

# 液压气动与密封®

02  
2023

YEYA QIDONG YU MIFENG

HYDRAULICS PNEUMATICS & SEALS

ISSN 1008-0813

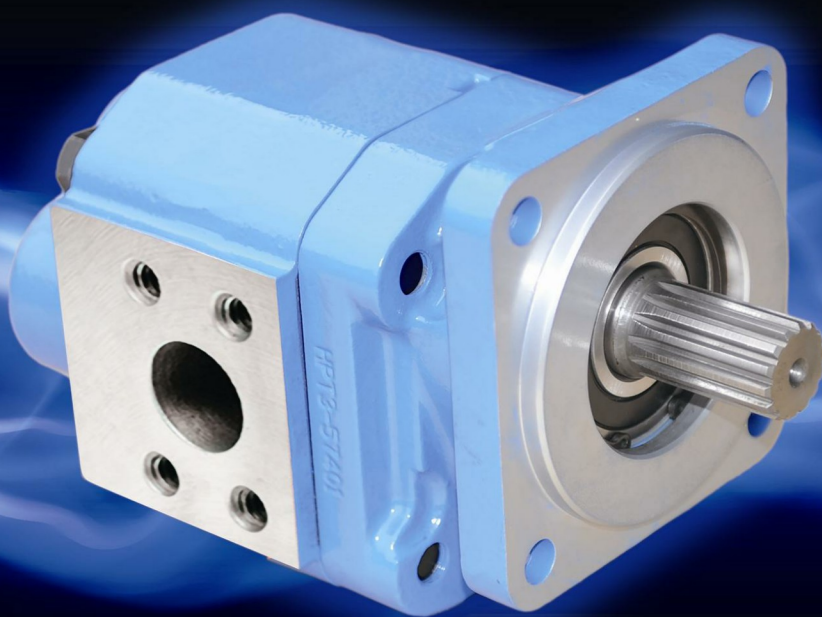


中国科技论文统计源期刊 (中国科技核心期刊)

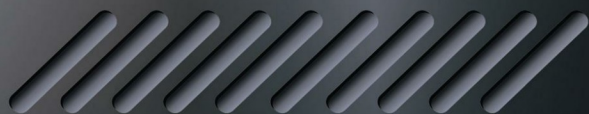


广告

## 泊姆克低噪音外啮合SP/DSP系列齿轮泵



- ★ 特殊的内部结构设计，多项专利加持<sup>①</sup>
- ★ 噪音值60-80dB (A) 远低于常规产品
- ★ 连续高压工况下稳定工作
- ★ 抗污染及自吸能力出众



① (实用新型专利号: ZL202023142749.X、ZL202023147054.0、ZL202030797464.6等)

泊姆克 (天津) 液压有限公司

地址: 天津空港经济区经四路151号  
总机: +86-22-25761959

Web: <http://www.permcotj.com/>  
E-mail: [permco@permcotj.cn](mailto:permco@permcotj.cn) (销售部)



主管单位 中国机械工业联合会  
主 办 中国液压气动密封件工业协会

出 版 《液压气动与密封》杂志社  
编 辑 《液压气动与密封》编辑部  
地址：北京市西城区德胜门外  
教场口1号

邮编：100120  
电话：86-10-63172781  
E-mail: chpsa-yqm@163.com  
http://www.chpsa.org.cn

编委会主任 杜旭东  
编委会副主任(按姓氏笔划为序)  
孔祥东 闫清东 周洪  
徐兵 黄兴 焦宗夏  
社 长 赵曼琳  
主 编 宋京其  
副 主 编 李绍云  
责任编辑 张婷婷  
发行范围 国内外公开发行  
印 刷 宝曹元仁浩(天津)印刷有限公司  
国内总发行 北京报刊发行局  
订 阅 处 全国各地邮局  
邮发代号 82-152  
海外总发行 中国国际图书贸易集团有限公司  
国外代号 BM4757  
刊 号 ISSN1008-0813  
CN11-4839/TH

广告发布登记 京西市监广登字 20170016 号  
境 内 定 价 20 元

### 声 明

凡向本刊投稿的作者均视为同意将该文的复制权、发行权、信息网络传播权、翻译权、汇编权、转许可权等权利免费许可给本刊使用，本刊有权将上述权利许可给第三方合作单位（知网、万方、维普等）使用。若有异议请来稿说明，本刊将做适当处理。

# 目 次

2023年第43卷第2期 总第296期

2023年2月15日出版

## 设计与研究

- 基于NUMECA的液力变矩器性能开发·····张磊,李亮,刘兴国(1)  
基于推理机的机械臂故障诊断专家系统优化设计·····刘雯(3)  
基于三维数字化的设备绝缘状态可视化监测模型  
·····姚明亮,周刚,张龙浩,等(7)  
复杂多向耦合液压机械臂电气化优化设计·····崔慧娟,朱建雷(12)  
滑动轴承的压力分布与功耗数值计算·····王连生(16)  
伺服机构加注活门泄漏分析及优化·····郭瑞,陈荣亮,曾好,等(21)  
微型涡轮增压发动机供油系统滤油器堵塞故障研究·····雷言开,张天宏(27)  
混合动力汽车液压制动系统的仿真与分析·····邢福荣(32)

## 系统与应用

- 电力用油污染度现场检测装置的研制与应用  
·····窦鹏,周义凤,黄燕,等(36)  
多路阀稳态液动力的仿真与试验研究·····彭雄凤,王涛(39)  
起重机卷扬闭式液压系统负载扭矩控制策略研究  
·····罗炎热,郭堃,李林岩,等(42)  
活塞速度对液压缸缓冲特性的影响分析·····周文平,蔡泽昱,杨彬(47)  
电动缸试验过程梯形螺母咬死的解决方案·····丁大江,何焱,王培,等(52)  
重型卡车液力机械传动特性分析与动力学建模·····李志国(55)  
增材制造航空液压阀块流道仿真及成型工艺研究  
·····杨明,李纪友,公姿俨,等(61)  
燃气轮机进气滤筒动态清灰效果评价·····杨晓光,宋云飞,王富安,等(67)  
四柱液压机底缸结构改进·····罗相文,李俊国,陈国扬(71)  
比例阀滞环、颤震与PWM驱动研究·····马超,叶荣科,朱红岩,等(74)  
高压金属软管失效分析及可靠性优化·····刘贝贝,刘伟,赵鹏,等(76)

## 使用与维护

- 齿轮泵降噪分析与措施·····杨华(81)  
断路器液压机构控制阀故障分析与优化设计·····陈晓东(84)

## 新产品·新技术·新工艺

- 一种超低开启压力安全阀设计·····苑高辉,张万年,陈正立,等(88)  
基于CAN的电磁阀内孔及阀芯磨损检测传感器设计  
·····李派霞,谷良田,李海凤,等(91)  
一体式智能型电液执行器设计和试验研究·····曹永明,胡建田,张森(98)

## 密封技术专题

- 《低温装置用密封垫片》标准解读·····程云朗,何松,鹿璐,等(105)  
卡套式管接头密封失效分析及仿真优化研究·····胡小冬,仲维超,李林燎(108)  
发动机缸盖用冲孔复合垫片性能研究·····颜星星,杨勇,刘元杰,等(111)  
新能源工程车液压系统的密封性与冷却油液流动特性分析·····刘心田(116)  
延长高含硫天然气田机械密封运行周期技术研究  
·····潘向东,林万洲,黄斌,等(120)  
核电厂压力容器热电偶机械密封装置密封结构分析与应用  
·····励行根,范伟丰,励勇,等(125)  
信息·····(73、80)

Vol.43, No.2, 2023  
Issue Date: Feb.15, 2023

# CONTENTS

Hydraulics Pneumatics & Seals  
(Monthly)

**Sponsor:**

China Hydraulics Pneumatics & Seals  
Association

**Director of Council:**

DU Xu-dong

**Vice Director of Council:**

KONG Xiang-dong YAN Qing-dong

ZHOU Hong XU Bing HUANG Xing

JIAO Zong-xia

**President:**

ZHAO Man-lin

**Editor in Chief:**

SONG Jing-qi

**Deputy Editor in Chief:**

LI Shao-yun

**Editor in Charge:**

ZHANG Ting-ting

**Publisher:**

Editorial Office of Hydraulics  
Pneumatics & Seals

Address: No. 1 Jiaochangkou,

Deshengmen Wai

Beijing 100120, P. R. China

Tel/Fax: +86-10-63172781

E-mail: chpsa-yqm@163.com

http://www.chpsa.org.cn

**Overseas Distributor:**

China International Books Trading Corp.

Address: P. O. BOX 399, Beijing, P. R. China

Code No. : BM4757

Publication Code: ISSN1008-0813  
CN11-4839/TH

**Advertisement Business Licence:**

No. 20170016

万方数据

## Design & Research

- Development of Hydrodynamic Torque Converter Performance Based on NUMECA  
..... ZHANG Lei, LI Liang, LIU Xing-guo(1)
- Optimal Design of Manipulator Fault Diagnosis Expert System Based on Inference Engine  
..... LIU Wen(3)
- Visual Monitoring Model of Equipment Insulation Status Based on 3D Digitization  
..... YAO Ming-liang, ZHOU Gang, ZHANG Long-hao, et al(7)
- Electrification Optimization Design of Complex Multidirectional Coupling Hydraulic Manipulator  
..... CUI Hui-juan, ZHU Jian-lei(12)
- A Numerical Simulation of Pressure Distribution and Power Dissipation on Journal Bearing  
..... WANG Lian-sheng(16)
- Leakage Analysis and Optimization of Servo Filling Valve  
..... GUO Rui, CHEN Rong-liang, ZENG Hao, et al(21)
- Study on Fault of Filter Blockage for Fuel Supply System of Micro-turbine Engine  
..... LEI Yan-kai, ZHANG Tian-hong(27)
- Simulation and Analysis of Hydraulic Braking System for Hybrid Electric Vehicle..... XING Fu-rong(32)

## System & Application

- Development and Application of Degree Contamination Detection Device in Electric Power Oils  
..... DOU Peng, ZHOU Yi-feng, HUANG Yan, et al(36)
- Simulation and Optimization of Steady-state Flow Force of Multi-way Valve  
..... PENG Xiong-feng, WANG Tao(39)
- Research on the Negative Torque Control Strategy of the Crane's Hoisting Winch Closed Hydraulic System..... LUO Yan-re, GUO Kun, LI Lin-yan, et al(42)
- Analysis of the Influence of Piston Speed on Hydraulic Cylinder Cushioning Characteristics  
..... ZHOU Wen-ping, CAI Ze-yu, YANG Bin(47)
- Solution for Trapezoidal Nut Bite Dead During the Test Process of Electric Cylinders  
..... DING Da-jiang, HE Yi, WANG Pei, et al(52)
- Characteristic Analysis and Dynamic Modeling of Hydraulic Mechanical Transmission for Heavy Truck  
..... LI Zhi-guo(55)
- Research on Flow Channel Simulation and Forming Process of Aero Hydraulic Manifold with Additive Manufacturing ..... YANG Ming, LI Ji-you, GONG Zi-yan, et al(61)
- Evaluation on Dynamic Dust Removal Effect of Gas Turbine Intake Filter Cartridge  
..... YANG Xiao-guang, SONG Yun-fei, WANG Fu-an, et al(67)
- The Bottom Cylinder Improvement for Four Columns Hydraulic Presser  
..... LUO Xiang-wen, LI Jun-guo, CHEN Guo-yang(71)
- Research on Hysteresis, Chatter and PWM Drive of Proportional Valve  
..... MA Chao, YE Rong-ke, ZHU Hong-yan, et al(74)
- Failure Analysis and Reliability Optimization of High-pressure Metal Hose  
..... LIU Bei-bei, LIU Wei, ZHAO Peng, et al(76)

## Operation & Maintenance

- Gear Pump Reduction Noise Analysis and Measures ..... YANG Hua(81)
- Fault Analysis and Optimization Design of Hydraulic Mechanism Control Valve for Circuit Breaker  
..... CHEN Xiao-dong(84)

## New Product, New Technology & New Process

- Design of an Ultra-low Opening Pressure Safety Valve  
..... YUAN Gao-hui, ZHANG Wan-nian, CHEN Zheng-li, et al(88)
- Wear Detection Sensor for Inner Hole and Valve Core of Solenoid Valve with CAN  
..... LI Pai-xia, GU Liang-tian, LI Hai-feng, et al(91)
- Design and Experimental Study of Integrated Intelligent Electro Hydraulic Actuator  
..... CAO Yong-ming, HU Jian-tian, ZHANG Miao(98)

## Focused on Seals Technology

- Standard Interpretation of "Gaskets for Cryogenic Device"  
..... CHENG Yun-lang, HE Song, LU Lu, et al(105)
- Research on Sealing Failure Analysis and Simulation Optimization of Cone Connectors  
..... HU Xiao-dong, ZHONG Wei-chao, LI Lin-liao(108)
- Research on Performance of Sprinting Composite Gasket for Engine Cylinder Head  
..... YAN Xing-xing, YANG Yong, LIU Yuan-jie, et al(111)
- Analysis on Sealing Performance and Coolant Flow Characteristics of Hydraulic System for New Energy Engineering Vehicle ..... LIU Xin-tian(116)
- Technical Study on Prolonging the Operation Cycle of Mechanical Seals for High Sour Natural Gas Fields ..... PAN Xiang-dong, LIN Wan-zhou, HUANG Bin, et al(120)
- Analysis and Application of Thermocouple Mechanical Seals Sealing Structure for Nuclear Power Plants Pressure Vessels ..... LI Xing-gen, FAN Wei-feng, LI Yong, et al(125)



# 胜达,24年专注工业过滤净化

## 专业专注 服务客户上千

<b>34省市</b> 业务覆盖全国	<b>34位</b> 研发人员 专业团队	<b>28个</b> 大型项目 端到端交付	<b>28项</b> 创新突破 技术精湛	<b>3大</b> 体系认证 质量保障
-----------------------	-------------------------	--------------------------	-------------------------	------------------------



### 新乡市胜达过滤净化技术有限公司

地址：河南省新乡市开发区德源西路200号

电话：+86-373-7152887 传真：+86-373-2642112

邮箱：hydraulic@sdfilters.com 网站：www.sdfilters.com

万方数据

