ring vacuum pump is suitable for pumping out gas and wet steam. The suction pressure can reach 33mbar absolute pressure (97% vacuum degree). When the vacuum pump works for a long time under the condition that the suction pressure is lower than 80mbar, cavitation protection pipe should be connected to protect the pump. If the suction pressure of an atmospheric ejector can reach 10mbar, the ejector can be directly installed on the suction port of the vacuum pump. When it is used as a compressor, the maximum pressure is 0.26Mpa (absolute pressure).

2BV series water ring vacuum pumps and compressors are widely used in petroleum, chemical, pharmaceutical, food, sugar industry and other fields. Because the gas compression process is isothermal during the working process, it is not easy to explode when compressing and pumping flammable and explosive gases, so it is more widely used.

Working principle

As shown in Fig. (1), the impeller 3 is eccentrically installed in the pump body. When starting, a certain height of water is injected into the pump. Therefore, when the impeller 3 rotates, the water forms a rotating water ring 1 on the inner wall of the pump body under the action of centrifugal force. The inner surface of the lower part of the water ring is tangent to the hub and rotates in the direction of the arrow. During the first half of the rotation, the inner surface of the water ring gradually shrinks, and the space gas pressure increases. When the pressure is higher than the exhaust port pressure, the gas between the blades will flow from the disk. The exhaust port is vented. In this way, every time the impeller rotates, the space between the blades will suck and exhaust once. Many spaces will work continuously, and the pump will continuously suck or compress the gas.

During the working process, the work will generate heat, which will heat the working water ring, and some water and gas will be discharged together. Therefore, during the working process, the pump must be continuously supplied with water to cool and supplement the water consumed in the pump to meet the working requirements of the pump.

When the gas discharged from the pump is no longer used, a gas water separator is connected to the pump exhaust port. After the waste gas and part of the water are discharged into the gas water separator, the gas and water are separated, and the gas is discharged from the exhaust pipe. The water left is supplied to the pump through the return pipe for further use. With the extension of working time, the temperature of working water will increase continuously. At this time, it is necessary to supply cold water from the water supply pipe to reduce the temperature of working water and ensure that the pump can meet the required technical requirements and performance indicators.

When used as a compressor, the pump exhaust port is connected with a gas water separator, and the gas water mixture enters the gas water separator for automatic distribution. The gas is transported to the required system through the exhaust pipe, and the working water enters the pump through the separator. When compressing the gas, the working water is very hot, and the temperature of the water will become higher when it is discharged from the pump exhaust port. The water supply pipe shall continuously supply cold water to supplement the discharged water, and at the same time play a cooling role, so that the working water temperature will not be too high, so as to ensure the compressor performance, meet the technical indicators, and meet the process requirements.



图解

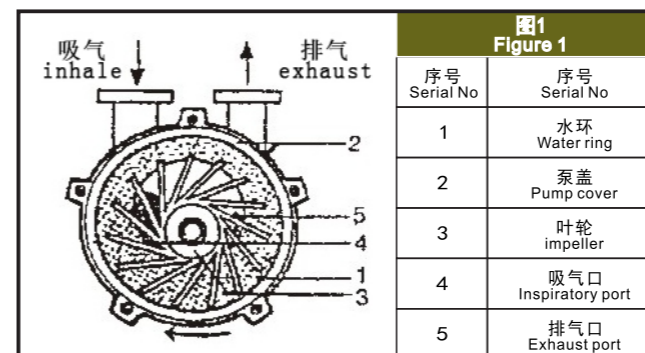
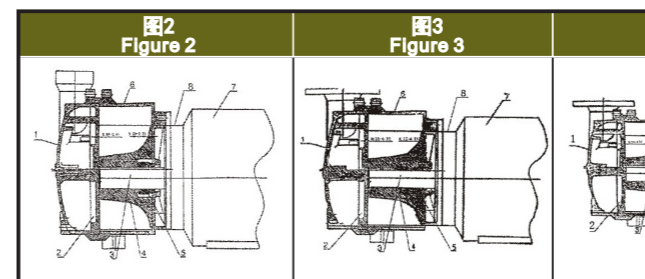


图1 Figure 1	
序号 Serial No	名称 Name
1	水环 Water ring
2	泵盖 Pump cover
3	叶轮 Impeller
4	吸气口 Inspiratory port
5	排气口 Exhaust port



Graphic

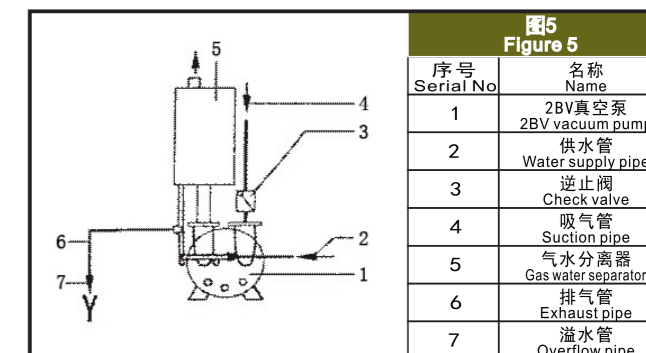


图5 Figure 5	
序号 Serial No	名称 Name
1	2BV真空泵 2BV vacuum pump
2	供水管 Water supply pipe
3	逆止阀 Check valve
4	吸气管 Suction pipe
5	气水分离器 Gas water separator
6	排气管 Exhaust pipe
7	溢水管 Overflow pipe

结构说明

泵由泵盖、泵体、圆盘，叶轮、机械密封、电动机等零部件组成。进气管排气管通过安装在泵盖上的圆盘上的吸气孔和排气孔与泵腔相连。轴偏心地安装在泵体中，叶轮用平键固定在轴上，泵两端的部间隙由泵体和圆盘之间的垫来调整，叶轮与泵盖上的圆盘之间的间隙由圆盘和泵体之间的垫来调整，叶轮两端面与泵盖上圆盘之间间隙决定气体在泵腔内由进气口至排气口流动中损失的大小及其极限压力。

泵的密封采用机械密封，机械密封安装在叶轮和泵体间。由机械密封定出叶轮与泵体之间的间隙。在泵盖上安装有圆盘，圆盘上设有吸、排气孔和柔性排气阀片，柔性阀片的作用是当叶轮叶片间的气体压力达到排气压力时，在排气口以前就将气体排出，减少了因气体压力过大而消耗的功率、从而降低率消耗。

设备说明

2BV系列水真空泵及压缩机系统由真空泵(压缩机)、电动机、气水分离器管路组成，如图5气示。

真空泵及压缩机与气水分离器的工作过程如下：气体由管路经阀门进入真空泵或压缩机，然后经排气管进入气水分离器中，经气水分离器排气管排出。当作为压缩机使用时，经压缩机排出的气水混合物在气水分离器中分离后，气体经阀门输送到需要压缩气体的系统上去。真空泵或压缩机内的工作水是由气水分离器不经冷却排至真空泵重新使用，其余工作水由供水管补充，供水量的大小，由供水管上的阀门来调整。

气体抽吸和压送系统的区别仅在干气水分离器的内部构造有所有同。抽吸气体时，吸气口压力低于大气压，而排气口压力等于大气压，气水分离器有溢水管；压送气体时，吸气口为常压(也可真空状态)，排气口压力高于一个大气压，为保证输送气体压力，气水分离器的水位通过溢水开关来控制。

Structure description

The pump is composed of pump cover, pump body, disc, impeller, mechanical seal, motor and other parts. The intake pipe and exhaust pipe are connected with the pump chamber through the suction hole and exhaust hole on the disc mounted on the pump cover. The shaft is eccentrically installed in the pump body. The impeller is fixed on the shaft with a flat key. The clearance between the two end faces of the pump is adjusted by the pad between the pump body and the disc. The clearance between the impeller and the disc on the pump cover is adjusted by the pad between the disc and the pump body. The clearance between the two end faces of the impeller and the disc on the pump cover determines the loss of gas in the pump cavity from the air inlet to the exhaust port and its limit pressure.

The pump is sealed by mechanical seal, which is installed between the impeller and the pump body. The clearance between the impeller and the pump body is determined by the mechanical seal. A circular disc is installed on the pump cover. The circular disc is equipped with suction holes, exhaust holes and flexible exhaust valve plates. When the gas pressure between the impeller blades reaches the exhaust pressure, the flexible valve plates discharge the gas before the exhaust port, reducing the power consumption due to excessive gas pressure, thus reducing the rate of consumption.

Equipment description

2BV series water vacuum pump and compressor system consists of vacuum pump (compressor), motor and gas water separator pipeline, as shown in Fig. 5.

The working process of vacuum pump, compressor and gas water separator is as follows: the gas enters the vacuum pump or compressor through the pipeline through the valve, then enters the gas water separator through the exhaust pipe, and is discharged through the exhaust pipe of the gas water separator. When used as a compressor, the gas water mixture discharged from the compressor is separated in the gas water separator, and then the gas is transmitted to the system requiring compressed gas through the valve. The working water in the vacuum pump or compressor is discharged from the air water separator to the straight air pump without cooling for reuse. The rest of the working water is supplemented by the water supply pipe. The water supply volume is adjusted by the valve on the water supply pipe.

The difference between gas suction and pressure delivery systems is only the same in the internal structure of the dry gas water separator. When pumping gas, the air inlet pressure is low dry atmospheric pressure, while the air outlet pressure is dry atmospheric pressure, such as dry atmospheric pressure, and the gas water separator has an overflow pipe; When the gas is compressed, the suction port is under normal pressure (or vacuum state), and the pressure at the exhaust port is higher than one atmospheric pressure. To ensure the gas pressure, the water level of the gas water separator is controlled by the overflow switch.



性能参数表

Performance parameter table

序号 Serial NO.	型号 Model number	极限真空度 Ultimate vacuum kpa	最大气量 Air Capacity m³/min	电机功率 Motor power kW	转速 Speed r/min	水耗量 Water consumption L/min	噪声 Noise A	重量 Weight kg
1	2BV2060	3.3	0.45	0.81	2880	~2	62	20
2	2BV2061	3.3	0.87	1.45	2880	~2	65	22
3	2BV2070	3.3	1.33	2.35	2880	~2.5	66	31
4	2BV2071	3.3	1.83	3.85	2880	~4.5	72	42
5	2BV5110	3.3	2.75	4	1450	~7	63	78
6	2BV5111	3.3	3.83	5.5	1450	~8.5	68	100
7	2BV5121	3.3	4.68	7.5	1450	~10	69	145
8	2BV5131	3.3	6.68	11	1450	~15	73	165
9	2BV5161	3.3	8.3	15	970	~20	74	252
10	2BV6110	3.3	2.75	4	1450	~7	63	107
11	2BV6111	3.3	3.83	5.5	1450	~8.5	68	142
12	2BV6121	3.3	4.68	7.5	1450	~10	69	198
13	2BV6131	3.3	6.68	11	1450	~15	73	238
14	2BV6161	3.3	8.3	15	970	~20	74	350

注:1、表中所列数据在下列条件下测出:

- ①大气压力101325Pa (1013mbar)
- ②进水温度15℃
- ③吸入空气温度20℃
- ④空气相对湿度70%

2、性能允许偏差: ±10%

Note: 1. The data listed in the table are measured under the following conditions:

- ① Atmospheric pressure 101325 Pa (1013 mbar)
- ② Water inlet temperature 15 °C
- ③ Suction air temperature 20 °C
- ④ Relative air temperature 70%

2. Allowable performance deviation: ± 10%

设备安装

1、泵的安装

真空泵和压缩机在安装时, 安装面必须水平, 并通过底角的孔用螺栓安装牢固。为防止安装时焊渣进入真空泵, 在安装时, 应在吸气管上安装上过滤网。

2、气水分离器的安装

气水分离器可直接安装在真空泵的排气口上, 并用螺栓固定牢固。气水分离器有一管路与泵相连, 由此供给泵工作需水量, 其余工作水由供水管供给, 供水量大小由管路上的阀门调节。

真空泵或压缩机的进气管上应装有逆止阀, 以便在停车时, 防止真空泵或压缩机内的水在排气管方面的压力作用下返回系统。

启动及停车

1、启动

长期停车的泵在开动以前, 必须用手转动数圈, 以证实泵内没有卡住或其它损坏现象。

启动按以下顺序进行(参见图5)

- (1) 打开排气管阀门。
- (2) 启动电动机(应注意电机的正反转)
- (3) 迅速打开图5供水管2. 逐渐增加供水量, 至供水量符合规定要求为止, (应注意不要干运行真空泵)。

2、停车

停车按以下顺序:

- (1) (如进气管有阀门)关闭进气管上的阀门。
- (2) 关闭供水管2, 并迅速关停真空泵。
- (3) 停车后应将泵腔内的水放掉, 以免再次启动时, 会造成叶片与泵轴断裂。

Equipment installation

1. Installation of pump

When installing the vacuum pump and compressor, the mounting surface must be horizontal and firmly installed with bolts through the holes at the bottom corner. In order to prevent welding slag from entering the straight air pump during installation, a filter screen shall be installed on the suction pipe during installation.

2. Installation of gas water separator

The air-water separator can be directly installed on the exhaust port of the vacuum pump and fixed firmly with bolts. The air-water separator has a pipeline connected with the pump to supply the working water demand of the pump, and the rest of the working water is supplied by the water supply pipe. The water supply is regulated by the valve on the pipeline.

The intake pipe of the vacuum pump or compressor shall be equipped with a check valve to prevent the water in the vacuum pump or compressor from returning to the system under the pressure of the exhaust pipe during shutdown.

Start and stop

1. Start

Before starting the pump that has been stopped for a long time, it must be turned for several turns by hand to verify that there is no seizure or other damage in the pump.

Start in the following order (see Figure 5)

- (1) Open the exhaust pipe valve.
- (2) Start the motor (pay attention to the forward and reverse rotation of the motor)
- (3) Quickly open Figure 5 water supply pipe 2. Increase the water supply gradually until the water supply meets the specified requirements (be careful not to run the vacuum pump dry).

2. Parking

Stop in the following order:

- (1) (If the air inlet pipe has a valve) Close the valve on the air inlet pipe.
- (2) Close the water supply pipe 2 and shut down the vacuum pump quickly.
- (3) After shutdown, the water in the pump chamber shall be drained to prevent the blade and pump shaft from breaking when starting again.

维护

1、为避免磨损叶轮、泵体或卡住叶轮, 随气体和工作液进入泵腔的灰尘颗粒, 可通过泵底部的冲洗口冲洗掉。

2、如果用硬水作工作液, 须经软化, 或在一定周期内用溶液清洗泵。

3、电动机常工作的轴承比周围温度高15℃~20, 最高不允许超过55℃~60℃, 正常工作的轴承每年应装油1-2次, 每年至少清洗轴承一次, 并将润滑油全部更换。

4、采用的机械密封, 出现泄漏现象, 应检查机械密封的动、静环是否已损坏, 或是密封圈已老化, 如出现上述情况, 均需更换新零件。

故障和解决方法

Maintain

1. To avoid wearing the impeller, pump body or jamming the impeller, the dust particles that enter the pump chamber with gas and working fluid can be washed away through the flushing port at the bottom of the pump.

2. If hard water is used as working fluid, it must be softened, or the pump shall be cleaned with solution within a certain period.

3. The temperature of the bearing in normal operation of the motor is 15 °C~20 °C higher than the ambient temperature, and the maximum temperature is not allowed to exceed 55 °C~60 °C. The bearing in normal operation shall be filled with oil 1-2 times a year, and the bearing shall be cleaned at least once a year, and all lubricating oil shall be replaced.

4. In case of leakage of the mechanical seal used, check whether the dynamic and static rings of the mechanical seal are damaged or the seal ring is aged. In case of any of the above conditions, replace them with new parts.

Faults and solutions

故障 failure	原因 Cause	解决方法 resolvent
电机不起动; 无声音 The motor does not start; No sound	两根电源线断裂 Two power lines are broken	检查接线 Check wiring
电机不起动; 有嗡嗡声 The motor does not start; There is a buzz	一根接线断, 电机转子堵转叶轮故障电机轴承故障 One wire is broken, motor rotor is blocked, impeller is faulty, motor bearing is faulty	必要时排空清洁泵, 修正叶轮间隙换叶轮换轴承 Drain and clean the pump if necessary, correct the impeller clearance, replace the impeller and replace the bearing
电机开动时, 电流 断路器跳闸 When the motor starts, the current circuit breaker trips	绕组短路 电机过载 排气压力过高 工作液过多 Winding short circuit Motor overload Exhaust pressure is too high Excessive working fluid	检查电机绕组 降低工作液流量 降低排气压力 减少工作液 Check the motor winding Reduce the working fluid flow Reduce the exhaust pressure Reduce working fluid
消耗功率过高 Power consumption is too high	产生沉淀 Precipitate	清洁、除掉沉淀 Clean and remove sediment
泵不产生真空 The pump does not produce vacuum	无工作液 系统泄漏严重 旋转方向错 No working fluid Serious system leakage Wrong direction of rotation	检查工作液 修复泄漏处 更换两根导线改变旋转方向 Check the working fluid Repair the leak Replace two wires to change the direction of rotation
真空度太低 The vacuum is too low	泵太小 工作液流量太小 工作液温度过高 (<15℃)磨蚀 系统轻度泄漏 密封泄漏 The pump is too small Working fluid flow is too small Working fluid temperature is too high (<15 °C) Abrasion Slight system leakage Seal leakage	用大一点的泵 加大工作液流量 冷却工作液, 加大流量 更换零件 修得泄漏处 检查密封 Use a larger pump Increase the working fluid flow Cooling the working fluid and increasing the flow Replace parts Repaired leak Check the seal
尖锐噪声 Sharp noise	产生气蚀 工作液流量过高 Cavitation Working fluid flow is too high	联接气体蚀保护件 检查工作液, 降低流量 Connecting gas corrosion protection parts Check the working fluid and reduce the flow
泵汇漏 Pump manifold leakage	密封垫坏 The sealing gasket is damaged	检查所有密封面 Check all sealing surfaces