目　录

注　意

□请仔细阅读本说明书，理解各项内容，以便能正确安装、运行、操作和保养维护等。
□本说明书应保存在实际最终使用人的手中。
□本产品技术规范可能发生变化，恕不另行通知。

一、结构特点及设计优点

JLZ系列高效砂浆循环泵是我公司在JLNZ系列渣浆泵、成功设计制造的经验基础上，针对我国太阳能硅料工业中料浆用泵的特点，吸收国内同类产品的先进技术，精心研制的新一代系列砂浆泵。适用于PH值：2.5～13，砂浆比重:≤2，介质温度：4℃～100℃。

砂浆循环泵是硅料切片装置中的关键设备之一，装置对其可靠性及使用寿命有很高要求，因此，砂浆循环泵应具有较高的效率及耐磨性和良好的抗汽蚀性能。泵的水力设计、结构设计以及过流部件材料的选择直接关系着泵运行的效率、可靠性和使用寿命。

我们开发的砂浆循环泵，泵体、泵盖等过流件采用Cr26材料，叶轮、叶轮螺母、后挡水圈采用SS304材料。

泵的水力设计，借鉴了川大杜教授固液两相流泵的设计制造技术，并采用现代化的CAD、CFD技术进行修正。泵的结构如图1所示：

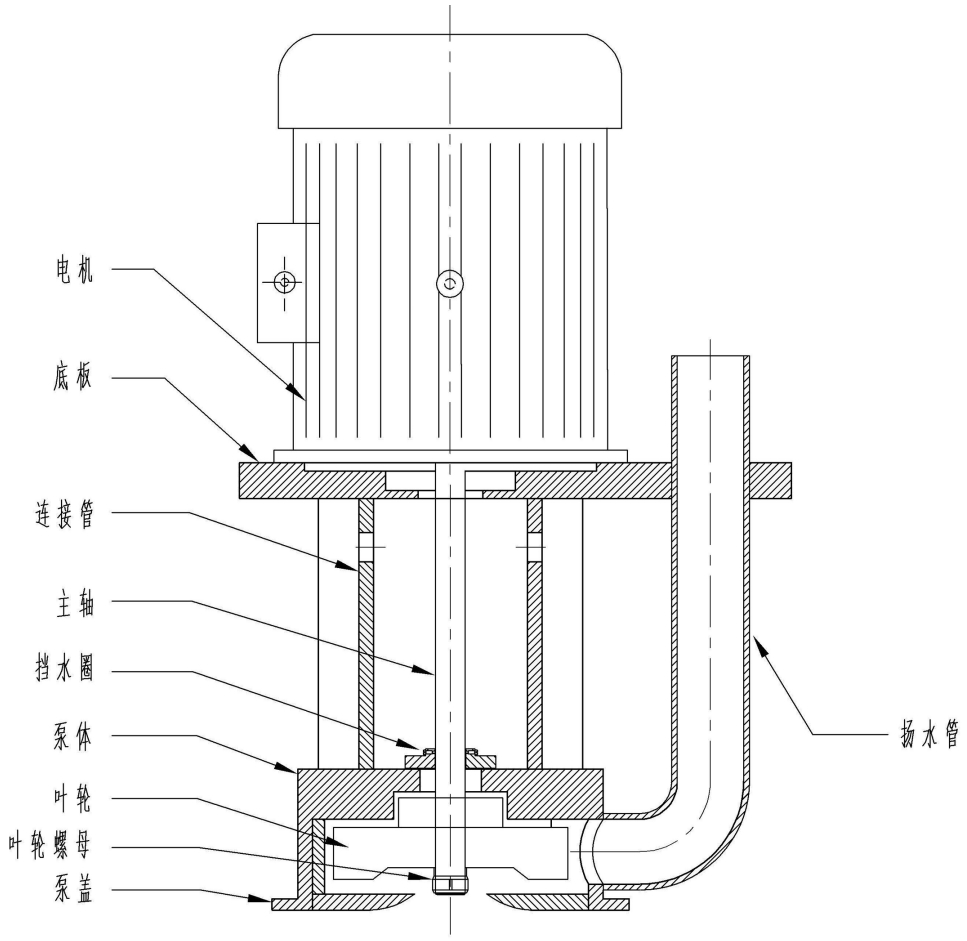

图1.JLZ系列高效砂浆循环泵结构图

1、结构特点

（1）泵为单级单吸立式离心泵，叶轮叶片为开式结构。该形式在实践中已证明特别适用于硅料切片装置中料浆回收池里的高浓度、磨蚀性料浆的循环泵送。

（2）叶轮、泵体不采用口环密封形式，口环的设置将会被浆体快速磨损，从而导致泵的效率快速下降。

（3）具有轴向调节结构，能方便轴向调节保持叶轮与前盖板泵体流道的间隙，从而保持泵的高效率。这是始终保持泵高效运行的最简便和最有效的办法。

（4）泵的轴向推力由电机承受，轴承采用脂润滑。轴承安装在有橡胶密封圈辅助密封的轴承盒内，防止污物和水进入。

（5）泵与电机共用一根轴，轴为大直径、短轴头，可以减少轴在工作中的挠曲，从而提高了泵组运行的可靠性。

2、料浆循环泵的设计优点

总述：背拉出式设计：整条轴部件可以从电机端拉出，易于维护，比传统联轴器型式安装更方便，更简洁，轴的同心度更高，运行可靠性更高。

前拉出式设计：耐磨板、叶轮可由进口端拆卸，水泵在安装板以下长度可以根据客户要求进行调节。

●泵体：

泵体尺寸足够承压及耐磨，材料采用Cr26整体加工，可焊，蜗舌部分特殊耐磨处理，流道切线出口。

●叶轮：

材料为SS304，考虑到长期运行更为经济，当叶轮有磨蚀的情况，叶轮可以重新加工，更换叶片延长使用寿命。前叶片高度低的结构可防止大的颗粒冲到叶轮与耐磨板的间隙中，前叶片与耐磨板间隙大，减小了介质（在叶轮与耐磨板）流速，减小磨损，同时防止了间隙汽蚀的产生，提高了泵的抗汽蚀性能。叶片进行了特殊耐磨处理设计，平衡孔的设计，减小了轴向力。

叶轮平衡孔的设计，能够通过挡水圈排出介质内的气体，使泵组得以安全安全可靠地运行，同时亦提高了泵的汽蚀性能。

●轴承：

轴承采用原装进口的NSK或SKF轴承，保证水泵的平稳长期运行，延长维护周期；轴伸端装有进口骨架油封，使得泵无论在检修还是清洗时，无论从任何角度摆放，介质都不会进去轴承体内。

●轴封：

采用挡水圈形式的设计，当泵运行时，能迅速的让泵体内的空气从挡水圈处排出。精确的间隙设计，使得在排出空气的同时不损失泵的效率。

●砂浆循环泵性能参数表：

泵型号	流量（m^3/h）	扬程（m）	转速（rpm）	配套功率（kW）
JLZ6–10	6	10	2900	2.2
JLZ8–10	8	10	2900	4
JLZ120–10	120	10	2900	7.5

注：以上型号水力模型可以根据客户要求的参数进行调节订做。

二、技术参数

流量：4～500m³/h
扬程：5～30m
温度：–20～100℃
电源电压：三相200V/380V

三、泵型号的意义

JLZ8–10
JLZ —— 立式渣浆泵（砂浆泵）
8 —— 设计点流量8m³/h
10 —— 设计点扬程10m
注：配套功率随着砂浆的比重的不同略有变化，故不明确标识。

四、安全规程

这里所列出的操作规程只是包括了安装，运行，和维护期间必须遵守的一些基本的规程要求。所以，在安装和交付使用之前，有关的安装人员和经过培训的操作人员就应该阅读并理解本运行安全手册。

1、安全规程的违章

对安全规程的违章操作会危及到操作人员、周围环境、以及机器设备本身的安全。并且，对安全规程的违章操作也会导致任何形式的罚金，以及影响到追讨赔偿损失的权利。

尤其注意，违章操作会引起，例如：

○机器设备/组合件功能的重大故障
○有关维护/维修的故障
○电力、机械、化工方面的事故危及人员的安全。

2、有关维护，检修，安装工作的安全规程

只能在机器停运期间，对机器进行维护，检修，安装工作。必须严格执行手册中所描述的关于机器停止运行的程序，以确保不发生故障。

将机器设备投入运行之前，请遵守本章中所有的关于“交付使用”的安全规程。

3、未经授权的更改及其备件的制造

只有向制造商咨询以后，才能对机器设备进行修改或更换。要确保制造商授权的原来的备件及其附属零件的安全存放，如果使用了其他部件，制造商将可以不履行对相应损失的赔偿义务。

4、不允许的运行方式

任何情况下，都不能超过数据列表中所描述的限制范围。

五、存放

1、 暂时性存放/保存

当组合件需要临时的存放时，浸湿的低合金部件必须妥善保存。可以采用商品贸易的保存方法。请遵守制造商关于设备应用/搬移的规程。

2、交付使用之前的被安装的泵的存放

3、注意防潮。

4、注意电机风扇被其他重物挤压。

六、开箱检查

收到泵后，应立即进行下列检查：

1、确认标牌之型号及流量、扬程与订单相符；

2、确认产品合格证标注材料与订单相符；

3、确认零部件完整无损坏；

4、成套产品供货范围：泵、底座、电机、扬水管。

七、现场安装

1、基础验收及处理

按泵的安装图对基础的尺寸和位置进行复验检查；料浆回收池安装孔周围的钢板必须有足够大的强度，以确保安全以及安装符合相关标准。在放垫铁处的基础表面应铲平。

2、整机就位，找平

将水平仪放在泵安装板上进行找平。横向水平度允差为0.1mm/m，纵向水平允差为0.1mm/m。拧紧螺栓上的螺母，再检查水平并校正。

3、管道连接

注意： 绝对不能将泵本身作为连接管道的支撑点。不能超过允许的管道压力。管道应该固定在泵的附近，并且连接处也不能传递任何的应力和应变。管道的标称直径应该至少等于泵出口法兰的标称直径。

系统在出液管路高位装上排气阀，必要时可以排气。

系统在出水管路上建议逆止阀，以免停车时发生回流。

必须采取合适的措施来补偿管道的热膨胀，以确保不对泵施加额外的负载而超过允许的管道压力和力矩。

4、连接电源

电源的连接必须要由电气专业技术人员来进行，对照电动机上铭牌的数据来检查可以利用的主电源，并且选择合适的接线方法。我们强烈推荐使用电动机保护开关。

八、交付使用、启动和断开

1、开车启动前必须对泵的安装进行复验

（1）泵安装正确；

（2）泵旋转方向正确；

（3）管路铺设合理；

（4）电器线路正确；

（5）辅助管路安装；

（6）电机是否接地或者有漏电保护。

2、运转前的准备

（1）盘车：查看有无呆滞、擦壳、异响以及卡死的现象；

（2）检查旋转方向:使泵能可靠运行，确保泵的叶轮的旋转方向是至关重要的。如果旋转方向错误，泵会打不出液体，无法运行到其额定工作点；将会产生震动和过热，可能会损坏轴封和泵本体。旋转的正确方向：旋转的方向必须和泵上所标明箭头的方向一致。

（3）启动以前，泵和出管必须保持畅通，并且准备好要抽取的液浆。

3、 启动

砂浆循环泵运行时启动步骤如下：

（1）准备好要抽取的料浆，料浆液面在回收池的高度要达到泵的最低淹没深度要求；

（2）检查转向；旋转的方向必须和泵上所标明箭头的方向一致。

（3）启动泵；泵组刚刚停止运行不能立刻重新启动水泵，需过一会等泵内进入了空气后才能再次启动泵。

4、断开

砂浆循环泵运行时，断开步骤如下：

（1）关闭排水端的闸门阀；

（2）关闭泵电源开关；

（3）如果泵要停运24 小时以上，就有必要排出管道里面的浆液，用清水进行清洗，以免料浆凝固，堵塞管道。

5、运行界限

（1）工作介质的温度和环境温度

泵不能运行在超过数据清单或设备铭牌上指示的温度范围，除非获得设备制造商的书面同意。否则如果违反本注意事项，由此所引起的后果自负，不属于设备制造商的损失担保范围。

（2）工作介质的密度

泵的功率输入的大小和工作介质的密度成正比。为了避免电动机的过载，工作介质的密度都要符合购买清单上规定的数据。

6、存放

每一台泵都是经过严格认真组装、测试合格以后才出厂的。如果交货一段时间以后才交付使用，我们建议要采取以下措施对泵进行保存。

新泵的存放：我们厂提供的新泵要做好存放保存的准备。如果泵得到正确的室内保存，最大能保存12 个月。

存放泵的地方要保持干燥。

对于安装在回收池里的泵，要定期每周启动一次，或者在延期断开期间每一个月短时间启动一次泵（每次启动大约5 分钟），避免泵里面及其进水区域形成沉淀。

九、维　护

1、注意

进行有关泵的工作时，要确保断开泵的电源开关。并确保泵的电源开关不会被突然接通

2、维护/检修

（1）运行监督

①在开车及运转过程中，必须注意观察仪表读数，电机发热，及泵的振动和噪音是否正常，如果发现异常情况，应及时处理。

②任何时候泵在运行时，应该保持安静，不产生振动。避免让泵在干态下运行。

③轴承应及时补充或者更换润滑脂。

（2）润滑和润滑剂更换

泵的润滑要用不低于锂基脂来润滑滚动轴承。更换润滑剂的期限以以8000小时为一个更换周期。

3、拆卸

拆卸以前，要确保泵的电源不会被突然接通。

4、重新安装

将所有的部件擦拭干净，并检查其磨损程度。损坏的或者磨损的应该用原始的备用件来替换。确保密封面干净以及密封垫圈正确安装。

重新安装以前，单部件的接头处和螺栓连接应该涂上石墨粉或者其它类似的物质。安装期间，要正确的拧紧所有的螺钉和螺栓。

十、泵的组装和拆卸

拆卸前，首先要确保泵的电源开关不会被突然接通。

1、准备工作

（1）切断电源，关闭泵排出口阀门和辅助管阀门；

（2）排净泵内液体；

（3）拆掉辅助管线及仪表。拆除吸入口管道连接螺母螺栓。

（4）锁定挡水圈的轴向位置

2、泵的拆卸

（1）前泵盖的拆卸：把前泵盖法兰上的螺钉通过内六角扳手松开。

（2）叶轮的拆卸：拆卸叶轮之前，先依次拆卸叶轮螺母、垫圈，借助于叶轮安装和拆卸设备，拔出叶轮（不要遗失叶轮键）。

（3）挡水圈的拆卸：拆卸之前先要锁定挡水圈与泵体的位置、间隙，然后松开紧定螺钉。

（4）松开电机与安装板直接的连接螺栓，向上提出电机（注意不要碰弯加长轴）。

3、泵的组装

泵的组装顺序与拆卸顺序相反。

注意：挡水圈若用定位夹，完成密封定位后，须将其卸除，安装或存放起来。

十一、故障原因及解决办法

故　障	原　因	解决办法
泵不出液体	回收池内料浆液面高度不够 转向错误 叶轮流道、排出管堵塞 工位装置扬程大于泵的实际程	增加料浆 校正转向 消除杂物，使之畅通 改换泵型或增大转速
流量不足	叶轮严重磨蚀或腐蚀 工位需流量大于泵流量	更换叶轮 改换泵型或增加转速
流量过大	工位需扬程小于泵扬程	出口阀门关小、更换泵型、降低转速、 切割叶轮减小直径
电流超载	流量超过使用范围 输送液体比重过大	校验泵的选型、调小流量范围 更换较大功率电机
轴承箱温度过高	轴承润滑脂变质 轴承损坏	更换润滑脂 更换轴承
泵有振动噪声	轴承损坏 叶轮严重腐蚀磨蚀不平衡 泵轴弯曲	换新轴承 更换叶轮 更换轴或较直轴

建议根据具体故障分析解决或咨询本公司予以解决

PERFECT INDUSTRY
立 佳 机 械

Hunan Perfect Industry Co., Ltd

（“HPI”）

JLZ Series Slurry Circulation Pump

Installation, operation and maintenance manual

About Hunan Perfect Industry Co., Ltd ("HPI")

Hunan Perfect Industry Co., Ltd ("HPI"), registered in Hunan Administration for Industry and Commerce with its headquarter located in City Express Building, No. 496, Furong Zhong Road, Changsha City, was established in 1998 under the reform and reuniting of the state-owned pump manufacturers, mineral machinery and chemical machinery supervised by both the former machinery bureau.

HPI accumulated the traditional manufacturing experiences derived from pump manufacturing, mineral and chemical machinery manufacturing, and further developed the alarm, pre-alarm and auto control system for mineral industry, hydro power industry and electrical power industry. This series products fill a domestic gap in this field and has been sold all over the world. HPI implemented new reform plan for its manufacturing base in June, 2001. Up to now completed the phase 1 base in Xiangyin. The phase 1 manufacturing base occupies 100 hec area with 14,000m2 steel structure workshop, it owns 667 most advanced manufacturing equipment and has a modern test center with the capacity to test the pump with the diameter up to 2.2 meters, as well as a dynamic balance rotor with radius at 1.6 meters, total weight of 5 tons.

HPI has established and maintains good technical communication and cooperation with multiple universities and national research institutes, and has devoted to develop and manufacture new products such as pump, coal handling equipment and chemical machinery with unique technology and independent intellectual property rights. In 2001, HPI developed an unique JLS series single stage double suction high efficiency centrifugal pump based on the cooperation with JiangShu Science and Technology University and Huazhong Science and Technology University and based on utilizing the advanced Ω Pump Hydro Model. In 2003, cooperated with Zhongnan University, joint developed new long shaft turbine pump employing anti-abbreviation and anti-corrosion material. This pump has been successfully used in the coal mine drainage, power plant desulfurization system. Now HPI has owned 49 series, 1,126 products and 3,600 type products.

The company's goal is to offer the client with the safe, reliable and high performance products and aims to become a manufacturer at the top level of the world. HPI is committed to provide the best design, best manufacturing and best sales services to the client.

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NOTICE

☐Do read the manual carefully prior to installation, operation and maintenance of the pump and follow the instructions.

☐The manual should be kept and reserved by the end user operator.

☐The manufacturer reserves the rights to change the technical specification in the future without prior notice.

1、DESIGN AND STRUCTURE FEATURES

Overview: JLZ series high efficiency slurry circulation pump is a new generation product and was developed based on the successful experience of JLNZ series slurry pump, taking into account the specific conditions and requirement of the slurry pump employed in the solar energy silicon material industry in China and referencing the similar products worldwide. It's suitable to transfer the slurry with PH value 2.5~13, slurry specific gravity ≤2, temperature 4℃~100℃.

The slurry circulation pump is the critical component in the silicon material slicing system which has a stringent requirement on the pump's reliability, performance and life time. The slurry circulation pump must have high efficiency, anti–corrosion and anti–cavitation features. They pump hydraulic design, construction structure and the material selection of the flow–pass component impact the pump operation efficiency, reliability and lift–time.

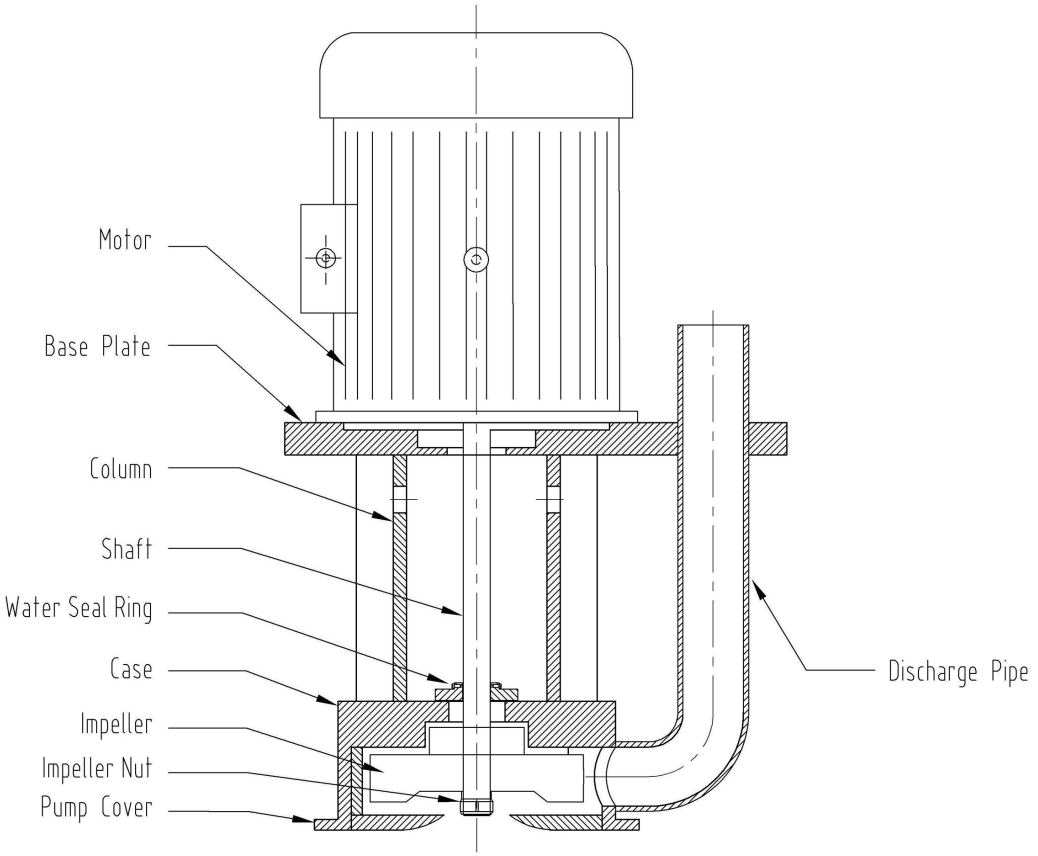

Figure 1

1.1 Pump Structure Features

(1) The pump is of single stage, single suction and vertical centrifugal type with open type impeller. This is a proven structure specifically used for the slurry circulation pump employed in the application of high concentration, high corrosion slurry in the recovery pond of the silicon slicing system.

(2) Traditional O–ring sealing is not used as the seal ring can be worn out quickly by the slurry and lower down the pump efficiency.

(3) The pump features axial adjustment to allow maintaining the clearance of pump impeller and the front end pump cover. This is the efficient provision to keep and maintain the pump efficiency at a high level during life time.

(4) The pump motor employs a thrust bearing to undertake the pump thrust. Grease lubrication is used for the bearing. The bearing is installed in the bearing box with rubber sealing ring to prevent water and foreign material from entering into the box.

(5) The pump and motor share one shaft with large diameter, short head. This structure can reduce the shaft inflection, vibration and increase the pump reliability

1.2 Pump Design Features

● Overview

Back pull–out design: the entire shaft component can be pull out from the motor side. Easier for maintenance and installation comparing with the traditional coupling type shaft. Further one single piece shaft design can ensure concentric rotation, minimize the vibration and increase the pump/motor reliability.

Front pull–out design: the anti–abrasion plate, impeller can be pull out from the pump inlet end.

The pump height below the installation plate can be adjusted per client's requirement.

● Pump Body

The pump has sufficient size taking into account the pressure. Cr26 is used and machined on a whole piece. Special treatment for anti–abrasion on the weld part. Tangent flow direction can be ensured.

● Impeller

SS304 is used for impeller. As an economic solution, the impeller can be re–machined and the blade can be replaced when abrasion/corrosion happen. The low light front–end blade can prevent the big size particulates from entering into the clearance between the impeller and the anti–abrasion plate. The size of this clearance can lower down the fluid speed thus to reduce the abrasion and to avoid the cavitation. Special treatment/machining

is performed on the blades. The blades have a balance hole design which can reduce the shaft thrust and to vent the air/gas coming from the fluid thus to further improve the anti–cavitation.

● Bearing

The import NSK bearing is used to ensure long term smooth operation and extend the maintenance period. The shaft extension end employs the import oil seal which ensures no fluid media will enter into the bearing no matter during maintenance, washing and whatever the position is.

● Shaft Sealing

Water seal ring is designed with the proper clearance to allow the ventilation of the air/gas while no negative impact to the pump efficiency.

● Slurry Circulation Pump Performance Datasheet

Type	Capacity (m^3/h)	Head (m)	Rotation Speed (rpm)	Power(kW)
JLZ6–10	6	10	2900	2.2
JLZ8–10	8	10	2900	4
JLZ120–10	120	10	2900	7.5

Remarks：The hydraulic model can be made available per clien's request and in accordance with the specific application conditions.

2、TECHNICAL SPECIFICATION

Capacity: 4~500 m^3/h

Head: 5~30m

Temperature: 4~100℃

Power supply voltage: Three Phase 200V or 380V

3、PUMP TYPE DEFINITION

JLZ8–10 is an sample to illustrate the meaning:

JLZ——Vertical slurry circulation pump

8——Design capacity is $8m^3/h$

10——Design head is 10m

Note: The motor capacity is not given as it varies from the slurry specific gravity.

4、SAFETY INSTRUCTION

The Instruction outlined below is the basic safety requirements/instructions to be followed during installation, operation and maintenance. The end–user operator shall read and understand the content of these Instructions prior to installation and operation.

4.1 Non–compliance of Safety Instruction

Non–compliance and violation of the safety Instruction could endanger/damage the t could result in penalties of any form. Even more, void the claim of damage.Specially, the non–compliance and violation would lead to the following:

○ Major fault of the equipments and malfunction of the system.

○ Maintenance fault

○ Major accident of electricity, machine, and chemical and endanger the safety of personnel.

4.2 The Safety Instruction for Maintenance, Repair and Installation

The maintenance, repair and installation shall be carried out when the machine is shutdown. The procedures as defined in the manual must be strictly followed to ensure the faults won't happen.

The "handover" safety Instruction as outlined hereby shall be followed prior to putting the equipment into operation.

4.3 Un–authorized Modification and Manufacturing of Spare Parts

Only after consulting the manufacturer and getting prior consent from the manufacturer, the modification and replacement to the product can be allowed; The spare parts shall be properly stored and reserved; If the above conditions can not be met, the warranty can be void and manufacturer will not take responsibility for the consequence/damage due to such un–authorized modification and replacement of the components.

4.4 The Limitation of Operation Conditions

The operation of the equipment shall not exceed the limitation of the conditions as defined in the datasheet.

5、STORAGE

5.1 Temporary Storage

The low alloy material components shall be well reserved when temporary storage is required.

5.2 Storage prior to Installation

5.3 Anti–moisture

5.4 No pressure or heavy weight object allowed on the motor fan

6、OPEN BOX INSPECTION

The following inspection shall be performed when the pump is received:

6.1 Check and confirm the pump type, flow rate and head as shown on the pump name plate are consistent with the purchase order.

6.2 Check and confirm the pump material as specified in the certificate is consistent with the purchase order.

6.3 Check and confirm no damage and fault on the pump components.

6.4 Check and confirm the scope of supply includes the pump, base plate, motor, discharge pipe.

7、SITE INSTALLATION

7.1 Acceptance of Pump Foundation

Re-inspect the size and location of the pump foundation in accordance with the pump's installation drawings. The steel plate around the installation hole at the slurry recovery pond shall have sufficient strength to ensure the compliance of the relevant standards and the installation safety.

The foundation surface around the steel plat embedment shall be flattened.

7.2 Equipment Settling and Leveling

Use the gradienter on the foundation surface to ensure the level. Both tolerance of horizontal and longitudinal levelness are 0.1mm/m.

Screw down nuts and then re-check the level.

7.3 Pipe Connection

Attention： It's forbidden to support the pipe by the case of pump. The pipe shall be supported by anchor support close to the pump outlet to ensure no piping stress, forces and moments will be transferred to the pump. The pipe nominal size shall equal to the pump's discharge flange nominal size.

It's recommended to install high point vent valve at the Pump discharge pipe.

The check valve shall be installed at the pump outlet to prevent reverse flow.

7.4 Power Supply

Qualified electrical professionals are required for the power supply. The power capacity should be sufficient in accordance with the motor capacity as shown on the motor name plate and the proper connection should be considered. It's strongly recommended that a motor protection switchgear shall be provided.

8、HANDOVER, STARTUP AND SHUTDOWN

8.1 Recheck the installation of pump before startup

(1) Pump is installed correctly

(2) The pump rotation direction is correct

(3) The pipe layout is reasonable

(4) The power supply and circuit connection are correct

(5) Auxiliary piping installation is correct

(6) Motor grounding is correct, or leakage protection is to be provided

8.2 Work before Startup

(1) Jigger: it should be smooth, no clash

(2) Check the rotation direction: the direction must be in accord with the direction of arrow marked on the pump

(3) Prepare the slurry and make sure the pump and outlet pipe are unimpeded before startup.

8.3 Startup

The pump startup has the following procedures:

(1) Prepare the slurry to be transferred. The slurry height in the circulation slurry pond shall meet the minimum height requirement in accordance with the pump submerged depth.

(2) Check the rotation direction;

(3) Startup

The pump shall not be restarted immediately after shutdown as certain time is required to allow the air enters into the pump.

8.4 Shutdown

The pump shutdown has the following procedures:

(1) Close the gate valve at the pump outlet

(2) Turn off the power switch

(3) The empty of the slurry inside the pump and pipe shall be carried out if the pump won't be in operation again within 24 hours to prevent the slurry from becoming solid and blocking the pump and pipe.

8.5 Operation Limits

(1) Fluid Medium and Ambient Temperature Limits

The temperature limits have been specified in the pump datasheet and the name

plate. Unless the consent in written from manufacturer is made available, the pump operation should not exceed the temperature limits. The warranty will void and manufacturer will not take any responsibility for the damage and/or loss due to the operation temperature exceeds the limit.

(2) Working Fluid Specific Gravity

The pump power consumption has a linear relationship with the fluid specific gravity. To avoid overload, the working fluid specific gravity shall meet the pump specification.

8.6 Storage

Each pump will be assembled, tested prior to ex–work. In the case a longer storage time is foreseen after ex–work and before operation, the following provisions shall be taken into account.

(1) New pump storage

The workshop offers a good indoor condition for pump storage up to a maximum 12 months. The dry condition shall be kept.

(2) Storage for pump after installation.

For the pump installed in the slurry recovery pond, operate the pump once a week is required. Or as an alternative, startup and operate the pump for 5 minutes every one month to avoid the slurry condensing.

9、MAINTENANCE

9.1 Attention

Make sure the power switch is turned off during maintenance. even more ensure the power wouldn’t be switched on accidently.

9.2 Maintenance/repair

(1) Operation Supervision

① During the startup and operation, pay attention to the reading of the instrument meters, the temperature of bearing, the vibration and noise of the pump, if there is abnormal phenomena, treat it in time.

② To avoid imposing external vibration on the pump during operation

③ Never operate the pump without fluid

④ Bearing should be replaced or added lubricant on schedule.

(2) The replacement of lubricant.

The rolling bearings should be lubricated with the grease quality not less than lithium base grease. The cycle to replace lubricant shall not be longer than 8000 hours.

9.3 Disassembly

To ensure the power is isolated prior to disassembly

9.4 Re–installation

All components shall be cleaned up and check on the damage and abrasion shall be proceeded. Replacement of the damaged parts and/or the worn out parts shall ensure the use of the original spare parts. The sealing surface shall be cleaned up.

10、ASSEMBLY AND DISASSEMBLY

Make sure the power will not be switched on accidently before disassembly.

10.1 Preparation

(1) Get the power off, close the pump discharge valve and auxiliary pipe valves;

(2) Empty the liquid in the pump;

(3) Remove the auxiliary pipeline, instrument and the connection bolts of discharge pipe

(4) Lock the water reflect axial position.

10.2 Disassembly

(1) Disassembly of suction cover: screw off screws on the cover by inner hexagon spanner.

(2) Disassembly of impeller: assemble impeller nut、washer according to priority, then take out the impeller with the help of tools (Don't lose the impeller key) .

(3) Disassembly of water reflect: lock the water reflect axial position before assembly, then screw off the stopper screw.

(4) Screw off bolts connected motor and mounting plate, and the put up the motor (Don't touch curved motor extended shaft)

10.3 Assembly of pump

Assembly of pump is opposite with its disassembly.

11、TROUBLE ANALYSIS AND SHOOTING

Troubles	Possible Causes	Remedies
Fail to pump liquid	1. Slurry height in slurry recovery pond is not enough 2. Wrong rotation direction 3. Impeller and outlet pipe is blocked 4. The actual head/piping pressure drop is higher than the pump head.	1. Increase the slurry 2. Check rotation direction 3. Get rid of impurities 4. Renew to choose the type or increase the rotation speed
Insufficient flow rate	1. Impeller wear or corroded badly 2. The requirement of equipment over the pump’ s capacity	1. Replace the impeller 2. Renew to choose the type or increase the rotation speed
Flow rate is over expectation	The head of equipment less than the pump's	Turn down the outlet valve, change the pump type, reduction of speed, cut small the dia. Of impeller
Overload	1. The capacity over the range of application. 2. The density of liquid is too big	1. Check the model of pump, change the range of capacity. 2. Replace the motor with more powerful motor.
Overheating of bearing	1. The lubricating grease is bad 2. The bearing is damaged	1. Replace the grease 2. Replace the bearing
Too much noise	1. The bearing is damaged 2. Impeller abrasion and/or corrosion 3. Shaft was curved	1. Replace the bearing 2. Replace the impeller 3. Replace the shaft or straight shaft

Suggestions: specific analysis shall be performed to solve the issues or consult manufacturer for advices