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Global after sales service

张家港市太平洋泵业制造有限公司

Zhangjiagang Pacific Pump Manufacturing Co.,Ltd.

V. 1

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一、船用泵的故障处理 Troubleshooting of marine pumps

1、DL 离心泵常见故障解决方法

Common faults and solutions of the DL centrifugal pump

问题 Problem/symptom	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
沿轴泄露 leakge along the shaft	机械密封表面磨损 Running surfaces of the mechanical seal worn or damaged	更换机械密封 Replace the mechanical seal	P15-21
	机械密封安装不正确引起 O 型圈损坏 Mechanical seal mounted incorrectly or oring damaged	安装机械密封, 应使用润滑油 When install the mechanical seal correctly should use the lubricant	
	弹性件受损 Elastic damaged	更换机械密封的橡胶 replace the oring rubber	
	压力太高 Pressure too high	使用正确型号的机械密封 Use the right type of mechanical seal	
	轴磨损 Shaft worn	更换轴和机械密封 Replace shaft and mechanical seal	
泵的泄露 leakage of pump	泵体 O 型圈磨损 O-ring worn of the pump body	更换泵体 O 型圈 Replace the O-ring of the pump body	P25
	泵体 O 型圈在运行中不耐介质 O-ring not resistant of the pump body	更换合适的 O 型圈 Replace the O-ring of the pump body	
泵的振动和噪声 Pump is vibrating or noisy	联轴器安装错误 Coupling mounted incor-rectly	平行安装联轴器 Install the coupling in parallel	
	泵无水 There is no water in the pump	泵补、充水 fill the watre in the pump and vent the air of the pump	
	轴承或者电机磨损 Bearing of pump and/or motor worn	更换原厂配件 Replace the bearings	
	气蚀 Available NPSH too low (cavitation)	提高吸入深度 Improve suction condition increase the waterpressure of suction	P23

	泵不在工作范围 Pump does not work in its working range	正确选型、调整工作参数在工作范围内 Select another pump or adjust the system to work within its working range	
	泵水平安装不平整 Pump is standing on an uneven surface	调水平 Level the surface	
异常 Malfunction	泵内部堵塞 Internal blockage in the pump	检查泵 check and clean the pump	
泵不运转 Pump does not start	终端线夹无电压 No voltage on the terminal clamps	检查电源:电路、主开关、保险 Check the power supply Circuit、Main switch、Fuses	
		检查电机、漏电开关 Check the motor safety relay、earth leakage swith	
电机能运行但泵不工作 The motor is run, but the pump does not work	联轴器松了 not tighter coupling	拧紧链接螺丝 Should be tighter coupling	
泵的流量扬程不够 Pump supplies insufficient capacity and/or pressure	泵内有空气 There is air in the pump	打开排气丝堵 Open the air plug	
	进口压力不够 The suction pressure is insufficient	增加进口压力 Increase the suction pressure	
	泵旋转方向不对 Pump rotates in the wrong direction	改变三相线序 Change over L1 and L2 of the three phase supply	
	进水管内有空气 Air bubble in the suction line	重装进水管吸入管高于泵 reinstall the suction line with line higher than pump	P23
	泵内水太少导致气泡堵塞 Too little water consumption so air bubbles clog up in the pump	确定流量, 调整泵规格 Make sure the capacity increases or select correctly pump type	
	吸入管径小 The diameter of the suction line is too small	调整管路 Increase the diameter of the suction line	

	流量少 Capacity of water meter in the supply line is too small	增大流量 Increase the capacity of the water meter	
	叶轮堵塞 The impeller or the diffuser is blocked	清洗叶轮 Clean the impeller	

2、CISG 管道泵常见故障及解决方法

Common faults and solutions of the CISG pipeline pump

问题 problem	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
水泵不出水 Pump out of water	进出口阀门未打开 Inlet and outlet valves are not open	检查开启阀 Check opening valve	
	电机运动方向不对, 电机缺相, 转数很慢 The motor movement direction is wrong, the motor phase is missing, and the revolution is very slow	调整电机方向 Adjust motor direction	
	泵没灌满液体, 泵腔内有空气 The pump is not filled with liquid. There is air in the pump chamber	打开泵上排气阀, 排尽空气 open the air plug to exhaust the air plug	
	进口供水不足, 吸程过高 Imported water supply is insufficient and suction is too high		
水泵流量不足 Insufficient pump flow	转数太低 The revolution is too low	增加水泵轴转数 Increase the pump shaft revolution	
	出口阀开度过大 The outlet valve is too wide open	调小出口阀 Turn down the outlet valve	
出口压力不足 Insufficient outlet pressure	液体中有空气 air in the liquid	排除液体中空气 Expel air from the liquid	
	出口阀开度过大 The outlet valve is too wide open	调小出口阀 Turn down the outlet valve	

<p>电机发热 Electric heating</p>	<p>环境温度过高，电动机散热不良 Ambient temperature is too high, motor heat dissipation is poor 电机负荷太重 Motor load is poor 电压过高或过低或缺相 Too high or too low voltage or phase loss</p>	<p>保证泵在额定流量和扬程附近工作 Ensure that the pump works near the rated flow and head</p>	
<p>水泵振动或有杂音 Pump vibration or noise</p>	<p>吸水管口淹没深度不够，使泵内吸入空气 water suction pipe mouth submerged depth is not enough, so that the pump inhaled air 叶轮产生汽蚀 The impeller make the "NPSH"</p>	<p>堵塞漏气处或加长吸入管淹没深度 Block off the air leak or extend the inundation depth of the suction pipe 降低泵安装高度或加大吸入管径或增加进口压力 Lower pump mounting height or increase suction pipe diameter or increase inlet pressure 尽可能调至高效区（额定点）运行，避免泵在大流量点运行 As far as possible to adjust to the high efficiency area (rated point) operation, to avoid the pump in the large flow point operation</p>	
<p>水泵漏水 Leak of pump</p>	<p>密封面不平整 The sealing surface is not smooth</p>	<p>更换 Replacement the mechanical seal</p>	
	<p>安装螺栓松懈 Loose mounting bolts</p>	<p>紧固 Tighter boles</p>	
<p>水泵噪音过重 noise of pump</p>	<p>电机轴承过热缺油 Motor bearing overheating and lack of oil</p>	<p>电机轴承处加油 Oiling at bearing of motor</p>	
	<p>水泵负荷过重 Overloading of pump</p>	<p>保证泵在规定的工况点工作 Should the pump working near the rated flow and head</p>	
<p>电机功率过大 Power is too large of motor</p>	<p>超过额定流量使用 Use in excess of rated flow rate</p>	<p>调整流量，关小出口阀门 Adjust the flow and turn down the outlet valve</p>	
	<p>吸程过高 The practical high absorption</p>	<p>降低安装面 Lower mounting surface</p>	

3、CISG-Z 自吸泵常见故障及解决方法

Common faults and solutions of the CISG-Z Self-priming pump

问题 problem	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
通电源后无反应 No response after power supply	电源引出线和电机绕组断路 power lead and motor windings are broken	检查更换 Check and replacement	
电机发热 Motor heating	轴承损坏 Bearing damage	更换轴承 Replace the bearing	
	泵轴弯曲或两轴不同心 Pump shaft bent or two shafts different center	检查泵轴或调整两轴的同心度 check the pump shaft or adjust the concentricity of both shafts	
泵内产生杂音或振动 Noise or vibration in the pump	吸程高度超过规定值 The suction height exceeds the specified value	降低吸程 Reduce the suction	
	泵轴弯曲 Pump shaft bending	修理或更换 Repair or replacement	
不出水 Not out of the water	检查泵体的储水室启动前是否加足水(至少水面超过叶轮中心线) Check whether the water storage chamber of the pump body is filled with sufficient water before starting (at least the water level exceeds the center line of the impeller)	加足水 Add enough water	
	旋转方向不一致 The direction of rotation is inconsistent	调整使其与泵的旋转方向一致 Adjust it in line with the direction of rotation of the pump	
	叶轮口堵死 The impeller mouth is blocked	疏通叶轮口 Clean the impeller	
	吸水管漏气或堵塞。 Leakage or blockage of suction pipe 检查机械密封 Inspect mechanical seals	更换或清洗 Replace or clean	
	泵体内的回流孔不畅通 The backflow hole in the pump body is not smooth.	清洗回流孔, 清除堵塞 Clean the backflow hole to remove blockage	

	水泵转速过低 The pump speed is too low	应使其达到正常转速 It should be allowed to reach the normal speed	
自吸时间过长 The self-priming time is too long		提高回流孔的位置 Improve the position of backflow hole 控制叶轮外径与泵体隔舌的间隙 Control the clearance between the impeller outer diameter and the pump body tongue 保证叶轮中心线与涡壳中心线重合 Ensure that the center line of the impeller and the center line of the vortex case coincide	
自吸泵运转吐水后，不能完成自吸过程 The self-priming pump can not complete the self-priming process after running and spitting water	回流孔增大 Increase of return hole	适当堵补回流孔 Appropriately plug and fill the backflow hole	
	泵的出口高度低 Pump outlet height is low	适当提高泵的出口高度 Raise the outlet height of the pump appropriately	

4、柱塞泵常见故障及解决方法

Common faults and solutions of the plunger pump

问题 problem	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
泵不转 Pump does not turn	电动机轴未转动 电气线路及元件故障 Motor shaft not rotating electrical circuit and component failure	确认接通电源 Confirm power on 检查电气并排除故障 Check electrical and troubleshoot	
泵反转 Pump reversal	电动机转向不对 Motor steering wrong 电气线路接错 The electrical connection is wrong	纠正电气线路 纠正泵体上旋向箭头 Correct electrical wiring Correct pump body upturning arrow	
泵供水流量不足 Insufficient pump supply flow	吸入侧堵塞 Suction side blockage	检查清理过滤器及其管线 Check and clean the filter and its lines suction pont	
	柱塞填料磨损 Piston packing is worn	检修或更换填料 Repair or replace packing	
填料损坏严重 stuffseal damaged	安装不当 Improper installation	正确安装 Correct installation	
	润滑不当或不充足 Improper or inadequate lubrication	检查润滑情况 Check lubricatiingoil	
	填料选择不当 Improper selection of stuffseal	选择合适的填料 Choose the right filler	
	柱塞有伤痕 The plunger is scarred	更换柱塞 Replace piston plunger	
	喉部衬套磨损或尺寸过大 Laryngeal bushing worn or oversized	检查衬套的内径和外径，及时更换 Check the inner and outer diameters of the bushings and replace them in time	
泵振动或有噪声 Pump vibration or noise	进泵水压低，供水不稳定 Inlet pump water is low, water supply is not stable	检查供水压力和供水量 Check water supply pressure and water supply	
	泵阀卡住不能关闭 The pump valve is stuck and cannot be closed	停机，清理阀底部的杂物 Stop the pump and clean the bottom of the valve	

	阀片或阀座损坏 Damaged valve sheet and valve seat	更换阀片或阀座 Replace valve sheet and valve seat	
	阀座总成跳出 Seat assembly jumps out	将阀座总成复位 Reset the seat assembly	
	阀弹簧折断 Valve spring broken	更换新弹簧 Replace the new spring	
输出流量不足或不输出油液 Insufficient output flow or no output oil	吸油管路上的阻力过大或补油量不足导致吸入量不足 The resistance on the suction pipe is too large or the amount of oil is insufficient, resulting in insufficient suction	调低泵的转速 Turn down the pump speed	
	泵的间隙过大，密封不良造成泄漏量过大 The clearance of the pump is too large, and the leakage is too large due to poor sealing	检查泵体内液压油中混杂的异物判别泵被损坏的部位 Check the pump body hydraulic oil mixed with foreign bodies to identify the damaged parts of the pump	
	倾斜盘倾角太小 The inclination of the tilting plate is too small	调节变量活塞，增加斜盘倾角 Adjust the variable piston to increase the inclination of the swash plate	
中位时排油量不为零 Median displacement is not zero	控制器的位置偏离、松动或损伤 The position of the controller is deviated, loosened or damaged	重新调零、紧固或更换 Resetting, fastening, or replacing	
动力端温度过高 The power end temperature is too high	曲轴箱内的油不符合要求或机油乳化 Oil in crankcase does not meet the requirements or oil emulsification	检查油位、油质及机油乳化情况 Check oil level, oil quality and oil emulsification	
	过载 overload	检查运行条件 Check operating conditions	
	泵曲轴倒转 Pump crankshaft inverted	检查泵上标明的曲轴旋转方向 Check the direction of rotation of the crankshaft marked on the pump	
	泵速太快 Pump speed is too fast	调整柱塞泵电机频率 Adjust the motor frequency of the piston pump	
机油乳化 The oil emulsion	机油乳化不及时处理 Oil emulsification is not handled in time	检测轴瓦间隙并将曲轴箱内彻底清洗干净 Check the clearance of the bearing bush and clean the crankcase thoroughly	

5、齿轮泵常见故障及解决方法

Common faults and solutions of the gear pump

问题 problem	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
泵吸不上油或无压力 No oil or pressure on the pump	原动机与泵的旋转方向不一致 The direction of rotation of the prime motor is inconsistent with that of the pump	纠正原动机旋转方向 Correct prime motor rotation direction	
	泵传动键脱落 Pump transmission key falls off	重新安装传动键 Reinstall the drive keys	
	进出油口接反 Reverse connection of inlet and outlet	按说明书选用正确接法 Choose the correct connection according to the instruction	
	油箱内液面过低, 吸入管口露出液面 The liquid level in the tank is too low and the suction nozzle is exposed	补充油液至最低液位线以上 Replenish oil above the minimum level line	
	转速太低, 吸力不足 Too low speed, insufficient suction	提高转速至泵的最低转速以上 Increase speed to pump minimum speed above	
	油液粘度过高或过低 Oil viscosity is too high or too low	选用推荐粘度的工作油液 Choose the recommended viscosity of the working oil	
	吸入管道或过滤装置堵塞造成吸油不畅 Blockage of suction pipe or filter device causes poor oil absorption	清洗管道或过滤装置, 除去堵塞物 Clean the pipe or filter device to remove blockage	
	吸入口过滤器过滤精度过高造成吸油不畅 High filtration precision of suction inlet filter causes poor oil absorption	更换过滤油箱内油液 Replace filter the oil in the tank 按产品样本和说明书正确选用过滤器 Correct selection of filters according to product samples and instructions	

	吸入管道漏气 Leakage in suction pipe	检查管道各连接处，并予以密封、紧固 Check the joints of pipes and seal and tighten them	
流量不足，达不到额定数值 Insufficient flow, not up to the rated value	转速过低，未达到额定转速 Speed is too low, not up to the rated speed	按产品样本或说明书指定额定转速选用原动机转速 The prime motor speed is selected according to the rated speed specified in the product sample or manual	
	系统中有泄露 There's a leak in the system	检查系统，修补泄露点 Check the system and fix the leaks	
	由于泵长时间工作、振动导致泵盖联接螺钉松动 Because the pump works for a long time, the vibration causes the screw of the pump cover to loosen	适当拧紧螺钉 Tighten the screws properly	
	吸入管道漏气 Leakage in suction pipe	检查管道各连接处，并予以密封、紧固 Check the joints of pipes and seal and tighten them	
	入口过滤器堵塞或通流量过小 The inlet filter is blocked or the flow rate is too small	清洗过滤器或选用通流量为泵流量 2 倍以上的过滤器 Clean the filter or choose a filter whose flow rate is more than 2 times the pump flow rate	
	吸入管道堵塞或通径小 Blocked suction line or small diameter	清洗管道，选用不小于泵入口通径的吸入管 Clean pipes, choose suction pipe not less than the inlet diameter of the pump	
	油液粘度不当 Improper viscosity of oil	选用推荐粘度的工作油液 Choose the recommended viscosity of the working oil	

压力升不上去 The pressure doesn't go up	<p>泵吸不上油或流量不足 The pump does not absorb oil or has insufficient flow</p> <p>液压系统中的溢流阀设定压力太低或出现故障 The relief valve in the hydraulic system is set too low pressure or malfunction</p>	<p>重新设定溢流阀压力或修复溢流阀 Reset the relief valve pressure or repair the relief valve</p>	
	<p>系统中有泄露 There's a leak in the system</p>	<p>检查系统修补泄露点 Check for system repair leaks</p>	
	<p>吸入管道漏气 Leakage in suction pipe</p>	<p>检查管道各连接处，并予以密封、紧固 Check the joints of pipes and seal and tighten them</p>	
	<p>油液粘度太高或油温过高 Too high oil viscosity or oil temperature</p>	<p>选择粘度适宜的液压油，如温度过高则应装冷却装置 Choose the appropriate viscosity of hydraulic oil, such as high temperature should be installed cooling device</p>	
	<p>电动机功率与齿轮泵不匹配 The motor power does not match the gear pump</p>	<p>选用相匹配的电动机 Choose a matching motor</p>	
	<p>滤油器堵塞 The oil filter is clogged</p>	<p>清理滤油器 Clean the oil filter</p>	
异常发热 Abnormal heating	<p>间隙选配不当，造成滑动部位过热 Improper clearance selection causes overheating of sliding parts</p>	<p>拆开清洗，测量间隙，重新配合达到规定间隙 Disassemble and clean, measure the clearance, and rematch to reach the specified clearance</p>	
	<p>轴承质量差或装配时被打坏，或安装时未清洗干净，造成运转不畅 Bearing quality is poor or is broken during assembly, or is not cleaned during installation, resulting in poor operation</p>	<p>拆开检查，更换轴承，重新装配 Disassemble for inspection, replace bearings, and reassemble</p>	

	油液质量差 Poor oil quality	按泵要求选择或更换油液 Select or replace oil according to pump requirement	
	吸油管径细, 吸油阻力大 The oil suction pipe diameter is thin and the oil suction resistance is large	加粗管径, 减小弯头, 减小吸油阻力 Increase pipe diameter, reduce elbow, reduce oil absorption resistance	
	外界热源高, 散热条件差 High external heat source, poor heat dissipation conditions	清除外界影响, 增设隔热措施 Remove external influences and add insulation measures	
振动噪声过大 Excessive vibration noise	齿轮泵进油管直径太小 Gear pump inlet pipe diameter is too small	更换直径较大的进油管 Replace inlet tubing with larger diameter	
	滤油器堵塞, 或转速过高 The oil filter is blocked, or the speed is too high	清理滤油器或降低转速 Clean the oil filter or reduce the speed	
	泵体与泵盖不垂直密封, 旋转时吸入空气 电动机与齿轮泵轴不同心 The pump body and the pump cover are not sealed and vertically, and the air is inhaled when rotating Motor and gear pump shaft different center	调整泵体与电机的同轴度, 使其误差不超过 0.01mm Adjust the coaxiality of the pump body and the motor, so that the error is not more than 0.01mm	
油液泄露 The oil leak	泵盖与密封圈配合过松 The pump cover is too loose with the sealing ring	调整泵盖与密封圈间隙 Adjust the clearance between the pump cover and the sealing ring	
	油封骨架弹簧脱落 Oil seal skeleton spring off	更换密封件 Replace seals	
	轴的密封面被划伤 The sealing surface of the shaft was scratched	重新处理密封面 Reprocess the sealing surface	

齿轮泵运转不正常 或有咬死现象 Gear pump operation is not normal or bite dead phenomenon	泵体轴间间隙或径向间隙过小 The pump body interaxial clearance or radial clearance is too small	调整轴向或径向间隙 Adjust axial or radial clearance	
	滚针转动不灵活 The needle roll does not rotate flexibly	更换活动滚针轴承 Replace movable needle roller bearings	
	盖板与轴的同心度不够 The concentricity of cover plate and shaft is not enough	更换盖板使其与轴同心 Replace the cover plate so that it is concentric with the shaft	
	压力阀失灵 Pressure valve malfunction	更换弹簧，清洁阀体小孔污物 或换滑阀 Replace the spring, clear the valve body hole dirt or change the slide valve	
	泵与电动机联轴器同心度不够 The concentricity of pump and motor coupling is not enough	调整泵轴与电动机联轴器同心 度，使其不超过 0.01mm Adjust the concentricity between the pump shaft and the motor coupling, so that it does not exceed 0.01mm	
	泵中有杂质 There are impurities in the pump	用细丝绸网过滤机油除污物 Use a thin silk mesh to filter oil and remove dirt	

6、喷射泵常见故障及解决方法

Common faults and solutions of the jet pump

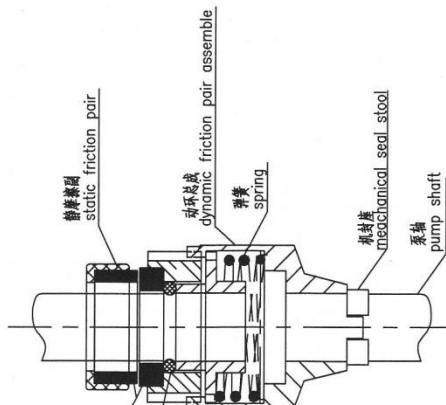
问题 problem	可能原因 possible cause	解决方法 troubleshoot	页/章 page/chapter
返水 Return water	设计、加工或装配的问题 Problems of design, fabrication or assembly	安装时检查尺寸、加工精度， 进行气密性测试，及时调整 Check the size, machining precision, air tightness test and adjust in time	

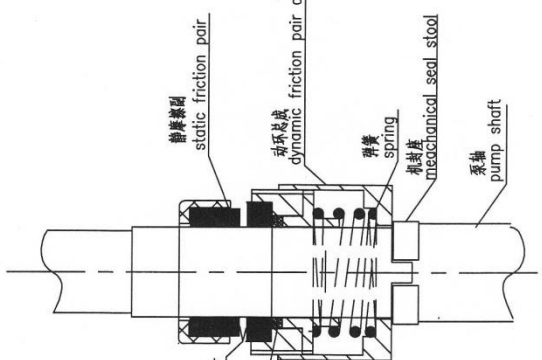
二、机械密封更换作业指导书

Standard operating manual replacement of mechanical seal

1、内装机械密封更换作业指导书

Standard operating manual replacement of inside mechanical seal of pump

张家港市太平洋泵业制造有限公司 Zhangjiagang Pacific Pump Manufacturing Co., Ltd.		JDL4-12.5/U1U1V-1 Standard operating manual replacement of inside mechanical seal of pump 零件图号 Part drawing No. DL2.4/4-8×10-M32-0001		JDL4-12.5/U1U1V-1 内装机械密封更换作业指导书 零件名称 Part name 机械密封 mechanical seal		共 1 页 第 1 页 工具 Tools	
		产品图号 Product drawing No. DL2.4/4-8×10-M32-0001		立式多级离心泵 Vertical multistage centrifugal pump			
工序内容 Step content		安装简图及注意 Installation diagram and notes					
1 拆除联轴器，电机座上端螺栓，移走电机。 Dismantle the coupling bolts, and motor stool bolts, then remove the motor.							
2 拆除电机座螺栓，移走电机座和泵盖。 Dismantle the motor stool bolts, then remove the motor stool and pump cover.		注意: Note: 1. 保持摩擦副镜面清洁; Keep the friction pair clean; 2. 安装前请使用润滑油对O形圈进行润滑。 When installing mechanical seal rubber o ring, use lubricating oil					
3 3.1 拆除旧的机械密封，在轴端安装新的机械密封。 Dismantle the old mechanical seal, then install new dynamic friction pair of mechanical seal on shaft. 3.2 在球形泵盖内安装新机械密封静摩擦副。 Installing new static friction pair of mechanical seal in pump cover.							
描述 Tracing							
校核 Proofread							
底图号 Drawing No							
装订号 Binding No							
标记 Label		处数 Number of places		更改文件号 Change document number		签字 Sign	
日期 Date		日期 Date		设计 Design 黄春花 Huang Chunhua		审核 Examine 刘竹君 Liu zhu jun	
日期 Date		日期 Date		标准化 Standardization		会签 Sign 刘竹君 Liu zhu jun	
版本号 Version number		版本号 Version number		版本号 Version number		版本号 Version number V1.0	

张家港市太平洋泵业制造有限公司 Zhangjiagang Pacific Pump Manufacturing Co., Ltd.		JDL8-17.5/U1U1V-I 内装机械密封更换作业指导书 Standard operating manual replacement of inside mechanical seal of pump	
		产品图号 Product drawing No. JDL6/12-8×10-DN40-0001	零件图号 Part drawing No. JDL6/12-8×10-DN40-0904-J
产品名称 Product name 立式多级离心泵 Vertical multistage centrifugal pump		零件名称 Part name 机械密封 mechanical seal	
工序号 Step number	工序内容 Step content	安装简图及注意 Installation diagram and notes	
1	拆除联轴器, 电机座上端螺栓, 移走电机。 Dismantle the coupling bolts, and motor stool bolts, then remove the motor.	 <p>注意: Note: 1. 保持摩擦副镜面清洁; Keep the friction pair clean; 2. 安装前请使用润滑油对O形圈进行润滑。 When installing mechanical seal rubber o ring, use lubricating oil!</p>	
2	拆除电机座螺栓, 移走电机座和泵盖。 Dismantle the motor stool bolts, then remove the motor stool and pump cover.		
3	3.1 拆除旧的机械密封, 在轴端安装新的机械密封摩擦副。 Dismantle the old mechanical seal, then install new dynamic friction pair of mechanical seal on shaft. 3.2 在球形泵盖内安装新机械密封静摩擦副。 Installing new static friction pair of mechanical seal in pump cover.		
插图 Tracing		工具 Tools 十字形螺丝起 Cross head driver 梅花扳手 Ring spanner 活络扳手 Adjustable spanner 内六角扳手 Hexagon wrench 橡胶榔头 Rubber hammer 多功能撬棒 Multifunctional crowbar	
校核 Proofread		会签 Sign 刘竹君 Liu zhu jun	
底图号 Drawing No.		标准化 Standardization	
装订号 Binding No.		版本号 Version number V1.0	
标记 Tab	处数 Number of places	更改文件号 Change document number	设计 Design 黄春花 Huang chunhua
	日期 date	签字 Sign	审核 Examine 刘竹君 Liu zhu jun

张家港市太平洋泵业制造有限公司 Zhangjiagang Pacific Pump Manufacturing Co., Ltd.		JDL18-25/U1U1V-I Standard operating manual replacement of inside mechanical seal of pump JDL18-25/U1U1V-I 内装机械密封更换作业指导书		零件图号 Part drawing No DL12.5/18-15 × N-DN65-09/4-J		机械密封 mechanical seal 共 1 页 第 1 页						
		产品图号 Product drawing No DL12.5/18-15 × 10-DN65-0001		零件名称 Part name 立式多级离心泵 Vertical multistage centrifugal pump								
工序内容 Step content		安装简图及注意 Installation diagram and notes										
1	拆除联轴器，电机座上端螺栓，移走电机。 Dismantle the coupling bolts, and motor stool bolts, then remove the motor.	<p>注意: Note: 1. 保持摩擦副镜面清洁; Keep the friction pair clean; 2. 安装前请使用润滑油对O形圈进行润滑。 When installing mechanical seal rubber o ring, use lubricating oil</p>										
2	拆除电机座螺栓，移走电机座和泵盖。 Dismantle the motor stool bolts, then remove the motor stool and pump cover.											
3	3.1 拆除旧的机械密封，在轴端安装新的机械密封摩擦副。 Dismantle the old mechanical seal, then install new dynamic friction pair of mechanical seal on shaft. 3.2 在球形泵盖内安装新机械密封静摩擦副。 Installing new static friction pair of mechanical seal in pump cover.											
描图 Tracing	校描 Proofread	底图号 Drawing No	装订号 Binding No	处数 Number of pieces	更改文件号 Change document number	签字 sign	日期 date	设计 Design 黄春花 Huang chunhua	审核 Examine 刘竹君 Liu zhu jun	标准化 Standardization	会签 sign 刘竹君 Liu zhu jun	版本号 Version number V1.0

2、外装机械密封更换作业指导书

Standard operating manual replacement of external mechanical seal of pump

<p>张家港市太平洋泵业制造有限公司 Zhangjiagang Pacific Pump Manufacturing Co., Ltd.</p>		<p>JDL4-12/U2U2V-0 外装机械密封更换作业指导书 Standard operating manual replacement of external mechanical seal of pump</p>	
<p>产品图号 Product drawing No. JDL2.4/4-8×10-DN32-0001</p>		<p>零件图号 Part drawing No. DL2.4/4-8×N-DN32-0904-J</p>	
<p>产品名称 Product name 立式多级离心泵 Vertical multistage centrifugal pump</p>		<p>零件名称 Part name 机械密封 mechanical seal</p>	
<p>工序号 Step number</p>		<p>工具 Tools</p>	
<p>工序内容 Step content</p>		<p>安装简图及注意 Installation diagram and notes</p>	
1	<p>拆除联轴器, 电机座上端螺栓, 移走电机。 Dismantle the coupling bolts, and motor stool bolts, then remove the motor.</p>	<p>注意: Note: 1. 保持摩擦副镜面清洁。 Keep the friction pair clean. 2. 安装前请使用润滑油对O形圈进行润滑。 When installing mechanical seal rubber o ring, use lubricating oil. 3. 调整轴套定位螺栓时, 小心轴套松脱。 Adjustment the mechanical seal axle sleeve locating bolts careful The axle sleeve slide down.</p>	
2	<p>拆除电机座螺栓, 移走电机座和泵盖。 Dismantle the motor stool bolts, then remove the motor stool and pump cover.</p>		
3	<p>3.1 稍微松开机械密封轴套定位螺栓。 Loosen the mechanical seal axle sleeve locating bolts. 3.2 拆除旧的机械密封, 在球形泵盖上安装新的机械密封组件。 Dismantle the old mechanical seal, then install new mechanical seal assembly on pump cover.</p>		
4	<p>紧固机械密封轴套定位螺栓。 Tighten the mechanical seal axle sleeve locating bolts.</p>		
标记 Lab	<p>处数 Number of pieces</p>	<p>更改文件号 Change document number</p>	<p>签字 Sign</p>
日期 date	<p>日期 date</p>	<p>设计 Design 黄春花 Huang Chunhua</p>	<p>审核 Examine 刘竹君 Liu zhujun</p>
版本号 Version number	<p>版本号 Version number</p>	<p>标准化 Standardization</p>	<p>会签 Sign 刘竹君 Liu zhujun</p>
版本号 Version number	<p>版本号 Version number</p>	<p>版本号 Version number</p>	<p>版本号 Version number VI.0</p>
描图 Tracing			
校核 Proofread			
底图号 Drawing No			
装订号 Binding No			

<p>张家港市太平洋泵业制造有限公司 Zhangjiagang Pacific Pump Manufacturing Co., Ltd.</p>		<p>JDL18-22/U202V-0 外装机械密封更换作业指导书 JDL18-22/U202V-0 Standard operating manual replacement of external mechanical seal of pump</p>	
<p>产品图号 Product drawing No</p>	<p>零件图号 Part drawing No</p>	<p>产品名称 Part name</p>	<p>机械密封 mechanical seal</p>
<p>产品图号 Product drawing No</p>	<p>零件图号 Part drawing No</p>	<p>立式多级离心泵 Vertical multistage centrifugal pump</p>	<p>共 1 页 第 1 页</p>
<p>工序内容 Step content</p>		<p>安装简图及注意 Installation diagram and notes</p>	
<p>1</p>	<p>拆除联轴器，电机座上端螺栓，移走电机。 Dismantle the coupling bolts, and motor stool bolts, than remove the motor.</p>	<p>注意: Note: 1. 保持摩擦副镜面清洁。 Keep the friction pair clean. 2. 安装前请使用润滑油对O形圈进行润滑。 When installing mechanical seal rubber o ring, use lubricating oil. 3. 调整轴套定位螺栓时，小心轴套松动。 Adjustment the mechanical seal axle sleeve locating bolts careful. The axle sleeve slide down.</p>	
<p>2</p>	<p>拆除电机座螺栓，移走电机座和泵盖。 Dismantle the motor stool bolts, than remove the motor stool and pump cover.</p>		
<p>3</p>	<p>3.1 稍微松开机械密封轴套定位螺栓。 Loosen the mechanical seal axle sleeve locating bolts. 3.2 拆除旧的机械密封，在球形泵盖上安装新的机械密封组件。 Dismantle the old mechanical seal, than install new mechanical seal assembly on pump cover.</p>		
<p>4</p>	<p>紧固机械密封轴套定位螺栓。 Tighten the mechanical seal axle sleeve locating bolts.</p>		
<p>描图 Tracing</p>			
<p>校核 Proofread</p>			
<p>底图号 Drawing No</p>			
<p>装订号 Binding No</p>			
<p>工具 Tools</p>		<p>十字形螺丝起 Cross head driver</p> <p>梅花扳手 Ring spanner</p> <p>活络扳手 Adjustable spanner</p> <p>内六角扳手 Hexagon wrench</p> <p>干净棉布 Clean cotton</p> <p>润滑油 Grease</p>	
<p>标记 TAB</p>	<p>处数 Number of places</p>	<p>更改文件号 Change document number</p>	<p>审核 Examine</p>
<p>日期 date</p>	<p>日期 date</p>	<p>设计 Design</p>	<p>标准化 Standardization</p>
<p>签字 SIGN</p>	<p>签字 SIGN</p>	<p>设计 Design</p>	<p>审核 Examine</p>
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<p>处数 Number of places</p>	<p>处数 Number of places</p>	<p>设计 Design</p>	<p>审核 Examine</p>
<p>标记 TAB</p>	<p>标记 TAB</p>	<p>设计 Design</p>	<p>审核 Examine</p>
<p>版本号 Version number</p>	<p>版本号 Version number</p>	<p>设计 Design</p>	<p>审核 Examine</p>

四、最小进口压力 NPSH

Minimum inlet pressure NPSH

如果泵中的压力低于运输液体的蒸汽压力，可能发生气蚀，为避免气蚀，确保泵进口侧有一最小压力，最大吸程 H[m]可按下式计算：

If when the pressure inner pump low than liquid steam pressure, it will be make the cavitation ,avoid the cavitation, ensure suction have minimum pressure is inlet side, the max suction pressure H[m] calculate according to the following formula:

$$H = P_b \times 10.2 - NPSH - H_f - H_v - H_s$$

P_b =大气压力[bar] (大气压力可设为 1bar) 在封闭系统中, P_b 为系统压力[bar]

P_b =Atmospheric pressure [1.02bar] when in the close system, P_b =system pressure

NPSH=净正吸头 [m] (可从 NPSH 曲线上泵可能的最大流量处读取)

NPSH= positive head [m]

H_f =入口的管路损失[m]

H_f =suction pipe loss[m]

H_v =汽化压力[m]

H_v =cavitation pressure [m]

H_s =安全余量=最小 0.5m 水头

H_s = Safety allowance >0.5m

如计算所得 H 为正值，泵可在最大吸程 H 情况下运行。如计算所得 H 为负值，必须有一最小进口压力 H 的水头。

If calculation H have positive, the pump can operate at the maximum suction H value. If calculation H is negative, ensure have minimum suction pressure head.

