

WQN 型系列 新型潜水排污泵

WQN SERIES IMPROVED SUBMERSIBLE SEWAGE PUMPS

使用说明 OPERATING INSTRUCTIONS



中美合资
Sino.-U.S.

浙江克瑞丰球泵业有限公司

FENGQIU (ZHEJIANG) PUMP CO., LTD.



WQN 型系列新型潜水排污泵

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一、简介

浙江克瑞丰球泵业有限公司是浙江丰球集团与美国克瑞泵与系统公司共同出资组建的中美合资企业。公司注册资金 1442 万美元。主要生产“丰球”和“克瑞”系列的各类泵与系统。

丰球集团是中国国内泵行业中的骨干重点企业和国家重点高科技技术企业，丰球牌泵在中国国内享有较高的知名度。

克瑞泵与系统公司是美国久负盛名的泵生产厂家，已有一百多年的历史，技术力量雄厚。克瑞泵与系统公司在许多国家拥有品牌知名度和强大的国际销售网络。

克瑞丰球的合作，实现了双方的优势互补，融合了美国的先进技术，工艺和管理理念。克瑞丰球将合力打造中国国内泵行业的航空母舰……

WQN 系列新型潜水排污泵是公司在引进国外先进技术基础上研制成功的新一代潜污泵产品，具有高效区宽广、运行效率高、通过能力强、使用寿命长、安装方便、控制功能齐全等特点，是 WQ 型无堵塞潜水排污泵理想的更新换代产品，尤其在电机冷却和产品环保技术上更具特色。

1. Brief Introduction

Crane Fengqiu (Zhejiang) pump Co., Ltd. Is a Sino-US joint venture company, with registered capital of 14.42 million US dollars, invested by Zhejiang Fengqiu Group Co., Ltd. And Crane Pumps & Systems. We mainly manufacture various types of “F&Q” and “Crane” pumps series.

Fengqiu is ranked as one of the key pump manufacturers and has been a major and high-tech enterprise in Chinese domestic market. F&Q is a well-recognized Chinese pump brand. Crane pumps & Systems is a famous company in the pump industry with a history over 100 years. The company is renowned for its advanced technology and excellent worldwide sales network.

With our combined strength, we integrated our state of the art technology and management philosophy. We are certain that we will have great opportunity for significant future growth in both China and international market.

WQN series improved submersible sewage pumps based on foreign advanced technology are new sewage pumps developed by the Corporation, featuring excellent hydraulic abilities, high efficiency, long service life, easy to be installed and fully automatic operation, etc., especially the motor cooling and environment protection Technology, it's a perfect new product based on the old product WQ series improved submersible sewage pump.

二. 产品特点

我公司最新研制的 WQN 新型潜水排污泵继承原有 WQ 潜水排污泵的所有优点,并在此基础上有了突破性的改进与提高。该产品填补了国内空白,处于国际领先地位,可广泛使用于各种污水处理场合,主要特点表现为:

1. 过流部件设计独特,高效区域宽,具有全扬程(无过载)特性。泵能在全扬程范围内高效、安全运行,更加符合污水处理的需要。
2. 通过能力强。叶轮的大通道防堵塞设计使泵能有效地输送含有直径达 125 毫米的固体颗粒、杂质、长纤维等的污水。
3. 泵的性能稳定,该系列泵的叶轮与泵壳的间隙可以调整,泵始终运行在高效区域。
4. 泵的可靠性大幅度提高,泵的主轴长度更短,主轴刚性进一步增强,运行时振动噪音低,泵的密封性能进一步提高,控制系统进一步优化,控制系统可靠性显著提高。
5. 泵和维护更加简便,叶轮与主轴采用锥度配合,拆装相当方便,叶轮与主轴配合完好,无磨损、无松动。
6. 电机的冷却系统有了根本性的改进,以往的电机冷却系统虽采用冷却套,但易产生冷却套污水污物堵塞现象,且都存在冷却水量小、冷却不完全、电机易发热等缺点。
7. 配有漏水、漏电、漏油、过载、欠压、缺相等多项报警保护系统和液位控制系统,并对各种运行状态进行集中控制和有效的保护。
8. 自动安装系统设计合理,强度好,安装灵活简便,无需建造泵房,可大幅降低工程造价。
9. 采用进口优质轴承和机械密封,结构选材优良,整机无故障运行时间高达一万小时。
10. 该泵可广泛使用于各种污水场合,对于输送污泥含量大、污水温度高的液体,效果最为明显。
11. 采用干式安装时,无需另配冷却循环水系统。

2. Characteristics

The newly developed WQN submersible sewage pump not only inherits all the advantages in WQ series but also has significant improvements based on the old product; it is the first in domestic market and ranks top in international market. The new product is specially designed to meet the demand of sewage delivering, mainly featured in the following aspects as below.

1. Unique hydraulic design provides excellent hydraulic abilities, non-loading characteristic, allowing the pump to run with high efficiency and safely in higher capacity.
2. Excellent hydraulic abilities. The pump's high capacity and non-clogging impeller is capable of handling 125mm spherical solids and lint-providing long life in demanding applications.
3. Stable pump performance. The gap between impeller and pump casing can be adjusted, which makes the pump run in the high-efficiency field all the time.
4. Better reliability. The product has much shorter shaft, stronger rigidity, less operation noise, better sealing, optimized control system, and more reliable control system.
5. Better design for pump's maintenance. The taper design is applied between impeller and shaft, which is much easier for disassembly, the impeller and shaft fit well each other without getting worn and loosed.
6. Fundamentally improved in motor's cooling system. The old cooling system is prone to have cooling shroud clogging problem, and has the weakness as small amount of cooling water, incomplete cooling function, and motor easy to get heated.
7. The pump is equipped with fully automatic alarm protection system and liquid level control system to protect the pump against water, oil or electricity leakage, overloading, overheating and lack of phase, etc. in addition, the pump is controlled in various status and we ensure it is operating properly.
8. The automatic installation system provides an easy way of being installed and maintained; especially no pumping station is needed.
9. The pump employs exotic high quality bearing and mechanical seal; the whole machine can run without failure 10,000 hours.
10. The pump can be widely applied in sewage delivering, especially delivering the high temperature liquid and the liquid with heavy silt.
11. Another cooling circulation system is not needed when using dry installation.

三. 新型冷却系统的特点

新型冷却系统采用最新的冷却技术，冷却效果特别明显，主要有下述特点：

- A. 冷却液采用专用冷却剂，沸点高（高达 195°C ），冰点低（达 -40°C ），且溶于水，不会造成二次污染。
- B. 装在封闭系统内的冷却液与污水输送介质完全隔离，稳定性好，一般2年更换一次。
- C. 冷却系统内部设置循环叶轮及热交换器，设计有专用循环通道，经过电机外壳的冷却液通过热交换器与输送介质进行充分热交换，冷却液循环速度快，流量大，散热效果特别好。经测定，电机温度 $\leq 35^{\circ}\text{C}$ 。
- D. 冷却系统拆、装及冷却液灌装、更换方便，无需拆卸电机、水泵。

3 *3.Characteristics of brand new cooling system*

The new cooling system uses the newest cooling technology and its effect is perfectly distinct. It is featured in the aspects as below.

- A. The dedicated refrigerant applied has the advantages as high boiling point (reach to 195°C), low freezing point (reach to -40°C), and it is dissolvable without causing secondary pollution.
- B. The cooling liquid installed inside the closed system is completely separated from the sewage delivering medium, it is often replaced twice a year.
- C. A circulated impeller and a heat exchanger are equipped inside the cooling system with a dedicated circulating path, the cooling liquid across the motor housing exchanges heat with the delivering medium through heat exchanger, with the cooling fluid's high speed circulation and large capacity, the heat surrounding the motor housing can be removed quickly, it is tested that the motor temperature is less than 35°C .
- D. Convenient assembling and disassembling for the cooling system. Without disassembling the motor and the whole machine, the cooling system is easy to be assembled and disassembled. We can easily pour in the cooling liquid into the system and change the liquid if needed.

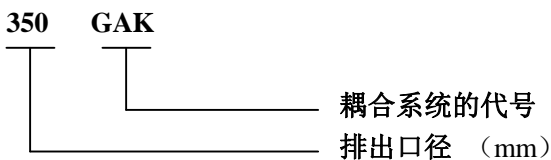
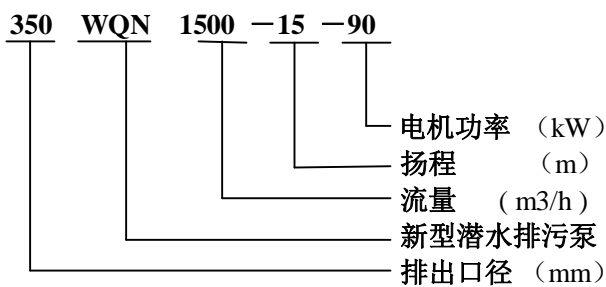
四、产品适用范围

广泛使用于市政污水处理工程、工矿企业、医院、宾馆、饭店、建筑等行业各种污水污泥的排放，也可用于水利防洪排涝和农田灌溉。

五、使用条件

1. 水温不超过 60℃
2. 液体的 PH 值为 4~10
3. 颗粒直径 6~125 mm

六、型号说明



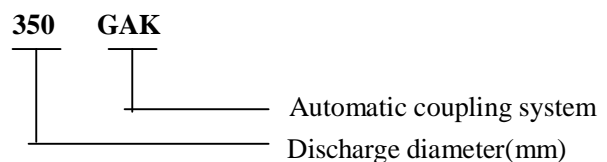
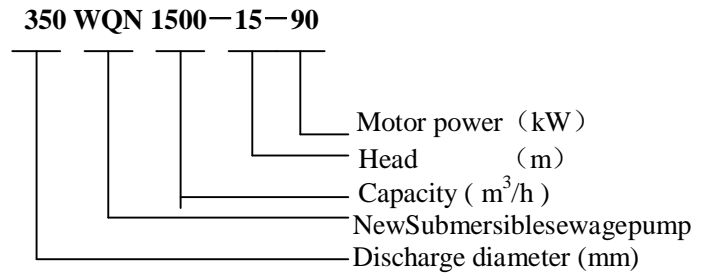
4. Application fields

WQN series developed submersible sewage pump is specially designed to meet the demand of delivering waste water and sewage in municipal engineering, industry, hospitals, hotels and commercial building applications, it is also used for flood control and drain flooded fields in water conservancy and farmland irrigation.

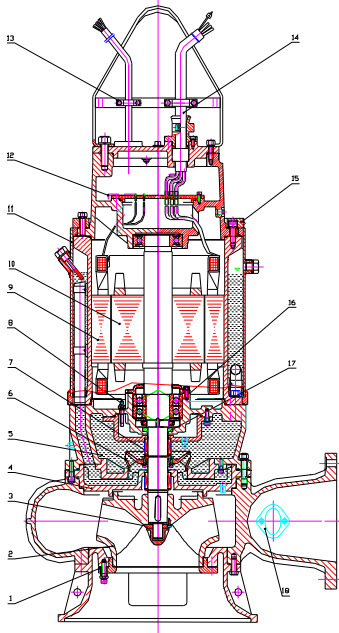
5. Operating conditions

1. Liquid temperature limit: 60℃ maximum
2. The PH value is between 4 and 10
3. Solids handling capabilities: 6-125mm diameter.

6. Type designation



七. 结构简介



18.5KW 及以上

1. 叶轮间隙调节装置
2. 高效，无阻塞的水力部件
3. 结实可靠的叶轮夹紧装置
4. 热交换装置
5. 冷却专用冷冻液
6. 强制循环冷却叶轮
7. 机械密封
8. 泄漏探头
9. 定子，F级绝缘，每相均装有热保护元件
10. 转子，主轴材料为不锈钢
11. 冷却套
12. 接线盒泄漏探头
13. 电缆夹紧装置，有效释放应力，防止电缆扯断
14. 水密电缆，该设计为外皮及线芯全密封结构
15. 冷却套压板
16. 主轴承，SKF
17. 唇形密封圈
18. 清污盖

7. Structure

1. Impeller clearance adjusting set-up
2. Non-clogging hydraulic component with high efficiency
3. Reliable impeller clamping set-up
4. Heat exchanger
5. Coolant used for cooling
6. Forced oil circulation cooling impeller
7. Mechanical seal
8. Leakage probe
9. Stator, class F insulation, each phase equipped with heat protector.
10. Rotor, shaft is stainless steel.
11. Cooling shroud.
12. Leakage probe for junction box.
13. Cable clamping set-up to release the stress for protecting cable
14. Watertight cable, the scarfskin and core are all sealing structure.
15. Cooling shroud clamp plate
16. Headstock, SKF.
17. Lip type packing
18. Sewage cleaning cap

十. 安装方式

根据安装原理决定泵的安装方式：湿式安装（泵潜入液体中）、干式安装（泵与液体分离）。

1. 固定湿式安装

水泵在集水坑中沿导杆下滑到底座出水口位置,通过泵的自重,自动耦合密封,维修时无需维修人员进出污水池。

2. 固定干式安装

泵装于集水池之外侧，与进水管一起固定在底座上，由于泵内设置闭式自循环冷却系统，可确保水泵在满载条件下安全、正常运行。此种安装方式还可避免水流对集水坑的连续冲击对水泵的影响，同时也可防止意外的泛滥。另外，当输送腐蚀性较强的液体时，只需过流部件采用耐腐蚀不锈钢。

10.Types of installation

The pump should be installed in the liquid (submerged in the liquid), in a dry place (in separate pump chamber) or in a removable way.

1.Stationary wet installation

For

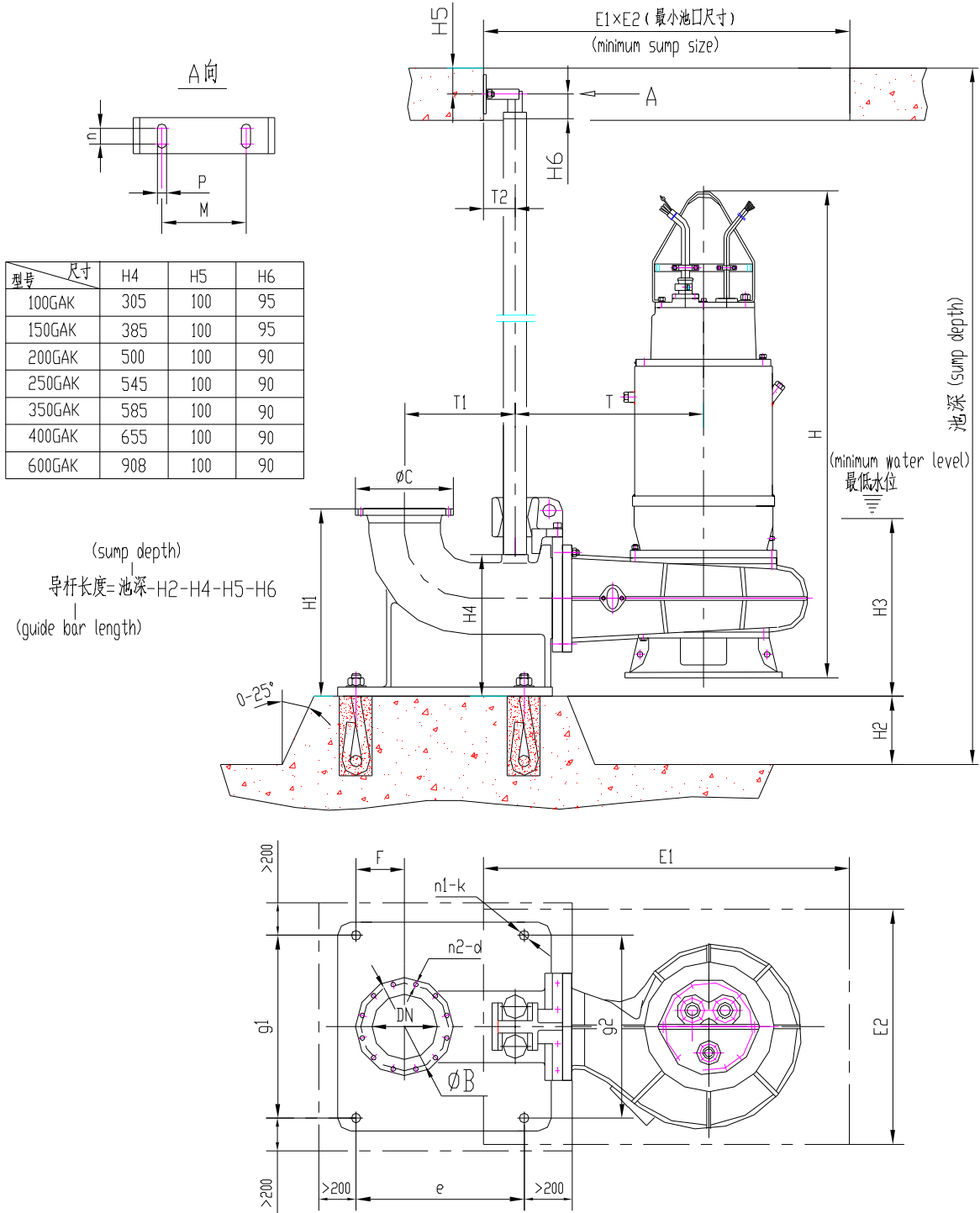
For wet installation way, the pump is equipped with a suspension device placed directly on the floor of a solid chamber (sump), this permits easy withdrawal of the pump from the sump without loosening screwed connections, and the pump can be reinstalled. The special coupling flange engages automatically with the support elbow at the foot of rigid riser pipe.

2.Stationary dry installation

For dry installation way, the pump is equipped with a duckfoot elbow placed directly on the floor of a solid chamber (sump), and provide a closed water self- circulation cooling system, as well as assisting in dissipating heat from the motor. They continue to work when submerged in case of floods, leakage or rupture of hydraulic accessories or pipelines. In addition, only corrosion proof stainless steel is needed for the flow path components in case of delivering the high-causticity liquid.

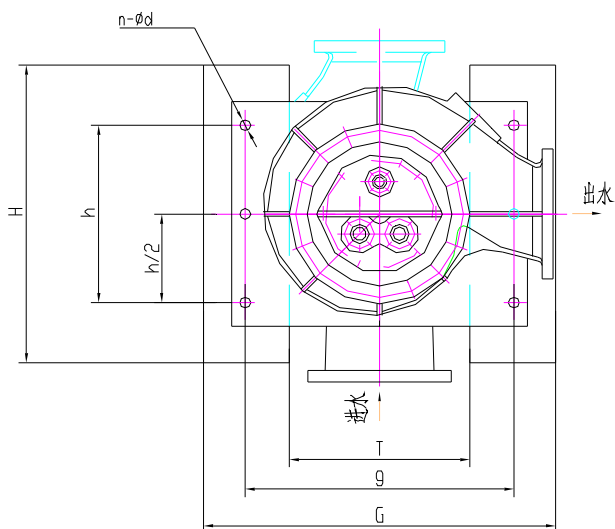
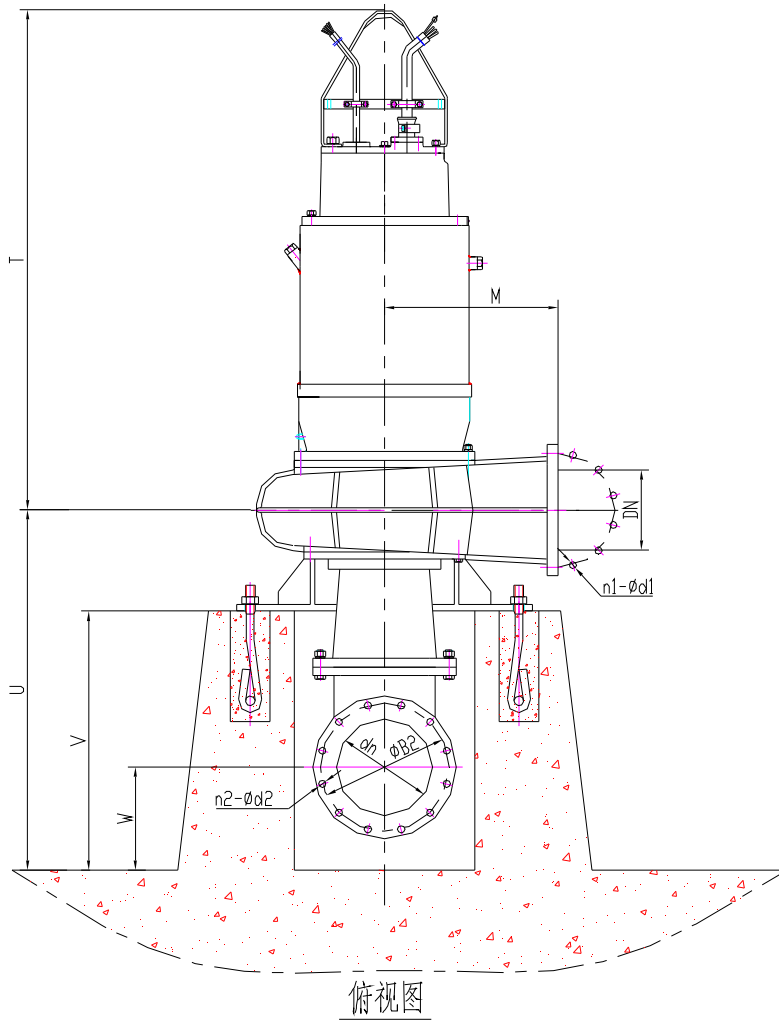
湿式自动安装

Wet auto-installation



干式安装图

Dry Installation



注：也可按用户要求将出水口与进水口安排在同一直线上。

Note: The discharge can be designed as well aligned with the inlet per customer's requirement.

十三. 安装与使用时提请用户检查

正常情况下，我公司产品已经过严格的检查和测试，用户可参照下述使用水泵。

1. 泵在运输、存放、安装过程中有无变形或损坏、紧固件是否松动或脱落。
2. 检查外表面，是否有专用冷却剂泄漏。
3. 叶轮转动是否灵活。
4. 电源装置是否安全、可靠、正常。电压、频率应符合规定（电压为 $380V \pm 5\%$ 、频率为 $50HZ \pm 1\%$ ）。
5. 电缆线有无破损、折断，电缆线的入口密封是否完好，发现有可能漏电或泄漏的地方及时妥善处理。
6. 严禁把泵的电缆线当作吊线使用，以防发生意外。
7. 用 500V 兆欧表定期测量电泵电动机相间和相对地间绝缘电阻，其值不许小于 $2M\Omega$ ，否则应拆机检修，同时检查电泵接地是否牢固可靠。
8. 电泵不宜在易燃，易爆的环境中使用，也不宜抽送强腐蚀性以及可燃性的液体。
9. 电泵正常工作时的旋转方向从进水口看为逆时针转动，如电泵反转，须将电缆线中的任二根线对调一下接线位置即可。
10. 为了确保电泵的使用寿命，使其更好地为您服务，建议在正常工作条件下电泵运行一年后对电泵进行一次检修，更换机械密封件、易损件、补充或更换轴承润滑脂（封闭轴承在使用寿命内不必更换润滑脂）。
11. 叶轮和泵体之间的密封环具有调节功能，为了确保电泵抽水效率，当密封环磨损，导致流量、效率下降时，可以通过调节装置调整与叶轮的间隙。
12. 电泵长时间放置不用时宜将电泵从水中取出，以减少电机定子绕组受潮的机会，延长电泵的使用寿命。当气温较低时，也应将泵提出，防止冰冻。
13. 电泵在移动或安装时应轻起轻放。

13. Before operation, read the following instructions carefully. Reasonable care and safe methods should be practiced.

In normal case, our products are all strictly inspected and tested, and customers can operate the pumps as per the following aspects.

1. Check whether pump has become deformed or damaged, and locking parts have become loose or fallen off when pump is transported, place or installed.

2. Check if there is any coolant leakage outside of the pump.

3. Check whether impeller rotates normally.

4. Check power source, voltage and frequency and make sure they are the given values (Voltage $380 \pm 5\%$, Frequency $50Hz \pm 1\%$).

5. Check cable, connector box and cable inlet seal. Take measures immediately when you find leakage or possible leakage of electricity.

6. Prohibit lifting pump with cable to avoid being damaged.

7. Use 500v megohmmeter to check resistance of motor windings for ground, value must be more than $2M\Omega$. If not, a leakage through stator insulation or moisture in windings occurs and pump must be examined and repaired.

8. Do not pump flammable and explosive liquids and strong chemicals.

9. Check pump rotating direction. It should be in counter clockwise revolution when seem from inlet side. Exchange any two wires inside the cable if you find pump rotates in reverse.

10. If pump has been operating for one year, it is recommended that pump be examined and repaired to replace oil in oil chamber, mechanical seal, bearing lubricant and other vulnerable parts to insure pumping system is working properly when needed. It is not necessary to replace lubricating in enclosed bearing grease during service life.

11. The seal ring between impeller and pump housing plays the role of adjusting the gap to ensure pumping efficiency. We need to adjust the impeller gap to ensure the capacity and efficiency in case the seal ring get worn out.

12. If pump lies idle for months at a time, it is recommended that pump be taken out of water to avoid windings being dampened, and we can extend its service life, especially to prevent pump from being frozen up in cold day.

13. While removing or installing pump, make sure it is handled up and down carefully.

十四、可能发生的故障和排除方法

仔细核对下列记录，可能找到排除故障的方法，因而节省您的时间和费用。

14.Trouble Shooting

Check the following,you may find the solution to your problem and save your time and money.

故障现象 Trouble	产生原因 Causes	解决办法 Remedies
不出水或水量不足 Pump does not deliver water or only deliver less amount of water.	1. 泵倒转 1. Pump may be installed backwards.	调整转向 Adjust rotating direction.
	2. 管道、叶轮被堵 2. Pipe or impeller may be clogged.	清除堵塞物 Remove pump and clean pipe or impeller.
	3. 电机不转或转速太小 3. Motor does not run or run slowly.	检查阀门 Check valve.
	4. 水位太低或阀门没打开 4. Water level may be too low or valve is not opened.	调整检查水位开关和阀门 Adjust water level and check valve.
	5. 密封环磨损 5. Seal ring may be worn out.	通过叶轮间隙调节装置调节间隙 Replace seal ring.
	6. 抽送液体密度较大或粘度高 6. Pumping liquids of high gravity or viscosity.	改变抽送的液体 Dilute pumping liquid.
泵运行不稳定 Pump is not operating free from vibrations and shocks.	1. 转子或叶轮不平衡 1. Rotor or impeller may be defective.	送制造厂校正或调换 Return pump to service center for verifications or replace it.
	2. 轴承磨损 2. Bearing may be worn out.	更换轴承 Replace bearing.
绝缘电阻低或机组发热 Low insulation resistance or pump system overload.	1. 电缆线破损或电源接线端渗漏 1. Cable may be damaged or power cord may be loosely fixed.	更换并拧紧压紧螺母 Replace and tighten locking nut.
	2. 电源电压低或电源引线过细 2. Power voltage may be too low or power cord may be too thin.	调整工作电压和引线 Adjust power volage or replace power cord.
	3. 机械密封损坏 3. Mechanical seal may be worn out.	更换机械密封 Replace mechanical seal
	4. 各“O”型密封圈失效 4. “O” seal ring may be damaged.	更换“O”型密封圈 Replace “O” seal ring
	5. 在大流量、低扬程区域使用 5. Pump may be used for over-large capacity and over-low head.	调整至额定工作点 Adjust pump to rated duty point.
电流过大 over current	1. 工作电压过低 1. Low voltage.	调整工作电压 Adjust voltage.
	2. 管道、叶轮堵塞 2. Impeller clogged.	清理管道和叶轮堵塞物 Unclog or clean impeller.
	3. 抽送液体的密度较大或粘度较高 3. Liquid density is too large or viscosity is too high	改变抽送液体的密度或粘度 Change the liquid density and viscosity
	4. 阀门开度较大 4. Valve open widely.	减小阀门开度 Adjust the valve.

十五、关于控制柜和端子箱（详见本公司的控制柜使用说明书）

1. 控制柜

A) JKI 型系列电机自耦减压启动控制柜产品适用于交流 50HZ (60HZ)，电压 380V，功率从 1.1-250KW，三相鼠笼型感应电动机自耦减压启动，并可加速电动机至额定转速和停止电动机，对电动机具有过载、缺相、短路等多种保护，该系列产品专门为本厂潜污泵作配套时，增加了电机定子超温保护、水泵油室漏油漏水保护以及电缆线破损漏水保护并对各种故障作出相应显示，实现泵的无人看管、自动运行和信号输出。有手动和自动两种方式。

B) 使用环境

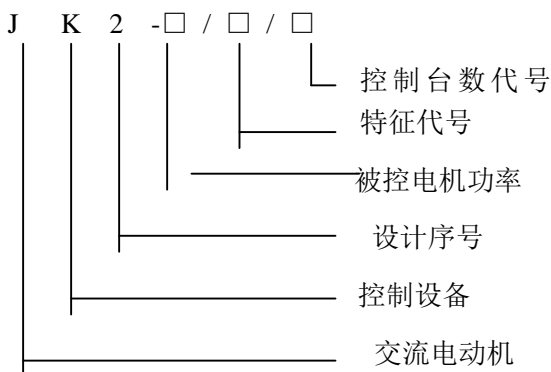
控制柜在下列环境中能可靠工作：

- 1) 最高环境温度不超过+40℃，最低不低于-5℃
- 2) 空气月平均最大湿度不大于 90%（平均气温为 25℃）
- 3) 无爆炸危险的场合，且介质中无足以腐蚀金属和破坏绝缘的气体 and 导电尘埃。
- 4) 海拔高度不超过 2000 米

C) 种类

控制柜有一控一、一控二、一控三、一控四共四种类型，请在订货时注明

D) 产品型号意义



15. Control cabinet and terminal box

(See installation instructions of control cabinet in all details)

1. Control cabinet

A) JKI series control cabinet provides coupling start for three phase squirrel cage induction motor, 380V/50Hz(60Hz), power 18.5 to 250kW, adjusting motor speed to rated values or stopping run, in addition, protecting motor against overloading, lack of phase and short circuit, etc., especially equipped with our submersible sewage pump, the cabinet design provides such flexibility in adding options that stator circuit breaker protection, oil or water leakage alarm and cable rupture protection, the panels may display the relative failure information. Control cabinet provides with manual and automatic control functions.

B) Operating conditions

- 1) Ambient temperature : -5℃ to 40℃.
- 2) Average humidity below 90% (average temperature : 25℃)
- 3) Avoid using the cabinet in a harsh environment such as locations with danger of explosive, metal corrosion and insulation damage, much conductive dust in the air.
- 4) Elevation: below 2,000 meters.

C) Types

There are four types for selection.

- 1 cabinet controls 1 pump
- 1 cabinet controls 2 pumps
- 1 cabinet controls 3 pumps
- 1 cabinet controls 4 pumps

D) Type designation

2. 端子箱

每台水泵都配有一只中间端子箱，用于水泵与控制柜的中间连接，详见示意图。

1. 信号线和动力线必须分别埋设管道、不可两线混穿。
2. 动力线按提供的电缆线直径、数量自行确定预埋管的大小。
3. 端子箱与控制柜之间采用直流电流信号，可长距离输送，无衰减。

2. Terminal box

Each pump is equipped with a terminal box to connect control cabinet with pump. For more details, see the diagram.

1. The piping for signal line and the piping for power line must be laid separately. Don't mix up the two lines.
2. The size of power line piping is selected by yourself in accordance with the cable diameter and number.
3. DC signals are transmitted between terminal box and control cabinet, suitable for long-distance transmission with attenuation.

