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半导体晶圆/光罩/基板 自动化传输系统整体解决方案

Total Solution for Automated Handling System of Semiconductor Wafers/Masks/Substrates

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上海大族富创得科技股份有限公司
Shanghai Fortrend Technology Co.,Ltd



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COMPANY PROFILE

企业介绍

半导体晶圆/光罩/基板自动化传输系统整体解决方案及核心组件提供商

上海大族富创科技股份有限公司是一家高科技企业、科技小巨人企业、“专精特新”企业，于2017年3月入驻上海市闵行区。全球员工约650人，共有七个子公司和研发中心，总占地面积约68000m²，分别为：浙江大族富创科技有限公司、浙江富创得智能装备有限公司、无锡富创得智能科技有限公司、无锡富创得精密设备有限公司、绵阳大族富创科技有限公司、美国富创得工程公司、马来西亚富创得工程公司。

大族富创得自成立以来深耕于半导体自动化搬运领域的研发、生产和销售，拥有超过45年的技术积累和经验传承，致力于打造以半导体晶圆、光罩、基板自动化搬运系统及其核心组件的整体解决方案，具备全系列产品的客制化能力。在设备前端分选及搬运自动化系统(SORTER/EFEM)、标准机械界面(SMIF)、清洗机&炉管自动化系统(WTS&FTS)、真空传输腔体(VTM)、搬运机器人(Robot)、装载系统(LoadPort)、自动寻边装置(Aligner)、Open Cassette Station (OCS)、超洁净光罩片&EUV自动化系统(Reticle)、全自动化存储系统AMHS (AMR+Stocker+OHT)等设备领域，实现全自主研发、生产，为半导体领域提供具有行业竞争力的定制化整合方案。

Shanghai Fortrend Technology Co., Ltd. is a high-tech enterprise, a “Little Giant” science-and-technology company, and a “Specialized, Refined, Distinctive and Innovative” firm that moved into Shanghai’s Minhang District in March 2017. The group employs roughly 650 people worldwide and operates seven subsidiaries and R&D centers with a combined footprint of about 68,000 m²: Zhejiang Fortrend Technology Co., Ltd., Zhejiang Fortrend Intelligent Equipment Co., Ltd., Wuxi Fortrend Intelligent Technology Co., Ltd., Wuxi Fortrend Precision Equipment Co., Ltd., Mianyang Fortrend Technology Co., Ltd., Fortrend Engineering Corp. (USA), and Fortrend Engineering Sdn. Bhd. (Malaysia).

Since its inception, Fortrend has concentrated on the R&D, manufacture and sale of automation solutions for semiconductor material handling, drawing on more than 45 years of accumulated technology and experience. The company delivers turnkey, fully customizable systems for the automated transport of wafers, photomasks and substrates. Its self-developed product portfolio spans SORTER/EFEM equipment, SMIF (Standard Mechanical Interface) modules, WTS & FTS cleaning/furnace automation, vacuum transfer chambers (VTM), handling robots, LoadPort systems, wafer aligners, Open Cassette Stations (OCS), ultra-clean reticle & EUV automation, and fully automated AMHS storage solutions (AMR + Stocker + OHT), providing the semiconductor industry with competitive, tailored integration packages.

45⁺ 年	7[↑]	100⁺ ↑	6.8⁺ 万m ²
技术积累和经验传承 Tech Accumulation & Experience Transfer	七个子公司和研发中心 Subsidiaries and R&D Bases	全球专利 Global Patents	占地面积 Floor area



ADVANTAGES

企业优势



专注于为客户提供半导体晶圆/光罩/基板自动化传输系统整体解决方案。
We are dedicated to providing comprehensive automated handling solutions for semiconductor wafers, photomasks, and substrates.



遵循严格标准及产品检验,全方位把控产品质量,为客户提供最佳品质保障。
Committed to adhering to stringent standards and conducting comprehensive product inspections, we ensure full - spectrum quality control to provide customers with the best possible quality assurance.



配备百级洁净车间达到500m² (MASK专用), 千级洁净车间达到6000m², 万级洁净车间达到12000m², 产品专注于半导体核心领域, 为产品的高产量和高质量提供了坚实保障。
The site houses 500 m² of Class 100 cleanroom (dedicated to mask processes), 6,000 m² of Class 1,000 cleanroom, and 12,000 m² of Class 10,000 cleanroom. Focused on the core of the semiconductor industry, these facilities provide a solid guarantee for high throughput and superior product quality.



全球员工约650人, 研发人员占比33%, 研发投入占比21%, 拥有专业的技术研发团队和先进的实验室设备, 以技术创新理念服务市场。
With over 650 employees worldwide, 33% of whom are R&D personnel, and an R&D investment ratio of 21%, we possess a professional technical R&D team and advanced laboratory equipment, serving the market with a technology - innovation - oriented philosophy.

SERVICE

服务与支持



销售分为华东/华北/华南/西南/西北5大地区, 在上海/深圳/北京/武汉等近32个本地客服中心, 并逐渐增加中, 总体近130名销售和售后服务人员。
Sales and support are organized across five major regions—East China, North China, South China, Southwest and Northwest—and served by nearly 32 local service centers in cities such as Shanghai, Shenzhen, Beijing and Wuhan, with more being added. In total, the company fields close to 130 sales and after-sales personnel.



我们的服务遍布全球, 构建覆盖世界的服务网络, 以专业团队与前沿技术, 为客户提供全天候、全方位、全领域的最佳体验。
We are dedicated to providing comprehensive automated handling solutions for semiconductor wafers, photomasks, and substrates.

PATENT STRENGTH

专利实力

以技术创新为核心，全球专利超百项

上海大族富创得科技股份有限公司始终坚持以技术创新为核心，公司通过不断的研发投入，成功将创新理念转化为实际应用，已在全球范围内拥有超100多项专利。实现关键核心技术自有自主，体现富创得在半导体行业中技术研发和创新方面的深厚实力，展现产品和服务的独特性和竞争力。

Shanghai Fortrend Technology Co., Ltd. has consistently upheld technological innovation as its core value. The company has successfully transformed innovative concepts into practical applications through continuous R&D investment, and has secured over 100 patents worldwide. This achievement underscores Han's Laser's robust capabilities in technology research and innovation within the semiconductor industry, highlighting the uniqueness and competitive edge of its products and services.

全球认证 Global Certification



TUV认证证书
TUV Certification



TUV认证证书
TUV Certification



UACK认证证书
UACK Certification



SAFES认证证书
SAFES Certification

产品专利 Product Patent



发明专利认证证书
Invention Patent Certification



GLORIES OF COMPANY

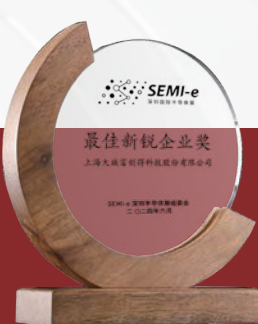
公司荣誉



上海大族富创得科技股份有限公司在技术创新和行业贡献方面获得了广泛认可，荣获了多项重要奖项。包括“中国瞪羚企业TOP1000强”、“闵行区科技小巨人企业”、“高新技术企业”以及“国家级专精特新企业”，此外，上海大族富创得还获得了“湾芯奖-年度企业奖”以及被北方华创评为2025年度“精英合作伙伴”（Elite Partnership Award），这反映了其在富创得卓越的产品性能、领先的核心技术、优质的售后保障及强大的供应链协同能力。

Shanghai Fortrend Technology Co., Ltd. has garnered extensive recognition for its technological innovation and contributions to the industry, receiving numerous prestigious awards. These include "China's Top 1000 Gazelle Enterprises," "Minhang District Technology Little Giant Enterprises," "High-Tech Enterprise," and "National Specialized and New Enterprise." Additionally, the company has been honored with the "Bay Chip Award - Enterprise of the Year" and recognized as the "Elite Partnership Award" by North Microelectronics for 2025, reflecting its exceptional product performance, leading core technologies, high-quality after-sales support, and robust supply chain collaboration capabilities.

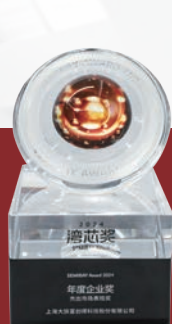
荣誉奖杯 Honorary Trophy



SEMI-e -最佳新锐企业奖
Bay Chip Award - Enterprise of the Year



求是缘-新芯会员
Seeking Truth Is a Bond - New Core Member



湾芯奖-年度企业奖
Bay Chip Award - Enterprise of the Year



北方华创-精英合作伙伴
Elite Partnership Award



中国瞪羚企业TOP1000强
China's Top 1000 Gazelle Enterprises



闵行区科技小巨人企业
Minhang District Technology Little Giant Enterprises



高新技术企业
High-Tech Enterprise



国家级专精特新企业
Specialized and New enterprise

全自动化搬运、存储及核心部件整体解决方案

FULLY AUTOMATED HANDLING, STORAGE, AND CORE-COMPONENT TURNKEY SOLUTION

标准机械界面

-  晶圆标准机械界面
Wafer SMIF
-  150-200mm晶圆自动开盒器
Wafer SMIF Loadport (PLM)

设备前端模块

-  晶圆分选设备
Wafer Sorter
-  晶圆前端自动传输设备
Wafer EFEM
-  槽式清洗机前端自动化设备
WTS
-  立式炉自动化设备
FTS

真空传输设备

-  真空传输平台
VTM
-  真空传输机械手
VTM Transfer Robot
-  真空寻边装置
VTM Aligner

核心部件

-  晶圆/光罩/PLP传输机械手
Wafer/Mask/PLP Robot
-  300mm/Frame晶圆装置平台
Wafer/Frame Loadport
-  OCS/Frame OCS
OCS/Frame OCS
-  玻璃基板装载平台PANEL
Panel PLP Loadport
-  寻边装置
Aligner

光罩搬运系统

-  光罩分选设备
Mask Sorter
-  光罩前端自动传输设备
Mask EFEM
-  光罩标准机械界面
Mask SMIF
-  光罩自动开盒器
Mask SMIF Loadport (PLM)
-  光罩真空传输平台
Mask VTM
-  光罩自动存储系统
Mask Stocker
-  光罩传输机械手
Mask Robot
-  光罩真空传输机械手
Mask Vacuum Transfer Robot

物料自动化搬运及存储系统（AMHS）

-  天车系统
OHT-Overhead Hoist Transport
-  自动搬运机器人
AGV
-  晶圆/光罩存储系统
Wafer/Sorter Stocker
-  空中缓存净化设备
OHBP-Overhead Buffer (Purge)

2010年起获中国专利 久经市场验证



产品介绍

PRODUCT INTRODUCTION

富创得SMIF设备拥有3种机身设计和9种夹钳设计,便于处理盒式、侧斜式、旋转式、平移式cassettes满足各种复杂工况需求;可提供整体解决方案改造计划,软件和硬件配置包括:射频识别 (RFID) 批次跟踪硬件系统、材料物流管理软件、无尘室处理机器人、200mm/300mm自动晶圆和微粒载体开启器等。

Fortrend SMIF equipment features three types of chassis designs and nine types of clamp designs, facilitating the handling of cassettes in box, side-tilted, rotating, and translating styles to meet various complex working conditions; it can provide comprehensive solution transformation plans, flexible software and hardware configurations including: Radio Frequency Identification (RFID) batch tracking hardware systems, material logistics management software, cleanroom handling robots, 200mm/300mm automatic wafer and micro-carrier openers, etc.

产品特点

PRODUCT FEATURES

- 特有的无尘腔体,内循环可达Class1等级洁净度,杜绝开盖过程污染晶圆

Unique dust-free chamber, internal circulation can reach Class 1 level of cleanliness, prevent the lid opening process contamination of the wafer.
- 模块化设计结合多样化客制选项,可适配在不做框架修改的情况下的不同设备

The modular design, combined with a variety of custom options, can be adapted to different equipment without frame modifications.
- 灵活的PIO连接搭配自主研发的软件与宏指令,操作更便捷,易上手

Flexible PIO connection with self-developed software and macro instructions, more convenient operation, easy to use.
- 可选配AMHS通讯方式,满足多样化传输需求

AMHS communication mode is optional to meet diverse transfer needs.

规格参数

SPECIFICATIONS PARAMETER

可选型号 Models	PLUS500S / PLUS500R / PLUS500Sx / PLUS500Cx / PLUS500F / PLUS500Ux / PLUS500Sd / PLUS500TX
适用载具类型 Applicable Carrier Types	150/200 mm SMIF Pod (SEMI)
载具负载高度 Carrier Load Height	900 毫米(可根据需求调整) 900 mm (adjustable on demand)
洁净度 Cleanliness	Class 1 (ISO-Class 3)
通讯方式 Comm Mode	并行 I/O (SEMI E23-96) 8 路输入/输出或 EIA-RS232 (SECS I/II) ,网口TCP/IP Parallel I/O (SEMI E23-96) 8 in / 8 out or EIA-RS232 (SECS I/II)/Ethernet TCP/IP
循环周期 Cycle Time	< 90 秒 (包括倾斜和侧向移动) < 90 s (including tilt and lateral motion)
Lot ID读取方式 Lot ID Reader	智能标签 / RFID 标签 Smart Label / RFID Tag
Gripper轴定位精度 Axis - Gripper Positioning Accuracy	± 0.1 mm

Arm Elevator轴定位精度 Axis - Arm Elevator Positioning Accuracy	± 0.1 mm
Arm Extent轴定位精度 Axis - Arm Extent Positioning Accuracy	± 0.1 mm
Tilt轴定位精度 Axis - Tilt Positioning Accuracy	± 0.1 mm
Wrist轴定位精度 Axis - Wrist Positioning Accuracy	± 0.1 mm
平均故障间隔时间 MTBF	2000 小时
正常工作时间 Up time	≥ 99.5%
通讯协议 Communication Protocol	ASCII/SECS/Fortrend-HEX/Parallel I/O ASCII/SECS/Fortrend-HEX/Parallel I/O
通讯接口 Communication Interface	串口(DB9)/网口(RJ45) Serial Port (DB9) / Ethernet Port (RJ45)

150-200mm晶圆自动开盒器

150-200MM SMIF POD



产品介绍

PRODUCT INTRODUCTION

PLM是较为成熟的开盒器，所搭载传感器兼容6寸与8寸的晶圆开盒检测，可以精确检测POD盒中晶圆状态。PLM可与多种设备对接，丰富的功能选配为客户产线升级提供了更多的解决方案。

PLM is a mature wafer opener that is equipped with sensors compatible with both 6-inch and 8-inch wafer unpacking and inspection, capable of accurately detecting the status of wafers in POD boxes. PLM can interface with a variety of equipment, and its rich selection of optional features provides more solutions for customer production line upgrades.

产品特点

PRODUCT FEATURES

■ 标准PLM-200W设备、完全符合SEMI标准,具有高通用性、高兼容性

Standard LoadPort Universal equipment , fully compliant with SEMI standards, with high versatility, high compatibility.

■ 载料类型:SMIF POD可装载兼容 6" 8" 晶圆

Loading type: SMIF POD is compatible with 6" and 8" wafers.

■ 内置原厂Mapping系统,可进行叠片、斜片、凸片等检测,杜绝整合品圆传输中的撞片问题

Built-in original factory mapping system enables the detection of overlapping, skewed, and protruding wafers, effectively preventing wafer collisions during integrated wafer transportation.

■ 可选配多种客制化组件:Info Pad Sensor;E84接口;Adapter 实现Open cassette 上料形式,灵活应对不同工况需求

Optional customization components are available: Info Pad Sensor; E84 interface; Adapter to implement the open cassette loading method, flexibly meeting various working condition requirements.

规格参数

SPECIFICATIONS PARAMETER

设备尺寸 Equipment dimension	长 426 mm* 宽 468mm* 高 775 mm L 421mm* W 364mm* H815 mm
设备重量 Equipment weight	40 千克 (依配置决定) 40kg (Decide by config)
额定电压 Rated voltage	DC 24 V DC 24 V
额定功率 Rated power	60 W 60 W
主体材质 Body material	铝合金、不锈钢 (SUS 304) Aluminum, Stainless steel (SUS 304)
适用载具类型 Applicable carrier types	150/200mm POD(SEMI) 150/200mm POD(SEMI)
通讯接口 Communication interface	串口 EIA-RS232C, Parallel, I/O, 网口TCP/IP Serial EIA-RS232C, Parallel I/O,Ethernet TCP/IP
通讯协议 Communication protocol	HEX, SECS, ASC II

洁净度 Cleanliness	Class 1 @ 0.1μm Class 1 @ 0.1μm
晶圆盒界面 Wafer box interface	SEMI E19.4 SEMI E19.4
载入循环 Load loop	负压: -80 kPa (Ø6 气体接口) Vacuum: -80 kPa (Ø6 air tube)
移出循环 Removal loop	正压: 0.5 ~ 0.6 MPa (Ø6 气体接口) Positive pressure: 0.5 ~ 0.6 MPa (Ø6 air tube)
选配选项 Optional Components	150/200mm 开盒检测传感器配置 150/200mm Open box to detect sensor configuration
	E84 电控模组选配 E84 Electric control module selection
	通讯协议选择 HEX/SECS/ ASC II Communication protocol module selection HEX/SECS/ASC II
	ID 读写装置选配 RFID ID read/write device with RFID module or IR Link

晶圆分选设备/设备前端自动化模块

WAFER SORTER/EFEM

产品介绍 PRODUCT INTRODUCTION

晶圆分选设备 (Sorter) 和前端自动化传输模块 (EFEM) 是集成电路制造的重要设备和组成部分, 广泛应用于半导体制造过程及工艺设备、检测设备等制程设备当中, 是实现集成电路自动化生产的核心模块。富创得已实现Sorter/EFEM产品一级模组全自主自研, 攻克了多项核心技术, 拥有自主知识产权, 并能够满足半导体及泛半导体客户的量产及高度客制化定制需求。

Wafer Sorter and front-end automation transfer modules are crucial equipment and integral components in the manufacturing of integrated circuits, extensively used in the semiconductor manufacturing process, as well as in process and inspection equipment. They are the core modules for achieving automated production of integrated circuits. Fortrend has independently developed first-tier modules for Sorter/EFEM products, overcoming multiple core technologies, holding proprietary intellectual property rights, and is capable of meeting the mass production and highly customized needs of semiconductor and broader semiconductor industry clients.



产品特点 PRODUCT FEATURES

■ 富创得晶圆分选机主要应用于晶圆的高效转移、分选、合并等, 具备独立完整性

Fortrend wafer sorter is primarily used for efficient transfer, sorting, and merging of wafers, and it has independent integrity.

■ 富创得设备前端自动化模块主要应用于各工艺制程设备的对接, 满足客制化定制需求

Fortrend front-end automation modules are primarily used for interfacing with various process equipment to meet customized requirements.

■ 采用模块化设计, 内部洁净度可达到ISO Class 1, 可适应不同尺寸、类型的晶圆。具备高洁净度; 高兼容性等特点

Adopting a modular design, the internal cleanliness can reach ISO Class 1, adaptable to wafers of different sizes and types. It features high cleanliness and high compatibility.

■ 可以兼容所有符合SEMI标准的FOUP、FOSB、SMIF POD和Cassette

It is compatible with all SEMI-standard FOUPs, FOSBs, SMIF PODs, and Cassettes.

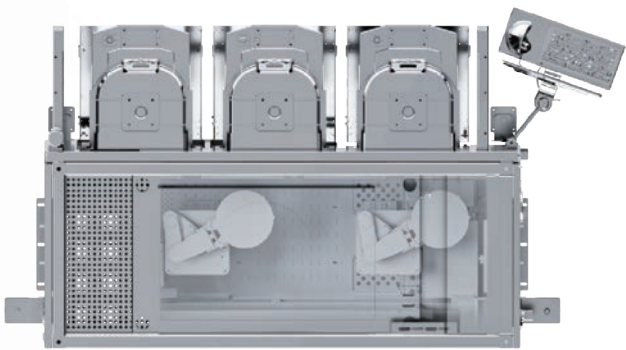
上料口可选配模组

Feeding Port with Optional Module



可选特殊模组

Feeding Port with Optional Module

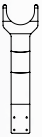


上料口可选配模组

Feeding Port with Optional Module



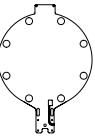
真空型FORK —Y型
Vacuum FORK -- Y type



真空型FORK —一字型
Vacuum FORK - One font



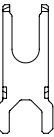
非接触式伯努利
Non-Contact Bernoulli



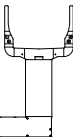
接触式伯努利
Contact Bernoulli



夹持型 (6/8/12 FOUP 选配)
Clamp type (optional on 6/8/12)



夹持型 Frame FORK
Clamp type FrameFORK



清洗机晶圆传输存储系统

WET WAFER TRANSFER & STORAGE SYSTEM



规格参数 SPECIFICATIONS PARAMETER

设备尺寸 Equipment dimension	长 2600 * 宽 2100 * 高 3080 mm L 2600* W 2100* H 3080 mm
设备重量 Equipment weight	4500kg (依配置决定) 4500kg (Decide by config)
额定电压 Rated voltage	单相 AC 220V 50 Hz Single Phase AC 220V 50 Hz
额定功率 Rated power	9.9 kW 9.9 kW
主体材质 Body material	喷涂碳钢 (RAL 9003) Painted SPCC (RAL 9003)
通讯接口 Comm interface	RJ 45 RJ 45
通讯协议 Comm protocol	HEX HEX

产品介绍 PRODUCT INTRODUCTION

12寸槽式清洗晶圆传输系统主要由洁净晶圆盒机械手、晶圆盒移栽台、晶圆盒搬运对接模块、批量晶圆传输系统、存储单元、监控系统、控制系统组成一个高洁净度的晶圆盒存储及晶圆传输系统。晶圆盒存储与晶圆搬运的应用在半导体生产工序及工序之间半成品的晶圆盒及晶圆的搬运、存储，能够实现对芯片晶圆的高效、高可靠性、高安全性、高准确的管理和处理可以在晶圆生产过程中进行晶圆存储、对接过程中实现全自动化运行，提升晶圆存储及制造的效率。

The 12-inch slot-type wafer cleaning and transportation system mainly consists of a clean wafer cassette manipulator, wafer cassette transfer platform, wafer cassette handling docking module, batch wafer transportation system, storage unit, monitoring system, and control system, forming a high-purity wafer cassette storage and wafer transportation system. The application of wafer cassette storage and wafer handling is in the transportation and storage of wafer cassettes and wafers between semiconductor production processes and procedures, enabling efficient, highly reliable, secure, and accurate management and processing of chip wafers. It can perform wafer storage during the wafer production process and achieve fully automated operation during docking processes, thereby improving the efficiency of wafer storage and manufacturing.

产品特点 PECIFICATION PARAMETER

- 兼容各种品牌晶圆盒在机台内搬运
Compatible with various brands of wafer cassettes for transportation within the machine.
- 安全的3轴机械手臂设计配合晶圆和固定夹持机构
A safe 3-axis robotic arm design with a wafer and fixed gripping mechanism.
- 通过pusher与HV模组组合动作，实现晶圆从水平变切换到垂直状态，可实现2盒晶圆的组合，，并通过不同的recipe配置，实现不同wafer方向变化
By combining the actions of the pusher with the HV module, the wafer spacing is adjusted to 5mm, and different recipe configurations are used to achieve variations in wafer orientation.
- 整合EFEM与储存工位，搭配富创得自主研发的控制系统,可解决如槽式清洗机、炉管、离子注入机等复杂工艺流程的晶圆暂存和吞吐不畅等问题
Integrating EFEM with storage workstations, and equipped with Fortrend's self-developed control system, it can address issues such as wafer temporary storage and inadequate throughput in complex process flows like slot cleaning machines, furnace tubes, and ion implanters.

晶圆接触材质 Wafer contact material	聚醚醚酮 / 特氟龙 不同模块接触材质有所区分 PEEK / PTFE Different modules have different contact materials
适用载具类型 Applicable carrier types	300mm FOUP (SEMI) 300mm FOUP (SEMI)
适用晶圆材质 Applicable wafer materials	单晶硅 Si
适用晶圆规格 Applicable specif types	直径 300 mm / 厚度 775 μm ± 25μm Dia. 300 mm / Thick. 775 μm ± 25 μm
平均故障修复时间 MTTR	< 4 小时 < 4H
平均故障间隔时间 MTBF	1500 小时 1500H
气体压力供应 Gas pressure supply	负压: - 80 kPa, >10LPM(Ø8 气体接口) 正压: 0.5 ~ 0.7 MPa, >10LPM(Ø16 气体接口) Negative pressure: -80 kPa, >10LPM(Ø8 gas interface) Positive pressure: 0.5 ~ 0.7 MPa, >10LPM(Ø16 gas interface)

晶圆立式炉管自动化传输系统

VERTICAL WAFER FURNACE AUTOMATED TRANSFER SYSTEM



产品介绍

PRODUCT INTRODUCTION

立式炉管设备是集成电路工艺制程中的一种关键热处理设备，具有占地面积小、污染低、温度均匀稳定等优点，工艺包含氧化、扩散、退火、合金和低压化学气相沉积等，属于晶圆制造厂需求量较多的工艺设备。FTS作为立式炉管的模块之一与反应室、真空系统、工艺气路系统等集成一体；主要应用与氧化、退火和LPCVD沉积，这些是半导体制造的核心。

The vertical furnace tube equipment is a key thermal processing device in the integrated circuit process sequence. It features a small footprint, low contamination, and uniform and stable temperature. The processes it supports include oxidation, diffusion, annealing, alloying, and low - pressure chemical vapor deposition (LPCVD). It is one of the process devices with high demand in wafer - making factories. The FTS, as a module of the vertical furnace tube, is integrated with the reaction chamber, vacuum system, and process gas - supply system. It is mainly used for oxidation, annealing, and LPCVD deposition, which are at the core of semiconductor manufacturing.

产品特点

PECIFICATION PARAMETER

■ FTS系统通过闭环气路设计，有效抑制腔体内氧含量波动，保障薄膜沉积环境纯净

The FTS system uses a closed-loop gas circuit to suppress oxygen fluctuation inside the chamber, ensuring a pristine film-deposition environment.

■ 采用自主温控模块，实现腔体温度均匀分布，满足氧化、退火等高温工艺需求

An in-house temperature-control module guarantees even chamber temperature, meeting the demands of high-temperature processes such as oxidation and annealing.

■ 集成颗粒过滤与干式等离子清洗功能，减少污染源，延长维护周期

Integrated particle filtration and dry-plasma cleaning reduce contamination sources and extend maintenance intervals.

■ 支持GEM300标准通信协议，兼容人工与自动化上下料，具备Mapping与ID识别功能，操作便捷

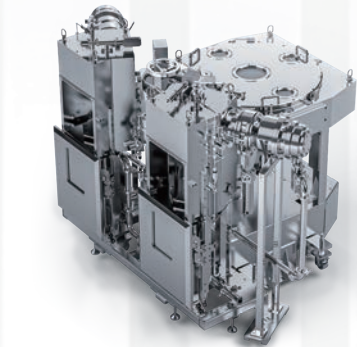
GEM300-compliant, the system supports both manual and automated loading/unloading, offers wafer mapping and ID recognition, and enables convenient operation.

规格参数

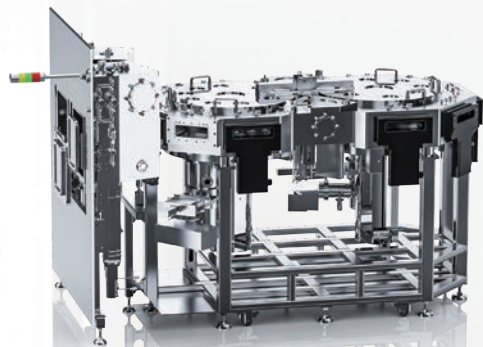
SPECIFICATIONS PARAMETER

额定电压 Equipment dimension	单相AC220V 50HZ L 2600* W 2100* H 3080 mm
额定功率 Equipment weight	额定功率8.8KW 4500kg (Decide by config)
通讯接口 Rated voltage	RJ45XXXX Single Phase AC 220V 50 Hz
通讯协议 Rated power	HEX 9.9 kW
负压 Body material	-70-80kpa Painted SPCC (RAL 9003)
进气口 Comm interface	φ6 RJ 45
正压 Comm protocol	0.5-0.7Mpa HEX

晶圆接触材质 Wafer contact material	聚醚醚酮 / 特氟龙 不同模块接触材质有所区分 PEEK / PTFE Different modules have different contact materials
适用载具类型 Applicable carrier types	300mm FOUP (SEMI) 300mm FOUP (SEMI)
适用晶圆材质 Applicable wafer materials	单晶硅 Si
适用晶圆规格 Applicable specif types	直径 300 mm / 厚度 775 μm ± 25μm Dia. 300 mm / Thick. 775 μm ± 25 μm
平均故障修复时间 MTTR	< 4 小时 < 4H
平均故障间隔时间 MTBF	1500 小时 1500H
特殊机手臂 Special Robot Arm	4+1变间距机械手 4+1 Variable Spacing Robot Arm



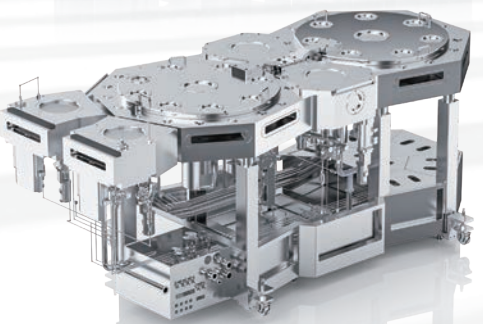
五边形真空传输系统



8寸八字形真空传输系统



12寸五边形双入料真空传输系统



12寸八字形真空传输系统

产品介绍

PRODUCT INTRODUCTION

真空传输系统核心组件均由富创得自主设计研发,并在自有生产基地组装生产,实现更好的交期与性能

The core components of the vacuum transfer system are independently designed and developed by Fortrend, and assembled and produced at its own production base, achieving better delivery times and performance.

富创得深耕半导体传输领域四十余年,设备适配半导体前道工艺多数制程。所有量产设备均符合SEMI标准,适配各种晶圆/掩膜等半导体/泛半导体物料工艺设备的工况需求

Fortrend has been deeply involved in the semiconductor transfer field for over forty years, with equipment adapted to most semiconductor front-end processes. All production equipment complies with SEMI standards and adapts to the process requirements of various semiconductor/microelectronic material processing equipment, such as wafers/masks.

真空传输系统可提供标准方案供制程设备进行对接,也可根据客户要求进行设备的客制化,软硬件均有成熟方案可供选择,满足不同的制程设备与实际工况的需求

Fortrend vacuum transfer systems can provide standard solutions for process equipment integration and can also be customized according to customer requirements. Both software and hardware have mature solutions to choose from, meeting the needs of different process equipment and actual operating conditions.

三段式整合方案

THREE-STAGE INTEGRATION PLAN

真空机械手
Vacuum Robot

真空机械手
Vacuum Robot



客制化机械手
Customized Robot



锁定腔体
Load Lock

12" Load Lock



8" Load Lock



客制化 Load Lock
Customized Load Lock



完全客制化设备
Fully customized equipment

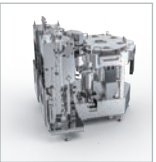


真空传输腔体
Vacuum Transfer Chamber

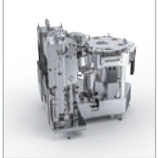
标准型传输腔体
Standard transfer chamber



四边标准真空传输模组



五边标准真空传输模组



六边标准真空传输模组



七边标准真空传输模组

设备前端模组
EFEM/SMIF

12"EFEM



8"SMIF



设备前端可选配EFEM/SMIF,EFEM可提供标准型与客制型

The equipment front end can optionally be equipped with an EFEM or SMIF , The EFEM is available in both standard and customized types.

Load Lock可选不同结构与传输方式

The Load Lock is available with different structures and transfer methods.

可根据实际工艺腔要求制作客制化传输腔体

Customized transfer chambers can be designed to meet the specific requirements of the process chambers.

真空机械手可根据实际工况选择不同型号与末端执行器

Vacuum robots can be selected in different models and end effectors based on actual operating conditions.

传输腔体与Load Lock可选内置的定向/冷却/预热模组

The transfer chamber and Load Lock can be optionally equipped with built-in modules for orientation, cooling, and preheating.

可选配的AWC功能、Buffer 功能、晶圆存储模组

Optional AWC (Automatic Wafer Centering) function, Buffer function, and wafer storage module.



产品介绍PRODUCT INTRODUCTION

该产品采用磁流体密封, 具有先进的碰撞防护功能, 广泛应用于ETCH、PVD、PECVD、MOCVD等半导体设备。主要应用于采用了高端制造工艺的芯片制程, 实现晶圆在各个工艺腔室间的传送, 具有真空度高, 传输效率高, 负载能力强, 耐高温等特点, 大大提高了芯片生产制造的良率和效率, 是芯片制造装备的关键产品。PIONEER 系列机械手满足用户个性化定制, 提供从机械臂到末端手指的全面定制方案, 为客户提供与生产工艺匹配的最优传输解决方案。

The product features magnetic-fluid sealing and advanced collision protection, and is widely used in semiconductor equipment such as ETCH, PVD, PECVD, and MOCVD. It is primarily applied in chip manufacturing processes that utilize high-end fabrication technologies, enabling the transfer of wafers between various process chambers. With advantages such as high vacuum level, high transfer efficiency, strong load capacity, and high temperature resistance, it significantly enhances the yield and efficiency of chip production, making it a key component in semiconductor manufacturing equipment. The PIONEER series robotic arms support personalized customization, offering comprehensive solutions ranging from the robotic arm itself to the end-effector fingers, providing customers with the optimal transfer solution that best matches their production processes.

产品特点PRODUCT FEATURES

■ 高真空度 , 空高洁净度传输, 避免晶圆受到空气、杂质、离子等污染;

High vacuum degree, high air cleanliness transmission, avoiding wafer contamination by air, impurities, ions, etc;

■ 具有碰撞保护系统以及AWC纠偏功能,最大限度的保护了机械手和晶圆;

With collision protection system and AWC (Active Wafer Centering) correction function, it provides maximum protection for the robot and wafer.

■ 被广泛应用于PVD、CVD、ALD、PECVD、MOCVD等工艺设备, 具有很强的工艺适用性, 支持客户化定制;

It is widely used in PVD, PVD, ALD, PECVD, MOCVD and other process equipment, with strong process applicability and support customized customization;

规格参数SPECIFICATIONS PARAMETER

晶圆尺寸 Wafer Size		100mm,200mm,300mm
重复定位精度 Repeat positioning accuracy	R轴 R-axis	±0.05mm
	T轴 T-axis	±0.005 °
	Z轴 Z-axis	±0.05mm
耐真空度 Vacuum resistance		10-6 Pa
漏率 Leak rate		5x10-9 Pa.m3/sec He (Base Vacuum 5x10E-4Pa)
通讯协议 Communication protocol		TCP/ASCII
通讯方式 Communication method		EtherNet

洁净等级 Cleanliness Level		ISO Class 1
本体+手臂重量 Weight of Base and Arm		<50kg
工作温度 Operating Temperature		<60°(高温可订制) <60°C (High temp version customizable)
负载重量 Load Capacity		≤4kg (including end-effect and wrist)
轴数 Number of Axes		3轴 4轴 3-axis 4-axis
运动范围 Motion Range	R轴 R-axis	根据实际工位及手指定制 Customized according to actual station and finger dimensions
	T轴 T-axis	±360 °
	Z轴 Z-axis	35mm、100mm、150mm (Z轴高度可定制) Z-axis height can be customized

真空寻边器

VTM ALIGNER

产品介绍

PRODUCT INTRODUCTION

该产品采用磁流体密封,具有先进的算法校准功能,广泛应用于ETCH、PVD、PECVD、MOCVD等半导体设备。主要应用于采用了高端制造工艺的芯片制程,实现在真空环境下精确、快速地找到晶圆的中心位置和缺口(Notch)和平边(Flat)的朝向,具有高精度、高速旋转、高可靠性、紧凑设计和智能算法等特点,大大提高了芯片生产制造的良率和效率,是芯片制造装备的关键产品。寻边器满足用户个性化定制,提供兼容4、6、8、12寸晶圆寻边校准解决方案。

This product adopts magnetic fluid sealing and features advanced algorithm calibration functions. It is widely used in semiconductor equipment such as ETCH, PVD, PECVD, and MOCVD. It is mainly applied in chip manufacturing processes that adopt advanced manufacturing techniques, achieving precise and rapid identification of the center position of wafers and the orientation of notches and flats in a vacuum environment. It has the characteristics of high precision, high-speed rotation, high reliability, compact design, and intelligent algorithms, significantly improving the yield and efficiency of chip production. It is a key product in chip manufacturing equipment. Series edge finders meet users' personalized customization requirements, are built-in, and provide compatible 4, 6, 8,12-inch wafer edge finding and calibration solutions.



■ 精密运动控制:核心硬件采用直接伺服电机和高精度编码器,搭配先进算法,保证平稳运行和精确校准

Precision Motion Control: Core hardware utilizes direct-drive servo motors and high-precision encoders, combined with advanced algorithms to ensure smooth operation and accurate calibration.

■ 模块化深度定制:可定制旋转组件高度/负载/接触方式/接触晶圆材料,兼容半导体洁净环境,支持校准4,6,8寸晶圆

Diverse functional configuration options are available to meet a wide range of working conditions

规格参数

SPECIFICATIONS PARAMETER

机身尺寸 Machine Dimensions	H 1424 mm * W 796 mm * L 732mm Height 1424 mm * Width 796 mm * Length 732 mm
整备质量 Total Weight	100 kg ± 1 kg (依配置不同而变化) Total Weight 100 kg ± 1 kg (varies depending on configuration)
额定电压 Rated Voltage	DC 24 V DC 24 V
额定电流 Rated Current	8 A 8 A
额定功率 Rated Power	192 W 192 W
通讯方式 Communication Method	串口通讯RS-232C,并行通讯I/O Serial Communication RS-232C, Parallel I/O
通讯协议 Communication Protocol	HEX, ASCII HEX, ASCII
载体尺寸 Carrier Dimensions	符合SEMI标准的Panel FOUP Compliant with SEMI standards for Panel FOUP

真空传输LOAD LOCK设备

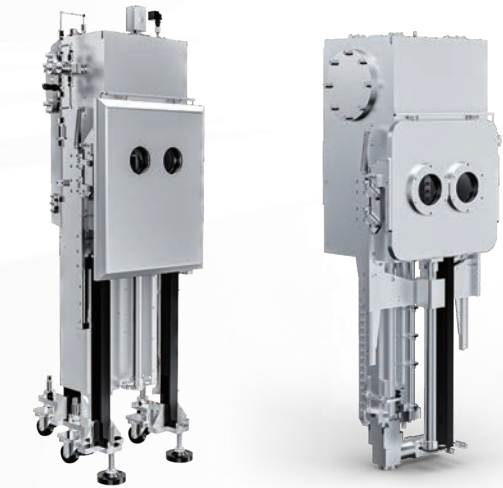
VACUUM LOAD LOCK TRANSFER EQUIPMENT

产品介绍

PRODUCT INTRODUCTION

该产品为晶圆真空传输LoadLock设备,具备高精度晶圆传输与环境隔离功能,广泛适配ETCH、PVD、PECVD、MOCVD等半导体制程设备,主要服务于6、8寸晶圆的高端制造场景,实现洁净环境与真空环境间的晶圆高效转运。LoadLock满足用户个性化定制,提供兼容6,8寸晶圆传输的解决方案。

This Vacuum Load Lock Transfer System delivers high-precision wafer handling and environmental isolation, seamlessly interfacing with ETCH, PVD, PECVD and MOCVD process tools. Designed for 6" and 8" wafers in advanced fabs, it enables rapid, contamination-free transfer between atmospheric and vacuum environments. The unit supports user-specific configurations and turnkey 6"/8" solutions.



■ 模块化深度定制:可定制旋转组件高度/负载/接触方式/接触晶圆材料,兼容半导体洁净环境,支持校准4,6,8寸晶圆

Modular deep customization: height, load, contact method, and wafer-touching materials can all be tailored; compatible with semiconductor clean environments and supports alignment of 4", 6", and 8" wafers.

■ 设备采用高密封性结构设计一体式铝腔体,兼具结构强度与便捷维护性;配合高密封性结构设计,漏率<1.0×10⁻⁹ Pa·m³/s,并维持ISO Class 1洁净等级,从根源上保障晶圆传输的洁净度。Class 1洁净等级,从根源上保障晶圆传输的洁净度

The unit uses a high-sealing, one-piece aluminum chamber that combines structural rigidity with easy maintenance; leakage rate <1.0×10⁻⁹ Pa·m³/s and sustained ISO Class 1 cleanliness, guaranteeing wafer-transfer purity at the source.

规格参数

SPECIFICATIONS PARAMETER

适用晶圆尺寸 Applicable Wafer Size	150MM/200MM
片盒规格 Cassette Specification	SEMI标准25槽CASSETTE SEMI-standard 25-slot cassette
升降轴Z轴行程 Z-axis Travel Range	346
升降轴Z轴精度 Z-axis Positioning Accuracy	±0.1
MAPPING速度 Wafer Mapping Speed	<=20S
自动开关门时间 Auto Door Cycle Time	开门10S,关门10S Door open 10 s, door close 10 s
通讯方式 Communication Protocol	RS232
洁净等级 Cleanliness Class	ISO Class1

光罩分选设备/设备前端自动化模块(SORTER/EFEM)

MASK SORTER/EFEM

产品介绍 PRODUCT INTRODUCTION

光罩分选设备 (Mask Sorter) 支持将各种Shipping Box 的Mask/Reticle 传输到生产工艺载具 (Canon/Nikon/RSP等) 满足倒片转换功能;光罩设备前端自动化模块 (Mask EFEM) 适用于传输并对接Mask/Reticle的工艺制程设备,腔体内部的洁净等级可达到 ISO Class 1,整机可搭配多种形式的开盒模组,对中、翻转、扫码、目检、缓存等功能机构,可自定义编辑任意传片路径,支持客制化选配定制。

Mask Sorter supports the transfer of various Shipping Box Masks/Reticles to production process carriers (Canon/Nikon/RSP, etc.) to meet the function of wafer flipping; the Mask Front-end Automation Module (Mask EFEM) is suitable for transferring and interfacing with Mask/Reticle process equipment, with an internal cleanliness level that can reach ISO Class 1. The entire machine can be equipped with various forms of box-opening modules, alignment, flipping, scanning, inspection, caching, and other functional mechanisms, allowing for the customization and editing of any wafer transfer path, and supporting customized options and configurations.



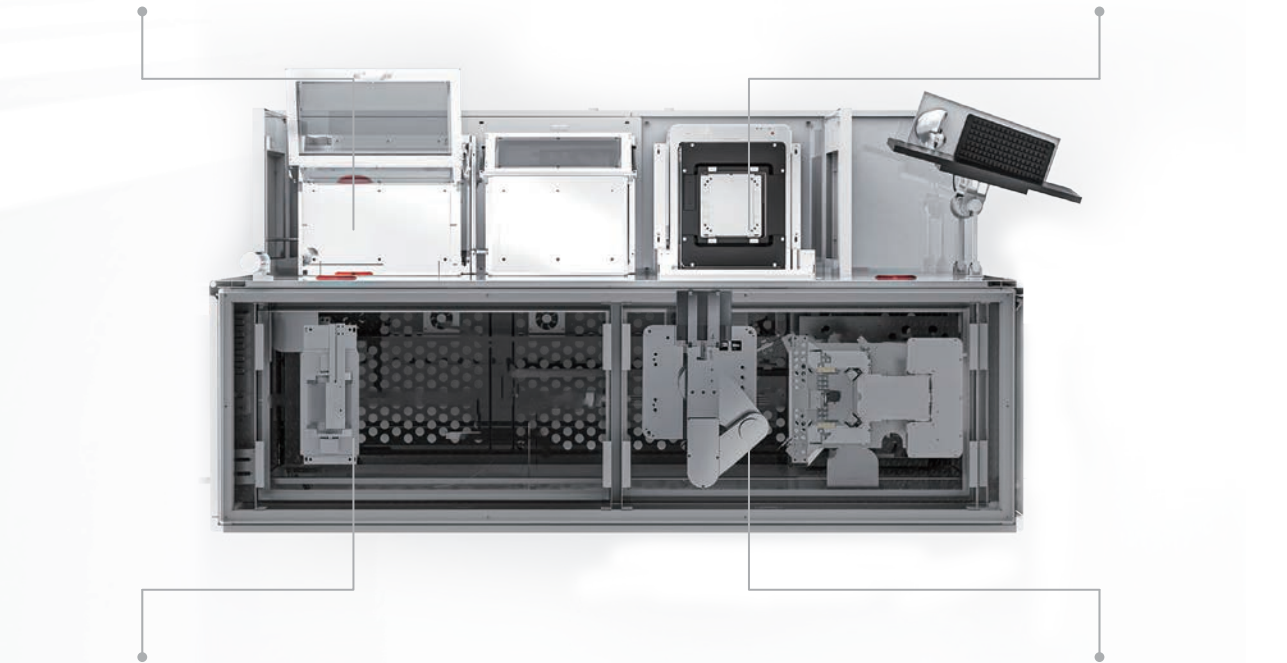
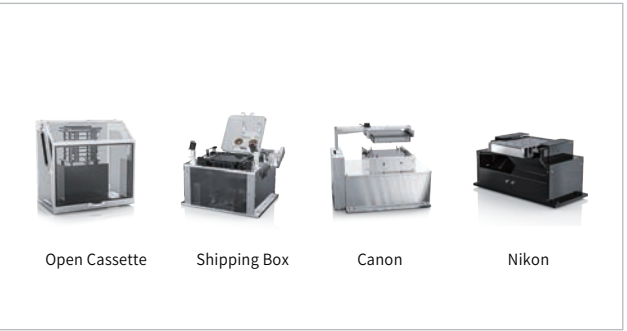
产品特点 PRODUCT FEATURES

- 可实现全自动化载具更换,运输盒(Hoya、ShinEtsu、Nikon、Canno等)之间和RSP光照盒 (RSP150/RSP200/RSP EUV) 之间转换
Fully automated cassette exchange enables seamless transfers among all standard carriers (Hoya, Shin-Etsu, Nikon, Canon, etc.) and RSP light-tight pods (RSP150 / RSP200 / RSP EUV).
- 可客制化机械手搭配光罩片末端执行器,满足各种复杂的应用场景,包括Reticle、Mask、Pellicle
Customizable robotic arms equipped with reticle handling end-effectors to meet various complex application scenarios, including reticles, masks, and pellicles.
- 可配置Turntable模组满足Mask/Reticle 的水平360°旋转和正反面翻转功能,并实现精确对准Mask ID/Pellicle ID的读码功能
Configurable turntable module for 360° horizontal rotation and flip of Mask/Reticle, with precise alignment and reading of Mask ID/Pellicle ID.
- 可配置人工目检装置,风刀模组等,实现光罩片目检功能和表面颗粒吹扫功能
Configurable manual inspection device, air knife module, etc., to achieve reticle inspection function and surface particle sweeping function.

MASK LOAD PORT (PLM)



MASK LOAD PORT



MASK 机械手
MASK Robot



可选模组
Optional Modules



产品介绍

PRODUCT INTRODUCTION

由富创得全面自主研发,应用于MASK / Reticle的开盒模组,提供多种掩模版搬运臂和夹爪设计,以满足灵活的OEM掩模版操作需求(包括翻转、旋转、长距离伸展、OCR/BCR等)。

Fully self-developed by Fortrend, this mask/reticle opening module offers a variety of reticle handling arms and gripper designs to meet flexible OEM reticle-handling needs, including flipping, rotating, long-distance extension, OCR/BCR, and more.



■ 集成RSP 200 SMIF开盖器与掩模版搬运机器人——最小的自动化占地面积

Integrated RSP 200 SMIF Opener & Reticle Handling Robot – The Smallest Automation Footprint.

■ 支持SEMI E100 RSP-200, 开盖器与机器人臂满足环境要求

SEMI E100 RSP-200 compliant; opener and robot arm meet environmental requirements.

■ 多样化的功能配置选项, 适用多种工况

Diverse functional configuration options are available to meet a wide range of working conditions

规格参数

SPECIFICATIONS PARAMETER

机身尺寸 Footprint Dimensions	467W x 460D x 770H mm
升降行程 Lift Stroke	210 mm
负载能力 Load Capacity	5.4kg
Pod 类型 Pod Types	SEMI E100 Single RSP, SEMI E152 EUV SMIF Pod
电源需求 Power Requirement	100V/240VAC @ 1Amp, 50/60Hz, or 24 VDC (可选)
开 Pod 时间 Pod Open Time	< 12 seconds
平均无故障周期 (MCBF) Mean Cycles Between Failures (MCBF)	50,000 循环
通讯方式 Communication Interface	Parallel/Serial, EIA-RS232C (SECS I/II)

产品介绍

PRODUCT INTRODUCTION

由富创得全面自主研发,应用于MASK / Reticle的开盒模组,可对接符合Semi标准的 RSP 150 / RSP 200 / EUV Pod / MRSP 等来料。上料方式可支持人工/天车/AGV。

Fully independently developed by Fortrend, the opening module for MASK/Reticle can interface with incoming materials that comply with the Semi standards, such as RSP 150, RSP 200, EUV Pod, MRSP, etc. The loading methods supported include manual, overhead hoist transport (OHT), and automated guided vehicle (AGV).



■ 达到ISO 1级洁净度, 配备主动自清洁气流设计, 提起舱壳, 使光罩留在密封的微环境中

Achieves ISO Class 1 cleanliness, features an active self-cleaning airflow design, lifts the pod shell while keeping the reticle in a sealed micro-environment.

■ 配有Pod在位传感器;配有Mask / Reticle Mapping传感器;配有Mask / Reticle在位传感器;配有Mask / Reticle 凸片传感器

Equipped with Pod presence sensor; Mask/Reticle mapping sensor; Mask/Reticle presence sensor; Mask/Reticle protrusion sensor.

■ 可选配RFID Reader;可集成OHT (天车运输系统) 功能

Optional RFID Reader; integrable OHT (Overhead Hoist Transport) functionality.

■ 符合SEMI E19.3、E111、E112、E117、S2和S8标准, 并通过CE认证

Compliant with SEMI E19.3, E111, E112, E117, S2 and S8 standards, and CE-certified.

规格参数

SPECIFICATIONS PARAMETER

Mask规格 Mask Specification	467W x 460D x 770H mm
模组尺寸 Module Dimensions	依配置而定 Configuration-dependent
升降行程 Lift Stroke	210-240 mm
料盒类型 Pod Type	SEMI E111 Single RSP/SEMI E112 Multiple RSP/SEMI E152 EUV SMIF Pod
料盒接口 Pod Interface	SEMI E19.4
电源需求 Power Requirements	100V/240VAC @ 1Amp 50/60Hz Or 24 VDC (Option)
平均无故障周期 Mean Cycles Between Failures (MCBF)	50,000 cycles
通讯方式 Communication Interface	EIA-RS232C SECS I/II

光罩真空传输平台

MASK VTM

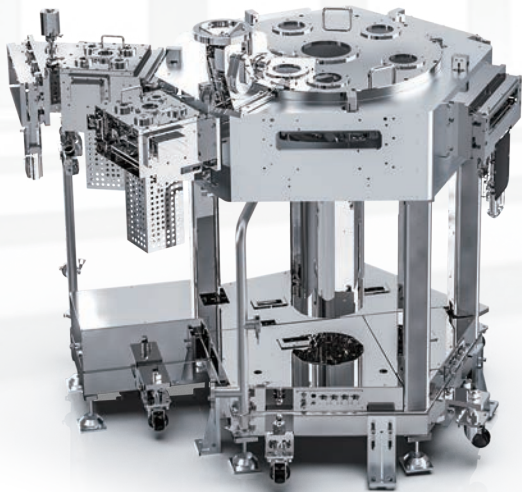
光罩存储系统

MASK STOCKE

产品介绍 PRODUCT INTRODUCTION

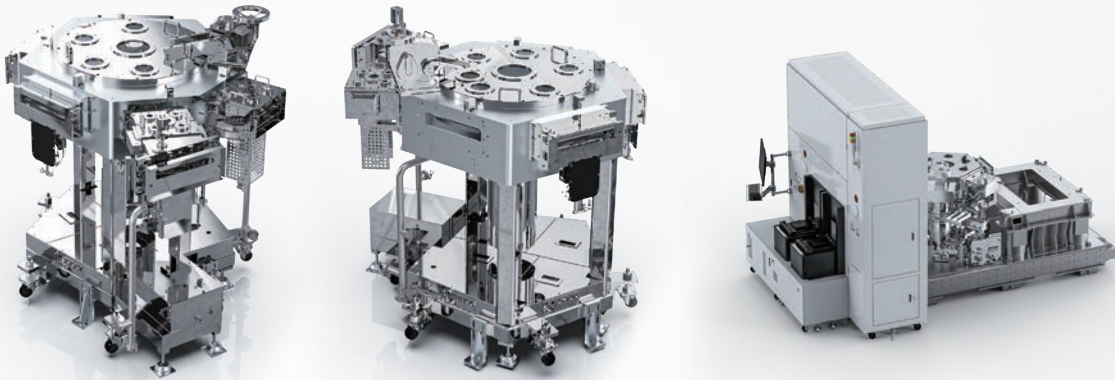
Mask真空传输平台支持将各种Mask/Reticle 传输到生产工艺设备,腔体内部的洁净等级可达到ISO Class 1,整机可搭配多种形式的Load Lock、缓存、校准等功能机构,可自定义编辑任意传片路径,支持客制化选配定制。

The Mask Vacuum Transfer Platform is designed to transport various types of masks/reticles to process equipment. The interior chamber achieves a cleanliness level of ISO Class 1, and the entire system can be integrated with diverse load-lock, buffering, and pre-alignment modules. It allows user-defined editing of any wafer-handling route and supports customized optional configurations.



- 可实现全自动化Mask真空传输
Fully automated mask vacuum transfer is achieved.
- 可客制化机械手搭配Mask末端执行器,单臂单叉、双臂双叉均可选择,满足不同的应用场景;
Customizable robot arms with mask end-effectors are available in single-arm single-paddle or dual-arm dual-paddle configurations to suit different applications.
- 可配置缓存腔满足真空多片暂存,可配置校准腔进行真空视觉校准提高传片精度,可配置单Load Lock内多层升降满足;
Buffer chambers can be integrated for multi-mask temporary storage under vacuum, and pre-alignment chambers can be added for in-vacuum vision calibration to improve transfer accuracy;
- 可客制化机械手搭配Mask末端执行器,单臂单叉、双臂双叉均可选择,满足不同的应用场景;
Customizable robot arms with mask end-effectors are available in single-arm single-paddle or dual-arm dual-paddle configurations to suit different applications.

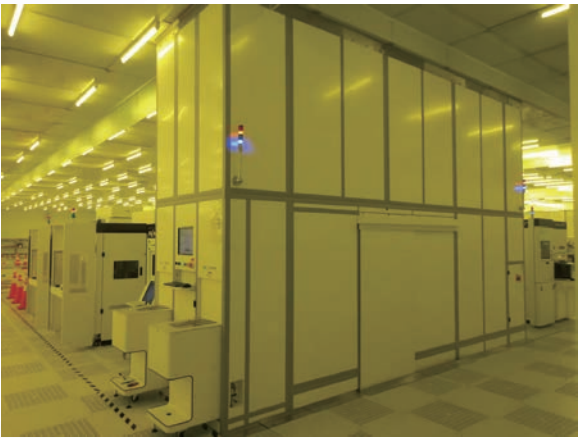
产品三视图 THREE ORTHOGRAPHIC VIEWS OF THE PRODUCT



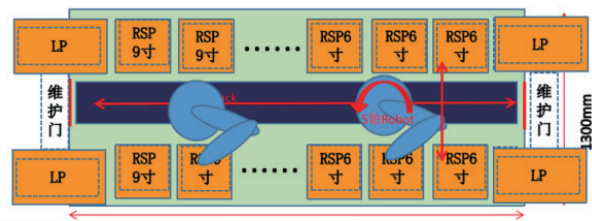
产品介绍 PRODUCT INTRODUCTION

富创得提供多种光罩存储和管理解决方案,以满足晶圆厂日益增长的光罩数量需求,可为提供以下存储解决方案:

Frontek offers a comprehensive range of photomask storage and management solutions to meet the growing mask volumes in wafer fabs, including:



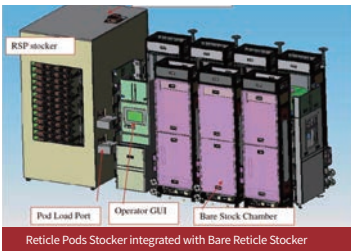
- Carousel SMIF盒存储系统
Carousel SMIF Pod Storage System
- SMIF盒缓冲区
SMIF Pod Buffer
- I-Cell空白光罩存储,用于高级光罩
I-Cell Reticle Storage for Advanced Reticles
- E-Racks,用于SMIF盒
E-Racks for SMIF Pods
- 自动化E-Racks,用于SMIF盒存储
Automated E-Racks for SMIF Pod Storage



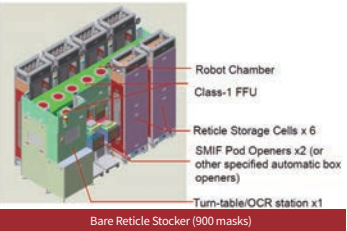
客制化方案 CUSTOMIZED SOLUTIONS



Reticle Pods Stocker with Embedded Sorter (256 pods)



Reticle Pods Stocker integrated with Bare Reticle Stacker



Bare Reticle Stocker (900 masks)



Reticle SMIF Pods Buffer Storage

光罩传输机械手

MASK ROBOT

光罩真空传输机械手

MASK VACUUM TRANSFER ROBOT

产品介绍PRODUCT INTRODUCTION

适用于高洁净状况下的传输,采用闭环控制方式,适用于MASK片/方形玻璃片的传输。应用于 MASK EFEM等MASK 片传输,高洁净度要求、高精度、高可靠性等要求的工况,确保光刻工艺MASK片传输的高效和稳定。

Designed for ultra-clean environments, this system employs closed-loop control to handle the transfer of photomasks and square glass substrates. It is engineered for use in Mask EFEM and other photomask-handling modules that demand high cleanliness, high precision, and high reliability, ensuring efficient and stable transport throughout the lithography process.



- 可选拟水平多关节动作对应平行配置的设备布局
Optional pseudo-horizontal multi-joint motion corresponding to parallel equipment layout
- EEF采用闭环控制的夹爪方式
The EEF employs a closed-loop control system using a gripping mechanism
- 可搭配不同类型的Fork, 满足多种工况的MASK片传输
Compatible with various types of Forks to meet the wafer transfer needs for different applications
- 根据设备布局可选上固定方式或下固定方式
Based on the equipment layout, you can choose either an upper or lower fixing method

规格参数SPECIFICATIONS PARAMETER

搬运物 Payload	Mask片/方形玻璃片 Photomask / square glass substrate		
可动范围 (旋转中心至第三关节中心处) Reach (from center of rotation to center of 3rd joint)	手臂:376mm Arm: 376 mm	Theta旋转:340度	升降:240/300/400/500
搬送速度 (平均速度) Transfer speed (average)	600mm/s 600 mm/s	235°/s	250mm/s
搬运高度 Transfer height	520-820mm(底座固定面到手指上的晶圆安装面的高度, 依配置而定) 520-820 mm (height from base mounting surface to wafer seating plane on end-effector, configuration-dependent)		
重复精度 Repeatability	±0.1mm以内 ≤ ±0.1 mm		
通讯协议 Communication protocol	HEX/ASCII HEX/ASCII		
洁净度 Cleanliness class	最高 ISO Class1 ISO Class 1 (maximum cleanliness)		
厂务 Facility interface	电源:220V, 10A, 真空:-70~-90Kp, 正压:0.1~0.5Mpa Power: 220 V, 10 A; Vacuum: -70 to -90 kPa; Positive pressure: 0.1-0.5 MPa		

产品介绍PRODUCT INTRODUCTION

适用于高洁净真空环境下的MASK片或方形玻璃片的传输,全轴采用伺服电机与高精度谐波减速机传动。通过磁流体密封装置和波纹管来实现真空密封。S曲线加减速控制方式能够高速, 高精度地搬运。具有碰撞检测保护系统, 最大限度地保护晶圆, 有效提升设备工艺的稳定性和。

Engineered for ultra-clean vacuum transport of masks or square glass substrates. All axes driven by servo motors paired with high-precision harmonic reducers; vacuum integrity maintained via magnetic-fluid seals and bellows. S-curve motion profiling delivers fast, accurate handling, while an integrated collision-detection system maximizes wafer safety and process stability.



- 可选拟水平多关节动作对应平行配置的设备布局
Optional pseudo-horizontal multi-joint motion corresponding to parallel equipment layout
- 采用下托式的MASK片固定方式, 利用MASK片自重的边缘夹持式
Employs bottom-support mask holding with edge clamping utilizing the mask's own weight
- 可以使用较长的手指, 实现较长的伸展距离。可以针对搬运物体, 客户设备布局的实际情况提供最优的手指
Long fingers can be used to achieve extended reach; optimal finger design is provided based on the handled object and the customer's actual equipment layout.
- 机械臂长度和末端负载可根据客户的需求定制
Robot arm length and end-effector load can be customized to customer requirements

规格参数SPECIFICATIONS PARAMETER

搬运物 Handling object	Mask片/方形玻璃片 Mask substrate / Square glass substrate
轴数 Number of axes	3轴/4轴 3-axis / 4-axis
重复定位精度 Repeat positioning accuracy	±0.1mm DC 24 V
耐真空度 Vacuum compatibility	10-6Pa 6 A
漏率 Leak rate	5x10-9 Pa.m³/sec He (Base Vacuum 5x10-4 Pa) 144W
电源范围 Power-supply range	220VAC(+7%, -10%) Serial communication RS-232C, Parallel communication I/O
通讯协议 Communication protocol	ASCII HEX, ASCII
通讯方式 Communication method	Ethernet Frame FOUF

自动化物料搬运系统(AMHS)

AUTOMATED MATERIAL HANDLING SYSTEM



产品介绍

PRODUCT INTRODUCTION

OHT (Overhead Hoist Transport) 天车是半导体 AMHS (自动物料搬运系统) 的核心设备, 悬挂在洁净室天花板轨道上运行, 通过升降机构直接抓取并运送 FOUF、晶圆盒或面板载具到各工艺机台, 实现“Tool-to-Tool”全自动空中物流, 系统由轨道、滑触供电、OHT 小车、地面接驳以及调度软件组成, 具有不占地、高洁净、高节拍、低振动等优势, 可将机台等待时间缩短 30 % 以上。

OHT (Overhead Hoist Transport) is the core vehicle of the semiconductor AMHS (Automated Material Handling System). Suspended from ceiling rails inside the cleanroom, it lowers a hoist to pick up and deliver FOUFs, wafer cassettes or panel carriers directly to each process tool, enabling fully automatic “tool-to-tool” overhead logistics. The system comprises rails, collector power, OHT shuttles, floor buffers and scheduling software, offering zero floor footprint, high cleanliness, high throughput and low vibration while cutting tool wait times by more than 30 %.

产品特点

PECIFICATION PARAMETER

■ 轻量化和小型化设计:降低能耗, 提高运行效率, 产品各方面性能更高;对安装空间和吊装称重要求更低

Lightweight and Compact Design:Reduces energy consumption and improves operational efficiency, enhancing overall product performance; requires less installation space and lifting capacity.

■ 模块化设计:安装维护便捷, 操作简易;轨道LAYOUT布局更灵活, 满足多种布局设计方案

Modular Design:Easy installation and maintenance, simple operation; more flexible track layout to meet various design schemes.

■ 供应链可控, 交付快:拥有稳定的供应链体系, 95%关键零部件可满足国产替换, 可根据客户需求变更

Controllable Supply Chain, Fast Delivery: With a stable supply chain system, 95% of key components can be domestically sourced, and can be customized according to customer needs.

■ 可定制化:针对楼层较低和一些机台狭窄或布局参差不齐的生产环境, 我们可以提供多种不同的解决方案

Customizable: For production environments with low floors and narrow machines or irregular layouts, we can provide a variety of different solutions.

■ 经验丰富的售后团队:售后技术人员均有5年以上相关经验, 可以快速响应处理现场问题, 保证生产安全平稳运行

Experienced After-sales Team: After-sales technicians have over 5 years of relevant experience and can quickly respond to and handle on-site issues, ensuring safe and stable production operations.

规格参数

SPECIFICATIONS PARAMETER

尺寸 Dimensions	L*W*H:955x460x880mm
车重 Vehicle Weight	≤120KG
供电方式 Power Supply Method	WPS 非接触式供电方式 (9.78kHz) WPS Non-contact Power Supply (9.78kHz)
载具类型 Vehicle Type	FOUF;SMIF POD;MAGAZINE;
旋转功能(抓手) Rotation Function (Gripper)	±3°
行走速度(直行) Travel Speed (Straight)	3.3m/s (直线距离超过70米轨道速度最高可达到5m/s) T3.3m/s (Straight line distance over 70 meters, maximum track speed can reach 5m/s)
行走速度(加速) Travel Speed (Acceleration)	2m/s2
行走速度(减速) Travel Speed (Deceleration)	3m/s2

行走速度(弯道) Travel Speed (Curve)	MAX.1m/s Maximum 1m/s
动作时长-机台设备(工厂层高4.5m) Action Duration - Machine Equipment (Factory Height 4.5m)	装载:12s 卸载:12s Loading: 12s Unloading: 12s
动作时长-OHB Action Duration - OHB	装载:7.5s 卸载:7.5s Loading: 7.5s Unloading: 7.5s
回转轨道半径 Rotation Track Radius	R=500mm (可做到400mm) R=500mm (Capable of achieving 400mm)
停止精度 Stop Accuracy	±1mm ±1mm
振动值 Vibration Value	<0.5G <0.5G
洁净等级 Cleanliness Level	Class 100 Class 100 Cleanroom Standard
通讯协议 Communication Protocol	E84 SECS/GEM Communication E84 SECS/GEM Communication Protocol

自动化物料搬运系统(AMHS)

AUTOMATED MATERIAL HANDLING SYSTEM

晶圆自动存储系统 AUTOMATED STORAGE SYSTEM (STOCKER)

晶圆自动存储系统(是专为半导体晶圆厂设计的自动存储子系统,具备多层存放空间,用于自动化存储、提取和传送各种规格的晶圆料盒,以实现晶圆在不同工艺之间的流转。富创得Stocker可配套AMHS,降低人力盘点的需求,实现自动化的物流管理,实现物料的统一管理,提高工作效率的同时减少人为错误。

The automatic wafer storage system, specifically designed for semiconductor wafer fabs, features multiple storage levels for the automated storage, retrieval, and transportation of wafer cassettes of various specifications, facilitating the transfer of wafers between different processes. Fortrend's Stocker can be integrated with the Automated Material Handling System (AMHS), reducing the need for manual inventory counting and enabling automated logistics management. It achieves unified material management, enhances work efficiency, and minimizes human errors.



- 模块化设计,组装调适更快,并可根据需求客制化制作,满足各种工况需求
Modular design allows for faster assembly and adjustment, and can be customized according to needs to meet various operational requirements.
- 提供对接接口,可对接Fab厂内已有OHT和AGV,补充已有AMHS体系
Provides interface connections that can be integrated with existing OHT and AGV systems within the Fab plant, complementing the existing AMHS framework.
- 可与富创得一同推出的载具搬运/便携货架式AGV联动,快速吞吐多个晶圆盒,效率更高
Can be linked with the carrier handling/portable rack-style AGVs also introduced by FCT, quickly processing multiple wafer cassettes for higher efficiency.

规格参数 SPECIFICATIONS PARAMETER

设备尺寸 Equipment dimension	长 5800 * 宽 1600 * 高 4620 mm (依配置决定) L 5800* W 1600* H 4620 mm (Decide by config)
适用载具类型 Applicable carrier types	SMIF 吊舱、光罩盒、FOUP/FOSB SMIF Pod, Reticle Box, FOUP/FOSB
装载端口 Load Port	2 个 (可选 P-rack 接口) 2 Ports (Optional P-rack Port)
载具负载高度 Carrier Load Height	900 ± 10 毫米 900 ± 10 mm
额定电压 Rated voltage	单相 DC 220V 50 Hz Single Phase AC 220V 50 Hz
洁净度 Cleanliness	Class 100 (可选 FFU) Class 100 (Optional FFU)
防震等级 Quakeproof Level	0.3G (M-S>7.0) 0.3G (M-S>7.0)
存储容量 Storage Capacity	146+6 载具 (依配置决定) 146+6 carriers (Decide by config)

自动搬运机器人 FRONT LOAD AUTOMATED MOBILE ROBOT (AMR)

富创得AMR自动搬运机器人专为洁净室内晶圆或FOUP全自动搬运设计,可在机台、缓存与仓储间安全高效转运,完美融入现有产线,实现无人化晶圆运输。

Fortrend AMHS Automated Mobile Robot is purpose-built for fully automated wafer or FOUP handling in cleanrooms, enabling safe, efficient transfers between tools, buffers and storage while integrating seamlessly into existing lines to achieve unmanned wafer transportation.



- SLAM激光导航设计与自定义地图导航系统,实现无轨道自由导航,轻松应对各种复杂路况,更便捷、更灵活
SLAM laser navigation with custom map system enables track-free navigation, easily handling complex routes for greater convenience and flexibility.
- 自主研发的FTC和MCS调度派遣、交通管制系统,算法更优,可快速完成全厂AGV运输规划
Self-developed FTC and MCS dispatching & traffic-control algorithms provide superior performance, rapidly planning AGV transport across the entire fab.

便携式自动货架导引车 P-RACK AUTOMATED GUIDED VEHICLE

富创得便携式自动货架导引车专为洁净室设计,可一次性搬运多个FOUP或Panel Cassette,在机台、缓存与仓储间灵活穿梭,实现“人到货”与“货到机”混合模式,快速补位现有AMHS,提升晶圆搬运柔性及效率。

Fortrend portable shelf-guided AGV is purpose-built for cleanrooms, capable of handling multiple FOUPs or Panel Cassettes in one trip. It shuttles nimbly between tools, buffers and storage, enabling hybrid "person-to-goods" and "goods-to-tool" modes that seamlessly augment existing AMHS and enhance wafer-handling flexibility and efficiency.



- SLAM激光导航设计与自定义地图导航系统,实现无轨道自由导航,轻松应对各种复杂路况,更便捷、更灵活
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Self-developed FTC and MCS dispatching & traffic-control algorithms provide superior performance, rapidly planning AGV transport across the entire fab.

传输机械手(晶圆/光罩/基板)

TRANSFER ROBOT (WAFER/MASK/SUBSTRATE)



产品介绍 PRODUCT INTRODUCTION

晶圆机器人 (Wafer Robot) 是半导体制造中在洁净环境下搬运晶圆或晶圆盒 (FOUP) 的精密自动化设备,是EFEM、炉管、湿法、离子注入等核心工艺不可或缺的一环。富创得晶圆机器人全自研核心部件,支持真空/边缘/伯努利多方式搬运3-12寸晶圆及PLP基板,交期快、成本低,快速对接全线工艺。

The Wafer Robot is a precision automated device used for transporting wafers or wafer cassettes (FOUP) in a clean environment within semiconductor manufacturing. It is an essential component of core processes such as EFEM, furnace tubes, wet processes, and ion implantation. Fortrend's wafer robots feature fully self-developed core components, supporting the transportation of 3-12 inch wafers and PLP substrates via vacuum, edge, and Bernoulli methods. They offer fast delivery, low cost, and rapid integration with the entire production line.

产品特点 PECIFICATION PARAMETER

- 通用RS232协议接口,操作更便捷
Universal RS232 protocol interface for more convenient operation.
- SCARA手臂设计理念,适配真空吸附/边缘夹持/非接触式伯努利吸附等多种晶圆保持方式
TSCARA arm design supports multiple wafer retention methods: vacuum suction, edge gripper, and non-contact Bernoulli.
- 多样化末端执行器规格选择和可定制化直线模组,满足多种工况需求
A variety of end-effector specifications and customizable linear modules to meet diverse process requirements.
- 具有SmartMove功能,可实现最短距离、最佳运动轨迹
SmartMove function enables shortest-path motion with optimized trajectories.

规格参数 SPECIFICATIONS PARAMETER

结构 Structure	3~6轴(伺服电机) Z轴:带制动器的电机 3 to 6 axes (Servo motors) Z-axis: Motor with Brake	
晶圆尺寸 Wafer Size	2寸~12寸晶圆 2-inch to 12-inch Wafers	
工作范围 Working Range	R轴 R-axis	146mm/190.5mm/213mm
	单Z轴 Single Z-axis	240mm/300mm/400mm/500mm
	双Z轴 Dual Z-axis	600mm/700mm/800mm/920mm
	θ轴 Theta-axis (θ-axis)	340°
	Flip轴 Flip-axis	180°
	Track Track	可根据工况定制

洁净等级 Cleanliness Class	最高 ISO Class1 Highest ISO Class 1	
通讯方式 Communication Method	Ethernet通讯/RS232 Ethernet Communication/RS232	
最大速度 Maximum Velocity	R轴 R-axis	1500mm/S
	单Z轴 Single Z-axis	500mm/S
	双Z轴 Dual Z-axes	800mm/S
	θ轴 Theta-axis (θ-axis)	235~340°/S
	Flip轴 Flip-axis	360°/S
	Track Track	800mm—1500mm

300MM晶圆装载系统

300MM LOADPORT

产品介绍

PRODUCT INTRODUCTION

富创得300mm LoadPort 适用于晶圆自动化传输的设备接口,能够高效、洁净地实现FOUP盒与设备之间的自动化晶圆传输,适用于各类半导体设备EFEM、Sorter、清洗设备、检测设备等。

Fortrend 300mm LoadPort is an equipment interface designed for automated wafer transfer. It enables efficient and clean automated wafer transfer between FOUP (Front Opening Unified Pod) containers and equipment, suitable for various semiconductor equipment such as EFEM (Equipment Front End Module), Sorter, cleaning equipment, inspection equipment, etc.



■ 300mm LoadPort内关键结构与设计均为富创得自主专利,设计与生产均在富创得自有生产基地内进行。软硬件垂直整合,保证设备的标准性与一致性

The key structures and designs of the 300mm LoadPort are all independently patented by Fortrend, and both the design and production are carried out within Fortrend's own production base. Integration of hardware and software ensures the standardization and consistency of the equipment.

■ 符合SEMI相关标准,运用RS-232 HEX通信协议与对接设备通讯,也可拓展多种通讯与对接方式

Compliant with SEMI standards, utilizing the RS-232 HEX communication protocol for communication with interfacing equipment, and also capable of expanding to various communication and interfacing methods.

■ 原厂自带的Wafer Mapping,利用自研的先进控制算法,可以实现晶圆有/无、叠片、斜片检测。可选的E84通讯协议、氮气置换等功能,满足各种现场需求。

The original Wafer Mapping system utilizes proprietary advanced control algorithms to enable detection of wafer presence, absence, stacking, and tilting. Optional functions such as the E84 communication protocol and N2 purge can meet various on-site requirements

规格参数

SPECIFICATIONS PARAMETER

机身尺寸 Machine Dimensions	H 1349 mm * W 472 mm * L 586mm Height: 1349 mm * Width: 472 mm * Length: 586 mm
整备质量 Total Weight	66 kg ± 0.5 kg (依配置不同而变化) Weight: 66 kg ± 0.5 kg (varies depending on configuration)
额定电压 Rated Voltage	DC 24 V Power Supply: DC 24 V
额定电流 Rated Current	6 A Current: 6 A
额定功率 Rated Power	144W Power Consumption: 144W
通讯方式 Communication Method	串口通讯RS-232C,并行通讯I/O Communication: Serial RS-232C, Parallel I/O
通讯协议 Communication Protocol	HEX, ASCII Data Format: HEX, ASCII
载体尺寸 Carrier Dimensions	符合SEMI标准的300 mm / 200 mm (选配) FOUP Compatible with SEMI standards for 300 mm / 200 mm (optional) FOUP

FRAME 装载系统

FRAME LOADPORT

产品介绍

PRODUCT INTRODUCTION

富创得 Frame LoadPort 适用于晶圆自动化传输的设备接口,能够高效、洁净地实现FOUP盒与设备之间的自动化晶圆传输,适用于各类半导体设备EFEM、Sorter等,可适配中勤、硕顶等 Frame FOUP。

Fortrend Frame LoadPort is an interface for automated wafer transfer designed for equipment. It efficiently and cleanly facilitates automated wafer transfer between FOUP (Front Opening Unified Pod) boxes and equipment, suitable for various semiconductor devices like EFEM (Equipment Front End Module), Sorter, etc., and can accommodate Frame FOUPs from manufacturers such as Zhongqin and Shuoding.



■ Frame LoadPort内关键结构与设计均为富创得自主专利,设计与生产均在富创得自有生产基地内进行。软硬件垂直整合,保证设备的标准性与一致性

The key structures and designs of the Frame mm LoadPort are all independently patented by Fortrend, and both the design and production are carried out within Fortrend's own production base. Integration of hardware and software ensures the standardization and consistency of the equipment.

■ 符合SEMI相关标准,运用RS-232 HEX通信协议与对接设备通讯,也可拓展多种通讯与对接方式

Compliant with SEMI standards, utilizing the RS-232 HEX communication protocol for communication with interfacing equipment, and also capable of expanding to various communication and interfacing methods.

■ 原厂自带的 Wafer Mapping,利用自研的先进控制算法,可以实现晶圆有/无、叠片、斜片检测。可选的 E84 通讯协议,可应用于AMHS/AGV 自动化传输需求

The original Wafer Mapping system utilizes proprietary advanced control algorithms to enable detection of wafer presence, absence, stacking, and tilting. The optional E84 communication protocol can be applied to AMHS/AGV automated transportation.

规格参数

SPECIFICATIONS PARAMETER

机身尺寸 Machine Dimensions	H 1349 mm * W 485 mm * L 594mm H 1349 mm * W 485 mm * L 594mm
整备质量 Total Weight	70 kg ± 0.5 kg (依配置不同而变化) 70 kg ± 0.5 kg (varies with configuration)
额定电压 Rated Voltage	DC 24 V DC 24 V
额定电流 Rated Current	6 A 6 A
额定功率 Rated Power	144W 144W
通讯方式 Communication Method	串口通讯RS-232C,并行通讯I/O Serial communication RS-232C, Parallel communication I/O
通讯协议 Communication Protocol	HEX, ASCII HEX, ASCII
载体尺寸 Carrier Dimensions	Frame FOUP Frame FOUP

晶圆 OPEN CASSETTE STAGE

WAFER OCS

FRAME OPEN CASSETTE STAGE

FRAME OCS

产品介绍 PRODUCT INTRODUCTION

富创得 Wafer OCS 能够适应多种尺寸的晶圆盒, 支持开放式和半开放式设计, 同时配备防护罩以降低颗粒污染风险, 确保晶圆在传输过程中的洁净度和稳定性, 广泛适用于半导体设备EFEM、Sorter等。

Fortrend Wafer OCS (Open Cassette Stage) can accommodate wafer cassettes of various sizes, supports both open and semi-open designs, and is equipped with a protective cover to reduce the risk of particle contamination. It ensures cleanliness and stability during wafer transfer and is widely applicable to semiconductor equipment such as EFEM (Equipment Front End Module) and Sorter.



Wafer OCS 带外罩支架



Wafer OCS



Wafer OCS 带外罩

■ 可选配多种客制化配件, 灵活应对不同工况需求

A variety of customizable accessories are available to flexibly meet the needs of different working conditions.

■ 专为Wafer Open Cassette设计

Specifically designed for Wafer Open Cassette.

■ 可原配原厂Mapping系统, 可进行叠片、斜片等检测, 杜绝晶圆传输中的撞片问题

It can be equipped with the original factory Mapping system, capable of detecting overlapping and tilted wafers, effectively preventing wafer collisions during transfer.

产品介绍 PRODUCT INTRODUCTION

富创得 Frame OCS 能够适应多种尺寸的晶圆盒, 支持开放式和半开放式设计, 同时配备防护罩以降低颗粒污染风险, 确保晶圆在传输过程中的洁净度和稳定性, 广泛适用于半导体设备EFEM、Sorter等。

Fortrend Frame OCS (Open Cassette Stage) can accommodate wafer cassettes of various sizes, supports both open and semi-open designs, and is equipped with a protective cover to reduce the risk of particle contamination. It ensures cleanliness and stability during wafer transfer and is widely applicable to semiconductor equipment such as EFEM (Equipment Front End Module) and Sorter.



Frame OCS 带外罩支架



Frame OCS



Frame OCS 带外罩

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It can be equipped with the original factory Mapping system, capable of detecting overlapping and tilted wafers, effectively preventing wafer collisions during transfer.

规格参数 SPECIFICATIONS PARAMETER

机身尺寸 Body dimensions	425mm*365mm*772mm (依据配置不同而变化) 425 mm × 365 mm × 772 mm (varies with configuration)
整备质量 Curb weight	35~100±0.5kg(依据配置不同而变化) 35~100 kg ±0.5 kg (varies with configuration)
额定电压 Rated voltage	DC 24 V
额定电流 Rated current	6 A
额定功率 Rated power	144W
通讯方式 Communication method	RS232
通讯协议 Communication protocol	HEX, ASCII
载体尺寸 Carrier dimensions	符合SEMI标准的Open Cassette SEMI-compliant Open Cassette

规格参数 SPECIFICATIONS PARAMETER

机身尺寸 Body dimensions	425mm*365mm*772mm (依据配置不同而变化) 425 mm × 365 mm × 772 mm (varies with configuration)
整备质量 Curb weight	60~130±1kg(依据配置不同而变化) 60~100 kg ±1 kg (varies with configuration)
额定电压 Rated voltage	DC 24 V
额定电流 Rated current	6 A
额定功率 Rated power	144W
通讯方式 Communication method	RS232
通讯协议 Communication protocol	HEX, ASCII
载体尺寸 Carrier dimensions	符合SEMI标准的Open Cassette SEMI-compliant Open Cassette

PLP 传输整体解决方案

PLP TRANSMISSION COMPREHENSIVE SOLUTION

产品介绍 PRODUCT INTRODUCTION

富创得 Panel LoadPort 是一种高效的设备接口, 针对FO-PLP 封装制程设计, 能够实现玻璃基板的洁净、高精度传输, 并与封装设备无缝对接, 确保生产过程的自动化和高良率。

Fortrend Panel LoadPort is an efficient equipment interface specifically designed for FO-PLP (Fan-Out Panel Level Package) packaging processes. It enables clean, high-precision transfer of glass substrates and seamless integration with packaging equipment, ensuring automation and high yield in the production process.



- 整机生产自主化, 核心零部件专利自有
- 符合SEMI相关标准与通用规格的软硬件设计
- 多样化的功能配置选项, 适用多种工况

产品介绍 PRODUCT INTRODUCTION

PLP机械手适用于高洁净状况下的传输,采用闭环控制方式, 适用于PLP玻璃基板的搬运。应用于高洁净度、空间紧凑的玻璃基板PLP EFEM等。

The PLP robotic arm is suitable for transportation under high cleanliness conditions, using closed-loop control, and is applicable for handling PLP glass substrates. It is used in high cleanliness, space-compact glass substrate PLP EFEM applications.



- 可选拟水平多关节动作对应平行配置的设备布局
- 搬运重量:4Kg以下
- 可搭配不同类型的Fork, 满足多种工况的wafer传输
- 可根据设备布局采用上固定方式/下固定方式

规格参数 SPECIFICATIONS PARAMETER

机身尺寸 Machine Dimensions	H 1424 mm * W 796 mm * L 732mm Height 1424 mm * Width 796 mm * Length 732 mm
整备质量 Total Weight	100 kg ± 1 kg (依配置不同而变化) Total Weight 100 kg ± 1 kg (varies depending on configuration)
额定电压 Rated Voltage	DC 24 V DC 24 V
额定电流 Rated Current	8 A 8 A
额定功率 Rated Power	192 W 192 W
通讯方式 Communication Method	串口通讯RS-232C,并行通讯I/O Serial Communication RS-232C, Parallel I/O
通讯协议 Communication Protocol	HEX, ASCII HEX, ASCII
载体尺寸 Carrier Dimensions	符合SEMI标准的Panel FOUN Compliant with SEMI standards for Panel FOUN

规格参数 SPECIFICATIONS PARAMETER

搬运物 Machine Dimensions	515mmx510mm玻璃基板(最大600*600mm) 515mm x 510mm Glass Substrate(The maximum size is 600 mm x 600 mm)
可动范围(旋转中心至第三关节中心处) Total Weight	手臂:376/500/760mm Arm: 376/500/760mm
搬送速度(平均速度) Rated Voltage	550mm/s 550mm/s
手臂类型 Rated Current	双臂 Dual Arms
搬运高度 Rated Power	890mm (底座固定面到手指上的晶圆安装面的高度, 具体依配置) 890mm (height from the base mounting surface to the wafer mounting surface on the fingers, varies depending on configuration)
重复精度 Communication Method	±0.2mm以内 Within ±0.2mm
通讯协议 Communication Protocol	HEX/ASCII HEX/ASCII
洁净度 Carrier Dimensions	最高 ISO Class1 Highest ISO Class 1



FPA-612-V



FPA-48-V

规格参数

SPECIFICATIONS PARAMETER

晶圆尺寸 Wafer size	4~12寸共用型 4"~12" universal
晶圆材质 Wafer material	半透明、不透明 Semi-transparent / opaque
晶圆特征 Wafer features	Flat 或 Notch(SEMI Standard) Flat or Notch (SEMI standard)
晶圆承载方式 Wafer handling method	真空吸盘 Vacuum chuck
晶圆厚度 Wafer thickness	0.3-0.8mm* 0.3~0.8 mm*
晶圆翘曲量 Wafer warpage	≤1mm ≤1 mm warpage
位置精度 Position accuracy	晶圆中心:±0.1mm 晶圆平边(缺角):±0.1° Wafer center: ±0.1 mm; notch/flat angle: ±0.1°
晶圆偏移容许值 Allowable wafer offset	±R5 mm Allowable offset: ±5 mm

产品介绍

PRODUCT INTRODUCTION

富创得晶圆寻边器可实现高速、稳定、高精度校准,适用于晶圆加工预对准,以确保晶圆的位置及方向。产品广泛应用于半导体制造过程中的各个阶段,可集成至各类半导体设备中使用。

Fortrend Aligner can achieve high-speed, stable, and high-precision calibration, suitable for pre-alignment in wafer processing to ensure the position and orientation of the wafers. These products are widely used in various stages of the semiconductor manufacturing process and can be integrated into a range of semiconductor equipment for use.

产品特点

PECIFICATION PARAMETER

■ FPA系列晶圆寻边器为四轴控制,采用微型单轴机器人模组;具有高刚性特性,实现高速高效高精度的晶圆寻边和中心位置校准(晶圆位置≤±0.1mm;晶圆缺边/缺口≤±0.1°)

The FPA series Aligner is a four-axis controlled device, utilizing a compact single-axis robot module with high rigidity characteristics. It achieves high-speed, high-efficiency, and high-precision wafer edge finding and center alignment(Wafer position accuracy ≤ ±0.1 mm; Wafer edge/notch angle accuracy ≤ ±0.1°).

■ 高效的运行,寻晶圆缺口位置≤7S(不包括晶圆取放时间),快速完成晶圆中心与角度补正

Efficient operation, locating the wafer notch position in ≤7 seconds (excluding wafer pick-up and placement time), and quickly completing wafer centering and angular correction;

■ 可支持半透明与不透明晶圆应用,适用于直径100-300mm的硅晶圆,碳化硅片等

Supports both semi-transparent and opaque wafer applications, suitable for silicon wafers, silicon carbide wafers, and others with diameters ranging from 100 to 300 mm;

■ 一体化设计,内嵌式控制器,无需额外设置控制器及走线空间,实现超小体积尺寸

Integrated design with an embedded controller, eliminating the need for additional controller setup and wiring space, achieving an ultra-compact size;

通讯方式 Communication interface	RS232
通讯协议 Communication protocol	HEX, ASCII
电源电压 Supply voltage	DC24V
电源电流 Supply current	5V
真空管径 Vacuum port diameter	φ6mm
真空压力 Vacuum pressure	-50~-80kPa
真空流量 Vacuum flow rate	10L/min(ANR)
寻边时间 Alignment time	≤7S