

张家港市太平洋泵业制造有限公司 ZhangJiagang Pacific Pump MFG CO.,LTD					DL-CM船用磁力泵维护作业指导书 Standard operating manual of DL-CM Marine Magnetic Drive Pump Maintenance									
					产品图号 Product drawing No.		DL-CM		零件图号 Part drawing No.		/			
					产品名称 Product name		磁力联轴器多级船用离心泵 Magnetic couplings multistage centrifugal pumps in ships		零件名称 Part name		/		共 4 页 第 1 页 Total page page of	
检修磁力泵是一项细致操作的工作，主要涉及检查、维护和修复泵的关键部件，以确保其无泄漏、高效运行。以下是磁力泵检修的主要工作内容及步骤： Maintenance of magnetic drive pumps is a meticulous task that primarily involves inspection, servicing, and repair of critical components to ensure leak-free and efficient operation. Below are the key steps and procedures for magnetic drive pump maintenance: 一、检修前准备 Pre-Maintenance Preparation: 1、安全措施 Safety Measures: 1.1切断电源并上锁挂牌（LOTO），确保安全作业；Disconnect power and implement Lockout-Tagout (LOTO) to ensure safe operation. 1.2排空泵内介质，防止有毒或腐蚀性液体泄漏；Drain the pump of all media to prevent leakage of toxic or corrosive liquids. 1.3佩戴防护装备（手套、护目镜等）。Wear protective gear (gloves, goggles, etc.). 2、工具与材料 Tools and Materials: 2.1准备专用工具（如磁力强度检测仪）、更换件（如止推单元、密封圈）；Prepare specialized tools (e.g., magnetic strength tester) and replacement parts (e.g., thrust unit, sealing rings). 2.2查阅DL-CM船用磁力泵维护手册，了解结构（如隔离套、磁转子位置）。Refer to the DL-CM Marine Magnetic Pump Maintenance Manual to understand the structure (e.g., isolation sleeve, magnetic rotor positioning). 二、拆卸与检查 Disassembly and Inspection: 1、检查泵体有无裂纹、腐蚀或渗漏痕迹。Check the pump casing for cracks, corrosion, or signs of leakage. 2、确认进出口法兰、螺栓紧固状态。Verify the tightness of inlet/outlet flanges and bolts. 3、拆卸部件:依次拆解电机、磁力联轴器、泵转子单元。Sequentially disassemble the motor, magnetic coupling, and pump rotor assembly. 4、重点拆卸磁力驱动部分 Key Disassembly of Magnetic Drive Section: 4.1分离外磁环和内磁环，检查磁体有无退磁、破损、铁磁杂质、硬质颗粒；Separate the outer and inner magnetic ring; inspect for demagnetization, damage, ferromagnetic impurities, or hard particles. 4.2检查隔离套有无外部磁场干扰。Check the isolation sleeve for external magnetic interference. 5、关键部件检查: 5.1滑动轴承: 检查磨损、润滑情况，必要时更换；Sliding Bearings: Inspect for wear and lubrication; replace if necessary. 5.2轴和轴套: 测量轴跳动，检查磨损或划痕；Shaft and Sleeve: Measure shaft runout; check for wear or scratches. 5.3密封系统: 检查O型圈、垫片是否老化或变形；Sealing System: Inspect O-rings and gaskets for aging or deformation. 5.4叶轮: 检查平衡性、腐蚀或气蚀现象。Impeller: Check balance, corrosion, or cavitation marks.														
标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	日期 Date	编制 Edit	审核 Examine	标准化 Standardization	会签 Sign	版本号 Version number	
								2025.8.12	黄春花 Huang chunhua	路云 Lu yun	钱易 Qian yi	刘竹君 Liu zhu jun	V1.0	

张家港市太平洋泵业制造有限公司 ZhangJiagang Pacific Pump MFG CO.,LTD	DL-CM船用磁力泵维护作业指导书 Standard operating manual of DL-CM Marine Magnetic Drive Pump Maintenance				
	产品图号 Product drawing No.	DL-CM	零件图号 Part drawing No.	/	
	产品名称 Product name	磁力联轴器多级船用离心泵 Magnetic couplings multistage centrifugal pumps in ships	零件名称 Part name	/	共 4 页 第 2 页 Total page page of

- 三、维护与更换Maintenance and Replacement
- 1、清洁部件Component Cleaning:

1.1用无尘布PET或PA材质清洁磁转子表面，避免磁性杂质吸附；Wipe magnetic rotor surfaces with lint-free PET or PA cloth to avoid magnetic particle adhesion.

1.2清洗止推轴承座、流道内的沉积物。Clean deposits from thrust bearing seats and flow channels.
- 2、更换损坏件：Replacement of Damaged Parts

2.1更换隔离套（若厚度磨损超过10%需更换）；Replace the isolation sleeve if wear exceeds 10% of its thickness.

2.2更换退磁的磁转子（用高斯计检测磁通量）；Replace demagnetized rotors (test flux density with a Gauss meter).

2.3更新所有密封件。Renew all sealing components .
- 四、测试与验收 Testing and Acceptance
- 1、机械测试： Mechanical Testing

1.1手动盘车，确认转动灵活无卡阻。Manually rotate the pump to confirm smooth operation without jamming.
- 2、运行测试：Operational Testing

2.1点动试车，观察电流、振动是否正常；Perform a trial start; observe current and vibration for abnormalities.

2.2负载运行1~2小时，监测温度、噪音和泄漏情况。Conduct 1-2 hours of load operation; monitor temperature, noise, and leakage.
- 3、性能记录：Performance Documentation

3.1记录流量、扬程等参数，对比设计值。Record parameters such as flow rate and head; compare with design values.
- 五、注意事项Precautions
- 1、磁力泵严禁干运转。Never run the magnetic pump dry .
- 2、避免磁性部件靠近强磁场或高温环境。Avoid exposing magnetic components to strong magnetic fields or high temperatures.

标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	日期 Date	编制 Edit	审核 Examine	标准化 Standardization	会签 Sign	版本号 Version number
								2025.8.12	黄春花 Huang chunhua	路云 Lu yun	钱易 Qian yi	刘竹君 Liu zhu jun	V1.0

张家港市太平洋泵业制造有限公司 ZhangJiagang Pacific Pump MFG CO.,LTD				DL-CM船用磁力泵维护作业指导书 Standard operating manual of DL-CM Marine Magnetic Drive Pump Maintenance									
				产品图号 Product drawing No.		DL-CM		零件图号 Part drawing No.		/			
				产品名称 Product name		磁力联轴器多级船用离心泵 Magnetic couplings multistage centrifugal pumps in ships		零件名称 Part name		/		共 4 页 第 3 页 Total page page of	
磁力泵的维护是确保其长期稳定运行、防止泄漏和故障的关键。以下是磁力泵日常维护、定期检查及关键注意事项。 Maintaining magnetic pumps is essential for ensuring long-term stable operation, preventing leaks, and avoiding failures. Below is a systematic maintenance protocol covering daily monitoring, periodic inspections, annual overhauls, and safety guidelines. 一、日常维护Routine Maintenance 1、运行监控Operational Monitoring 1.1电流与功率：检查电机电流是否正常（异常升高可能表示过载或摩擦）。Current & Power: Monitor motor current; abnormal increases may indicate overload or friction. 1.2振动与噪音：异常振动可能由止推轴承磨损、气蚀或对中不良引起。Vibration & Noise: Excessive vibration may signal thrust bearing wear, cavitation, or misalignment. 1.3温度监测：轴承、隔离套和电机温度应低于70℃（过高可能润滑不良或磁涡流损耗）。Temperature Checks: Bearing, isolation sleeve, and motor temperatures should remain below 70° C (higher temperatures suggest poor lubrication or eddy current losses). 1.4泄漏检查：确认泵体、法兰、自润滑毛细管接口密封处无渗漏。Leak Inspection: Verify no leaks at the pump body, flanges, or self-lubricating capillary interfaces. 2、介质管理Medium Management 2.1避免空转：磁力泵严禁干运转。Dry Run Prohibition: Magnetic pumps must not run dry. 2.2防止颗粒物：介质含固体颗粒时需加装过滤器（防止叶轮或止推轴承磨损）。Particle Prevention: Install filters if the medium contains solids (to avoid impeller or thrust bearing wear). 2.3气蚀预防：确保进口压力足够（NPSHr > NPSHa）。Cavitation Avoidance: Ensure sufficient inlet pressure (NPSHr > NPSHa). 二、定期检查（月度/季度）Periodic Inspections (Monthly/Quarterly) 1、机械部件检查Mechanical Component Checks 1.1轴承状态：检查磨损、润滑情况，必要时更换。Bearing Condition: Inspect for wear and lubrication; replace if necessary. 1.2轴与轴套：测量轴跳动（应 ≤ 0.05mm），检查磨损或划痕。Shaft & Sleeve: Measure shaft runout (should be ≤ 0.05mm); check for wear/scratches. 2、磁力驱动部分检查Magnetic Drive Inspection 2.1磁转子退磁检测：用高斯计测量磁通量（若下降>10%需更换）。Rotor Demagnetization: Use a Gauss meter to measure flux density (replace if >10% drop). 2.2隔离套（屏蔽套）：检查磨损、腐蚀或穿孔（关键防漏部件）。Isolation Sleeve: Inspect for wear, corrosion, or perforation (critical leak-proof component). 2.3密封件：O型圈、垫片是否老化。Seals: Check O-rings/gaskets for aging .													
标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	日期 Date	编制 Edit	审核 Examine	标准化 Standardization	会签 Sign	版本号 Version number
								2025.8.12	黄春花 Huang chunhua	路云 Lu yun	钱易 Qian yi	刘竹君 Liu zhu jun	V1.0

张家港市太平洋泵业制造有限公司 ZhangJiagang Pacific Pump MFG CO.,LTD					DL-CM船用磁力泵维护作业指导书 Standard operating manual of DL-CM Marine Magnetic Drive Pump Maintenance								
					产品图号 Product drawing No.		DL-CM		零件图号 Part drawing No.		/		
					产品名称 Product name		磁力联轴器多级船用离心泵 Magnetic couplings multistage centrifugal pumps in ships		零件名称 Part name		/		共 4 页 第 4 页 Total page page of
3、性能测试Performance Testing 3.1流量与扬程：对比设计参数，下降>10%需排查原因（如叶轮磨损、气蚀）。Flow & Head: Compare with design specs; investigate if performance drops >10% (e.g., impeller wear/cavitation). 3.2振动分析：使用振动仪检测（GB/T 29531-2013标准）。Vibration Analysis: Use a vibrometer per GB/T 29531-2013 standards.													
三、年度大修Annual Overhaul													
1、全面拆解检查Comprehensive Disassembly & Inspection 1.1叶轮：检查腐蚀、气蚀或平衡性。Impeller: Check for corrosion, cavitation, or imbalance. 1.2泵体与流道：清理沉积物，检查腐蚀情况。Pump Casing & Flow Path: Clean deposits; inspect for corrosion.													
2、关键部件更换Critical Component Replacement 2.1隔离套：若厚度磨损>10%必须更换。Isolation Sleeve: Replace if thickness wear exceeds 10%. 2.2磁转子：退磁严重时成对更换（内外磁转子需匹配）。Magnetic Rotors: Replace as a matched pair if severely demagnetized. 2.3密封系统：所有O型圈、垫片建议每年更换。Seal System: Replace all O-rings/gaskets (recommended annually).													
3、重新装配与测试Reassembly & Testing 3.1试运行：空载运行30分钟，再带载运行2小时，监测温度、振动和电流。Test Run: Operate unloaded for 30 minutes, then under load for 2 hours; monitor temperature, vibration, and current.													
四、维护注意事项Key Maintenance Notes 1、严禁反转运行（会导致叶轮松动或磁转子退磁）。Reverse Rotation Prohibited: May loosen the impeller or demagnetize rotors. 2、停机时排空腐蚀性介质（防止结晶或腐蚀）。Drain Corrosive Media During Downtime: Prevents crystallization/corrosion. 3、定期备份运行数据（电流、温度、振动趋势分析）。Back Up Operational Data: Log current, temperature, and vibration trends for analysis.													
五、维护安全防护措施Safety Precautions (MSDS 要求 MSDS Requirements) 1、呼吸防护：在通风不良时佩戴酸性气体防毒面具。Respiratory Protection: Wear acid-gas respirators in poorly ventilated areas. 2、皮肤防护：穿戴耐酸手套和防化服。Skin Protection: Use acid-resistant gloves and chemical protective clothing. 3、眼睛防护：化学护目镜 + 面罩。Eye Protection: Chemical goggles + face shield.													
标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	标记 Tab	处数 Number of places	更改文件号 Change document number	签字 Sign	日期 Date	编制 Edit	审核 Examine	标准化 Standardization	会签 Sign	版本号 Version number
								2025.8.12	黄春花 Huang chunhua	路云 Lu yun	钱易 Qian yi	刘竹君 Liu zhu jun	V1.0