



半导体晶圆自动传输系统 整体解决方案

SEMICONDUCTOR WAFER AUTOMATIC TRANSMISSION SYSTEM TOTAL SOLUTION

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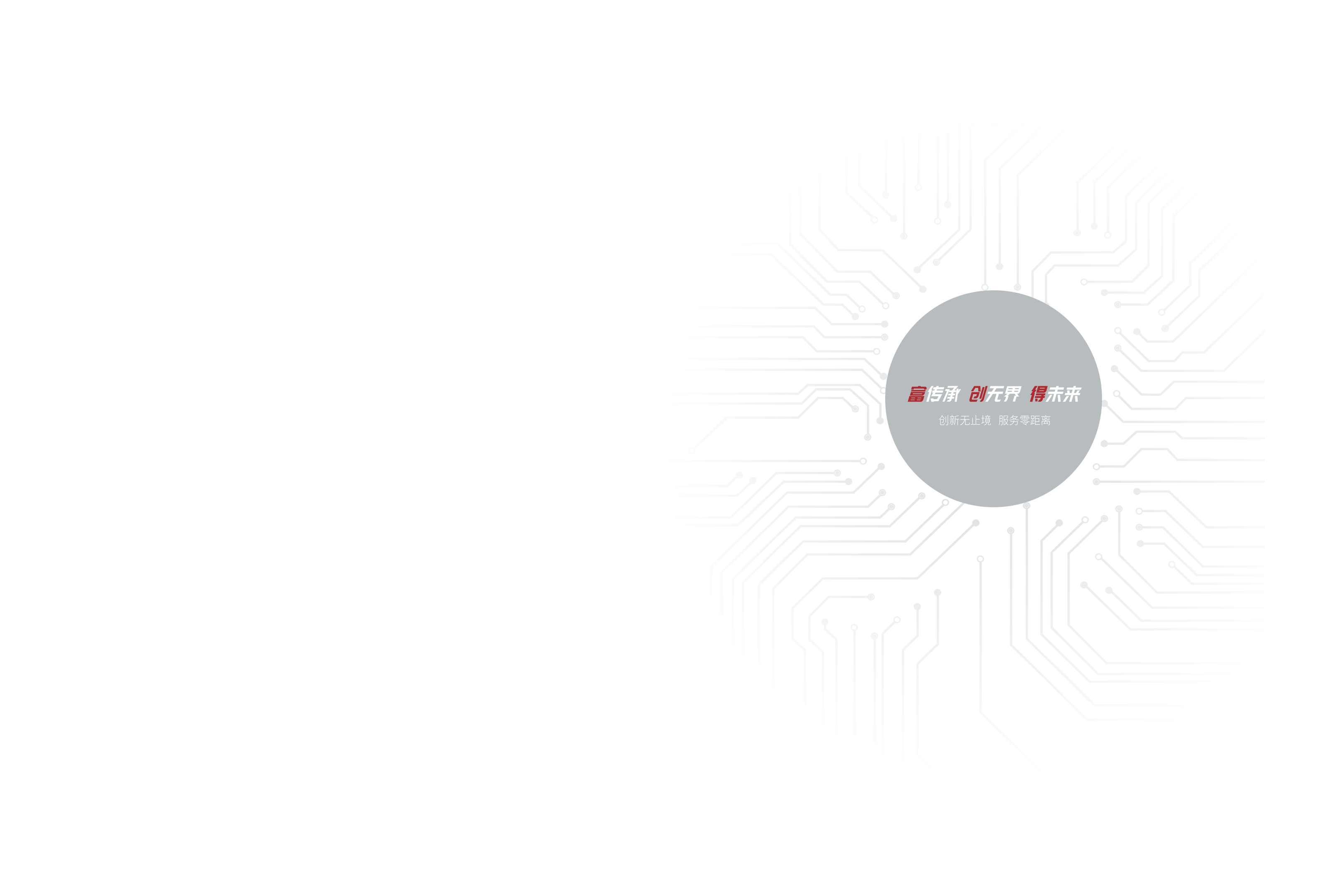
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富传承 创无界 得未来

创新无止境 服务零距离



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关于富创得

ABOUT FORTREND

富创得里程碑

FORTREND MILESTONE

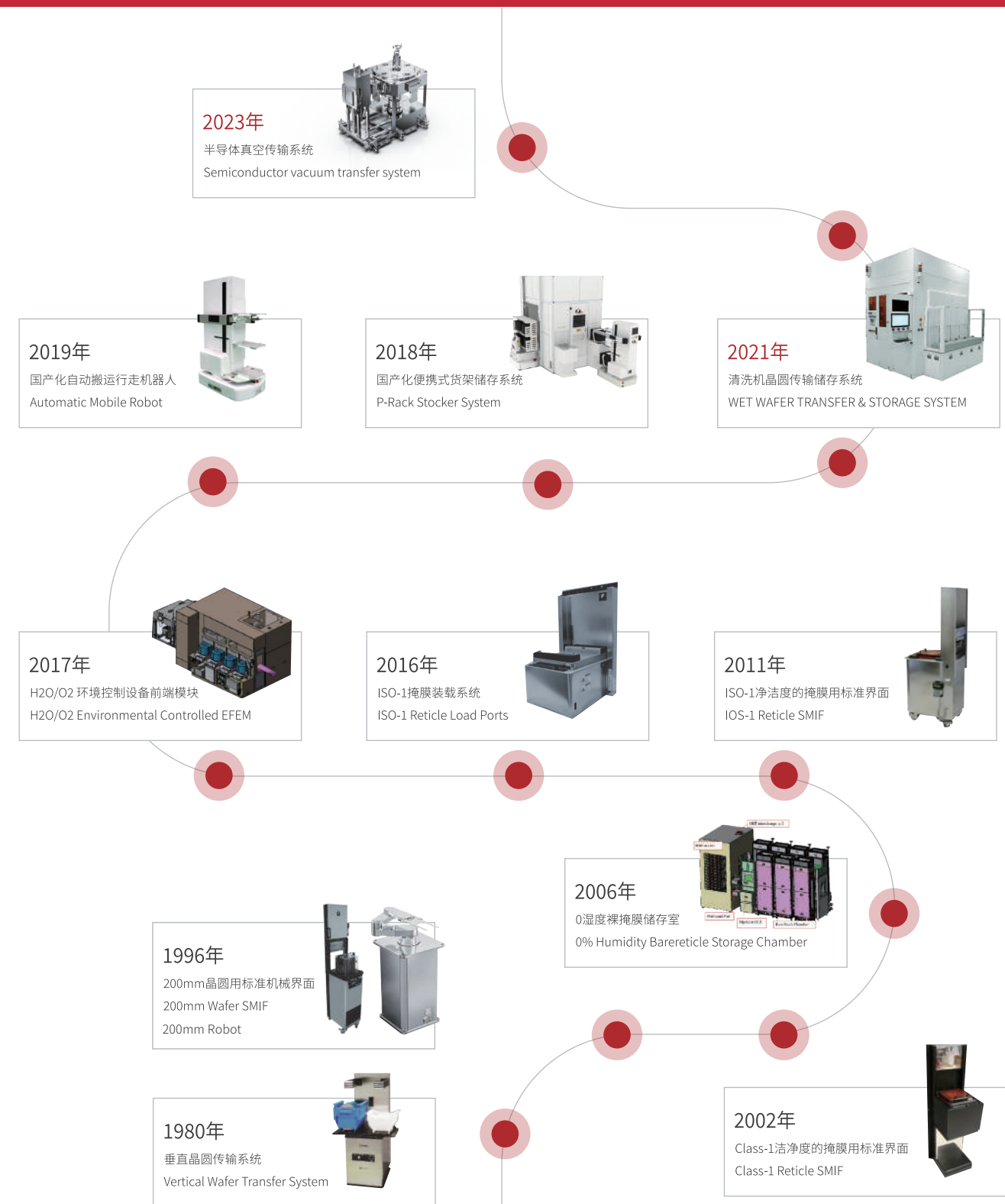
上海大族富创得科技股份有限公司是一家高新科技企业、科技小巨人企业、“专精特新”企业，于2017年3月入驻上海市闵行区，旗下拥有四家子公司，分别为：浙江富创得科技有限公司、无锡富创得智能科技有限公司、无锡富创得精密设备有限公司、美国工程公司。

公司自成立以来，深耕于半导体晶圆自动化传输领域的研发、生产和销售，致力打造以半导体晶圆传输、光罩传送自动化系统为核心的整体解决方案供应商。公司在半导体行业拥有超过45年的技术积累和经验传承，在设备前端晶圆传输及存储系统 (SORTER/EFEM)、晶圆标准机械界面 (SMIF)、晶圆真空传输腔体 (VTM)、晶圆传输机器人 (Robot)、晶圆装载系统 (LoadPort)、晶圆自动寻边装置 (Aligner)、超洁净光罩片/EUV自动化解决方案、无人车自动搬运机器人 (AMR) 及晶圆自动存储系统等技术实现全国自主研发，为半导体领域提供具有行业竞争力的系统定制化整合方案。

Shanghai Fortrend Technology Co., Ltd. is a high-tech enterprise, a small giant enterprise of science and technology, and a SRDI company. It settled in Minhang District, Shanghai, in March 2017 and has four subsidiaries, namely: Zhejiang Fortrend Technology Co., Ltd., Wuxi Fortrend Intelligent Technology Co., Ltd., Wuxi Fortrend Precision Equipment Co., Ltd., and Fortrend Engineering Corporation.

Since its establishment, the company has been deeply engaged in R&D, production, and sales of semiconductor wafer automatic transfer, and is committed to building an integrated total solution provider with semiconductor wafer transfer and mask transfer automation system at its core. With over 45 years of technical accumulation and experience inheritance in the semiconductor industry, the company has achieved independent research and development of domestic products in technologies such as front-end wafer transfer and storage systems (SORTER/EFEM), Standard Mechanical Interfaces (SMIF), vacuum wafer transfer system (VTM), wafer transfer robot (Robot), wafer loading system (LoadPort), automatic wafer alignment device (Aligner), ultra-clean mask/EUV automation solutions, automatic mobile robot (AMR), and automatic wafer storage system. It provides the semiconductor field with system customization and integration solutions that are competitive in the industry.

45 年技术积累 years experience	100+ 全球专利 patents worldwide	100+ 研发团队 researchers	100+ 售后团队 after-sales supporters	20000+ 平方米园区 square meters factory space	1800+ 台/年交付 equipment nstalled year
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晶圆标准机械界面

WAFER STANDARD MECHANICAL INTERFACE



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特有的无尘腔体，内循环可达Class 1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.

2010年起获中国专利 久经市场验证



规格参数 Specification parameter

可选型号 Models	PLUS500S / PLUS500R / PLUS500Sx / PLUS500Cx / PLUS500F / PLUS500Ux / PLUS500Sd
适用载具类型 Applicable carrier types	200mm SMIF Pod (SEMI)
载具负载高度 Carrier Load Height	900 毫米 (可根据需求调整) 900 mm (tailor to fit specific needs)
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) Parallel I/O (SEMI E23-96) 8 in / outputs or EIA-RS232(SECS I/II)
循环周期 Cycle Time	< 90秒 (包括倾斜和侧向移动) < 90 sec (with tilt and lateral movements)
Lot ID读取方式 Lot ID Reader	智能标签 / RFID 标签 Smart tag / 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 > 2000 Hours
正常工作时间 Up time	≥ 99.5 %

晶圆分选机

WAFER SORTER



- 

精小化设计,减少占地使用面积的同时又能保证内部高洁净度和高产能,降本增效;

Down-sizing design, reduce the floor space and ensure high internal cleanliness and high productivity, reduce cost and increase efficiency.
- 

多种拾取方式和LP组合,多样化的客制选项,可满足各种工况需求。

A variety of handling methods and LP combinations, a variety of custom options, can meet the needs of various working conditions.

规格参数 Specification parameter

额定电压 Rated voltage	单相DC 220V 50/60 Hz Single Phase AC 220V 50/60 Hz
额定功率 Rated power	3.52千瓦 (依配置决定) 3.52kW (Decide by config)
主体材质 Body material	喷涂碳钢 (RAL 9003) Painted SPCC (RAL 9003)
通讯接口 Comm interface	RJ45
通讯协议 Comm protocol	HSMS&SECS II
软件 Software	富创得客订配置软件 Fortrend custom configuration software
洁净度 Cleanliness	Class 1 (ISO-Class 3) Class 1 (ISO-Class 3)
末端执行器 End-effector	真空/边缘夹持/伯努利非接触式/客制化 Vacuum blade / edge grip / Bernoulli / custom
装载端口 Load Port	2 ~ 4个端口 (可选兼容开放式卡盒) 2 ~ 4 Ports (optional compatible open cassette)
适用载具类型 Applicable carrier types	卡盒、SMIF Pod、FOUP/FOSB (SEMI) cassette, SMIF Pod, FOUP/FOSB (SEMI)
气体压力供应 Gas pressure supply	负压: - 70 ~ - 90 kPa, >10LPM (Ø6 气体接口) 正压: 0.4 ~ 0.6 MPa, >10LPM (Ø6 气体接口) VAC: - 70 ~ - 90 kPa, >10LPM (Ø6 air tube) CDA: 0.4 ~ 0.6 MPa, >10LPM (Ø6 air tube)

适用晶圆材质 Applicable wafer materials	单晶硅、碳化硅等 (依配置决定) Si、SiC etc. (Decide by config)
适用晶圆规格 Applicable specif. types	直径 100 ~ 300 mm (4 寸 ~ 12 寸) Dia. 100 ~ 300 mm (4 inch ~ 12 inch)
晶圆传输机器人重复精度 Robot repeatability	± 0.1 毫米 ± 0.1 mm
对位器允许初始偏移 Aligner initial offset	最高 6 毫米 Max 6 mm
对位器定心 Aligner centering	± 0.1 毫米 (依配置决定) ± 0.1 mm (Decide by config)
对位器角度偏移 Aligner angularoffset	± 0.1 ° (依配置决定) ± 0.1 ° (Decide by config)
对位器寻边时间 Aligner notch finding time	< 5 秒 / 片 < 5 sec / pcs
平均故障修复时间 MTBR	< 2 小时 < 2 Hours
平均故障间隔时间 MTBF	> 4000 小时 > 4000 Hours
平均保养间隔时间 MTBM	> 6 个月 > 6 Months
晶圆破损率 Wafer breakage rate	每 100,000 片中破损少于 1 片 < 1 Per 100,000 Wafer
正常工作时间 Up time	≥ 98 %

设备前端自动化模块

EFEM(EQUIPMENT FRONT END MODULE)



- 

可对接不同类型的多种制程设备, 并可针对制程需求客制化定制;

It can be connected to a variety of different types of process equipment, and can be customized for process requirements.
- 

多种拾取方式和LP组合, 多样化的客制选项, 可满足各种工况需求。

A variety of handling methods and LP combinations, a variety of custom options, can meet the needs of various working conditions.

规格参数 Specification parameter

额定电压 Rated voltage	单相DC 220V 50/60 Hz Single Phase AC 220V 50/60 Hz
额定功率 Rated power	3.52千瓦 (依配置决定) 3.52kW (Decide by config)
主体材质 Body material	喷涂碳钢 (RAL 9003) Painted SPCC (RAL 9003)
通讯接口 Comm interface	RJ45
通讯协议 Comm protocol	ASCI/HEX/HSMS&SECS II
软件 Software	富创得客订配置软件 Fortrend custom configuration software
洁净度 Cleanliness	Class 1 (ISO-Class 3) Class 1 (ISO-Class 3)
末端执行器 End-effector	真空/边缘夹持/伯努利非接触式/客制化 Vacuum blade / edge grip / Bernoulli / custom
装载端口 Load Port	2 ~ 4个端口 (可选兼容开放式卡盒) 2 ~ 4 Ports (optional compatible open cassette)
适用载具类型 Applicable carrier types	卡盒、SMIF Pod、FOUP/FOSB (SEMI) cassette, SMIF Pod, FOUP/FOSB (SEMI)
气体压力供应 Gas pressure supply	负压: - 70 ~ - 90 kPa, >10LPM (Ø6 气体接口) 正压: 0.4 ~ 0.6 MPa, >10LPM (Ø6 气体接口) VAC: - 70 ~ - 90 kPa, >10LPM (Ø6 air tube) CDA: 0.4 ~ 0.6 MPa, >10LPM (Ø6 air tube)

适用晶圆材质 Applicable wafer materials	单晶硅、碳化硅等 (依配置决定) Si, SiC etc. (Decide by config)
适用晶圆规格 Applicable specif. types	直径 100 ~ 300 mm (4 寸 ~ 12 寸) Dia. 100 ~ 300 mm (4 inch ~ 12 inch)
晶圆传输机器人重复精度 Robot repeatability	± 0.1 毫米 ± 0.1 mm
对位器允许初始偏移 Aligner initial offset	最高 6 毫米 Max 6 mm
对位器定心 Aligner centering	± 0.1 毫米 (依配置决定) ± 0.1 mm (Decide by config)
对位器角度偏移 Aligner angular offset	± 0.1 ° (依配置决定) ± 0.1 ° (Decide by config)
对位器寻边时间 Aligner notch finding time	< 5 秒 / 片 < 5 sec / pcs
平均故障修复时间 MTBR	< 2 小时 < 2 Hours
平均故障间隔时间 MTBF	> 4000 小时 > 4000 Hours
平均保养间隔时间 MTBM	> 6 个月 > 6 Months
晶圆破损率 Wafer breakage rate	每 100,000 片中破损少于 1 片 < 1 Per 100,000 Wafer
正常工作时间 Up time	≥ 98 %



清洗机晶圆传输存储系统

WET WAFER TRANSFER & STORAGE SYSTEM



- 

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;

The integration of EFEM and storage stations, combined with the control system developed by Fortrend, can solve the problems of wafer storage and throughput difficulties in complex processes such as Wet bench cleaner, furnace, and implanter.
- 

内置多重Mapping系统,可在多工段进行叠片、斜片等检测,杜绝整合晶圆传输中的撞片问题。

Built-in multi-mapping function can detect stacked and inclined chips in multiple sections to eliminate the chip collision problem in wafer transfer.



规格参数 Specification 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
主体材质 Body material	喷涂碳钢 (RAL 9003) Painted SPCC (RAL 9003)
通讯接口 Comm interface	RJ 45
通讯协议 Comm protocol	HEX
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) VAC: -80 kPa, >10LPM(Ø8 air tube) CDA: 0.5 ~ 0.7 MPa, >10LPM(Ø16 air tube)
晶圆接触材质 Wafer contact material	聚醚醚酮 / 特氟龙 PEEK / PTFE 不同模块接触材质有所区分 Different modoules have different contact materials

适用载具类型 Applicable carrier types	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
平均保养间隔时间 MTBM	> 6 个月 > 6 Months
晶圆破损率 Wafer breakage rate	每 100,000 片中破损少于 1 片 < 1 Per 100,000 Wafer
正常工作时间 Up time	≥ 98 %
软件 Software	富创得标准配置软件 Fortrend Standard configuration software
洁净度 Aligner notch finding time	Class 1 @ 0.1µm *仅晶圆传输区域, 储存工位洁净度同Fab内洁净等级 *Only the wafer transfer area shares the same cleanliness level as cleanroom grade within the Fab.



光罩片自动传输系统

FULL AUTOMATIC RETICLE HANDLING SYSTEM



客制化机械手搭配光罩片末端执行器, 满足各种复杂光罩处理应用程序;
Customized manipulators with mask end effectors for a variety of complex mask handling applications.
robotic arm



多种运输盒 (Hoya、ShinEtsu、Nikon、Canno等) 和全自动光罩RSP pod可选;
A variety of shipping boxes (Hoya, ShinEtsu, Nikon, Cannno, etc.) and fully automatic robotic RSP pod are available.



可选集成分选和PDS子系统。
Selectable component selection and PDS subsystem.



规格参数 Specification parameter

材料 Material	掩模, 光罩, EUV Mask, Reticle, EUV
载体 Carrier	RSP150, RSP200, 双 EUV Pod, 各种运输盒 RSP150, RSP200, Dual EUV Pod, Various Shipping Boxes
读取 ID 位置 Read ID Position	光罩和薄膜 Mask and Pellicle
洁净度等级 Cleanness Level	优于 ISO Class1 Better than ISO Class1
第三方颗粒物检测 3rd Party particle inspection Station	测量颗粒≥1μm (PDS) Measure particles ≥1μm (PDS)

可选配强光目检工作站
Optional Bright Light Inspection Station

掩模厚度测量
Mask Thickness Measurement

- 0° 到 360° 翻转和目视检查
0° to 360°turn flip and Bright Light Review
- N2 或 XCDA 吹扫枪
N2 or XCDA Blow off Gun
- 掩模 1D 和 2D 条形码阅读器
Mask 1D & 2D Bar Code Reader
- 薄膜 ID 读取器和测量相机
Pellicle ID Reader and Measurement Camera
- 掩模倒角识别
Mask Chamfer Identification
- 重复精度≤0.2μm (与测量模块集成)
Repeatability ≤ 0.2μm (integrated with measurement module)

晶圆自动存储系统

AUTOMATED STORAGE SYSTEM(STOCKER)



-
- 模块化设计, 组装调适更快, 并可需求客制化制作, 满足各种工况需求;

Modular design, faster assembly and adjustment, and can be customized according to demand to meet the needs of various working conditions.
-
- 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 docking interfaces to the existing OHT and AGV in the Fab, complementing the existing AMHS system.
-
- 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。

It can be interconnected with the vehicle handling/portable shelf AGV launched together to quickly handle multiple wafer boxes for higher efficiency.

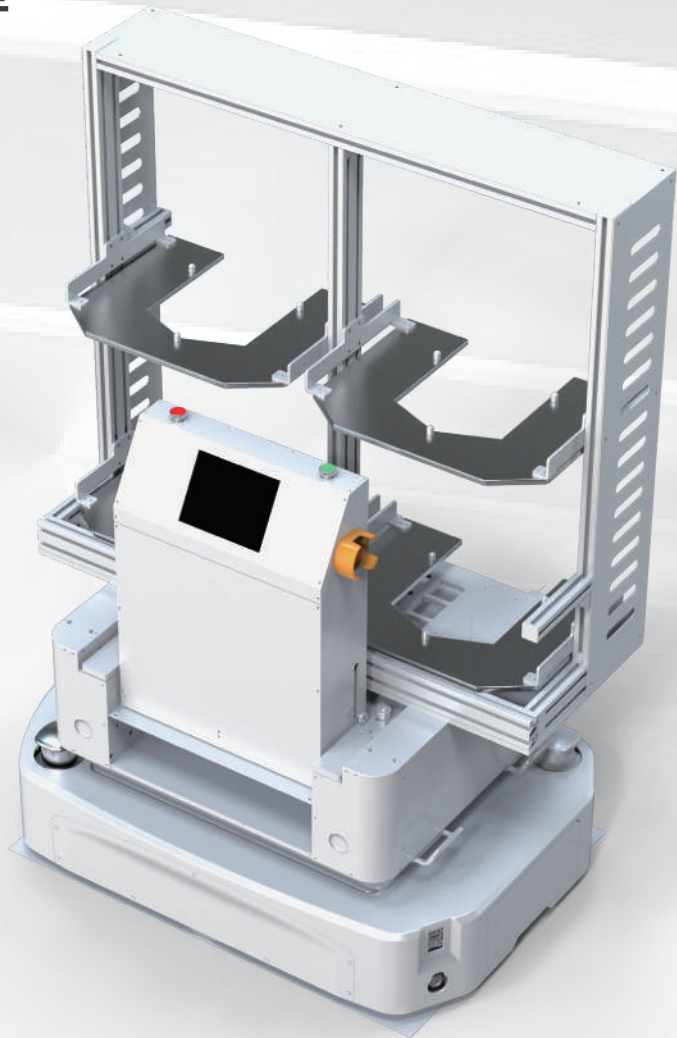
规格参数 Specification parameter

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
通讯协议 Comm protocol	HSMS 或 SECS I / SECS II HSMS or SECS I / SECS II
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)
存储容量 Storage Capacity	146+6 载具 (依配置决定) 146+6 carriers (Decide by config)

运载臂最大负载 Max. carrier arm Load	20 千克 20 kg
单件搬运时间 Single Continuous Pod In/Out	< 6 秒 < 6 sec
运载臂最大移动速度 Max. moving speed of the carrier arm	2 米 / 秒 (非线性运动) 2m / s (non-line motion)
运载臂最大旋转速度 Max. rotating speed of carrier arm	90° / 秒 90°/sec
运载臂重复定位精度 Carrier arm repeat positioning accuracy	± 0.2 毫米 ± 0.2mm
平均故障修复时间 MTTR	< 4 小时 < 4 Hours
平均故障间隔时间 MTBF	> 2000 小时 > 2000 Hours
平均保养间隔时间 MTBM	> 6 个月 > 6 Months
正常工作时间 Up time	≥ 98 %

便携式自动货架导引车

P-RACK AUTOMATED GUIDED VEHICLE



SLAM激光导航设计和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 design and custom map navigation system, to achieve trackless free navigation, easy to cope with a variety of complex road conditions, more convenient, more flexible.



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。
The self-developed FTC and MCS dispatching and traffic control systems have better algorithms, which can quickly complete the AGV transportation planning of the whole plant.



规格参数 Specification parameter

设备尺寸 Equipment dimension	长 1000 * 宽 700 * 高 1180 毫米 L 1000* W 700* H 1180 mm
设备重量 Equipment weight	300千克 (依配置决定) 300 Kg (Decide by config)
电池类型 Battery Type	三元锂电池 Ternary lithium battery
电池容量 Battery Capacity	48V, 52Ah
续航时间 Battery runtime	> 8小时 > 8 h
充电时间 Charging Time	0-80%, 2小时; 0-100%, 3小时 0-80%, 2h; 0-100%, 3h
电池寿命 Battery Life	满充满放>500次; 电池衰减比85%, 充放电次数>1500次 Full discharge>500 times; Battery attenuation ratio of 85%, charging and discharging frequency>1500 times
充电方式 Charging Mode	手动/自动/快换 Manual/Automatic/Quick change
单次运量 Single shipment	4件 (300mm FOUP) (依配置决定) 4 pcs (300mm FOUP) (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

控制方式 Control method	电脑无线控制& 触摸屏控制 Computer wireless control & touch screen control
导航方式 Navigation method	SLAM激光导航 SLAM by laser navigation
通讯方式 Comm method	2.4G / 5G WiFi (AMR 到服务器) & HSMS / SECS II (AMR 服务器到MCS/MES系统) 2.4G / 5G WIFI(AMR to AMR server) & HSMS / SECS II (AMR sever to MCS/MES)
最大移动速度 Max. moveing speed	1米/秒 1m / s
最小错车距离 Min. Miss Distance	2米 2m
最小通道宽度 Min. Passage Width	1米 1m
定位精度 Positioning Accuracy	±10毫米, ±1° ±10mm, ±1°
正常工作时间 Up time	≥ 98 %
平均故障修复时间 MTTR	< 4 小时 < 4 Hours
平均故障间隔时间 MTBF	> 2000 小时 > 2000 Hours



自动搬运机器人

FRONT LOAD AUTOMATED MOBILE ROBOT (AMR)



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SLAM激光导航设计和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 design and custom map navigation system, to achieve trackless free navigation, easy to cope with a variety of complex road conditions, more convenient, more flexible.
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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。
The self-developed FTC and MCS dispatching and traffic control systems have better algorithms, which can quickly complete the AGV transportation planning of the whole plant.



规格参数 Specification parameter

设备尺寸 Equipment dimension	长 1050 * 宽 700 * 高 1611 毫米 1050* W 700* H 1611 mm
设备重量 Equipment weight	300 千克 (依配置决定) 300 Kg (Decide by config)
电池类型 Battery Type	三元锂电池 Ternary lithium battery
电池容量 Battery Capacity	48V, 52Ah
续航时间 Battery runtime	> 8 小时 > 8 h
充电时间 Charging Time	0-80%, 2 小时; 0-100%, 3 小时 0-80%, 2h; 0-100%, 3h
电池寿命 Battery Life	满充满放 >500 次; 电池衰减比 85%, 充放电次数 >1500 次 Full discharge>500 times; Battery attenuation ratio of 85%, charging and discharging frequency>1500 times
充电方式 Charging Mode	手动 / 自动 / 快换 Manual/Automatic/Quick change
单次运量 Single shipment	2+1 件 (300mm FOUN) (依配置决定) 2+1 pcs (300mm FOUN) (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
最大有效载荷 Max. Payload	15 千克 15kg

驱动类型 Drive Type	双轮差速驱动 Dual wheel differential drive
控制方式 Control method	电脑无线控制 & 触摸屏控制 Computer wireless control & touch screen control
导航方式 Navigation method	SLAM 激光导航 SLAM by laser navigation
通讯方式 Comm method	2.4G / 5G WiFi (AMR 到服务器) & HSMS / SECS II (AMR 服务器到 MCS/MES 系统) 2.4G / 5G WIFI (AMR to AMR server) & HSMS / SECS II (AMR sever to MCS/MES)
最大移动速度 Max. moveing speed	1 米 / 秒 1m / s
最小错车距离 Min. Miss Distance	0.1 米 0.1 m
最小通道宽度 Min. Passage Width	0.9 米 0.9 m
定位精度 Positioning Accuracy	±10 毫米, ±1° ±10mm, ±1°
正常工作时间 Up time	≥ 98 %
平均故障修复时间 MTTR	< 4 小时 < 4 Hours
平均故障间隔时间 MTBF	> 2000 小时 > 2000 Hours

晶圆传输机器人

WAFER TRANSFER ROBOT



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通用RS232协议接口，操作更便捷；

Universal RS232 protocol interface, more convenient operation.
- 

SCARA手臂设计理念，适配真空吸附/边缘夹持/非接触式伯努力吸附等多种晶圆保持方式；

The design concept of SCARA arm adopts to a variety of wafer retention methods such as vacuum suction /edg gripper /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 a variety of working conditions.
- 

具有Smart Move功能，可实现最短距离、最佳运动轨迹。

With Smart Move function, it can achieve the shortest distance and the best movement trajectory.

规格参数 Specification parameter

设备尺寸 Equipment dimension	长 340 * 宽 340 * 高 931.2 毫米（依配置决定） L 340* W 340* H 931.2 mm (Decide by config)
控制箱尺寸 Control box size	长 421.5*宽 263.5*高 261.5 毫米 (不含把手) L 421.5* W 263.5* H 261.5 mm (Without handle)
设备重量 Device weight	45 ~ 60 千克 (依配置决定) 45 ~ 60Kg (Decide by config)
额定电压 Rated voltage	单相 AC 220 V Single phase AC 220 V
额定功率 Rated power	1.1 千瓦 1.1 kW
主体材质 Body material	铝合金 Aluminum
末端执行器材质 End effectors(EEF) Specif	陶瓷 / 铝合金 / 碳纤维复材 Ceramics / Aluminum / CFRP
手臂数量 Arm qty	单臂 / 双臂 Single Arm / Double Arm
气压供应范围 Single shipment	负压 VAC - 70 ~ - 90 千帕 / 正压 CDA 0.1 ~ 0.3 兆帕 VAC - 70 ~ - 90 kPa / CDA 0.1~ 0.3 MPa
晶圆保持方法 Wafer holding Method	真空吸附 / 边缘夹持 / 伯努利非接触式 / 夹持托举式 VaCUUM/ eDGE-GRIPPER / bERNOULLI / CLAMP TYPE FORK
纯净度 Cleanliness	最高 Class1@0.1µm MaxClass 1 @0.1µm

Z 轴最大速度 Axis-Zmax speed:	500 毫米 / 秒 500 mm/S
θ轴最大速度 Axis-Theta max speed	340° / 秒 340°/s
R1&R2 轴最大速度 Axis-R1& R2 max speed	750 毫米 / 秒 (非线性运动) 750 mm/s (non-line motion)
θ轴重复定位精度 Axis-θ Repeatable positioning accuracy	± 0.05°
重复定位精度 Repeatable positioningaccuracy	± 0.1mm
θ轴最大运动范围 Axis-Theta max Range of motion	340°
R1&R2 最大运动距离 R1&R2 Max stretch	520~685.5 毫米 (200 毫米晶圆)/600~729.4mm(300 毫米晶圆) 520~685.5mm(200mmWafer)/600~729.4mm(300 mm Wafer)
Z 轴最大运动距离 Axis-Z max Range of motion	单 Z 轴 :300/400/450/500 毫米双 Z 轴 :600 毫米 Single Axis-Z:300/400/450/500mm Dual Axis-Z:600 mm
单次运量 Single shipment	2+1 件 (300mm FOUP) (依配置决定) 2+1 piece (300mm Foup) (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
手臂负载 Arm load	3 千克 3kg

300mm晶圆装载系统

300MM LOAD PORT



-
- 标准Load Port通用设备, 完全符合SEMI标准, 具有高通用性、高兼容性;

Standard Load Port Universal equipment , fully compliant with SEMI standards, with high versatility, high compatibility.
-
- 内置原厂Mapping系统, 可进行叠片、斜片等检测, 杜绝整合晶圆传输中的撞片问题, 并可装载200/300晶圆;

Built-in original Mapping system, can be stacked, inclined chip detection, eliminate the chip collision problem in integrated wafer transfer, and can load 200/300 wafers.
-
- 可选配多种客制化组件, 灵活应对不同工况需求。

A variety of customized components can be selected to flexibly respond to different working conditions.

规格参数 Specification parameter

设备尺寸 Equipment dimension	长 586 * 宽 472 * 高 1349 毫米 L 586* W 472* H 1349 mm
设备重量 Equipment weight	66 ± 0.5 千克 (依配置决定) 66 ± 0.5kg (Decide by config)
额定电压 Rated voltage	DC 24 V
额定功率 Rated power	120 W
主体材质 Body material	铝合金、喷涂碳钢 (RAL9003) Aluminum、Painted SPCC (RAL9003)
适用载具类型 Applicable carrier types	200 / 300mm FOUP (SEMI)
噪声 Acoustic Noise	≤ 60 分贝 ≤ 60 dB
通讯接口 Comm interface	串口 RS-232C, 并行 I/O Serial RS-232C, Parallel I/O
通讯协议 Comm protocol	HEX

洁净度 Cleanliness	Class 1 @ 0.1μm
载具负载高度 Carrier Load Height	900 ± 10 毫米 900mm ± 10mm
气体压力供应 Gas pressure supply	负压: -80 kPa (Ø6 气体接口) VAC: -80 kPa (Ø6 air tube)
	正压: 0.5 ~ 0.6 MPa (Ø6 气体接口) CDA: 0.5 ~ 0.6 MPa(Ø6 air tube)
	氮气 (选配): 0.1 ~ 0.2 MPa(Ø8 气体接口) N2(Matching): 0.1 ~ 0.2 MPa(Ø8 air tube)
选配选项 Matching options	氮气置换功能 (MFC 控制) N2 purge function (MFC control)
	AMHS 系统通信端口 (E84) AMHS system communication port
	机械 / 电子式信息板 Mechanical control / Electrical control Info Pad
	8 寸卡匣适配器 200mm cassette adaptor



200mm晶圆装载系统

200MM LOAD PORT



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标准PLM-200W设备、完全符合SEMI标准, 具有高通用性、高兼容性;
Standard Load Port Universal equipment , fully compliant with SEMI standards, with high versatility, high compatibility.
- 

内置原厂Mapping系统, 可进行叠片、斜片等检测, 杜绝整合晶圆传输中的撞片问题, 并可装载150/200晶圆;
Built-in original Mapping system, can be stacked, inclined chip detection, eliminate the chip collision problem in integrated wafer transfer, and can load 120/200 wafers.
- 

可选配多种客制化组件, 灵活应对不同工况需求, 比如: 是否需要对接天车。
A variety of customized components can be selected to flexibly respond to different working conditions, such as whether is connectel with OHT



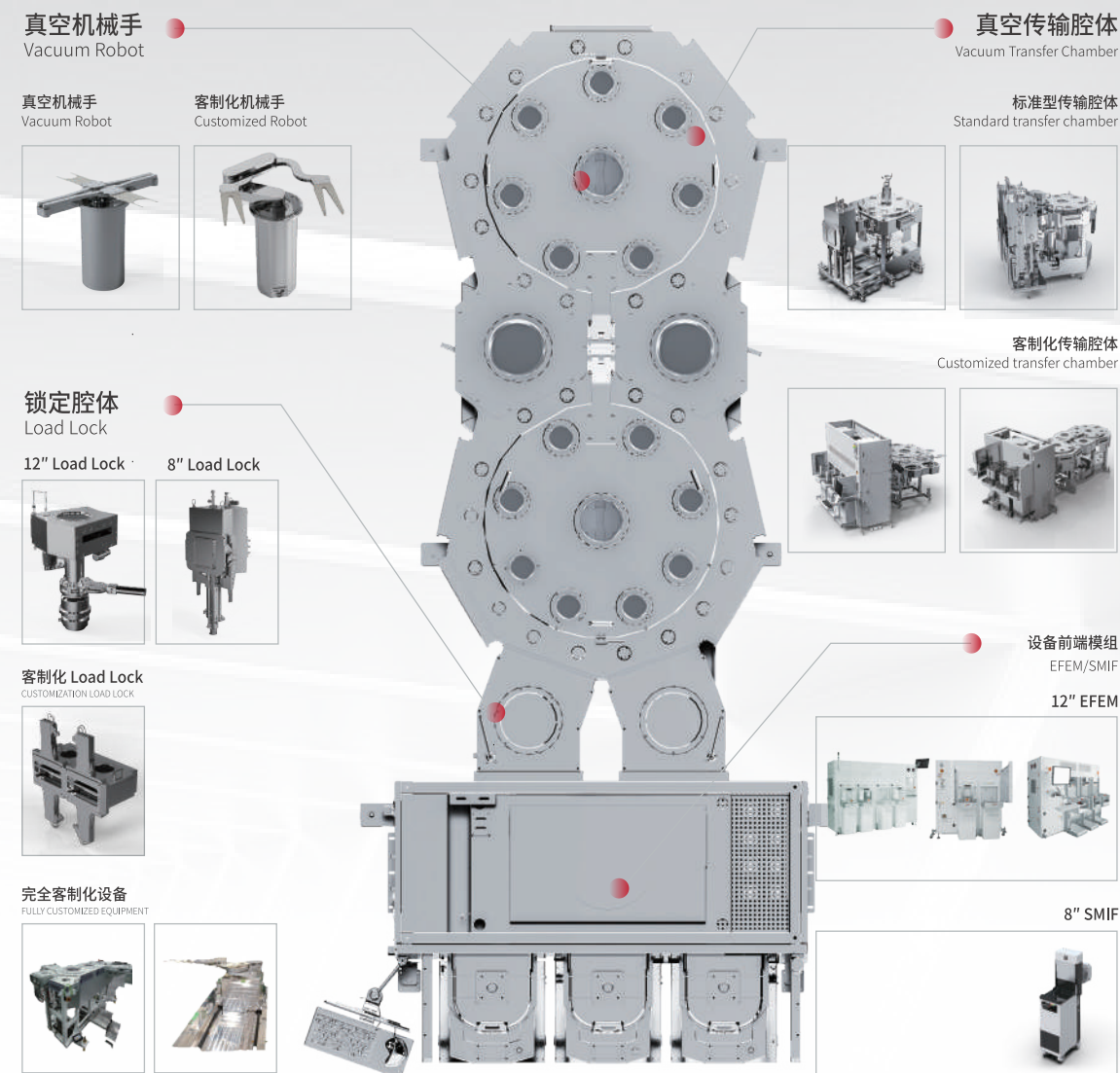
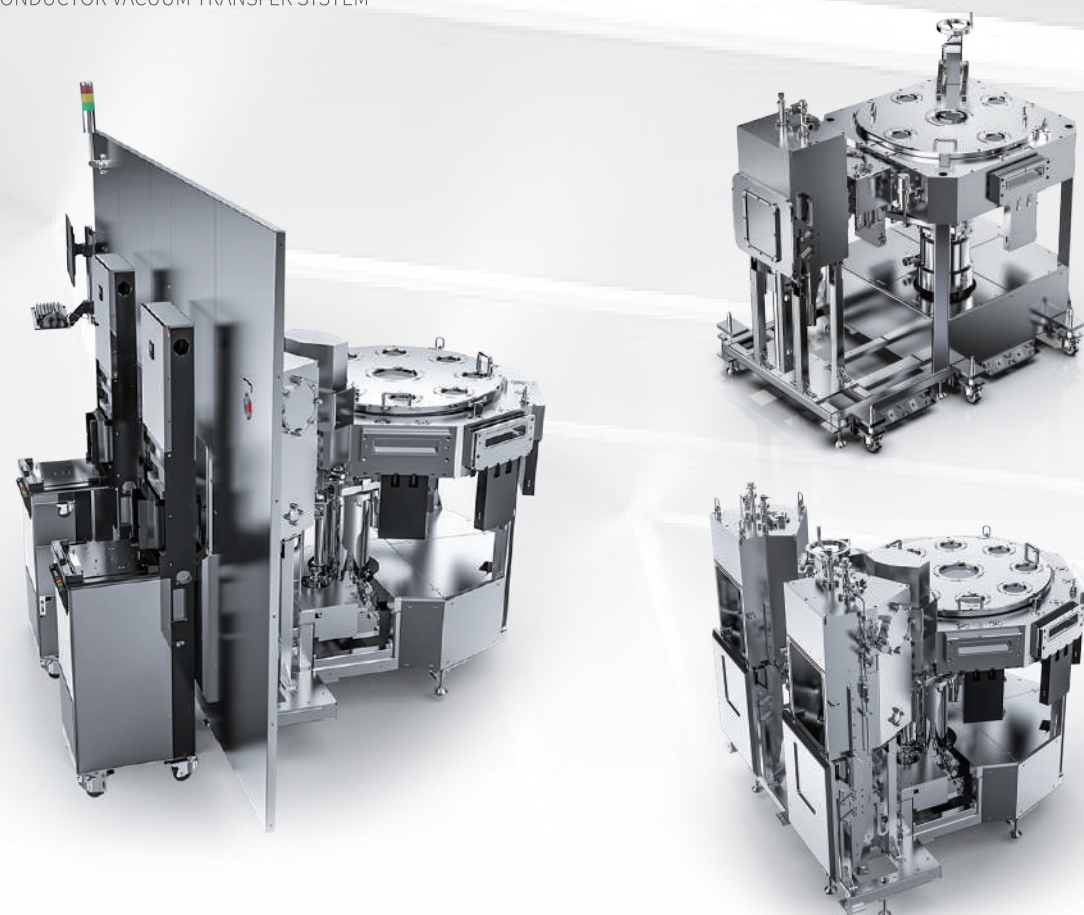
规格参数 Specification parameter

设备尺寸 Equipment dimension	长 421 mm* 宽 364 mm* 高 815 mm L 421mm* W 364mm* H815 mm
设备重量 Equipment weight	40 不千克 (依配置决定) 40kg (Decide by config)
额定电压 Rated voltage	DC 24 V
额定功率 Rated voltage	60 W
主体材质 Body material	铝合金、不锈钢 (SUS 304) Aluminum、Stainless steel (SUS 304) T
适用载具类型 Applicable carrier types	150/ 200mm POD(SEMI)
噪声 Acoustic Noise	≤ 60 分贝 ≤ 60 dB
通讯接口 Comm interface	串口 EIA-RS232C,Paralle I/O Serial EIA-RS232C,Paralle I/O
通讯协议 Comm protocol	HEX、SECS

洁净度 Cleanliness	Class 1 @ 0.1μm
晶圆盒界面 Wafer box interface	SEMI E19.4
载入循环 Load loop	负压: - 80 kPa (Ø6 气体接口) VAC : - 80 kPa (Ø6 air tube)
移出循环 Removal loop	正压: 0.5 ~ 0.6 MPa (Ø6 气体接口) CDA: 0.5 ~ 0.6 MPa(Ø6 air tube)
选配选项 Matching options	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 Communication protocol module selection HEX/SECS
	ID 读写装置选配 RFID ID read/write device with RFID module or IR Link

半导体真空传输系统

SEMICONDUCTOR VACUUM TRANSFER SYSTEM



核心组件自主研发生产,软硬件垂直整合

Independent research, development and production of core hardware and software.

真空传输系统核心组件均由富创得自主研发设计,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.



深耕半导体领域多年,适配多数前道工艺设备

Deeply rooted in the semiconductor field for many years, adaptable to most semiconductor front-end process equipment.

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.



提供标准化模块与客制化方案,满足不同需求

Providing standardized modules and customized solutions to meet different requirements.

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.

客制化方案 Customized solutions



设备前端可选配EFEM / SMIF, EFEM可提供标准型与客制型

EFEM / SMIF can be optionally equipped at the equipment front end, with EFEM offering standard and custom types.



Load Lock可选不同结构与传输方式

Load Lock can be chosen 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 made according to actual process chamber requirements.



真空机械手可根椐实际工况选择不同型号与末端执行器

Vacuum mechanical arms can be selected with different models and end effectors according to actual operating conditions.



传输腔体与Load Lock可选内置的定向 / 冷却 / 预热模组

Transfer chambers & Load Lock can include optional built-in directional / cooling / pre-heating modules.



可选配的AWC功能、Buffer 功能、晶圆存储模组

Optional features include AWC functionality, Buffer functionality, wafer storage modules.