

【国机集团国际化经营系列丛书】



国机制造

R&D AND MANUFACTURE

(2019版)

第六卷
Volume VI



中国机械工业集团有限公司
China National Machinery Industry Corporation



国机制造
R&D AND MANUFACTURE

CONTENTS

目录

按公司分类

第一卷 Volume I

中国机械设备工程股份有限公司
China Machinery Engineering Corporation

1. 中设集团装备制造有限责任公司 China Machinery Industrial Products Co., Ltd.	1
2. 天津电气传动设计研究所有限公司 Tianjin Research Institute of Electric Science Co., Ltd.	10
3. 哈尔滨电站设备成套设计研究所有限公司 CHINA HARBIN POWER SYSTEM ENGINEERING & RESEARCH INSTITUTE CO.,LTD.	33

中国福马机械集团有限公司
China Foma (Group) Co.,Ltd.

4. 中国福马机械集团有限公司 China Foma (Group) Co.,Ltd.	73
--	----

中国地质装备集团有限公司
China Geological Equipment Group Co., Ltd

5. 中国地质装备集团有限公司 China Geological Equipment Group Co., Ltd	118
--	-----

中国国机重工集团有限公司
China SINOMACH Heavy Industry Corporation

6. 中国国机重工集团有限公司 China SINOMACH Heavy Industry Corporation	241
--	-----

第二卷 Volume II

国机重型装备集团股份有限公司
SINOMACH Heavy Equipment Group Co., Ltd.

7. 二重（德阳）重型装备有限公司 Erzhong (Deyang) Heavy Equipment Co.,Ltd.	341
--	-----

目录

CONTENTS

国机汽车股份有限公司
Sinomach Automobile Co.,Ltd.

8. 中国汽车工业工程有限公司
China Automobile Industry Engineering Corporation (AE)

447

机械工业第六设计研究院有限公司
No.6 Institute of Project Planning & Research of Machinery Industry

9. 机械工业第六设计研究院有限公司
No.6 Institute of Project Planning & Research of Machinery Industry

510

国机集团科学技术研究院有限公司
SINOMACH Academy of Science and Technology Co.,Ltd.

10. 沈阳仪表科学研究院有限公司
Shenyang Academy of Instrumentation Science Co.,Ltd.

528

洛阳轴研科技股份有限公司
Luoyang Bearing Science & Technology Co.,Ltd.

11. 洛阳轴研科技股份有限公司
Luoyang Bearing Science & Technology Co.,Ltd.

551

第三卷 Volume III

中国农业机械化科学研究院
China Academy of Agriculture Mechanization Sciences

12. 中国农业机械化科学研究院
China Academy of Agriculture Mechanization Sciences

599

第四卷 Volume IV

中国一拖集团有限公司
YTO Group Corporation

13. 中国一拖集团有限公司
YTO Group Corporation

885

CONTENTS

目录

第五卷 Volume V

中国恒天集团有限公司
China Hi-Tech Group Corporation

14. 经纬纺织机械股份有限公司 JingWei Textile Machinery Co., Ltd.	971
15. 经纬智能纺织机械有限公司 Jingwei Intelligent Textile Machinery Co.,Ltd.	974
16. 郑州纺机工程技术有限公司 Zhengzhou Textile Machinery Engineering & Technology Co. Ltd.	993
17. 青岛宏大纺织机械有限责任公司 QINGDAO HONGDA TEXTILE MACHINERY CO, LTD.	1000
18. 沈阳宏大纺织机械有限责任公司 Shenyang grand textile machinery Co., LTD.	1030
19. 天津宏大纺织科技有限公司 Tianjin Hongda Textile Machinery Co., Ltd.	1036
20. 郑州宏大新型纺织机械有限责任公司 Zhengzhou Hongda New-type Textile Machinery Co.,Ltd.	1043
21. 常德纺织机械有限公司 CHANGDE TEXTILE MACHINERY CO., LTD.	1053
22. 宜昌经纬纺机有限公司 Yichang Jingwei Textile Machinery Co., Ltd.	1062
23. 经纬津田驹纺织机械（咸阳）有限公司 JINGWEI TSUDAKOMA TEXTILE MACHINERY (XIANYANG) CO., LTD.	1081
24. 无锡宏大纺织机械专件有限公司 Wuxi Hongda Texparts CO., LTD.	1085
25. 黄石经纬纺织机械有限公司 HUANGSHI JINGWEI TEXTILE MACHINERY CO.,LTD.	1090
26. 武汉纺友技术有限公司 Wuhan Texmate Technology Co. Ltd.	1093
27. 立信染整机械（深圳）有限公司 FONG'S NATIONAL ENGINEERING CO., LTD.	1103

目录

CONTENTS

28. 高乐纺织机械有限公司 Goller (HK) Limited	1109
29. 立信门富士纺织机械（中山）有限公司 Company Name: Monforts Fong's Textile Machinery (Zhongshan) Co., Ltd.	1112
30. 中国纺织科学技术有限公司、宏大研究院有限公司 China Textile Science and Technology Co., Ltd. ; Hongda Research Institute Co., Ltd.	1116
31. 常德经纬摇架科技有限公司 CHANGDE JINGWEI PENDULUM ARM TECHNOLOGY CO.,LTD.	1121
32. 江西凯马百路佳客车有限公司 Jiangxi Kama Business Bus Co., Ltd.	1133
33. 北京恒天鑫能新能源汽车技术有限公司 Beijing Hi-Tech Xinneng New Energy Automobile Co., Ltd.	1138
34. 湖北新楚风汽车股份有限公司 Hubei Xin chufeng auto	1143
35. 山东华源莱动内燃机有限公司 Shandong Huayuan Laidong Engine Co., Ltd.	1154
36. 山东凯马汽车制造有限公司 Shandong Kama Automobile Manufacturing Co.,Ltd.	1159
37. 南昌凯马有限公司 Nanchang Kama Co., Ltd.	1165
38. 无锡华源凯马发动机有限公司 WUXI WORLDBEST KAMA POWER CO.,LTD.	1172
39. 郑州恒天大建桥梁钢构有限公司 Zhengzhou Hi-Tech Dajian Bridge Steel Co. LTD.	1176
40. 郑州宏达汽车工业有限公司 Zhengzhou Hongda Automobile Industry Co., Ltd.	1180
41. 郑州恒天重型装备有限公司 ZHENGZHOU HI-TECH HEAVY INDUSTRY CO.,LTD	1185
42. 恒天九五重工有限公司 CHTC JOVE HEAVY INDUSTRY Co.,Ltd.	1194
43. 保定天鹅新型纤维制造有限公司 Baoding Swan fiber co.,ltd.	1205

CONTENTS

目录

44. 恒天宝丽丝生物基纤维股份有限公司 HI-TECH POLYACE BIOBASED FIBER CO., LTD.	1212
45. 恒天长江生物材料有限公司 CHTC CHANGJIANG PLA CO.,LTD.	1215
46. 恒天中纤纺化无锡有限公司 CHTC sinofiber wuxi co., LTD.	1218
47. 恒天海龙（潍坊）新材料有限责任公司 CHTC HELON (WEIFANG) NEW MATERIALS CO.,LTD.	1223

第六卷 Volume VI

中国电器科学研究院股份有限公司
China National Electric Apparatus Research Institute Co., Ltd.

48. 中国电器科学研究院股份有限公司 China National Electric Apparatus Research Institute Co., Ltd.	1229
---	------

国机智能科技有限公司
Sinomach Intelligence Technology Co., Ltd

49. 国机智能科技有限公司 Sinomach Intelligence Technology Co., Ltd	1251
---	------

合肥通用机械研究院有限公司
Hefei General Machinery Research Institute

50. 合肥通用机械研究院有限公司 Hefei General Machinery Research Institute	1325
---	------

桂林电器科学研究院有限公司
Guilin Electrical Equipment Scientific Research Institute Co., Ltd.

51. 桂林电器科学研究院有限公司 Guilin Electrical Equipment Scientific Research Institute Co., Ltd.	1406
--	------

目录 CONTENTS

按产品类别分类

1 农业机械 Agriculture Machinery

1.1 中国福马机械集团有限公司 CHINA FOMA (GROUP) CO.,LTD.

(1) 水田车 3WZ-350A/Paddy field Vehicle 3WZ-350A—NO.7	75
(2) 果园机 3WL-16A/machine 3WL-16A—NO.8.....	77
(3) 手扶式插秧机 (2ZS-6) /Hand-supported rice transplanter (2ZS-6)	79
(4) 乘坐式高速插秧机 /High-speed rice transplanter (2ZG-6D1)	80

1.2 中国农业机械化科学研究院 China Academy of Agriculture Mechanization Sciences

(1) 耕整种植机械 /Cultivator and planting series	601
(2) 排灌节水机械 /Equipment and Engineering for Irrigation System.....	612
(3) 植保机械 /Equipment for Modern Agriculture–Plant Protection	614
(4) 收获机械 /Harvesting Machinery	621
(5) 9YFQ-1.9 型跨行式方草捆捡拾压捆机 /9YFQ-1.9 Square Baler	639
(6) 9YFQ-1.5 型跨行式方草捆打捆机 /9YFQ-1.5Square Baler.....	641
(7) 9YFC-1.7 型方草捆捡拾压捆机 /9YFC-1.7 Square Baler	643
(8) 9YFS-2.0 型三道捆绳方草捆捡拾压捆机 /9YFS-2.0MiddleSquare Baler.....	645
(9) 9YG-1.4/1.2 圆草捆卷捆机 /9YG-1.4-1.2Round Baler	647
(10) 9YFE-450 型二次饲草压缩机 /9YFE-450 forage compressor	648
(11) 9GBQ-3.0 切割压扁机 /9GBQ-3.0 Mover Conditioner	649
(12) 9LZ-6.0 指盘式搂草机 /9LZ-6.0 disc rake	651
(13) 9JK-2.7 型小方草捆捡拾车 /9JK-2.7 Square balepick-up.....	653
(14) 9CJ-3.0 型散草捡拾运输车 /9CJ—3.0Scattered grass pick-up truck.....	654
(15) 9GZ-0.5 自走式灌木平茬收割机 /9GZ-0.5 type Self-propelled Shrub Harvester	655
(16) 9GZ-1.0 自走式灌木平茬收割机 /9GZ-1.0 type Self-propelled Shrub Harvester	657
(17) 方草捆机系列 /Squarebale Binding Machine	659
(18) 92YG 系列圆捆机 /92YG Round balebaling machine.....	660
(19) 1BQ-3、1BQ-4 动力驱动耙 /1BQ-3, 1BQ-4 Power Harrows	661
(20) 92GZX-0.9、1.7、2.5 系列旋转割草机 -92GZX-0.9, 1.7, 2.5Rotary mower	662
(21) 9LZ-3.0、4.0、4.8 系列指盘搂草机 /9LZ-3.0, 4.0 ,4.8Disc Rakes	664
(22) 小方捆打捆机 /Small Rectangular Balers.....	665
(23) 大中型方捆打捆机.....	666

CONTENTS 目录

(24) 栅栏式搂草翻晒机 /Fence Type Hay Rale	667
(25) 切枝机 /Brush Chippers.....	668
(26) 全混合日粮搅拌喂料车 / TMR Complete Diet Mixer/Feeder	669
(27) 饲料膨化机 / Multi-function Extruders for Feed.....	670
(28) 9TXS-9.0 型钢屋架采暖畜舍 /9TXS-9.0Barn with Heating	671
(29) 9CK-9.0 储草库 / The 9CK-9.0 grass storage	672
(30) 9L-2.0 畜舍围栏 /9L-2.0 Fence for the barn	673
(31) GLC 型链板式干燥机 /GLC Series Dryer	674
(32) 智能化挂面干燥系统 / Intelligent noodles drying system	676
(33) 屠宰加工生产线 /slaughter and processing equipment and engineering	677
(34) 薯类深加工设备 /Potato Processing Equipment.....	680
(35) 油脂加工设备 / Oil processing equipment.....	694
(36) 制冷设备 / Renewable Energy Equipment.....	700
(37) “Ace” 牌剪羊毛定刀片及动刀片 /Fixed and moving shearing blades.....	881
(38) 电动剪羊机组 /Electric shearing machine.....	882

1.3 中国一拖集团有限公司 YTO Group Corporation

(1) 轮式拖拉机（中马力） / Wheeled tractor (Middle Power)	887
(2) 轮式拖拉机（大马力） /Wheeled tractor (Big Power).....	905
(3) 履带式拖拉机 / Kind of Product: crawler tractor	924
(4) 收获机械 / Harvester.....	933
(5) 机具产品 /Machinery products.....	943
(6) 动力机械 /Engine	956

1.4 中国恒天集团有限公司 China Hi-Tech Group Corporation

(1) 收获机 /Harvester	1158
(2) 微型耕作机 /Micro Tilling Manager.....	1174

2 工程机械 Construction Machinery

2.1 中国国机重工集团有限公司 China SINOMACH Heavy Industry Corporation

(1) 挖掘机 /Excavator.....	242
(2) 装载机 /Loader	250
(3) 压路机 /Roller	263

目录 CONTENTS

(4) 平地机 /Motor grader	276
(5) 推土机 /Bulldozer.....	290
(6) 摊铺机 /Paver	305
(7) 挖掘装载机 /Backhoe loader.....	314
(8) 汽车起重机 /Truck Crane	317
(9) 旋挖钻机 /Rotary Drilling Rig	327
(10) 垃圾压实机 /Landfill Compactor.....	329
(11) 垃圾转运车 /Garbage Truck	333
(12) 剥进机 /Roadheader.....	335

2.2 中国农业机械化科学研究院 China Academy of Agriculture Mechanization Sciences

(1) 伸缩臂叉车 / Telescopic handler	728
(2) 沥青混凝土摊铺机 /6.1 Asphalt Paver	745

2.3 中国恒天集团有限公司 China Hi-Tech Group Corporation

(1) 液压挖掘机 /Hydraulic Excavator	1195
(2) 旋挖钻机 /Rotary Drilling Rig	1196
(3) 液压静力压桩机 /Hydraulic Static Pile Driver	1197
(4) 全液压多功能桩架 /Full Hydraulic Multifunction Pile Frame	1198
(5) 钻机 /Drilling Machine	1199
(6) 挖树机 /Tree Digger.....	1203

3 车辆产品 Vehicle Product

3.1 中国福马机械集团有限公司 CHINA FOMA (GROUP) CO.,LTD.

(1) 特种车辆 T-BOSS550/750 / Special vehicle T-BOSS550/750	101
(2) 电动特种车辆 EV-BOSS/ Electric special vehicle EV-BOSS.....	102
(3) 特种车辆 M550/750 / Special vehicle M550/750	103
(4) 电动特种车辆 LH40DA / EV-BOSS LH40DA.....	104
(5) 特种车辆 LH1630 / Special vehicle LH1630	105
(6) 摩托车 (LH125T-20、LH175T) / Motorbike (LH125T-20、LH175T).....	106
(7) 消防四轮摩托车 (XMC4PW/60-LH300ATV)/Fire fighting four-wheel motorcycle (XMC4PW/60-LH300ATV)	114
(8) 消防四轮摩托车 (LH800UTV) /Fire fighting four-wheel motorcycle (LH800UTV)	116

CONTENTS 目录

3.2 中国汽车工业工程有限公司

China Automobile Industry Engineering Corporation (AE)

(1) 焊装业务 /Welding	448
(2) 装配业务 /Assembling.....	454
(3) 涂装业务 /Painting	478
(4) 铸造业务 /Casting.....	488
(5) 自动化设备 /Automation equipment.....	506

3.3 中国农业机械化科学研究院

China Academy of Agriculture Mechanization Sciences

飞机牵引车 /Aircraft Tractor	716
-------------------------------	-----

3.4 中国恒天集团有限公司

China Hi-Tech Group Corporation

(1) 新能源公交车 /New-Energy Bus	1134
(2) 整车控制器 /Vehicle Control Unit (VCU)	1139
(3) 远程监控终端 /Remote Monitoring Terminal (RMT)	1140
(4) 电池控制单元 /Battery Control Unit (BCU)	1140
(5) 电池电子部件 / Battery Electronics (BE)	1140
(6) 电池包 /Battery Pack (Pack).....	1141
(7) 电动汽车远程服务与管理系统企业平台 Enterprise Platform of Remote Service and Management System for Electric Vehicles	1141
(8) 电机控制器 /Motor Control Unit (MCU).....	1142
(9) 专用车地盘 /Chassis	1144
(10) 牵引车 /Tractor	1148
(11) 纯电动车系列 /Pure electric vehicle series.....	1150
(12) 单缸系列发动机 /Single cylinder series engine	1155
(13) 多缸系列发动机 /Multi-cylinder series engine	1156
(14) 厢式运输车 /VAN BOX TRUCK.....	1160
(15) 载货汽车 /Light Duty Truck.....	1160 & P1162
(16) 自卸车 /Dump Truck	1161
(17) 纯电动厢式运输车 /ELECTRONIC VAN BOX TRUCK	1161
(18) 森林消防车 /FOREST FIRE TRUCK.....	1162
(19) 平板运输车 /FALTBED TRUCK.....	1163
(20) 仓栅式运输车 /STORAGE TRUCK.....	1163
(21) 随车起重运输车 /CRANE TRUCK.....	1164
(22) 停车设备 /Parking Equipment.....	1171
(23) 城建工程、环卫车辆等 /City Engineering& Sanitation Vehicle	1181

目录 CONTENTS

4 采矿设备 Mine Exploring Machine

4.1 中国地质装备集团有限公司 China Geological Equipment Group Co., Ltd

(1) 钻采设备 /Drilling and Exploring Machine.....	119
(2) 钻采工具 /Drilling TOOLS	170
(3) 物探仪器 /Geophysical Instrument	185
(4) 分析仪器 /Analytical Instruments	234
(5) 环保设备 /Environmental Protection Equipment.....	240

4.2 中国恒天集团有限公司 China Hi-Tech Group Corporation

(1) 牙轮钻机 /Rotary drill	1166
(2) 地下铲运机 /Underground Load-haul-dump (LHD)	1167
(3) 地下运矿车 /Underground ore car.....	1169
(4) 地下辅助设备 /Underground auxiliary equipment	1170

5 核电设备 Nuclear Power Equipment

5.1 二重（德阳）重型装备有限公司 Erzhong (Deyang) Heavy Equipment Co.,Ltd

(1) CAP1400 堆芯补水箱 /CAP1400 Core Makeup Tank.....	424
(2) 稳压器 /Regulator.....	425
(3) 泵壳 /Pump Shell.....	426
(4) AP1000RPV 重型支撑 /AP1000RPV Heavy Support.....	428
(5) AP1000 SG 核电管板 /AP1000 SG nuclear power tube plate.....	429
(6) AP1000 CMT 封头锻件 /Forgings for AP1000 CMT Seal Head	430
(7) AP1000PRZ 上封头 /AP1000PRZ Upper Seal Head	431
(8) AP1000SG 锥形筒节 /Cone Shape AP1000SG Shell Ring.....	432
(9) CPR1000RPV 过渡段 /CPR1000RPV Transition Section	433
(10) CPR1000SG 一次侧封头 /CPR1000SG Water Chamber Seal Head	434
(11) 主管道 /Main pipeline.....	435

5.2 中国恒天集团有限公司 China Hi-Tech Group

空气净化系统的过滤装置箱体 /Filter unit of air purification system.....	1188
--	------

CONTENTS 目录

6 新能源设备 New Energy Equipment

6.1 中国农业机械化科学研究院 China Academy of Agriculture Mechanization Sciences	
新能源设备 / New Energy	710
6.2 中国电器科学研究院股份有限公司 China National Electric Apparatus Research Institute Co., Ltd.	
新能源电池自动检测系统 /New energy battery inspection system	1240

7 工业制造设备 & 材料 Industry Manufacturing Equipment & Material

7.1 二重（德阳）重型装备有限公司 Erzhong (Deyang) Heavy Equipment Co.,Ltd	
(1) 冶金设备 /Metallurgical equipment	343
(2) 锻压设备 /Forging press equipment	363
(3) 其他通用设备（起重设备、矿山设备、水泥设备、水利机械等）/ general equipment——Hoisting equipment, construction machinery and equipment, mining equipment, cement equipment,water conservancy machinery, etc.	372
(4) 传动产品 /Driving Products.....	381
(5) 石化装备 /Petrochemical Equipment	438
7.2 机械工业第六设计研究院有限公司 No.6 Institute of Project Planning & Research of Machinery Industry	
(1) 工业窑炉和无机非金属材料行业成套装备 / Industry Furnace and Kin, Lnorganic Non-metallic Materials Industry Equipment.....	511
(2) 半龙门移动喷漆室 /Semi-gantry mobile paint spray booth	518
(3) 工业炉余热回收利用系统 /Industrial furnace waste heat recovery system	521
(4) 整体移动喷漆室 /Overall mobile paint spray booth	525
7.3 沈阳仪表科学研究院有限公司 Shenyang Academy of Instrumentation Science Co.,Ltd	
(1) VCF 系列真空自耗电极电弧炉 /VCF-Series vacuum consumable electrode arc furnace.....	549
(2) VSC 系列真空自耗电极电弧凝壳熔铸炉 / VSC-Series vacuum consumable electrode arc melting/casting.....	550
7.4 中国农业机械化科学研究院 China Academy of Agriculture Mechanization Sciences	
(1) 热喷涂设备 / Thermal Spraying Equipment	722
(2) 工业炉及特种装备 / Industrial heat treatment.....	738

目录 CONTENTS

7.5 中国电器科学研究院股份有限公司

China National Electric Apparatus Research Institute Co., Ltd.

- | | |
|---|------|
| (1) 家电智能工厂 /Home appliances Intelligent factory | 1130 |
| (2) 环保涂料及树脂 /Environment friendly coatings and resins | 1242 |

7.6 国机智能科技有限公司

Sinomach Intelligence Technology Co., Ltd

- | | |
|---|------|
| (1) 装修涂胶复合生产线 /r Assembly Decoration and Glue Coating Line | 1301 |
| (2) 汽车产品智能生产线 /Intelligence Automobile product line..... | 1302 |
| (3) 微波炉自动生产线 /Microwave oven Line..... | 1306 |
| (4) 智能工厂制造运行系统 /Manufacturing Operation System in Intelligent Factory | 1307 |
| (5) 机油 /Engine Oil | 1320 |
| (6) 切削液 /Cutting Fluid | 1321 |
| (7) 密封胶 /Sealant | 1323 |

7.7 桂林电器科学研究院有限公司

Guilin Electrical Equipment Scientific Research Institute Co., Ltd

- | | |
|---|------|
| (1) 塑料加工专用设备 /Plastics Processing Equipments | 1416 |
| (2) 塑料制品、半成品及辅料 /Biaxially Oriented Polyester (BOPET) Production line | 1421 |
| (3) 特种薄膜 /Special Film..... | 1433 |
| (4) 绝缘材料及制件 /Insulating Material and parts..... | 1457 |

7.8 中国福马机械集团有限公司

CHINA FOMA (GROUP) CO.,LTD.

- | | |
|--|----|
| (1) 4 英尺、6 英尺、8 英尺、9 英尺宽幅连续平压热压机 /4', 6', 8', 9' width continuous press..... | 81 |
| (2) 砂光机 /Sanding Machine..... | 83 |
| (3) 砂光锯切生产线 /Sanding and CTS Line..... | 84 |
| (4) 日产 110 ~ 500m ³ 刨花板生产线 /110~500m3/d Particleboard Production Line | 85 |
| (5) 日产 150 ~ 500m ³ 中 / 高密度纤维板生产线 /150~500m3/d MDF Production Line | 86 |
| (6) 气流铺装机 /Airflow Mat-former | 87 |
| (7) 通道式干燥机 /Passage dryer | 89 |
| (8) 矩形筛 /Oscillating screen | 90 |
| (9) 盘式削片机 /Disk chipper | 91 |
| (10) 鼓式削片机 /Drum chipper | 93 |
| (11) 滚筒式剥皮机 /Drum De-barker | 95 |
| (12) 环式刨片机 /Knife ring flaker | 96 |
| (13) 环式长材刨片机 /Knife ring long log flaker | 97 |
| (14) 筛环式打磨机 /Double-stream Mil | 98 |

CONTENTS 目录

(15) 热磨机 /Pressurized Refiner 99

7.9 洛阳轴研科技股份有限公司 Luoyang Bearing Science & Technology Co., Ltd.

(1) 特种材料制品 /Special Material Products.....	562
(2) 轴承防锈润滑油 /Anti-rust and Lubricant Oil Proudcts	563
(3) 超硬材料制品 /Superhard material products	564
(4) 研磨、抛光制品 /Grinding and polishing products	571
(5) 金刚石烧结修整滚轮 /Sintered diamond dressing rollers.....	573
(6) L 系列回转试验机 /L series rotation test machine	574
(7) 磨具生产设备 /Abrasive Production equipment	576
(8) 超硬材料生产设 /Superhard materials production equipment	577
(9) 磨轧辊砂轮 /Roll Grinding Wheels	582
(10) 齿轮磨砂轮 /Gear Grinding Wheels	582
(11) 磨螺纹砂轮 /Thread Grinding Wheels	583
(12) 磨曲轴砂轮 /Crankshaft Grinding Wheels	583
(13) 碟形砂轮 /Dish Grinding Wheels	584
(14) 珩磨油石 /Honing Sticks	585
(15) 石油专用管螺纹车刀 /Thread Turning Tools for Oil Pipe.....	585
(16) 可转位螺纹车刀 /Indexable Thread Turning Cutting Tool	586
(17) 浅槽 (成型槽) 加工专用数控刀具 /Groove Machining Cutting Tool Profile CNC cutting tool	587
(18) 汽车皮带轮楔槽加工专用刀具 /Pulley Groove Cutting Tools for Automobiles Application	588
(19) 深孔加工刀具 (深孔钻) /Deep Hole Machining Tool (Deep Hole Drill)	589
(20) 金属陶瓷轴承成型刀具 /Cermet Bearing Profile Cutting Tool.....	590
(21) 第二代 QPQ 复合处理技术与装备 Second Generation of QPQ Complex Salt Bath Treatment Technology and Equipment.....	591
(22) 超硬刀具 /Super-hard Cutting Tools	592
(23) 金刚石木工刀具 /PCD Woodworking Tool	593
(24) 精密复杂硬质合金成型刀具 /Precised Complex Carbide Profile Cutting Tools	594
(25) 焊管加工刀具 / Cutting Tools for Welded Pipe	594
(26) 高温合金加工刀具 /The High-temperature Alloy Machining Tool	595
(27) 汽车零件加工刀具 /Automotive Parts Machining Tool	595
(28) 无心车系列刀具 /Bars Peeling processing Tool.....	596
(29) 毛刷系列产品 /Brushes Series Product.....	596
(30) MJS 系列激光干涉仪 /MJS Calibration Laser Interferometer Series.....	597
(31) 主动量仪产品 / In Process Gauge.....	598

目录 CONTENTS

8 智能产品 & 精密仪器 & 测试设备

Intelligence Product & Precision Instrument & Testing Equipment

8.1 沈阳仪表科学研究院有限公司

Shenyang Academy of Instrumentation Science Co.,Ltd

(1) 自动砂轮划片机 /Automatic grinding wheel dicing saw	534
(2) GS 系列高压水清洗机及清洗系统 GS series of high-pressure water cleaning machines, power plant air cooling, cleaning and sprinkler system	545
(3) 生化分析滤光片 /Biochemical Analytical Filter	563
(4) 圆形渐变密度滤光片 /Circular Variable ND Filters	538
(5) 数字放映机用反光镜 /Reflector for Digital Cinema	539
(6) 鱼眼投影镜头 /Fish-eye projection lens	539
(7) 智能压力 / 差压 / 绝压变送器 Smart Pressure / Differential Pressure / Absolute Pressure Transmitter.....	540
(8) HB9500 系列压力变送器 /HB9500 series pressure transmitter	541
(9) HB26S 系列压力变送器 /HB26S series pressure transmitter.....	542
(10) UHB/UQK 系列浮球式液位变送器 / 控制器 /UHB / UQK Series Float Level Transmitter / Controller..	543
(11) UHZ 系列磁翻柱式液位变送器 /UHZ Series Magnetic column level transmitter	544
(12) WBJ 系列一体化温度变送器 /WBJ series integrated temperature transmitters	545
(13) HB871 投入式液位变送器 /HB871 cast-in liquid transmitter.....	546
(14) HB2119 压力传感器 /HB2119 pressure sensor.....	547

8.2 中国农业机械化科学研究院

China Academy of Agriculture Mechanization Sciences

(1) 动态试验机 / Dynamic testing machine.....	748
(2) 静态试验机 /Static testing machine.....	773
(3) 矫直机 /Straightening Machine.....	839

8.3 国机智能科技有限公司

Sinomach Intelligence Technology Co., Ltd

(1) 机器人 /Robot.....	1254 & P1309
(2) 扫描式 3D 相机 /Scanning 3D camera.....	1273
(3) 高速电火花小孔加工机床 /Micro hole Drilling Machine	1277
(4) 电火花加工喷孔设备 /EDM Nozzle Equipment	1285
(5) 电火花成形机 /EDM Machine	1286
(6) 数控磨床 /CNC Grinding Machine	1294

CONTENTS 目录

(7) 电化学去毛刺机 /Electrochemical Deburring Machine	1300
(8) 智能检测和控制 /Intelligence Testing & Control	1311

8.4 合肥通用机械研究院有限公司 Hefei General Machinery Research Institute

通用机械试验设备 /General Mechanical Test Equipment.....	1381
--	------

8.5 洛阳轴研科技股份有限公司 Luoyang Bearing Science & Technology Co., Ltd.

(1) 轴承试验机 /Bearing Testing Machine	559
(2) 轴承检测仪器 /Inspection Instruments for Bearing.....	560
(3) 精密机床 /Precision Machine tool.....	561

8.6 哈尔滨电站设备成套设计研究所有限公司 CHINA HARBIN POWER SYSTEM ENGINEERING & RESEARCH INSTITUTE CO.,LTD.

(1) 全厂辅助车间控制系统 (电厂辅控网)/ Auxiliary workshop-BOP control system (Power plant auxiliary control network).....	34
(2) 水处理 PLC 程控系统 /Water treatment PLC control system	37
(3) 输煤 PLC 程控系统 /Coal handling PLC control system	40
(4) 脱硫 PLC 控制系统 /Desulfurization PLC control system	44
(5) 除灰、除渣 PLC 控制系统 /Ash and slag handling PLC control system.....	46
(6) 分散控制系统 DCS/Distributed control system DCS	49
(7) 工业电视系统 /Industrial Television Monitoring System	53
(8) 管理信息系统 /Management Information System (MIS).....	56
(9) 远程监控系统 /Remote Monitoring System.....	58
(10) 设备故障诊断预警系统 /Equipment fault diagnosis and predictive alarm system.....	60
(11) CFB 锅炉低氮燃烧与 SNCR/SCR 脱硝技术与装备 CFB Boiler Low Nitrogen Combustion and SNCR/SCR Denitration Technology and Equipment.....	61
(12) 煤粉锅炉低氮燃烧和 SCR 脱硝技术与装备 Technology and Equipment for Low Nitrogen Combustion and SCR Denitrification of Pulverized Coal Boilers....	64
(13) CFB 锅炉程控喷钙与回料活化脱硫技术与装备 Technology and Equipment of CFB Boiler Program Controlled Limestone Injection and Feedback Activated Desulfurization.....	66
(14) 石灰石—石膏湿法脱硫技术与装备 Technology and Equipment for Wet Desulfurization of Limestone and Gypsum	69
(15) 燃煤锅炉多污染物联合脱除技术与装备 Technology and Equipment of Mult-pollutant Removal for Coal-fired Boiler	71

目录 CONTENTS

9 纺织设备和产品 Textile Equipment & Products

9.1 中国恒天集团有限公司 China Hi-Tech Group Corporation

(1) 棉纺成套设备 / COMPLETE SET OF SPINNING EQUIPMENT	972
(2) 棉纺数字化车间 /Digital spinning workshop	973
(3) 环锭细纱机 /Ring spinning frame.....	976
(4) 精梳机 / Comber.....	983
(5) 条并卷机 /Sliver lap machine.....	985
(6) 转杯纺纱机 /Open end spinning machine.....	986
(7) 假捻变形机 /False twist texturing machine	987
(8) 剑杆织机 /Rapier Loom.....	988 & 997
(9) 罗拉 /Roller.....	989
(10) 锥子 / Spindle	990
(11) 钢领 /Ring	991
(12) 上罗拉轴承 /Top roller bearing	992
(13) 涤纶短纤成套设备 /Complete set of Polyester	994
(14) 粘胶短纤成套设备 / Complete set of Viscose Equipment.....	995
(15) 合成纤维长丝成套设备 /Complete set of filament machine	996
(16) 浆纱机 /Sizing Machine	998
(17) 水刺生产线 /Spun-laced Production line.....	999
(18) 自动络筒机 /AUTO-WINDER	1001
(19) 开清梳联合机 /Combined Opening/Blowing/Carding machine.....	1007 & 1045
(20) 匀整并条机 /DRAWFRAME	1031
(21) 整经机 /WARPING MACHINE	1035
(22) 粗纱机 /Fly frame	1037
(23) 传送系统 /Conveying system	1041
(25) 混纺 / 色纺高精度称量机组 /Blended/colored Spinning High -precision Weighing Unit	1051
(26) 高速经编机 /WAPP KNITTING MACHINE	1054
(27) 地毯丝加捻机 /Carpet twister	1063
(28) 玻璃纤维加捻机 /Glass fiber twister	1066
(29) 工业丝倍捻机 /Two-for-one twister	1071
(30) 直捻机 /Direct Cabling corder	1075
(31) 织机 /Loom	1082
(32) 摩擦式假捻器 /FRICTION TWISTERS	1086

CONTENTS 目录

(33) 包覆锭子 /COVERING SPINDLES	1087
(34) 花式捻线锭子 /FANCY YARN TWISTING SPINDLES	1088
(35) 纺锭轴承 /SPINDLE BEARINGS	1089
(36) 印花机 /PRINTING MACHINE.....	1091
(37) 高温染色设备 /High temperature dyeing machine	1104
(38) 水洗机 /Washing compartment.....	1110
(39) 拉幅定型机 /Stenter Frames Range	1113
(40) 松式平网烘干机 /Shrinkage & Relaxation Dryer.....	1115
(41) 摆架类产品 /Weighting Arms.....	1123
(42) 上销类产品 /Top apron cradles	1130
(43) 纺丝箱 /Spinning box.....	1186
(44) 粘胶滤机 /Viscose filter.....	1187
(45) 清梳辅机 /Carding auxiliary machine.....	1189
(46) 织物 /Fabric Product.....	1212

10 机电、电子产品 Electromechanical & Electronic Products

10.1 天津电气传动设计研究所有限公司 Tianjin Research Institute of Electric Science Co., Ltd.

(1) 水轮机调速器 /HTURBINE GOVERNOR	19
(2) 水轮机调压阀 /Turbine Pressure Relief Valve	24
(3) 油压装置 /Pressure Oil Unit.....	27
(4) 水电站自动化元件 /AUTOMATION ELEMENT FOR HYDROPOWER STATION	28
(5) 中小水电站设备成套 COMPLETE SUPPLY FOR MEDIUM & SMALL SIZED HYDROPOWER EQUIPMENT	30
(6) TMV1 中压大功率变频器 /High power three-level medium voltage converter	11
(7) 通用变频（逆变）器 /General-purpose Converter	12
(8) 变流装置 /Converter Device	13
(9) 大功率光伏并网逆变器 /High-power Photovoltaic Inverter	14
(10) 储能变流器 (PCS) /Power Control System (PCS)	16

10.2 中国电器科学研究院股份有限公司 China National Electric Apparatus Research Institute Co., Ltd.

(1) 励磁产品 /Excitation products.....	1238
(2) 大功率电解整流装置 /High power electrolytic rectifier	1241
(3) 移动电站 /UPS mobile	1248

目录 CONTENTS

10.3 合肥通用机械研究院有限公司

Hefei General Machinery Research Institute

(1) 压力容器 /Pressure Vessel	1326
(2) 压缩机 /Compressor	1343
(3) 风机 /Fan Products.....	1346
(4) 泵 /Pump	1350
(5) 阀门 /Valve	1354
(6) 过滤分离机械 /Filtration and separation equipment	1358
(7) 高压水射流产品 /High pressure water jet products	1362
(8) 密封产品 /Seal Products.....	1369

10.4 中国一拖集团有限公司

YTO Group Corporation

柴油机发电机组 /Diesel generator set.....	677
------------------------------------	-----

10.5 沈阳仪表科学研究院有限公司

Shenyang Academy of Instrumentation Science Co.,Ltd

硅压阻芯片 /Silicon piezoresistive die	531
---	-----

10.6 中国农业机械化科学研究院

China Academy of Agriculture Mechanization Sciences

(1) 污水处理装置 / Sewage Treatment Equipment	731
(2) 高低压配电柜系列 /High and low voltage distribution cabinet	871

10.7 中国恒天集团有限公司

China Hi-Tech Group Corporation

(1) 柴油发动机 /Diesel Engine.....	1173
(2) 柴油发电机 /Diesel Generator.....	1173

10.8 桂林电器科学研究院有限公司

Guilin Electrical Equipment Scientific Research Institute Co., Ltd

(1) 触头材料 /Voltage Contacts.....	1407
(2) 特种电机 /Special Motor	1437

10.9 中国福马机械集团有限公司

CHINA FOMA (GROUP) CO.,LTD.

(1) 智能高压串联森林消防泵 (SFBC10/2-A) Intelligent high pressure series forest fire pump (SFBC10/2-A)	108
(2) 远程高压森林消防泵 (SFBA30/1.0-C) /Remote high pressure forest fire pump (SFBA30/1.0-C)	110

CONTENTS 目录

(3) 森林消防泵 (4BJL-12/3.5) /Forest fire pump (4BJL-12/3.5).....	112
(4) 新型手持式风力灭火机 (6MF-22-50C) /New hand-held pneumatic extinguisher (6MF-22-50C)	117

11 金属加工件 Metal Products

11.1 中设集团装备制造有限责任公司 China Machinery Industrial Products Co., Ltd.

(1) 高速列车制动盘 /Brake discs for high speed train.....	2
(2) 高铁用摩擦盘和碳刷架 /Friction disc and carbon brush carrier for high speed train.....	3
(3) 四轮一带 /Undercarriages.....	4
(4) 铜套 /Bronze bushings	5
(5) 高温合金 /High temperature alloy	6
(6) 耐蚀合金 /Corrosion Resistant Alloy	7
(7) 气阀钢 /Air valve steel	8
(8) 特种合金丝材 /High Performance alloy material	9

11.2 二重（德阳）重型装备有限公司 Erzhong (Deyang) Heavy Equipment Co.,Ltd

(1) 电站锻件 /Heavy castings and forgings——forgings for electricity generating station.....	394
(2) 电站铸件 /Heavy castings and forgings——castings for electricity generating station	400
(3) 船用铸锻件 /Marine castings and forgings.....	412
(4) 各类机械设备大型铸锻件 Heavy Castings & Forgings for Different Kinds of Mechanical Equipments	416

11.3 沈阳仪表科学研究院有限公司 Shenyang Academy of Instrumentation Science Co.,Ltd

(1) GIS/GIL 伸缩节 / GIS/GIL.....	529
(2) 精密金属波纹管 /Precision metal bellows	530
(3) 换热器 /Heat exchanger	531

11.4 洛阳轴研科技股份有限公司 Luoyang Bearing Science & Technology Co., Ltd.

(1) 轴承 /Bearings.....	552
(2) 电主轴 /High-frequency Spindle	558

中国电器科学研究院股份有限公司

China National Electric Apparatus Research Institute Co., Ltd

公司名称：中国电器科学研究院股份有限公司
Company Name: China National Electric Apparatus Research Institute Co., Ltd

<http://www.geari.com>

中国电器科学研究院股份有限公司作为国家首批转制科研院所，前身为始建于 1958 年的第一机械工业部广州电器科学研究所，长期从事电器产品环境适应性基本规律与机理研究，致力于提升我国电器产品在不同的气候、机械、化学、电磁等复杂环境中的适应能力，提升电器产品质量水平。在环境适应性研究的基础上，践行国家创新驱动发展战略，公司围绕电器行业的标准规范、检测技术、系统集成技术、电能转换技术、先进控制技术、材料技术等质量提升共性技术研发，取得了一系列科技创新及核心技术成果，通过技术成果转化，为电器产品质量提升提供系统解决方案，具体包括质量技术服务、智能装备、环保涂料及树脂等三大业务领域。

公司建有工业产品环境适应性国家重点实验室、国家技术标准创新基地（家用电器及电器附件）、国家日用电器质量监督检验中心、国家智能汽车零部件质量监督检验中心等 12 个国家级研发和技术服务平台，拥有 15 个 IEC 国际标准对接平台和 11 个国家标准平台，是我国电器行业接轨国际、提高国际话语权的重要支撑平台，亦是国内电器领域领先的应用型研究机构和技术创新平台。

China National Electric Apparatus Research Institute Co., Ltd. is one of the first batch of system-transformed scientific research institutes in the China. Its predecessor is Guangzhou Electric Apparatus Research Institute of the First Ministry of Machinery Industry, which was established in 1958. It has long been engaged in the research on the basic law and mechanism of environmental adaptability of electrical products, and is committed to improving the adaptability and quality of Chinese electrical products in climate, mechanical, chemical, electromagnetic and other complex environments. Implementing the national innovation-driven development strategy on the basis of environmental adaptability research, the Company has carried out research and development in accordance with standards and specifications for the electrical appliance industry, taking into account common technologies for quality improvement, such as inspection technology, system integration technology, electric energy conversion technology, advanced control technology and material technology. In this process, the Company has achieved a number of scientific and technological innovations and core technological results, and transformed technological achievements into a systematic solution for improving the quality of electrical products. Its business areas mainly include quality technical service, intelligent equipment and environment-friendly coatings and resins.

The Company has 12 national science and technology research and development and technical service platforms, including the State Key Laboratory of Environmental Adaptability for Industrial Products, the National Technical Standard Innovation Base (Household Appliances and Accessories), the National Household Appliances Quality Supervision and Inspection Center and the National Intelligent Automotive Parts Quality Supervision and Inspection Center. The Company also has 15 platforms for matching IEC international standards and 11 national standard platforms, which not only play an important role in supporting the international compliance and representation of China's electrical apparatus industry, but also lead the applied research and technological innovation in the domestic electrical apparatus field.

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1 智能制造类

1 Intelligent manufacturing

1.1 家电智能工厂解决方案

1.1 Intelligent factory solution for home appliances

1.1.1 家电智能装配线

1.1.1 Intelligent assembly line for home appliances



产品简介

家电智能装配线按照家电产品的装配工艺流程以及厂房特点，有针对性地规划生产线布局，提供适当输送线类型，实现客户从预装、总装、在线监测、冷媒充注、安检、检漏、性能检测、包装、打包等整个工艺的流水作业，可按照客户的预算和散件类型，提供 SKD 和 CKD 两种生产模式，输送线通过 PLC 自动控制，速度可调，输送稳定。在家电自动化成套生产线的某些工位，设置机器人来替代人工操作，通过智能控制系统，实现生产过程自动化、智能化，降低操作工的工作强度、节约生产成本、提高生产效率。目前已经通过机器人视觉等先进技术，实现了机器人空调压缩机的安装、机器人安检、机器人套箱、机器人码垛、家电外壳与内胆自动组装等。

Product Introduction

According to the assembly process flow and factory characteristics of household appliances, the intelligent assembly line for household appliances plans the production line layout in a targeted manner, provides appropriate type of conveyor line, and helps customers realize the entire process flow operation covering pre-assembly, final assembly, on-line monitoring, refrigerant charging, security check, loophole detection, performance testing and packing. It provides two production modes, i.e. SKD and CKD, depending on the customer budget and the type of bulk parts. The PLC-controlled conveyor line enjoys adjustable speed and stable transfer. In some workstations of household appliances automation production line, manual labor is replaced by robotic operation. The intelligent control system makes the production process automated and intelligent, which reduces the work intensity of operators, cuts production cost and enhances production efficiency. Advanced technologies such as robot vision have been applied in the installation of air conditioning compressors, security check, casing, stacking by robots and the automatic assembly of shell and inner part of household appliances.

1.1.2 智能涂装线

1.1.2 Intelligent coating line



产品简介

智能涂装线主要用于钣金件涂装，解决其防腐蚀问题或满足装饰性效果。由前处理、喷房系统、烘烤系统、空调送风、废气废水处理等系统组成。该类设备可自动分析得出优化的设备运行参数，并根据优化的参数反过来控制设备的运行，使得涂装效果达到最佳水平；通过对涂装工件产量、质量及生产线能耗等数据自动统计及分析，实现涂装车间生产管理智能化及车间能耗最优。其特点是高效节能，具有快速换色功能，适应用户大批量、多颜色的喷涂需要；关键技术包括槽液浓度控制技术、烘炉热供技术、安全控制书、涂装工艺和节能减排技术等。

Product Introduction

Intelligent coating line is mainly used to address the corrosion problem or decoration need in the coating of sheet metal parts. It consists of pretreatment system, spray room system, baking system, air conditioning and air supply system, waste gas and water treatment system, etc. This equipment can conduct automatic analysis to determine the optimal operational parameters, which are used to control operation and optimize coating effect. By automatically collating and analyzing data of output, quality and energy consumption of coating production line, it achieves intelligent production management and optimal energy consumption in the coating workshop. It is characterized by high efficiency and energy conservation, and can change color quickly to meet the need for large-scale and multi-color coating. Its key technologies include tank concentration control technology, oven heat supply technology, safety control instructions, coating process and energy saving and emission reduction technology.

1.1.3 智能专机设备

1.1.3 Intelligent special equipment

1.1.3.1 智能数控钣金设备

1.1.3.1 Intelligent NC sheet metal equipment



产品简介

钣金设备采用冷加工技术来生产家电外壳机身。智能数控钣金设备主要由自动上料机、冲切机、180度翻转机、CNC长边折弯机、叠Z端折弯机、冷凝器自动贴附机、U形折弯机、下料机械手以及配套的气动系统、液压系统、电控系统等部分组成，实现从板料到家电外壳成品的自动化、智能化生产，其特点是外壳迷宫槽采用数控折弯成型，替代传统辊轧工艺，可适应不同厚度的板材，实现数字化柔性生产，通过伺服调整实现一键换型，通过以太网接口来将数据传输到整个工厂的管理系统，实现智能化生产。

图形化数字控制技术是智能数控钣金设备的关键技术，可在人机交互界面上快捷更改所需外壳迷宫槽形状，并动画模拟折弯过程，解决了传统辊轧工艺生产家电外壳时，只能制造一种厚度、一种槽型外壳的行业难题。

Product Introduction

Sheet metal equipment uses cold processing technology to produce the shell body of household appliances. The intelligent NC sheet metal equipment mainly consists of automatic feeder, punch cutter, 180 degree turnover machine, CNC long edge bending machine, Z-end bender, automatic attachment machine for condenser, U-bender, discharge manipulator as well as supporting pneumatic system, hydraulic system and electronic control system. It can produce finished sheet metal shell of household appliances in an automatic and intelligent manner. One of its characteristics is that the shell labyrinth groove is formed by CNC bending rather than traditional rolling process. The groove can adapt to sheet metal with different thickness, and realize digital flexible production. Through servo adjustment, one-button switching is realized. Through the Ethernet interface, data can be transmitted to the management system of the whole factory to realize intelligent production.

As a key technology of the intelligent NC sheet metal equipment, graphical digital control technology can quickly change the shape of shell labyrinth groove on the human-computer interface, and conduct animated simulation of bending process, compared to the traditional rolling process which cannot provide more than one thickness and one kind of groove shape for the production of appliance shell.

1.1.3.2 真空成型设备

1.1.3.2 Vacuum forming equipment



产品简介

该设备是生产冰箱内胆的专业设备，主要利用真空泵产生的真空吸力将加热软化后的塑料片材经过模具吸塑成家电内胆形状。主机包含上料部分、加热部分、输送部分、成型部分、自动冲孔切边部分、真空系统、冷却系统、润滑系统、水循环系统、模具加热系统及电气控制系统等，客户可根据预算和节拍要求选择单工位、双工位、多工位。五工位真空成型机生产箱胆节拍约为 40 秒，生产门内胆节拍约为 15 秒。

该设备采用热塑成型技术、凹模压空成型技术使得生产需用的原材料更薄，达到节省材料、节省能源的目的。同时采用 PID 控制加热技术，使加热瓦的温度快速稳定的达到设定值。

Product Introduction

Product profile: It is a kind of special equipment for producing refrigerator liner, which uses vacuum suction from vacuum pump and die to form softened plastic sheets into the shape of appliance liner. The equipment consists of feeding part, heating part, conveyor part, forming part, automatic punching and trimming part, vacuum system, cooling system, lubrication system, water circulation system, die heating system and electric control system. It has single, double and multi-station modes for selection, depending on the budget and rhythm requirements of customers. A five-station vacuum forming machine takes only about 40 seconds to produce a box liner and about 15 seconds to produce a door liner.

Thermoplastic forming technology and concave die cavity forming technology enable the equipment to produce with thinner materials, which saves materials and energy. PID control heating technology is used to increase the temperature of heating tile to the preset value in a quick and steady manner.

1.1.3.3 发泡专用设备

1.1.3.3 Special foaming equipment



产品简介

该设备主要用于冰箱门体的发泡生产。发泡专用设备由发泡夹具和发泡机两种专机组成。在家电发泡工艺里，夹具主要完成箱体或者门体自动定位、夹紧、锁模等，从而保证在发泡整个过程中，箱体、门体不变形。发泡机将发泡原料通过柱塞计量泵输送，在枪头高压喷射混合均匀，充注进入模腔开始发泡。通过数字化全自动电控系统可实时并远程监控设备运行状况。

发泡专用设备特点是采用伺服精确定位，可实现自动换模；采用自动扫码识别跟踪，箱体和对应的夹具、模具自动匹配；发泡机采用独立PID调节模块，响应时间为微秒级，精确控制流量，料比准确，重复性好。料比自动测试和精准控制是发泡专用设备的关键技术。

Product Introduction

The equipment is mainly used for the foaming production of refrigerator doors. The special foaming equipment consists of special foaming fixture and special foaming machine. In the appliance foaming process, the fixture is mainly used to automatically position, clamp and lock the box or door in a way that prevents distortion throughout the foaming process. Raw materials are transferred to the foaming machine through plunger metering pump, mixed uniformly by high pressure injection at the tip, and injected to produce foam in the die cavity. The digital automatic electronic control system can ensure the real-time and remote monitoring of equipment operation.

The special foaming equipment is characterized by servo precise positioning, which can realize automatic die change. Automatic scan, recognition and tracking are used for automatic match between box and corresponding fixture and die. The foaming machine adopts an independent PID regulation module that is characterized by microsecond-scale response, accurate flow control, precise material ratio and good repeatability. Automatic testing and precise control of material ratio is a key technology for the special foaming equipment.

1.1.4 家电智能检测系统

1.1.4 Intelligent inspection system for household appliances



产品简介

产品简介：家电在线检测系统由计算机数据采集处理系统、各种智能仪器仪表组成的数据采集系统、被测产品运行控制系统组成。用于控制被测家电产品的运行，监测生产的每个产品运行过程的各项性能参数是否在设定范围内，以判定生产的每个产品是否合格可以下线出厂。家电在线检测系统是家电产品生产质量控制必不可少的重要关键设备和手段。

家电在线检测系统关键技术在于产品测试流程及方案设计、硬件系统集成、软件系统开发设计，针对家电产品生产过程中的安全检测、性能检测、缺陷检测、质量控制等形成系列关键技术。采用工业以太网、现场总线技术、工业无线通讯技术，采集家电产品生产过程控制及质量控制点数据，进行数据分析和可视化展示，快速检测家电产品的性能，开发工业 APP 实现检测数据远程监视。

Product Introduction

The on-line inspection system for home appliances consists of computer data acquisition and processing system, intelligent instruments data acquisition system, and operation control system for products under test. It is used to control the operation of household appliances under test and monitor whether the performance parameters of each product are within the preset range, so as to determine whether the product is qualified for delivery. The on-line inspection system for household appliances is an indispensable key equipment and means for the quality control of household appliances production.

The system's key technologies include product testing process and scheme design, hardware system integration, development and design of software system, as well as a host of critical technologies for safety inspection, performance inspection, defect inspection and quality control in the process of home appliance product production. Industrial Ethernet, fieldbus technology and industrial wireless communication technology are used to collect data of production process control and quality control points of household appliances, and analyze and visualize data for rapid performance inspection of household appliances. An industrial APP is developed for remote monitoring of inspection data.

1.1.5 试验设备

1.1.5 Test equipment

1.1.5.1 空调焓差试验室

1.1.5.1 Air conditioning enthalpy difference laboratory



产品简介

测试空调器的制冷能力、制热能力、功耗、制冷系数、制热能效比、循环风量、季节能效比等各种参数，用于房间空调器生产过程抽检和新产品设计开发过程的测试

Product Introduction

It is capable of testing various parameters of air conditioner, such as refrigeration capacity, heating capacity, power consumption, refrigeration coefficient, coefficient of performance, circulating air volume and seasonal energy efficiency ratio. It is used for the sample inspection during the production of room air conditioners and the testing of new product design and development process.

1.1.5.2 冰箱冷柜性能试验设备

1.1.5.2 Refrigerator performance test equipment



产品简介

用于冰箱和冷柜的型式试验和工况试验，可测试冷冻能力、降温速度、能耗和制冷系数等参数，用于冰箱冷柜生产过程抽检和新产品设计开发过程的测试

Product Introduction

It is designed for the type test and working condition test of refrigerators. It is capable of testing such parameters as refrigeration capacity, cooling rate, energy consumption and refrigeration coefficient. It is used for the sample inspection during the production of refrigerators and the testing of new product design and development process.

1.1.5.3 全天候环境模拟试验室

1.1.5.3 All-weather environmental simulation laboratory



产品简介

可模拟环境温度、湿度、降雨、降雪、积冰、吹风、日照等自然条件，应用于家电、机电产品等领域的环境适应性测试

Product Introduction

It is capable of simulating ambient temperature, humidity, rainfall, snow, ice, wind, sunshine and other natural conditions, and can be used in the environmental adaptability testing of home appliances and mechanical and electrical products.

1.1.5.4 舒适性评价试验室

1.1.5.4 Comfort evaluation laboratory



产品简介

用于舒适性空调器的研究开发，试验室模拟空调器实际运行时的室内使用环境和室外使用环境，测定空调器运行时房间内的温湿度、风速及相关参数的分布特性，以评价空调器在使用条件下的舒适性、节能性、耐候性和环境适应性，可进行前瞻性的空调器人体舒适性研究

Product Introduction

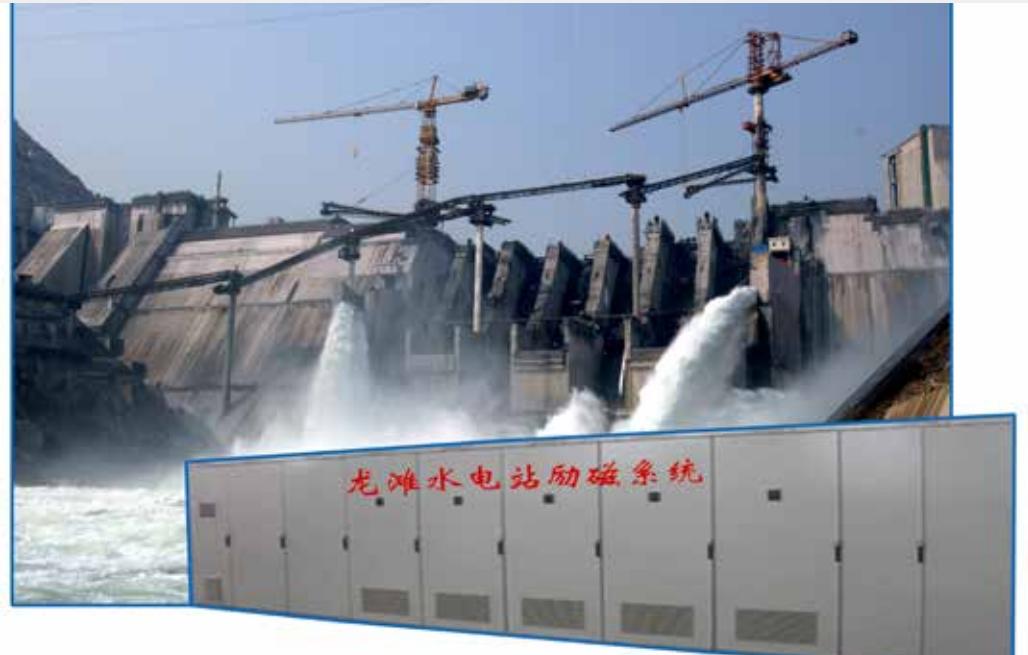
It is used for the research and development of comfortable air conditioners. The laboratory simulates the indoor and outdoor operating environments as the air conditioner operates. By determining the distribution characteristics of temperature, humidity, wind speed and related parameters in the room when the air conditioner is running, it evaluates the comfort level, energy conservation, weatherability and environmental adaptability of air conditioners under operating conditions. It can conduct prospective human comfort research of air conditioners.

1.2 励磁产品

1.2 Excitation products

1.2.1 发电机组励磁系统

1.2.1 Generator set excitation system



产品简介

励磁产品采用实时操作系统构建控制系统平台，实现高性能励磁控制技术和 IEC61850 智能化电站通信技术。国内率先推出的基于 CAN 总线技术的同步发电机智能化励磁系统，实现高性能励磁控制，处于国际先进、国内领先水平。在国际范围，率先实现了非线性鲁棒 PSS (NR-PSS) 先进控制技术。

励磁产品及相关技术曾荣获国家电网公司科技进步一等奖、中国机械工业技术奖二等奖、广东省科技进步二等奖等科技奖项，产品出口至二十多个国家。

Product Introduction

The excitation product uses a control system platform based on real-time operating system, which realizes high performance excitation control and IEC61850 intelligent power station communication. The Company is China's first manufacturer of intelligent excitation system of synchronous generator based on CAN bus technology which reaches the international advanced level and domestic leading level by achieving high-performance excitation control. Internationally, it is the first company to realize the advanced control of nonlinear robustness PSS (NR-PSS).

The excitation products and related technologies have won the first prize of scientific and technological progress award of State Grid Corporation, the second prize of China Machinery Industry technology award, and the second prize of Guangdong provincial scientific and technological progress award. The products are exported to more than 20 countries.

1.2.2 励磁装置

1.2.2 Excitation equipment



产品简介

励磁产品涵盖 0.5~1000MW 容量等级的所有水轮发电机组、抽水蓄能机组、汽轮发电机组和同步电动机组，是国内励磁产品系列最全的制造商。具备年生产 400 套励磁设备 /2000 个励磁柜的生产能力，具备强大的产能。产品可经受高海拔、高湿度、高地震烈度、高温等各种恶劣环境的考验，是适应性最强的励磁产品。产品质量可靠，性价比高，远销亚、非、拉、欧洲等二十多个国家，是出口量最大的励磁制造商。我公司励磁采用完全独立的微机 / 微机 / 模拟三通道双模冗余结构。采用 PID+PSS 调节规律，符合 IEC 标准的 PSS 可以有效地抑制电力系统低频振荡，提高系统输送能力。调节器硬件采用多 CPU 模式。柔性的智能接口电路。采用快速脉冲列技术，实现残压起励。可采用智能均流技术，均流系数达到 0.98。调节器具有优良的多语种人机界面，采用彩色液晶触摸屏。专用的 WINDOWS 版本调试软件，实现了智能化调试。

Product Introduction

The Company is a domestic manufacturer with the most complete offering of excitation products, covering 0.5~1000MW turbine generator units, pumped storage units, turbogenerator sets and synchronous motor sets. It is capable of producing 400 sets of excitation equipment/2000 excitation cabinets per year. The products are the most adaptable ones, which can withstand the test of harsh environments such as high altitude, high humidity, high seismic intensity and high temperature. The product quality is reliable and the cost performance ratio is high. The Company is the largest exporter of excitation products, which have been exported to more than 20 countries in Asia, Africa, Latin America and Europe. Its excitation products adopt the fully independent microcomputer/microcomputer/analog three-channel dual-modular redundancy architecture and the PID + PSS regulation pattern. PSS conforming to IEC standard can effectively suppress the low frequency oscillation of power system and improve the system's transmission capacity. The regulator hardware adopts multi-CPU mode, and has flexible intelligent interface circuit. The regulator adopts fast pulse train technology to realize residual voltage excitation, and can use intelligent current sharing technology with the current sharing coefficient of up to 0.98. The regulator has excellent multilingual man-machine interface and adopts color LCD touch screen. The special WINDOWS version debugging software realizes intelligent debugging.

励磁型号

- 1.EXC9000/9100 (适用于 10MW 以上机组)
- 2.UNITOL5000/6000 (适用于 10MW 以上机组)
- 3.EXC6000 (适用于 10MW 以下机组)
- 4.MER6000(适用于同步电动机励磁)

Excitation model

1. EXC9000/9100 (for units above 10MW)
2. UNITOL5000/6000 (for units above 10MW)
3. EXC6000 (for units below 10MW)
4. MER6000 (for synchronous motor excitation)

出口业绩

出口全球五大洲近三十多个国家。

Export performance

Export to more than 30 countries in five continents.

1.3 新能源电池自动检测系统

1.3 New energy battery inspection system



产品简介

新能源电池检测系统涵盖了化成分容系统设计与设备集成，涉及计算机软件、嵌入式控制、精密机械、电力电子、自动化控制以及数据库系统等诸多专业，核心技术集中于充放电过程电压 / 电流的控制检测精度、充放电安全保障、电池制造工艺的适应以及自动化和智能化水平，实现动力电池检测的节能化、系统化、自动化、智能化，能对化成分容系统进行整体设计和设备集成。电池检测设备产品种类丰富，规格齐全，可提供锂电池全自动后处理系统所需的所有设备。

Product Introduction

The new energy battery inspection system covers the design and equipment integration of formation and capacity grading system, and involves the disciplines of computer software, embedded control, precision machinery, power electronics, automation control and database system. Its core technologies include control inspection accuracy of voltage/current in charging and discharging processes, charging and discharging safety guarantee, and the adaptation, automation and intelligent levels of battery manufacturing technology. It realizes the efficient, systematic, automated and intelligent inspection of power batteries, and can conduct overall design and equipment integration of the formation and capacity grading system. The Company has various types and complete specifications of battery inspection equipment products and can provide all the necessary equipment for the automatic post-processing system of lithium batteries.

2 电力电子类

2 Power electronics

2.1 大功率电解整流装置

2.1 High power electrolytic rectifier



产品简介

本系列产品为大电流、大容量的整流装置，主要用于金属冶炼、电解化工等行业，作为电解铝、电解铅锌、电解镁、电解铜、电解锰、电解食盐、水电解和石墨炉加热之用。也可用作类似负载的直流电源。该装置用于铝合金型材表面氧化、着色、电泳及生产线控制和记录。

Product Introduction

As high current and large capacity rectifiers, the products are mainly used in the electrolysis of aluminum, lead, zinc, magnesium, copper, manganese, salt and water and the heating of graphite furnace in metal smelting and electrochemical industry. They can also be used as a DC power supply for similar loads. The devices are used for the surface oxidation, coloring, electrophoresis of aluminum alloy profiles and the production line control and recording.

3 环保涂料及树脂

3 Environment friendly coatings and resins

3.1 聚酯树脂

3.1 Polyester resin



产品简介

聚酯树脂系列产品是粉末涂料的重要原材料，其品种、质量、价格、性能等直接关系到粉末涂料的发展和涂料行业的结构调整。公司的聚酯树脂产品是以“国家 863 计划”科研成果为依托发展而来，技术创新能力突出，产品质量稳定，行业美誉度高，多次荣获省市科技进步奖。公司现有混合型聚酯、TGIC 固化型聚酯、羟烷基酰胺固化型聚酯和异氰酸酯固化型树脂 4 大系列近 80 余个牌号。

Product Introduction

As important raw materials for powder coatings, the polyester resin series products are directly related to the development of powder coatings and the restructuring of coatings industry in terms of their variety, quality, price and performance. The Company's polyester resin products are based on the research achievements of 863 Program. With prominent capacity of technological innovation, stable quality and wide recognition, they have won provincial and municipal science and technology progress awards on many occasions. The Company has over 80 grades under the series of mixed polyester, TGIC cured polyester, hydroxyalkyl amide cured polyester and isocyanate cured polyester.

3.2 粉末涂料 3.2 Powder coating



产品简介

粉末涂料物理状态为粉末状，通过粉末涂料的涂装，可以提升产品的防护性能并赋予优美的外观。相比于其他类型涂料，粉末涂料具有高效、经济、环保、高性能的优势。公司粉末涂料产品涵盖电器、汽车等领域。公司户外耐候型家电粉末涂料产品性能优异、知名度高，已销售给格力电器、海信科龙、奥克斯空调、三菱重工、松下电器等全球知名的家电企业，成果曾荣获广东省科学技术奖二等奖和广州市科学技术奖一等奖。

Product Introduction

The physical state of powder coatings is powder. The powder coating contributes to the protective performance and aesthetic appearance of products. Compared with other types of coatings, the powder coatings have the advantages of high efficiency, economy, environmental protection and high performance. The Company's powder coating products cover electrical appliances, automobiles and other fields. With superior performance and high visibility, the Company's outdoor weatherproof powder coating products for household appliances are sold to world leading home appliance enterprises such as Gree, Kelon, Aux, MHI and Panasonic. Its achievements have won the second prize of Guangdong provincial science and technology award and the first prize of Guangzhou science and technology award.

3.3 水性涂料

3.3 Waterborne coatings



产品简介

水性涂料是目前涂料市场上一种比较新型的涂料。水性涂料以水作溶剂，节省大量资源；水性涂料消除了施工时火灾危险性；降低了对大气污染。该水性涂料主要面向家电、汽车零部件等工业用户，其涂层干燥速度快、综合性能好，特别是在低温快干方面具有优越性，荣获广东省名牌产品称号。水性金属漆以水为溶剂，环保、安全。水性金属漆附着力好，耐水、耐盐雾、耐酸碱，丰满度高，装饰性好，具有优异的综合性能。

Product Introduction

Waterborne coatings are a relatively new type of coatings in the paint market. The solvent of waterborne coatings is water, which saves a lot of resources. The waterborne coatings eliminate fire hazard during construction and reduce air pollution. The waterborne coating mainly targets users from such industries as household appliances and automotive parts. Enjoying fast drying, good comprehensive performance and, in particular, excellent performance in quick drying at low temperature, it has won the title of Guangdong provincial famous brand. The water-based solvent of waterborne metal paint is environment-friendly and safe. The waterborne metal paint is characterized by good adhesion, resistance to water, salt fog, acid and alkali, high fullness, good decoration effect and excellent comprehensive performance.

4 科技服务

4 Science and technology services

产品细分 Product segmentation	产品简介 Product profile
产品认证 Product certification	CVC 威凯提供电工产品面板耐 UV 老化认证，电气设备外壳防护等级认证，内燃机交流发电站安全认证，汽车电子电器零部件电磁兼容认证和空气净化器安全 + 环保认证 5 个自愿性产品认证。 Vkan Certification & Testing Co., Ltd (CVC) provides 5 voluntary product certifications, i.e. UV aging resistance certification of electrical product panel, protection grade certification of electrical equipment enclosure, safety certification of AC power station with internal combustion engine, EMC certification of automotive electronic and electrical parts and safety + environmental protection certification of air purifiers.
体系认证 System certification	CVC 威凯提供 ISO9001 质量管理体系、ISO14001 环境管理体系、OHSAS18001 职业健康安全管理体系的评审及认证。 CVC conducts the review and certification of compliance with ISO 9001 quality management system, ISO14001 environmental management system and OHSAS 18001 occupational health and safety management system.
检测 Testing	CVC 威凯可开展家用电器、信息技术设备、音视频产品、电气附件、照明产品、玩具与儿童用品、汽车及其零部件、电池、材料、医疗器械、压缩机、电机、电焊机、内燃机、机械等广泛产品的安全、功能、能效、寿命、EMC、可靠性、环境适应性、材料成分分析、运输安全等检测服务。 CVC can carry out safety, function, energy efficiency, life, EMC, reliability, environmental adaptability, material composition analysis and transportation safety testing of a wide range of products, including household appliances, information technology equipment, audio and video products, electrical accessories, lighting products, toys and children's products, automobiles and their parts, batteries, materials, medical devices, compressors, motors, welding machines, internal combustion engines and machinery.
计量校准 Metrological calibration	CVC 威凯计量中心（机械工业第三计量测试中心站）是机电行业第一家被 CNAS 认可的国家校准实验室。建立了电磁学、无线电、时间与频率、热工、长度、力学等二十几项最高计量标准。 CVC metrology center (third metrology and testing center of machinery industry) is the first national electromechanical calibration laboratory approved by CNAS. It has established over 20 top metrological standards for electromagnetics, radio, time and frequency, thermodynamics, length and mechanics.
能力验证 Proficiency testing	CVC 威凯作为 CNAS 参考比对机构，承担 CNAS 的测量审核和参考比对任务，获准领域包括电池、照明、电动机、电焊机、电子类、家电类、EMC、玩具类、金属材料、汽车零部件等，是中国最早获得电器领域参比试验室的机构，也是覆盖领域最广的一家参比机构。 As one of the designated organizations by CNAS for comparison testing, CVC is tasked with CNAS' measurement audit and comparison testing. CVC is authorized to carry out comparison testing in the fields of batteries, lighting, motors, welding machines, electronics, household appliances, EMC, toys, metal materials, automotive parts and components. It is China's first body to be recognized as the home appliances comparison testing laboratory and also the comparison testing body with the widest coverage.
培训 Training	CVC 威凯致力于为企业提供包括职业资格、关键技术、产品标准与质量检验、产品问题整改技术、管理体系、品质管理、研发管理、生产制造管理、实验室与计量校准以及供应链管理在内的系统培训服务。 CVC is committed to providing enterprises with systematic training services covering professional qualification, key technology, product standard and quality inspection, product problem rectification technology, management system, quality management, R&D management, production and manufacturing management, laboratory and metrology calibration and supply chain management.
验货 Commodity inspection	CVC 威凯作为 CNAS 认可的检查与验货机构，能够为国内外客户提供包括各种形式的验厂、第二方委托验货（包括过程检验、产品随机抽样检验、装柜检验等）级第三方验货（如 SASO 等） As a CNAS-approved inspection and proficiency testing organization, CVC can provide domestic and foreign customers with various types of factory inspection, second-party entrusted commodity inspection (including process inspection, product random sampling inspection and container inspection) and third-party commodity inspection (e.g. SASO).
标准化 Standardization	CVC 威凯为企业提供标准信息查、国家标准制修订、行业标准制修订、标准差异分析与研究在内的标准化服务。 CVC provides enterprises with standardization services, including standard information enquiry, national standard revision, industry standard revision, standard difference analysis and research.
技术提升 Technological upgrading	CVC 威凯作为中国历史最悠久、规模最大的第三方检测机构之一，累计了丰富的试验室建设和管理经验，能为企业提供包括标准辅导、实验室规划、设备采购、人员培训、比对试验、CNAS 认可辅导等“一站式”的试验室建设和管理提升服务。 As one of the oldest and largest third-party inspection bodies in China, CVC has accumulated rich experience in laboratory building and management, and is capable of providing "one-stop" laboratory building and management upgrading services, including standard counseling, laboratory planning, equipment procurement, personnel training, comparison test and CNAS accreditation counseling.



海尔洗衣机检测
Haier Washing machine testing



美的冰箱检测
Midea Freezer testing



TCL 插座检测
TCL Socket testing



万宝压缩机检测
Wanbao compressor testing



飞利浦照明产品检测
Philips lighting testing



威灵电机检测
Wellinig motor testing



MD 玩具检测
Melissa & Doug toy testing



通用汽车老化检测
GM Auto Aging testing



通用汽车 EMC 测试
GM Auto EMC testing



通用汽车暴晒测试
GM Auto Exposure testing



天际咖啡壶检测
Tonze Coffee maker testing

5 电站产品

5 Power plant products

5.1 汽车电站

5.1 Power supply vehicle



应急不间断电源车
Emergency UPS vehicle



应急不间断电源车
Emergency UPS vehicle

产品简介

低噪声汽车电站是以汽车二类底盘为运载载体，由汽车底盘、低噪声舱体、柴油发电机组、控制及配电输出系统、进排风降噪系统、燃油箱及工具备件等组成，该产品具有噪声低、机动性强、运行可靠性高等特点，其性能指标特别是降噪指标达到国际先进水平。该系列产品广泛应用到部队、影视、邮政、通信、电力、勘探等各个需要移动电源的行业领域。该系列产品可选型各类汽车底盘品牌及发电机组品牌。

Product Introduction

With category II chassis as the carrier, the low noise series power supply vehicle consists of automobile chassis, low noise cabin, diesel generator set, control and distribution output system, inlet and exhaust noise reduction system, fuel tank, tools and spare parts. The product is characterized by low noise, strong maneuverability and high reliability. Its noise reduction indicator, among others, is among the world's advanced level. The products have been widely used in military, film and television, postal service, communications, electricity, exploration and other industries where there is a need for mobile power supply. The products are compatible with various brands of automobile chassis and generator set.

性能指标

- a) 电站功率：12kW ~ 600kW;
- b) 噪声指标：65dB (A) ~ 75 dB(A);
- c) 性能指标：可满足 GJB 235A-1997 《军用交流移动电站通用规范》 I ~ III 电站指标；
- d) 环境条件：
 - 工作温度：-40° C ~ +55°C ;
 - 贮存温度：-50°C ~ +65°C ;
 - 海拔高度：0 ~ 4000m。

Performance indicators

- a) Station power: 12kW ~ 600kW;
- b) Noise indicator: 65dB(A) ~ 75 dB(A);
- c) Performance indicators: In accordance with I ~ III power station indicators set out in GJB 235A-1997 General specification for military alternating current mobile electric power plant;
- d) Environmental conditions:
 - Working temperature: -40°C ~ +55°C;
 - Storage temperature: -50°C ~ +65°C;
 - Elevation: 0 ~ 4000m.

5.2 挂车电站

5.2 Trailer power station



产品简介

挂车电站主要由挂车底盘、低噪声舱体、柴油发电机组、控制及配电输出系统、进排风降噪系统、燃油箱及工具备件等组成，该产品具有噪声低、运行可靠、重量轻、体积小等特点。其部分性能指标达到国际先进水平。该系列产品广泛应用到部队、影视、邮政、通信、电力、宾馆、勘探等各个需要移动电源的行业领域。该系列产品可选型各类发电机组品牌。

Product Introduction

The trailer power station mainly consists of trailer chassis, low noise cabin, diesel generator set, control and distribution output system, inlet and exhaust noise reduction system, fuel tank, tools and spare parts. The product has the characteristics of low noise, reliable operation, light weight and small size. Some of its performance indicators have reached the international advanced level. The products have been widely applied in military, film and television, postal service, communications, electricity, hotels, exploration and other industries where there is a need for mobile power supply. The products are compatible with various brands of generator set.

性能指标

- a) 机组功率: 50kW ~ 80 kW;
- b) 噪声指标: 70dB(A) ~ 80 dB(A);
- c) 机组电气性能指标: 可满足 GB 2819—1995《移动电站通用技术条件》I ~ III类电站指标;
- d) 环境条件:
 - 工作温度: -40° C ~ +55°C ;
 - 贮存温度: -50°C ~ +65°C ;
 - 海拔高度: 0 ~ 4000m。

Performance indicators

- a) Unit power: 50kW ~ 80 kW;
- b) Noise indicator: 70dB(A) ~ 80 dB(A);
- c) Electrical performance indicators of unit: In accordance with category I ~ III power station indicators set out in GB 2819-1995 General specification for mobile electric power plant;
- d) Environmental conditions:
 - Working temperature: -40°C ~ +55°C;
 - Storage temperature: -50°C ~ +65°C;
 - Elevation: 0 ~ 4000m.

5.3 方舱电站

5.3 Shelter power station



产品简介

方舱电站主要由低噪声舱体、柴油发电机组、控制及配电输出系统、进排风降噪系统、燃油箱及工具备件等组成。该产品具有噪声低、运行可靠、重量轻、体积小等特点。其部分性能指标达到国际先进水平。该系列产品广泛应用于部队、影视、邮政、通信、电力、宾馆、勘探等各个需要移动电源的行业领域。

该系列产品可选型各类发电机组品牌。

性能指标

- a) 电站功率: 5kW ~ 2000kW;
- b) 噪声指标: 65dB (A) ~ 75 dB(A);
- c) 性能指标: 可满足 GJB 235A-1997 《军用交流移动电站通用规范》 I ~ III 电站指标;
- d) 环境条件:
 - 工作温度: -40° C ~ +55°C ;
 - 贮存温度: -50°C ~ +65°C ;
 - 海拔高度: 0 ~ 4000m。

Product Introduction

The shelter power station mainly consists of low noise cabin, diesel generator set, control and distribution output system, inlet and exhaust noise reduction system, fuel tank, tools and spare parts. The product has the characteristics of low noise, reliable operation, light weight and small size. Some of its performance indicators have reached the international advanced level. The products have been widely applied in military, film and television, postal service, communications, electricity, hotels, exploration and other industries where there is a need for mobile power supply.

The products are compatible with various brands of generator set.

Performance indicators

- a) Station power: 5kW ~ 2000kW;
- b) Noise indicator: 65dB(A) ~ 75 dB(A);
- c) Performance indicators: In accordance with I ~ III power station indicators set out in GJB 235A-1997 General specification for military alternating current mobile electric power plant;
- d) Environmental conditions:

Working temperature: -40°C ~ +55°C;

Storage temperature: -50°C ~ +65°C;

Elevation: 0 ~ 4000m.

国机智能科技有限公司

Sinomach Intelligence Technology Co., Ltd

公司名称：国机智能科技有限公司
Company Name: Sinomach Intelligence Technology Co., Ltd

<http://www.sinomach-it.com>

国机智能科技有限公司，以创建于 1959 年的广州机械科学研究院为主体，由中国机械工业集团与广州市政府共同投资组建，于 2015 年 12 月 25 日揭牌成立，注册资本 10 亿元。

国机智能致力于研究和发展机器人及关键零部件、智能装备、智能制造技术和相关产品，为工业客户提供系统的解决方案。

国机智能凭借雄厚的技术实力、先进的检测手段，为客户提供权威快捷的机器人检测、汽车零部件检测、油液与设备状态检测等检验检测、认证评价与技术咨询服务。

国机智能在机械基础技术、基础元件、基础工艺领域拥有技术和产品优势，密封、润滑、密封胶、液压、光机电一体化等方面的研究与开发位居国内先进水平。

经过 60 年的产业布局，目前在广州、北京、苏州、长沙、德阳等地设有子公司及产业基地。

Invested by China National Machinery Industry Corporation (Sinomach) and Guangzhou Municipal Government, Sinomach Intelligence Technology Co., Ltd. (Sinomach Inteltech) was established on December 25, 2015 with Guangzhou Mechanical Engineering Research Institute set up in 1959 as its main body. Its registered capital was RMB 1 billion.

Sinomach Inteltech is committed to researching and developing robots, key components, intelligent equipment, intelligent manufacturing technology and related products, and providing systematic solutions for industrial clients.

By virtue of strong technical strength and advanced testing means, Sinomach Inteltech provides its customers with authoritative testing, authentication, evaluation and technical advisory services, including robot testing, auto parts testing, oil and equipment status testing, etc. Sinomach Inteltech boasts technical and product advantages in the fields of supporting mechanical technology, components and process, and its research and development of sealing, lubrication, sealant, hydraulic and optical electromechanical integration rank among the best in China.

After 60 years of industrial layout, there are subsidiaries and industrial bases in Guangzhou, Beijing, Suzhou, Changsha and Deyang.

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汽车零部件智能连接装备和新型装配式装修涂胶复合生产线
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特种机器人业务

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汽车零部件、机器人及自动化装备的检测和认证服务

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1 智能板块

1.1.1 iSNM0030 智能机器人

1.1.1 iSNM0030 Intelligent Robot



主要应用			
装配、搬运			
规格			
工作范围	0.54m	工作负载	3kg
性能特点			
轴数	6	重量	25kg
防护	IP56	环境温度	5~50°C
安装方式	落地	环境湿度	<95%RH, 无结露
重复定位精度	±0.02mm	辐射	EMC/EMI 屏蔽
运动			
轴	关节行程	额定载荷下关节速度	
1	±170°	250° /s	
2	+50° ~ -170°	250° /s	
3	+150° ~ -110°	250° /s	
4	±170°	320° /s	
5	±120°	320° /s	
6	±360°	420° /s	

main application fields			
assembly、transport			
Specifications			
Working range	0.54m	workload	3kg
performance&characteristics			
axes	6	Weight	25kg
protection	IP56	environmental temperature	5~50°C
mounting	floor	environmental humidity	<95%RH, no condensation
Repeated positioning accuracy	± 0.02mm	radiation	EMC/EMI shield
movement			
axis	range of joint movement	the joint speed with rated payload	
1	± 170°	250° /s	
2	+50° ~ -170°	250° /s	
3	+150° ~ -110°	250° /s	
4	± 170°	320° /s	
5	± 120°	320° /s	
6	± 360°	420° /s	

1.1.2 iSNM0060 智能机器人

1.1.2 iSNM0060 Intelligent Robot



主要应用				
弧焊、搬运				
规格				
iSNM0060-6	工作范围	1.6m	工作负载	6kg
iSNM0060-16	工作范围	1.6m	工作负载	16kg
性能特点				
轴数	6		重量	230~250kg
防护	IP56		环境温度	5~50°C
安装方式	落地		环境湿度	<95%RH, 无结露
重复定位精度	±0.06mm		辐射	EMC/EMI 屏蔽
运动				
轴 axis	关节行程		额定载荷下关节速度	
1	±185°		156° /s	
2	+35° ~ -155°		156° /s	
3	+154° ~ -130°		156° /s	
4	±350°		343° /s	
5	±130°		362° /s	
6	±350°		659° /s	

Main purpose				
arc-welding、transport				
Specifications				
iSNM0060-6	Working range	1.6m	workload	6kg
iSNM0060-16	Working range	1.6m	workload	16kg
performance&characteristics				
axes	6		Weight	230~250kg
protection	IP56		environmental temperature	5~50°C
install	floor		environmental humidity	<95%RH, no condensation
Repeated positioning accuracy	±0.06mm		radiation	EMC/EMI shield
movement				
axis	range of joint movement	the joint speed with rated payload		
1	±185°	156° /s		
2	+35° ~ -155°	156° /s		
3	+154° ~ -130°	156° /s		
4	±350°	343° /s		
5	±130°	362° /s		
6	±350°	659° /s		

1.3 iSNM0500 智能机器人

1.1.3 iSNM0500 Intelligent Robot



主要应用				
码垛、上下料、打磨、装配				
规格				
iSNM0500-50	工作范围	2m	工作负载	50kg
iSNM0500-80	工作范围	2m	工作负载	80kg
性能特点				
轴数	6	重量	580kg	
防护	IP67	环境温度	5~45℃	
安装方式	落地	环境湿度	<95%RH,无结露	
重复定位精度	±0.07mm	辐射	EMC/EMI屏蔽	
运动				
轴	关节行程	关节速度 -50	关节速度 -80	
1	±185°	160° /s	160° /s	
2	+35° ~-155°	160° /s	120° /s	
3	+154° ~-130°	140° /s	120° /s	
4	±360°	250° /s	200° /s	
5	±120°	250° /s	200° /s	
6	±360°	320° /s	200° /s	

Main purpose				
Palletizing、loading and unloading、grinding and assembly				
Specifications				
iSNM0500-50	Working range	2m	workload	50kg
iSNM0500-80	Working range	2m	workload	80kg
performance&characteristics				
axes	6		Weight	580kg
protection	IP67		environmental temperature	5~45℃
install	floor		environmental humidity	<95%RH, no condensation
Repeated positioning accuracy	±0.07mm		radiation	EMC/EMI shield
movement				
axes	range of joint movement	joint speed-50	joint speed-80	
1	±185°	160° /s	160° /s	
2	+35° ~-155°	160° /s	120° /s	
3	+154° ~-130°	140° /s	120° /s	
4	±360°	250° /s	200° /s	
5	±120°	250° /s	200° /s	
6	±360°	320° /s	200° /s	

1.1.4 iSNM1500 智能机器人

1.1.4 iSNM1500 Intelligent Robot



主要应用				
点焊、搬运				
规格				
型号	iSNM1500-130	iSNM1500-150	iSNM1500-180	iSNM1500-220
工作范围	3.2m	2.8m	2.7m	2.5m
工作负载	130kg	150kg	180kg	220kg
负载偏心	0.3m	0.3m	0.3m	0.3m
性能特点				
轴数	6	重量	1200~1400kg	
防护	IP56	环境温度	5~50°C	
安装方式	落地	环境湿度	<95%RH, 无结露	
重复定位精度	± 0.15mm	辐射	EMC/EMI 屏蔽	
运动				
轴	关节行程	额定载荷下关节速度		
1	± 170°	90° /s		
2	+0° ~ -140°	90° /s		
3	+70° ~ -180°	90° /s		
4	± 300°	120° /s		
5	± 130°	120° /s		
6	± 300°	150° /s		

Main purpose			
spot-welding, transport			
Specifications			
models	iSNM1500-130	iSNM1500-150	iSNM1500-180
Working range	3.2m	2.8m	2.7m
workload	130kg	150kg	180kg
Load eccentricity	0.3m	0.3m	0.3m
performance&characteristics			
axes	6	Weight	1200~1400kg
protection	IP56	environmental temperature	5~50°C
install	floor	environmental humidity	<95%RH, no condensation
Repeated positioning accuracy	± 0.15mm	radiation	EMC/EMI shield
movement			
axes	range of joint movement	the joint speed with rated payload	
1	± 170°	90° /s	
2	+0° ~ -140°	90° /s	
3	+70° ~ -180°	90° /s	
4	± 300°	120° /s	
5	± 130°	120° /s	
6	± 300°	150° /s	

1.1.5 Hybot 系列主从遥操作机器人

1.1.5 Hybot Series Master-Slave Teleoperation Robots



产品简介

Hybot 系列主从操作机器人，是结构相同的两套机构，分别放置在不同的地方，其中主机器人放置在一个安全或方便的地方，从机器人放在人不宜接近的地方，如有高压电、强辐射、高温、水下等环境。操作者根据传感器信息，如视觉、接触力觉、接近觉等来操作主机器人，主机器人与从机器人之间存在着机械耦合，并将主机器人运动传递给从机器人，从机器人就跟随主机器人的运动。主从操作方式极大地延伸了机器人的应用空间，在许多危险的或极限环境下，采用机器人代替人是唯一可行办法。另外，从操作机器人末端设计有工具自动切换装置，可以自动更换各种作业工具，大大拓展了机器人的作业能力与工作效率。

Product Introduction

Hybot series master-slave manipulation robots are two sets of mechanisms with the same structure, which are placed in different places. The host robot is placed in a safe or convenient place, and the robot is placed in an inappropriate place, such as high-voltage electricity, strong radiation, high temperature, underwater environment. The operator operates the host robot according to the sensor information, such as vision, contact force and proximity. There is mechanical coupling between the host robot and the slave robot, and transfers the motion of the host robot to the slave robot. The slave robot follows the motion of the host robot from the robot. Master-slave mode of operation greatly extends the application space of robots. In many dangerous or extreme environments, it is the only feasible way to replace human beings with robots. In addition, a tool automatic switching device is designed from the end of the manipulator, which can automatically replace various tools, greatly expanding the ability and efficiency of the manipulator.

从手参数	
机械臂类型	6 轴串联型
结构件材料	铝合金阳极氧化、不锈钢
水平工作距离	1444mm
垂直工作距离	1722mm
装载高度	890mm
负载重量	30kg
手爪夹持力	300N
运动自由度	6+1
各轴运动范围	1 轴 ±90° 2 轴 0-120° 3 轴 0-110° 4 轴 ±50° 5 轴 ±45° 6 轴 0~360° (可连续旋转)
自重	70kg
液压源要求	油压: 恒压源, 油压波动量≤±5%, 公称油压≥16MPa 流量: ≥25L/min 油液清洁度: NAS1638 5 级 油温: 35~45°C, 有散热系统 油管接口: 锥外螺纹 M16×1.5
主手参数	
接口	CANopen/RS-232/ RS-422/485/ 以太网
手柄上按钮数量	4~8 个按钮
旋转分辨率	0.2°
重量	11.5kg
工作区	920 × 785 × 268mm ³
电源	100~240VAC 50/60Hz 单相
平均功率	275W
最大功率	800W

Slave parameter	
Manipulator type	6-Axis Series Type
Structural material	Anodic oxidation of aluminium alloy and stainless steel
Horizontal working distance	1444mm
Vertical working distance	1722mm
Loading Height	890mm
Load weight	30kg
Claw clamping force	300N
Degree of freedom of motion	6+1
The range of motion of each axis	1-axis (± 90 degrees) 2-axis (0-120 degrees) 3-axis (0-110 degrees) 4-axis (± 50 degrees) 5-Axis (± 45 degrees) 6-Axis 0-360 Degree (Continuous Rotation)
Dead weight	70kg
Hydraulic Source Requirements	Oil Pressure: Constant Pressure Source, Oil Pressure Fluctuation <5%, Nominal Oil Pressure <16MPa Flow: > 25L/min Oil cleanliness: NAS 16385 Oil temperature: 35 ~ 45°C , with heat dissipation system Tubing Interface: Extra-conical Thread M16*1.5
Master parameter	
Interface	CANopen/RS-232/ RS-422/485/ Ethernet
Number of buttons on the handle	4~8
Rotation resolution	0.2°
weight	11.5kg
work area	920 × 785 × 268mm ³
Power Supply	100~240VAC 50/60Hz
Average power	275W
maximum power	800W

1.1.6 Hytrue 远程立体视觉显示系统

1.1.6 Hytrue Remote Stereo Vision Display System



产品简介

立体视觉显示也称为 3D 显示，常见的 3D 显示技术都是利用了人类的视觉神经自动的通过双眼的视差对两幅副图像进行立体效果合成这一事实，将通过双目相机拍摄或制作的针对同一场景而左右略有差别的两幅图像同时单独给人的左右眼进行观看，由人脑加工出立体影像，产生 3d 效果。

Product Introduction

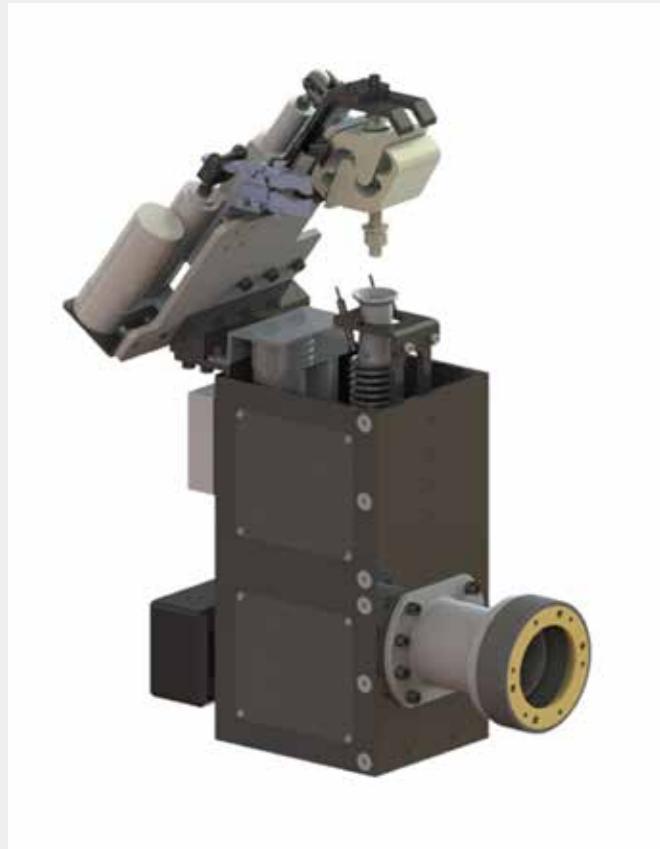
Stereo vision display is also called 3D display. The common 3D display technology uses the fact that human visual nerve automatically synthesizes the stereo effect of two sub-images through binocular disparity. Two images which are slightly different from each other for the same scene will be taken or produced by binocular cameras. The left and right eyes were watched, and the stereo images were processed by the human brain, which produced a 3-day effect.

性能参数	
分辨率	1920 * 1080
帧数	30 fps
光学参数	定焦、自动对焦
视角	60°
工作环境	室外、温度 -30 ~ 50°C , 湿度 < 95%
供电方式	USB

performance parameter	
Resolution ratio	1920 * 1080
Frame number	30 fps
Optical parameters	Focusing and auto-focusing
visual angle	60°
work environment	Outdoor, temperature - 30 - 50 °C , humidity < 95%
Power supply mode	USB

1.1.7 J型线夹自动拆装工具

1.1.7 J-type clamp automatic disassembly tool



产品简介

主要用于 10kV 高压带电作业 J 型线夹的拆装

Product Introduction

Mainly used for disassembly and assembly of J-type clamp for 10 kV high voltage live work

指标项目	指标参数
输入电源	DC 20V-24V
工作温度	-10°C ~40°C
存储温度	-10°C ~55°C
工作湿度	10%~70%RH
功能描述	<ul style="list-style-type: none"> ◆ 配备多种规格万向柔性套筒可满足 M8-M20 范围六角螺钉、螺栓、螺母拆装; ◆ 操作方向与接口方向垂直; ◆ 机身采用钢和铝合金材质; ◆ 电池座及接口采用绝缘材料，可实现操作端与工具端的绝缘; ◆ 配备适应快换装置的接口; ◆ 无线遥控控制; ◆ 锂电池供电 + 一块备用电池。

items	parameters
Input power supply	DC 20V-24V
working temperature	-10°C ~40°C
Storage temperature	-10°C ~55°C
Working humidity	10%~70%RH
Functional description	<ul style="list-style-type: none"> ◆ Equipped with a variety of specifications of universal flexible sleeve can meet the M8-M20 range of hexagonal bolts, bolts, nuts disassembly and assembly; ◆ The operation direction is perpendicular to the interface direction. ◆ The fuselage is made of steel and aluminium alloy. ◆ The battery seat and interface are insulated material, which can realize the insulation between the operating end and the tool end. ◆ Equipped with an interface adapted to the quick change device; ◆ Wireless remote control; ◆ Lithium battery plus a spare battery.

1.1.8 快换电动夹爪

1.1.8 Quick Change Electric Claw



产品简介

Product Introduction

Mainly used for clamping objects in 10 kV high voltage live work

指标项目	指标参数
输入电源	DC 12-24V
工作温度	-10°C ~40°C
存储温度	-10°C ~55°C
工作湿度	10%~70%RH
夹持距离	0-65mm
夹持力	58-120N
功能描述	<ul style="list-style-type: none"> ◆ 四杆机构平行夹持; ◆ 无刷直流电机驱动，夹持力可控; ◆ 具有位置传感器; ◆ 电池独立供电; ◆ 具有快换接头，更换方便; ◆ 可断电自锁; ◆ 夹头形式便于更换，可通过更换夹头形式调节夹持范围。

items	parameters
Input power supply	DC 12-24V
working temperature	-10°C ~40°C
Storage temperature	-10°C ~55°C
Working humidity	10%~70%RH
Clamping distance	0-65mm
Clamping force	58-120N
Functional description	<ul style="list-style-type: none"> ◆ Parallel clamping of four-bar mechanism; ◆ Brushless DC motor drive, clamping force is controllable; ◆ It has a position sensor. ◆ Batteries are powered independently. ◆ It has quick change connector and is convenient to replace. ◆ Power off and self-locking; ◆ The form of chuck is easy to replace, and the clamping range can be adjusted by changing the form of chuck.

1.1.9 电动遥控柔性套筒工具

1.1.9 Electric remote control flexible sleeve tool



产品简介

主要用于 10kV 高压带电作业中螺栓的拆装

Product Introduction

Mainly used for the disassembly and assembly of bolts in 10 kV high voltage live work

指标项目	指标参数
输入电源	DC 20V-24V
工作温度	-10°C ~40°C
存储温度	-10°C ~55°C
工作湿度	10%~70%RH
功能描述	<ul style="list-style-type: none"> ◆ 配备多种规格万向柔性套筒可满足 M8-M20 范围六角螺钉、螺栓、螺母拆装； ◆ 操作方向与接口方向垂直或相同； ◆ 机身采用钢和铝合金材质； ◆ 电池座及接口采用绝缘材料，可实现操作端与工具端的绝缘； ◆ 配备适应快换装置的接口； ◆ 无线遥控控制； ◆ 锂电池供电 + 备用电池。

items	parameters
Input power supply	DC 20V-24V
working temperature	-10°C ~40°C
Storage temperature	-10°C ~55°C
Working humidity	10%~70%RH
Functional description	<ul style="list-style-type: none"> ◆ Equipped with a variety of specifications of universal flexible sleeve can meet the M8-M20 range of hexagonal bolts, bolts, nuts disassembly and assembly; ◆ The operation direction is perpendicular to or the same as the interface direction. ◆ The fuselage is made of steel and aluminium alloy. ◆ The battery seat and interface are insulated material, which can realize the insulation between the operating end and the tool end. ◆ Equipped with an interface adapted to the quick change device; ◆ Wireless remote control; ◆ Lithium battery power supply + standby battery.

1.1.10 SAR8-1400 关节机器人

1.1.10 SAR8-1400 Robot



产品简介

主要用途：完成产品的平移、旋转、侧挂、翻转、码垛等功能，针对冲压行业而研发，对冲床、模具具有广泛的兼容性、使用范围广。

负载：8KG

工作范围：1400 mm

机身特点：精密齿轮箱，低噪音，寿命长，自动消隙，

应用范围广，进口减速机。

特点：

①通用性强，动作灵活，负载 80–300KG，可用于各种压力机；

② SAR 系列与 SRD 系列可按需搭配，可降低成本提高效率，亦可用 SCH 机型替代，在保证效率的同时降低成本；

③运行速度快、安装便捷、调试简单；

④可实现自动化连续生产及单机生产。

Product Introduction

Main purpose: Complete product translation, gyrate, Side hang, turn, pile up neatly, Equivalent functions, Developed for stamping industry, A hedge bed, matrix, Widespread compatibility, Wide range of uses.

Load: 8KG

Terms of reference:1400mm

Airframe features:Precision gearbox,Low noise,Long life span,Automatic clearance,Application is extensive,Import reducer.

Features:

① Universal, Flexibility, Load 80-300KG, Available for various types of presses.

② SAR series & SRD series Available on demand,Increased efficiency by reducing costs,Can also be used instead SCH,Reducing costs while ensuring efficiency;

③ Speed of operation, Easy to install, Easy to debug.

④ Can realize automatic continuous production and stand-alone production.

产品参数

结构形式	自由度	有效负载	最大活动半径	重复定位精度	本体实际重量	电源容量
水平关节式机器人	4	8kg	1453.9mm	±0.08mm	159.5KG	3.15KVA
运动角度	S 轴			± 140°		
	L 轴			- 35° , +80°		
	U 轴			- 95° , +35°		
	R 轴			± 360°		
环境条件	温度			0~45° C		
	湿度			20~80%RH (不结露)		
	振动			4.9m/s² 以下		
* 不可有引火性及腐蚀性气体、液体 * 不可涉及水、油、粉 * 不可靠近电磁气源头						

Product parameters

Structural form	Degree of freedom	Payload	Maximum radius of activity	Repeated positioning accuracy	Actual Body Weight	Power capacity
Horizontal joint robot	4	8kg	1453.9mm	±0.08mm	159.5KG	3.15KVA
Sports angle	S 轴			± 140°		
	L 轴			- 35° , +80°		
	U 轴			- 95° , +35°		
	R 轴			± 360°		
Environmental conditions	temperature			0~45° C		
	humidity			20~80%RH (No dew)		
	vibrate			4.9m/s² under		
*Do not ignite and corrosive gaseous liquids *Do not involve water oil powder *Do not approach the source of electromagnetic gas						

1.2.1 MR6-1300 关节机器人

1.2.1 MR6-1300 Robot



产品简介

MR 机器人作为一款轻型准协作机器人采用全新的关节式模块化创新设计，能轻松实现不同臂展机型的快速装配和不同应用场合的快速转换。相比传统六轴机器人，MR6-1300 具有模块化、系列化、轻量化等特性，能有效降低用户的测试和维护成本。

MR 内置动力学算法，可随意切换协作与工业两种模式。协作模式下，速度限制、拖动示教、碰撞检测等功能一应俱全；工业模式下，可与传统工业机器人等速，比协作机器人快 50% 以上。结构上，主副臂与关节之间采用隐藏式螺栓紧固方式，既保证了整体外观协调性，又能方便客户快速更换成不同臂展机型，扩展机型的应用范围。该机型具有传统机器人的高速与灵活，又具备协作机器人的安全与智能，作为一款通用性六轴机器人，其性价比相对于市场同类产品具有领先优势。

Product Introduction

MR Robot As a light light quasi-cooperative robot, the new modular design of joint is adopted, Can easily realize the rapid assembly of different arm display models and the rapid conversion of different applications. Compared to traditional six-axis robots, MR6-1300 Robot Modular, serialization of products, Lightweight, Equivalent characteristics, Can effectively reduce user testing and maintenance costs.

MR Built-in dynamics algorithm, Free to switch between collaboration and industry. Collaboration mode, Speed limit, Drag to teach, Collision detection All functions are available; Industrial mode, Can be compared with traditional industrial robots Equal speed, More than 50 % faster than a team robot. Structure, Hidden bolt fastening between main and secondary arms and joints, The overall appearance is coordinated, It can also facilitate customers to quickly change into different arms exhibition models, Extension of the application range of the model. This model has the high speed and flexibility of traditional robot, It also has the safety and intelligence of collaborative robots. As a universal six-axis robot, Its price performance has a leading advantage over similar products in the market.

产品参数

结构形式	自由度	有效负载	最大活动半径	重复定位精度	本体实际重量	电源容量
关节式机器人	6	6kg	1300mm	±0.08mm	78KG	1.54KVA
运动角度	S 轴			± 160°		
	L 轴			- 130° , +85°		
	U 轴			- 134° , +255°		
	R 轴			± 132°		
	B 轴			± 120°		
	T 轴			± 360°		
环境条件	温度			0~45° C		
	湿度			20~80%RH (不结露)		
	振动			4.9m/s² 以下		
	* 不可有引火性及腐蚀性气体、液体 * 不可涉及水、油、粉 * 不可靠近电磁气源头					

Product parameters

Structural form	Degree of freedom	Payload	Maximum radius of activity	Repeated positioning accuracy	Actual Body Weight	Power capacity
Horizontal joint robot	6	6kg	1300mm	±0.08mm	78KG	1.54KVA
Sports angle	S 轴			± 160°		
	L 轴			- 130° , +85°		
	U 轴			- 134° , +255°		
	R 轴			± 132°		
	B 轴			± 120°		
	T 轴			± 360°		
Environmental conditions	temperature			0~45° C		
	humidity			20~80%RH (No dew)		
	vibrate			4.9m/s² under		
	*Do not ignite and corrosive gaseous liquids *Do not involve water oil powder *Do not approach the source of electromagnetic gas					

1.2.2 SRD10-1400 关节机器人

1.2.2 SRD10-1400 Robot



产品简介

负载: 10KG

工作范围: 1400 mm

机身特点: 电机全防护，噪音低，寿命长，应用范围广，
进口减速机

主要用途: 弧焊、激光焊等各种焊接

应用行业: 汽车零部件、农机配件、钢结构等领域

系统介绍: 系统包括工业机器人 SRD10-1400、焊接设备、传感系统、变位系统、排气除尘系统和辅助设备等，利用点位控制、焊接跟踪技术、焊接检测技术等，实现生产中各种焊接需求。

Product Introduction

Payload: 10kg

Working range: 1400mm

The fuselage characteristics: Motor protection, low noise, long life, flexible operation and extensive use

Main use: arc welding resistance welding laser welding and other welding

Application industry: home appliances electronic auto parts, etc

System is introduced: The system consists of industrial robots SRD10-1400, welding equipment, sensing system, Deflection system, Exhaust dust removal system and auxiliary equipment, etc, Using the position control, Weld tracking technology, Welding testing technology and so on, Implementation in the production of various welding requirements.

产品参数

结构形式	自由度	有效负载	最大活动半径	重复定位精度	本体实际重量	电源容量
关节式机器人	6	10kg	1400mm	± 0.08mm	159KG	6.6KVA
运动角度	S 轴			± 150°		
	L 轴			- 60° ,+120°		
	U 轴			- 140° ,+170°		
	R 轴			± 145°		
	B 轴			± 135°		
	T 轴			± 360°		
环境条件	温度			0~45° C		
	湿度			20~80%RH (不结露)		
	振动			4.9m/s² 以下		
	* 不可有引火性及腐蚀性气体、液体 * 不可涉及水、油、粉 * 不可靠近电磁气源头					

Product parameters

Structural form	Degree of freedom	Payload	Maximum radius of activity	Repeated positioning accuracy	Actual Body Weight	Power capacity
Horizontal joint robot	6	10kg	1400mm	± 0.08mm	159KG	6.6KVA
Sports angle	S 轴			± 150°		
	L 轴			- 60° ,+120°		
	U 轴			- 140° ,+170°		
	R 轴			± 145°		
	B 轴			± 135°		
	T 轴			± 360°		
Environmental conditions	temperature			0~45° C		
	humidity			20~80%RH (No dew)		
	vibrate			4.9m/s² under		
	*Do not ignite and corrosive gaseous liquids *Do not involve water oil powder *Do not approach the source of electromagnetic gas					

1.2.3 SRK20-1700 关节机器人 1.2.3 SRDK20-1700 Robot



产品简介

主要用途：上下料，搬运，焊接，码垛，移载

负载：20KG

工作范围：1700 mm

机身特点：精密齿轮箱，低噪音，自动消隙，寿命长，

应用范围广

Product Introduction

Main usage: loading, unloading, welding, handling and transferring

Payload: 20kg

Working range: 1700mm

The fuselage characteristics: Precision gear box, low noise, long life, Automatic anti-backlash and extensive use

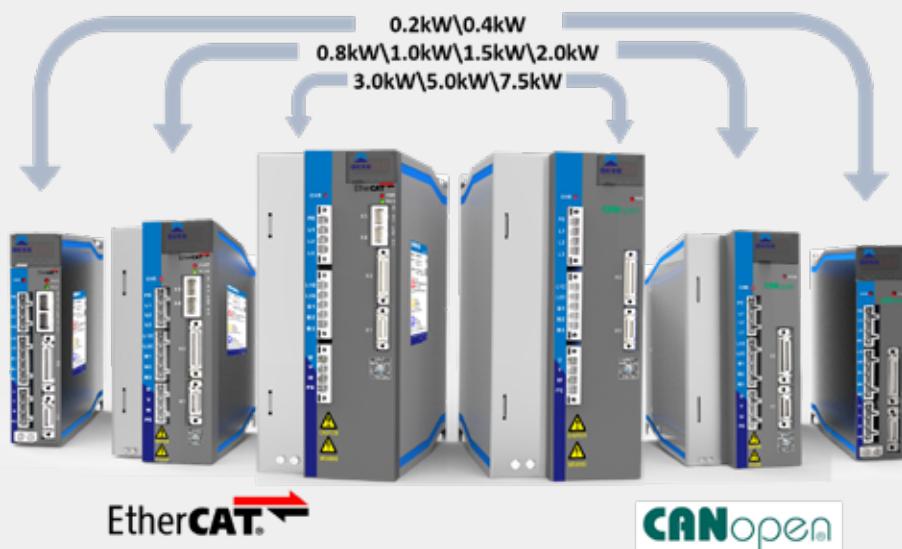
产品参数						
结构形式	自由度	有效负载	最大活动半径	重复定位精度	本体实际重量	电源容量
关节式机器人	6	20kg	1720mm	±0.05mm	270KG	5.7KVA
运动角度	S 轴			± 180°		
	L 轴			- 95° , +155°		
	U 轴			- 136° , +255°		
	R 轴			± 170°		
	B 轴			± 135°		
	T 轴			± 360°		
环境条件	温度			0~45° C		
	湿度			20~80%RH (不结露)		
	振动			4.9m/s² 以下		
* 不可有引火性及腐蚀性气体、液体 * 不可涉及水、油、粉 * 不可靠近电磁气源头						

Product parameters						
Structural form	Degree of freedom	Payload	Maximum radius of activity	Repeated positioning accuracy	Actual Body Weight	Power capacity
Horizontal joint robot	6	20kg	1720mm	±0.05mm	270KG	5.7KVA
Sports angle	S 轴			± 180°		
	L 轴			- 95° , +155°		
	U 轴			- 136° , +255°		
	R 轴			± 170°		
	B 轴			± 135°		
	T 轴			± 360°		
Environmental conditions	temperature			0~45° C		
	humidity			20~80%RH (No dew)		
	vibrate			4.9m/s² under		
	*Do not ignite and corrosive gaseous liquids *Do not involve water oil powder *Do not approach the source of electromagnetic gas					

1.2.4 ACSD-S 系列伺服驱动器

1.2.4 ACSD-S Serial Servo Driver

产品型号示例及解析						
ACSD - S - E —— 10 —— D —— T						
产品类型	系列名	通讯方式	功率等级	输入电压	编码器类型	
交流伺服	S: 单轴 D: 双轴	E: EtherCAT C: CANopen P: 脉冲型	02: 0.2kW 04: 0.4kW 07: 0.75kW 10: 1.0kW 15: 1.5kW	20: 2.0kW 30: 3.0kW 50: 5.0kW 75: 7.5kW	A: AC220V D: AC380V	I: 增量编码器 T: 多摩川编码器 B: BISS编码器 S: SSI编码器 E: EnDAT编码器 P: 松下编码器



产品简介

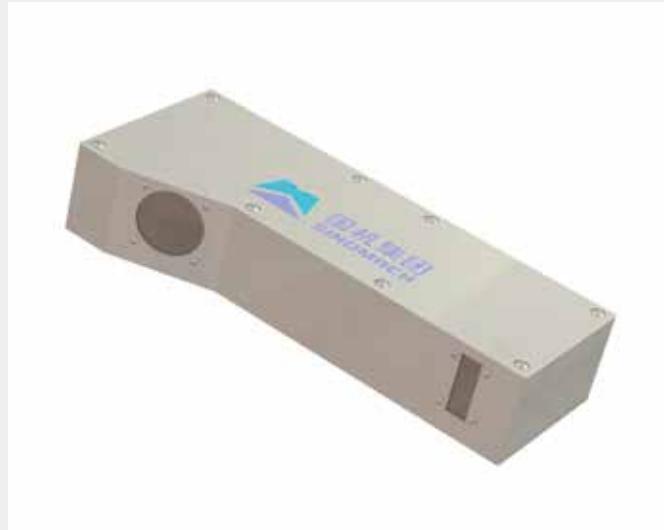
驱动器的供电方式支持交流三相 380V、三相 220V 和单相 220V，功率范围 0.2kW–7.5kW，通讯协议支持 EtherCAT、CANopen 和 Modbus，并支持脉冲和模拟量指令，支持的编码器包括增量型编码器与绝对值编码器，具体选型关系如图 2 所示。驱动器可用于机器人、机床和工业自动化设备。

Product Introduction

The servo driver supports ac three-phase 380V, three-phase 220V and single-phase 220V power supply modes, with a power range of 0.2kW to 7.5kW. The communication protocol supports EtherCAT, CANopen and Modbus, pulse and analog instruction, and the supported encoders include incremental encoders and absolute encoders. The specific model selection relationship is shown in figure 2. Drivers can be used for robots, machine tools and industrial automation equipment, while drivers can be customized to the specific needs of customers.

1.2.5 SV-P1280 被动扫描式 3D 相机

1.2.5 SV-P1280 Passive scanning 3D camera



产品简介

被动扫描式 3D 相机在获取点云的过程中需要由外部的运动机构带动扫描，使激光线扫描覆盖目标区域。该类产品在应用上的特点是精度高、视野大、使用灵活。

- ◆ 线激光光源，高精稳定
- ◆ 轮廓可达 1280 点高分辨率
- ◆ 轮廓速度 210Hz~2000Hz
- ◆ IP65 等级防护，可适应恶劣工作环境
- ◆ 符合 CE, FCC, RoHS 认证

Product Introduction

In the process of acquiring point cloud, passive scanning 3D camera needs to be driven by an external motion mechanism to make the laser line scan cover the target area. The application of this kind of products is characterized by high accuracy, wide field of vision and flexible use.

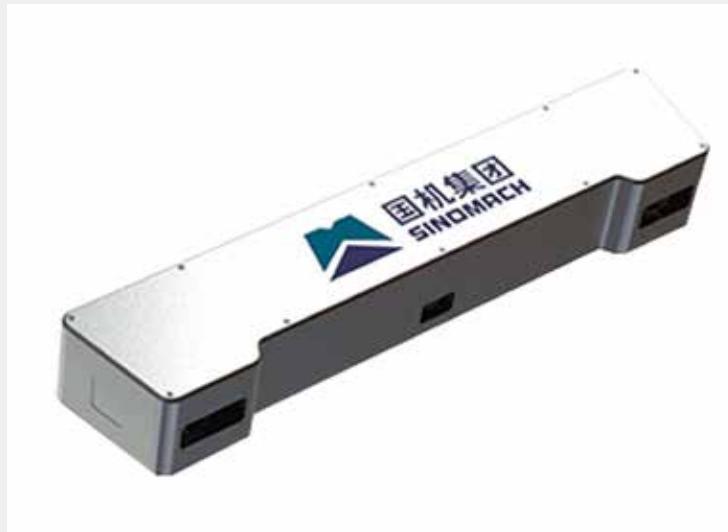
- Linear laser source, high precision and stability
- The contour can reach 1280 high resolution points.
- Contour velocities range from 210 Hz to 2000 Hz
- IP65 level protection, adapted to harsh working environment
- Compliance with CE, FCC, RoHS certification

运动方式	被动扫描
扫描帧率	210Hz-2000Hz
分辨率	1280
点云精度	0.01mm-0.3mm
数据输出	轮廓点云
通信接口	USB3.0
激光等级	3R
激光波段	660nm
激光功率	70mw
尺寸	340mm x 140mm x 67mm
重量	1.7KG
IP 防护等级	IP65
温度	工作温度 0~50°C , 储存温度 -20~70°C
湿度	10%~80%

Exercise mode	Passive
Scanning frame rate	210Hz-2000Hz
Resolving power	1280
Point Cloud Accuracy	0.01mm-0.3mm
Data output	Pointcloud
Communication interface	USB3.0
Laser grade	3R
Laser band	660nm
Laser power	70mw
Size	340mm x 140mm x 67mm
Weight	1.7KG
IP Protection Level	IP65
Temperature	Working temperature 0~50°C , Storage temperature -20~70°C
Humidity	10%~80%

1.2.6 SV-A130 主动扫描式 3D 相机

1.2.6 SV-A130 Active Scanning 3D Camera



产品简介

主动扫描式 3D 相机在获取点云的过程中不需要外部机构，其自身内部有主动扫描机构。该类产品在应用上的特点是精度高、视野大、使用方便，可以固定悬挂安装。

- ◆ 线激光光源，高精稳定
- ◆ 点云可达 130 万点高分辨率
- ◆ 扫描速度可达 3s
- ◆ IP65 等级防护，可适应恶劣工作环境
- ◆ 符合 CE, FCC, RoHS 认证

Product Introduction

Active scanning 3D camera does not need external mechanism in the process of obtaining point cloud, but has active scanning mechanism inside itself. The application of this kind of products is characterized by high accuracy, wide field of vision, easy to use, and can be fixed and mounted.

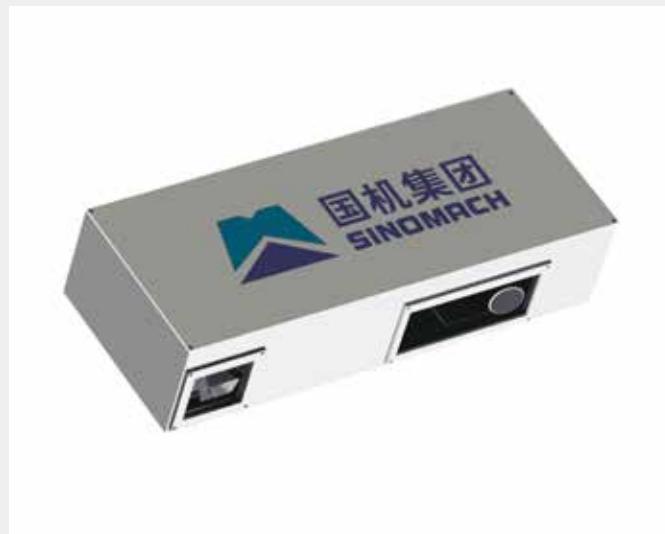
- Linear laser source, high precision and stability
- Point clouds can reach 1.3 million high resolution
- Scanning speed can reach 3S
- IP65 level protection, adapted to harsh working environment
- Compliance with CE, FCC, RoHS certification

运动方式	主动式
扫描速度	3s
分辨率	130 万
点云精度	0.01mm——0.3mm
数据输出	3D 点云
通信接口	USB3.0
激光等级	3R
激光波段	660nm
激光功率	70mw
尺寸	660mm x 134mm x 120mm
重量	3.0KG
IP 防护等级	IP65
温度	工作温度 0~50°C , 储存温度 -20~70°C
湿度	10%~80%

Exercise mode	Passive
Scanning frame rate	3s
Resolving power	1.3M
Point Cloud Accuracy	0.01mm——0.3mm
Data output	Pointcloud
Communication interface	USB3.0
Laser grade	3R
Laser band	660nm
Laser power	70mw
Size	660mm x 134mm x 120mm
Weight	3.0KG
IP Protection Level	IP65
Temperature	Working temperature 0~50°C , Storage temperature -20~70°C
Humidity	10%~80%

1.2.7 SV-C130 抓拍式 3D 相机

1.2.7 SV-C130 Capture 3D Camera



产品简介

抓拍式 3D 相机使用光栅结构光原理进行 3D 重建，3D 点云的采集形式是抓拍式，具有速度快、精度高的特点

- ◆ 白光光源，高精稳定
- ◆ 点云可达 130 万点高分辨率
- ◆ 成像速度可达 0.3s
- ◆ IP65 等级防护，可适应恶劣工作环境
- ◆ 符合 CE, FCC, RoHS 认证

Product Introduction

Capture-type 3D camera uses grating structured light principle for 3D reconstruction. The acquisition form of 3D point cloud is grab-type, which has the characteristics of fast speed and high precision.

- White light source, high precision and stability
- Point clouds can reach 1.3 million high resolution points.
- The imaging speed can reach 0.3s.
- IP65 level protection, adapted to harsh working environment
- Compliance with CE, FCC, RoHS certification

扫描速度	0.3s
分辨率	130 万点
点云精度	0.01mm——0.3mm
数据输出	3D 点云
通信接口	USB3.0
尺寸	248mm x 180mm x 50mm
重量	2.4KG
IP 防护等级	IP65
温度	工作温度 0~50°C , 储存温度 -20~70°C
湿度	10%~80%

Scanning frame rate	0.3s
Resolving power	1.3 M
Point Cloud Accuracy	0.01mm——0.3mm
Data output	Pointcloud
Communication interface	USB3.0
Size	248mm x 180mm x 50mm
Weight	2.4KG
IP Protection Level	IP65
Temperature	Working temperature 0~50 °C , Storage temperature -20~70°C
Humidity	10%~80%

1.2.8 控制系统 [示教器 · 主控制器]

1.2.8 Robotics Control system [pendant & controller]



产品简介

- ◆ 多微处理器架构，满足高实时性的需求
- ◆ 具有独立的安全单元
- ◆ 支持 12 轴插补，最小插补周期不大于 500us
- ◆ 多通道控制，支持 1 台控制器控制多台机器人
- ◆ 同时支持多外部轴扩展实现高精度轨迹的平滑过渡
- ◆ 简单快速的零点标定方法
- ◆ 功能强大的机器人语言编程
- ◆ 支持摇杆、触摸、离线编程等操作方式
- ◆ 提供多种机器人机械结构的运动学配置
- ◆ 支持 EtherCAT，实现控制器、伺服系统、IO 模块的

高速通信

- ◆ TCP/IP 通讯，连接视觉系统、远程监控终端、示教器
- ◆ 丰富的功能便于各种工艺应用
- ◆ 通过 CCC,CE 认证，为机器人高可靠性提供保障

Product Introduction

- multi-processor architecture, could satisfy high real-time task requirement
- standalone safety unit
- support 12 axes interpolation calculation, interpolation period no less than 500us
- multi-channel control method realized in one controller ,so can manipulate multi-robots with one controller
- high precision of trajectory smooth transition
- simple and fast zero calibration method
- powerful robotics programming language
- support operation mode of joystick, touch screen and offline programming etc
- support multiple robot mechanical structures kinematics Calculation
- support EtherCAT fieldbus
- support TCP/IP communication between controller and vision system/remote monitor system/pendant
- abundant industrial specialized programming packages
- obtained CCC,CE certificate

1.2.9 D703G 高速电火花小孔加工机床

1.2.9 D703G High Speed EDM Pin-hole Drilling Machine



产品简介

该机床利用电火花放电蚀除原理，采用中空圆电极高效加工各种导电材料的深小孔，主要用于加工线切割的穿丝孔、油嘴油泵喷油孔、化织喷丝板的喷丝孔、液压气动元件的油路孔、滤板、筛板的群孔、发动机中的冷却散热孔等各种传统加工方法难于加工的深小孔，该机床不仅在国内拥有广大的用户，而且出口日本、新加坡、韩国、土耳其、印尼、巴基斯坦、泰国、越南、德国等国家和地区。

该产品被评为国家级重点新产品，江苏省高新技术产品，获部技术进步奖，拥有多项国家专利。

- ◆ 能加工不锈钢、淬火钢、硬质合金、铜、铝等各种导电材料；
- ◆ 能加工直径 0.3–3mm，最大深径比 200 : 1 以上的孔；
- ◆ 加工速度每分钟可达到 1–60mm；
- ◆ 能直接从斜面、曲面穿入；
- ◆ 直接使用自来水作为工作液；
- ◆ 主轴采用直流伺服系统，具有快速上、下功能；
- ◆ 能根据用户要求，单轴数控或其他功能。

Product Introduction

Using the principle of EDM erosion, the machine adopts cylindrical electrode to process deep-small holes of various conductive materials. The machine is mainly used to drill holes on the Wire-Cut EDM, the oil nozzle and oil pump, the textile spinning board, the gas dynamic elements, the filter board, the engine cold holes and the deep holes which can't be machined in traditional machining way. A lot of customers have the machine in domestic, meanwhile, the machine has also exported to Japan, Singapore, Korea, Turkey, Indonesia, Pakistan, Thailand, Vietnam and Germany,etc.

This machine has own the award of National Key New Product, and Jiangsu New Hi-tech Product. It has owned several national patents.

- It can drill small holes on the materials, such as stainless steel, quenched steel, carbide, copper, aluminium, etc;
- It can drill the deep holes with diameters 0.3-3mm and depth diameter ratio 200:1 or more;
- Working speed is 1-60mm depth per minute;
- It can directly drill on oblique curved surfaces;
- It uses water as working liquid;
- The quill uses direct current servo system, it can go up and down rapidly;
- Achieve single-axis CNC or other functions according to the clients' requirements.

1.2.10 三轴数控电火花高速小孔加工机床 1.2.10 Three-axes NC High Speed EDM Pin-hole Drilling Machine



产品简介

该机利用电火花蚀除原理，采用中空圆电极对各种导电材料进行高效深小孔加工。

- ◆ X、Y、Z 三轴点位数控，自动高速进行深小孔加工；
- ◆ 自动检测零位，自动控制加工深度；
- ◆ 自动转换加工参数，自动修整电极；
- ◆ 每一程序加工完后自动停机，电极用完后自动发讯；
- ◆ 可自动转换 AUTOCAD 图形为孔位程序；

Product Introduction

Using the principle of EDM erosion, the machine uses hollow circular electrodes to process various conductive materials with high efficiency and deep holes.

- X, Y, Z axes numerical control, automatic machining deep-hole with high speed;
- Automatically inspect zero position and control the machining depth;
- Automatic machining parameters shift and trimming electrode;
- Each machining process finished, machine stops itself and automatically send out a signal once the electrode be used out;
- Can automatically convert AUTOCAD graphics for hole location program.

1.3.1 SE-GK020 型六轴数控电火花高速小孔加工机床

1.3.1 SE-GK020 Six-axes NC High Speed EDM Pinhole Drilling Machine



产品简介

该机床是为航空航天发动机制造业研制的专用设备。该设备利用电火花放电蚀除原理，采用中空电极高效加工各种导电材料的深小孔。主要用于发动机中特殊材料零件空间位置复杂的小孔加工，如叶片等小型零件上的小孔。除加工圆孔外，还可加工扇形孔、腰形孔。加工效率高、费用低。

- ◆ 加工孔径一般在 0.3–3mm；
- ◆ 该机床可配置 X、Y、Z、S、A、C 六个数控轴；
- ◆ 电极转速可调范围 0~800r/m；
- ◆ X、Y、Z、A、C 五轴光栅反馈全闭环控制；
- ◆ 加工中可自动修整电极，自动找加工零位，自动换规程，加工到位自动回退；
- ◆ 触摸屏显示，可显示坐标位置、加工状态、加工点位等信息；
- ◆ 使用标准圆电极铣加工扇形孔、腰形孔；
- ◆ 具有穿透检测功能。

Product Introduction

This machine is a kind of special device, it's developed for the engine manufacturing of aerospace. Using EDM ablation principle. The machine adopts hollow electrode to machine deep-hole high efficiently of various kinds of conductive material components. The machine is mainly used to drill holes in machine parts of special materials and complex dimensional position, such as vane or other small prats,pin-holes on rounding parts. Besides circular hole, it can also drill fan-shaped and waist-shaped holes. It is high performance and economical.

- It can drill the deep holes with diameters 0.3-3mm;
- The machine has X, Y, Z, S, A, C six axes numerical control;
- The rotating speed of the electrode can change in 0~800r/m;
- X, Y, Z, A and C are grating feedback full closed-loop control;
- In processing, the electrode can be automatically trimmed,the processing zero can be found automatically, the gauge can be changed automatically, and the processing position can be automatically returned;
- Touch screen display, display coordinate, machining state, machining location;
- It can use standard circular electrode to mill out fan-shaped and waist-shaped holes;
- It has penetration detection function.

1.3.2 SE-GK018 型七轴数控电火花高速小孔加工机床

1.3.2 SE-GK018 Seven-axes NC High Speed EDM Pin-hole Drilling Machine



产品简介

该机床是为航空航天发动机制造业研制的专用设备。该设备利用电火花放电蚀除原理，采用中空电极高效加工各种导电材料的深小孔。主要用于发动机中特殊材料零件空间位置复杂的小孔加工，如火焰筒、安装边、环形件等零件上的小孔，除加工圆孔外，还可加工腰形孔。加工效率高、费用低。

- ◆ 加工孔径一般在 0.3–3mm；
- ◆ 该机床可配置 X、Y、Z、W、S、B、C 等七个数控轴；
- ◆ 电极转速可调范围 0~800r/m；
- ◆ X、Y、Z、B、C 五轴光栅反馈全闭环控制；
- ◆ 加工中可自动修整电极，自动找加工零位，自动换规程，加工到位自动回退；
- ◆ 触摸屏显示，可显示坐标位置、加工状态、加工点位等信息；
- ◆ 使用标准圆电极铣加工腰形孔；
- ◆ 具有穿透检测功能。

Product Introduction

This machine is a kind of special device, it's developed for the engine manufacturing of aerospace. Using EDM ablation principle, The machine adopts hollow electrode to machine deep-hole high efficiently of various kinds of conductive material components. The machine is mainly used to drill holes in machine parts of special materials and complex dimensional position, such as vane flame canister fix border, microholes on rounding parts. Besides circular hole, it can also drill oval hole. It is high performance and economical.

- It can drill the deep holes with diameters 0.3-3mm;
- The machine has X, Y, Z, W, S, B, C seven axis numerical control;
- The rotating speed of the electrode can change in 0~800r/m;
- X, Y, Z, B and C are grating feedback full closed-loop control;
- In processing, the electrode can be automatically trimmed, the processing zero can be found automatically, the gauge can be changed automatically, and the processing position can be automatically returned;
- Touch screen display, display coordinate, machining state, machining location;
- It can use standard circular electrode to mill out waist-shaped holes;
- It has penetration detection function.

1.3.3 SE-GK021 型六轴数控电火花高速小孔加工机床

1.3.3 SE-GK021 Six-axes NC High Speed EDM Pin-hole Drilling Machine



产品简介

该机床是为航空航天发动机制造业研制的专用设备。该设备利用电火花放电蚀除原理，采用中空电极高效加工各种导电材料的深小孔。主要用于发动机中特殊材料零件空间位置复杂的小孔加工，如叶片等小型零件上的小孔。除加工圆孔外，还可加工扇形孔、腰形孔。该机床配备电极库及导向器库，配有机械手能自动进行换电极和导向器。

- ◆ 机械手能自动更换电极、导向器、工件；
- ◆ 安装有随动中分扶丝机构，防止电极旋转时摆动；
- ◆ 有 30 组以上可编辑加工参数库；
- ◆ X、Y、Z、B、C 五轴光栅反馈全闭环控制；
- ◆ 加工中可自动修整电极，自动找加工零位，自动换规准，加工到位自动回退；
- ◆ 触摸屏显示，可显示坐标位置、加工状态、加工点位等信息；
- ◆ 使用标准圆电极铣加工腰形孔；
- ◆ 具有穿透检测功能；
- ◆ 配备无线测量装置，能测量工件外形，纠正加工位置。

Product Introduction

This machine is a kind of special device, it's developed for the engine manufacturing of aerospace. Using EDM ablation principle, The machine adopts hollow electrode to machine deep-hole high efficiently of various kinds of conductive material components. The machine is mainly used to drill holes in machine parts of special materials and complex dimensional position, such as vane or other small prats, pin-holes on rounding parts. Besides circular hole, it can also drill fan-shaped and waist-shaped holes. The machine tool is equipped with electrode library , guide library and a manipulator which can automatically change electrode and guide.

- Manipulator can automatically replace electrode, guide, workpiece;
- It is equipped with a follow-up arm to prevent the electrode from swinging when rotating;
- It has database which is including more than 30 groups of editable machining parameters ;
- X, Y, Z, B and C are grating feedback full closed-loop control;
- In processing, the electrode can be automatically trimmed, the processing zero can be found automatically, the gauge can be changed automatically, and the processing position can be automatically returned;
- Touch screen display, display coordinate, machining state, machining location;
- It can use standard circular electrode to mill out waist-shaped holes;
- It has penetration detection function;
- It is equipped with wireless measuring device, which can measure the shape of workpiece and correct the processing position.

1.3.4 SE-WK007 数控微孔电火花加工机床

1.3.4 SE-WK007 CNC EDM Microhole Drilling Machine



产品简介

该设备利用电火花放电蚀除原理，采用精密细长电极加工各种形状的精密微孔，主要用于化纤喷丝板精密喷丝孔的加工。

- ◆ 能加工 0.2mm 以下的微孔，精度高，表面质量好；
- ◆ 能采用简单电极通过数控组合，加工各种复杂孔形；
- ◆ 能加工不锈钢、黄铜、淬火钢等各种导电材料；
- ◆ 采用工控机控制，五轴数控，更换电极自动报警，自动转换加工规程，自动完成群孔工件的加工过程；
- ◆ 群孔孔位自动编程；
- ◆ 显示加工参数，坐标位置等信息。

Product Introduction

Using the principle of EDM erosion, the machine adopts the precise slender electrode to process the precise microholes of various shapes, which is mainly used for the processing of the precise microholes of chemical fiber spinneret.

- It can drill the microhole under diameter 0.2mm, with high precision and good surface quality;
- It can drill several of complicated holes with a simple electrode combined by the CNC;
- It can drill small holes on the materials such as stainless steel, copper, quenched steel, etc;
- It adopts industrial control machine, five-axis numerical control, automatic alarm for changing electrode, automatic conversion of processing standard, and automatically completes the processing process of group holes;
- Automatic programming for the positions of group holes;
- Display processing parameters, coordinate, etc.

1.3.5 SE-WK008 精密微孔数控电火花加工机床

1.3.5 SE-WK008 CNC EDM Precision Microhole Drilling Machine



产品简介

该机床利用电火花放电蚀除原理，采用圆形细长丝电极加工各种高精度、高光洁度的精密微孔。主要用于加工各类喷油嘴零件精密喷油孔，加工精密圆形微孔范围一般在 $\phi 0.08\text{--}\phi 1\text{mm}$ 。

机床由主机、电控箱及工作液系统组成。电控箱由数控系统、电火花微精加工专用高频脉冲电源、检测伺服控制单元及机床电气组成。

该机床已在我国油嘴油泵骨干企业广泛应用。

◆孔的加工精度： $\pm 0.003\text{mm}$ (孔径 $\leq \phi 0.5\text{mm}$ 厚度 $\leq 1.0\text{mm}$ 材料 1Cr18Ni9Ti)；

◆加工表面粗糙度： $R_a \leq 0.6\mu\text{m}$ ；

◆单孔加工时间 < 35 秒 (孔径 $\phi 0.2\text{mm}$ 厚度 1.0mm 材料 1Cr18Ni9Ti)；

◆加工喷油嘴喷孔加工后针阀体喷孔流量在 $\pm 3\%$ 之内：

◆机床配置 X、Y、Z、W、A、B 六个数控轴；

◆采用工控机控制，X、Y、A、B、W 轴采用进口交流伺服电机驱动：

◆X、Y、A、B 轴的点位数控，Z、W 轴的伺服及位置控制：

◆电极的自动补偿，自动找零位，加工到预定深度后自动回退：

◆根据工艺要求，加工过程电参数的自动切换；

◆电极用完报讯；

◆六轴坐标显示，加工状态显示，加工参数显示；

◆可以指定任意孔位加工；

◆可储存 1000 种以上的工艺参数；

◆一般采用去离子水作为工作液，工作液系统可对工作液电导率进行检测并自动去离子处理。

Product Introduction

Using the principle of EDM erosion, the machine adopts round and slender wire electrode to process various precise microholes with high performance and high flatness.

It is mainly used to drill precision microholes on the nozzle of oil pump, it can drill the microhole between diameter 0.08mm and 1mm . This machine is made up of host computer, electrical control box, working fluid, The electronic control box is composed of CNC system, special high frequency pulse power supply for EDM micro-finishing, detection servo control unit and machine tool electrical.

This machine has already been widely used in key enterprise of nozzle and oil pump in China.

- Machining precision of hole: $\pm 0.003\text{mm}$ (aperture $\leq \phi 0.5\text{mm}$, thickness $\leq 1.0\text{mm}$, material: 1Cr18Ni9Ti);

- Roughness: $R_a \leq 0.6\mu\text{m}$;

- Single hole machining time $< 35\text{s}$ (aperture $\phi 0.2\text{mm}$, thickness 1.0mm , material: 1Cr18Ni9Ti);

- After machining nozzle, needle valve orifice flow within $\pm 3\%$;

- The machine has X, Y, Z, W, A, B six axes numerical control;

- Utilizes industry control computer, X, Y, A, B, W axes utilize imported ACservo motor driver;

- Point control of X, Y, A and B axes, Servo and position control of Z and W axes;

- Automatically compensate electrode, automatically match zero position, automatically go back once machining to the right depth;

- Automatically switch the electric parameters according to the requirements;

during the machining process:

- Automatic warn for changing electrode;

- Display six axes coordinates, machining state, machining parameters;

- It can specify any hole location machining;

- Store 1000 kinds of machining parameters or more;

It uses deionized water as working fluid. The working fluid system can inspect working fluid conductance and get rid of ion automatically.

1.3.6 SE-WK008D 智能多工位数控电火花精密微孔加工设备

1.3.6 SE-WK008D Intelligent Multi-position CNC EDM Precision Microhole Drilling Equipment



产品简介

该机床利用电火花放电蚀除原理，采用微细长圆丝、扁平电极等各种类型电极加工各种精密微细型腔、微细窄槽和微小异形孔。加工精密圆形微孔范围一般在 0.08—0.5mm。

主机采用双立柱双工位结构，机械臂自动控制上下物料，一台机械臂可同时协作四工位工件 24 小时不间断连续工作。

- ◆ 孔的加工精度： $\pm 0.003\text{mm}$ (孔径 $\leq 0.5\text{mm}$ 厚度 $\leq 1.0\text{mm}$ 材料 1Cr18Ni9Ti)；
- ◆ 单孔加工时间 < 35 秒 (孔径 0.2mm 厚度 1.0mm 材料 1Cr18Ni9Ti)；
- ◆ 加工表面粗糙度： $R_a \leq 0.6 \mu\text{m}$ ；
- ◆ 加工过程中，实际加工时间与设定时间偏差超过设定范围时报警；
- ◆ 采用机械手串联工件、机床，根据实际加工情况自动加工及更换工件；
- ◆ 设备具有交流伺服电机驱动器报警、限位报警、对刀声讯提示等功能，具备停电记忆、数控系统键盘闭锁功能。

Product Introduction

Using the principle of EDM erosion, the machine adopts round and slender wire electrode or flat electrode to process different kinds of precise micro cavity, micro narrow and micro special-shaped hole. It is mainly used to drill precision microhole between diameter 0.08mm and 0.5mm.

The machine adopts the structure of double pillars and double positions. Manipulator controls materials up and down automatically. A manipulator can cooperate with four-position workpieces continuously for 24 hours.

- Machining precision of hole: $\pm 0.003\text{mm}$ (aperture $\leq \varnothing 0.5\text{mm}$, thickness $\leq 1.0\text{mm}$, material: 1Cr18Ni9Ti);
- Single hole machining time $< 35\text{s}$ (aperture $\varnothing 0.2\text{mm}$, thickness 1.0mm, material: 1Cr18Ni9Ti);
- Roughness: $R_a \leq 0.6 \mu\text{m}$;
- When the deviation between the actual processing time and the set time exceeds the set range, the alarm will be given;
- Manipulators are used to connect workpieces and machine tools in series, and workpieces are automatically processed and replaced according to actual processing conditions;
- The equipment has the functions of AC servo motor driver alarm, limit alarm, knife sound prompt and so on. It has the functions of power outage memory and keyboard locking in CNC system.

1.3.7 SE-WK012 双工位双回路精密高效电火花加工喷孔设备

1.3.7 SE-WK012 Dual-station double circuit Precision and High Efficiency EDM Nozzle Equipment



产品简介

本机床利用电火花放电原理加工精密微孔和异型孔。主要适合于加工各类喷嘴，也可用于航空叶片、IT产业、精密模具、微型机械、仪器仪表等高科技领域的精密微孔加工。

本设备是国家科技重大专项的科技成果。使用该设备加工的燃油喷嘴（片）的燃油喷注孔，可以大大改善燃油雾化效果，燃油效率明显提高，达到节能减排，保护环境的目的。

- ◆ 加工喷孔直径范围： $\phi 0.10\text{mm} \sim \phi 0.60\text{mm}$ ；
- ◆ 加工油嘴喷孔圆柱度： $\leq 0.008\text{mm}$ ；
- ◆ 最低表面粗糙度： $Ra \leq 0.6\mu\text{m}$ ；
- ◆ 十一轴坐标显示，加工状态显示，加工参数显示；
- ◆ 采用人机对话及中文操作界面，具有简单方便的数据输入编程方式；
- ◆ 电极自动补偿修整，修整量可设置，加工到预定深度后自动回退；
- ◆ 设备具有交流伺服电机驱动器报警、限位报警、对刀声讯提示等功能，具备停电记忆、数控系统键盘闭锁功能；
- ◆ 具有螺距、反向间隙补偿功能。

Product Introduction

This machine uses the principle of EDM to process precise micro-holes and special-shaped holes. It is mainly suitable for processing all kinds of nozzles. It can also be used for precision micro-hole processing in high-tech fields such as aeronautical blades, IT industry, precision molds, micro-machinery, instruments and meters.

This equipment is a achievement of National Science and Technology Major Project. The fuel injection hole of the fuel nozzle or slice processed by the equipment can greatly improve the fuel atomization effect and fuel efficiency, achieve the purpose of energy saving, emission reduction and environmental protection.

- Processing nozzle diameter range: 0.10 mm to 0.60 mm;
- Cylindricity of nozzle hole for processing oil: <0.008mm;
- Minimum surface roughness: Ra < 0.6μm;
- Eleven-axis coordinate display, processing status display, processing parameters display;
- It adopts man-machine dialogue and Chinese operation interface, and has a simple and convenient data input programming mode;
- Electrode automatic compensation dressing, the dressing amount can be set, and automatically backout after processing to a predetermined depth;
- The equipment has the functions of AC servo motor driver alarm, limit alarm, knife sound prompt and so on. It has the functions of power outage memory and keyboard locking in CNC system;
- It has the functions of screwpitch and reverse clearance compensation.

1.3.8 Z 轴数控精密电火花成形机

1.3.8 Z axis NC Sinking Electric Discharge Machine



产品简介

该设备利用电火花放电蚀除的原理，采用成形电极对各种导电材料的零件的形腔或形孔进行加工。

- ◆ 控制系统采用工控计算机，高可靠性；
- ◆ Z 轴可采用进口直流或交流伺服电机控制，滚珠丝杠，滚动导轨；
- ◆ Z 轴数控，自动转换加工规程；
- ◆ 带工艺数据库；
- ◆ 高效率，低损耗；
- ◆ 液面、油温、火警保护；
- ◆ 自动完成粗、中、精加工；
- ◆ 显示加工参数、坐标位置、报警提示等信息。

Product Introduction

Using EDM ablation principal, the machine adopts shaped electrode to machine various kinds of cavities or holes of machine parts of conductive material components.

- Using industrial control computer for system,high reliability;
- Using import DC or AC servo motor for Z-axis control, rolling screw, rolling guide;
- Z-axis numerical control and automatic machining parameters exchange;
- A built-in processing data base;
- High performance,lower tool ware;
- Dielectric fluid level and temperature and firing protecting;
- Automatic complete rough, medium and finish machining;
- Display machining parameters, coordinate,alarm indication.

1.3.9 三轴数控精密电火花成形机

1.3.9 Three-axis CNC Precision Sinking EDM Machine



产品简介

该设备利用电火花放电蚀除的原理，采用成形电极对各种导电材料的零件的型腔或型孔进行加工。

◆ X、Y、Z 三轴数控，三轴均采用进口交流伺服电机驱动，直线滚动导轨，滚珠丝杠。数控系统采用工控机，任意轴伺服加工，工作台多轨迹平动；

◆ 自动转换加工参数，带工艺数据库，粗、中、精加工自动完成；

◆ 高速分级抬刀；

◆ 脉冲电源多种波形组合，适应控制，高效率，低损耗；

◆ 液面、油温、火警保护；

◆ 液晶显示工艺参数加工状态坐标位置，报警提示等信息。

Product Introduction

Using EDM ablation principle, the machine adopts electrode to machine the hole and cavity of conductive materials.

· X, Y, Z three axes numerical control, use import AC servo motor for X, Y, Z three axes driving, line rolling guide, ball screw. Use industrial computer for the system, servo machining for any axis, working table can level moves in several tracks;

· Automatic machining parameters exchange, build-in processing data base, complete rough, medium and finishing machining;

· High-speed classified moving up for electrode;

· Pulse power with several waves combination, adaptive control, high efficiency, lower tool wear;

· Dielectric fluid level, temperature and firing protecting;

· LCD displays machining parameters, state, coordinate, alarm indication, etc.

1.3.10 五轴数控精密电火花成形机

1.3.10 Five-axis NC Precision Sinking EDM Machine



产品简介

该设备利用电火花放电蚀除的原理，采用成形电极对各种导电材料的零件的型腔或型孔进行加工。

- ◆ X、Y、Z、A、C 五轴数控，五轴均采用进口交流伺服电机驱动，全闭环控制；
- ◆ 数控系统采用工控机，任意轴伺服加工，工作台多轨迹平动；
- ◆ 自动转换加工参数，带工艺数据库，粗、中、精加工自动完成；
- ◆ 高速分级抬刀；
- ◆ 脉冲电源多种波形组合，适应控制，高效率，低损耗；
- ◆ 液面、油温、火警保护；
- ◆ 液晶显示工艺参数加工状态坐标位置，报警提示等信息。

Product Introduction

Using EDM ablation principle, the machine adopts electrode to machine the hole and cavity of conductive materials.

- X, Y, Z, A, C five axes numerical control, use import AC servo motor for driving, closed-loop control;
- Use industrial computer for the system, servo machining for any axis, working table can move in sever tracks;
- Automatic machining parameters exchange, build-in processing data base, complete rough, medium and finishing machining;
- High-speed classified moving up for electrode;
- Pulse power with several waves combination, adaptive control, high efficiency, lower tool wear;
- Dielectric fluid level, temperature and firing protecting;
- LCD displays machining parameters, state, coordinate, alarm indication, etc.

1.4.1 SE-LC006 数控轮胎模电火花加工专用设备

1.4.1 SE-LC006 CNC-tyre Mould Special EDM Machine

**产品简介**

该设备是采用电火花成形加工的原理，为轮胎模具环形花纹的加工而研制的专用设备。已在我国的轮胎模具企业广泛应用，拥有多项专利技术。

- ◆ 采用工控机控制；
- ◆ Z 轴位控，自动转换加工规程；
- ◆ 转台自动分度、转位；
- ◆ 除更换电极外，自动完成加工过程；
- ◆ 显示加工参数，坐标位置等信息；
- ◆ 可加工半钢，全钢子午线轮胎模具；
- ◆ 高效率，低损耗；
- ◆ 数字化脉冲电源，可采用紫铜或石墨电极进行加工。

Product Introduction

This machine is designed for circular pattern tyre mould according the EDM theory. It is widely used in tyre mould enterprises and has many patents.

- Use industrial control computer;
- Z-axis position control and automatic machining parameter exchange;
- Swing table automatic dividing, revolve position;
- Except for changing electrode, complete machining process automatically;
- Displaying processing parameters, coordinate,etc;
- Suitable for machining semi-steel, full steel radial tire mould;
- High efficiency, lower tool wear;
- Digital pulse power source, both red copper and graphite electrode can be used.

1.4.2 数控高效钛合金电火花加工专用设备

1.4.2 CNC high-efficiency special EDM machine for titanium alloy



产品简介

该设备采用电火花加工原理，研发了专用脉冲电源、检测及工艺技术，显著提高了钛合金材料零件的型孔、窄缝、窄槽加工效率，如加工某发动机零件上一深窄槽，其效率是普通电火花的十多倍。

- ◆ 该机控制系统采用工业控制计算机、交流伺服电机驱动，彩色 CRT 显示各种加工信息；
- ◆ 该项技术及装备已在我国航空航天骨干企业成功应用，如 410, 171, 211, 311 等，解决了许多相关的加工难题。

Product Introduction

The device utilizes EDM principal, developed dedicated pulse power, inspection and process technology. It improves the machining efficiency of hole-type, narrow seam and narrow groove of titanium alloy components. For instance, if we process a deep narrow groove on one motor engine component, the efficiency is 10 times more than the ordinary EDM machine.

- The device control system adopt industrial control computer, AC servo motor driver, color CRT displays various machining parameters;
- The technology and equipment have been successfully applied to the key aviation enterprises of China. It has solved many processing problems.

1.4.3 DK7632 精密数控单向走丝电火花线切割机

1.4.3 DK7632 Unidirectional Travelling Type Wire Electrical-discharge Cut Machine



产品简介

该机床主要用于精度及表面质量要求高，形状复杂的精密模具及复杂零件的型面，型孔加工。

◆ 高效无电阻脉冲电源，最大切割速度大于 $200\text{mm}^2/\text{min}$;

- ◆ 切割精度 $\leq \pm 0.005\text{mm}$;
- ◆ 最低表面粗糙度 $R_a \leq 0.4 \mu\text{m}$;
- ◆ 防电解 AE 电源，确保优异的切割表面质量;
- ◆ 最大切割斜度 $\pm 15^\circ / 100\text{mm}$ 。

Product Introduction

This machine is mainly used for precision mould with high requirements of precision and surface quality, and used for surface complex parts and hole type.

- High efficiency resistance-free pulse power source, max machining speed $>200\text{mm}^2/\text{min}$;
- Cutting accuracy $\leq \pm 0.005\text{mm}$;
- Roughness $R_a \leq 0.4\mu\text{m}$;
- Anti-electrolysis AE power source ensures excellent cutting surface quality;
- Max cutting taper $\pm 15^\circ / 100\text{mm}$.

1.4.4 SE-XG40 数控电火花大型环件切割专用设备

1.4.4 SE-XG40 CNC EDM Large Ring Cutting Special Equipment



产品简介

该机床是为航空发动机制造行业研制的专用设备，主要用于发动机、轮胎模具等大型环件的分块切割，切口可带斜度且可调。机床配置数控 C 轴，数控系统采用工业控制计算机、交流伺服电机驱动、彩色 LED 显示各种加工信息。

Product Introduction

This machine is developed for the aviation engine manufacturing special device, it is mainly used for large ring, such as motor, tyre mould, etc. The incision can be beveled and adjustable. The machine is equipped with CNC C axis, and the CNC system uses industrial control computer, AC servo motor drive, color LED which display variety of working parameters.

1.4.5 SE-DG023 数控单向（低速）走丝电火花线切割机

1.4.5 SE-DG023 CNC Unidirectional Traveling Wire-cut Electrical-discharge Machine



产品简介

SE-DG023 数控单向（低速）走丝电火花线切割机适合于加工精度、粗糙度要求较高的环状类零件的切割加工。机床精度高、可靠性好、数控功能丰富、价格低、具有很高的性能价格比。是环状类零件加工的理想设备。

- ◆ 数控系统采用工控机，自动编程；
- ◆ X、Y、C 轴采用进口交流伺服电机驱动；
- ◆ 能加工不锈钢、耐热钢、淬火钢、硬质合金等各种导电材料；
- ◆ 加工工件最大厚度 100mm；
- ◆ 具有螺距补偿、反向间隙补偿、短路回退、旋转、缩放等数控功能。

Product Introduction

This machine is fit for cutting circular parts with high machining precision and good roughness. It has high precision, reliability, abundant NC functions and high price/performance ratio. It is a ideal machine for machining annular part.

- It uses industrial control computer for NC system; automatically programming;
- X, Y, C axes use imported AC servo motor drive;
- It can process stainless steel, heat resistant steel, hardened steel, hard alloy and other conductive materials;
- The maximum thickness of workpiece is 100mm;
- It can compensate pitch, compensate backlash, rollback when short, rotate and zoom, etc.

1.4.6 DCS-006 数控轧辊磨床

1.4.6 DCS-006 CNC Roll Grinding Machine



产品简介

DCS-006 数控轧辊磨床针对棒材轧辊，特别是针对棒材碳化钨轧辊磨削专门设计生产，机床刚性好、针对性强、使用简便、精度高、可靠性好，主要用于棒材生产用的碳化钨轧辊的外圆和R孔型槽作粗磨、半精磨、精磨等磨削加工。

◆ 采用西门子 828D 工业数控系统及西门子的三轴交流伺服电机驱动系统，并配有移动操作手盒，操作简便、质量稳定、性能可靠；

◆ 数控系统设计有轧辊加工专用程序软件，易操作，易学易懂；

◆ 与非数控磨床相比，人为影响小，具有机床精度高，操作简便，可靠性好，自动化程度高等特点，并可大幅减少工人的工作量。

Product Introduction

This machine is aimed at bar rolling, especially at bar made of tungsten carbide. The machine has the features of better rigidity, strong pertinence, easy using, high accuracy and better reliability. The machine is mainly applied in external grinding of tungsten carbide roller and rough grinding, semi grinding and finish grinding of groove with R-hole type.

· Grinding machine uses Siemens 828D industrial NC system, triple-axis AC servo motor driving system and mobile operating box as well. The quality and performance of machine is stable and reliable and also it is easy to operate;

· Roll machining software is involved in NC system design and it is easy to learn, understand and operate;

· Compared with traditional grinding machine, it has the features of low human impact, high accuracy, easy operation, better reliability and automation. In addition, it largely reduces the work volume of workers.

1.4.7 DCS-002Da 数控硬质合金轧辊成形磨床

1.4.7 DCS-002Da CNC Carbide Roll Contour Grinding Machine



产品简介

本机床是用于磨削加工硬质合金辊环外圆和槽形的数控专用设备。该机床曾获得机械部科技进步奖，属国家高新技术产品。该设备已在我国许多轧钢企业广泛应用并出口。

- ◆ 磨头导轨采用闭式自润滑导轨 – 刚性好；
- ◆ 主轴采用进口精密轴承，旋转精度高；
- ◆ 辊环装夹采用自定心弹性涨套夹具，定心精度高，工件装夹方便；
- ◆ 采用西门子数控系统自动化程度高、可靠性能好。

Product Introduction

This machine is a kind of CNC special equipment used for grinding cemented carbide roller ring and groove Cylindrical. The machine has received the Department of Mechanical Science and Technology Progress Award. It is a national high-tech product. The device has been widely used in many of our Rolling enterprises and been exported to abroad.

- Slideway of grinder head utilize closed self-lubricating slideway, rigidity;
- Main shaft uses imported precision bearing, with high rotation accuracy;
- Kun-ring clamping utilize self-centering flexible fixture, high centering precision, easy clamping for workpiece;
- Utilize Siemens numerical system, high degree of automation, reliability.

1.4.8 DCS-003A 金刚石砂轮成形修整机床 1.4.8 DCS-003A Diamond Grinding Wheel Dressing Electrical-discharge Machine



产品简介

该机床采用电火花放电加工原理，采用石墨成型电极轮与金刚石砂轮对滚，电火花蚀除其金属结合剂基体的方法对金刚石砂轮进行成形修整，砂轮成形精度高，工艺先进，可加工各种槽形曲线，是金刚石砂轮成形加工的理想设备。

- ◆ 砂轮成形精度高；
- ◆ 可修整各种复杂轮廓曲线外圆；
- ◆ 修整后的砂轮锋利、耐用；
- ◆ 加工时无切削力、机床可靠性好；
- ◆ 使用寿命长。

Product Introduction

Using EDM principle, the machine adopts graphite forming electrodes wheel to roll with diamond wheel. Forming a diamond grinding wheel dressing by the method of electric spark erode its metal binder matrix.

- Forming grinding wheel with high precision;
- It can dress various kinds of complex external contour;
- After dressing, the grinding wheel is sharp and durable;
- No cutting force when machining, good reliability;
- Long life-span.

1.4.9 SE-FM021 数控电火花蜂窝磨专用设备

1.4.9 SE-FM021 CNC EDM Cellular Grinding Special Equipment



产品简介

- ◆ 该机床是为航空发动机制造行业研制的专用设备，采用电火花加工原理，对飞机发动机零件的蜂窝环进行磨加工，加工中无切削力，加工质量满足要求，加工效率高；
- ◆ 该设备控制系统采用工业控制计算机，交流伺服电机驱动，LCD 显示各种加工信息；
- ◆ 该设备采用牛头式布局，在固定工作台上配置带动工件旋转式分度的数控转台，在牛头结构上配置 X、Y、Z、V、R 轴；
- ◆ 该设备配置数字化高效、精密脉冲电源；
- ◆ 该设备已在我国航空发动机制造的骨干企业（410、420、430、331、5719 等）广泛应用。

Product Introduction

- This machine is special equipment developed for the aerospace engine manufacturing, utilizes EDM principle, and grinds machining on cellular rings of the aircraft engine. No cutting force in machining. The machining quality can meet the requirements. The machining efficiency is high;
- This device utilizes industry control computer as its control system. AC servo motor drive, LCD color display variety of working parameters;
- The device uses tau-style layout, equipped with NC rotary table which drives workpiece rotating on fixed table and equipped with X,Y,Z,V,R axes on tau-style;
- The device equipped with digital high efficiency, precision pulse power;
- The device has been widely used in key aero-enginemanufacturing enterprises of China.

1.4.10 特种钢高效放电切割专用设备

1.4.10 Non-traditional Steel Discharge Cutting Special Device



产品简介

◆ 采用阳极机械加工原理，切割高温耐热合金，高铬高镍类合金，钛合金等机械切割方法难于切割的特种钢材，也用于对钢轨的切割。

- ◆ 切割效率高，最大切割效率 1800mm²/min。
- ◆ 采用钢带作为电极，成本极低。
- ◆ 切缝窄≤ 2mm，节约贵重钢材。

Product Introduction

- The machine utilizing anodic machining principle, cutting special steel that can't be easily cut, such as high-temperature heat-resistant alloys, high chromium, high nickel alloy, titanium alloy. It can also cut steel rail;
- The cutting efficiency is high, the maximum cutting speed is 1800mm²/min;
- Use steel as the electrode, the cost is rather lower;
- Cutting gap≤2mm, save precious steel.

1.5.1 数控高效放电铣削专用设备

1.5.1 CNC High Performance Electrical-discharge Milling Equipment



产品简介

该设备利用电加工不怕加工材料硬、脆、韧的优势，采用简单长铜管电极，以类似数控铣的方式，实现对金切机床难加工材料（如高温耐热合金、钛合金、不锈钢）零件复杂形面的高效低成本加工。

该设备技术属我国完全自主创新，已拥有四项发明专利。该设备已在我国航空发动机制造的骨干企业（沈阳 410、成都 420、西安 430）以及美国 GE 公司成功应用。

- ◆ 能顺利加工高温合金、钛合金等难加工材料；
- ◆ 能加工零件的复杂形面；
- ◆ 加工工具电极费用极低（只需金切刀具费用的十分之一）；
- ◆ 对难加工材料进行高效加工（比采用金切机床加工效率高出 30 ~ 100%）；
- ◆ 设备投资小（只有加工中心的十分之一）；
- ◆ 加工过程安全无污染。

Product Introduction

The device takes advantage of EDM that we needn't consider machining materials, whatever they are rigid, fragile or flexible. It uses a simple long copper electrode, in a way similar CNC milling, realizes efficient low-cost machining complex parts surface of difficult machining materials (such as high temperature heat-resistant alloys, titanium, stainless steel).

The technology is completely independent of China's origin. It has already had four patents. The device has been successfully applied to the backbone of China's aviation-engine manufacturing enterprises (410Shenyang, 420Chengdu, 430X'an) and America GE Corporation.

- It can easily machine high-temperature alloys, titanium alloys and other difficult materials;
- It can machining complex shape of parts;
- Very low cost of machining tool electrode (only a few one-tenth of metal cutting tool costs);
- Efficient machining of difficult materials (It is 30-100% higher than the processing efficiency of using metal cutting machine tool);
- A small investment in equipment (only one-tenth cost of machining center);
- Machining process is safe, without pollution.

1.5.2 DJK6032 电化学去毛刺机

1.5.2 DJK6032 Electrochemical Deburring Machine



产品简介

该设备是用于金属零件电化学去毛刺的专用设备。其利用电化学反应原理，对金属材料制成的零件自动地、有选择地完成去毛刺作业。可广泛用于气动、液压、工程机械、油嘴油泵、汽车、发动机等行业不同金属材质的泵体、阀体、连杆、曲轴、柱塞针阀偶件、齿轮等零件的去毛刺加工。

电化学去毛刺机的主要技术特点：

- ◆ 适用于难于去除的内部毛刺、热处理后和精加工的零件；
- ◆ 在孔的交贯处或棱边处可形成小圆角；
- ◆ 不损坏精加工表面；
- ◆ 去毛刺的效率高，每个加工循环只需 2-3 分钟；
- ◆ 可多件同时进行毛刺去除。

Product Introduction

The device is used for metal parts of special equipment for electrochemical deburring. It uses the electrochemical reaction principle, it can deburring the parts of metal materials automatically and selectively. It can be widely used in fields of pneumatic, hydraulic, engineering machinery, nozzle and oil pump, cars, engines, etc. It can debur pump, valve, connecting rod, crankshaft, plunger needle even parts, gears and other parts of different metal materials.

Main technical features of electrochemical deburring machine:

- Suitable to debur hard-remove burrs, heat-treatment and finishing machined parts;
- It can form roundlet corner at the edges of holes;
- Without any harmful influence on the workpiece of finish machining surface;
- High efficiency, every machining circle: 2-3min;
- Deburring more than one machine at the same time.

1.5.3 新型装配式装修涂胶复合生产线

1.5.3 Composite Production Line for Assembly Decoration and Glue Coating



产品简介

该产线能解决板件规格多、在线胶接难度大等自动化难题，特别是瓷砖与基板涂胶复合的技术要求，主要用于装配式室内装饰构件装配生产。

能生产 (300~2411) mm * (300~900) mm 的装饰构件，精度高，表面质量好。

- ◆ 能兼容瓷砖、石材等多规格板件装配生产；
- ◆ 能通过视觉等传感器对瓷砖、石材原料质量进行监测；
- ◆ 能对复合工位中多板件进行在线定位及 $\pm 1.5\text{mm}$ 间隙控制；
- ◆ 采用单组份胶初固和双组份淋胶的超大基板与瓷砖、石材快速胶接方法；
- ◆ 采用二次保压方法实现精准复合；
- ◆ 显示生产信息，可与 MES 系统对接。

Product Introduction

The production line can solve many automation problems such as plate specifications, online bonding difficulty, etc., especially the technical requirements of composite coating of ceramic tile and base plate, which is mainly used for assembly production of assembled interior decoration components.

It can produce (300 ~ 2411) mm * (300 ~ 900) mm decorative components with high accuracy and good surface quality.

- It can be compatible with the assembly and production of ceramic tile, stone and other specifications.
- It can monitor the quality of ceramic tiles and stone materials through visual sensors.
- It can locate multi-plate on-line and control the clearance of (+1.5mm) in compound workstation.
- Fast bonding of super-large substrates with ceramic tiles and stones is carried out by using one-component glue and two-component glue.
- Accurate Composition by Secondary Pressure Holding Method
- Display production information, can be docked with MES system.

主要技术参数

年产量	适应产品规格	最大工件长度	最大工件宽度
500000m ²	不少于 4 种	2411mm	900mm
瓷砖缺陷检测功能	涂胶质量	瓷砖间隙尺寸	
识别 5.0*5.0mm 内缺角缺陷，准确率 99% 以上	保压后胶厚均匀，厚度控制在 0.2mm	± 1.5mm	

Main technical parameters

Annual output	product specifications	Maximum Workpiece Length	Maximum Workpiece Width
500000m ²	No fewer than four species	2411mm	900mm
Defect Detection Function of Ceramic Tiles	Coating quality	Tile clearance size	
Recognition of 5.0*5.0 mm inner corner defect with accuracy over 99%.	After holding pressure, the rubber thickness is uniform, and the thickness is controlled at 0.2mm.	± 1.5mm	

1.5.4 汽车扰流板涂胶焊接工作站

1.5.4 Automobile spoiler gluing and welding station



产品简介

该设备集成了六轴机器人系统、双组份涂胶系统与超声波焊接系统，可应用于汽车零部件涂胶与焊接定制化解决方案。

- ◆ 集成涂胶工艺、热压合工艺、超声波焊接工艺以及自动装配线；
- ◆ 涂胶工艺：采用波尔霍夫双组份供胶系统，可调配比(1:1~25:1)，计量精度高，具备防固化排胶功能，胶线美观、均匀，无拉丝；
- ◆ 热压合工艺：采用热风加热系统，升温快、效率高；采用仿形胎模设计，压合精度高；
- ◆ 焊接工艺：采用钛合金焊头，深度控制与时间控制两种焊接模式，无拉丝、漏焊、鼓包、气泡等缺陷。

Product Introduction

The machine integrates six-axis robot system, two-component gluing system and ultrasonic welding system, it can be applied to auto parts gluing and welding customized solution.

- Integrated gluing process, thermo-compression process, ultrasonic welding process and automatic assembly line.
- Gluing process: adopt BOEHRHOF two-component gluing system, adjustable ratio(1:1~25:1), high metering precision;with solidification prevention expel gluing function.
- Thermo-compression process: adopt hot-air heating system,warming up quickly, high efficient;adopt profile mould design, high compression precision.
- Welding process: adopt titanium alloy welding head, depth control and time control two welding mode, without drawing,lack of weld,bump,bubble defects

1.5.5 汽车扰流板回转装配线

1.5.5 Automobile spoiler revolving assembly line



产品简介

该产线采用倍速链回转式生产线，产线集成了六轴机器人系统、双组份涂胶系统、自动装配系统以及热固化系统，可应用于汽车零部件涂胶定制化解决方案。

- ◆ 集成机器人自动涂胶、自动装配、自动压合以及热固化等工艺；
- ◆ 输送线：倍速链回转线，胎模工装在线体上循环回流；胎模采用快速设计，可快速换产。
- ◆ 供胶系统：BOEHRHOF（波尔霍夫）双组份计量泵，可调配比，计量精度高；
- ◆ 涂胶、装配：双机器人协作涂胶，在工装上直接完成自动装配；
- ◆ 热固化：热风循环式烘箱，可同时缓存多个扰流板产品，加热效率高。

Product Introduction

The production line adopts free flow conveyor, it integrates six-axis robot system, two-component gluing system, automatic assembly system and thermal cure system. It can be applied to auto parts gluing customized solution.

- Integrated robot gluing, auto assembling, auto compression and thermal curing process.
- Pipeline: free flow conveyor, mould fixture circulating reflux in pipeline; mould adopts quick-changing design, change production quickly.
- Glue supply system: BOEHRHOF two-component metering pump, adjustable ratio(1:1~25:1), high metering precision.
- Gluing and assembling: double robots collaboration gluing, auto assembly in fixture.
- thermal cure: hot air circulating oven, caching multiple products simultaneously, high heating efficient.

1.5.6 车灯自动涂胶生产线

1.5.6 Headlights auto gluing production line



产品简介

该设备为车灯定制化装配线，产线可实现对车灯的自动涂胶装配作业，产线效率高，质量好。

- ◆ 集成机器人自动涂胶、等离子表面处理工艺；
- ◆ 供胶系统：BOEHRHOF（波尔霍夫）双组份计量泵，可调配比，计量精度高；
- ◆ 机器人涂胶：自动涂胶，胶线连续、均匀，无断胶、拉丝等情况；
- ◆ 等离子处理：常压低温等离子体，直喷式枪嘴，处理宽度 10mm，火焰温度 50°C，环保无污染，对产品无影响。

Product Introduction

The machine is headlights customized assembly production line, it can be used for headlights auto gluing and auto assembling work, with high efficiency and good quality.

- Integrated robot gluing, plasma surface treatment process.
- Glue supply system: BOEHRHOF two-component gluing system, adjustable ratio, high metering precision.
- Robot gluing: auto gluing, continuous and uniform glue line, without interrupted glue and drawing.
- plasma treatment: atmospheric pressure and low temperature plasma, direct injection nozzle, treatment width is 10mm, flame temperature is 50°C , environmental pollution, no effect on the product.

1.5.7 微波炉自动涂胶生产线

1.5.7 Microwave oven auto gluing production line



产品简介

根据客户要求和产品工艺特点进行定制，采用双层倍速链输送线，可兼容 5 款微波炉产品生产，通过工艺的集成提高了产品生产效率，改善产品质量。

- ◆ 采用双层倍速链循环回流输送；
- ◆ 通用型工装设计，可通用现场 5 种产品，并实现快速换产；
- ◆ 生产节拍达到 10s/ 件；
- ◆ 胶线均匀，美观（外观件）。

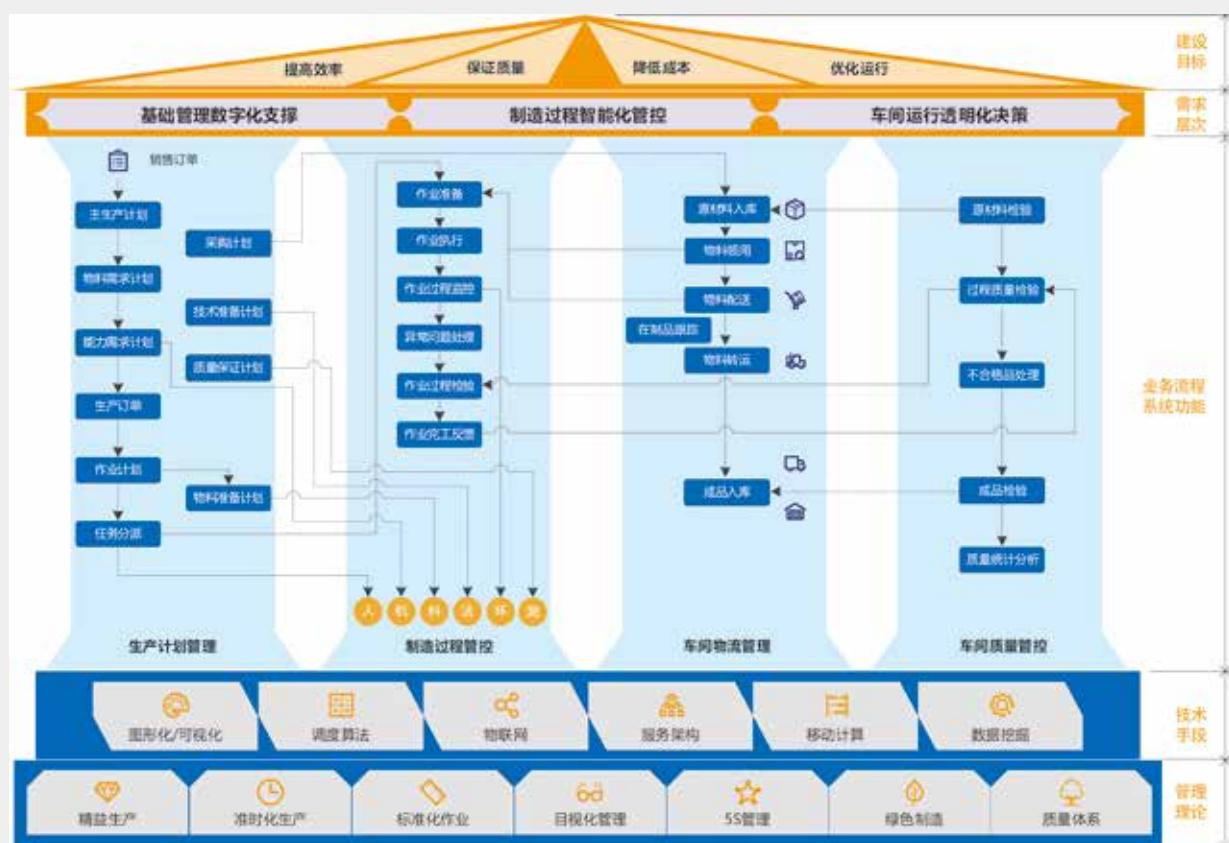
Product Introduction

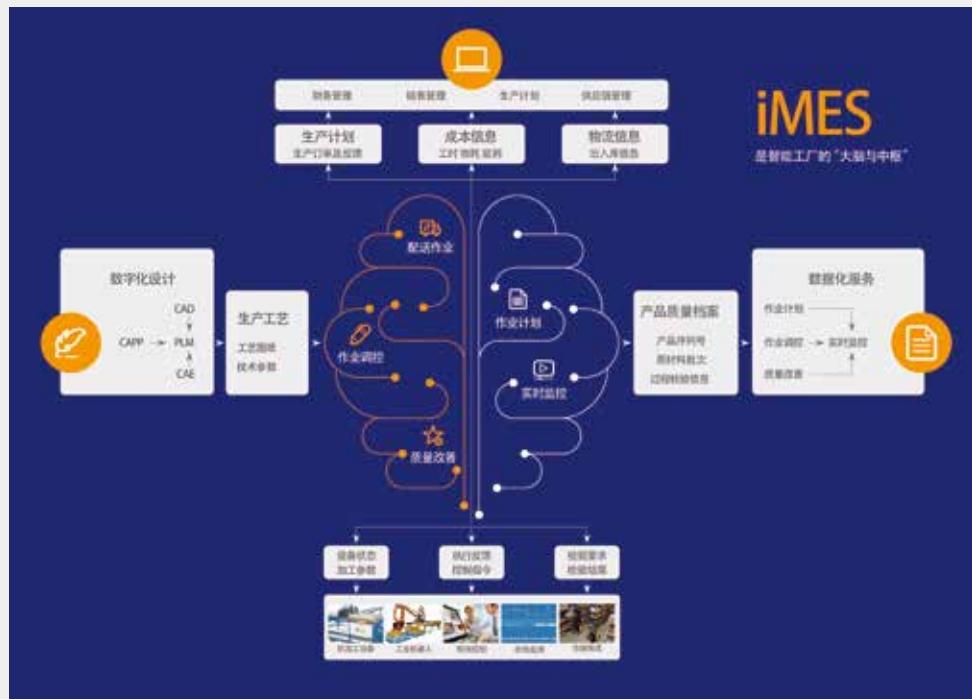
According to customer's requirements and technological characteristics of product, adopt double free flow conveyor line, compatible with 5 products, production efficiency and product quality improved by process integration.

- Adopt double free flow conveyor line.
- Universal fixture design, applied to five products, change production quickly.
- Production cycle is 10 second per piece.
- Uniform and beautifully glue line(appearance of parts).

1.5.8 iMES 智能工厂制造运行系统

1.5.8 iMES Manufacturing Operation System in Intelligent Factory





产品简介

采用平台化的研发管理思想、组织模式、系统方法，研发具有自主知识产权的平台化智能制造生产运行系统产品。掌握平台化的核心技术，攻克重大关键技术，形成具有自主知识产权的智能制造生产运行系统技术平台和产品平台。利用国机集团研发、设计、实施全产业链完整的优势，形成智能制造生产运行系统的产业。目前该系统产品已在农业机械、电力装备、新材料等行业领域完成了典型示范应用，帮助企业完成智能制造新模式应用转型。

产品特点

基于平台创新理念、横向纵向信息集成、由点到面逐级见效

生产要素有效整合、信息物理系统融合、工艺装备有机结合

产品模块

工厂建模、计划管理、物流管理、作业管理、质量管理、设备监控、可视化管理、绩效统计

解决方案

机械加工数字化车间、农机装备、新材料、电力装备

Product Introduction

With the idea of platform-based R&D management, organization mode and system method, the platform-based intelligent manufacturing production and operation system products with independent intellectual property rights are developed. We grasp the core technology of platform, overcome the key technology, and form the technology platform and product platform of intelligent manufacturing production and operation system with independent intellectual property rights. By taking advantage of the advantages of R&D, design and implementation of the whole industrial chain of China National Machinery Group, the industry of intelligent manufacturing production and operation system is formed. At present, the system products have completed typical demonstration applications in agricultural machinery, electric power equipment, new materials and other industries, helping enterprises to complete the application transformation of the new model of intelligent manufacturing.

Product Features

platform innovative, information integration, effective approach step by step

integration of production factors, CPS, combination of process & equipment

Product Modules

plant modeling, plan management, logistics management, operation management, quality management, device monitoring, visual management, performance statistics

Solution

Digital workshop for mechanical processing, agricultural machinery, new materials, power equipment

1.5.9 GJZN-ROBOT-INSSUB-001. 轮式巡检机器人

1.5.9 GJZN-ROBOT-INSSUB-001. Wheeled Inspection Robot

**产品简介**

轮式巡检机器人及其控制系统，可应用于电网、机房、矿山等领域，具有多种巡检模式，配以高效的运动平台，克服不良路面、恶劣天气对巡检工作的影响，极大提高了巡检机器人的实用性和可靠性。

核心技术

- ◆ 高精度自主导航与定位。
- ◆ 智能巡检与远程遥控。
- ◆ 多源传感器信息融合。
- ◆ 现场环境感知与预警。
- ◆ 检修全过程闭环管控。
- ◆ 移动 APP 支持。

Product Introduction

Wheeled Inspection Robot and its control system can be applied in power grid, machine room, mining and other fields. It has a variety of inspection modes, with an efficient motion platform, to overcome the impact of bad road surface and bad weather on inspection work, greatly improving the practicability and reliability of inspection robot.

Core Technologies

- High-precision automatic navigation and positioning.
- Intelligent inspection and remote control.
- Multi-source sensor information fusion.
- Awareness and early-warning of on-site environment.
- Closed-loop management and control for the overall maintenance process.
- Mobile APP support.

主要技术参数

最大涉水深度	最大运行速度	机器人整体重量	巡检覆盖率
≥100mm	≥1 m/s	≤100kg	99%
表计识别率	续航能力	巡检模式	
99%	≥8h	支持全自主、遥控两种控制模式	

Main technical parameters

Maximum wading depth	Maximum operating speed	Overall Weight of Robot	Patrol coverage
≥100mm	≥1 m/s	≤100kg	99%
Meter recognition rate	Endurance capability	Patrol mode	
99%	≥8h	Supporting two control modes of full autonomy and remote control	

1.5.10 GJZN-Robot-IntSer-002. 商用服务机器人

1.5.10 GJZN-Robot-IntSer-002. Business Service Robot

**产品简介**

商用服务机器人以 AI 人工智能系统为核心，辅助行业知识库，以自然语言方式，自动、高效地回答客户具有通用性、重复性的业务咨询问题，该服务包含语音识别、语义理解、语音合成、数据库加工与管理等等技术服务。

核心技术

- ◆ 自主 AI 云：自主的人工智能系统能够让机器人理解用户的想法、需求，给予越来越聪明的响应。
- ◆ 服务管理云：后台服务系统能够不断跟踪用户对于机器人的意见和建议，管理用户的帐号，跟进用户的投诉。
- ◆ 视觉学习云：通过不间断地从机器人视角采集得到数据，特别是景深的数据，用于物体识别、行为识别、场景识别、人脸识别。

Product Introduction

Business Service Robot takes AI artificial intelligence system as its core, assists industry knowledge base, and automatically and efficiently answers customers' general and repetitive business consultation questions in natural language. The service includes voice recognition, semantic understanding, voice synthesis, database processing and management and other technical services.

Core Technologies

- Autonomous AI Cloud: Autonomous AI systems enable robots to understand users' ideas and needs and to respond more and more intelligently.
- Service Management Cloud: Background service system can keep track of users' opinions and suggestions on robots, manage users' accounts, and follow up users' complaints.
- Visual Learning Cloud: Data, especially depth of field, are collected from the perspective of robots uninterruptedly for object recognition, behavior recognition, scene recognition and face recognition.

主要技术参数

身高	体重	视力	听力
150cm	<50kg	高分辨率广角摄像头	5米远场拾音
续航能力	行走方式	感知系统	
8h (自动充电)	轮式驱动	红外感应、超声波感应、激光雷达感应等	

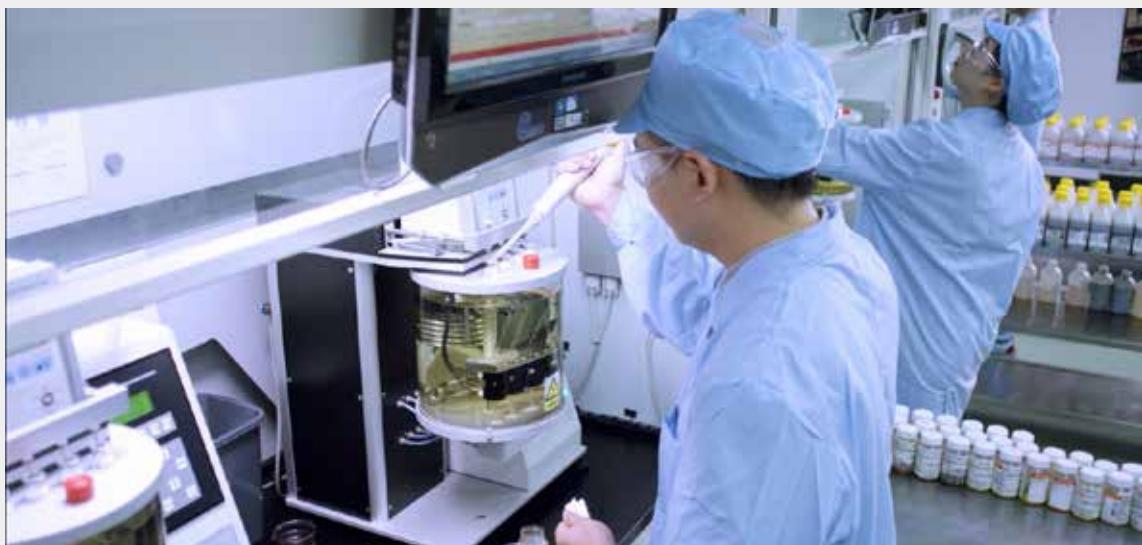
Main technical parameters

height	weight	Vision	hearing
150cm	<50kg	High Resolution Wide Angle Camera	5 m Far Field Pickup
Endurance capability	Way of walking	Perception System	
8h(Automatic Charging)	Wheel drive	Infrared Induction, Ultrasound Induction, Lidar Induction, etc.	

2 检测板块

2.1 在用油液状态监测

2.1 Condition monitoring for In-services lubricating oil



产品简介

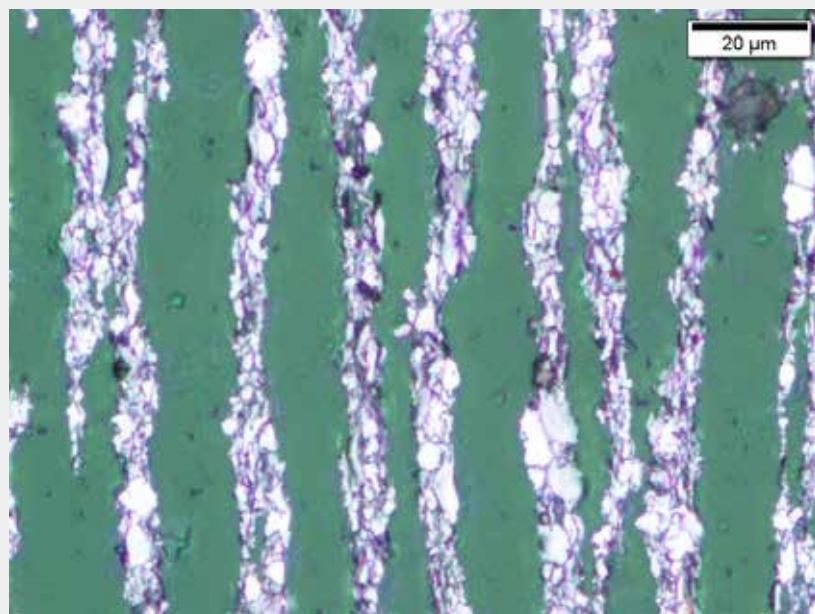
有测试仪器设备 200 多台套，试验室面积近 2000 平方米，拥有 1 个国家工程中心和 5 个省级技术中心。已为石油、电力、钢铁、风电、交通、铁路、港口、机械、造纸等行业的数千家中外企业提供油品检测和设备状态监测技术服务。

Product Introduction

The lab occupies an area of 2000m² and possesses approximately 200 sets of test devices, and there have a national engineering center and five provincial technical centers. We have provided oil testing and equipment condition monitoring services to thousands of Chinese and foreign companies in the oil, power, steel, wind power, transportation, railway, port, machinery, paper and other industries.

2.2 故障诊断服务

2.2 Diagnostic services



产品简介

根据设备在用油中磨损金属的分析，预测设备可能出现的故障、判断磨损程度、分析失效原因、诊断故障部位，实现视情维修。

Product Introduction

According to the analysis of equipment wear metal in oil, predict the possible failure of the equipment, judge the degree of wear, analyze the cause of failure, diagnose the fault location, and realize the maintenance according to the situation.

2.3 检测服务

2.3 Testing service



产品简介

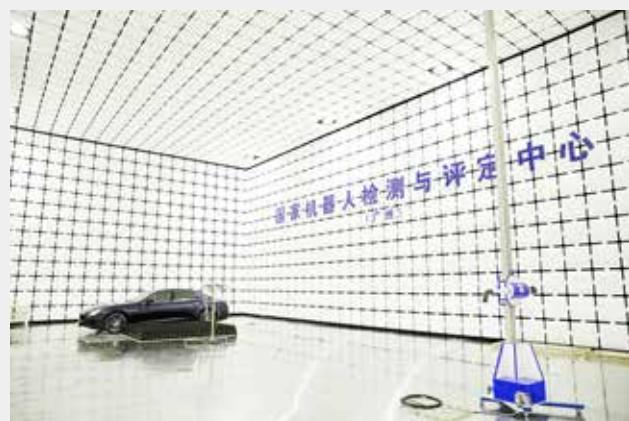
提供汽车、机器人整机及零部件等进行化学有害物质、材料特性、机械及可靠性测试、电磁兼容 EMC 性能测试。

Product Introduction

Our services includes chemical restricted substance testing, material analysis, mechanical and reliability testing, EMC testing for vehicle and robot products.

2.4 认证服务

2.3 Testing service



产品简介

提供机器人（CR）认证、汽车及零部件认证、陆地交通认证、功能安全、生产一致性审核等服务。

Product Introduction

Our service includes CR certification, vehicles and components homologations, land transportation certification, functional safety, COP audit.

3 三基板块

3.1 破碎机液压系统

3.1 Diagnostic services



产品简介

用于大件垃圾、生活垃圾、固废或者危废等破碎领域。

垃圾破碎机液压系统分为闭式和开式破碎机液压系统。

◆发热小、转矩大、噪音小、稳定性高、经久耐用；

◆结构紧凑，外形美观，体积小，能够有效防止灰尘进入；

◆适用于大件垃圾、生活垃圾、固废或者危废等破碎领域；

Product Introduction

For large pieces of garbage, domestic waste, solid waste or critical waste and other crushing fields, the garbage Crusher hydraulic system is divided into closed and open Crusher hydraulic system.

- Low heat, high torque, low noise, high stability, durable;
- Compact structure, beautiful appearance, small size, can effectively prevent dust entry;
- Applicable to large pieces of garbage, domestic waste, solid waste or hazardous waste and other broken areas;

主要技术参数

油箱容量	最高压力	电机功率	流量
800 L	32Mpa	132kw	220L/min

Main technical parameters

Fuel tank capacity	Maximum pressure	Motor power	flow
800 L	32Mpa	132kw	220L/min

3.2 硫化机行业液压系统

3.2 Hydraulic system in the vulcanizer industry



产品简介

硫化机液压系统主要用于轮胎的生产与制造，采用比例变量泵供油，分别控制左右开合模等动作所需的压力和流量。

- ◆ 产品配置结构成熟、性能可靠；
- ◆ 外形美观、无泄漏；
- ◆ 设备操作方便，使用寿命长。

Product Introduction

The hydraulic system of the vulcanizer is mainly used for the production and manufacture of tires. The proportional variable pump is used to supply oil and control the pressure and flow required for the left and right opening and closing modes respectively.

- Product configuration structure mature, reliable performance;
- Beautiful appearance, no leakage;
- Easy to operate equipment, long service life.

主要技术参数

油箱容量	系统压力	电机功率	流量
800 L	14/24 Mpa	2x15+5.5 kw	2x75+12L/min

Main technical parameters

Fuel tank capacity	System Pressure	Motor power	flow
800 L	14/24 Mpa	2x15+5.5 kw	2x75+12L/min

3.3 游乐行业液压系统

3.3 Amusement hydraulic system



产品简介

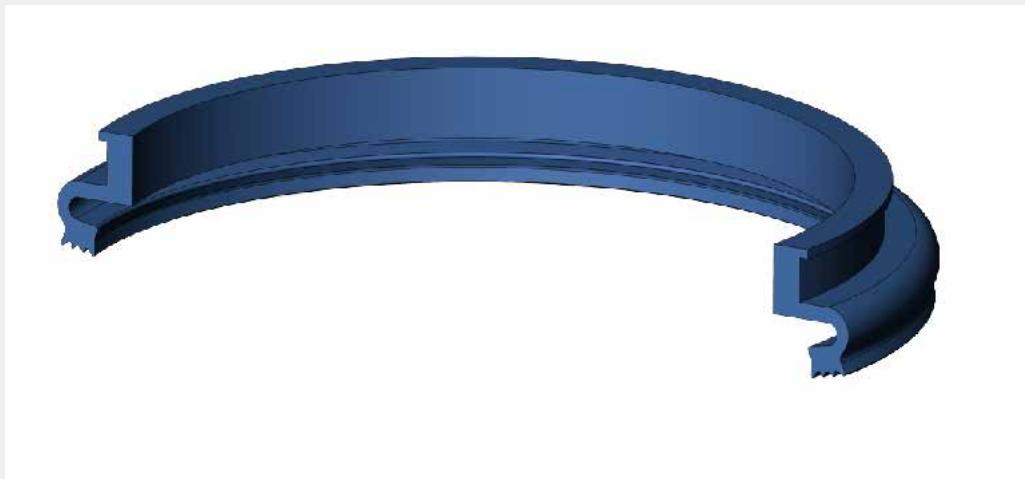
我司研制的液压系统广泛应用于旋转飞行塔、3D 飞行影院、风火轮、空中飞翔等游乐设备，终端客户有：福州新天地水上乐园、凌海九华山游乐园、天津方特世界、河源文化广场、南京游乐园、九江大千世界、哈尔滨游乐园。

Product Introduction

The hydraulic system developed by our company is widely used in rotating flying towers, 3D flying theaters, wind turbines, aerial flying and other amusement equipment. Terminal customers include: Fuzhou Xintiandi Water Park, Linghai Jiuhuashan Amusement Park, Tianjin Fangte World, Heyuan Cultural Plaza, Nanjing Amusement Park, Jiujiang Daqian World, and Harbin Amusement Park.

3.4 自补偿型端面密封

3.4 GVN



产品简介

自补偿型断面密封 GVN 由肩部、颈部、头部、一级防尘圈、二级防尘圈、一级密封唇、二级密封唇，以及多个应力槽何储油槽组成，拆装简便，适应性强。

- ◆ 采用喉箍固定方式，为自补偿型断面密封实施在线更换何改造提供了便利；
- ◆ 采用弹性体加工，通过尺寸过盈可保证两级密封唇和两级防尘唇对轴承箱端面的压紧力，从而确保密封不漏，且可在设备存在一定的向外压力时保证密封效果；
- ◆ 颈部 180° 弯曲设计，给位于头部轴向外侧端面上的两级密封唇和两级防尘唇提供了持续的轴向推力和可靠的回弹空间；
- ◆ 头部轴向外侧端面上的储油槽设计可以预填润滑油脂给两级密封唇和两级防尘唇提供润滑，还可储存外泄的油脂和从外部入侵的污染物；

Product Introduction

Self-compensating axial end face seal is composed by shoulder,neck,head,first-class sealing lip,second-class sealing lip,several stress-relief grooves,oil storage grooves.It can simply dismounting,quickly acclimatize and be a good substitute products for traditional seals

- Be fixed by hose clamps,apply convince for end-face seals to be exchanged and transformed on-line.
- Be processed by elastomer;ensure the pressing force and sealing
- 180°curving neck design can provide continuous axial thrust and reliable rebound space.
- Oil storage groove can not only provide lubrication for seal lips and wiper lips by prefill grease but also store leaked grease and invasive pollutant.

3.5 自定位型密封 3.5 GJAX



产品简介

GJAX 密封按照整装设计加工，一次成型，可实现免压盖安装，节省了加工成本；

GJAX 密封环的密封唇口采用特殊设计，加上导向插销设计，无论用于整体初装，还是在线剖分更换，均可保证密封不泄露。

- ◆ 支撑环采用硬塑料加工，成本低廉，并可长期使用；
- ◆ 磁力螺栓未永久磁铁加工，可长期使用而不用更换；
- ◆ 密封环接整体设计加工，预埋连接导向插槽，适合初装和在线更换

Product Introduction

Structure feature GJEX type double-split combined open seals can be used on replacing main shaft seal replacement without demounting engine room.

Seal change without disassembling generator parts, changing original design can easily dismounting, reliably seal, oil extraction adjust, cost low and especially be suitable for the installation without screw hole.

- Back-up rings are made from hard plastic, low-cost, and can be long-term used.
- Magnetic bolts are made from permanent magnet, has long-term working life.
- Sealing rings are designed and processed by whole holistic, have guide in pre-embedded, are suitable for initial assembly and on-line replacement.

3.6 自定位双剖分镜像密封

3.6 GJEX



产品简介

可以在不拆解设备部件得条件下实行在线改造，不改动原有结构，不留有隐患。具有 拆装简便，密封可靠、调节排油、性价比高等优点。特别适合用于没有螺栓孔可供借用的安装环境。

GJEX 型自定位双剖分镜像密封，整剖两用，并保证与整装油封具有同等密封性能和使用寿命。

- ◆ 弹簧：箍紧密封唇，使密封唇口紧贴密封面，从而实现密封；
- ◆ 密封唇：阻止油脂外泄；
- ◆ 防尘圈：组织环境中的水、汽、烟尘进入轴承
- ◆ 导向插槽：增强密封肩部的支撑力，保证在线安装时候的精准对接。
- ◆ 定位台阶：方便安装、拆卸、定位、固定；

Product Introduction

GJAX sealing was designed and processed by one-step forming to save cost.

GJAX sealing has special designed lips and tower bolt to avoid oil leak in both initial assembly and separate replacement without demounting engine room.

- Spring: Press the seal lips close to the sealing face by clamping the sealing lip;
- Wiper lips: Stop the entrance of water,dust and smoke
- Guide inserted pin: Increase the braced force of seals,ensure accurate butt joint without demounting engine room
- Location steps:Be convenient for installation,dismantlement,position-setting and settlement

3.7 吉力 1 号汽油机油 3.7 JILI 1 Gasoline Engine Oil



产品简介

粘度等级 Viscosity grade: SN 0W30, SN 0W40

顶级全合成机油，极高粘度指数，优异的低温流动性，超长换油周期。

适用于全年不同气温运作的各种高功率车型，特别推荐高性能运动型多功能 (SUV) 轿车，装备有高性能涡轮增压和最新款的发动机车型。

Product Introduction

It's a kind of top class fully synthetic engine oil with very high viscosity index, provides excellent low temperature fluidity and super long drain intervals.

Recommended for all kinds of high power vehicles working under all-weather conditions, high performance SUV and the latest vehicle models or vehicles equipped with turbocharged engines.

3.8 吉力劲刚 V6 柴油机油 3.8 Jili Strong V6 Diesel Engine Oil



产品简介

粘度等级 Viscosity grade: CI-4 15W40、CI-4 20W50

重负荷柴油机油，可以在各种压力和温度工况下为发动机部件提供可靠的润滑保护。

适用满足并超越欧 (国) IV 排放标准的低排放发动机。超大功率柴油发动机和自然吸气或涡轮增压发动机、超高负荷工况下 / 低排放发动机。

Product Introduction

Heavy duty diesel engine oil, offers reliable lubricating protection for engine components under various pressure and temperature working conditions.

Recommended for low emission engines exceeding EURO (National) IV emission standards, high-power diesel engines, naturally aspirated or turbocharged engines and low emissions engines working under ultra heavy duty conditions

3.9 GYSc 7085 微乳切削液 3.9 GYSc 7085 Micro-emulsion Cutting Fluid



产品简介

一种多用途、生物性能稳定的水溶性微乳切削液，良好的冷却性、抗乳化性和润滑性，工件加工精度高。不含氯、硫、苯酚添加剂和亚硝酸盐。

适用于多种金属加工，可加工黑色金属、铝和铝合金、铜合金，可以满足生产车间希望所有设备加工均使用同一个冷却液品种的需求。

Product Introduction

A kind of general purpose, bio-stable and water-soluble micro-emulsion. Offers good cooling, emulsion stability and lubricity performance, providing high machining precision. Chlorine, sulfur, phenol additives and nitrite free.

Works well on most metal alloys such as black metal, aluminum and aluminum alloy, copper alloy. It is the perfect choice for plants attempting to find one product to meet the challenges of the entire facility.

3.10 GYSyn 2011 全合成切削液 3.10 GYSyn 2011 Synthetic Cutting Fluid



产品简介

全合成切削液，专为铝及其合金材料的机加工和磨削加工而开发，具有良好的润滑和冷却性能。pH 值是中性，操作人员容易接受。

适用 6 系、7 系电子铝合金的精加工、高光等加工工艺润滑，也适用于铝合金的磨削、珩磨、铣削、车削、钻孔和攻丝加工。

Product Introduction

Synthetic cutting fluid designed for machining and grinding of aluminum and aluminum alloy, provides good cooling and lubricity properties. it has a neutral pH which offers high operator acceptance. Well suited for finishing and highlight operations of 6 series and 7 series aluminum alloy, and other operations such as grinding, honing, milling, turning, drilling and tapping.

3.11 广研硅酮型密封胶系列

3.11 Guangyan Silicone Sealant Series



产品简介

广研硅酮密封胶，单组分室温固化硫化，对铝、铁、钢等金属、大部分塑料、橡胶、玻璃等有优良的粘接性能，固化后有良好的弹性，优良的耐老化、耐候及耐高低温性能。

单组分室温硫化硅橡胶的硫化反应是靠与空气中的水分发生作用而硫化成弹性体。随着链剂的不同，单组分室温硫化硅橡胶可为脱酸型、脱肟型、脱醇型、脱酮型、脱胺型、和脱酰胺型等许多品种。

Product Introduction

Guangyan silincone sealant, one-part room temperature curing, has excellent bonding performance in metal, plastic, glass and rubber. After curing, there will be good elasticity, aging resistance, weather resistance and resistance to high and low temperature performance. One-part RTV sealant rubber can be devided into deacidification, deoximation, dealcoholization, Deketoxime, de-amine by different chain extender.

3.12 广研厌氧型密封胶系列

3.12 Guangyan Anaerobic Adhesive Series



产品简介

厌氧胶粘剂按照用途可分为三种：螺纹锁固厌氧胶、管螺纹密封厌氧胶和圆柱固持厌氧胶。

螺纹锁固厌氧胶：主要用于螺丝、螺栓的紧固。

管螺纹密封厌氧胶：主要用于螺纹管接头和螺纹插塞的密封、法兰盘配合面的密封、机械箱体结合面的密封。

圆柱固持厌氧胶：主要用于圆柱形组件，如轴承与轴、皮带轮与轴、齿轮与轴、轴承与座孔、衬套与孔等孔轴组合配件的填充。

Product Introduction

Anaerobic Adhesive is devided into three types according to application: Thread-locking, Pipe-thread and Cylindrical bonding.

Thread-locking sealant is applied in screw and bolt.

Pipe-thread sealant is applied in pipe joint, plug, flange and junction.

Cylindrical bonding sealant sealant is applied in Cylindrical component: bearing and shaft, belt pulley and shaft, bearing and hole, bush and hole.

合肥通用机械研究院有限公司

Hefei General Machinery Research Institute

公司名称：合肥通用机械研究院有限公司
Company Name: Hefei General Machinery Research Institute

<http://www.hgmri.com>

合肥通用机械研究院有限公司 1956 年成立于北京，1969 年搬迁至合肥，1999 年转制为科技型企业，是原国家机械部直属的多专业综合性的国家一类科研院所，现隶属于中国机械工业集团有限公司。主要从事石油、化工、能源、冶金、燃气、环保、国防军工等行业通用机械、化工设备的设计开发、产品研制、工程承包、设备成套、检测检验、设备及工程监理等。科研开发工作覆盖压力容器与管道安全工程技术、储运装备、特种金属材料设备、压缩机、风机、泵、阀门、密封、过滤与分离机械、高压水射流、制冷空调与环境控制技术、石油装备、包装机械及科普装备等专业领域。

合肥通用机械研究院始终致力于科技创新，以高新技术和新产品研发为动力，不断发展壮大，现已成为集科研开发、工程承包、产品生产、检测检测、职业教育五为一体的科技创新型企业，努力为促进社会和谐发展，建设创新型工业化国家做出新的更大贡献。

Hefei General Machinery Research Institute was founded in Beijing in 1956, relocated to Hefei in 1969 and turned to a science and technology enterprise through enterprise transformation in 1999. It is a multidiscipline comprehensive national class A scientific research institute under jurisdiction of the former Ministry of Machinery Industry and now is subordinate to China National Machinery Industry Corporation. It is mainly engaged in design and development and engineering supervision etc, of general machinery and chemical equipment for petrochemical industry, energy, metallurgy, gas, environment protection, national defense industries, etc. The scientific research and development work covers such fields as safety engineering technology of pressure vessels and pipelines storage and transportation equipment, special metallic material equipment, compressors, blowers, pumps, valves, seals, filtration and separation machinery, high pressure waterjet equipment, refrigerating and air conditioning and environmental control technology, petroleum equipment, packaging machinery, scientific popularization equipment, etc.

Always being devoted to scientific and technical innovation and taking the R & D of high-tech products as its drive, Hefei General Machinery Research Institute is growing stronger and stronger and now has become an innovation-oriented enterprise with integration of scientific research and development, project contracting, product manufacturing, inspection and testing as well as vocational education and is striving to make new and greater contribution to promoting harmonious development of the society and building an innovation-oriented industrialized country.

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1 压力容器

1 Pressure Vessel

1.1 储运容器

1.1 Spherical Tank

1.1.1 球罐

1.1.1 Spherical Tank

产品简介

球罐设计及工程总承包是合肥通用机械研究院有限公司的优势产品，可以设计和总承包 $200\text{m}^3 \sim 20000\text{m}^3$ 储存各种介质的球罐。我院有金属材料、焊接、无损检测、热处理、断裂力学、结构强度、腐蚀、压力容器等与球罐相关的专业。具有国内一流的技术队伍，从设计、原材料生产、球罐压片到安装全过程均有经验丰富的专业技术人员进行质量监控，可有效地保证产品质量。我院在球罐工程承包中积极采用新材料、新工艺，完成了一系列国内首创性的球罐工程。

★ 在高难低温球罐国产化方面：

解决了大型乙烯、丙烯球罐的国产化，独占国产化乙烯球罐的全部业绩和高参数大型丙烯球罐的主要业绩，承担过最大乙烯球罐 3000m^3 ，丙烯球罐 4000m^3 ；2012 年，又利用国产的 09MnNiDR 材料，和 LEPC 一道研制成功了国内首台 09MnNiDR 钢制 2000m^3 乙烯球罐，解决了 DMTO 装置中对乙烯球罐 -70°C 设计温度下的设计要求。

★ 在特大型化球罐国产化方面：

占有我国 10000m^3 特大型球罐的绝大部分业绩，承担过 10 台 10000m^3 丁烷球罐和 6 台 10000m^3 天然气球罐。

★ 在高压高参数球罐研制方面：

承担过最高参数组合的氮气球罐 ($3.15\text{MPa}, 1500\text{m}^3$)、氧气球罐 ($2.60\text{MPa}, 2000\text{m}^3$)，和设计压力 3.8MPa 的 1000m^3 轻烃球罐。

★ 高难度球罐的 PMC 项目质量管理

对国内新建的高难度球罐区，我院利用多专业的优势，为客户提供球罐全过程的质量管理，如 2019 年上海赛科新建 4 台 4000m^3 丙烯球罐全过程 PMC 管理。

★ 特殊要求的球形储罐的开发

随着国内对天然气的需求越来越大，对天然气的储存需求也非常大，天然气的液态存储相比完全气态带压存储，具有非常大的优势。我院参与研制了国内首台 2500m^3 液化

Product Introduction

Spherical tank design and project general contracting are the advantageous products of GMRI. We can design and general contract $200\text{m}^3 \sim 20000\text{m}^3$ tanks for storing various media. Our institute has many majors associated with the spherical tank, such as metallic materials, welding, non-destructive testing, heat treatment, fracture mechanics, structural strength, corrosion, pressure vessels, etc. With the domestic first-class technical team, from design, raw material production, spherical tank manufacturing to installation, the whole process is monitored by experienced and professional technical personnel for quality control, which can effectively guarantee product quality. Our institute actively adopt new materials, new technology in the tank project contracting, completed a series of domestic first tanks.

· Localization of highly difficult cryogenic tank:

Our institute has realized the localization of large spherical tanks of ethylene and propylene. All the localized Ethylene Tank and most of the large propylene tank with high parameters are completed by our institute. The largest ethylene and propylene spherical tanks we have completed are 3000m^3 and 4000m^3 . In 2012, our institute, in collaboration with LEPC, successfully developed the first domestic 2000m^3 ethylene spherical tanks made of domestic 09MnNiDR steel, satisfying the design requirements for ethylene spherical tank with -70°C design temperature in the DMTO device.

· Localization of extremely large spherical tanks:

The vast majority of the 10000m^3 extra large spherical tanks are completed by our institute. We have undertaken 10 sets of 10000m^3 butane spherical tank and 6 sets of 10000m^3 natural gas spherical tanks.

· Development of high pressure and parameters spherical tank:

Our institute has undertaken nitrogen tanks ($3.15\text{MPa}, 1500\text{m}^3$)，oxygen tanks ($2.60\text{MPa}, 2000\text{m}^3$) and light hydrocarbon spherical tanks ($3.8\text{MPa}, 1000\text{m}^3$) with the combination of highest parameters.

· PMC project quality management for highly difficult spherical tanks:

For the newly built domestic highly difficult spherical tank area, our institute takes advantages of multiple specialties to provide customers with quality management of the whole process of spherical tanks such as, the management of the entire process of PMC for the new construction of 4 sets of 4000m^3 propylene tanks in Shanghai SECCO in 2019

· Development of specially required spherical tanks:

With the increasing demand for natural gas in China, the demand for natural gas storage is also very large. The liquid storage of natural gas

天然气(LNG)球罐，这也是目前国内最大的LNG球罐。

我院先后承担 5000m^3 、 10000m^3 和 20000m^3 真空球罐的研制工作， 20000m^3 真空球罐也是我国国内建造的最大的真空球罐。

我院也承担了设计温度为 -196°C 的 3000m^3 真空球罐的设计和研制工作，球罐球壳为不锈钢材料，这也是目前国内利用不锈钢材料建造的最大的真空球罐。

我院研制出国际上首台 $08\text{Ni}3\text{DR}(3.5\text{Ni})$ 钢制 3000m^3 (-100°C)乙烷球罐，解决了LNG接收站接收LNG过程中低温乙烷的储存问题。

★ 在大型罐区的组织实施方面：

是国内球罐研究和建设方面最有经验的承包商，以EPC或PC方式组织完成过国内多个球罐数量多、难度大的球罐区的建设，典型的有宁波海越新材料公司的42台球罐罐区、独山子石化全压力罐区、天津石化公司化工罐区、兰州石化公司球罐区、海南炼油厂球罐区、天津碱厂球罐区、茂名石化球罐区、盘锦乙烯球罐区、庆阳石化球罐区、镇海炼化球罐区、河北海伟集团球罐区、辽宁同益球罐区、大庆石化球罐区、中煤榆林能源化工球罐罐区等，有着丰富的球罐组织和管理经验，对各种特殊困难都有有效的应对手段。

has a great advantage over completely compressed gaseous storage. Our institute participated in the development of the first 2500m^3 LNG spherical tank, which is currently the largest LNG spherical tank in China.

Our institute has undertaken the development of 5000m^3 , 10000m^3 and 20000m^3 vacuum spherical tanks. The 20000m^3 vacuum spherical tank is the largest one built in China.

Our institute has undertaken the design and development of a 3000m^3 vacuum spherical tank with a design temperature of -196°C . The spherical tank shell is made of stainless steel. This is the largest vacuum spherical tank made of stainless steel in China.

Our institute has developed the world's first $08\text{Ni}3\text{DR}$ (3.5Ni) steel 3000m^3 (-100°C) ethane spherical tank, solving the storage problem of ethane in LNG receiving station.

· Organization and implementation of spherical tank:

Our institute is the most experienced contractor in the aspect of research and construction in China. Through the way of EPC or PC, our institute has completed the construction of a number of domestic tank area which contains many tanks and had high difficulty in construction including Ningbo Haiyue New Materials Company's 42 sets of spherical Tanks, Dushanzi Petrochemical total pressure tank area, Tianjin Petrochemical Industries Co. chemical tank, tank farm of Lanzhou Petrochemical Industries Co., Hainan refinery tank area, Tianjin plant tank area, Maoming petrochemical tank area, Panjin District, Qingyang petrochemical ethylene spherical tank area, Zhenhai Refining & Chemical Tank District, Hebei Haiwei group tank area, Liaoning Tongyi tank area, Daqing Petrochemical spherical District, Yulin coal energy and chemical tank area etc. We have rich experiences in spherical tanks organization and management and effective ways to dealing with special difficulties.

出口及国外球罐设计业绩

1. 2004年，印尼PT.Tiga Samudra Perksa公司2台 2000m^3 液化石油气球罐总承包；
2. 2007年，印尼PT.Media公司1台 2000m^3 液化石油气球罐总承包；
3. 2011年，伊朗阿拉克石油化学公司2台 3000m^3 碳三、碳四球罐EP总承包；
4. 2017年斯里兰卡LAUGFS TERMINALS LIMITED 5台 6000m^3 丙烷球罐ASME分析设计工作；
5. 2018年马来西亚国家石油公司PETRONAS，1台 13306m^3 TAME球罐和1台 7467m^3 ISOMERATE球罐ASME分析设计技术服务工作。

Achievement in exportation and design of foreign spherical tanks

1. In 2004, general contracting of two 2000m^3 liquid gas spherical tank of LPG for PT. Tiga Samudra Perksa company, Indonesia.
2. In 2007, general contracting of one set of 2000m^3 LPG spherical tank of PT. Media company, Indonesia.
3. In 2011, general contracting of two sets of 3000m^3 C3 and C4 spherical tank of Arak petrochemical company, Iran.
4. In 2017, ASME analysis and design work of 5 sets of 6000m^3 propane spherical tank for Sri Lanka LAUGFS TERMINALS LIMITED.
5. In 2018, ASME analytical design technical service work of 1 set of 13306m^3 TAME spherical tank and 1 set of 7467m^3 ISOMERATE spherical tank for Malaysian National Petroleum Company PETRONAS.



独山子石化分公司罐区 35 台乙烯球罐



广州华凯公司 10000m³ 丁烷球罐



重庆 10000m³ 天然气球罐



2500m³LNG 双层球罐



首台 08Ni3DR 钢制 3000m³-C2 球罐



首台 08Ni3DR 钢制 3000m³- 乙烷球罐



合肥 5000 m³ 天然气球罐



马钢 1500m³ 氮气罐

1.1.2 大型 LNG 储罐

1.1.2 LNG storage tank



大型 LNG 储罐

产品类型：压力容器

Product category: Pressure vessel

产品简介

自 2009 年以来，先后完成了多台大型 LNG 储罐的建造，最大容积为 30000m³。大型 LNG 储罐采用内罐吊顶、外罐拱顶结构，为双壁单容罐。储罐主要由内罐、外罐、绝热层、平台梯子、阀门仪表及基础承台等组成，采用珠光砂粉末堆积绝热。

参数范围：

设计压力：外罐 29.0/-0.5kPa(g)；

工作压力：外罐 10kPa(g)；

设计温度：内罐 -168°C，外罐 -31/50°C；

工作温度：内罐 -166.64°C，外罐 -23/50°C；

物料名称：内罐 LNG，外罐珠光砂 +BOG。

Product Introduction

Since 2009, GMRI has completed the construction of a number of large LNG storage tanks, with a maximum volume of 30000m³. The large LNG storage tank adopts inner tank ceiling, outer tank arch roof structure and double wall single containment tanks. The tank is mainly composed of inner tank, outer tank, insulation layer, platform ladder, valve instrument and foundation cap, etc., which adopts perlite insulation.

Performance data:

Design pressure: Outer tank 29.0/-0.5kPa(g);

Working pressure: Outer tank 10kPa(g);

Design temperature: Inner tank -168°C , outer tank -31/50°C ;

Service temperature: Inner tank -166.64°C , outer tank -23/50°C ;

Name of material: Inner tank LNG, outer tank perlite + BOG.

1.2 换热器

1.2 Heat Exchanger

1.2.1 缠绕管式换热器

1.2.1 Spiral-wound Tube Heat Exchanger



缠绕管式换热器



产品类型：换热器

Product category: Heat Exchanger

产品简介

缠绕管式换热器是一种特殊管壳形式的热交换器，换热管形如弹簧并多层螺旋交替缠绕成管束，换热管管头与管板自由连接，管板与壳体焊接连接，与普通固定管板式换热器相比，在换热管管束和壳体之间不产生拘束热应力，具有以下结构特点：无膨胀节，无设备法兰 / 管箱法兰，无壳程折流板，管程多股流，全逆流换热，维护便捷，停工无需拆解，低维护费用，现场即可实现堵管 / 清洗。

设备突破了进口设备在煤制合成氨、煤制甲醇等传统煤化工应用领域的垄断，成功应用于煤制烯烃、煤制乙二醇、煤制油、煤制天然气、煤制氢等煤化工领域，开拓应用于LNG气化和处理、加氢裂化及加氢精制、重整及歧化和异构化、常减压、烯烃催化裂化、聚丙烯、空分、乙烯、甲烷化、丙烷脱氢、水处理、制药、电站、以及船舶和海洋平台等领域，业绩已逾千台。

Product Introduction

The Spiral-wound Tube Heat Exchanger(STHE) is different from traditional Shell & Tube Heat Exchangers(S&T), that the heat transfer tubes right and left-handed rotation spiral wound in multi-layer bundle shaped like mechanical springs, the tube tip freely connected to the plate, the plate welded with the shell, thus there is no thermal stress restraint between bundle and shell in STHE unlike S&T, and the structure characteristics of STHE as follows, no expansion joints, no shell/ channel flanges, no transverse baffles, multi-fluid with different streams in tube side, full counter-current, easy maintenance, overhauling-free, low maintenance cost, possibility to plugging and cleaning on site, etc.

Foreign monopoly was broken on STHE of ammonia synthesis and methanol in coal chemical industry domain, furthermore STHE have been applied to coal to olefin, coal to ethylene glycol, coal to oil, coal to natural gas, coal to hydrogen, and developed in following domains, LNG gasification and treatment, hydrocracking and hydrorefining, reforming and disproportionation and isomerization, atmospheric and vacuum distillation, olefin catalytic cracking, polypropylene, air separation, ethylene, methanation, propane dehydrogenation, water treatment, pharmaceuticals, power plants, marine platforms, with outstanding achievement exceeded 1000 units.

参数指标

1. 大型化: 设计压力 26MPa; 设计温度 -196°C ~ 610°C ; 钢制单台换热面积已超过 20000m²; 最大直径 5400mm; 单台长度可达到 30m 以上, 传热元件无缝换热管单根长度可达到 100m 以上 (有焊缝时无管长限制);
2. 高效性: 小端差, 低压降, 2kPa, 单位体积换热面积大, 单台可替代多台普通管壳式换热器群组、占地小、配管简化、流程优化;
3. 安全性: 长周期运行, 抵抗工况波动, 无内漏, 抗积垢, 抗振动, 无温差 / 压差限制, 无升降温速率限制, 能适用于从 -196°C 到 600°C 以上的操作温度, 操作压力可达到 30MPa 以上;
4. 材料适应性: CS, 304(L), 321, 316(L), 1Cr-0.5Mo, 1.25Cr-0.5Mo, 2.25Cr-1Mo, 2205, 825, SMO254, Ti 等。

Performance data

1. Large-scalization: Design pressure 26MPa; Design temperature -196°C ~610°C ; Heat transfer area exceeds 20000m²/per shell; Maximum DN5400; Length up to 30m plus; Length of seamless tube up to 100m plus (welded tube without limit of length).
2. Efficiency: Close temperature approach of 2°C ; Low pressure drop of 2kPa; Large heat transfer area per shell volume; 1 of STHE replaces several shells of S&T in series/parallel; Small footprint; Easy piping; Optimize process.
3. Safety: Long-term stable operation; Reliable under different process condition fluctuation, zero-interleakage, anti-fouling, Anti-vibration, no temperature & pressure difference limitation, no temperature rise/fall rate limitation, applicable operation temperature range from -196°C to 600°C plus and operation pressure up to 30MPa plus.
4. Material: CS, 304(L), 321, 316(L), 1Cr-0.5Mo, 1.25Cr-0.5Mo, 2.25Cr-1Mo, 2205, 825, SMO254, Ti, etc.

1.2.2 丁辛醇转化器

1.2.2 Butyl-octanol Converter



丁辛醇转化器

产品类型：换热器、反应器

Product category: Heat Exchanger, reactor

产品简介

丁辛醇转化器是重要化工原料丁辛醇生产装置的核心设备，具有以下特点：

- 1) 设备采用了挠性薄管板结构，补偿管、壳程轴向温差位移，降低了管板、管板与筒体连接处的温差应力。
- 2) 采用大直径薄壁 ($\phi 88.9\text{mm} \times 3.2\text{mm} \times 6000\text{mm}$) 反应换热管，解决了设计、制造耦合性难题。
- 3) 换热管振动支撑格栅结构设计，解决了反应换热管在反应过程中的振动难题等。
- 4) 解决了丁辛醇关键核心设备反应器与换热器一体化结构大型化设计。

目前已经在北京渤海化工、利华益、蓝帆化工、国泰化工、中海油惠州炼化等丁辛醇生产装置得到成功应用。

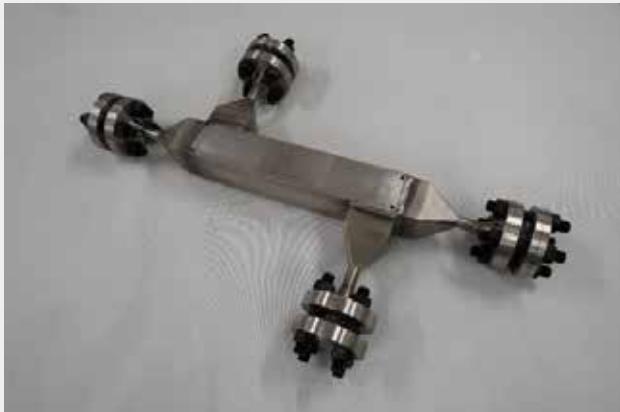
Product Introduction

Butyl-octanol is an important chemical raw material, and butyl-octanol converter is the core equipment for its production unit. It has the following characteristics:

- 1) The device adopts a flexible thin tube sheet structure to compensate the axial temperature difference displacement of the tube and the shell, and reduces the temperature difference stress of the tube sheet and the joint between tube sheet and shell.
- 2) The large-diameter thin wall heat exchange tubes which are $\phi 88.9\text{mm} \times 3.2\text{mm} \times 6000\text{mm}$ were adopted to solve the coupling problems of design and manufacturing.
- 3) The design of the vibration support grid structure of the heat exchange tube solves the vibration problem of the reaction heat exchange tube in the reaction process.
- 4) It solved the large-scaled design of the integrated structure of reactor and heat exchanger for the butyl-octanol key equipment. At present, it has been successfully applied in the butyl-octanol production unit in Tianjin Bohai Chemical, Lihuayi Group Co., LTD, Bluesail Chemical, Guotai Chemical and CNOOC Huizhou Refinery, etc.

1.2.3 扩散焊紧凑式换热器

1.2.3 Diffusion Bonding Compact Heat Exchanger



扩散焊紧凑式换热器



产品类型：换热器

Product category: Heat Exchanger

产品简介

扩散焊紧凑式换热器在高温高压、深冷高压等苛刻条件下表现出良好的综合性能，是实现节能和安全和谐统一的标志性换热器。其主要加工方法是：通过化学蚀刻的方法将薄板加工成具有各种流道形状的传热元件，再在高温下通过扩散焊技术实现固态金属传热元件的连接。

目前，扩散焊紧凑式换热器已广泛应用于海洋平台油气处理、天然气浮式气化装置、浮式天然气液化装置等海洋工程领域，并且在发电领域、氢能领域、核能领域中呈现出潜在的应用前景。

参数指标

1. 和同等热负荷的管壳式换热器相比，体积和重量大幅减少；
2. 承压可以达到 70MPa；
3. 能够有效地处理流体或者快速温度变化带来的大温差工况；
4. 在单一设备里可以允许多种介质实施换热过程；
5. 能够实现低达 2°C 的较小温度端差；
6. 无垫片（无泄漏）、无钎焊、无管板，具有更高的设备完整性。

Product Introduction

The diffusion-bonded compact heat exchanger exhibits good comprehensive performance under severe conditions such as high temperature and high pressure, cryogenic high pressure, and is an iconic heat exchanger that achieves energy conservation and safety. The main processing method is: the thin plate is processed into a heat transfer element having various flow path shapes by chemical etching, and the solid metal heat transfer element is connected by diffusion welding technology at a high temperature.

At present, diffusion-bonded compact heat exchangers have been widely used in marine platform oil and gas processing, natural gas floating gasification devices, floating liquefied natural gas plants and other marine engineering fields, and potential application prospects in the fields of power generation, hydrogen energy and nuclear energy.

Performance data

1. Significantly reduced volume and weight compared to shell and tube heat exchangers of the same heat load.
2. Pressure capability of over 70MPa.
3. Ability to cope with large temperature differentials between fluids and rapid temperature change.
4. Able to incorporate multiple process streams into a single unit.
5. It can achieve close temperature approaches (2°C).
6. High integrity, no gaskets (so no leaks), no braze and no tube sheets.

1.2.4 醋酸装置用不锈钢换热器

1.2.4 Acetic Acid Plant With Stainless Steel Heat Exchanger



醋酸装置用不锈钢换热器

1.2.5 醋酸装置用锆换热器

1.2.5 Acetic Acid Plant With Zirconium Heat Exchanger



醋酸装置用锆换热器

1.2.6 醋酸装置用 C-276 换热器

1.2.6 Heat Exchanger for Synthetic Acetic



醋酸装置用 C-276 换热器

产品类型：换热器

产品简介

1. 非标设备
2. 材质：316L

Product category: Heat Exchanger

Product Introduction

1. Nonstandard equipment
2. Texture of product: 316L

产品类型：换热器

产品简介

1. 非标设备
2. 材质：R60702
3. 换热管：2008 根

Product category: Heat Exchanger

Product Introduction

1. Nonstandard equipment
2. Texture of product: R60702
3. Heat exchanger tube: 2008

产品类型：换热器

产品简介

1. 非标设备
2. 材质：C-276

Product category: Heat Exchanger

Product Introduction

1. Nonstandard equipment
2. Texture of product: C-276

1.2.7 煤化工用波纹管换热器

1.2.7 Corrugated Tube Heat Exchanger for Coal Chemical Industry



煤化工用波纹管换热器

1.2.8 醋酐装置用羟化排气冷凝器

1.2.8 For Synthesis of Acetic Anhydride by Hydroxylation of Exhaust Condenser



醋酸装置用羟化排气冷凝器

1.2.9 核用铀化物冷凝器

1.2.9 Nuclear With Uranium Compounds Condenser



核用铀化冷凝器

产品类型：换热器

产品简介

1. 非标设备
2. 材质：316L

Product category: Heat Exchanger

Product Introduction

1. Nonstandard equipment
2. Texture of product:316L

产品类型：冷凝器

产品简介

1. 非标设备
2. 材质：C-276

Product category: Condenser

Product Introduction

1. Nonstandard equipment
2. Texture of product: C-276

产品类型：冷凝器

产品简介

1. 非标设备
2. 材质：16MnR

Product category: Condenser

Product Introduction

1. Nonstandard equipment
2. Texture of product: 16MnR

1.3 反应器

1.3 Reactor

1.3.1 高温超高压反应釜

1.3.1 High Temperature and Ultra-high Pressure Reactor



高温超高压反应釜

产品类型：反应器

Product category: Reactor

产品简介

高温超高压反应釜设计压力：200MPa、设计温度：650°C，是酸性氨热法生长高质量、大尺寸氮化镓(Gallium nitride, GaN)单晶的核心设备。GaN是继第一代Si半导体和第二代GaAs化合物半导体之后出现的第三代新型半导体材料，因其具有直接带隙宽、原子键强、热导率高、化学稳定性好和抗辐照能力强等诸多优点，在光电子、高温大功率器件和高频微波器件应用方面有着极为广阔的前景。目前国外在酸性氨热法生长高质量、大尺寸GaN单晶等方面都已经得到实证，是目前唯一可以实现GaN衬底规模化、工业化生产的技术。材质：UNS N07718。

Product Introduction

High temperature and ultra-high pressure reactor is the core equipment for obtaining the high quality and large size Gallium nitride single crystal by acid ammonia heating method, with design pressure 200MPa, design temperature 650°C . GaN is the third generation new semiconductor material after the first generation Si semiconductor and the second generation GaAs compound semiconductor, because of its many advantages, such as direct band gap width, strong atomic bond, high thermal conductivity, good chemical stability and strong radiation resistance. It has a broad prospect in optoelectronics, high temperature and high power devices and high frequency microwave devices. At present, obtaining high quality and large size GaN single crystal by acid ammonia heating has been proved abroad, and it is the only technology that can realize the large-scale and industrial production of GaN substrate at present. Texture of product is UNS N07718.

1.3.2 镍基合金 B-3 容器

1.3.2 Nickel-based Alloy B-3 Pressure Vessel



镍基合金 B-3 容器

产品类型：反应器

产品简介

1. 非标设备
2. 材质：B-3(N10675)
3. 规格：φ 3800 × 12.7mm, 22 吨

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: B-3(N10675)
3. Specifications: φ3800×12.7 mm, 22t

1.3.3 醋酸装置用锆钢复合板反应釜

1.3.3 Zirconium Steel Composite Board the Reaction Kettle Used for Acetate Synthesis



醋酸装置用锆钢复合板反应釜

产品类型：反应器

产品简介

1. 非标设备
2. 材质：R60700+SA516Gr.55

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: R60700+SA516Gr.55

1.3.4 环氧乙烷装置用半盘管加热反应器

1.3.4 Synthesis of Epoxy Ethane Device With Half Coil Heating Reactor



环氧乙烷装置用半盘管加热反应器



产品类型：反应器

产品简介

1. 非标设备
2. 材质：316L

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: 316L

1.3.5 己内酰胺氧化反应器

1.3.5 Caprolactam Oxidation Reactor



己内酰胺氧化反应器

产品类型：反应器

产品简介

1. 非标设备
2. 材质：316L

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: 316L

1.3.6 钛制酯化反应器

1.3.6 Esterification Reactor With Titanium



钛制酯化反应器



产品类型：反应器

产品简介

1. 非标设备
2. 材质：TA2
3. 换热管： $\phi 51 \times 2.5 \text{ mm}$, $\phi 73 \times 3.5 \text{ mm}$

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: TA2
3. Heat exchanger tube: $\phi 51 \times 2.5 \text{ mm}$, $\phi 73 \times 3.5 \text{ mm}$

1.3.7 酯化预反应器

1.3.7 Esterification Reactor



酯化预反应器

产品类型：反应器

产品简介

1. 非标设备
2. 材质：304
3. 换热管： $\phi 32 \times 2 \text{ mm}$

Product category: Reactor

Product Introduction

1. Nonstandard equipment
2. Texture of product: 316L
3. Heat exchanger tube: $\phi 32 \times 2 \text{ mm}$

1.4 塔类设备

1.4 Tower Equipment

1.4.1 醋酐装置用碘甲烷回收塔

1.4.1 Acetic Anhydride Device Iodomethane Recovery Tower



醋酐装置用碘甲烷回收塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：C-276
3. 规格：Φ1200×20500mm

Product category: Tower equipment

Product Introduction

1. Nonstandard equipment
2. Texture of product: C-276
3. Specifications: Φ1200×20500 mm

1.4.2 醋酸乙酯装置用乙酯酯化塔

1.4.2 Synthesis Ethyl Acetate Esterification Tower



醋酸乙酯装置用乙酯酯化塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：316L
3. 规格：Φ2200×41000mm

Product category: Tower equipment

Product Introduction

1. Nonstandard equipment
2. Texture of product: 316L
3. Specifications: Φ2200×41000mm

1.4.3 醋酸装置用锆塔

1.4.3 Synthetic Acetic Acid for The Zirconium Tower



醋酸装置用锆塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：R60702
3. 规格： $\phi 3000 \times \phi 1800 \times 38000\text{mm}$

Product category: Tower equipment

Product Introduction

1. Nonstandard equipment
2. Texture of product: R60702
3. Specifications: $\phi 3000 \times \phi 1800 \times 38000\text{mm}$

1.4.4 800 万吨炼油用脱吸塔

1.4.4 Desorption Tower With Eight Million tons of Oilrefinig



800 万吨炼油用脱吸塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：S11348+Q345R
3. 规格： $\phi 2000 \times 46000\text{mm}$

Product category: Tower equipment

Product Introduction

1. Nonstandard equipment
2. Texture of product: S11348+Q345R
3. Specifications: $\phi 2000 \times 46000\text{mm}$

1.4.5 钛制脱酸塔

1.4.5 Titanium Deacidification Tower



钛制脱酸塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：TA2
3. 规格：Φ 2640 × 15160mm

Product category: Tower equipment

Product Introduction

1. Nonstandard equipment
2. Texture of product: TA2
3. Specifications: Φ2640×15160mm

1.4.6 乙酸仲丁酯用钛塔

1.4.6 SCE Butyl Acetate With Titanium Tower



乙酸仲丁酯用钛塔

产品类型：塔类设备

产品简介

1. 非标设备
2. 材质：TA2
3. 规格：Φ 2400 × 61848mm

Product category: Tower equipment

Product Introduction

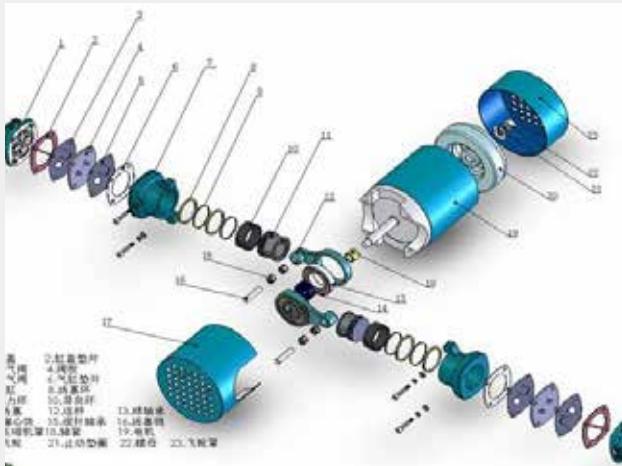
1. Nonstandard equipment
2. Texture of product: TA2
3. Specifications: Φ2400×61848mm

2 压缩机

2 Compressor

2.1 机车用无油压缩机

2.1 Oil-free Compressor Used Inelectric Locomotive System



机车用无油压缩机

产品类型：压缩机

产品简介

机车用无油压缩机可用于电力机车等对气体品质要求较高的用气系统，为系统提供洁净的压缩空气。

通过对气阀组件、活塞环及导向环等部件宽环境工况适应性研究，突破了低气压及高低温等环境条件下若干关键技术问题，使得压缩机可满足机车各种运行工况要求。机车用无油压缩机为对称平衡式结构，全无油压缩，压缩机与电机直连，结构紧凑、振动小、可靠性高。

参数指标：

排气量： $\geq 0.07\text{m}^3/\text{min}$ ，排气压力 0.6MPa(绝压) 状态下；
最高排气压力：1.0MPa；
工作环境温度：-40°C ~ +70°C；
最高工作海拔：5000m；
振动、冲击：满足机车车体安装设备要求；
电源：110VDC(波动范围 -30%~+25%)；
电机功率：750W。

Product category: Compressors

Product Introduction

Oil-free compressor for locomotive can be used for gas systems requiring high gas quality (e.g. electric locomotive) to supply clean compressed air to the system.

Through the research on the adaptability of air valve components, piston ring and guide ring etc. under wide environment conditions, several key technical problems under low air pressure and high/low temperature have been solved so as to ensure that the compressor meets various operation requirements of locomotive. The oil-free compressor for locomotive applies symmetrical balanced structure to provide complete oil-free compression. The direct connection between compressor and motor ensures compact structure, small vibration and high reliability.

Performance data:

Gas displacement: $\geq 0.07\text{m}^3/\text{min}$, under the exhaust pressure of 0.6MPa (absolute pressure);
Maximum exhaust pressure: 1.0MPa;
Operating temperature: -40°C ~ +70°C ;
Highest working altitude: 5000m;
Vibration & impact: meeting the requirements for car-body installation equipments of locomotive;
Power: 110VDC (fluctuation range -30%~+25%);
Motor power: 750W.

2.2 MVR 系统蒸汽压缩机

2.2 Vapor Compressor for MVR System



MVR 系统蒸汽压缩机



产品类型：压缩机

产品简介

蒸汽压缩机是合肥通用机械研究院为 MVR 系统研制开发的系列化风机产品。产品性能以及可靠性具有国际先进水平，用户评价良好。

参数指标:

压缩机介质特性：含各种物质的饱和水蒸汽；

压缩机质量流量：5~40t/h；

压比：1.2~2.5；

功率：75~1500kW。

Product category: Compressors

Product Introduction

Vapor compressor is the new product for MVR system, designed by Hefei General Machinery Research Institute. The product performance and reliability with the international advanced level, and the evaluation given by user are good.

Performance data:

Compressor media properties: saturated water vapor various substances;

Compressor mass flow: 5~40t/h;

Pressure ratio: 1.2~2.5;

Power: 75~1500kW.

2.3 压缩机阀片 2.3 Compressor Valve Leaves



压缩机阀片

产品类型：压缩机零件

Product category: Compressor parts

产品简介

阀片是制冷压缩机、空气压缩机的关键配件，它的精度和寿命直接影响主机的性能和可靠性。

我公司生产所用的原材料是选用国际公认的瑞典SANDVIK公司生产的优质阀片钢，同时采用了先进的加工技术和生产工艺，结合合肥通用机械研究院最新科技成果，以质优价廉的服务保证产品质量。并可协助用户进行新产品开发和试制。目前生产的阀片有百余种，向国内几十个厂家提供阀片配套，受到国内用户的好评。

Product Introduction

The valve leaves produced by our company are the critical parts of refrigerating compressors and air compressors. The precision and service life of valve leaves directly affect the performance and reliability of the compressors. The raw material used by us for production is the premium steel strip for valve leaves by the internationally recognized Sweden SANDVIK company, meanwhile we adopt advanced process technology and production technique in combination with GMRI's latest scientific research achievements, therefore we can guarantee product quality with high quality and competitive prices. At the same we can assist our customers in new product development and pilot production. At present there are more than two hundred specifications which are provided to tens of domestic companies, and our products have enjoyed favorable reputation.

3 风机 3 Fan Products

3.1 百万吨 PTA 装置用 RPF 鼓风机 3.1 RPF Blower for Million-ton PTA Plant



百万吨 PTA 装置用 RPF 鼓风机



产品类型：鼓风机

Product category: Blower

产品简介

RPF 鼓风机是合肥通用机械研究院为百万吨 PTA 装置而研制开发的系列化鼓风机产品。鼓风机介质特性: 醋酸(乙酸)、氮气、水蒸汽含 CTA 或 PTA 粉尘。醋酸有强烈腐蚀性、PTA 粉尘易爆、水蒸气易凝结水。

鼓风机流量 20~300m³/min, 进口静压头 3.5~8kg/cm²(G), 出口静压头 4.0 ~ 10kg/cm²(G), 功率 75~500kW。该鼓风机是具有多极、单级等多种规格的系列化产品。产品性能以及可靠性具有国际先进水平，用户评价良好。

Product Introduction

The RPF blower is the new product for the large (million tons) PTA plant ,designed by Hefei General Machinery Research Institute. Gas: acetic acid, nitrogen, steam, CTA and PTA dust. Acetic acid is strongly corrosive, the PTA dust has explosive characteristics and the stream is easy to condense.

Volume 20-300m³/min, inlet pressure 3.5-8kg/cm²(G), outlet pressure 4.0-10kg/cm²(G), power 75-500kW. This series blower has two specifications, the multistage and the single-stage. The product performance and reliability with the international advanced level, and the evaluation given by user are good.

3.2 GW 系列高温排烟风机 3.2 GW Series High-temperature Exhaust Fan



GW 系列高温排烟风机

产品类型：风机

Product category: Fan

产品简介

GW 系列高温排烟风机是合肥通用机械研究院为冶炼行业开发生产的系列大型通风机。具有高效、高可靠性的特点。用于输送冶炼工艺中的各种高温烟气。

流量 $\leq 600000 \text{m}^3/\text{h}$,

全压 $\leq 16000 \text{Pa}$,

进气温度 $150\text{--}450^\circ\text{C}$,

功率 $\leq 3000 \text{kW}$ 。

Product Introduction

The GW Series High-temperature exhaust fan designed by Hefei General Machinery Research Institute is a new product for smelting industry. The fan has the advantages of high efficient and high reliability. The series fan is specially designed for conveying hot fume. Volume (less than or equal to) $600000 \text{m}^3/\text{h}$, pressure (less than or equal to) 16000Pa , inlet gas temperature $150\text{--}450^\circ\text{C}$, power (less than or equal to) 3000kW .

3.3 HC 系列送、排风机 3.3 HC Series Supply and Exhaust Fan



HC 系列送、排风机

产品类型：风机

Product category: Fan

产品简介

HC 系列送、排风机是合肥通用机械研究院为冶炼行业开发生产的系列大型通风机，具有高效、高可靠性的特点。用于输送冶炼工艺中的各种气体。流量 $\leq 550000 \text{m}^3/\text{h}$ ，全压 $\leq 2000 \text{Pa}$ ，进气温度 $20\text{--}150^\circ\text{C}$ ，功率 $\leq 3000 \text{kW}$ 。

Product Introduction

The HC Series supply and exhaust fan designed by Hefei General Machinery Research Institute, is a new product for smelting industry. The fan has the advantages of high efficient and high reliability. The series fan is specially designed for conveying various gases produced in smelting process.

Volume (less than or equal to) $550000 \text{m}^3/\text{h}$, pressure(less than or equal to) 2000Pa , inlet temperature $20\text{--}150^\circ\text{C}$, power (less than or equal to) 3000kW .

3.4 磁悬浮鼓风机

3.4 Magnetic Suspension Blower



磁悬浮鼓风机



产品类型：鼓风机

Product category: Blower

产品简介

GM 系列磁悬浮鼓风机主要用于处理量 1-20 万吨 / 日污水处理厂，型号 GM75、GM110、GM150、GM200、GM250，主要特点与优势：

结构一体化，高速小型轻量，节能高效低噪，橇装式安装方便；

磁悬浮轴承：无机械磨损，能耗低，半永久性寿命；

高效叶轮：三元流设计，五轴加工，级效率高达 87% 左右；

变频调速：工作范围宽，流量调节 50%~110%；

环保优势：无二次油污染，噪音低于 85dB(A)；

降低运行维护费用；

降低土建费用；

使用操作方便。

Product Introduction

GM series magnetic suspension blower; Mainly used for processing 10,000-200,000 tons/day sewage treatment plant. The models include GM75, GM110, GM150, GM200, GM250. The main features and advantages as follows:

Integrated structure, high speed, small size and light weight, energy saving, high efficiency and low noise, easy to install by skid mounted; Magnetic suspension bearing: no mechanical wear, low energy consumption, semi-permanent life;

High-efficiency impeller: ternary flow design, five-axis machining, grade efficiency up to 87%;

Frequency control: wide working range, flow regulation 50%-110%;

Environmental advantages: no secondary oil pollution, noise below 85dB (A);

Reduce operating and maintenance costs;

Reduce civil construction costs;

Easy to use and operate.

4 泵

4 Pump Products

4.1 DH 系列高压灰水泵 4.1 DH Series High Pressure Ash Pump



DH 系列高压灰水泵

产品类型：多级离心泵

Product category: Multi-stage centrifugal pump

产品简介

符合 API610 标准 BB5 型高压多级离心泵，采用高效固液两相流叶轮且对称布置，采用耐磨耐蚀材料。

参数范围：

最大流量：700 m³/h;

最大扬程：2465 m;

最大允许压力：30MPa;

最高允许温度：200°C；

在输送含煤渣等固体颗粒的场所有其独特优势，主要用于煤化工、钢厂高压水除磷、锅炉给水、油田注水及原油外输等场合。

Product Introduction

DH series high pressure ash pump is designed according to API 610, and be designated pump type BB5, with impellers which are efficient and solid-liquid two-phase flow and be installed symmetrically. The pump is made of wear-resistant and corrosion-resistant materials.

Performance data:

Maximum flow:700m³/h;

Maximum head:2465m;

Maximum permissible pressure: 30MPa;

Maximum permissible temperature:200°C ;

It's a great advantage to transport the liquid containing solids, such as cinder, and mainly for coal-chemical industry, high-pressure water decaling, boiler feed water, oilfield flooding, crude oil transportation, etc.

4.2 远程调节计量泵

4.2 Remotely Adjust Metering Pump



远程调节计量泵

产品类型：计量泵

Product category: Metering pump

产品简介

远程调节计量泵按调节方式可选择远程电动行程调节、气动行程调节和变频调节；按液力端分为两大类：柱塞式计量泵或隔膜式计量泵；现有 J1.6、J5、J12.5、J25 和 J50 共五个机座系列。

单联柱塞式计量泵流量范围：0.2 ~ 25000L/h，最高排出压力 50MPa；单联隔膜式计量泵流量范围：0.32 ~ 16000L/h，最高排出压力 16MPa。输送温度范围 -30°C ~ 200°C，粘度可达 800mm²/s。

出口业绩：产品远销土耳其、吉尔吉斯斯坦、安哥拉、印度等国家。

Product Introduction

Remotely adjust Metering pump, adjustment mode selectable by remote electric stroke adjustment, pneumatic stroke adjustment and frequency regulation .Metering pump is classified into plunger metering pump and diaphragm metering pump, according to its fluid end; There are five transmission case series including J1.6, J5, J12.5, J25 and J50.

Capacity ranges of simplex plunger type pumps is from 0.2 to 25000L/h, the maximum discharge pressure can reach 50MPa; And then, Capacity ranges of simplex diaphragm type pumps is 0.32-16000L/h, the maximum discharge pressure can reach 16MPa. Metering pump can transport -30°C -200°C liquids, the viscosity of which can reach 800mm²/s.

Export performance: Exported to Turkey, Kyrgyzstan, Angola, India and other countries.

4.3 JHB 系列串并联泵

4.3 JHB Series Parallel Pump



JHB 系列串并联泵

产品类型：离心泵

Product category: Centrifugal pump

产品简介

JHB 系列串并联泵是一种具有并联串联切换的特殊结构，可以实现一泵多参数使用功能，串并联可以通过自动或手动实现。JHB 系列串并联泵具高效节能、噪声低、振动小、无过载、结构紧凑、安装占地面积少等优点。

Product Introduction

JHB series parallel connection pump is a special structure with parallel series switch, it can realize multi parameter function of a pump, and the series parallel connection can be realized through automatic or manual. JHB series parallel connection pump has some advantage, like high efficiency and energy saving, low noise, small vibration, no-overload, compact structure, and installation occupies less area.

参数范围

流量: $25\text{m}^3/\text{h} \sim 180\text{m}^3/\text{h}$;

扬程: $20\text{m} \sim 160\text{m}$;

最大功率: 80kW ;

必需汽蚀余量: 3m ;

JHB 系列串并联泵应用于输送不含杂质的海水、淡水，用于船舶装置抽送海水、舱底压舱水、冷却及消防水及供喷射泵的工作用水等。

Performance data

Flow: $25\text{m}^3/\text{h}-180\text{m}^3/\text{h}$;

Head: $20\text{m}-160\text{m}$;

Maximum power: 80kW ;

NPSHr: 3m ;

Applied to Transporting seawater and fresh water with free of impurities, used for pumping water, ship bilge ballast water, cooling and water and injection pump working water, etc.

4.4 WGC 系列微型高速磁力泵 4.4 WGC Series High Speed Magnetic Drive Mini-pump



WGC 系列微型高速磁力泵

产品类型：离心泵

Product category: Centrifugal pump

产品简介

WGC 泵系无泄漏回转动力泵，主要用于循环冷却系统，集泵、磁力联轴器和电机为一体，结构紧凑、体积小、重量轻。

Product Introduction

The WGC high speed magnetic drive mini-pump is a leak-free rotary power pump, which is used in circulating cooling system mainly. It comprises of pump, magnetic coupling and motor, and it is compact, small and light.

参数范围：

最大流量：90L/min;
最大扬程：200m;
最大使用压力：4MPa;
最高转速：24000r/min;
最高温度：150°C。

Performance data:

Maximum flow: 90L/min;
Maximum head: 200m;
Maximum permissible pressure: 4MPa;
Maximum speed: 24000r/min;
Maximum permissible temperature: 150°C .

5 阀门

5 Valve Products

5.1 煤粉给料三通换向阀

5.1 Coal Feed Flow Diverter Valve



煤粉给料三通换向阀

产品类型：煤化工特殊阀门

Product category: Special valves used in coal chemistry

产品简介

CPD型煤粉给料三通换向阀是干煤粉气化工艺装置的关键设备，当气化炉不具备气化条件时，煤粉通过该阀进行旁路循环；当气化炉具备气化条件时，该阀在3秒内将流态煤粉的流向切换到气化炉烧嘴。

阀门介质为煤粉+CO₂/N₂，煤粉密度(kg/m³): 95(气)/1400(固)；公称口径DN32~DN65，公称压力PN16-PN100，使用温度<80°C；阀门气开弹簧关，换向角度30°，气源压力4-6bar，换向时间<3s；密封等级符合EN12266-1的B级要求。

Product Introduction

CPD type Coal feed flow diverter valve is critical equipment used in coal powder gasification furnace .The valve can divert coal flow carried by gas between by-pass line and inject line within 3 seconds.

The valve Media: coal+CO₂/N₂;

Density: (kg/m3): 95(gas)/1400(solid);

Nominal diameter: DN32-DN65;

Nominal pressure: PN16-PN100;

Temperature: <80°C ;

Pneumatic-rotated valve with an angle 30°, pneumatic valve with a pressure 4-6 bar and change direction time is less than 3s;

Seal class: B.

5.2 煤粉流量调节阀 5.2 Coal Flow Control Valve



煤粉流量调节阀



产品类型：煤化工特殊阀门

Product category: Special valves used in coal chemistry

产品简介

CFCV 型煤粉流量控制阀是干煤粉气化工艺装置的关键设备，在煤粉气化系统中，该阀可以调节煤粉的流量，控制气化系统的生产负荷。

适用介质为：煤粉 +CO₂/N₂，煤粉密度 (kg/m³): 90(气)/1400(固)；公称口径 DN25-DN80，公称压力 PN16~PN150，使用温度 <80 °C，流量范围 (kg/h): 10000~30000；阀门气关弹簧开，带定位器，气源压力 4~6bar，行程 64mm，密封等级：IV 级。

Product Introduction

CFCV type Coal flow control valve is a critical equipment used in coal powder gasification furnace .The valve can adjust coal flow carried by gas within 10000-30000kg/h.

The valve Media: coal+CO₂/N₂;

Density: (kg/m³): 90(gas)/1400(solid);

Nominal diameter: DN25-DN80;

Nominal pressure: PN16-PN150;

Temperature: <80°C ;

Flow range : 10000-30000kg/h;

Pneumatic valve with a pressure 4-6 bar and a stroke 64mm;

Seal class: IV.

5.3 多级节流控制阀

5.3 Multi-stage Throttle Control Valve



多级节流控制阀

产品类型：煤化工、石油化工特殊阀门

Product category: Special valves used in coal chemistry and petroleum chemistry

产品简介

MSC/MGC 型多级节流控制阀，针对石油化工、煤化工等装置中介质高压差工况，该阀通过多级节流控制，可以有效抑制汽蚀并无害化分布冲蚀破坏。

适用介质为：水、油、气或带微量固体颗粒；公称通径 DN25~DN150，公称压力 PN16~PN250，使用温度 <425°C；阀门气开弹簧关，智能定位器，气源压力 4-6bar，密封等级：不低于 V 级。

Product Introduction

FKT type Coal feed vessel vent valve is critical equipment used in coal powder gasification device. The valve can control the pressure balance of coal feed vessel.

The valve Media: water, oil, gas or with fewer solid;

Nominal diameter: DN25-DN150;

Nominal pressure: PN16-PN250;

Temperature: <425°C ;

Pneumatic valve with a pressure 4-6 bar;

Seal class: not less than V.

5.4 煤给料罐放空阀 5.4 Coal Feed Vessel Vent Valve



煤给料罐放空阀

产品类型：煤化工特殊阀门

Product category: Special valves used in coal chemistry

产品简介

FKT 型煤给料罐放空阀，在干煤粉气化工艺装置中，该阀可以调节控制煤给料罐的压力平衡（高压差压力泄放）。

适用介质为：CO₂/N₂+ 少量煤粉；煤粉密度 (kg/m³)：90(气)/1400(固)；公称口径 DN25-DN150，公称压力 PN16-PN150，使用温度 <80°C；阀门气开弹簧关，带定位器，气源压力 4-6bar；密封等级：不低于 V 级。

Product Introduction

FKT type Coal feed vessel vent valve is a critical equipment used in coal powder gasification device. The valve can control the pressure balance of coal feed vessel.

The valve Media: CO₂/N₂+fewer coal;

Density (kg/m³): 90(gas)/1400(solid);

Nominal diameter: DN25-DN150;

Nominal pressure: PN16-PN250;

Temperature: <80°C ;

Pneumatic valve with a pressure 4-6 bar;

Seal class: not less than V.

6 过滤分离机械

6 Filtration and separation equipment

6.1 GLZ 刮刀卸料自动离心机

6.1 Model GLZ Vertical Peeler Centrifuge



GLZ 刮刀卸料自动离心机

产品类型：密闭离心机

Product category: Hermetic centrifuge

产品简介

GLZ 型离心机是一种新型立式刮刀下部卸料过滤式间歇操作自动离心机。该离心过滤机集多项高新技术于一体，如电脑触摸屏程序控制；变频驱动，电器制动；密闭、防爆；无接触料位探测，多次自动进料；特殊布料装置，均匀平稳加料和洗涤；定制的阻尼减振系统，无基础设计，多点自动在位清洗。该机是满足药品生产 GMP 规范的新一代自动离心过滤机，是用户更新换代、一步到位的固 - 液分离设备。

该机转鼓直径 800-1800mm，可以过滤粒度 0.005mm 以上，固相浓度 3% ~ 50% 的悬浮液，处理能力从 50kg/h ~ 5t/h。

Product Introduction

GLZ centrifuge is a new type of automatic intermittent operation and bottom discharge filtering centrifuges that with a vertical scraper. This centrifugal filter is integrated with a number of high-tech, such as computer touch screen program control, variable frequency drives and electrical brake, airtight and explosion proof. It has non contact material liquid position detection, repeatedly automatic feeding, special distributing device, smooth uniform loading and washing. At the same time it has the custom damping system, non foundation design and multi point automatic cleaning in place. This solid-liquid separation equipment is a new generation automatic centrifugal filter to meet the GMP pharmaceutical production standard, which allows the user to update in one step.

The diameter of the drum is 800-1800mm, the machine can filter suspension with the particle size above 0.005mm and solid concentration of 3%-50%, and it's processing capacity is from 50kg/h to 3t/h.

6.2 MY 过滤洗涤干燥一体机

6.2 The MY Filter/Dryer



MY 过滤洗涤干燥一体机



产品类型：压滤机

产品简介

MY 过滤洗涤干燥一体机集浆化洗涤、过滤、干燥等操作于一体，对多种物料均有良好的适应性，尤其适用于难以过滤的浆料和易燃易爆、有毒、易挥发、易污染等物料的处理，具有简化工艺流程、提高生产效率、防止物料污染、卸料方便以及容易实现机电一体化等特点，同时可使整个生产过程所用的厂房面积大幅度减少，大大降低客户的基础投资费用。该机广泛适用于制药、农药、生化、染料、食品、饮料、精细化工、染料等行业，特别适用于洁净度要求较高或小批量多品种生产的场所。

过滤机最大过滤面积：0.2-15m²，最大直径 4500mm。

Product category: Filter press

Product Introduction

MY filter/dryer machine, which integrating washing, filtration and drying operation, have a good adaptability for a variety of materials, especially suitable for difficult filter pulp, flammable, explosive, toxic, volatile, and easy to pollution materials, which can simplify technological process, improving the production efficiency, preventing material pollution, and easy to realize the characteristics of electromechanical integration, at the same time, it can greatly reduce the plant area, and reduce the basis of customer investment costs greatly. The machine is widely used in pharmaceutical, pesticide, biochemical, food, beverage, fine chemicals, dyes ect, especially suitable for high cleanliness requirements or small batch but more varieties production places.

The biggest filter area is 0.2-15m², the maximum diameter is 4500mm.

6.3 FWZ 翻袋卸料自动离心机

6.3 FWZ Type Inverting Filter Centrifuge



FWZ 翻袋卸料自动离心机



产品类型：密闭离心机

产品简介

FWZ 型翻袋式自动离心机是一种新型、高性能、自动卸料的固 - 液分离机械。离心机在结构上将传统的卧式离心机回转构件分离成同步旋转的内、外轴系两部分，外轴系轴向固定，内轴系可在机械装置的作用下沿轴向运动。滤布为袋状，一端固定在外轴系的转鼓大端，另一端固定在内轴系的推盘小端。分离时，在离心力的作用下滤液穿过滤布和转鼓，固体被滤布截留并形成滤饼；卸料时，在机械装置的作用下内轴系沿轴向被推出并带动滤袋翻转，同时完成滤饼卸出和滤布再生操作。卸料完成后，收回内轴系并锁紧，进入下一个工作循环。

机器卸料干净无残余滤饼，符合 GMP 规范，转鼓直径 300~1250mm。

Product category: Hermetic centrifuge

Product Introduction

FWZ automatic centrifuge is a new type, high performance and automatic unloading of solid-liquid separation machinery. In structure, separating the traditional horizontal centrifuge of rotary components into synchronous rotating shaft inside and outside, the outside axial is fixed, the inside axis rotating under the mechanical device. The filter cloth for the pouch, one end fixed on the outer drum, the other end is fixed on the push plate. Under the centrifugal force, the filtrate through the filter cloth and drum, the solid intercepted and forming filter cake; When discharging, under the action of mechanical, the shafting along axial were introduced and drives the filter bag, the filter cake discharge and the filter cloth regeneration accomplished simultaneously. After discharging, recover the shafting and lock, get to the next work cycle. The machine unload without the residual of filter cake, conform to the requirements of GMP, the drum diameter is 300-1250mm.

6.4 CTL 新型高效离心萃取机

6.4 CTL Type Liquid-liquid Centrifugal Extractor



CTL 新型高效离心萃取机



产品类型：密闭离心机

产品简介

CTL 新型高效离心萃取机是借助于离心力实现液液萃取及分离的机器，包括两个过程即混合传质过程与两相分离过程，而这两个过程都是在同一机器内完成的。轻重两相溶液按一定比例分别进入或混合进入腔体，此时两相液体得到了充分混合，使溶质从一相液体中传递到另一相液体中，从而完成了混合传质过程。混合液在转鼓中由幅板带动，使之与转鼓同步回转。在离心力场下，两互相分离，比重大的重相液体在向上流动过程中逐步远离转鼓中心而靠向鼓壁；比重小的轻相液体逐步远离鼓壁靠向中心。最终两相液体分别通过各自堰板进入收集室由引管接出机外，完成两相分离过程。与传统的厢式和塔式萃取设备相比，级存留时间短、分相迅速、适应的相比范围宽；相平衡建立快，易于实现单级或多级串联逆流或错流洗涤和萃取；通过调换堰板和变频调速可满足不同密度、不同粘度的液体物料；机器型号 CTL50~CTL1000，混合通量 20L/h-100000L/h。

Product category: Hermetic centrifuge

Product Introduction

CTL centrifugal extraction machine is extraction and separation by means of centrifugal force, including two processes that is mixing and mass transfer process and the two phase separation process, the two process is done in the machine. Weight according to certain proportion respectively into two phase solution or mixed into the cavity, the two phase liquid were fully mixed, and the solute from a liquid phase transfer to another in the liquid phase, then completing the mixing and mass transfer process. The mixture in the drum by picture of board, and synchronous with rotary drum. In the centrifugal force field, the two phases separate mutually, the heavier phase liquid in the process of upward mobility and gradually away from the drum center on the wall; The light phase gradually away from the drum wall to the center. The final two phase liquid weir plate into the collection chamber by a closed tube, completing the two phase separation process. Compared with the traditional van and extraction tower equipment, the saved time is shorter, the phase split is quicker, the phase proportion is wider; the phase equilibrium set up faster, and easier to implement series single stage or multistage counter-current and extraction; By changing the weir plate and frequency control of motor speed can meet the different density and viscosity of liquid materials; The machine type is CTL50-CTL1000, the mixed flux is 20~100000 L/h.

7 高压水射流产品

7 High pressure water jet products

7.1 大型五轴联动超高压精密水切割加工装备

7.1 Large Scale Five Axis Linkage Ultra-high Pressure Precise Waterjet Cutting Machine



大型五轴联动超高压精密水切割加工装备



产品类型：航空工业水切割加工装备

产品简介

主要用于大型飞机机翼蒙皮、方向舵蒙皮等高级复合材料构件的精密切割、钻孔加工及在线检测。装备由500MPa超高压水射流主机、大型五轴联动高精度水射流加工平台、浮动点阵柔性装夹托架系统、带C型杯可自动回收切割废液的五轴联动水切割头、五轴联动水射流加工数控系统及工件在线测量系统等部件组成。

参数范围：

★ 水射流主机

最高压力 500MPa，流量 6L/min。

★ 切割平台

工作行程：15000mm/5000mm/1200mm；

最高进给速度：40/40/20m/min；

定位精度：≤0.08mm；

重复定位精度：≤0.03mm；

A/C 轴最大垂直摆角：±90°；

绕 C 轴旋转角度：±360°。

★ 加工精度

全尺寸切割加工误差 ≤0.5mm，误差大于 0.75mm 的加工点不多于千分之三。

Product category: Waterjet cutting machine for aviation industry

Product Introduction

This equipment is mainly used for precise water cutting, drilling and on-line inspection of advanced composite components such as wing skin and rudder skin of large aircraft. The equipment consists of 500 MPa ultra-high pressure generating main pump, large five-axis linkage high precision waterjet cutting platform, floating lattice flexible bracket, five-axis linkage water cutting head with C-cup which can automatically recover water cutting waste, five-axis linkage water cutting numerical control system and workpiece online measurement system.

Performance data:

- Main pump

Maximum pressure 500MPa, flow 6L/min.

- Water cutting platform

Work travel: 15000mm/5000mm/1200mm;

Maximum speed: 40/40/20m/min;

Positioning accuracy: ≤0.08mm;

Repeated positioning accuracy: ≤0.03mm;

Maximum vertical swing angle of A/C axis: ±90°;

Rotation angle around Caxis: ±360°;

- Water cutting accuracy

The water cutting error of full-size workpiece is less than 0.5 mm, and the point with error greater than 0.75 mm is not more than three thousandths.

7.2 大型储油罐自动化清洗成套装置

7.2 Large Oil Storage Tank Cleaning and Recycling Equipment



大型储油罐自动化清洗成套装置



产品类型：机械化清洗成套装备

Product category: Mechanical Cleaning Equipment

产品简介

大型储油罐自动化清洗成套装置用于大型储油罐罐底油泥清洗、分离与回收，全封闭、自动化作业，使储罐达到动火检修条件。成套设备包括清洗回收一体化装置、清洗喷枪、气体检测系统、制氮机、油水分离装置等。

Product Introduction

The cleaning and recycling equipment is used for cleaning, separating and recycling oil sludge from bottom of large oil storage tank. Fully enclosed, automated operation can make the storage tank reach the condition of overhaul by using fire. The complete sets of equipment include oil recovery system, oil cleaning system, spray guns, O₂ monitor, N₂ generator, oil-water separation device etc.

产品特点及性能参数:

- ★ 安全性：非人进入，全防爆设计，结合注氮抑氧的安全保障，使储罐清洗变为本质安全的标准化作业流程。
- ★ 高效性：智能化设计实现高效作业，以人机交互设备（触摸屏）和可编程控制器为核心，系统按照智能化理念进行设计。具有手 / 自动清洗两种模式，简化人员操作难度，以达到高效运行的效果。
- ★ 经济性：油泥回收率达到 98% 以上。
- ★ 环保性：全封闭施工，无油泥外泄。
- ★ 清洗回收一体装置：具有负压抽吸罐底污油、输送油品及将清洗用油或水加压、加热泵送至清洗喷枪等功能。
- ★ 清洗喷枪：用于击碎、溶解罐内油泥及清洗罐壁。
- ★ 气体检测系统：实时多点监测罐内氧气浓度。
- ★ 制氮机：向罐内注氮，维持低于 8% 的安全氧气浓度。
- ★ 油水分离装置：用于水清洗阶段，分离清洗产生的油水混合物。

Performance & Parameters:

- Safety: Non-human entry, full explosion-proof design, combined with the safety guarantee of nitrogen injection and oxygen suppression, make tank cleaning become a standard operation process of intrinsic safety.
- Efficiency: Intelligent design realizes efficient operation, with human-computer interaction equipment (touch screen) and programmable controller as the core; the system is designed according to the concept of intelligence. It has two modes of hand/automatic cleaning, which simplifies the difficulty of personnel operation and achieves the effect of efficient operation.
- Economy: sludge recovery rate is over 98%.
- Environmental protection: totally closed construction, no sludge leakage.
- Cleaning and recycling integrated device: with negative pressure suction tank bottom dirty oil, transportation of oil products and cleaning oil or water pressure, heating pump to clean spray gun and other functions.
- Cleaning spray gun: used for crushing, dissolving sludge in tank and cleaning tank wall.
- Gas Detection System: Real-time multi-point monitoring of oxygen concentration in tank.
- Nitrogen Maker: Nitrogen is injected into the tank to maintain a safe oxygen concentration of less than 8%.
- Oil-water separator: Used in water cleaning stage to separate oil-water mixture produced by cleaning.

7.3 加油站地埋罐水射流清洗设备

7.3 Water Jet Cleaning Equipment for Buried Tank in Gas Station



加油站地埋罐水射流清洗设备



产品类型：机械化清洗成套装备

Product category: Mechanical Cleaning Equipment

产品简介

GMTC-II-12EX 加油站地埋罐罐体的机械清洗成套设备，采用多级离心泵产生高压水经三维喷头喷射，对清洗对象进行冲蚀、剥蚀、切除、打击以达到清洗的目的。罐壁污油混入水中一并抽出进入油水分离装置内得到分离再生。再生水可直接排放也可进入循环清洗，可显著节约清洗油罐用水及减少贮水耗时，污油和油渣可作为燃料回收利用。本系统具有高效、节能、适用性强，清洗成本低等其它清洗方法（人工清洗、化学清洗、超声波清洗等）不可替代的优点。

Product Introduction

GMTC-II-12EX gas station underground tank body mechanical cleaning complete set of equipment, using multi-stage centrifugal pump to produce high-pressure water through three-dimensional sprinkler, cleaning object erosion, denudation, removal, strike to achieve the purpose of cleaning. The contaminated oil on the tank wall is mixed with water and pumped into the oil-water separation device for separation and regeneration. Recycled water can be discharged directly or can be recycled for cleaning, which can significantly save water for tank cleaning and reduce water storage time. Polluted oil and oil residue can be recycled as fuel. This system has the advantages of high efficiency, energy saving, strong applicability, low cleaning cost and other irreplaceable cleaning methods (manual cleaning, chemical cleaning, ultrasonic cleaning, etc).

产品特点

- ★ 三维水射流清洗技术更高效，罐内清洗全覆盖，清洗时间短，污物产量小，设备维护成本低。
- ★ 清洗后的污水进行深度处理，达到直接排放标准，更环保。
- ★ PLC 全自动控制，更可靠。
- ★ 电气设备防爆等级 Ex dII BT4，更安全。
- ★ 结构紧凑，撬装设计，可车载，更便捷。

Performance

- Three-dimensional water jet cleaning technology is more efficient, full coverage of tank cleaning, short cleaning time, low output of dirt, low maintenance cost of equipment.
- Wastewater after cleaning is treated in depth to meet the direct discharge standard, which is more environmentally friendly.
- PLC automatic control, more reliable.
- Ex dII BT4, explosion-proof grade of electrical equipment, safer.
- Compact structure, skid design, vehicle-mounted, more convenient.

7.4 钻井泥浆罐自动化清洗成套装置

7.4 Complete Set of Automatic Cleaning Equipment for Drilling Mud Tank



钻井泥浆罐自动化清洗成套装置

产品类型：机械化清洗成套装备

Product category: Mechanical Cleaning Equipment

产品简介

钻井泥浆罐自动化机械清洗系统是一套基于水射流技术针对钻井泥浆罐罐底沉积物的水射流破碎、泵送、回收与分离、清洗全过程管道化、自动化运行的高度集成的移动式清洗设备。

Product Introduction

The automatic mechanical cleaning system for drilling mud tank is highly integrated mobile cleaning equipment based on water jet technology, which aims at water jet breaking, pumping, recovery and separation, pipeline cleaning and automatic operation of the bottom sediment of drilling mud tank.

产品特点

★ 基于空化射流技术设计的三维旋转喷枪，最大射程达到 16m 以上，射流轨迹可以形成球面或半球迷的清洗轨迹，实现各种罐型结构的全方位清洗。

★ 设计的负压抽吸系统，可长距离负压输送，高效便捷。真空泵无磨损设计，性能可靠，对介质不挑剔，适合泥浆介质的抽吸输送。

★ 自动化程度高，以人机交互设备和可编程控制器为核心，人性化设计，操控简便。

★ 油泥减量化，大幅降低固废处理费用，经济效益巨大。

Performance

- Based on the cavitating jet technology, a three-dimensional rotating spray gun with a maximum range of more than 16 m can form a spherical or semi-fan cleaning trajectory, which can achieve all-round cleaning of various tank structures.

- The designed negative pressure suction system can be used for long distance negative pressure transportation, which is efficient and convenient. The vacuum pump has no wear and tear design, reliable performance, non-critical medium, and is suitable for pumping and transporting mud medium.

- It is highly automated, with human-computer interaction equipment and programmable controller as the core, humanized design, easy to operate.

- Sludge reduction greatly reduces the cost of solid waste treatment and has great economic benefits.

7.5 超高压水力破拆机器人

7.5 Ultra-high Pressure Hydraulic Dismantling Robot



超高压水力破拆机器人



产品类型：高压水射流设备

Product category: High pressure water jet equipment

产品简介

超高压水力破拆机器人用于桥梁、隧道、高架路维修混凝土破碎与破拆工程作业，具有无污染、作业安全、不破坏钢筋本体等优点。设备主要由超高压水射流系统和机器人作业系统两大部分组成，是将超高压水射流技术和机器人技术融合为一体的高端智能型施工装备。

Product Introduction

Ultra-high pressure hydraulic demolition robot is used in bridge, tunnel and viaduct repair concrete crushing and demolition engineering operation, which has the advantages of no pollution, safe operation and no damage to steel reinforcement body. The equipment is mainly composed of ultra-high pressure water jet system and robot operation system, which is a high-end intelligent construction equipment integrating ultra-high pressure water jet technology and robot technology.

Performance data

- ★ 高压水系统：压力 120 ~ 140MPa, 流量 140 ~ 160L/min, 功率 450 ~ 500kW。
- ★ 机器人系统：作业自由度 ≥7, 具备全地形、全方位、远程控制、自动避障越障等功能。
- ★ 效率：一次性混凝土破碎深度 150 ~ 200mm, 破碎量 1m³/h。
- High pressure water system: 120-140MPa, 140-160 L/min, 450-500kW.
- Robot system: Operating freedom is more than seven; it has the functions of all terrain, omni-directional, remote control, automatic obstacle avoidance and obstacle surmounting.
- Crushing efficiency: The crushing depth of one-time concrete is 150-200mm, and the crushing quantity is 1m³/h.

7.6 机场跑道除胶车

7.6 High pressure water jet equipment



机场跑道除胶车



产品类型：高压水射流设备

Product category: High pressure water jet equipment

产品简介

机场跑道除胶车主要应用于机场沥青、混凝土跑道道面除胶，还可用于场道、公路标志线清除、停机坪油污清除等，主要由高压水射流系统、液压系统、真空回收系统、控制系统、执行机构等组成，这些系统安装在同一个底盘车上。

Product Introduction

Airport Runway Rubber Removal Vehicle is used for professional runway and surface cleaning, just as rubber removal and Oil removal. This vehicle consists of high pressure water system, hydraulic system and control system. All of the components are enclosed in one cabin.

产品特点和性能参数：

★ 除胶宽度为1米或2米的平面清洗器安装在卡车车头前面，由液压系统控制其升降和喷杆组件的旋转，当除胶车进行长距离行驶时，清洗器可以放到后面的储藏箱中

★ 底盘车加装副变速箱，可以满足行走速度为6~20m/min的除胶要求，清水箱储量可以满足至少1小时的除胶作业

★ 采用多只微孔雾化喷嘴避免对跑道造成损伤

★ 除胶车进行除胶作业时只需一个人在控制室里操作，自动监控系统可以保证设备的安全运行

Performance & Parameters:

- The 2000mm Surface Cleaner, which is located in front of the vehicle, can be lifted up by hydraulic system. When the vehicle need run long-distance, the surface cleaner can be disassembled and installed in the rear.

- The chassis, which is added with one slowdown box, can achieve working speed 6-20m/min. Water Tank can fulfill one hours cleaning work.

- 40~50 sets of atomizing nozzle tips are used, less damage to the airport runway.

- The Process parameters and all units are controlled from the chassis cab only by one person. Automatic control system ensures safe operation.

8 密封产品 8 Seal Products

8.1 CMJ 系列集装式机械密封 8.1 CMJ Series Container Type Mechanical Seal



CMJ 系列集装式机械密封

产品类型：液体泵零件

Product category: Liquid pump parts

产品简介

CMJ 系列集装式机械密封是新开发的泵用机械密封，获授权专利，该机械密封采用模块化设计，具有高度集成、安装简捷、可靠性高；抗泥沙、颗粒堵塞、适用范围广泛；自动调心、不改变密封安装尺寸即可实现变压力等优点。

介质压力：≤5.0MPa；
介质温度：-40 ~ 200°C；
转速：≤3000r/min；
轴径：φ 20 ~ φ 120mm。
适用介质：油、水、海水、含颗粒、纤维、易结晶及一般酸、碱等。

Product Introduction

CMJ series container type mechanical seal is the new development of the pump with mechanical seal, has been awarded the patent license, the mechanical seal USES modular design, highly integrated, easy installation, high reliability; Sediment, and particles of blocking, the broad scope; Automatically adjustable heart, do not change the seal installation size can be realized variable pressure, etc.

Medium pressure: ≤5.0MPa;
The temperature of the medium: -40-200°C ;
Rotation speed: more than 3000 r/min;
Shaft diameter: 20~120mm.
Applicable medium: oil, water, water, contain grain, fiber, easy to crystallization and general acid, alkali, etc.

8.2 UU7000、TYU 系列双端面机械密封

8.2 UU7000, TYU Series Double Seals



UU7000、TYU 系列双端面机械密封

产品类型：风机、工业风扇用零件

Product category: Fan, industrial fan with parts

产品简介

UU7000 系列、TYU 系列双端面机械密封主要应用于中等参数离心风机、罗茨鼓风机等，集装式模块化设计，结构紧凑，可靠性极高。

介质压力：≤1.0MPa；

介质温度：-20 ~ 200°C；

转速：≤3000 r/min；

轴径：φ 20 ~ φ 240mm。

适用介质：各种气体介质。

出口业绩：随主机出口俄罗斯、土耳其、韩国等。

Product Introduction

UU7000 and TYU series double seals are mainly applied in medium parameters centrifugal fan, ROM watts, and blower. It has the advantages of modular design, compact structure and high reliability. Medium pressure: ≤ 1.0MPa;

The temperature of the medium: -20-200°C ;

Rotation speed: more than 3000r/min;

Shaft diameter: 20~240mm.

Applicable medium: all kinds of gas medium.

Export performance: Russia, Turkey, South Korea.

8.3 HMJ 系列集装式双端面机械密封 8.3 HMJ Series BP220 Mechanical Seal



HMJ 系列集装式双端面机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

HMJ 系列集装式机械密封广泛应用于化工泵、搅拌釜，它采用模块化设计，具有高度集成、安装简捷、可靠性高、自动调心、不改变安装尺寸即可实现压力平衡等优点。

介质压力：≤5.0MPa；

介质温度：-40 ~ 200°C；

转速：≤3000r/min；

轴径：φ 30 ~ φ 120 mm。

适用介质：酸、碱、等化工介质。

尺寸系列：可提供满足 JB1472、ISO3069 标准要求的系列产品，可定制。

Product Introduction

HMJ series of Cartridge Mechanical seals are widely used in the period of chemical pump and agitator. It adopts the modular design, with the advantage of high integration, simple installation, high reliability, the automatic aligning, etc. It also can realize the pressure balance without changing the installation size.

Medium pressure: ≤5.0MPa;

Medium temperature: -40°C -200°C ;

Rotational speed: ≤3000r/min;

Shaft diameter: 30~120mm.

Applicable medium: acid, alkali, and other chemical medium.

Dimension series: They can satisfy the requirements of ISO3069 standard JB1472, the series of products. The products can be customized.

8.4 H8E 系列超短型机械密封

8.4 H8E Series Super Short Type Mechanical Seal



H8E 系列超短型机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

H8E 系列超短型机械密封适用于轴承箱、齿轮箱、油泵等设备的轴封，该密封具有轴向尺寸短，密封性能好、使用寿命长等优点，安装尺寸与骨架油封相同，可以与骨架油封互换。

介质压力： $\leq 0.6\text{MPa}$ ；

介质温度： $-40 \sim 120^\circ\text{C}$ ；

转速： $\leq 10000\text{r/min}$ ；

轴径： $\phi 10 \sim \phi 100\text{mm}$ 。

适用介质：润滑油类。

尺寸系列：可提供替换骨架油封的系列产品，可定制。

Product Introduction

H8E series type mechanical seal is suitable for bearing box, gear box, pump and other equipment seal, the seal has short axial dimension, good sealing performance, long service life and other advantages, and its installation dimensions are as the same as skeleton oil seal's ,so it can be interchangeable with the skeleton oil seal.

Medium pressure: $\leq 0.6\text{MPa}$;

medium temperature: $-40^\circ\text{C} \sim 120^\circ\text{C}$

Rotational speed: $\leq 10000\text{r/min}$;

Shaft diameter: $10\text{--}100\text{mm}$.

Applicable medium: Lubricating oil.

Dimension series: we provide replacement of the skeleton oil seal products. The products can be customized.

8.5 CMV 系列变压力机械密封 8.5 CMV Series Variable Pressure Mechanical Seal



CMV 系列变压力机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

CMV 系列变压力机械密封至少由主密封和应急密封两部分组成，主密封为平衡型机械密封，应急密封为填料密封。主密封正常工作时，应急密封处于备用状态，应急密封在主密封失效时投入使用。采用模块化设计，具有高度集成、安装简捷、可靠性高；抗泥沙、颗粒堵塞、适用范围广泛；自动调心、不改变密封安装尺寸即可实现变压力等优点。

介质压力：≤4.5MPa；

介质温度：-20 ~ 120°C；

转速：≤3000r/min；

轴径：φ 20 ~ φ 120 mm。

适用介质：水、海水等。

尺寸系列：可提供满足 JB1472、ISO3069 标准要求的系列产品，可定制。

Product Introduction

CMV series variable pressure mechanical seal is composed of at least two parts: the primary seal and emergency seal, the main seal is balanced mechanical seal, and emergency seal packing seal. The main seal in normal work , the emergency seal is in standby state ,and the main seal failure ,the emergency seal start to work. The mechanical seal with a modular design, high integration, simple installation, high reliability; sand, particle plugging, the applicable scope is wide; the automatic aligning, mounting dimensions can be realized without changing the sealing pressure.

Medium pressure: ≤4.5MPa;

Medium temperature: -20°C -120°C ;

Rotation speed: ≤3000r/min;

Shaft diameter: 20~120mm.

Suitable medium: water, sea water and so on.

Dimension series: They can satisfy the requirements of ISO3069 standard JB1472, the series of products. The products can be customized.

8.6 干气密封

8.6 Dry gas seal



干气密封

产品类型：密封产品

Product category: Sealing products

产品简介

可提供泵用、风机用干气密封。

介质压力：≤3.0MPa；

介质温度：-40 ~ 150°C；

转速 ≤500r/min ~4000r/min。

适用介质：易燃、易爆等气体或低沸点易挥发液体。

尺寸系列：根据用户要求定制。

Product Introduction

Dry gas seal are provided for centrifugal pumps and blower.

Medium pressure: ≤3.0MPa;

Medium temperature: -40°C ~150°C ;

Rotational speed: ≤500r/min-4000r/min.

Applicable medium: flammable, explosive gas or volatile liquid with low boiling point.

Dimension series: The products can be customized according to user's requirements.

8.7 AQ 系列高粘稠度介质用机械密封 8.7 AQ Series High Viscosity Medium Mechanical Seal



AQ 系列高粘稠度介质用机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

AQ 系列机械密封是单端面、单弹簧机械密封，采用特殊的密封面结构，专门用于输送各种高粘稠度介质的泵等设备。

介质压力：≤5.0MPa；介质温度：-20 ~ 200 °C；转速≤3000r/min；轴径：Φ 30 ~ Φ 100 mm。

适用介质：油漆、腈纶原液、糖浆、蓖麻油、润滑脂等各种高粘稠度液体介质。

尺寸系列：可提供 JB1472、ISO3069 标准要求的系列产品，可定制。

Product Introduction

Mechanical seal of the AQ series is a single face, single spring mechanical seal, using a special sealing face structure, and is specially used for conveying high viscosity medium pump and other equipment.

Medium pressure: ≤5.0MPa;

Medium temperature: -20 °C ~200 °C ;

Rotational speed: ≤3000r/min;

Shaft diameter: 30~100mm.

Applicable medium: paint, acrylic liquid, syrup, castor oil, grease and other high viscosity liquid medium.

Dimension series: we can provide JB1472, ISO3069 standard products. The products can be customized.

8.8 HKM 系列航空装备用集装式机械密封

8.8 HKM Series Aviation Equipment Mechanical Seal



HKM 系列航空装备用集装式机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

HKM 系列航空装备用集装式机械密封主要用于航空主减速器等齿轮箱轴端，它采用模块化设计，具有结构紧凑、高度集成、安装简捷、可靠性高，可完美替代传统轴端密封结构。

介质压力：≤1.0MPa；

介质温度：-40 ~ 200°C；

转速：≤15000r/min；

轴径：φ 20 ~ φ 100 mm。

适用介质：航空润滑油。

尺寸系列：可定制。

Product Introduction

HKM series of Mechanical seals are widely used in the aviation main reducer and other gear box shaft end. It adopts the modular design, with the advantage of high integration, simple installation, high reliability etc. It can perfectly replace the traditional shaft end sealing structure.

Medium pressure: ≤1.0MPa;

Medium temperature: -40-200°C ;

Rotational speed: ≤15000r/min;

Shaft diameter: 20~100mm.

Applicable medium: aviation lubricating oil.

Dimension series: The products can be customized.

8.9 干运转密封 8.9 Dry-running Seal



干运转密封

产品类型：密封产品

Product category: Sealing products

产品简介

可提供各规格接触式干运转密封，区别于一般非接触式干运转密封，无需复杂阻塞气体控制系统，结构简单、安装方便、维护方便，成本大大低于常规非接触式干运转密封。

介质压力：≤1.0MPa；

介质温度：-40 ~ 150°C；

转速 ≤4000r/min。

适用介质：易燃、易爆等气体或低沸点易挥发液体。

尺寸系列：根据用户要求定制。

Product Introduction

Various specifications of contacting dry running seal can be provided. Different from the general non contacting dry running seal, contacting one does not need any complicated blocking gas control system, so that its structure is simple, installation convenient, maintenance convenient, and cost significantly less than conventional non contacting dry running seal.

Medium pressure: ≤1.0MPa;

Medium temperature: -40°C -150°C ;

Rotational speed: ≤4000r/min.

Applicable medium: flammable, explosive gas or volatile liquid with low boiling point.

Dimension series: The products can be customized according to user's requirements.

8.10 釜用密封

8.10 Agitator Seal Products



釜用密封

产品类型：密封产品

Product category: Sealing products

产品简介

可提供各种工况条件下标准系列釜用密封产品，可用于反应釜等各种搅拌设备。

介质压力：≤6.0MPa；

介质温度：-40 ~ 220°C；

转速 ≤3000r/min；

轴径：φ 16 ~ φ 250mm。

适用介质：各种酸、碱、胶料等化工介质。

尺寸系列：可提供 JB1472、ISO3069 标准要求的系列产品，可定制。

Product Introduction

Standard series of Agitator seal products under various operating conditions can be provided. These products can be used for the reactor and other mixing equipment.

Medium pressure: ≤6.0MPa;

Medium temperature: -40°C -220°C ;

Rotational speed: ≤3000r/min;

Shaft diameter: 16-250mm.

Applicable medium: all kinds of acid, alkali, glue and other chemical medium.

Dimension series: JB1472, ISO3069 standard products can be provided. The products can be customized.

8.11 普通泵用标准，非标系列机械密封 8.11 Ordinary Pump Standard and Non-standard Series Mechanical Seal



普通泵用标准，非标系列机械密封

产品类型：密封产品

Product category: Sealing products

产品简介

可提供各种工况条件下的标准系列及非标系列机械密封产品。

介质压力：≤6.0MPa；

介质温度：-40 ~ 350°C；

转速 ≤3000r/min；

轴径：φ 16 ~ φ 250mm。

适用介质：清水、污水、各种酸、碱等化工介质。

尺寸系列：可提供 JB1472、ISO3069 标准要求的系列产品，可定制。

Product Introduction

Standard and non-standard series of mechanical seal products under various operating conditions can be provided.

Medium pressure: ≤6.0MPa;

Medium temperature: -40°C -350°C ;

Rotational speed: ≤3000r/min;

Shaft diameter: 16-250mm.

Applicable medium: water, sewage, various kinds of acid, alkali and other chemical medium.

Dimension series: JB1472, ISO3069 standard products can be provided. The products can be customized.

8.12 煤气化炉除积碳敲击装置

8.12 Coal Gasification Furnace Carbon Removing Knocking Device



煤气化炉除积碳敲击装置

产品类型：化工机械

Product category: Chemical machinery

产品简介

除积碳敲击装置是保证煤气化炉正常运行的关键设备。本产品具有自主知识产权，密封材料选用自主研发的新型耐高温材料，密封结构采用集装式设计，装拆方便。

介质压力：≤6.0MPa；

介质温度：≤350°C；

敲击频次：3~20 次 /min

尺寸系列：可定制。

Product Introduction

Carbon removing knocking device is the key device to ensure the normal operation of gasification furnace. The products have independent intellectual property rights. The sealing material of choice is a new type of high temperature resistant materials of independent research and development. The sealing structure is used in packaging design, with the advantages of convenient assembly and disassembly.

Medium pressure: ≤6.0MPa;

Medium temperature: ≤350°C；

Tapping frequency: 3~20times/min.

Dimension series: The products can be customized.

9 通用机械试验设备 9 General Mechanical Test Equipment

9.1 单元式空气调节机试验装置

9.1 Test Device for Unitary Air Conditioner



单元式空气调节机试验装置



产品类型：通用机械试验设备

产品简介

单元式空气调节机试验装置准确测试单元机、风管机、恒温恒湿机、低温单元机等产品的制冷量、环境温度、风量、相对湿度等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

测试范围：

制冷量：2.5 ~ 600kW;

环境温度：-50 ~ 80°C ;

风量：300 ~ 120000m³/h;

相对湿度：10 ~ 100%。

Product category: General machinery test equipment

Product Introduction

Test device for unitary air conditioner can accurately test refrigeration (heat), environment temperature, air volume, relative humidity of unitary air conditioner, ducted type air conditioner, constant temperature and humidity air conditioner, and low temperature unitary air conditioner, etc.. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

Performance data:

Cooling capacity: 2.5-600kW;

Environment temperature: -50-80°C ;

Air flow: 300-120000m³/h;

Relative humidity: 10-100%.

9.2 多联式空调 (热泵) 机组试验装置

9.2 Test Device for Multi-connected Air Conditioner (heat pump) Unit



多联式空调 (热泵) 机组试验装置

产品类型：通用机械试验设备

产品简介

多联式空调 (热泵) 机组试验装置准确测试多联式空调 (热泵) 机组的制冷量、环境温度、相对湿度等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

测试范围：

制冷 (热) 量：2.5 ~ 500kW;

环境温度：-50 ~ 80°C ;

相对湿度：10 ~ 100%。

Product category: General machinery test equipment

Product Introduction

Test device for Multi-connected air conditioner (heat pump) unit can accurately test refrigeration, environment temperature, relative humidity of multi-connected air conditioner (heat pump) unit. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

Performance data:

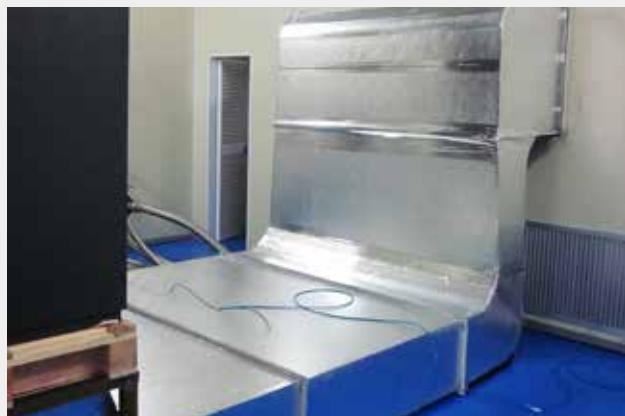
Cooling capacity: 2.5-500kW;

Environment temperature: -50-80°C ;

Relative humidity: 10-100%.

9.3 精密空调 / 机房空调 / 洁净空调试验装置

9.3 Test Device for Precision Air Conditioner/Computer Room Air Conditioner/Clean Air Conditioner



精密空调 / 机房空调 / 洁净空调试验装置

产品类型：通用机械试验设备

产品简介

精密空调 / 机房空调 / 洁净空调试验装置准确测试精密空调、机房空调、洁净空调的制冷量、风量、环境温度、相对湿度等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

测试范围如下：

制冷量：2.5 ~ 300kW;

环境温度：-50 ~ 80°C ;

风量：500-80000m³/h;

相对湿度：10 ~ 100%。

Product category: General machinery test equipment

Product Introduction

Test device for precision air conditioner/computer room air conditioner/clean air conditioner can accurately test refrigeration, environment temperature, relative humidity of precision air conditioner, computer room air conditioner and clean air conditioner, etc.. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

Performance data:

Cooling capacity: 2.5-300kW;

Environment temperature: -50-80°C ;

Air flow: 500-80000m³/h;

Relative humidity: 10-100%.

9.4 风冷冷水（热泵）机组试验装置

9.4 Test Device for Air-cooled Water Chilling (heat pump) Packages



风冷冷水（热泵）机组试验装置

产品类型：通用机械试验设备

产品简介

风冷冷水（热泵）机组试验装置：准确测试风冷冷水（热泵）机组的制冷量、环境间温湿度等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

测试范围：

制冷量：5 ~ 2100kW;

环境温度：-50 ~ 80°C ;

相对湿度：10 ~ 100%。

Product category: General machinery test equipment

Product Introduction

Test device for air-cooled water chilling (heat pump) packages: This test device can provide accurate measurements of cooling capacity, environment temperature, environment humidity and other technical parameters of air-cooled water chilling (heat pump) packages. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

Performance data:

Cooling capacity: 5-2100kW;

Environment temperature: -50-80°C ;

Relative humidity: 10-100%.

9.5 水冷冷水机组试验装置

9.5 Test Device for Water-cooled Chiller



水冷冷水机组试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

水冷冷水机组试验装置准确测试水冷冷水机组的制冷量等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

Product Introduction

Test device for water-cooled chiller can provide accurate measurements of cooling capacity and other technical parameters. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

测试范围如下：

制冷量：15 ~ 18000kW。

Performance data:

Cooling capacity: 15-18000kW.

9.6 冷冻冷藏设备试验装置

9.6 Test Device for Freezer/refrigerator Equipment



冷冻冷藏设备试验装置

产品类型：通用机械试验设备

产品简介

冷冻冷藏产品试验装置主要包括冷藏车、冷冻冷藏集装箱、冷冻冷藏机组、冷风机等的试验装置，该类性能试验装置可以对冷藏车和冷冻冷藏集装箱进行保温性能试验，也可对冷冻冷藏机组、船用冷藏设备、冷风机等进行性能测试。该类试验采用校准箱量热计热平衡法，通过校准箱内的热湿负荷的测量，计算出冷藏车或集装箱内冷藏设备的相关性能，如制冷量、功率、性能系数等参数，可对电驱动和燃油驱动式的相关设备进行测试。

测试范围：

制冷量：1 ~ 100kW;

环境温度：-50 ~ 80°C ;

相对湿度：10 ~ 100%。

Product category: General machinery test equipment

Product Introduction

Test device for freezer/refrigerator equipment mainly consists of the performance test devices for refrigerated vehicle, freezer/refrigerator container, freezer/refrigerator unit, gas cooler, etc. Such performance test device can provide thermal insulation performance test on refrigerated vehicle and freezer/refrigerator container and also can provide performance test on freezer/refrigerator unit, marine refrigerated equipment, unit cooler, etc. It adopts calibration tank calorimeter thermal balance method to calculate relevant performance of refrigerated equipment within the refrigerated vehicle or container through measurement of heat and moisture load within the calibration tank such as parameters like cooling capacity, power, coefficient of performance, etc. It can test electrically driven and fuel driven related equipment.

Performance data:

Cooling capacity: 1-100kW;

Environment temperature: -50-80°C ;

Relative humidity: 10-100%.

9.7 制冷压缩机性能试验装置 9.7 Performance Test Device for Refrigeration Compressors



制冷压缩机性能试验装置



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

制冷压缩机性能试验装置准确测试制冷压缩机的排气量等技术数据。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

Product Introduction

Performance test device for refrigeration compressors can provide accurate measurements of exhaust volume and other technical parameters. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and reliable. The measured values are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

测试范围：

排气量：0.1 ~ 10000Nm³/h。

Performance data:

Exhaust volume: 0.1-10000Nm³/h.

9.8 换热器性能试验装置

9.8 Performance Test Devices for Heat Exchanger



换热器性能试验装置

产品类型：通用机械试验设备

产品简介

换热器性能试验装置用于准确测试各类蒸发器、冷凝器以及表冷器等制冷空调换热器的性能参数，包括换热量、风量、阻力等技术数据。该装置也可用于其他用途的换热器测试。设备运转采用可编程序控制器 + 人机界面控制，界面直观，操作方便、可靠，测量值由计算机进行数据采集处理并存档自动打印试验报告，并可分析试验结果和测试数据。

测试范围：

换热量：1 ~ 1500kW；

环境温度：-50 ~ 80°C；

相对湿度：10 ~ 100%。



Product category: General machinery test equipment

Product Introduction

Accurate test for performance parameters of various evaporators, condensers and air coolers, such as heat exchange capacity, air flow, resistance, etc. al. environment temperature and environment humidity. The testing device can also be used for other heat exchangers. The equipment operation is controlled by programmable controller + man-machine interface. The interface is intuitive, easy to operate and being reliable. The measured data are collected and processed by the computer and archived automatically to print the test report. The test results and test data can be analyzed.

Performance data:

Cooling(heat) capacity: 1-1500kW;

Environment temperature: -50-80°C ;

Relative humidity: 10-100%.

9.9 试验中心冷源集群供给及调控系统

9.9 Supply and Control System of Cold Source Cluster in Test Center



试验中心冷源集群供给及调控系统



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

试验中心冷源集群供给及调控系统通过精确调控技术将冷冻源和冷却源供给用户规划的多个实验室使用，为大型制冷空调试验研发中心的实验室集群提供集中冷冻水和冷却水。该系统的控制部分独立于各个实验室，自成调控回路为末端设备提供稳定流量和温度。

Product Introduction

Supply and control system of cold source cluster in test center provides centralized chilled water and cooling water to the laboratory cluster of the large-scale refrigeration and air-conditioning test and development center by using precision control technology to supply the refrigeration source and cooling source to multiple laboratories planned by the user. The control parts of the system are independent of each laboratory, and the self-contained control loop provides stable flow and temperature to the end equipment.

测试范围：

冷却水流量范围：0 ~ 3000m³/h;
冷冻水流量范围：0 ~ 2000m³/h;
冷却水、冷冻水压力供给范围：0.2 ~ 0.4MPa(控制精度 $\pm 0.5\%FS$);
冷却水温度范围：20 ~ 32°C (控制精度 $\pm 0.1^\circ C$);
冷冻水温度范围：5 ~ 10°C (控制精度 $\pm 0.1^\circ C$).

Performance data:

Cooling water flow range is 0-3000m³/h;
chilled water flow range is 0-2000m³/h;
Cooling water and chilled water pressure supply range is 0.2-0.4MPa (control accuracy $\pm 0.5\%FS$);
Cooling water temperature range is 20-32 °C (control accuracy $\pm 0.1^\circ C$);
Chilled water temperature range is 5-10°C (control accuracy $\pm 0.1^\circ C$).

9.10 人工环境模拟及舒适性试验装置

9.10 Artificial Environment Simulation and Comfort Test Devices



人工环境模拟及舒适性试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

人工环境模拟及舒适性试验装置能够模拟高低温(湿)环境、日照辐射环境、淋雨环境、降雪环境等，在试验室内创造出各类复杂人工环境，并通过测量温度、湿度、风速等环境参数，建立具有通用型数据接口和可编程控制功能的软件系统，满足企业和科研单位对电子元器件、工业与建筑材料、制冷空调设备等产品可靠性及舒适性的多方位测试需求。

Product Introduction

Artificial environment simulation and comfort test devices can simulate high and low temperature (wet) environment, sunshine radiation environment, raining environment, snowfall environment, etc., various complex artificial environments are created in the test room, the software system with universal data interface and programmable control function is established by measuring environmental parameters such as temperature, humidity and wind speed, which meets the multi-faceted testing requirements of enterprises and scientific research units for multi-directional testing requirements for reliability and comfort of electronic components, industrial and building materials, refrigeration and air conditioning equipment and other products.

9.11 整车环境模拟试验装置

9.11 Climate Simulation and Performance Test Device for Vehicle



整车环境模拟试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

整车环境模拟试验装置可以在试验室里人工创造各种条件，模拟自然环境，让汽车真实地行驶起来，测试行驶中的相关技术参数，用于技术研究和质量控制。汽车环模室一般根据其具体要求，会由以下组成部分：速度模拟系统（底盘测功机）；迎面风速模拟系统；环境温度和湿度控制系统；怠速状态模拟；日照系统；特殊气候模拟系统；尾气排放系统和新风系统。

Product Introduction

The environment simulation room can create various conditions artificially in the laboratory and simulate the natural situation in order to let the automobile actually run, then measure relevant technical parameters during the running, which will be used for technical research and quality control. The automobile environment simulation room will generally consist of the following parts according to its specific requirements: speed simulation system (dynamometer machine of chassis); frontal wind velocity simulation system; ambient temperature and humidity control system; simulation of idle conditions; sunlight system; The special climate control simulation system; exhaust emission system and fresh air system.

9.12 列车 / 大巴空调性能试验装置

9.12 Performance Test Device for Train/bus Air Conditioners



列车 / 大巴空调性能试验装置

产品类型：通用机械试验设备

产品简介

列车 / 大巴空调性能试验装置可测试列车 / 大巴制冷系统的制冷量、风量、迎面风速、制冷剂流量、扭矩、转速和能效比等性能参数。测试方法为空气焓差法和制冷剂流量计法，自动调节工况、处理数据并输出试验报告

测试范围：

冷量范围：5 ~ 60kW;

蒸发器风量范围：500 ~ 12000m³/h;

皮带传动压缩机扭矩范围：0 ~ 200Nm;

直流电动压缩机电压范围：0 ~ 1500V。

Product category: General machinery test equipment

Product Introduction

Performance test device for train/bus air conditioners can measure the performance parameters of train/bus air conditioning system, such as the refrigerating capacity, wind velocity, frontal wind velocity, flow rate of refrigerant, torque, rotating speed and energy efficiency ratio, etc. The test method is the air enthalpy method and refrigerant flow meter method with automatic adjustment of operating conditions, data processing and output of test report.

Performance data:

Cooling range: 5-60kW;

Evaporator air volume range: 500-12000m³/h;

Belt drive compressor torque range: 0-200Nm;

DC electric compressor voltage range: 0-1500V.

9.13 中巴 / 轿车 / 工程车空调性能试验装置

9.13 Performance Test Device for Air Conditioners for Medium-sized Buses/cars/engineering Vehicles



列车 / 大巴空调性能试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

中巴 / 轿车 / 工程车空调性能试验装置可测试中巴 / 轿车 / 工程车空调制冷系统及部件(含两器)的制冷量、风量、迎面风速、制冷剂流量、扭矩、转速和能效比等性能参数，同时也可测试暖风和水箱装置及风机的性能。可作为中巴及轿车空调性能的检定装置，也为开发、优化空调系统提供了手段。本装置能控制和测量与各试验有关的空气侧、制冷剂侧和水侧的参数，有利于试验结果的分析。整个试验过程由计算机控制，并具有自动记录和打印数据等功能。主要功能包括：空调系统的性能试验、蒸发器总成性能试验、蒸发器总成结霜试验、蒸发器芯体性能试验、蒸发器芯体温控器感温包布置点试验、冷凝器总成试验、HVAC 总成试验、压缩机运行试验、暖风装置性能试验、散热器水箱性能试验、空空型中冷器性能试验、风机性能试验、膨胀阀性能试验、油冷器换热试验等。

Product Introduction

Performance test device for air conditioners for medium-sized buses/cars/engineering vehicles: The device can be used to measure the performance parameters of air conditioning system and components(including evaporator and condenser) for medium-sized buses/cars/engineering vehicles such as cooling capacity, air volume, frontal air velocity, flow rate of refrigerant, torque, rotating speed and energy efficiency ratio, etc., and test the performance of heater unit and water tank assembly as well as fan. It can be used as the calibration device for performance of air conditioners for medium-sized bus and car, and to provide a means for air conditioning system development and optimization. This device can control and measure the parameters related to various tests on air side, refrigerant side and water side, which are favorable to test results analysis. The entire test process is controlled by computer and with functions of automatic record, data printout, etc. Main functions include performance test of air conditioning system, performance test of evaporator assembly, frost test of evaporator assembly, performance test of evaporator core, test for placement point of temperature sensing bulb of temperature controller for evaporator core, test of condenser assembly, test of HVAC assembly, compressor operation test; performance of heater device, performance test of radiator water tank, performance test of air-to-air charge air cooler, fan performance test, performance test of expansion valve, heat exchange test of oil cooler, etc.

测试范围：

蒸发器换热量范围：1 ~ 12kW，蒸发器风量范围：

80 ~ 2500m³/h;

冷凝器换热量范围：3 ~ 20kW，冷凝器风量范围：

200 ~ 25000m³/h;

水箱 / 暖风换热量范围：2 ~ 150kW，中冷器换热量范围：

10 ~ 60kW;

油冷器换热量范围：2 ~ 20kW，皮带传动压缩机扭矩范围：0 ~ 100Nm;

直流电动压缩机电压范围：0 ~ 1000V。

Performance data:

Evaporator heat exchange range: 1~12kW, evaporator air volume range: 80~2500m³/h;

Condenser heat exchange range: 3~20kW, condenser air volume range: 200~25000m³/h;

Water tank/warm air heat exchange range: 2~150kW, intercooler heat exchange range: 10~60kW;

Oil cooler heat exchange range: 2~20kW, belt drive compressor torque range: 0~100Nm;

DC electric compressor voltage range: 0~1000V.

9.14 汽车空调压缩机性能试验装置

9.14 Performance Test Device for Automobile AC Compressors



汽车空调压缩机性能试验装置

产品类型：通用机械试验设备

产品简介

汽车空调压缩机性能实验装置依据相关标准设计建造，可准确测量汽车 / 工程车 / 航空空调压缩机的吸气压力、吸气温度、排气压力、排气温度、阀前压力、阀前温度、量热器出口压力、量热器出口温度、第二制冷剂压力、制冷剂流量、压缩机环境温度、转速、扭矩、功率、制冷量、能效比等性能参数。试验方法主要有第二制冷剂量热器法、水冷冷凝器法、制冷剂液体流量计法等。该系统设备运转采用触摸屏与可编程控制器联合控制，运行稳定，测量准确，工况设置和调节器操作直观方便，仪表控制设备先进可靠。实测数据由计算机进行自动采集处理并存档，软件可以生产曲线报与数据报告。

测试范围：

制冷量：1 ~ 12kW;

皮带传动压缩机扭矩范围：0 ~ 100Nm;

直流电动压缩机电压范围：0 ~ 1000V。



Product category: General machinery test equipment

Product Introduction

The performance test device for automobile AC compressor is designed and constructed according to relevant standards and can accurately measure such performance parameters of automobile/ engineering vehicle/aviation AC compressor as suction pressure, suction temperature, exhaust pressure, exhaust temperature, pressure before valve, temperature before valve, outlet pressure of calorimeter, outlet temperature of calorimeter, pressure of secondary refrigerant, refrigerant flow rate, ambient temperature of compressor, rotating speed, torque, power, cooling capacity, energy efficiency ratio, etc. the test methods include secondary refrigerant calorimeter method, etc. device operation is jointly controlled by touch screen and PLC with the features of stable operation, accurate measurement, intuitive and convenient setting of operating conditions and operation of regulator, advanced and reliable of instrument control equipment. The measured data are acquired, processed and archived automatically by the computer, and the software can produce curve report and data report.

Performance data:

Cooling range: 1-12kW;

Belt drive compressor torque range: 0-100Nm;

DC electric compressor voltage range: 0-1000V.

9.15 汽车空调压缩机耐久试验装置

9.15 Durability Test Device for Automobile Air Conditioning Compressor



汽车空调压缩机耐久试验装置



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

压缩机基本耐久检测设备主要用于模拟压缩机实际运行过程中出现的各种压力、温度、加减速、离合器吸合与断开等状态，以检测压缩机在各种恶劣状态下的耐久性。汽车空调压缩机喷水、耐尘耐久试验装置主要用于汽车空调压缩机防水及防尘性能的测试。该装置可以周期性地向工作中的汽车空调压缩机进行喷水、喷尘，以检测汽车空调压缩机在淋水和喷尘条件下的寿命。汽车空调压缩机特殊耐久检测设备除了可以满足基本耐久检测项目外，还可以模拟制冷系统中蒸发器和冷凝器的状态，复合耐久除具有特殊耐久功能外，还具有模拟压缩机低温工作环境运行的耐久效果。

Product Introduction

Compressor basic durability test device is mainly used to simulate various states appearing in the actual operation process of compressor such as pressure, temperature, acceleration and deceleration, pickup and release of clutch, etc. so as to test the durability of compressor under various harsh conditions. The water spray and dust resistance and durability test device of compressor for automobile air conditioner. This device can cyclically spray water and dust to the automobile AC compressor during its operation so as to test the lift of automobile AC compressor under the water and dust spray condition. Besides satisfying the basic durability test items, the special durability test device for automobile AC compressors simulate the state of evaporator and condenser in the refrigerating system. The combined durability test device has the durability effect of simulating operation of compressor in low-temperature operating environment besides having the functions of the special durability test equipment.

测试范围：

制冷量：1 ~ 12kW。

Performance data:

Cooling capacity: 1-12kW.

9.16 低温阀门工况模拟试验系统

9.16 Cryogenic Valve Working Condition simulating system



汽车空调压缩机性能试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

低温阀门工况模拟试验系统将低温阀门从内部冷却，模拟低温阀门的真实运行工况，在此基础上进行加长盖板和滴水盘温度分布的测量以及密封性能的试验测试。

Product Introduction

Cryogenic valve working condition simulating system cools down the valve from cavity, which simulate the true working condition. Basically, the temperature distribution of extended bonnet and drop panel can be detected. Meanwhile, the sealing performance can be tested.

参数指标

DN600 及以下、PN250 及以下、温度 -196°C 、介质回收重复利用 (回收率 ≥85%)、一键式操作、远程通讯。

Performance data

Nominal diameter≤600, Nominal pressure≤250, temperature around -196°C , medium recycle (recycling rate≥85%), one-button operation, remote communication.

9.17 阀门流量流阻试验装置 9.17 Flow and Flow Resistance Test Device for Valve



阀门流量流阻试验装置



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

阀门流量流阻试验装置是一套阀门流量系数、流阻系数和流量特性试验的计算机自动测试系统。该试验装置测量范围广，测试精度高，重复性好，适用于通用阀门和调节阀的流量系数、流阻系数和流量特性测试。被试阀门夹部分与管路部分采用了模块化设计，适应了不同规格阀门的需要，缩短了施工周期。计算机集中监控所有设备、实时采集并处理各个试验数据，体现了试验装置的自动化和智能化。

Product Introduction

Flow and flow resistance test device for valve is a set of valve flow coefficient, flow resistance coefficient and flow characteristic test of computer automatic test system. The test device is characterized by: wide measuring range, high measurement precision, good repeatability, applicable to flow coefficient, flow resistance coefficient and flow characteristic test of general valve and control valve. The clamping part of the tested valve and pipe section adopted the modular design, this design adapted to the needs of different specifications of the valve, shorten the construction period. Computer monitoring and control of all equipment, collecting and processing the experiment data, reflected automation and intellectualization of the test device.

参数指标

DN1000 及以下，常温清水，智能型、一键式操作、远程通讯。

Performance data

No more than DN1000, normal temperature water, intelligent, one-click operation, remote communication.

9.18 阀门耐火试验装置

9.18 Fire Test Device for Valve



阀门耐火试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

阀门耐火试验装置是一套用于阀门耐火试验的计算机自动测试系统，适用于 API607、API6FA、ISO10497、GB/T26479 和 GB/T26482 等标准要求的阀门耐火测试。燃烧系统采用先进的燃烧控制技术调节火焰大小、位置以及温度，并实现自动点火和灭火功能，提高了火烧过程的安全性。测控系统采用高精度传感器和先进的数据采集器，提高了测试精度。

参数指标：

PN420 及以下，DN400 及以下，智能型、一键式操作、远程通讯。

Product Introduction

Fire test device for valve is a set of computer automatic test system for the fire test for valve, suitable for API607, API6FA, ISO10497, GB/T26479 and GB/T26482. Combustion system through the use of advanced combustion control technology adjust the size, location, temperature of flame, and realize automatic ignition and automatic fire extinguishing, these functions improved the security of the burning process. High precision sensor and data collector used in the measurement and control system, improve the test accuracy.

Performance data:

No more than PN420, no more than DN400, intelligent, one-click operation, remote communication.

9.19 安全阀全性能试验装置 9.19 Full Performance Test Device for Safety Valve



安全阀全性能试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

安全阀全性能试验装置是一套用于测试安全阀整定、开启、排放、回座压力及开启高度、排量等参数的自动测试系统，适用于 ASME PTC25、GB/T12242 等标准要求的安全阀性能测试。装置配置大容量储罐，高压差调节阀组，可建立稳定的试验工况，测试范围大，调节精度高。测控系统采用高速数据采集器和高精度传感器，自动化程度高。

Product Introduction

The full performance test system for safety valve is used to test opening pressure, popping pressure, relieving pressure, resetting pressure, opening lift, flow capacity and other parameters, suitable for ASME PTC25, GB/T12242 and other standards. The system is equipped with large-capacity vessels and a group of some high-pressure control valves, which can establish stable test conditions, large test range and high adjustment precision. High precision sensor and data collector used in the measurement and control system, improve the automation.

参数指标：

PN420(Class2500) 及以下，DN200(NPS 8") 及以下。

Performance data:

No more than PN420(Class2500), no more than DN200(NPS 8").

9.20 空气阀进排气性能试验装置

9.20 Intake and Exhaust Performance Test Device for Air Valve



空气阀进排气性能试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

空气阀进排气性能试验装置是一套用于测试空气阀进气量、排气量、空气闭阀压力等参数的自动测试系统，适用于 GB/T 36523、CJ/T217 等标准要求的空气阀性能测试。装置配置大容量储气罐，多组调节阀联动，可建立稳定的试验工况，测试范围大，调节精度高，测控系统采用高速数据采集器和高精度传感器，自动化程度高。配备专门的进气试验系统，可模拟实际工况，测试更准确。

Product Introduction

The intake and exhaust performance test system for air valve is used to test intake flow rate, discharge capacity, pressure difference in close instant and other parameters, suitable for GB/T 36523, CJ/T217 and other standards. The system is equipped with large-capacity gasholder and multiple groups of control valves, which can establish stable test conditions, large test range and high adjustment precision. High precision sensor and data collector used in the measurement and control system, a special air intake test system to simulate actual working conditions, improve the automation and accuracy of the test.

参数指标

PN25(Class150) 及以下，DN500(NPS 20") 及以下。

Performance data

No more than PN25(Class150), no more than DN500(NPS20").

9.21 智能型阀门装配试压一体机

9.21 Intelligent Valve Assembly Test Equipment



智能型阀门装配试压一体机



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

智能型阀门装配试压一体机是一种基于智能制造的专业阀门试验系统。采用互联网+技术，可对接MES系统，依托企业大数据云平台，自动实现了阀门的装配、试压工艺的智能化。“一体机”根据阀门种类、规格型号专业定制，通过企业大数据中心下达装配、试压等关键作业参数，阀门精加工下线后可就地按工艺要求集中批量的完成装配、试压工作，自动判定试压结果，科学严谨。节约了产品转运时间，合理利用了装配、试压空间，可实现装配、试压流水作业，大大降低了劳动强度，提高了生产效率。

Product Introduction

The intelligent valve assembly test equipment is a professional valve test system based on intelligent manufacturing. Using Internet + technology, it can dock the MES system and rely on the enterprise big data cloud platform to automatically realize the intelligent assembly of the valve and the pressure test process. The "one machine" is customized according to the valve type, specification and model. Through the enterprise big data center, the key operating parameters such as assembly and pressure test are issued. After the valve is finished, it can be assembled and tested in batches according to the process requirements. The results of pressure test could be determined automatically, scientifically and rigorously. It saves product transit time, makes rational use of assembly and pressure test space, can realize assembly and pressure test flow operation, greatly reduces labor intensity and improves production efficiency.

9.22 泵性能试验装置

9.22 Pump Performance Test System



泵性能试验装置

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

泵性能试验装置主要有离心泵试验台、往复泵试验台、转子泵试验台，具有测试精度高、安装拆卸简便、自动化程度高等特点，主要应用于泵生产厂、泵第三方检测机构、泵使用单位性能测试平台。

Product Introduction

Pump performance test system mainly comprises centrifugal pump test system, reciprocating pump test system and the rotor pump test system. Character of the pump performance test system is high test precision, convenient installation and disassembly, high degree of automation. They are widely used in pump manufacturing plant, the third party testing institutions and pump user unit.

参数范围：

最大流量：6000 m³/h；

最大压力：140MPa；

最大功率：3000kW；

最大转速：25000r/min；

最高温度：120 °C。

测试精度：

流量：±0.5%；

压力：±0.5%；

功率：±0.5%；

转速：±0.2%。

Performance data:

Maximum flow: 6000m³/h;

Maximum pressure: 140MPa;

Maximum power: 3000kW;

Maximum speed: 25000r/min;

Maximum temperature: 120°C .

Measurement accuracy:

Flow: ±0.5%;

Pressure: ±0.5%;

Power: ±0.5%;

Speed: ±0.2%.

9.23 MST-T-400 型热油机械密封试验台 9.23 MST-T-400 Type Test Bench for Mechanical Seal



MST-T-400 型热油机械密封试验台

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

采用闭式循环加热系统，结构合理、实用，密封拆装方便，密封腔温度可准确控制，密封扭矩可测量。试验范围较广，既能做单端面机械密封试验，又能做双端面机械密封试验，试验装置精度完全满足 API682 标准规定要求。

Product Introduction

Adopts a closed circulating system, reasonable structure, practicability, convenient disassembly seal.. The temperature of sealed chamber can be controlled accurately and the torque can be measured. A wider range of tests, which can be single face mechanical seal test, but also can do double mechanical seal test. Test device can satisfy the requirements of API682.

工作参数

设计压力：0 ~ 4.2MPa;
温度：常温 ~ 400°C ;
轴径：30 ~ 120mm;
转速：750 ~ 6000r/min;
介质：高温油。

Performance data:

Design pressure: 0-4.2MPa;
Temperature: room temperature-400°C ;
Shaft diameter: 30-120mm;
Rotational speed: 750-6000r/min;
Medium: machinery oil.

9.24 MST-A 型机械密封试验台

9.24 MST-A Type Test Bench for Mechanical Seal



MST-A 型机械密封试验台

产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

采用闭式循环系统，结构合理、实用，密封拆装方便，既能做单端面机械密封试验，又能做双端面机械密封试验。能满足弹簧式机械密封（高、中、低压、潜水电泵用机械密封、波纹管机械密封（金属波纹管、橡胶波纹管、聚四氟乙烯波纹管）性能试验要求，试验装置精度完全满足 GB/T 14211。

Product Introduction

Adopts a closed circulating system, reasonable structure, practicability, and convenient disassembly seal. Not only can do single face mechanical seal test, but also can do double mechanical seal test. It can meet the spring mechanical seal (high, low-voltage), submersible pumps with mechanical seals, bellows mechanical seal (metal bellows, bellows rubber, PTFE bellows) performance test. Test device can satisfy the GB/T 14211.

工作参数

设计压力：0 ~ 4.0MPa;

温度：常温；

轴径：≤80mm;

转速：≤3000r/min;

介质：清水。

Performance data:

Design pressure: 0-4.0MPa;

Temperature: room temperature;

Shaft diameter: ≤80mm;

Speed: ≤ 3000r/min;

Medium: water.

9.25 釜用机械密封试验台

9.25 Test Bench for Mechanical Seal of Agitator



釜用机械密封试验台



产品类型：通用机械试验设备

Product category: General machinery test equipment

产品简介

被试机械密封从主轴上端直接套入，拆装方便，采用侧传动型式，使台架的结构紧凑，并可低速启动，运转平稳。试验范围较广，既能做单端面机械密封试验，又能做双端面机械密封试验，试验装置精度完全满足 HG/T 2099 标准规定要求。

Product Introduction

Mechanical seal from the upper end of the main shaft is directly sleeved, convenient disassembly and assembly. Adopt side drive type, the platform has the advantages of compact structure, and can start at low speed, stable operation. A wider range of tests, which can be single face mechanical seal test, but also can do double mechanical seal test. Test device can satisfy the requirements of HG/T standard 2099.

工作参数

设计压力：0 ~ 6.4MPa;

温度：常温；

轴径：30 ~ 300mm;

转速：40 ~ 360r/min;

介质：气、水、机械油。

Performance data:

Design pressure: 0-6.4MPa;

Temperature: room temperature;

Shaft diameter: 30-300mm;

Rotational speed: 40-360r/min;

Medium: gas, water, machinery oil.

桂林电器科学研究院有限公司

Guilin Electrical Equipment Scientific Research Institute Co., Ltd.

公司名称：桂林电器科学研究院有限公司

Company Name: Guilin Electrical Equipment Scientific Research Institute Co., Ltd.

<http://www.glesi.com.cn>

桂林电器科学研究院有限公司（简称桂林电科院）前身为第一机械工业部电器科学研究院，1954年在北京成立，1970年搬迁至桂林，1999年转制为科技型企业，2013年整体改制为有限责任公司，现隶属于中国机械工业集团有限公司。桂林电科院成立以来，承担了多项国家、部（省）级科研项目和地方经济建设科研项目，取得成果1000余项，获得国家、部（省）级科技进步奖140余项，为我国机械、电器工业的发展做出了重要贡献。

桂林电科院转制后，经过专业与产业重组，已发展成为以电触头材料、电工塑料、双向拉伸聚酰亚胺薄膜、薄膜成套装备、特种电机为主导产品的高科技型企业。

桂林电科院现有职工800余人，其中专业技术人员占职工总人数的50%以上；占地面积近31万平方米，建筑面积13余万平方米；拥有精良的测试设备，先进的科学仪器和强大的产品开发手段，拥有国家级“企业技术中心”、“电工材料行业生产力促进中心”、国家认可检测实验室和“博士后科研工作站”；设有“广西院士工作站”、“广西电器产业工程院”、“广西电工材料工程技术研究中心”等多个省级科研开发平台，被广西自治区认定为“高新技术企业”、“创新型企业”和“智能工厂示范企业”等，是我国电工合金、薄膜成套装备、绝缘材料重要的研发和生产基地。

Guilin Electrical Equipment Scientific Research Institute Co., Ltd. (GLESI) was founded in Beijing in 1954 and relocated in Guilin in 1970. GLESI was originally a research institute directly under the Ministry of Machinery Industry, and was transformed into a scientific and technological enterprise in 1999, and then into a limited liability company in 2013. GLESI is now subordinated to China National Machinery Industry Corporation Ltd (SINOMACH). Since its establishment, GLESI has undertaken many national, provincial / ministerial and local-level research projects and obtained over 1000 scientific achievements, including more than 140 national, provincial / ministerial Science & Technology Progress Awards. GLESI has been making significant contributions to the development of the mechanical and electrical equipment industries of China.

After being transformed into an enterprise from a research institute, GLESI has made special efforts to integrate its various businesses, and has developed into a high-tech enterprise, with electrical contact materials, plastic moulding compounds, BOPI film, BO-film equipment and special motors as its leading products.

GLESI currently has more than 800 employees, of whom over 50% are professional engineers and technicians, and occupies a floor area of over 310,000 m² with a building area of 130,000 m². GLESI is well-equipped with sophisticated testing equipment, advanced scientific instruments as well as strong product development technology. GLESI has several affiliated organizations, such as the national-level “Enterprise Technology Center”, “Electrical Material Productivity Promotion Center”, Nationally Authorized Testing Lab and “Post-Doctoral Research Center”, and possesses several provincial-level R&D platforms such as “Guangxi Academician Workstation”, “Guangxi Engineering Academy for Electrical Equipment Industry” and “Guangxi Engineering Research Center for Electrical Materials”. GLESI is an important R&D and production base for electrical alloys, BO-film equipment and insulating materials, and is awarded by Guangxi government as “High-Tech Enterprise”, “Innovative Enterprise” and “Model Enterprise of Intelligent Plant”.

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1 触头材料

1 Contact Materials

1.1 低压触头

1.1 Low Voltage Contacts

产品简介

公司数十年专注于低压触头材料的研究和开发，拥有深厚的技术基础，积累了丰富的研发和生产经验，拥有近800吨的年生产能力，产品质量稳定，为国内外低压电器制造商所信赖。近年来，陆续开发出系列拥有自主知识产权的新工艺、新装备及新材料，所开发出的新产品成功应用于多家国内外电器制造商的民用产品和我国神舟系列飞船、军用飞机等航空航天领域，技术水平持续提升，在行业内享有良好的声誉。

Product Introduction

Guilin Coninst has been conducting research and development in low-voltage contact materials for about 50 years, and possesses a strong technical base and rich experience in R & D and production of contact materials, with the annual production capability of 800 tons. In recent years, Guilin Coninst has developed a series of new processes, new equipment and new contact materials, with a high technical level in the field of electrical contacts in China. The newly developed contact materials have been successfully applied to many international and domestic device manufacturers and to some ultramodern fields like "Shenzhou" spaceship and military aircrafts, etc. With the technical level been improving continuously, Guilin Coninst enjoys a very good reputation in the market.



片材、铆钉及元件



元件



铆钉



片材



丝材

1.1.1 银镍触头材料

1.1.1 AgNi contact materials

银镍触头材料性能特点及应用

银镍具有电弧转移特性好、接触电阻低而稳定及加工性能优异的优点，在中小电流下具有良好的抗熔焊性能及耐电弧侵蚀性能，直流条件下抗材料转移能力较强；增加镍含量可提高材料的抗熔焊性能，但会适当增大接触电阻及温升。

通过加入微量特殊添加剂，可明显提高材料的抗熔焊性能和耐电弧侵蚀性能。

银镍触头材料环保无毒，可广泛应用于功率继电器、塑封继电器、主令开关、微型开关、空调接触器及中小功率工控接触器。

公司银镍触头材料产品的供货形式有线材、型材、片材、铆钉和焊接 / 铆接元件。

Characteristics and Applications of AgNi Contact Materials

AgNi possesses very good arc transfer characteristic, low and stable contact resistance, and good workability. It has good resistance against welding and arc erosion under middle and low current, and good arc transfer performance under direct current. Increasing nickel content can improve the welding resistance, but would also increase the contact resistance and temperature rise.

By adding a small quantity of special additives, the welding resistance and arc erosion resistance of AgNi can be obviously improved.

AgNi contact materials are environment-friendly, and can be applied to power relays, control switches, miniature switches, air-conditioner contactors and middle- and small-power contactors.

AgNi contact materials are supplied in the forms of wire, profile, sheet, rivet and welded or riveted assembly part.

AgNi 材料力学物理性能

Mechanical and Physical Properties

牌号	材料名称	密度 g/cm ³	电阻率 $\mu \Omega \cdot \text{cm}$	硬度 HV	抗拉强度 MPa	断后伸长率 %
Designation	Material	Density	Resistivity	Hardness	Tensile Strength	Elongation Rate
SNB28	AgNi(10)	10.30	1.85	95	335	4.0
SNB27	AgNi(15)	10.20	1.95	100	340	4.0
SNB02	AgNi(12)T	10.35	1.95	100	340	3.0
SNB07	AgNi(15)T	10.28	2.05	105	340	3.0
SNB29	AgNi(20)	10.12	2.05	105	370	3.0
SNB39	AgNi(20)T	10.20	2.15	115	390	3.0

1.1.2 银氧化锡触头材料

1.1.2 AgSnO₂ contact materials

银氧化锡触头材料性能特点及应用

银氧化锡是目前替代有毒银氧化镉最理想的环保型低压触头材料，具有优良的抗熔焊及耐电弧侵蚀性能，已逐步替代银氧化镉材料广泛应用于接触器、通用继电器、磁保持继电器和汽车继电器中。添加了3~5wt.% 氧化铟的银氧化锡氧化铟材料，在直流负载条件下具有更好的抗材料转移性能，适合应用于汽车继电器等领域。

为满足低压电器的多样性与个性化需求，公司开发出多种牌号的银氧化锡系列材料供顾客选用，通常氧化锡含量8~16wt.%，氧化铟含量0~5wt.%。

公司银氧化锡触头材料产品的供货形式有线材、片材、铆钉和焊接 / 铆接元件。

Characteristics and Applications of AgSnO₂ Contact Materials

AgSnO₂ is the best environment-friendly material for substitution of toxic AgCdO material at present. With very good welding resistance and arc erosion resistance, it has been widely applied to contactors, power relays, magnetic latching relays and automobile relays. AgSnO₂In₂O₃, with 3-5% of In₂O₃, has better resistance against material transfer under DC load conditions, and is suitable for application to automobile relays.

In order to meet the requirements of various low-voltage electrical devices, a series of AgSnO₂ materials have been developed, with the tin oxide content of 8~16 wt.% and the indium oxide content of 0~5 wt.%.

AgSnO₂ contact materials are supplied in the forms of wire, tip, rivet and brazed or riveted assembly part.

AgSnO₂ 材料力学物理性能

Mechanical and Physical Properties

牌号	材料名称	密度 g/cm ³	电阻率 μ Ω·cm	硬度 HV	抗拉强度 Mpa	断后伸长率 %
Designation	Material	Density	Resistivity	Hardness	Tensile Strength	Elongation Rate
STA05	AgSnO ₂ (10)	9.85	2.15	75	250	28
STA08	AgSnO ₂ (12)	9.75	2.25	80	260	25
STC07	AgSnO ₂ (8)	9.95	1.95	80	295	18
STC04	AgSnO ₂ α (12)	9.85	2.15	100	310	13
STC16	AgSnO ₂ (16)	9.45	2.55	95	300	20
STD05	AgSnO ₂ (10)	9.85	2.10	70	245	30
SIE06	AgSnO ₂ (7)In ₂ O ₃ (3)	9.90	2.15	85	320	25
SIE08	AgSnO ₂ (8)In ₂ O ₃ (4)	9.80	2.25	105	330	20
SIC18	AgSnO ₂ (8)In ₂ O ₃ (4)	9.80	2.45	110	365	14
SIC88	AgSnO ₂ (8)In ₂ O ₃ (4)	9.80	2.50	115	360	16
SIC19	AgSnO ₂ (10)In ₂ O ₃ (4.5)	9.70	2.75	125	415	14
SIC99	AgSnO ₂ (10)In ₂ O ₃ (4.5)	9.70	2.80	125	415	14

1.1.3 银氧化镉触头材料

1.1.3 AgCdO contact materials

银氧化镉触头材料性能特点及应用

银氧化镉因所含的氧化镉在电弧作用下发生剧烈分解、蒸发而具有良好的抗熔焊、耐电弧侵蚀性能及低而稳定的接触电阻。同时，银氧化镉还具有良好的加工性能。

氧化镉含量的增加可提高银氧化镉材料的抗熔焊性能，但会增大接触电阻及温升，同时降低材料的加工性能。

银氧化镉曾经是应用最广泛的低压触头材料，大量应用于中大容量继电器、接触器、交直流开关及中小容量断路器中。由于镉的毒性，银氧化镉触头材料的使用将受到越来越严格的限制。

公司银氧化镉触头材料产品的供货形式主要是线材和片材。

Characteristics and Applications of AgCdO Contact Materials

Due to CdO decomposition and vaporization under the action of arc, AgCdO has high resistance against welding and arc erosion. AgCdO has also low and stable contact resistance, and good workability. By increasing CdO content, the welding resistance can be improved, but the contact resistance and temperature rise will increase, and the workability would be decreased.

AgCdO materials used to be applied the most widely to relays, contactors and AC/DC switches and circuit breakers. But as CdO has a certain degree of toxicity, the application of AgCdO materials will be increasingly restricted.

AgCdO contact materials are supplied in the forms of wire and tip.

AgCdO 材料力学物理性能

Mechanical and Physical Properties

材料名称	密度 g/cm ³	电阻率 μ Ω ·cm	硬度 HV	抗拉强度 MPa	断后伸长率 %
Material	Density	Resistivity	Hardness	Tensile Strength	Elongation Rate
AgCdO(12)	10.10	2.10	80-90	270-290	25.0
AgCdO(13.5)	10.06	2.12	80-95	270-300	20
AgCdO(15)	10.00	2.20	85-95	280-300	18
AgCdO(17)	9.90	2.30	85-95	290-310	15

1.1.4 银石墨触头材料

1.1.4 AgC contact materials

银石墨触头材料性能特点及应用

银石墨是抗熔焊性能最好的低压触头材料，而且接触电阻较低。

银石墨触头材料广泛应用于微型断路器（MCB）、塑壳断路器（MCCB）等保护类低压开关电器中，通常与细晶银、银镍或铜非对称配对使用。

公司银石墨触头材料产品的供货形式主要是片材、型材和焊接元件。

Characteristics and Applications of AgC Contact Materials

AgC material possesses the best welding resistance among the contact materials for low-voltage application, and has very low contact resistance.

AgC contact materials are widely applied to protective low-voltage devices such as MCBs, MCCBs, normally used as one contact component in asymmetrical pairing with fine Ag, AgNi or Cu contacts. AgC contact materials are supplied in the forms of tip, profile and welded assembly part.

AgC 材料力学物理性能

Mechanical and Physical Properties

材料名称	密度 g/cm ³	电阻率 $\mu \Omega \cdot \text{cm}$	硬度 HV
Material	Density	Resistivity	Hardness
AgC(3)	9.30	2.05	30-45
AgC(4)	8.95	2.10	35-55
AgC(5)	8.65	2.2	45-55

1.1.5 银钨和银碳化钨触头材料

1.1.5 AgW and AgWC contact materials

银钨和银碳化钨触头材料性能特点及应用

银钨材料既具有银的良好导电性和易加工性，又具有钨的高熔点、高硬度及耐电弧侵蚀、抗熔焊、材料转移少的特性，其对大电流电弧的承受能力强。

与银钨材料相比，银碳化钨除具有银钨的特性外，还具有更高的硬度，在强电弧场合下更具优越性。

银钨和银碳化钨触头材料主要应用于万能式断路器、塑壳式断路器、重负荷交直流接触器等低压开关电器。

公司银石墨触头材料产品的供货形式主要是片材。

Characteristics and Applications of AgW and AgWC Contact Materials

AgW material possesses not only good conductivity and good workability, but also the characteristics of W metal such as high melting point, high hardness, good arc erosion resistance and welding resistance, and low material transfer. It has very strong resistance against high current arc.

Besides the characteristics of AgW, AgWC material possesses even higher hardness and behaves more superior under strong arc condition.

AgW and AgWC contact materials are applied to various low-voltage device such as frame circuit breakers, moulded-case circuit breakers and heavy-load AC/DC contactors.

AgW and AgWC contact materials are supplied in the form of tip.

AgW 和 AgWC 材料力学物理性能

Mechanical and Physical Properties

产品名称	密度 g/cm ³	电阻率 $\mu \Omega \cdot \text{cm}$	硬度 HV
Material	Density	Resistivity	Hardness
AgW(50)	13.3	3.00	125
AgWC(45)	11.8	3.50	190

1.2 真空触头材料

1.2 Vacuum Contact Materials



产品简介

本公司自二十世纪七十年代开始从事真空开关触头材料的研究，二十世纪八十年代中期引进德国西门子公司熔渗法铜铬（CuCr）触头的制造技术和生产线，在中国首先开展铜铬触头材料的研究及批量生产；二十世纪九十年代末从德国引进真空自耗电弧熔炼炉，自主研发高性能的电弧熔炼法铜铬触头材料；本公司可分别采用电弧熔炼法、固相烧结法、熔渗法工艺生产铜铬触头材料。本公司真空触头产品种类齐全、性能优异、质量稳定，已广泛应用于1.14kV ~ 72.5kV 等级的真空断路器、真空接触器和真空负荷开关中，在国、内外享有良好的声誉。

本公司真空触头材料的主要种类

- 1) CuCr(10~50)
- 2) WCu(10~30)
- 3) WCAg(25~40)

Product Introduction

Guilin Electrical Equipment Scientific Research Institute Co., Ltd. (GLESI) started to conduct research of contact materials for vacuum switches in 1970s. In 1985, GLESI imported infiltration technology and equipment for manufacturing CuCr contacts from Siemens, Germany, and thus was the earliest in China to develop and produce CuCr contacts.

In 1999, GLESI imported a vacuum arc remelting Furnace from Germany and began to develop high-performance CuCr contacts with vacuum arc melting (VAM) method. GLESI has totally 3 technological processes for manufacturing CuCr contacts, including vacuum arc melting method, solid-state sintering method and infiltration method. GLESI produces many varieties of vacuum contacts, with good performance and stable quality, widely applied to vacuum breakers, contactors and load switches in the voltage range from 1.14kV to 72.5kV.

Main Varieties of Vacuum Contact Materials

- 1) CuCr(10~50)
- 2) WCu(10~30)
- 3) WCAg(25~40)

AgW 和 AgWC 材料力学物理性能
Mechanical and Physical Properties

材料牌号 Contact materials	制造工艺 Processes	密度 Density (g/cm ³)	硬度 Hardness HB	电导率 Conductivity (MS/m)	氧含量 Oxygen content (ppm)	氮含量 Nitrogen content (ppm)
CuCr(25)-SS	固相烧结法 Solid sintering	8.30	70	28	500	40
CuCr(30)-SS		8.20	75	24	500	40
CuCr(35)-SS		8.10	75	22	500	40
CuCr(40)-SS		8.00	80	20	500	40
CuCr(50)-SS		7.90	80	18	500	40
CuCr(40)-MI	真空熔渗法 Vacuum infiltration	8.10	85	22	500	40
CuCr(50)-MI		7.95	90	20	500	40
CuCr(40)-AM	电弧熔炼法 Vacuum arc melting	8.10	100	24	500	40
CuCr(45)-AM		8.05	105	22	500	40
CuCr(50)-AM		8.00	110	20	500	40
WCu(10)-MI	熔渗法 Vacuum infiltration	17.10	280	20	50	10
WCu(20)-MI		15.50	230	25	50	10
WCu(30)-MI		14.20	200	30	50	10
WCAG(25)-MI	熔渗法 Vacuum infiltration	13.75	450	15	100	30
WCAG(40)-MI		13.00	300	20	100	30

1.3 高压触头材料

1.3 High -Voltage Contact Materials



产品简介

本公司从事高压触头材料的研究与制造已有四十多年的历史，在历次国家引进国外高压断路器制造技术重大项目中承担高压触头的研制工作，所研制的高压触头产品顺利通过了各种电压等级六氟化硫（SF₆）高压断路器的型式试验验证，产品性能质量优良。本公司采用预烧钨骨架、熔渗技术制造的耐弧铜钨（CuW）触头材料，具有优异的综合电性能；采用电子束焊接技术制造的高压触头产品具有热影响区域小、结合强度高等优良的力学物理性能，已广泛应用于10kV～252kV六氟化硫高压断路器中。

本公司高压触头材料的主要种类

- 1) CuW(60~80)/Cu
- 2) CuW(60~80)/CuCr(1)
- 3) CuW(60~80)/Fe

Product Introduction

GLESI has been conducting research and production of high-voltage contact materials for over 40 years. In previous key projects of China on high-voltage circuit breaker manufacturing technology, Coninst undertook the research and development of the high-voltage contacts which have very good quality and performance, and passed all the type tests of various voltage for SF₆ high-voltage breakers. The arc-resistant CuW contact materials manufactured with pre-sintering tungsten skeleton method and infiltration technology have good integrated electrical property. The high-voltage contact assemblies welded by electron beam welding process have very small heat-affected area and very high bonding strength, and are widely applied to the SF₆ circuit breakers of 10 kV ~ 252 kV.

Main Varieties of High-Voltage Contact Materials

- 1) CuW(60~80)/Cu
- 2) CuW(60~80)/CuCr(1)
- 3) CuW(60~80)/Fe

本公司主要高压触头材料的典型力学物理性能
Typical Mechanical and Physical Properties of High-Voltage Contact Materials

材料牌号 Contact materials	制造工艺 Processes	密度 Density (g/cm ³)	硬度 Hardness HB	电阻率 Resistivity (μΩ.cm)
CuW (60)-MI	熔渗法 Infiltration	13.00	140	3.5
CuW (70)-MI		14.20	180	4.0
CuW (80)-MI		15.50	220	5.0

本公司主要高压触头产品的电气应用情况

CuW(60) /CuCr(1) 触头：在国内通过了 252kV/50kA SF6 断路器的型式试验验证；

CuW(70) /CuCr(1) 触头：在国内通过了 126kV/40kA SF6 断路器的型式试验验证；

CuW(80)/CuCr(1) 触头：通过了 40.5kV/40kA、126kV/40kA、252kV/40kA、50kA SF6 断路器的型式试验验证；

CuW(80)/Fe 触头：在国内通过了 40.5kV/25kA、31.5kA、40kA SF6 断路器的型式试验验证。

Main applications tested with the high-voltage contact materials

CuW(60)/CuCr(1) contacts passed the test for SF6 circuit breakers of 252kV/50kA in China;

CuW(70)/CuCr(1) contacts passed the test for SF6 circuit breakers of 126kV/40kA in China;

CuW(80)/CuCr(1) contacts passed the tests for SF6 circuit breakers of 40.5kV/40kA, 126kV/40kA, 252kV/40kA, 50kA in China;

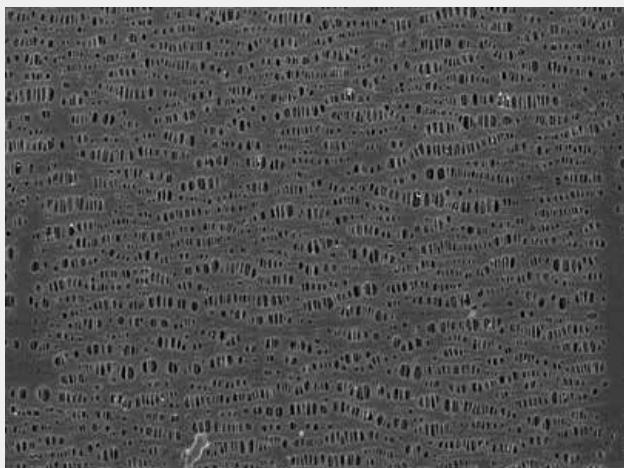
CuW(80)/Fe contacts passed the tests for SF6 circuit breakers of 40.5kV/25kA, 31.5kA and 40kA in China.

2 塑料加工专用设备

2 Plastics Processing Equipments

2.1 干法 / 湿法 单向 / 双向拉伸电池隔膜生产线

2.1 Dry/Wet Method Mono-/Bi-axially Oriented Battery Separator Film Production Line



产品简介

从 2003 年第一条电池隔膜线开始，桂林格莱斯已向客户提供了接近 50 条干法、湿法，单拉、双拉电池隔膜生产线。我院研发的具有世界先进水平的同步拉伸技术也已经应用在电池隔膜生产线上。

电池隔膜广泛应用于各种液态锂电池，如手机电池、笔记本电脑电池、电动工具电池、汽车动力电池等。

Product Introduction

From first battery separator film line in 1997, up to now, GLESI has supplied nearly 30 lines to our customers, covering dry method, wet method, mono-axial orientation and bi-axial orientation. For world-leading simultaneous orientation technology, GLESI has already applied to our battery separator film production lines.

Battery separator film is widely used on various liquid Lithium batteries, like cell phone battery, laptop battery, electrical tool battery, automobile battery etc.

设备亮点
Highlights

Orientation Method 工艺	Dry Method 干法
	Wet Method 湿法
Orientation Direction 拉伸方向	Mono-axial Orientation 单拉
	Bi-axial Orientation 双拉
Orientation Technology 拉伸方式	Two-step Orientation 分步
	Simultaneous Orientation 同步

目前主要生产以下规格薄膜**Mechanical Specifications**

Thickness 产品厚度	6-60um
Width 产品宽度	Max.4500mm
Speed 生产速度	Max.130m/min

2.2 双向拉伸聚丙烯薄膜（BOPP）生产线

2.2 Biaxially Oriented Polypropylene (BOPP) production line



产品简介

由原料配送、挤出铸片、双向拉伸、后处理、收卷、分切、过程自动控制系统等部分组成，用于生产各种规格具有优良机械性能和电气性能、良好的耐热性、耐寒性、气密性及尺寸稳定性的双向拉伸聚丙烯薄膜（BOPP）。

Product Introduction

Biaxially Oriented Polypropylene (BOPP) production line
Biaxially Oriented Polypropylene (BOPP) production line consists of resin system, extrusion system, casting system, MDO, TDO, post-treatment, pull roll stand, winding system, slitting system and Integrated Process Control (IPC) system. It is used for producing various specified BOPP film with excellent mechanical and electrical performance, superb heat-resistance, cold-resistance, tightness and size stability.

设备亮点

1. 高精度的辊筒速度 / 温度控制
2. 方便灵活的拉伸间隙调节
3. 自主研发的链夹、导轨及润滑系统
4. 高速、宽幅、高效

Highlights

1. Precised MDO Speed/Temperature Control
2. Easy and Flexible Adjustment of Stretching Gap
3. Proprietary Rights on Clips, Guiding Rail and Lubricating System
4. High Speed, Wide Web, High Efficiency

目前主要生产以下规格薄膜

薄膜厚度范围: 6~60 μm
 最大膜卷宽度: 8700mm
 最大膜卷直径: Φ 1200mm
 最大生产速度: 450m/min
 纵向拉伸比: 1: 1-1: 8
 横向拉伸比: 1: 7-1: 10
 最大年产量: 35000T/Y

Mechanical Specifications

Thickness Range: 6~60 μm
 Max.Width: 8700mm
 Max.Diameter: Φ 1200mm
 Max.Speed: 450m/min
 MDO Ratio: 1 : 1-1 : 8
 TDO Ratio: 1 : 7-1 : 10
 Max.Production: 35000T/Y

2.3 双向拉伸聚酰亚胺薄膜 (BOPI) 生产线

2.3 Biaxially Oriented Polyimide (BOPI) Production line



产品简介

由原料合成、流延、双向拉伸、后处理、收卷、分切、过程自动控制系统等部分组成，用于生产 F、H 绝缘等级的各种规格具有优良机械性能和电气性能、良好的耐热性、耐寒性、气密性及尺寸稳定性的双向拉伸聚酰亚胺薄膜 (BOPI)。聚酰亚胺薄膜 (BOPI) 广泛应用于机车牵引电机、核能电机、潜油电机、轧钢电机、矿用电机、航空及航海电机、中频发电机、柔软印刷电路及耐高温电缆。由于耐热性与耐辐射性优异，已成为宇航、火箭技术领域中理想的配套材料。如图：BOPI 生产线

Product Introduction

Biaxially Oriented Polyimide (BOPI) Production line consists of resin system, casting system, MDO, TDO, post-treatment, winding system, slitting system and Integrated Process Control (IPC) system. It is used for producing various specified F, H grade BOPI film with excellent mechanical and electrical performance, superb heat-resistance, cold-resistance, tightness and size stability. BOPI film is widely used in pulling motor, nuclear motor, submersible motor, rolling motor, mining motor, aviation and sailing motor, IF generator, flexible printing circuit and heat-resistant cables. With its superb heat-resistant and radiation-resistant performance, BOPI film is the ideal material for space navigation and rocketry areas.

目前主要生产以下规格薄膜

薄膜厚度范围：5-100 μm

最大膜卷宽度：1600mm

最大膜卷直径：Φ800mm

最大生产速度：10m/min

纵向拉伸比：1 : 1-1 : 5

横向拉伸比：1 : 1-1 : 5

最大年产量：150T/Y

Mechanical Specifications

Thickness Range: 5-100μm

Max.Width: 1600mm

Max.Diameter: Φ800mm

Max.Speed: 10m/min

MDO Ratio: 1 : 1-1 : 5

TDO Ratio: 1 : 1-1 : 5

Max.Production: 150T/Y

2.4 双向拉伸聚脂薄膜（BOPET）生产线

2.4 Biaxially Oriented Polyester (BOPET) Production line



产品简介

由原料干燥、挤出铸片、双轴定向、后处理、收卷、分切、过程自动控制系统等部分组成，用于生产各种规格具有优良机械性能和电气性能、良好的耐热性、耐寒性、气密性及尺寸稳定性的双轴定向聚脂薄膜（BOPET）。如图：5.2 米 BOPET 生产线

Product Introduction

Biaxially Oriented Polyester (BOPET) Production line consists of resin system, extrusion system, casting system, MDO, TDO, post-treatment, winding system, slitting system and Integrated Process Control (IPC) system. It is used for producing various specified BOPET film with excellent mechanical and electrical performance, superb heat-resistance, cold-resistance, tightness and size stability.

设备亮点

1. 电容膜生产线技术达到世界水平
2. 厚膜生产线技术成熟
3. 自主研发的链夹、导轨及润滑系统
4. 热风系统的均匀性

Highlights

1. First-class Technology in Capacitor Film Production Line
2. Mature Technology in Thick Film Production Line
3. Proprietary Rights on Clips, Guiding Rail and Lubricating System
4. Uniformity in Hot Wind System

目前主要生产以下规格薄膜

薄膜厚度范围：3-350 μm
 最大膜卷宽度：6700mm
 最大膜卷直径：Φ1200mm
 最大生产速度：400m/min
 纵向拉伸比：1: 1-1: 4
 横向拉伸比：1: 2.5-1: 4
 最大年产量：25000T/Y

Mechanical Specifications

Thickness Range: 3-350 μm
 Max.Width: 6700mm
 Max.Diameter: Φ1200mm
 Max.Speed: 400m/min
 MDO Ratio: 1 : 1-1 : 4
 TDO Ratio: 1 : 2.5-1 : 4
 Max.Production: 25000T/Y

3 塑料制品、半成品及辅料

2.4 Biaxially Oriented Polyester (BOPET) Production line

3.1 电工用特种模塑料

3.1 Special Moulding Compounds for Electrical Applications

3.1.1 耐热改性不饱和聚酯模塑料 PT-310

3.1.1 Heat-Resistant Modified Unsaturated Polyester Moulding Compounds PT-310



产品简介

该塑料具有耐漏电起痕指数高，耐电弧性能好，电气性能优异，缺口冲击高，阻燃、耐热性能好，耐磨损，吸水性小，制品尺寸稳定性好等特性，颜色多样，室温贮存期为一年。该塑料已通过美国 UL 安全认证，认证号为 E208587。

应用领域：主要用于空调、冷柜、冰箱、洗衣机、电梯等电器的温控器、电源开关、电磁线圈骨架及接线端子的绝缘结构部件，低压电器、防爆电器等绝缘结构部件。

Product Introduction

PT-310 is of high tracking index, good arc resistance, excellent electrical performance, high notch impact, good flame retardancy, good heat resistance, wear resistance, small water absorption, good dimensional stability and various colors. The storage period at room temperature is one year. PT-301 passed the US UL safety certification (certificate No. E208587).

Application fields: Mainly applied to making the thermostats of air conditioners, refrigerators, washing machines and elevators, etc., and for the insulation structural parts of power switches, electromagnetic coil skeletons, connection terminals, low-voltage devices and explosion-proof devices and so on.

性能指标 Property	单位	测试标准	PT-310
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.9-2.1
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.3
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.4-0.8
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥6.5
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥2.5
弯曲强度 Flexural strength	MPa	GB/T9341	≥80
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹³
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹¹
耐电痕化指数 (CTI) Comparative tracking index	V	GB/T4207	≥600
耐电弧 Arc resistance	s	GB/T1411	≥180
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥210
燃烧性 UL94(0.8mm) Flammability(0.8mm)	级 UL94	GB/T11020	V-0
电气强度 Dielectric strength	MV/m	GB/T1408	≥18.0

3.1.2 密胺 – 聚酯模塑料 MU-100

3.1.2 Melamine Modified Unsaturated Polyester Moulding Compounds MU-100



产品简介

该产品为密胺改性不饱和聚脂塑料，耐漏电起痕指数高，电气性能优异，缺口冲击高，耐热性能好，耐磨损，吸水性小，制品尺寸稳定性好，颜色多样，室温贮存期为一年以上。该塑料已通过美国 UL 安全认证，认证号为 E208587。

应用领域：主要用于交流接触器动作部件，开关外壳及低压电器等绝缘结构部件。

Product Introduction

MU-100 is melamine modified unsaturated polyester moulding compounds with high tracking resistance index, excellent electrical performance, high notch impact, good heat resistance, good wear resistance, low water absorption, good dimensional stability and various colors. The storage period at room temperature is more than one year. MU-100 passed the US UL safety certification (certificate No. E208587).

Application: Mainly applied to making the action parts of AC contactors, and the insulation structural parts of switch housings and low-voltage devices.

性能指标 Property	单位	测试标准	MU-100
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.75-1.85
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.5
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.9-1.3
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥7.5
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥2.5
弯曲强度 Flexural strength	MPa	GB/T9341	≥75
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹³
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹¹
耐电痕化指数 (CTI) Comparative tracking index	V	GB/T4207	≥600
耐电弧 Arc resistance	s	GB/T1411	≥180
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥160
燃烧性 UL94(1.6mm) Flammability(1.6mm)	级 UL94	GB/T11020	V-0
电气强度 Dielectric strength	MV/m	GB/T1408	≥19.0

3.1.3 耐磨不饱和聚酯模塑料 PT-900

3.1.3 Abrasion-Resistant Modified Unsaturated Polyester Moulding Compounds PT-900



产品简介

该产品为不饱和聚脂塑料，耐漏电起痕指数高，电气性能优异，缺口冲击高，耐热性能好，耐磨损，吸水性小，制品尺寸稳定性好，颜色多样，室温贮存期为一年以上。

应用领域：主要用于交流接触器动作部件，开关外壳及低压电器等绝缘结构部件。

Product Introduction

PT-900 is unsaturated polyester moulding compounds, with high tracking resistance index, excellent electrical performance, high notch impact, good heat resistance, good wear resistance, low water absorption, good dimensional stability and various colors. The storage period at room temperature is more than one year.

Application: Mainly applied to the action parts of AC contactors, and to the insulation structural parts of switch housings and low-voltage devices.

性能指标 Property	单位	测试标准	PT-900
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.8-2.0
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.3
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.30-0.80
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥7.5
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥3.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥80
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹³
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹¹
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥210
燃烧性 UL94(1.6mm) Flammability(1.6mm)	级 UL94	GB/T11020	V-0
电气强度 Dielectric strength	MV/m	GB/T1408	≥18
耐电痕化指数 (CTI) Comparative tracking index	V	GB/T4207	≥600
耐电弧 Arc resistance	s	GB/T1411	≥180

3.1.4 耐漏电改性聚酯模塑料 PT-610

3.1.4 Tracking Resistant Modified Unsaturated Polyester PT-610



产品简介

该产品具有优异的电气性能和耐热性，耐漏电起痕指数高，吸水性小，室温贮存期长，制品尺寸稳定性好等特性，室温贮存期为一年。

应用领域：主要用于航空航天高可靠线簧电连接器，战车、计算机、电动机车通讯接插件及接线端子，电子集成块壳，继电器基座等绝缘结构部件。

Product Introduction

PT-610 is of superior dielectric strength and heat resistance, high creepage resistance index, low water resistance, low water absorption, and excellent long-term dimensional stability. The storage time at room temperature is over 12 months.

Application: Mainly applied to the insulation structural parts for high-reliability wire spring electrical connectors for aerospace, communication connectors and terminals of combat vehicles, computers and electric car, as well as electronic integrated blocks and relay bases.

性能指标 Property	单位	测试标准	PT-610
密度 23°C Density 23°C	g/cm ³	GB/T1033	≤1.85
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.2
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.4-0.9
简支梁无缺口冲击强 Charpy impact strength	kJ/m ²	GB/T1043	≥5.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥60
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹⁴
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹²
耐电痕化指数 (CTI) Comparative tracking index	V	GB/T4207	≥500
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥210
电气强度 Dielectric strength	MV/m	GB/T1408	≥18
耐热性能 (200°C 恒温 2h) Heat resistance (200°C 2h)	-	无起泡，无开裂现象	

3.1.5 电工特种模塑料 PT-201

3.1.5 Special Electrical Mounding Compounds PT-201



产品简介

本产品耐热性优异，同时具有良好的机械性能、电气性能、热刚性、耐磨性、尺寸稳定性，吸水率小，适于注射及模压成型。室温贮存期为一年。

应用领域：主要应用于机电产品的耐热部件，如电机换向器、焊枪接头等。

Product Introduction

PT-210 is of good flame retardancy, excellent heat resistance, good electrical performance, good thermal rigidity, small water absorption and good dimensional stability. It can be used for injection molding and compression molding. The storage period at room temperature is one year.

Application: Mainly applied to the heat-resistant parts of electrical devices, such as motor commutators and welding gun joints.

性能指标 Property	单位	测试标准	PT-201
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.75-2.0
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.2
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.10-0.50
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥10.0
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥3.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥100
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹⁰
体积电阻率 Volume resistivity	Ω .m	GB/T1410	≥10 ⁹
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥210
燃燒性 UL94(3.2mm) Flammability(3.2mm)	级 UL94	GB/T11020	V-0
电气强度 Dielectric strength	MV/m	GB/T1408	≥10
压缩强度 Compression strength	MPa	GB/T1041	≥180

3.1.6 电工特种模塑料 PT-202

3.1.6 Special Electrical Moulding Compounds PT-202



产品简介

本产品具有优良的抗冲击性能，尺寸稳定性好，适于注射及模压成型，制品表面平滑光亮，室温贮存期为一年。

应用领域：主要用于机电产品、电子电器、家用电器抗冲击结构件，如开关压桥、汽车抗冲部件等。

Product Introduction

PT-202 has excellent impact resistance, good dimensional stability, smooth and bright surface. It can be used for injection molding and compression molding. The storage period at room temperature is one year.

Application: Mainly applied to making the impact-resistant structural parts of electromechanical products, electronic devices and household appliances, including switch bridges, automobile anti-impact parts.

性能指标 Property	单位	测试标准	PT-202
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.50-1.70
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.30
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.30-0.70
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥15.0
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥4.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥80
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹⁰
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ⁹
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥180
电气强度 Dielectric strength	MV/m	GB/T1408	≥10.0

3.1.7 电工特种模塑料 PT-205

3.1.7 Special Electrical Mounding Compounds PT-205



产品简介

本产品具有优异的耐磨性能，尺寸稳定性好，适于注射及模压成型，制品表面平滑光亮，室温贮存期为一年。

应用领域：主要用于触头支架、滑轮、操控轮等机电产品的耐磨部件。

Product Introduction

PT-205 has excellent wear resistance, good dimensional stability, and smooth and bright surface. It can be used for injection molding and compression molding. The storage period at room temperature is one year.

Application: Mainly applied to making the wear parts of electromechanical products such as contact brackets, pulleys and control wheels.

性能指标 Property	单位	测试标准	PT-205
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.40-1.70
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	mg	GB/T1034	≤80
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.60-1.00
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥6.0
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥2.2
弯曲强度 Flexural strength	MPa	GB/T9341	≥60
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ⁹
体积电阻率 Volume resistivity	Ω .m	GB/T1410	≥10 ⁷
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥150
电气强度 Dielectric strength	MV/m	GB/T1408	≥10

3.1.8 电工特种模塑料 FX501-J

3.1.8 Special Electrical Moulding Compounds FX501-J



产品简介

本产品耐热性优异，同时具有良好的机械性能、电气性能、热刚性、耐磨性、尺寸稳定性，吸水率小，适于注射及模压成型。室温贮存期为一年。

应用领域：主要应用于机电产品的耐热部件，如电机换向器、焊枪接头等。

Product Introduction

FX501-J is of excellent heat resistance, good electrical performance, good thermal rigidity, small water absorption and good dimensional stability. It can be used for injection moulding and compression moulding. The storage period at room temperature is one year.

Application: Mainly applied to the heat-resistant parts of electrical devices, such as motor commutators, and welding gun joints.

性能指标 Property	单位	测试标准	FX501-J
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.75-2.00
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	%	GB/T1034	≤0.20
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.10-0.50
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥10.0
简支梁缺口冲击强度 Charpy notch impact strength	kJ/m ²	GB/T1043	≥3.5
弯曲强度 Flexural strength	MPa	GB/T9341	≥100
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹²
体积电阻率 Volume resistivity	Ω .m	GB/T1410	≥10 ⁹
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥240
燃烧性 UL94(3.2mm) Flammability(3.2mm)	级 UL94	GB/T11020	V-0
电气强度 Dielectric strength	MV/m	GB/T1408	≥12
压缩强度 Compression strength	MPa	GB/T1041	≥180

3.1.9 DAP 模塑料

3.1.9 DAP Moulding Compounds



产品简介

该产品在长期湿热条件下也能保持良好的机械性能和杰出的电气性能，具有良好的尺寸的稳定性，耐电弧，抗化学性，抗霉菌，不腐蚀等特点。

应用领域：广泛用于飞机，船舶，电气及电子制品的接线板，开关，转换器，汽车，铁路等电气装备零件，电子器件等，以及计算机中要求公差变化特别小的精密电子组件，并可在恶劣环境中使用。

Product Introduction

DAP moulding compounds can maintain good mechanical properties and outstanding electrical properties under long-term damp heat conditions, with good dimensional stability, arc resistance, chemical resistance, anti-fungal and non-corrosive characteristics.

Application: Widely applied to making the electrical and electronic wiring boards for aircrafts and ships, and the electrical and electronic parts of switches, converters, automotives and railways, as well as the precision electronic components of computers with very small tolerance ranges. DAIP can be used in harsh environments.

性能指标 Property	单位	测试标准	DAP-1000	DAP-2000
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.8-2.0	1.8-2.0
吸水性 (24 小时 23°C)Water absorption (24h 23°C)	mg	GB/T1034	≤20	≤20
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.3-0.8	0.3-0.8
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥4.5	≥6.0
简支梁缺口冲击强度 Charpy impact strength notched	kJ/m ²	GB/T1043	≥2.5	≥2.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥80	≥60
表面电阻率 Surface resistivity	Ω	GB/T1410	≥1013	≥1013
体积电阻率 Volumer resistivity	Ω.m	GB/T1410	≥1011	≥1011
耐电痕化指数 (CTI) Comparative tracking index		GB/T4207	≥600	≥600
耐电弧 Arc resistance	s	GB/T1411	≥180	≥180
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥240	≥240
电气强度 Dielectric strength	MV/m	GB/T1408	≥12	≥12
燃燒性 Flammability	级 L94	GB/T11020	V-0(1.6mm)	V-0(0.8mm)

3.1.10 DAIP 模塑料

3.1.10 DAIP Moulding Compounds

产品简介

该产品在长期湿热条件下也能保持良好机械性能和杰出的电气性能，具有良好的尺寸的稳定性，耐电弧，抗氧化性，抗霉菌，不腐蚀等特点，耐高温达200°C以上。

应用领域：广泛用于飞机，船舶，电气及电子制品的接线板，开关，转换器，汽车，铁路等电气装备零件，电子器件等，以及计算机中要求公差变化特别小的精密电子组件，并可在恶劣环境中使用。

Product Introduction

DAIP mould compounds can maintain good mechanical properties and outstanding electrical properties under long-term damp heat conditions, with good dimensional stability, arc resistance, chemical resistance, anti-fungal, non-corrosive characteristics, and high temperature resistance up to 200°C.

Application: Widely applied to making the electrical and electronic wiring boards for aircrafts and ships, and the electrical and electronic parts of switches, converters, automotives and railways, as well as the precision electronic components of computers with very small tolerance ranges. DAIP can be used in harsh environments.

性能指标 Property	单位	测试标准	DAIP-1000
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.8-2.0
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	mg	GB/T1034	≤20
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.3-0.8
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥7.5
简支梁缺口冲击强度 Charpy impact strength notched	kJ/m ²	GB/T1043	≥2.5
弯曲强度 Flexural strength	MPa	GB/T9341	≥80
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹³
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹¹
耐电痕化指数 (CTI) Comparative tracking index	-	GB/T4207	≥550
耐电弧 Arc resistance	s	GB/T1411	≥180
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥240
电气强度 Dielectric strength	MV/m	GB/T1408	≥12

3.1.11 EM-300 电工环氧模塑料

3.1.11 Electrical Epoxy Moulding Compounds EM-300



产品简介

该产品电气性能优良，机械强度高，耐热性、耐腐蚀性好，可用于注射与模压成型。

应用领域：用于制造继电器、高压开关、绝缘子、互感器、阻抗器、电缆头、机动车点火线圈等电气绝缘部件，以及电子元器件塑封等。

Product Introduction

EM-300 possesses excellent electrical properties, high mechanical strength, good heat resistance and corrosion resistance. It can be used for injection molding and compression molding.

Application: Applied to making the insulation parts for relays, high voltage switches, insulators, mutual inductors, resistors, cable heads, automotive ignition coils, as well as the plastic seals for electronic components.

性能指标 Property	单位	测试标准	EM-300
密度 23°C Density 23°C	g/cm ³	GB/T1033	1.9-2.1
吸水性 (24 小时 23°C) Water absorption (24h 23°C)	mg	GB/T1034	≤20
模塑收缩率 Moulding shrinkage	%	JB/T3958.2	0.4-0.9
简支梁无缺口冲击强度 Charpy impact strength	kJ/m ²	GB/T1043	≥8.0
弯曲强度 Flexural strength	MPa	GB/T9341	≥120
表面电阻率 Surface resistivity	Ω	GB/T1410	≥10 ¹³
体积电阻率 Volume resistivity	Ω.m	GB/T1410	≥10 ¹¹
耐电弧 Arc resistance	s	GB/T1411	≥180
负荷热变形温度 Deflection temperature	°C	GB/T1634	≥240
电气强度 Dielectric strength	MV/m	GB/T1408	≥12

4 特种薄膜 4 Special Film

4.1 聚酰亚胺薄膜 4.1 Polyimide Film



产品简介

GLESI-VN 和 GLESI-VM 型为增强级聚酰亚胺薄膜，具有普通级聚酰亚胺薄膜的所有优点，且在拉伸强度、断裂伸长率、表面张力、热收缩率等性能方面有了显著地提升，是能够满足柔性覆铜板产品要求的优质绝缘材料。产品图片如图 1 所示。

Product Introduction

GLESI-VN and GLESI-VM are reinforced grade polyimide films, which have all the advantages of ordinary grade polyimide films, and have remarkable improvement in tensile strength, elongation at break, surface tension and thermal shrinkage. They are high quality insulating materials that can meet the requirements of flexible copper clad laminates.

GLESI-VN 型聚酰亚胺薄膜技术指标
GLESI-VN-Type PI Film Technical Properties

指标名称 Properties	单位 Unit	指标值 Value			
厚度 Thickness	μm	5±0.8	7.5±1.0	12.5±1.0	25±1.5
拉伸强度 Tensile Strength	MPa	200	240	270	270
拉伸模量 Tensile Modulus	GPa	3.5	3.7	3.6	3.5
电气强度 Frequency Electrical Strength	kV/mm	≥250	≥250	≥250	≥250
表面电阻率 Surface Resistivity	Ω	≥10 ¹⁴	≥10 ¹⁴	≥10 ¹⁴	≥10 ¹⁴
体积电阻率 Volume Resistivity	Ω·m	≥10 ¹²	≥10 ¹²	≥10 ¹²	≥10 ¹²
介电损耗因数 Dissipation Factor	—	≤0.004	≤0.004	≤0.004	≤0.004
吸湿性 Moisture Absorption	%	≤2.0	≤2.0	≤2.0	≤2.0
热膨胀系数 Coefficient of Thermal Expansion	×10 ⁻⁶ /K	≤30	≤30	≤30	≤30
尺寸稳定性 Dimensional Stability (200°C)	%	-0.10 ~ 0.10	-0.10 ~ 0.10	-0.10 ~ 0.10	-0.10 ~ 0.10
燃烧特性 Flammability	—	VTF0	VTF0	VTF0	VTF0

GLESI-VM 型聚酰亚胺薄膜技术指标
GLESI-VM-Type PI Film Technical Properties

指标名称 Properties	单位 Unit	指标值 Value		
厚度 Thickness	μm	7.5±1.0	12.5±1.0	25±1.5
拉伸强度 Tensile Strength	MPa	260	280	280
拉伸模量 Tensile Modulus	GPa	4.7	4.5	4.3
电气强度 Frequency Electrical Strength	kV/mm	≥250	≥250	≥250
表面电阻率 Surface Resistivity	Ω	≥10 ¹⁴	≥10 ¹⁴	≥10 ¹⁴
体积电阻率 Volume Resistivity	Ω·m	≥10 ¹²	≥10 ¹²	≥10 ¹²
介电损耗因数 Dissipation Factor	—	≤0.004	≤0.004	≤0.004
吸湿性 Moisture Absorption	%	≤2.0	≤2.0	≤2.0
热膨胀系数 Coefficient of Thermal Expansion	×10 ⁻⁶ /K	≤25	≤25	≤30
尺寸稳定性 Dimensional Stability (200°C)	%	-0.10 ~ 0.10	-0.10 ~ 0.10	-0.10 ~ 0.10
燃烧特性 Flammability	—	VTF0	VTF0	VTF0

4.2 GLESI-VB 型聚酰亚胺薄膜 4.2 GLESI-VB-Type PI Film



产品简介

GLESI-VB 型为黑色聚酰亚胺薄膜，具有优异的机械性能、化学稳定性、耐高温性能和遮光性，是黑色耐高温胶带、黑色耐高温标签和黑色覆盖膜等的理想材料。产品图片如图 2 所示。

Product Introduction

GLESI-VB is a black polyimide film with excellent mechanical properties, chemical stability, high temperature resistance and light blocking. It is an ideal material for the heat resistant black tape, heat resistant black label and black cover film.

GLESI-VB 型聚酰亚胺薄膜技术指标 GLESI-VB-Type PI Film Technical Properties

指标名称 Properties	单位 Unit	指标值 Value			
		VB-1		VB-2	
厚度 Thickness	μm	7.5±1.0	12.5±1.0	25±1.5	12.5±1.0
拉伸强度 Tensile Strength	MPa	190	190	170	180
拉伸模量 Tensile Modulus	GPa	3.0	3.2	3.0	3.5
电气强度 Frequency Electrical Strength	kV/mm	≥60	≥60	≥60	≥60
表面电阻率 Surface Resistivity	Ω	≥10 ¹⁴	≥10 ¹⁴	≥10 ¹⁴	≥10 ¹⁴
体积电阻率 Volume Resistivity	Ω·m	≥10 ¹²	≥10 ¹²	≥10 ¹²	≥10 ¹²
介电损耗因数 Dissipation Factor	—	≤0.04	≤0.04	≤0.04	≤0.04
吸湿性 Moisture Absorption	%	≤2.0	≤2.0	≤2.0	≤2.0
光泽度 (空气面) Gloss	GU	55	50	50	30
尺寸稳定性 Dimensional Stability (200°C)	%	-0.10 ~ 0.10	-0.10 ~ 0.10	-0.10 ~ 0.10	-0.10 ~ 0.10
燃烧特性 Flammability	—	VTF0	VTF0	VTF0	VTF0

4.3 产品应用领域

4.3 Product Application Field

产品简介

产品广泛应用于电子产品、新能源及高温绝缘材料等领域。

- ★ 太阳能电池背板基材及风力发电设备；
- ★ 高铁、地铁等轨道交通牵引电机绝缘；
- ★ LED 灯条、汽车车灯及车用智能控制系统；
- ★ 航空、航天、太空探索设备用防辐射材料；
- ★ 手机、平板电脑等数码产品柔性线路。

Product Introduction

The film products are widely used in the fields of electronic products, new energy resources and high-temperature insulating materials, etc:

- Base material for the backboard of solar cells and Insulating material for wind power generation equipment;
- Insulation for traction motors for rail vehicles such as high-speed trains and subways;
- LED lamps, automobile lamps and intelligent control systems for automobiles;
- Radiation proof materials for aviation and aerospace exploration equipment;
- Flexible circuit for digital products like mobile phones and tablet computers.

5 特种电机 5 Special Motor

5.1 直流印制绕组电机及配套驱动系统 5.1 DC printed motor and supporting drive system



产品简介

拥有从美国科尔摩根 (KOLLMORGEN) 公司引进的直流印制绕组电机生产技术和生产线，功率从 30W-7KW，年产四十万台。印制绕组电机是理想的控制执行元件，扁平结构、无铁芯、无齿槽效应、转动惯量低、响应迅速、过载能力强，适合于频繁启动、加速、制动、正反转工作等现代化高精度变速驱动装置和快速频繁作业系统。

Product Introduction

The production line and technology of DC print motor in GLESI was introduced from KOLLMORGEN in the United States., make GLESI 400,000PCS print motors of annual output capability. The output power of the print motor developed by the company ranges from 30w to 7000W. Printed motor is an ideal control and drive element for automated equipment. With design features in flat structure, no iron core, no slot effect, low moment of inertia, rapid response, strong overload capacity, suitable for frequent start, acceleration, braking, forward and reverse rotation and other modern high-precision variable speed drive devices and fast frequent operating system.

70SN 系列 70SN Series

Type	Rated power (w)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)
70SN01	30	3000	10	6.8	10

100SN 系列 100SN Series

Type	Rated power (w)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)
100SN01	40	2300	16	6.7	12
100SN01F	40	1450	28	5.5	12
100SN02F	75	2500	28	4.3	24
100SN01P	40	3000	16	7.2	15
100SN01N	100	2800	34	5.6	24

154SN 系列 154SN Series

Type	Rated power (w)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)
154SN01	75	3600	20	5	24
154SN12Z	63	2000	30	4.3	24
154SN20A	200	3200	60	11	24
154SN22	150	2200	66	8.2	24
154SN25	180	3250	56	9.6	24
154SN12F	125	3600	32	7	26
154SN33	180	2800	64	6.3	36
154SN37	250	3200	73	8.6	36
154SN04A	150	3000	48	5.3	36
154SN35	350	2800	115	9.5	48

185SN 系列 185SN Series

Type	Rated power (KW)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
185SN-C01	0.4	3500	110	4.5	125	6
185SN05	0.5	3000	160	6.5	105	
195SN01	0.7	3000	223	9.5	88	

210SN 系列 210SN Series

Type	Rated power (KW)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
210SN-C07	0.75	3000	239	8.3	107	6
210SN08	0.8	3000	255	10.7	90	
210SN-C10	1.0	3000	320	14.6	90	6
210SN-C10A	1.0	3000	320	7.5	168	6
210SN11	1.1	3000	350	14.0	98	
245SN-C15	1.5	3000	480	10.4	174	6

300SN 系列 300SN Series

Type	Rated power (KW)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
300SN21	2.1	3000	670	12.8	174	
300SN-C22	2.2	3000	700	14.8	172	
300SN-C30	3.0	3000	956	24.3	138	6
300SN30A	3.1	3000	990	21.0	172	
300SN-C45	4.5	3000	1434	33.6	150	6
300SN45A	4.3	3000	1370	23.0	210	

9CD 系列 9CD Series

Type	Rated power (W)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
9CD	109	3000	35.3	8.7	24	
9CDT	94	3000	31.8	8	22	2.9
9CDH	180	3000	56.5	8.3	32	

12CD 系列 12CD Series

Type	Rated power (W)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
12CD	275	3000	91.8	8.7	43.3	
12CDT	250	3000	81.2	8.7	40	5.4
12CDH	380	3000	123.6	8	59	
12CDHT	390	3000	112.5	8.2	60	7.7

9FG 系列 9FG Series

Type	Rated power (W)	Rated speed (RPM)	Ratio	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
9FG/15:1	25	208	15:1	1.1	5.2	12.4	
9FGT/15:1	25	208	15:1	0.9	5.2	11.4	1.1
9FG/25:1	25	125	25:1	1.9	5.2	12.4	
9FGT/25:1	25	125	25:1	1.5	5.2	11.4	1.1
9FG/50:1	25	60	50:1	3.8	5.2	12.4	
9FGT/50:1	25	60	50:1	3.1	5.2	11.4	1.1
9FG/80:1	25	38	80:1	6	5.3	12.4	
9FGT/80:1	25	38	80:1	5	5.3	11.4	1.1
9FG/100:1	18	31	100:1	6.7	5	12.2	
9FGT/100:1	18	31	100:1	5.6	5	11.4	1.1
9FG/150:1	15	21	150:1	6.7	3.9	10.9	
9FGT/150:1	15	21	150:1	6.7	4.3	10.5	1.1
9NG/60:1	50	52	60:1	9	4.3	20.2	

12FG 系列 12FG Series

Type	Rated power (W)	Rated speed (RPM)	Ratio	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
12FG/15:1	70	189	15:1	3.5	6.6	21.2	
12FGT/15:1	56	189	15:1	3.2	7.4	19.4	3.3
12FGV/15:1	45	160	15:1	2.7	7	12	
12FG/25:1	70	123	25:1	5.3	6.6	21.2	
12FGT/25:1	56	123	25:1	4.8	7.4	19.4	3.3
12G/50:1	70	60	50:1	11	6.6	21.2	
12GT/50:1	56	60	50:1	9.8	7.4	19.4	3.3
12FG/80:1	70	36	80:1	17.5	6.6	21.2	
12FGT/80:1	56	36	80:1	15.7	7.4	19.4	3.3
12FG/100:1	70	30	100:1	21.1	6.6	21.2	
12FGT/100:1	56	30	100:1	19.1	7.4	19.4	3.3
12FG/150:1	60	21	150:1	22.6	5.2	19.2	
12FGT/150:1	60	21	150:1	22.6	6	17.8	3.3
12FGVT/150:1	35	17	150:1	19.1	6.6	12	3.3

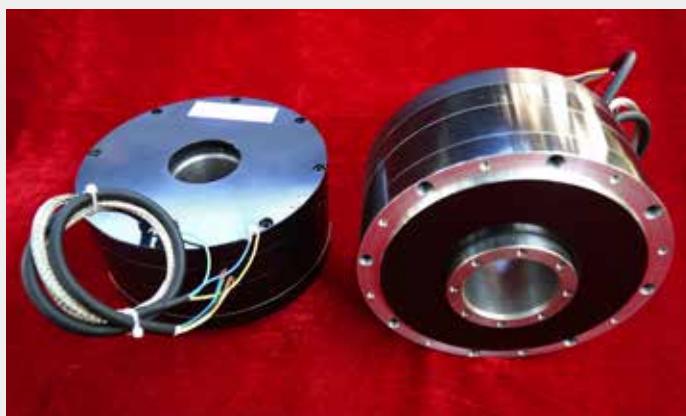
N9M4 系列 N9M4 Series

Type	Rated power (W)	Rated speed (RPM)	Rated torque (N.cm)	Rated current (A)	Rated voltage (V)	output voltage gradient (v/kRPM)
N9M4	153	3000	49	7.8	30	
N9M4T	126	3000	40	7.1	28	3.2

测速机性能参数
The performance parameters of the tachometer

output voltage gradient (v/kRPM)	Asymmetry of output voltage	Ripple coefficient	Min.load resistance (KΩ)	Linear error	Error of temp. Variation (1/°C)	Max. Speed (RPM)
≥6.0	≤1.5%	≤3%		≤0.3%	≤0.05%	4000
≥3.0	≤1.5%	≤3%		≤0.3%	≤0.05%	4000
≥5.0	≤1.5%	≤3%		≤0.3%	≤0.05%	4000

5.2 交流永磁伺服电机及配套驱动系统(交流力矩电机、防爆伺服电机) 5.2 AC permanent magnet servo motor and its supporting drive system



产品简介

具有功率密度高、调速范围宽、机电时间常数小、机械特性曲线坚挺、控制精度高、过载能力强、高可靠性、免维护等特点。

我司各类交直流伺服电机，旨在为人工智能、机器人、高端伺服等装备提供伺服解决方案，目前在石油机械、医疗器械、自动焊机、纺织机械、印刷机械、卷绕机械、数控机床、外骨骼机器人等工业自动化控制领域，表现出色，同时在海陆空军武器装备系统：雷达、测控、导航、火炮、飞行模拟、电子干扰、随动、吊舱、拖拽、升降及车载装备等，得到广泛应用。

Product Introduction

AC permanent magnet servo motor and its supporting drive system (AC torque motor, explosion-proof servo motor) have the characteristics of high power density, wide speed range, small electromechanical time constant, strong mechanical characteristic curve, high control accuracy, strong overload capacity, high reliability, maintenance-free and so on.

Our AC / DC servo motors are designed to provide servo solutions for artificial intelligence, robots, high-end servo and other equipment. At present, we are doing well in the fields of industrial automation control, such as petroleum machinery, medical equipment, automatic welding machine, textile machinery, printing machinery, winding machinery, CNC machine tools, exoskeleton robots and so on. At the same time, in the sea, land and air force weapon equipment system: radar, measurement and control, navigation, artillery, flight simulation, Electronic interference, follow-up, pods, towing, lifting and vehicle equipment, etc., have been widely used.

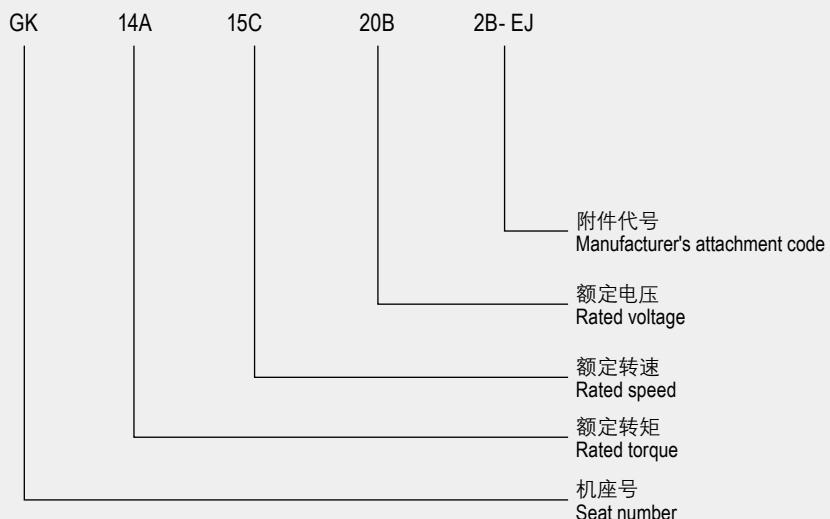
交流伺服电机技术规范及环境要求

Technical specifications and environmental requirements of AC servo motor

电机类型 Type of motor	交流永磁同步伺服电机 Ac permanent magnet synchronous servo motor
磁性材料 Magnetic material	超高内禀矫顽力稀土永磁材料 Ultra-high intrinsic coercive rare earth permanent magnet materials
绝缘等级 Insulation grade	F 级 F Grade
绝缘耐压 Insulation withstand voltage	AC1500V, 1 分钟 AC1500V, 1 minutes
绝缘电阻 Insulation resistance	DC500V, 100M 以上 DC500V, above 100m
保护等级 Protection level	IP65
冷却方式 cooling-down method	自然冷却 natural cooling
噪音 Noise	≤65dB(A)
工作制 character of service	SI 连续 SI continuity
环境温度 Ambient temperature	-40 ~ 55°C
环境湿度 Ambient humidity	90%RH 以下 (不结霜条件) Below 90%RH (no frosting condition)

伺服电机型号由机座号、产品名称代号、性能参数代号和派生代号等组成。

The model of servo motor is composed of machine base number, product name code, performance parameter code and derivative code.



产品系列号

GK- 产品系列号，表示 GK 系列交流永磁同步伺服电动机。

机座号

用英文字母和阿拉伯数字表示，其值为阿拉伯数字乘以系数，系数 A=10，系数 B=100，单位为 mm。

额定转矩

用英文字母和阿拉伯数字表示，其值为阿拉伯数字乘以系数，系数 A=0.1，系数 B=0.01，系数 C=1，系数 D=10，单位为 N.m。

额定转速

用英文字母和阿拉伯数字表示，其值为阿拉伯数字乘以系数，系数 A=10，系数 B=100，单位为 rpm。

额定电压

用英文字母和阿拉伯数字表示，其值为阿拉伯数字乘以系数，系数 A=10，系数 B=100，单位为 V。

附件代号

R 表示旋转变压器，E 表示光电编码器，G 表示绝对值编码器，T 表示温度传感器，Z 表示失电制动器，J 表示电机轴伸带键。

型号示例

GK14A15C20B2B-EJ 表示：适配驱动器输入电压 220V、额定转矩 15N.m，额定转速 2000rpm，反馈元件为光电编码器，电机轴伸带键，机座号为 142 的 SK 系列交流永磁同步伺服电动机。

Product line number

GK-- product series number, indicating GK series AC permanent magnet synchronous servo motor.

Seat No.

In English letters and Arabic numerals, the numerical value are Arabic numerals multiplied by coefficients, coefficients A=10, coefficients B=100, in mm.

Rated torque

Represented by English letters and Arabic numerals, the numeral value is Arabic numerals multiplied by coefficients, coefficient A ≤ 0.1, coefficient B ≤ 0.01, coefficient C ≤ 1, coefficient D ≤ 10, in units of N.M.

Rated speed

Represented by English letters and Arabic numerals, the numeral value is Arabic numerals multiplied by coefficients, coefficient A ≤ 10, coefficient B ≤ 100, in rpm.

Rated voltage

Represented by English letters and Arabic numerals, the numeral value is Arabic numerals multiplied by coefficients, coefficient A ≤ 10, coefficient B ≤ 100, in the unit of V.

Manufacturer's attachment code

R stands for rotating transformer, E for photoelectric encoder, G for absolute encoder, T for temperature sensor, Z for power loss brake and J for motor shaft extension key.

Model Example

GK14A15C20B2B-EJ indicates that the input voltage of the driver is 220V, the rated torque is 15N.m, the rated speed is 2000rpm, the feedback element is the photoelectric encoder, the motor shaft extension key, and the frame number is 142 SK series AC permanent magnet synchronous servo motor.

60 系列交流永磁同步伺服电动机技术参数
Technical parameters of 60 Series AC permanent Magnet synchronous Servo Motor

技术数据 Technical data	符号 Symbol	单位 Unit	GK06A32B30B2B-EJ
额定功率 Rated power	P _N	KW	0.1
额定转速 Rater speed	n _N	rpm	3000
母线电压 Busbar voltage	U _{dc}	V	320
额定电压 Rater Voltage	U _N	V	220
额定转矩 Rated torque	M _N	N.m	0.32
额定电流 Rated current	I _N	A	0.8
峰值转矩 Peak torque	M _{max}	N.m	0.96
峰值电流 Peak current	I _{max}	A	2.5
反电势 Counter potential	Ke	V/Krpm	35
转矩系数 Torque coefficient	K _t	N.m/A	0.46
电机极数 Motor pole number	2P		6
绕组电阻 (线 -- 线) Winding resistance (line-line)	R _{2ph}	Ω	21.2
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	17
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	0.19
电机长度 Motor length	L	mm	111

80 系列交流永磁同步伺服电动机技术参数
Technical parameters of 80 Series AC permanent Magnet synchronous Servo Motor

技术数据 Technical data	符号 Symbol	单位 Unit	GK08A24A30B2B-EJ	GK08A32A30B4B-EJ
额定功率 Rated power	P _N	KW	0.75	1
额定转速 Rater speed	n _N	rpm	3000	3000
母线电压 Busbar voltage	U _{dc}	V	320	560
额定电压 Rater Voltage	U _N	V	220	380
额定转矩 Rated torque	M _N	N.m	2.4	3.2
额定电流 Rated current	I _N	A	2.9	2.6
峰值转矩 Peak torque	M _{max}	N.m	7.2	9.6
峰值电流 Peak current	I _{max}	A	8.7	7.8
反电势 Counter potential	Ke	V/Krpm	55.5	65.5
转矩系数 Torque coefficient	K _t	N.m/A	0.88	1.23
电机极数 Motor pole number	2P		6	6
绕组电阻 (线 -- 线) Winding resistance (line-line)	R _{2ph}	Ω	3.99	7.4
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	14.07	27.3
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	1.8	2.2
电机长度 Motor length	L	mm	150	170

90 系列交流永磁同步伺服电动机技术参数

Technical parameters of 90 Series AC permanent Magnet synchronous Servo Motor

技术数据 Technical data	符号 Symbol	单位 Unit	GK09A24A30B2B-EJ	GK09A32A30B2B-EJ
额定功率 Rated power	P _N	KW	0.75	1
额定转速 Rater speed	n _N	rpm	3000	3000
母线电压 Busbar voltage	Udc	V	320	320
额定电压 Rater Voltage	U _N	V	220	220
额定转矩 Rated torque	M _N	N.m	2.4	3.2
额定电流 Rated current	I _N	A	4	6
峰值转矩 Peak torque	Mmax	N.m	7.2	9.6
峰值电流 Peak current	I _{max}	A	12	18
反电势 Counter potential	Ke	V/Krpm	47.7	39.4
转矩系数 Torque coefficient	Kt	N.m/A	0.6	0.53
电机极数 Motor pole number	2P		8	6
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	2.58	1
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	5.45	2.8
电机转动惯量 Motor moment of inertia	Jm	Kg·cm ²	2.6	3.9
电机长度 Motor length	L	mm	154	189

110 系列交流永磁同步伺服电动机技术参数 (一)

Technical parameters of 110 Series AC permanent Magnet synchronous Servo Motor (1)

技术数据 Technical data	符号 Symbol	单位 Unit	GK11A20A30B2B-EJ	GK11A40A20B4B-EJ
额定功率 Rated power	P _N	KW	0.63	0.83
额定转速 Rater speed	n _N	rpm	3000	2000
母线电压 Busbar voltage	Udc	V	320	560
额定电压 Rater Voltage	U _N	V	220	380
额定转矩 Rated torque	M _N	N.m	2	4
额定电流 Rated current	I _N	A	2.8	2.5
峰值转矩 Peak torque	Mmax	N.m	6	12
峰值电流 Peak current	I _{max}	A	8.4	7.5
反电势 Counter potential	Ke	V/Krpm	51	112
转矩系数 Torque coefficient	Kt	N.m/A	0.71	1.6
电机极数 Motor pole number	2P		4	4
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	4.14	8
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	21.8	33.6
电机转动惯量 Motor moment of inertia	Jm	Kg·cm ²	2.46	3.3
电机长度 Motor length	L	mm	156	182

110 系列交流永磁同步伺服电动机技术参数 (二)
Technical parameters of 110 series AC permanent magnet synchronous servo motor (2)

技术数据 Technical data	符号 Symbol	单位 Unit	GK11A40A30B2B-EJ	GK11A60A20B2B-EJ
额定功率 Rated power	P _N	KW	1.25	1.25
额定转速 Rater speed	n _N	rpm	3000	2000
母线电压 Busbar voltage	U _{dc}	V	320	320
额定电压 Rater Voltage	U _N	V	220	220
额定转矩 Rated torque	M _N	N.m	4	6
额定电流 Rated current	I _N	A	5	5
峰值转矩 Peak torque	M _{max}	N.m	12	18
峰值电流 Peak current	I _{max}	A	15	15
反电势 Counter potential	K _e	V/Krpm	59.6	85.5
转矩系数 Torque coefficient	K _t	N.m/A	0.8	1.2
电机极数 Motor pole number	2P		4	4
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	2.14	3.18
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	9.25	13.2
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	3.3	4.6
电机长度 Motor length	L	mm	182	212

110 系列交流永磁同步伺服电动机技术参数 (三)
Technical parameters of 110 Series AC permanent Magnet synchronous Servo Motor (3)

技术数据 Technical data	符号 Symbol	单位 Unit	GK11A60A30B4B-EJ
额定功率 Rated power	P _N	KW	1.88
额定转速 Rater speed	n _N	rpm	3000
母线电压 Busbar voltage	U _{dc}	V	540
额定电压 Rater Voltage	U _N	V	380
额定转矩 Rated torque	M _N	N.m	6
额定电流 Rated current	I _N	A	5.5
峰值转矩 Peak torque	M _{max}	N.m	18
峰值电流 Peak current	I _{max}	A	16.5
反电势 Counter potential	K _e	V/Krpm	90
转矩系数 Torque coefficient	K _t	N.m/A	1.2
电机极数 Motor pole number	2P		6
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	2.8
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	9.1
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	4.6
电机长度 Motor length	L	mm	212

130 系列交流永磁同步伺服电动机技术参数（一）

Technical parameters of 130 Series AC permanent Magnet synchronous Servo Motor (1)

技术数据 Technical data	符号 Symbol	单位 Unit	GK13A40A20B2B-EJ	GK13A50A30B2B-EJ
额定功率 Rated power	P _N	KW	0.84	1.57
额定转速 Rater speed	n _N	rpm	2000	3000
母线电压 Busbar voltage	U _{dc}	V	320	320
额定电压 Rater Voltage	U _N	V	220	220
额定转矩 Rated torque	M _N	N.m	4	5
额定电流 Rated current	I _N	A	3.5	7.5
峰值转矩 Peak torque	M _{max}	N.m	12	15
峰值电流 Peak current	I _{max}	A	10.5	21
反电势 Counter potential	K _e	V/Krpm	91.2	58
转矩系数 Torque coefficient	K _t	N.m/A	1.14	0.71
电机极数 Motor pole number	2P		4	8
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	5.99	0.54
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	20	2.2
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	6.2	15.2
电机长度 Motor length	L	mm	154	180

130 系列交流永磁同步伺服电动机技术参数（二）

Technical parameters of 130 Series AC permanent Magnet synchronous Servo Motor (2)

技术数据 Technical data	符号 Symbol	单位 Unit	GK13A50A25B2B-EJ	GK13A50A30B4B-EJ
额定功率 Rated power	P _N	KW	1.3	1.57
额定转速 Rater speed	n _N	rpm	2500	3000
母线电压 Busbar voltage	U _{dc}	V	320	560
额定电压 Rater Voltage	U _N	V	220	380
额定转矩 Rated torque	M _N	N.m	5	5
额定电流 Rated current	I _N	A	5.2	4.2
峰值转矩 Peak torque	M _{max}	N.m	15	15
峰值电流 Peak current	I _{max}	A	12.6	12.6
反电势 Counter potential	K _e	V/Krpm	66.67	87.3
转矩系数 Torque coefficient	K _t	N.m/A	0.96	1.19
电机极数 Motor pole number	2P		8	8
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	1.58	2.47
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	7.24	11.86
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	12.77	12.67
电机长度 Motor length	L	mm	188	168

130 系列交流永磁同步伺服电动机技术参数 (三)
Technical parameters of 130 Series AC permanent Magnet synchronous Servo Motor (3)

技术数据 Technical data	符号 Symbol	单位 Unit	GK13A75A30B2B-EJ	GK13A95A15B2B-EJ
额定功率 Rated power	P _N	KW	2.3	1.5
额定转速 Rater speed	n _N	rpm	3000	1500
母线电压 Busbar voltage	U _{dc}	V	320	320
额定电压 Rater Voltage	U _N	V	220	220
额定转矩 Rated torque	M _N	N.m	7.5	9.55
额定电流 Rated current	I _N	A	10	9.5
峰值转矩 Peak torque	M _{max}	N.m	22.5	28.65
峰值电流 Peak current	I _{max}	A	30	28.5
反电势 Counter potential	Ke	V/Krpm	46.7	76.7
转矩系数 Torque coefficient	K _t	N.m/A	0.75	1
电机极数 Motor pole number	2P		4	4
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.7	1.01
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	3.5	6.31
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	9.6	14.5
电机长度 Motor length	L	mm	190	230

130 系列交流永磁同步伺服电动机技术参数 (四)
Technical parameters of 130 series AC permanent magnet synchronous servo motor(4)

技术数据 Technical data	符号 Symbol	单位 Unit	GK13A10C25B4B-EJ	GK13A10C30B4B-EJ
额定功率 Rated power	P _N	KW	2.6	3.1
额定转速 Rater speed	n _N	rpm	2500	3000
母线电压 Busbar voltage	U _{dc}	V	560	560
额定电压 Rater Voltage	U _N	V	380	380
额定转矩 Rated torque	M _N	N.m	10	10
额定电流 Rated current	I _N	A	6.5	7
峰值转矩 Peak torque	M _{max}	N.m	30	30
峰值电流 Peak current	I _{max}	A	20.1	10.08
反电势 Counter potential	Ke	V/Krpm	106.1	114
转矩系数 Torque coefficient	K _t	N.m/A	1.53	1.4
电机极数 Motor pole number	2P		8	8
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.73	1.4
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	4.3	4.2
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	19.4	25.2
电机长度 Motor length	L	mm	220	220

142 系列交流永磁同步伺服电动机技术参数

Technical parameters of 142 Series AC permanent Magnet synchronous Servo Motor

技术数据 Technical data	符号 Symbol	单位 Unit	GK14A15C20B2B-EJ	GK14A18C30B4B-EJ
额定功率 Rated power	P _N	KW	3.1	5.5
额定转速 Rater speed	n _N	rpm	2000	3000
母线电压 Busbar voltage	U _{dc}	V	320	560
额定电压 Rater Voltage	U _N	V	220	380
额定转矩 Rated torque	M _N	N.m	15	17.5
额定电流 Rated current	I _N	A	12	14
峰值转矩 Peak torque	Mmax	N.m	45	52.5
峰值电流 Peak current	I _{max}	A	36	52
反电势 Counter potential	Ke	V/Krpm	90	98.5
转矩系数 Torque coefficient	Kt	N.m/A	1.25	1.25
电机极数 Motor pole number	2P		6	6
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.48	0.59
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	2.79	2.78
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	32	34
电机长度 Motor length	L	mm	267	277

180 系列交流永磁同步伺服电动机技术参数 (一)

Technical parameters of 180 Series AC permanent Magnet synchronous Servo Motor (1)

技术数据 Technical data	符号 Symbol	单位 Unit	GK18A13C15B2B-E	GK18A15C30B2B-E
额定功率 Rated power	P _N	KW	2	4.7
额定转速 Rater speed	n _N	rpm	1500	3000
母线电压 Busbar voltage	U _{dc}	V	320	320
额定电压 Rater Voltage	U _N	V	220	220
额定转矩 Rated torque	M _N	N.m	12.8	15
额定电流 Rated current	I _N	A	13	20
峰值转矩 Peak torque	Mmax	N.m	38.4	45
峰值电流 Peak current	I _{max}	A	39	60
反电势 Counter potential	Ke	V/Krpm	84.5	60
转矩系数 Torque coefficient	Kt	N.m/A	0.98	0.75
电机极数 Motor pole number	2P		8	6
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.338	2.1
绕组电感 (线 - 线) Winding inductor (wire-wire)	L _{2ph}	mH	3.1	9.6
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	37.6	43.2
电机长度 Motor length	L	mm	244	244

180 系列交流永磁同步伺服电动机技术参数 (二)
Technical parameters of 180 Series AC permanent Magnet synchronous Servo Motor (2)

技术数据 Technical data	符号 Symbol	单位 Unit	GK18A19C15B2B-EJ	GK18A20C30B4B-EJ
额定功率 Rated power	P _N	KW	3	6.3
额定转速 Rater speed	n _N	rpm	1500	3000
母线电压 Busbar voltage	U _{dc}	V	320	560
额定电压 Rater Voltage	U _N	V	220	380
额定转矩 Rated torque	M _N	N.m	19.1	20
额定电流 Rated current	I _N	A	20	14.5
峰值转矩 Peak torque	M _{max}	N.m	57.3	24
峰值电流 Peak current	I _{max}	A	60	43.5
反电势 Counter potential	K _e	V/Krpm	120.46	100
转矩系数 Torque coefficient	K _t	N.m/A	0.75	1.38
电机极数 Motor pole number	2P		6	8
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.68	1
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	11.96	4.1
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	64.8	57.6
电机长度 Motor length	L	mm	276	264

180 系列交流永磁同步伺服电动机技术参数 (三)
Technical parameters of 180 Series AC permanent Magnet synchronous Servo Motor (3)

技术数据 Technical data	符号 Symbol	单位 Unit	GK18A30C30B4B-RJ
额定功率 Rated power	P _N	KW	9.4
额定转速 Rater speed	n _N	rpm	3000
母线电压 Busbar voltage	U _{dc}	V	560
额定电压 Rater Voltage	U _N	V	380
额定转矩 Rated torque	M _N	N.m	30
额定电流 Rated current	I _N	A	23
峰值转矩 Peak torque	M _{max}	N.m	90
峰值电流 Peak current	I _{max}	A	69
反电势 Counter potential	K _e	V/Krpm	107.2
转矩系数 Torque coefficient	K _t	N.m/A	1.3
电机极数 Motor pole number	2P		8
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.19
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	3.2
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	95
电机长度 Motor length	L	mm	308

180 系列交流永磁同步伺服电动机技术参数 (四)

Technical parameters of 180 Series AC permanent Magnet synchronous Servo Motor (4)

技术数据 Technical data	符号 Symbol	单位 Unit	GK18A50C30B4B-EJ	GK18A72C18B4B-RJ
额定功率 Rated power	P _N	KW	15	13.5
额定转速 Rater speed	n _N	rpm	3000	1800
母线电压 Busbar voltage	U _{dc}	V	560	560
额定电压 Rater Voltage	U _N	V	380	380
额定转矩 Rated torque	M _N	N.m	50	72
额定电流 Rated current	I _N	A	37.1	35
峰值转矩 Peak torque	Mmax	N.m	150	216
峰值电流 Peak current	I _{max}	A	111.3	105
反电势 Counter potential	Ke	V/Krpm	87.2	178
转矩系数 Torque coefficient	Kt	N.m/A	1.35	2
电机极数 Motor pole number	2P		6	8
绕组电阻 (线 -- 线) Winding resistance (line-line)	R _{2ph}	Ω	0.09	0.36
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	2.52	4.35
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	162.6	222
电机长度 Motor length	L	mm	404	454

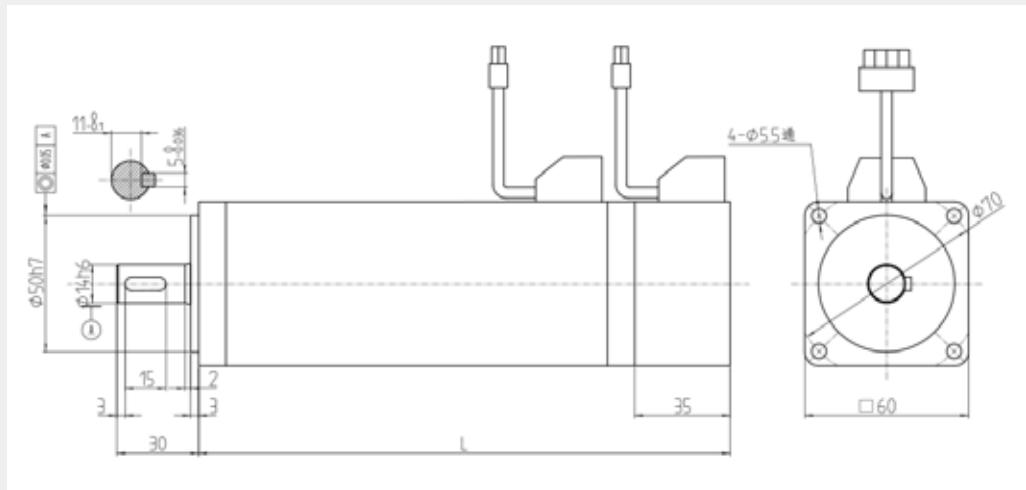
200 系列交流永磁同步伺服电动机技术参数

Technical parameters of 200 series AC permanent magnet synchronous servo motor

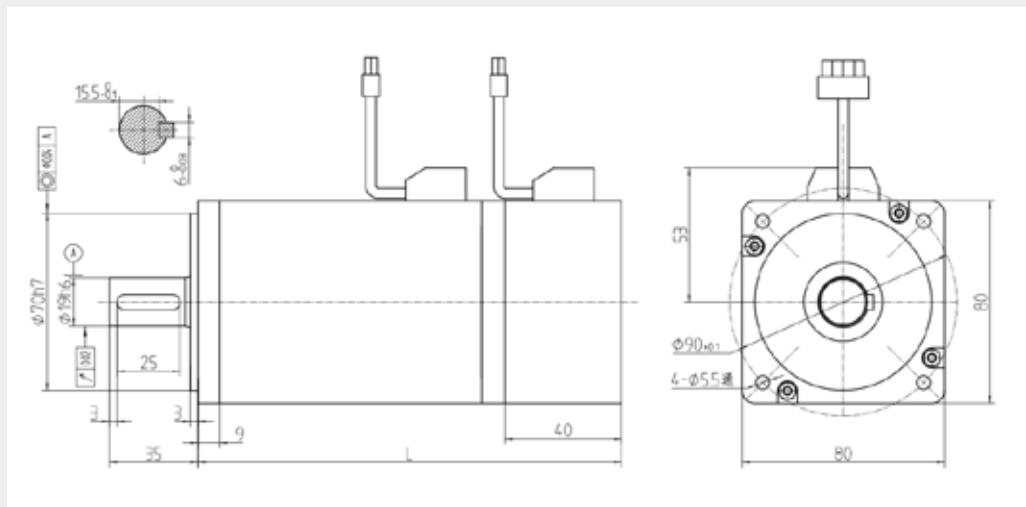
技术数据 Technical data	符号 Symbol	单位 Unit	GK20A58C18B4B-RJ	GK20A12D15B4B-RJ
额定功率 Rated power	P _N	KW	11	18.5
额定转速 Rater speed	n _N	rpm	1800	1500
母线电压 Busbar voltage	U _{dc}	V	560	560
额定电压 Rater Voltage	U _N	V	380	380
额定转矩 Rated torque	M _N	N.m	58	118
额定电流 Rated current	I _N	A	22	40
峰值转矩 Peak torque	Mmax	N.m	145	280
峰值电流 Peak current	I _{max}	A	55	100
反电势 Counter potential	Ke	V/Krpm	180	192
转矩系数 Torque coefficient	Kt	N.m/A	2.97	3.15
电机极数 Motor pole number	2P		8	8
绕组电阻 (线 -- 线) Winding resistance (line-line)	R _{2ph}	Ω	0.6	0.25
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	3.7	2.21
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	221	426
电机长度 Motor length	L	mm	417	542

230 系列交流永磁同步伺服电动机技术参数
Technical parameters of 230 Series AC permanent Magnet synchronous Servo Motor

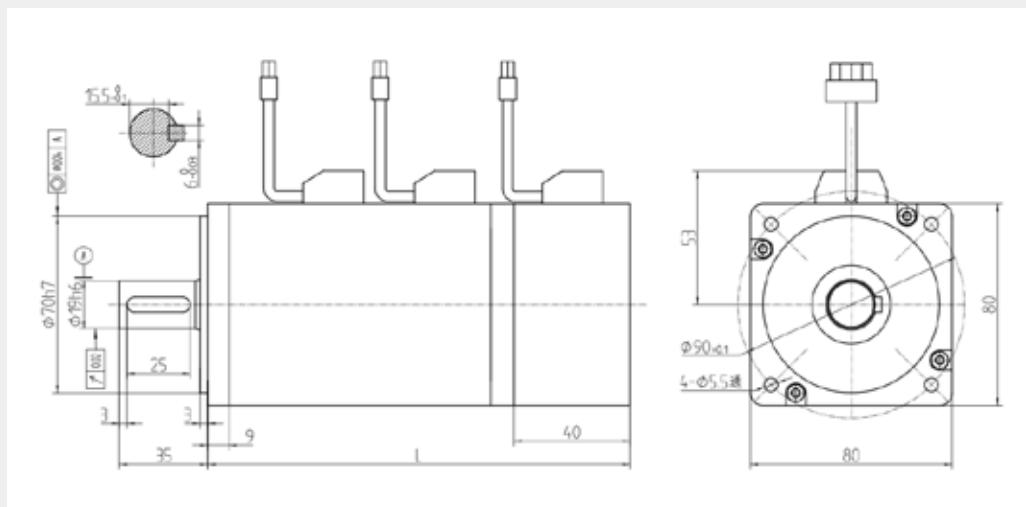
技术数据 Technical data	符号 Symbol	单位 Unit	GK23A70C20B4B-EJ	GK23A11D20B4B-EJ
额定功率 Rated power	P _N	KW	14.6	23
额定转速 Rater speed	n _N	rpm	2000	2000
母线电压 Busbar voltage	U _{dc}	V	560	560
额定电压 Rater Voltage	U _N	V	380	380
额定转矩 Rated torque	M _N	N.m	70	110
额定电流 Rated current	I _N	A	35	64
峰值转矩 Peak torque	Mmax	N.m	210	330
峰值电流 Peak current	I _{max}	A	105	192
反电势 Counter potential	K _e	V/Krpm	129	127.6
转矩系数 Torque coefficient	K _t	N.m/A	2	1.89
电机极数 Motor pole number	2P		6	6
绕组电阻 (线 - 线) Winding resistance (line-line)	R _{2ph}	Ω	0.16	0.07
绕组电感 (线 -- 线) Winding inductor (wire-wire)	L _{2ph}	mH	2.9	1.46
电机转动惯量 Motor moment of inertia	J _m	Kg·cm ²	375.6	610.4
电机长度 Motor length	L	mm	370	450



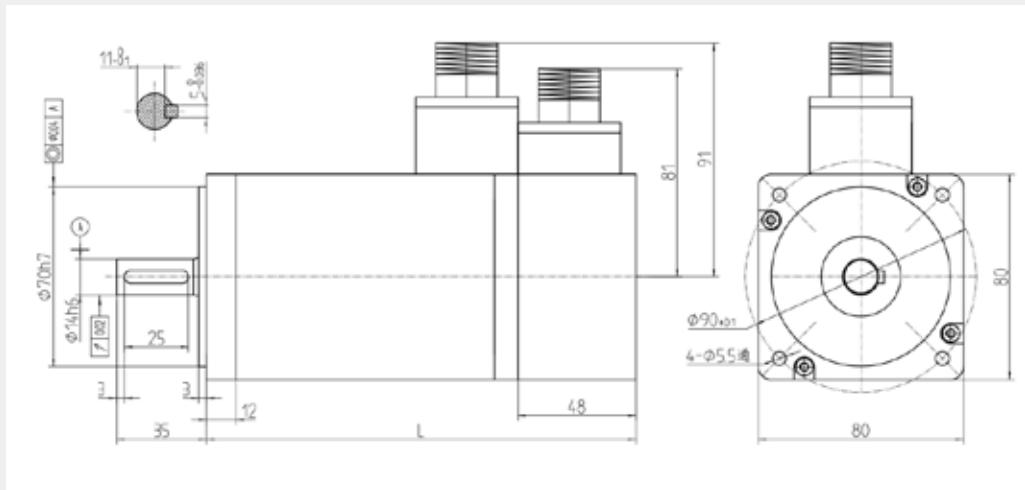
60 系列交流永磁同步伺服电动机引线式外形图
Lead shape of 60 Series AC permanent Magnet synchronous Servo Motor



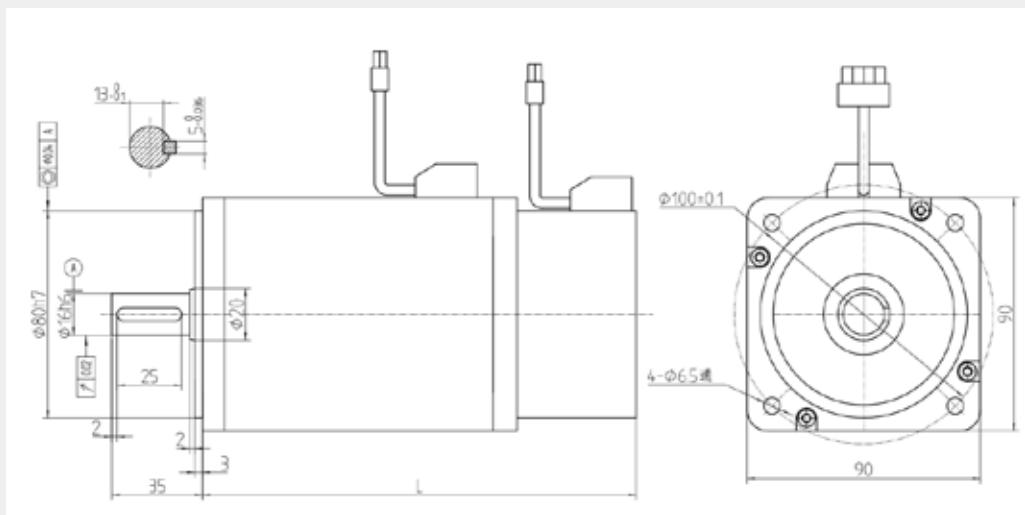
80 系列交流永磁同步伺服电动机引线式外形图
Lead-type outline drawing of 80 series AC permanent-magnet synchronous servo motor



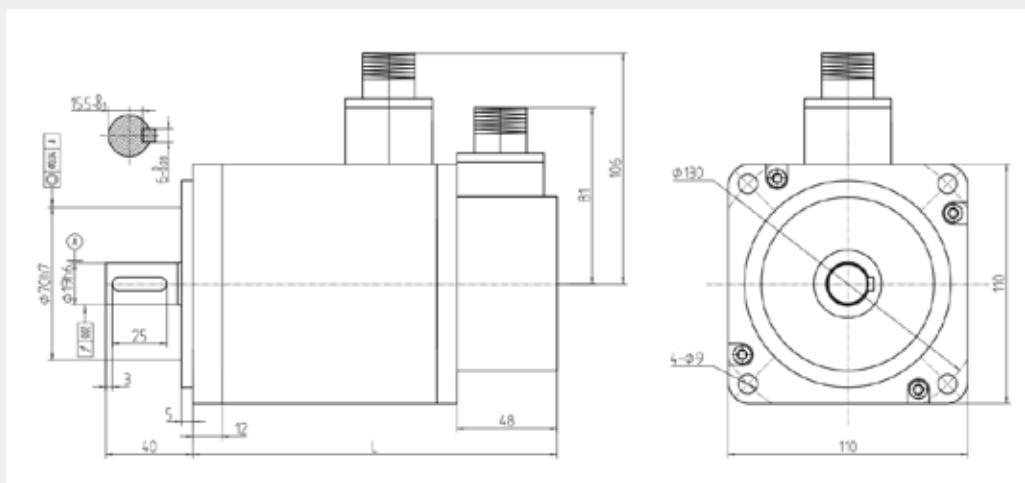
80 系列带制动器交流永磁同步伺服电动机引线式外形图
80 Series AC permanent Magnet synchronous Servo Motor lead shape with Brake



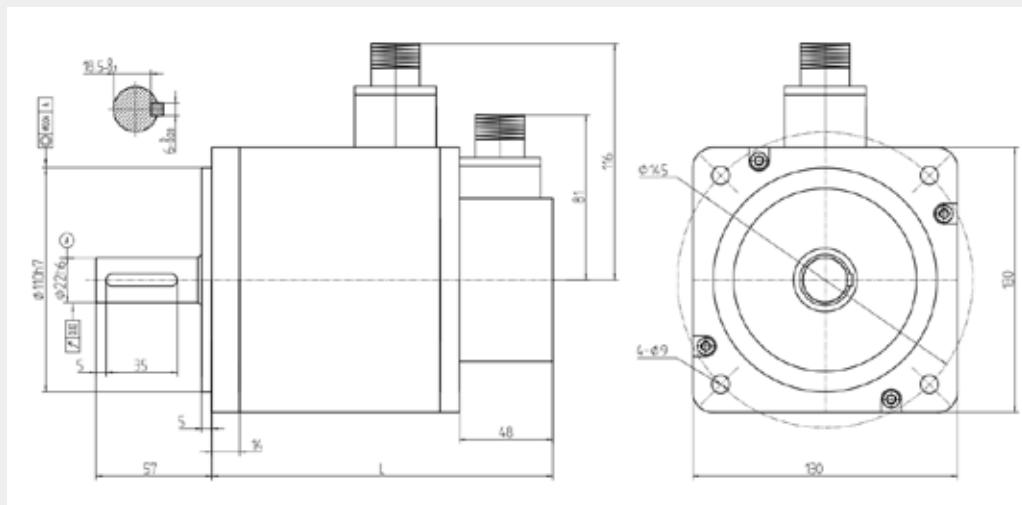
80 系列交流永磁同步伺服电动机航插式外形图
AC plug-in form of 80 series AC permanent-magnet synchronous servo motor



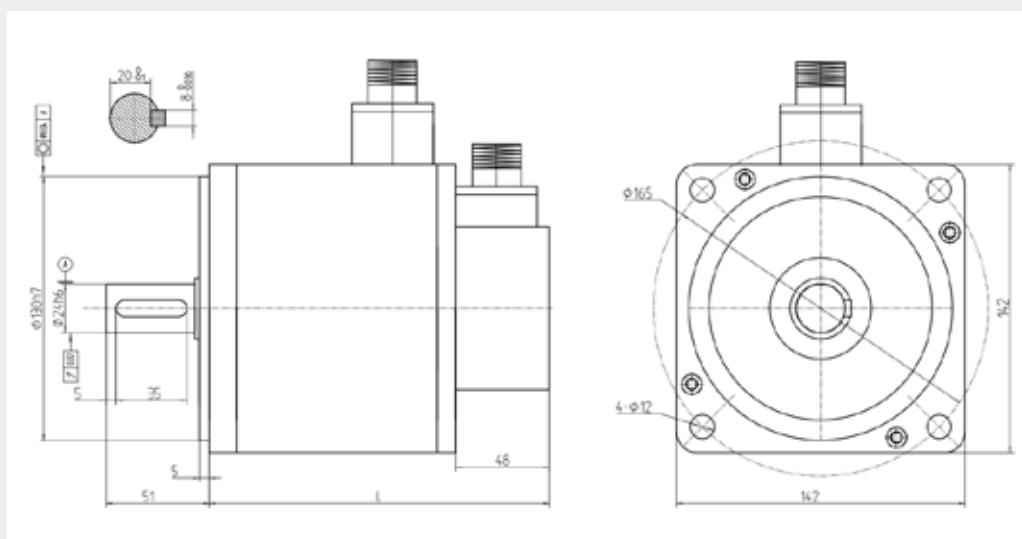
90 系列交流永磁同步伺服电动机引线式外形图
Lead shape of 90 Series AC permanent Magnet synchronous Servo Motor



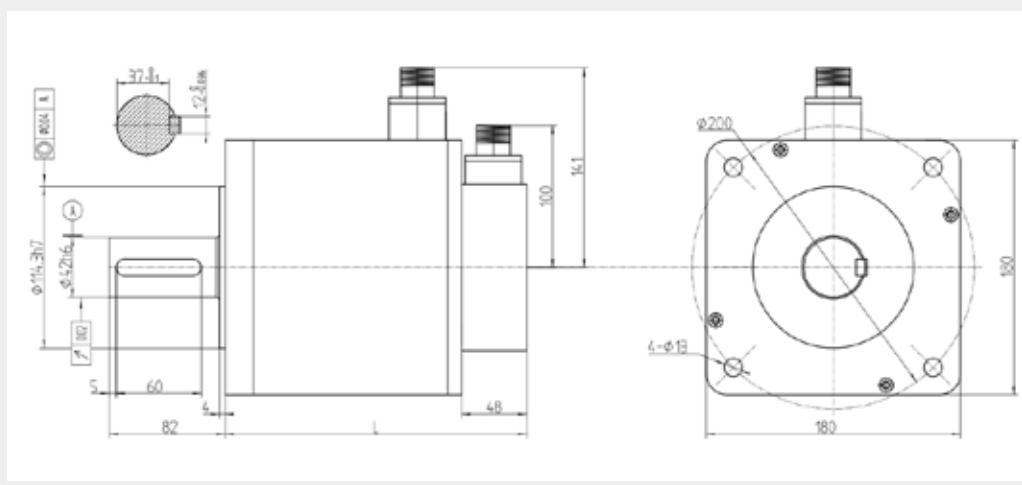
110 系列交流永磁同步伺服电动机外形图
Outline drawing of 110 series AC permanent magnet synchronous servo motor



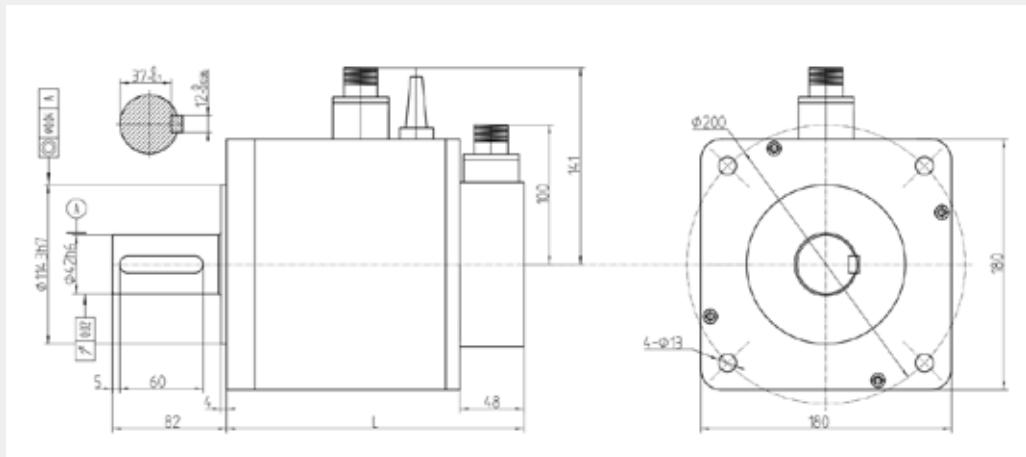
130 系列交流永磁同步伺服电动机外形图
External Diagram of 130 Series AC permanent Magnet synchronous Servo Motor



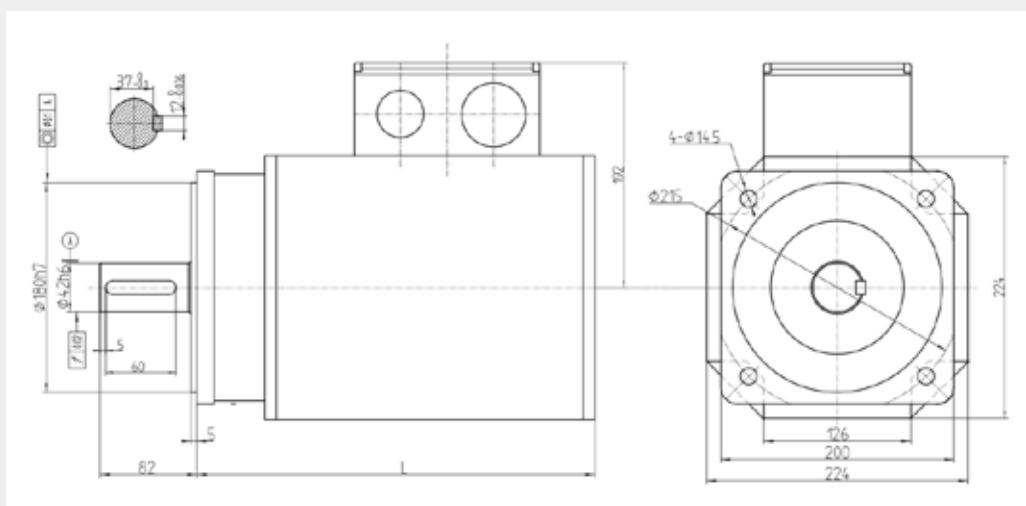
142 系列交流永磁同步伺服电动机外形图
External Diagram of 142 Series AC permanent Magnet synchronous Servo Motor



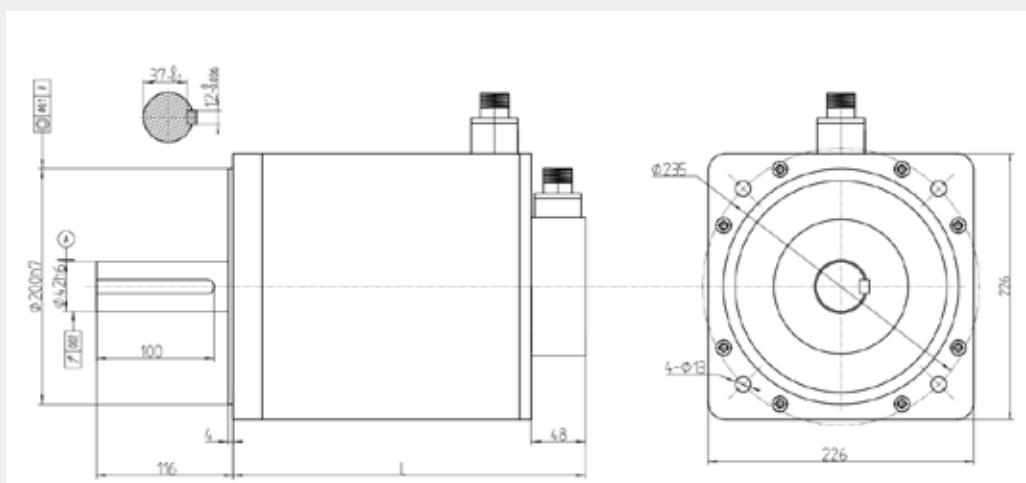
180 系列交流永磁同步伺服电动机外形图
External Diagram of 180 Series AC permanent Magnet synchronous Servo Motor



180 系列带制动器交流永磁同步伺服电动机外形图
External Diagram of 180 Series AC permanent Magnet synchronous Servo Motor with Brake



200 系列交流永磁同步伺服电动机外形图
External Diagram of 200 Series AC permanent Magnet synchronous Servo Motor



230 系列交流永磁同步伺服电动机外形图
External Diagram of 230 Series AC permanent Magnet synchronous Servo Motor

6 绝缘材料及制件

6 Insulating Material and parts

6.1 1070 聚酰亚胺浸渍漆

6.1 Polyimide Impregnating Varnish



产品简介

该漆是由均苯型聚酰胺酸溶于强极性溶剂中配制而成。产品经热烘成型后漆膜光滑、坚硬，具有优异的电气性能，耐高温、耐辐射，主要应用于高温、高辐射环境用电机、电器绝缘绕组的浸渍处理。

Product Introduction

The varnish is made by polypyromelliticimide within polar solvents. The paint film is smooth and hard after hot baking, It has excellent electrical properties, with high temperature, radiation resistance, mainly used for the insulation windings of motors or electric devices in high temperature and high radiation condition.

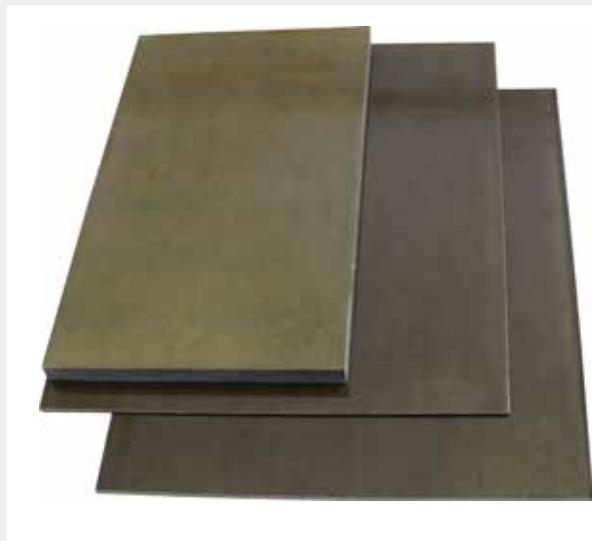
技术指标

Technical Properties

性能 Property		单位 Unit	指标值 Value
固体含量 Solid Content	(180°C ± 2°C, 2h)	%	10±1
粘度 Viscosity	涂 4 #杯 (25°C ± 2°C) 4#Cup (25°C ± 2°C)	s	75 ~ 240
电气强度 Dielectric Strength	常态 Normal	MV / m	≥80
	200°C ± 3°C		≥50
	(23°C ± 2°C) 浸水 24h Water Immersion 24h		≥50
体积电阻率 Volume Resistivity	常态 Normal	Ω·m	≥1.0 × 10 ¹⁴
	200°C ± 3°C		≥1.0 × 10 ¹¹
	(23°C ± 2°C) 浸水 24h Water Immersion 24h		≥1.0 × 10 ¹²

6.2 3270 聚酰亚胺层压板

6.2 Rigid laminated sheet based on Polyimide Resin



产品简介

本产品以电工无碱玻璃布为基材，以聚酰亚胺树脂作为粘合剂经热压而成的层压制品。高温下机械强度高，高湿下电气性能稳定，适用于高温、高辐照环境用电机、电器绝缘零部件。

产品厚度规格：0.25–20mm

Product Introduction

This product is based on electrician non - alkali glass cloth, use Polyimide resin as adhesive by hot pressing into laminated product. High mechanical strength at high temperature, stable electrical performance under high humidity, is suitable for high temperature, high irradiation environment with motor, electrical insulation parts
Thickness:0.25-20mm

技术指标

Technical Properties

性能 Property	单位 Unit	指标值 (2mm) Value(2mm)
弯曲强度 Flexural Strength	MPa	≥350
冲击强度 Impact Strength	kJ / m ²	≥60
表面电阻率 Surface Resistance	常态 Normal	≥1.0 × 10 ¹⁴
	250°C ± 3°C	≥1.0 × 10 ¹³
	(23°C ± 2°C) 浸水 24h Water Immersion 24h	≥1.0 × 10 ¹²
体积电阻率 Volume Resistivity	常态 Normal	≥1.0 × 10 ¹³
	250°C ± 3°C	≥1.0 × 10 ¹¹
	(23°C ± 2°C) 浸水 24h Water Immersion 24h	≥1.0 × 10 ¹⁰
电气强度 Dielectric Strength	常态 Normal	≥45
	250°C ± 3°C	≥40
	(23°C ± 2°C) 浸水 24h Water Immersion 24h	≥30
介质损耗因数 (1MHz) Dielectric Dissipation Factor (1MHz)	—	≤5.0 × 10 ⁻²
相对介电常数 (1MHz) Relative Permittivity (1MHz)	—	3 ~ 4

6.3 2470 聚酰亚胺玻璃漆布

6.3 Glass cloth based on Polyimide Resin



产品简介

由电工无碱玻璃布浸渍聚酰胺酸树脂，经烘干环化而成，具有耐高温、耐辐照、耐腐蚀、耐溶剂的特点，同时还具有优良的介电性能和机械性能，可在 C 级条件下长期使用，适用于电机做槽绝缘和端部衬垫绝缘。

Product Introduction

The product made by the electrician alkali - free glass cloth impregnated with polyamide acid resin then thermal imidization, which is resistant to high temperature, irradiation, corrosion and solvent, also has excellent dielectric and mechanical properties, it can be used for a long time under C-level condition, suitable for groove insulation and end gasket insulation of motor.

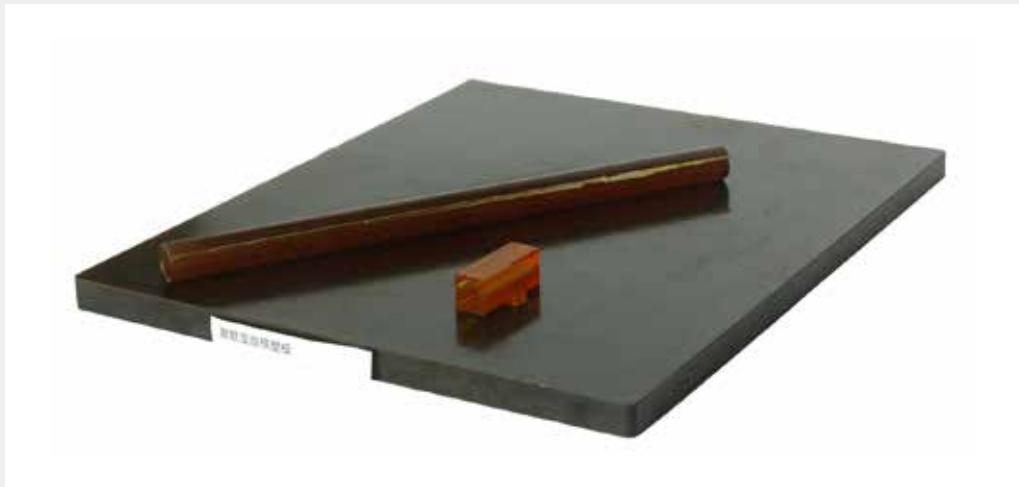
技术指标

Technical Properties

性能 Property	单位 Unit	指标值 Value
厚度 Thickness	mm	0.15 ± 0.02
拉伸强度 Tensile Strength	MPa	≥ 150
体积电阻率 Volume Resistivity	常态 Normal	$\geq 1.0 \times 10^{13}$
	$250^{\circ}\text{C} \pm 3^{\circ}\text{C}$	$\geq 1.0 \times 10^{11}$
	($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) 浸水 24h Water Immersion 24h	$\geq 1.0 \times 10^{10}$
表面电阻率 Surface Resistance	常态 Normal	$\geq 1.0 \times 10^{14}$
	$250^{\circ}\text{C} \pm 3^{\circ}\text{C}$	$\geq 1.0 \times 10^{13}$
	($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) 浸水 24h Water Immersion 24h	$\geq 1.0 \times 10^{12}$
电气强度 Dielectric Strength	常态 Normal	≥ 45
	$250^{\circ}\text{C} \pm 3^{\circ}\text{C}$	≥ 40
	($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) 浸水 24h Water Immersion 24h	≥ 20
吸水性, ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) 浸水 24h Water Absorption, ($23^{\circ}\text{C} \pm 2^{\circ}\text{C}$) Immersion 24h	%	≤ 3.0
介质损耗因数 (1MHz) Dielectric Dissipation Factor (1MHz)	—	$\leq 5.0 \times 10^{-2}$
相对介电常数 (1MHz) Relative Permittivity (1MHz)	—	3 ~ 4

6.4 4670 聚酰亚胺模塑板 / 棒

6.4 Molded Polyimide Sheet or Bar



产品简介

由可熔性聚酰亚胺模塑粉经模压成型制备的板 / 棒材，具有优异的机械强度、刚性和尺寸稳定性，可用于各种机械设备的零部件，同时利用其优异的耐热性、电绝缘性和耐辐照性等特点，可用于制造插头、插座等电子电器零件，以及宇航工业上的耐辐照制品。

Product Introduction

The product is made by molding meltability polyimide molding powder which has excellent mechanical strength, rigidity and dimensional stability, can be used for various mechanical equipment parts .it also can be used as plug, socket and other electronic electrical parts and radiation resistant products in the aerospace industry with its excellent heat resistance, electrical insulation and radiation resistance.

技术指标

Technical Properties

性能 Property	单位 Unit	指标值 Value
拉伸强度 Tensile Strength	MPa	≥80
弯曲强度 Flexural Strength	MPa	≥100
压缩强度 Compression Strength	MPa	≥120
简支梁冲击强度 (无缺口) Charpy Impact Strength	KJ/m ²	≥150
击穿强度 Breakdown Strength	MV/m	≥15
介质损耗角正切值 tan δ	—	(1 ~ 5) × 10 ⁻³
介电常数 Dielectric Constant	—	3.0 ~ 5.0
体积电阻率 Volume Resistivity	Ω·m	≥1.0 × 10 ¹⁵



扫描关注国机集团国际化经营公众号



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