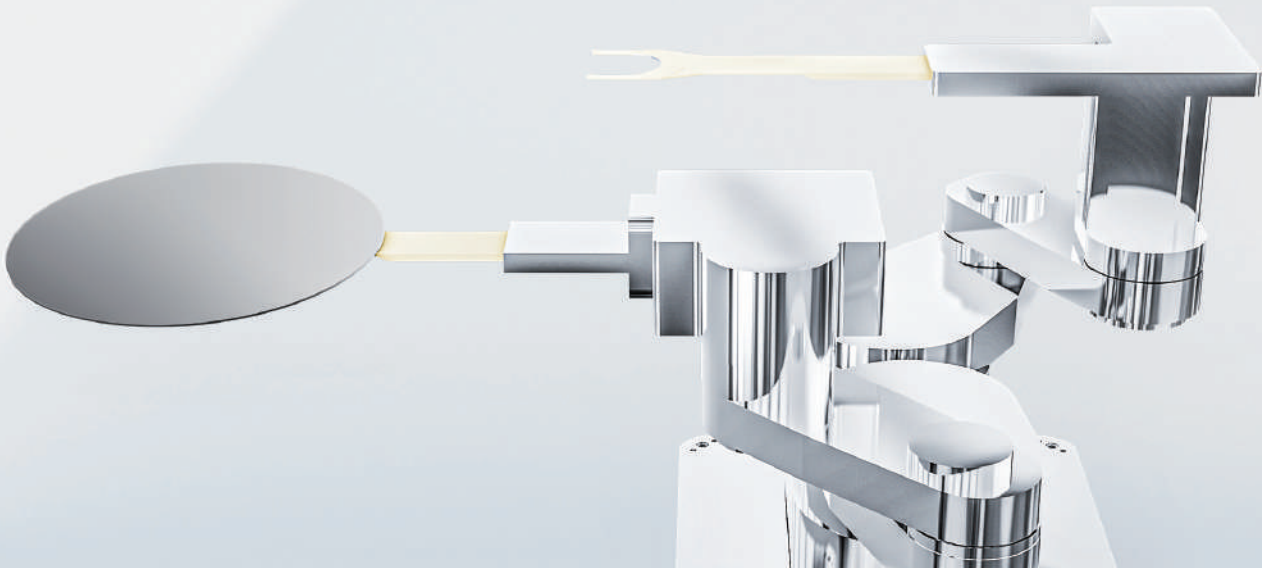




半导体装备核心部件
ROBOT/LOADPORT/OCS/ALIGNER

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无锡富创得智能科技有限公司
WUXI FORTREND INTELLGENT TECHNOLOGY CO.,LTD



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ROBOT

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机械手

ROBOT

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公司简介

Company Profile

无锡富创得智能科技有限公司是半导体自动化传输设备及核心部件提供商，为行业提供稳定可靠的产品，包含有：晶圆传输机器人ROBOT、晶圆装载系统 LOAD PORT、OCS、晶圆寻边器 ALIGNER等半导体产品，广泛应用在半导体和泛半导体传输制程中。

Wuxi FORTREND Intelligent technology Co., Ltd. is a semiconductor automatic transfer equipment and core components provider, to provide the industry with stable and reliable products, including: wafer transfer ROBOT, wafer loading system LOAD PORT, wafer finder ALIGNER, etc., widely used in semiconductor and universal semiconductor transfer process.

核心优势

Core advantage

45+

45年半导体行业经验
45 years of experience in semiconductor industry

12.5%

研发支出约占公司收入的12.5%
R&D spending accounts for about 12.5% of the company's revenue

36%

研发人员占比36%
Research and development personnel accounted for 36%

1800+

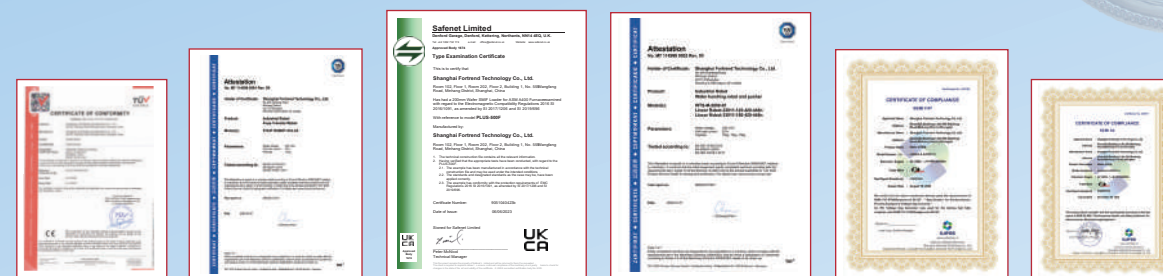
年产能超1800台
The annual production capacity exceeds 1800 units

全球专利

Global Patent

关键核心专利自有 | 全球专利超100项

Key core patents have more than 100 global patents



全球售后无忧

Global after-sales

24

24个当地客服中心
24 local call centers

2-4H

最快2-4小时内响应
The fastest response within 2-4h



富创得 ROBOT选型规则

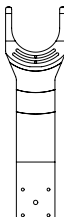
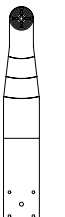
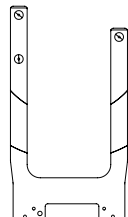
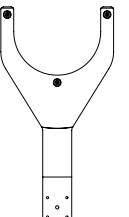
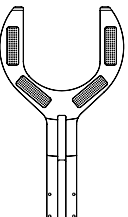
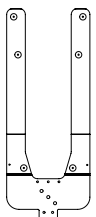
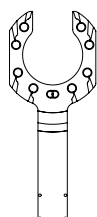
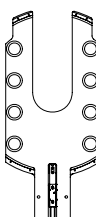
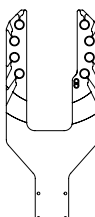
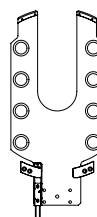
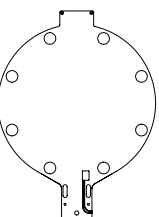
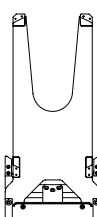
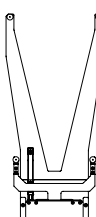
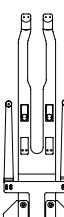
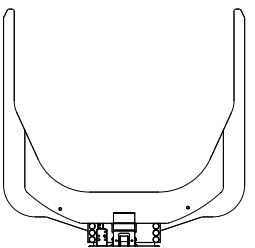
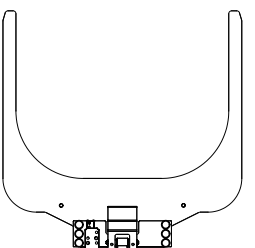
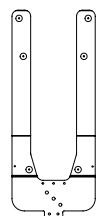
Fortrend Robot Selection Rules

FWRD-Z400-R190.5-Rta-Ata-F-8-MRTX-MOD

F:Fortrend W:wafer P:PLP基板 M:Mask C:Cassette H:humid(湿) R:Robot D:手臂数量 Arm Qty. S:单臂 D:双臂 A*:X(X:手臂数量)	Z:标准型升降高度 Axis-Z Height 240mm 300mm 400mm 500mm Z*XXX(定制) LZ: 紧凑型升降高度: 240mm 300mm 400mm 500mm LZ*XXX (定制) 双Z型 ZD600mm ZD700mm ZD800mm ZD*XXX(定制) 模组型 MZXXX	R:传动臂长度 Drive arm R length 146mm 190.5mm 213mm 偏心ER (选配)	特殊模组 Special module Rta: 单FLIP Rta: : Single arm FLIP Rta1:双臂上FLIP Rta2: Double Arm Up FLIP Rta2:双臂下FLIP Rta2: Double Arm Down FLIP RtaD:双臂双Flip RtaD: Double arm double FLIP FR: 晶圆框架 FR: wafer frame 无: 不做选配 No Options	牙叉类型 Fork Type F: 原厂牙叉 无:不做选配 No Options	晶圆尺寸 Wafer Size 4/6/8/12 F:Original fork N*:非晶圆对象 N*:Non-wafer object	特殊非标定制 Special Customization 有:特制机型 Have: Special Model 无:量产机型 None: Normal Device	末端执行器类型 End-effector Type Ata:真空吸取式 Ata:Vacuum suction Cta:末端夹持式 Cta:Edge gripper Han:夹持托举式 Han:Clamp lift type Ber1:接触式伯努利式 Ber1:Contact Bernoulli Ber2:非接触式伯努利式 Ber2:Non-Contact Bernoulli C*: 客户定制 Customer Customization	选配选项 Matching Options M: M1:对射Mapping数量1 M2:对射Mapping数量2 M*:反射Mapping数量1 无:不做选配 No Options R: R:原厂教导器 R:Original teach pendant 无:不做选型 TX: T:原厂Track轴 T:Original Track axis X:TRACK有效行程/mm X:TRACK axis effective distance/mm 无: 不做选配 No Options
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ROBOT FORK系列

Robot Fork Series

真空Fork Vacuum Fork	 标准型真空吸Y型	 标准型真空吸一字型	 对接Takio盘的U型真空Fork	 可应对1.5—5mm大翘曲Fork	 多孔真空吸Fork	 真空吸&摩擦垫Fork
伯努利Fork Bernoulli Fork	 接触式伯努利圆型	 边缘接触式伯努利	 接触式伯努利Y型	 边缘夹持式非接触式伯努利	 边缘夹持式非接触式伯努利	
Wafer夹持型Fork Wafer-holding Fork	 夹持型-Fork	 夹持翻转型	 兼容型夹持Fork			
Frame型Fork Frame-type Fork	 Frame夹持型-Fork	 Frame夹持型-Fork	 Frame真空吸型-Fork			

传输机械手

Transfer Robot

高效

High efficiency

高精

Highly refined

高稳定性

High stability



- 核心组件全自主研发、整机由富创得无锡生产基地组装、生产，更可靠；

The core components are fully developed in-house, and the entire machine is assembled and produced at the Fortrend Wuxi manufacturing base, ensuring greater reliability;
- 采用RS232串口接口及Ethernet总线通讯，操作更便捷；

The device features RS232 serial interface and Ethernet bus communication, making operation more convenient;
- 具备Smart Move功能，搭配教导设计，更智能；

It is equipped with the Smart Move function and features a teaching design, making it more intelligent;
- 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。

It offers a variety of end-effector specifications and customizable linear modules to meet the needs of diverse working conditions.ess.

规格参数 specifications parameter		
项目	规范	
结构	3~6轴(伺服电机) Z轴:带制动器的电机	
晶圆尺寸	2寸--12寸晶圆	
工作范围	R轴	146mm/190.5mm/213mm
	单Z轴	240mm/300mm/400mm/500mm
	双Z轴	600mm/700mm/800mm/920mm
	θ轴	340°
	Flip轴	180°
	Track	可根据工况定制
最大速度	R轴	1500mm/S
	单Z轴	500mm/S
	双Z轴	800mm/S
	θ轴	235~340°/S
	Flip轴	360°/S
	Track	800mm—1500mm
最大有效负载	第三关节中心处3Kg以下	
重复定位精度	±0.1mm	
洁净等级	最高 ISO Class1	
噪音等级	80分贝或更低	
机械人材质	铝合金	
EEF (End Effector末端执行器)	陶瓷/碳纤维/铝合金等 (根据要求定制)	
工作电压	220V	
通讯方式	Ethernet通讯/RS232	
通讯协议	HEX/ASCII	
气源	正压:0.15--0.5Mpa/负压:-70-- -90Kpa	

应用案例 CASE STUDY



FWRS-3轴单臂机械手系列

FWRS-3-Axis Single-Arm Robot Series

本机机械手适用于高洁净状况下的传输,采用闭环伺服方式,适用于高速搬运。

This mechanical arm is designed for material handling in high-cleanliness environments, employing a closed-loop servo control system and is suitable for high-speed transportation.



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

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

可搭配不同类型的Fork,满足多种工作的wafer传输

Compatible with various types of Forks to meet the wafer transfer needs for different jobs

晶圆固定方式:真空吸型/夹持型/夹持托举型/接触式伯努利型/非接触式伯努利型

Wafer securing methods: Vacuum suction type / Clamping type / Clamping and lifting type / Contact Bernoulli type / Non-contact Bernoulli type

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

应用:适用于各种半导体设备/EFEM/Sorter/检测设备等。

Application: Suitable for various semiconductor equipment, including EFEM, Sorter, inspection equipment, etc.

规格参数 specifications parameter			
搬运物	3寸/4寸/6寸/8寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	旋转:340°	升降:240/300/400/500
搬送速度(平均速度)	750mm/S	235~340°/S	500mm/S
手臂类型	单臂		
搬运高度	700-1000mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1—0.5Mpa		

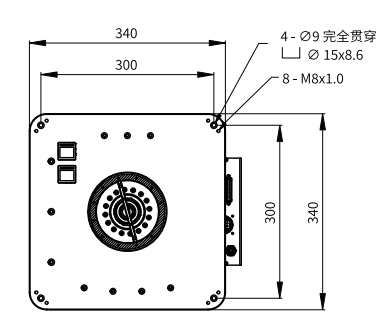
运动范围 RANGE OF MOTION

顶部固定方式

(固定沉头孔和调整螺丝依配置而定)

Top fixed mode

(Fix the counterbore and adjust the screw according to the configuration)

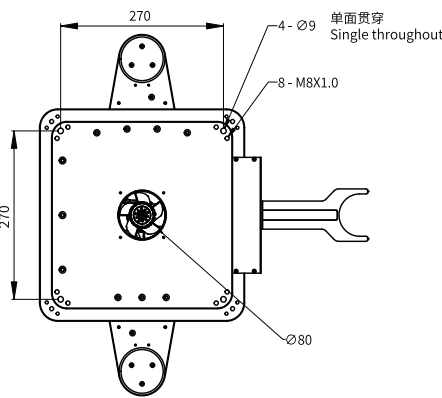


底部固定方式

(固定沉头孔和调整螺丝依配置而定)

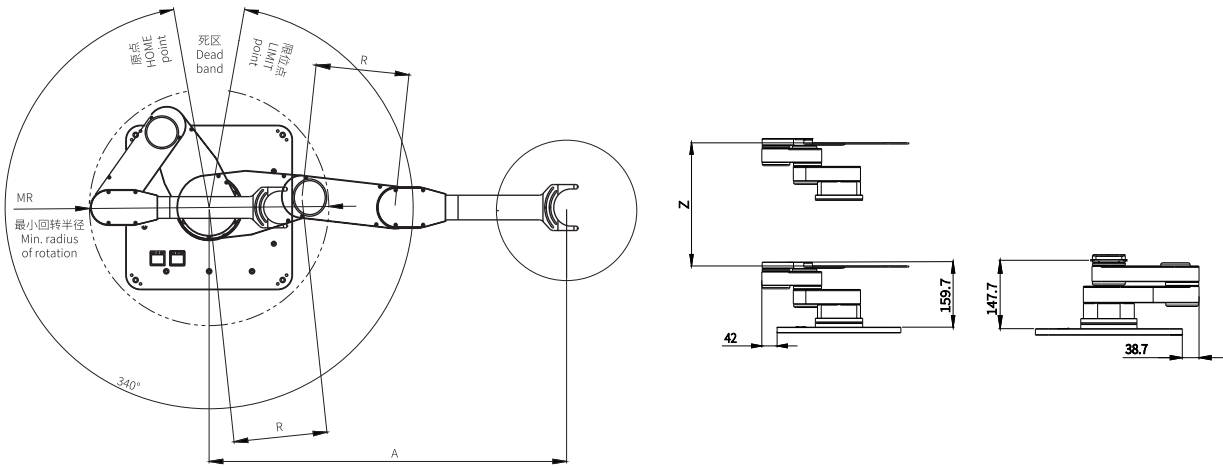
Bottom fixed mode

(Fix the counterbore and adjust the screw according to the configuration)



单臂机械臂运动范围示意图

Single - arm robot motion range schematic



型号	Z	R	MR*	A*
FWRS	300/400/500	146	8寸540	600
		190.5	12寸610	680

执行臂长与最小回转半径因实际选装末端执行器与传动轴不同,具体长度以实际产品为准。

The arm length and minimum rotation radius may vary depending on the specific end effectors and drive shafts selected. The actual length should be based on the final product

FWRD-4轴双臂机械手系列

FWRD-Four-Axis Dual-Arm Robot Series

本机机械手适用于高洁净状况下的传输,采用闭环伺服方式,适用于高速搬运。

This mechanical arm is designed for material handling in high-cleanliness environments, employing a closed-loop servo control system and is suitable for high-speed transportation.



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

采用双Arm构造,实现wafer的高速传输

Utilizing a dual-arm structure to achieve high-speed wafer transfer

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

可搭配不同类型的Fork,满足多种工作的wafer传输

Compatible with various types of Forks to meet the wafer transfer needs for different jobs

晶圆固定方式:真空吸型/夹持型/夹持托举型/接触式伯努利型/非接触式伯努利型

Wafer securing methods: Vacuum suction type / Clamping type / Clamping and lifting type / Contact Bernoulli type / Non-contact Bernoulli type

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

应用:大气环境半导体晶圆高速搬运,适用于各种半导体设备/EFEM/Sorter/涂胶显影设备/清洗设备/检测设备等。

Application: Suitable for high-speed wafer handling in atmospheric environments, applicable to various semiconductor equipment, including EFEM (Equipment Front End Module), Sorter, coating and developing equipment, cleaning equipment, and inspection equipment.

规格参数 specifications parameter			
搬运物	3寸/4寸/6寸/8寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	旋转:340°	升降:240/300/400/500
搬送速度(平均速度)	750mm/s	235~340°/s	500mm/s
手臂类型	双臂		
搬运高度	700-1020mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1—0.5Mpa		

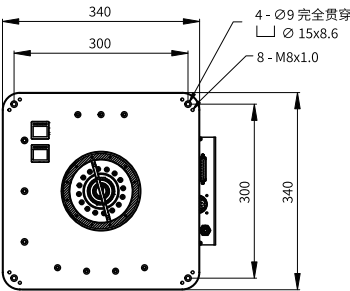
运动范围 RANGE OF MOTION

顶部固定方式

(固定沉头孔和调整螺丝依配置而定)

Top fixed mode

(Fix the counterbore and adjust the screw according to the configuration)

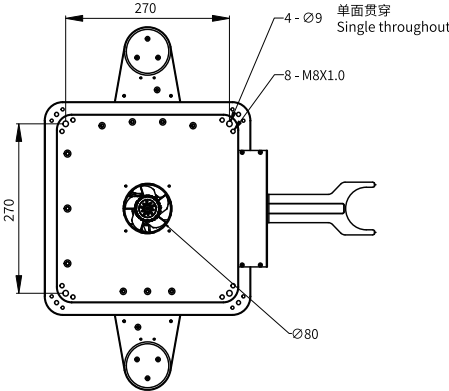


底部固定方式

(固定沉头孔和调整螺丝依配置而定)

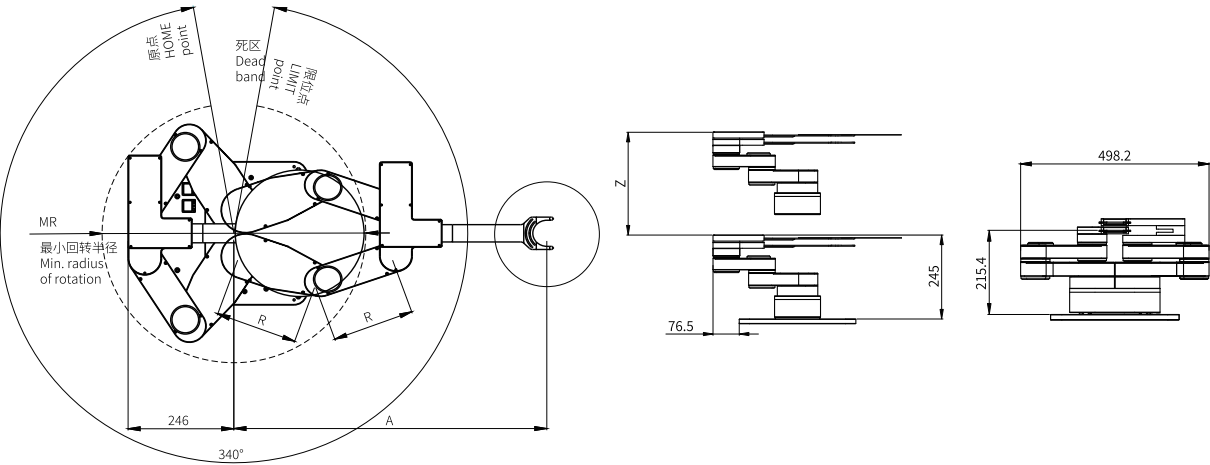
Bottom fixed mode

(Fix the counterbore and adjust the screw according to the configuration)



双臂机械臂运动范围示意图

Schematic diagram of the motion range for a dual-arm robotic arm



型号	Z	R	MR*	A*
FWRS	300	146	8寸520	600
	400	190.5	8寸600	720
	500	213	12寸630	910

行臂长与最小回转半径因实际选装末端执行器与传动轴不同,具体长度以实际产品为准。

The arm length and minimum rotation radius may vary depending on the specific end effectors and drive shafts selected. The actual length should be based on the final product.

FPRD-4轴双臂PLP机械手

FPRD Series Dual-Arm 4-Axis PLP Robot

本机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。

This mechanical arm is designed for material handling in high-cleanliness environments. It employs a closed-loop control system and is suitable for the transportation of PLP glass substrates.



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

搬运重量:4Kg以下
Carrying weight: below 4Kg

可搭配不同类型的Fork, 满足多种工况的wafer传输
Capable of being paired with different types of Forks to meet various wafer transfer requirements

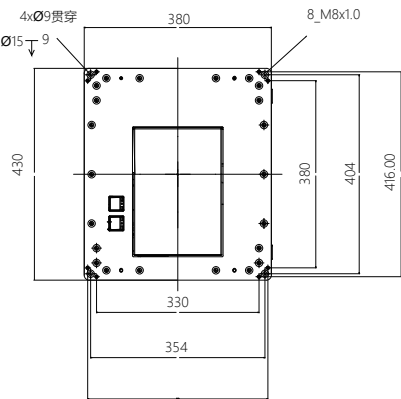
可根据设备布局采用上固定方式/下固定方式
Fixed methods can be chosen either from the top or bottom based on the equipment layout

应用:高洁净度、空间紧凑的玻璃基板PLP EFEM等。
Application: High-cleanliness, space-constrained glass substrate PLP EFEM and similar equipment.

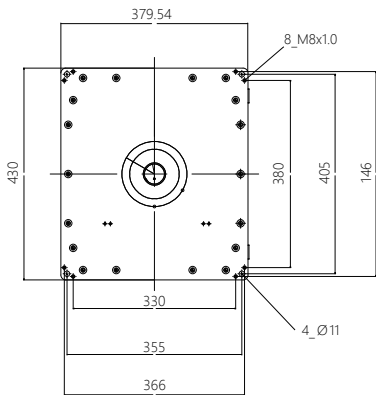
规格参数 specifications parameter			
搬运物	515*510玻璃基板		
可动范围(旋转中心至第三关节中心处)	手臂:376/500/760mm	Theta旋转:340°	升降:Z300/ZD500/ZD700
搬送速度(平均速度)	550mm/s	200°/s	300mm/s
手臂类型	双臂		
搬运高度	890mm (底座固定面到手指上的晶圆安装面的高度,具体依配置)		
重复精度	±0.2mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mpa		

运动范围 RANGE OF MOTION

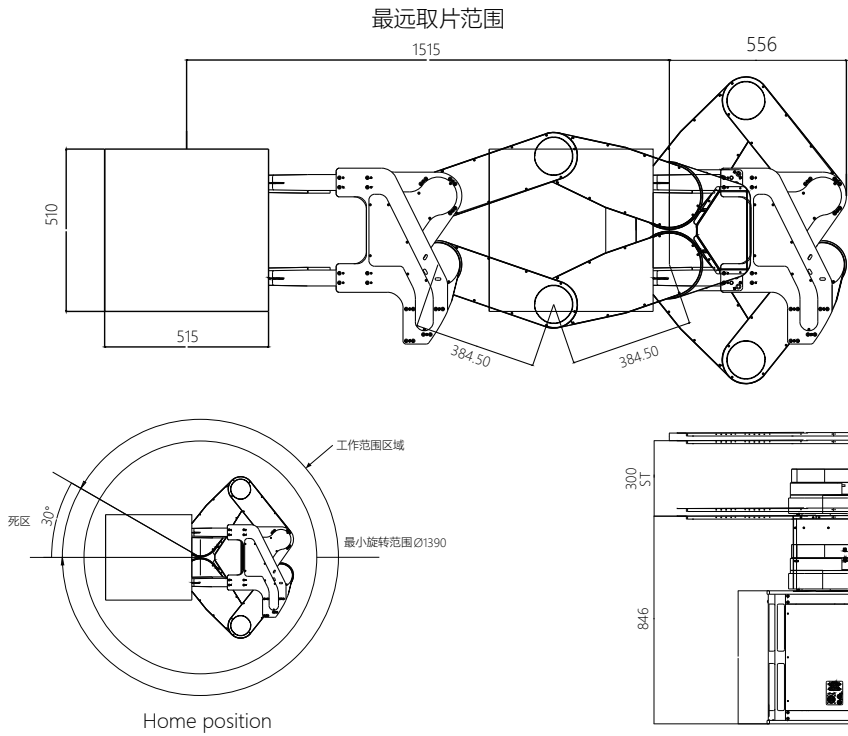
顶部固定方式
(固定沉头孔和调整螺丝依配置而定)
Top fixed mode
(Fix the counterbore and adjust the screw according to the configuration)



底部固定方式
(固定沉头孔和调整螺丝依配置而定)
Bottom fixed mode
(Fix the counterbore and adjust the screw according to the configuration)



双臂机械臂运动范围示意图
Schematic diagram of the motion range for a dual-arm robotic arm



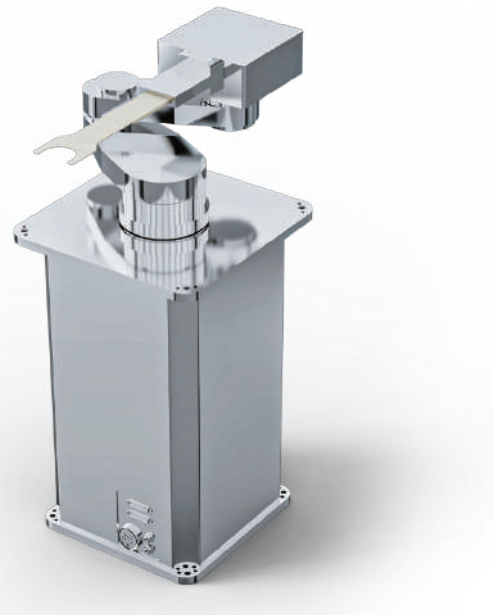
行臂长与最小回转半径因实际选装末端执行器与传动轴不同,具体长度以实际产品为准。
The arm length and minimum rotation radius may vary depending on the specific end effectors and drive shafts selected. The actual length should be based on the final product.

FWRS-4轴单臂翻转机械手系列

FWRS Series Single-Arm Rotary Robot with 4-Axis

本机机械手适用于高洁净状况下的传输,采用闭环控制方式,适用于需要EEF进行翻转的工况。

This mechanical arm is designed for material handling in high-cleanliness environments. It features a closed-loop control system and is suitable for applications where End Effector (EEF) rotation is required.



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可实现0--180°翻转

The EEF can achieve a flip from 0 to 180 degrees

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

可搭配不同类型的Fork, 满足多种工况的wafer传输

Compatible with various types of Forks to meet the wafer transfer needs for different jobs

晶圆固定方式:真空吸型/夹持型/接触式伯努利型/非接触式伯努利型

Wafer retention methods: Vacuum suction type/Clamping type/Contact Bernoulli type/Non-contact Bernoulli type

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

应用:大气环境半导体晶圆高速搬运,适用于各种半导体设备/EFEM/Sorter/涂胶显影设备/清洗设备/检测设备等。

Application: High-speed wafer handling in atmospheric environments, suitable for various semiconductor equipment such as EFEM, Sorter, coating and developing equipment, cleaning equipment, and inspection equipment.

规格参数 specifications parameter				
搬运物	3寸/4寸/6寸/8寸/12寸晶圆			
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	旋转:340°	升降:240/300/400/500	Flip旋转:180°
搬送速度(平均速度)	750mm/s	340°/s	500mm/s	360°/s
手臂类型	单臂			
搬运高度	690-1050mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)			
重复精度	±0.1mm以内			
通讯协议	HEX/ASCII			
通讯方式	EtherNet/RS232			
洁净度	最高 ISO Class1			
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1—0.5Mpa			

FWRD-5/6轴双臂翻转机械手系列

FWRD-Five/Six-Axis Dual-Arm Flip Manipulator Series

本机机械手适用于高洁净状况下的传输,采用闭环控制方式,适用于需要EEF进行翻转的工况。

This mechanical arm is designed for material handling in high-cleanliness environments. It features a closed-loop control system and is suitable for applications where End Effector (EEF) rotation is required.



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可实现0--180°翻转

Utilizing a dual-arm structure to achieve high-speed wafer transfer

双臂可以交互取片,应用于产能要求较高的工况

Utilizing a dual-arm structure to achieve high-speed wafer transfer

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

可搭配不同类型的Fork, 满足多种工况的wafer传输

Carrying capacity: Below 3Kg at the third joint of the arm

晶圆固定方式:真空吸型/夹持型/接触式伯努利型/非接触式伯努利型

Wafer holding methods: Vacuum suction/Clamping/Contact Bernoulli/Non-contact Bernoulli

可根据设备布局采用上固定方式/下固定方式

Carrying capacity: Below 3Kg at the third joint of the arm

应用:大气环境半导体晶圆高速搬运,适用于各种半导体设备/EFEM/Sorter/清洗设备/检测设备等。

Application: High-speed wafer handling in atmospheric conditions, suitable for various semiconductor equipment, including EFEM, Sorter, cleaning equipment, and inspection equipment.

规格参数 specifications parameter				
搬运物	3寸/4寸/6寸/8寸/12寸晶圆			
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	旋转:340°	升降:240/300/400/500	Flip旋转:180°
搬送速度(平均速度)	750mm/s	235~340°/s	500mm/s	360°/s
手臂类型	双臂单翻转/双臂双翻转可选			
搬运高度	690-1050mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)			
重复精度	±0.1mm以内			
通讯协议	HEX/ASCII			
通讯方式	EtherNet/RS232			
洁净度	最高 ISO Class1			
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1—0.5Mpa			

FMRS-3轴MASK单臂机械手

FMRS-Three-Axis MASK Single-Arm Manipulator

本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MASK片/方形玻璃片的传输。

This mechanical arm is designed for material handling in high-cleanliness environments. It employs a closed-loop control system and is suitable for the transfer of MASK wafers and square glass plates.



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

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

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

晶圆固定方式: 夹持型 /托举型

Wafer holding methods: Clamping type, Lifting type

可根据设备布局采用上固定方式/下固定方式

Based on the equipment layout, you can choose either an upper or lower fixing method

应用: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;适用于 MASK EFEM等MASK 片传输。

Application: Suitable for working conditions with high requirements for cleanliness, precision, and reliability, ensuring the efficient and stable transfer of photomask (MASK) wafers in lithography processes. It is applicable to MASK EFEM and other MASK wafer transfer systems.

规格参数 specifications parameter			
搬运物	Mask片/方形玻璃片		
可动范围(旋转中心至第三关节中心处)	手臂:376mm	Theta旋转:340°	升降:240/300/400/500
搬送速度(平均速度)	600mm/s	235°/s	250mm/s
手臂类型	单臂		
搬运高度	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)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mpa		

FMRD-4轴MASK双臂机械手

FMRD-Four-Axis MASK Dual-Arm Manipulator

本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MASK片/方形玻璃片的传输。

This mechanical arm is designed for material handling in high-cleanliness environments. It employs a closed-loop control system and is suitable for the transfer of MASK wafers and square glass plates.



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;

采用双臂结构,缩短晶圆交换时间;

Adopting a dual-arm structure, the robotic arm can reduce the wafer exchange time.

晶圆固定方式: 夹持型 / 托举型;

Wafer holding methods: Clamping type, Lifting type;

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;

搬运重量:手臂第三关节处基准3Kg以下;

Carrying capacity: Below 3Kg at the third joint of the arm;

可根据设备布局采用上固定方式/下固定方式;

Based on the equipment layout, you can choose either an upper or lower fixing method.

应用: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;适用于 MASK EFEM等MASK 片传输。

Application: Suitable for working conditions with high requirements for cleanliness, precision, and reliability, ensuring the efficient and stable transfer of photomask (MASK) wafers in lithography processes. It is applicable to MASK EFEM and other MASK wafer transfer systems.

规格参数 specifications parameter			
搬运物	Mask片/方形玻璃片		
可动范围(旋转中心至第三关节中心处)	手臂:376mm	Theta旋转:340度	升降:240/300/400/500
搬送速度(平均速度)	600mm/s	235°/s	250mm/s
手臂类型	双臂		
搬运高度	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)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCI		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kp, 正压:0.1~0.5Mpa		

FHRS-3轴 Humid单臂机械手

FHRS-Three-Axis Humid Single-Arm Manipulator

本机械手适用于防水环境下的晶圆传输,可配合晶圆翻转+边缘夹持机构,防护等级IP64,能在酸性/碱性/清洗环境下搬运晶圆。

This robotic arm is suitable for wafer transfer in waterproof environments and can be used in conjunction with a wafer flipper and edge grip mechanism. It has a protection level of IP64 and is capable of handling wafers in acidic, alkaline, and cleaning environments.



- 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
- 搬运重量:手臂第三关节处基准3Kg以下
Carrying capacity: Below 3Kg at the third joint of the arm
- 手臂部分可采用特氟龙镀层保证耐腐蚀性
The arm section is coated with Teflon to ensure corrosion resistance
- 部件接合面采用O型密封圈方式
O-ring seals are used at component joint interfaces
- Z轴的防水结构使用风琴蛇皮管
The waterproof structure of the Z-axis utilizes an accordion-style bellows
- 晶圆固定方式:真空吸型/夹持型
Wafer fixing methods: Vacuum suction type / Clamping type

应用:防水环境半导体晶圆高速搬运,适用于各种湿制程半导体设备/EFEM/Sorter等清洗工艺设备。
Application: High-speed transportation of semiconductor wafers in waterproof environments, suitable for various wet process semiconductor equipment, EFEM (Equipment Front End Module), Sorter, and other cleaning process equipment.

规格参数 specifications parameter			
搬运物	3寸/4寸/6寸/8寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	Theta旋转:340°	升降:300/400/500
搬送速度(平均速度)	750mm/s	235°/s	500mm/s
手臂类型	单臂		
搬运高度	780~980mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mpa		

FHRD-4轴 Humid双臂机械手

FHRD-Four-Axis Humid Dual-Arm Manipulator

本机械手适用于防水环境下的晶圆传输,可配合晶圆翻转+边缘夹持机构,防护等级IP64,能在酸性/碱性/清洗环境下搬运晶圆。

This manipulator is suitable for wafer transfer in waterproof environments and can be used in conjunction with wafer flipping and edge clamping mechanisms. It has a protection level of IP64, enabling the handling of wafers in acidic, alkaline, and cleaning environments.



- 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
- 手臂部分材质可采用特氟龙镀层保证耐腐蚀性
The arm section is coated with Teflon to ensure corrosion resistance
- 搬运重量:手臂第三关节处基准3Kg以下
Carrying capacity: Below 3Kg at the third joint of the arm
- 部件接合面采用O型密封圈方式
O-ring seals are used at component joint interfaces
- Z轴的防水结构使用风琴蛇皮管
The waterproof structure of the Z-axis utilizes an accordion-style bellows
- 晶圆固定方式:真空吸型/夹持型
Wafer fixing methods: Vacuum suction type / Clamping type
- 采用双臂结构,缩短晶圆交换时间
Adopting a dual-arm structure, the robotic arm can reduce the wafer exchange time
- 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

应用:防水环境半导体晶圆高速搬运,适用于各种湿制程半导体设备/EFEM/Sorter等清洗工艺设备。
Application: High-speed transportation of semiconductor wafers in waterproof environments, suitable for various wet process semiconductor equipment, EFEM (Equipment Front End Module), Sorter, and other cleaning process equipment.

规格参数 specifications parameter			
搬运物	3寸/4寸/6寸/8寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	Theta旋转:340°	升降:300/400/500
搬送速度(平均速度)	750mm/s	235°/s	500mm/s
手臂类型	双臂		
搬运高度	800~1000mm(底座固定面到手指上的晶圆安装面的高度,依配置而定)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mp		

FHRA*4-6轴 Humid四臂机械手

FHRA*4-6 Axis Humid Quadruple-Arm Robot

本机械手适用于防水环境下的晶圆传输,可配合真空吸/边缘夹持机构,防护等级IP64,能在酸性/碱性/清洗环境下搬运晶圆。

This robotic arm is suitable for wafer transfer in waterproof environments and can be equipped with vacuum suction/edge clamping mechanisms. It has an IP64 protection rating, allowing it to handle wafers in acidic, alkaline, and cleaning environments.



配置4个Fork可分干/湿手

Equipped with four Forks, it can be separated for dry and wet handling.

搬运重量:手臂第三关节处基准500g以下

Carrying capacity: Below 500g at the third joint of the arm

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

晶圆固定方式:真空吸型/夹持型

Wafer fixing methods: Vacuum suction type / Clamping type

采用4臂结构,独立运动传片,缩短晶圆交换时间

Using a 4-arm structure, with independent motion for wafer transfer, reduces wafer exchange time

Arm臂展/Track 行程可根据实际工况定制

The arm reach and track travel can be customized according to actual working conditions

应用：防水环境半导体晶圆高速搬运,适用于各种湿制程相关的半导体设备/EFEM/Sorter等空间要求比较紧凑的清洗工艺设备。

Application: High-speed wafer handling in waterproof environments, suitable for various semiconductor equipment related to wet processes, including EFEM, Sorter, and cleaning process equipment with compact space requirements.

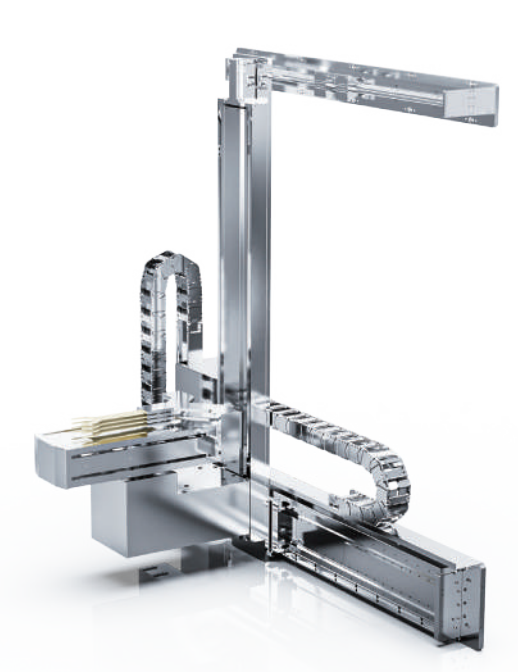
规格参数 specifications parameter			
搬运物	3寸/4寸/6寸/8寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	Theta旋转:340°	升降:300/400/500
搬送速度(平均速度)	1000mm/s	200°/s	500mm/s
手臂类型	单臂		
搬运高度	692--792,,(底座固定面到手指上的晶圆安装面的高度,依配置而定)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mp		

FHRA*4-7轴 Humid四臂机械手

FHRA*4-7 Axis Humid Quadruple-Arm Robot

本机械手适用于防水环境下的晶圆传输,可配合真空吸/边缘夹持机构,防护等级IP64,能在酸性/碱性/清洗环境下搬运晶圆。

This robotic arm is suitable for wafer transfer in waterproof environments and can be equipped with vacuum suction/edge clamping mechanisms. It has an IP64 protection rating, allowing it to handle wafers in acidic, alkaline, and cleaning environments.



配置4个Fork可分干/湿手

Equipped with four Forks, it can be separated for dry and wet handling.

搬运重量:手臂第三关节处基准500g以下

Carrying capacity: Below 500g at the third joint of the arm

搬运重量:手臂第三关节处基准3Kg以下

Carrying capacity: Below 3Kg at the third joint of the arm

晶圆固定方式:真空吸型/夹持型

Wafer fixing methods: Vacuum suction type / Clamping type

采用4臂结构,独立运动传片,缩短晶圆交换时间

Using a 4-arm structure, with independent motion for wafer transfer, reduces wafer exchange time

Arm臂展/Track 行程可根据实际工况定制

The arm reach and track travel can be customized according to actual working conditions

应用:防水环境半导体晶圆高速搬运,适用于各种湿制程相关的半导体设备/EFEM/Sorter等升降/横移行程需要根据空间要求定制的清洗工艺设备。

Application: High-speed wafer handling in waterproof environments, suitable for various semiconductor equipment related to wet processes, including EFEM, Sorter, and cleaning process equipment where the vertical and horizontal travel distances need to be customized according to space requirements.

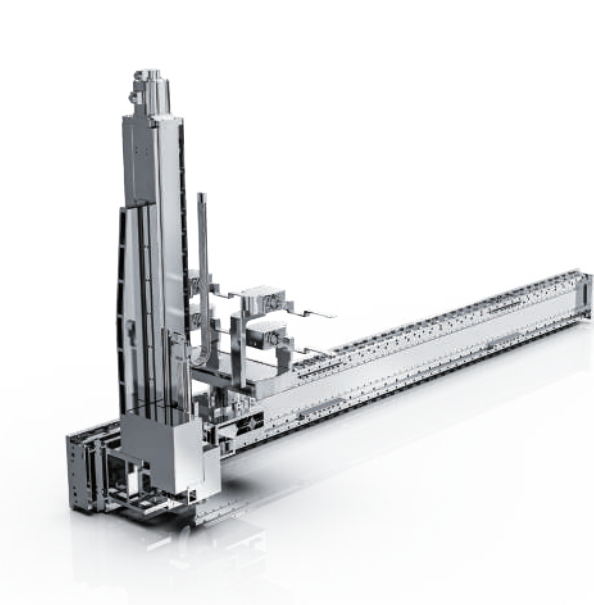
规格参数 specifications parameter				
搬运物	3寸/4寸/6寸/8寸/12寸晶圆			
可动范围(旋转中心至第三关节中心处)	手臂:1000mm	旋转:340度	升降:定制≥500	Track:定制
搬送速度(平均速度)	2000mm/s	200°	400~1000mm/s	800~3500mm/s
手臂类型	四臂			
重复精度	±0.1mm以内			
通讯协议	HEX/ASCII			
通讯方式	EtherNet/RS232			
洁净度	最高 ISO Class1			
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mp			

FHRD-7轴电镀制程Process机械手

FHRD-Seven-Axis Electroplating Process Manipulator

本机械手适用于洁净间有腐蚀性液体环境要求,采用闭环伺服方式,适用于稳定传输。

This mechanical arm is designed for material handling in cleanroom environments with corrosive liquids. It employs a closed-loop servo control system and is suitable for stable transportation.



可选XY模组式的设备布局

Optional XY Module-based Equipment Layout

采用模组式双 Arm 构造, 实现 wafer 高速传输

Adopting a modular dual-arm structure to achieve high-speed wafer transfer

采用模组式升降结构, 实现本体快速升降及定制设计

Adopting a modular lifting structure to achieve rapid elevation of the main body and customized design

可搭配不同类型Fork, 满足多种工况wafer传输

Can be paired with different types of Forks to meet various wafer transfer requirements under different working conditions

搬运重量:手臂含EEF 3Kg 以下

Handling Weight: The arm, including the End Effector (EEF), is below 3Kg

晶圆固定方式:真空吸型 / 夹持型

Wafer Fixation Methods: Vacuum Adsorption / Mechanical Clamping

可根据客户空间实现定制

Customizable according to customer space requirements

◆ 应用:布局在客户的电镀工艺腔体内部实现湿制程的Wafer传输,可根据客户空间定制XYR的行程。

Application: Positioned inside the customer's electroplating process chamber to facilitate the transfer of wafers in wet processes, and the travel range of XYR can be customized according to the customer's spatial requirements.

规格参数 specifications parameter

搬运物	12寸晶圆			
可动范围(旋转中心至第三关节中心处)	手臂:475mm可定制	Theta旋转:340°	升降:500—2000mm可定制	FLIP 轴:±180°
搬送速度(平均速度)	550mm/s	340°/s	400——1000mm/s可定制	340°/s
手臂类型	双臂			
搬运高度	依配置而定			
重复精度	±0.1mm以内			
通讯协议	HEX/ASCII			
通讯方式	EtherNet/RS232			
洁净度	最高 ISO Class1			
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mp			

FCRS-4轴 Cassette机械手

FCRS-Four-Axis Cassette Robot

本机械手适用于高洁净状况下的传输,采用闭环伺服方式,适用于高速搬运。

This robotic arm is designed for material handling in high-cleanliness conditions, employing a closed-loop servo control system, and is suitable for high-speed transfer operations.



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

采用单Arm构造, 可实现wafer的高速传输

Adopting a single-arm construction, it can achieve high-speed transfer of wafers

采用单 Z升降结构, 可实现本体的快速升降

Adopting a single Z-axis lifting structure, it is possible to achieve rapid lifting and lowering of the main body

搬运重量:手臂第三关节处基准4Kg以下

Carrying capacity: Below 4Kg at the third joint of the arm

可搭配不同类型的定制夹爪, 满足多种规格的Cassette/试剂盒等传输

Capable of being paired with various types of custom forks to meet the transportation needs of different specifications of Cassette/reagent boxes

固定方式: 夹持型

Fixed Method: Clamping Type

可根据设备布局采用上固定方式/下固定方式

Fixed methods can be chosen either from the top or bottom based on the equipment layout

◆ 应用:洁净环境Open Cassette/试剂盒等搬运,可根据实际使用工况定制。

Application: Suitable for handling open cassettes, reagent boxes, and similar items in clean environments, with customization available based on specific usage conditions.

规格参数 specifications parameter

搬运物	3寸/4寸/6寸/8寸Cassette/合适尺寸试剂盒		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	Theta旋转:340°	升降:300/400/500
搬送速度(平均速度)	750mm/s	235°/s	500mm/s
手臂类型	单臂		
搬运高度	依配置而定		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mpa		

FWRD-ZD5轴双Z机械手系列

FWRD-ZD Five-Axis Dual-Z Robot Series

本机械手适用于高洁净状况下的传输,采用闭环伺服方式,适用于高速搬运。

This robotic arm is designed for material handling in high-cleanliness conditions, employing a closed-loop servo control system, and is suitable for high-speed transfer operations.



- 可以在选配中选择拟似水平多关节动作对应平行配置的设备布局
The robot is equipped with four forks to accommodate dry/wet robotic arms
- 采用双Arm构造,可实现wafer的高速传输
The dual-arm configuration can achieve high-speed wafer transfer
- 采用双Z升降结构,可实现高行程内本体的快速升降
Using a dual Z-axis lifting structure, rapid lifting and lowering of the main body can be achieved within a high travel range.
- 可搬运重量:手臂第三关节处基准3Kg以下
Carrying capacity: Below 3Kg at the third joint of the arm
- 可搭配不同类型的Fork, 满足多种工作的wafer传输
Capable of being paired with different types of Forks to meet various wafer transfer requirements
- 晶圆固定方式:真空吸型/夹持型/夹持托举型/接触式伯努利型/非接触式伯努利型
Wafer holding methods: Vacuum suction type/Clamping type/Clamping and lifting type/Contact Bernoulli type / Non-contact Bernoulli type
- 可根据设备布局采用上固定方式/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	3寸/4寸/6寸/12寸晶圆		
可动范围(旋转中心至第三关节中心处)	手臂:290/376mm	Theta旋转:340度	升降:300/400/500
搬送速度(平均速度)	750mm/s	235°/s	800mm/s
手臂类型	双臂		
搬运高度	820~1020mm(底座固定面到手指上的晶圆安装面的高度)		
重复精度	±0.1mm以内		
通讯协议	HEX/ASCII		
通讯方式	EtherNet/RS232		
洁净度	最高 ISO Class1		
厂务	电源:220V, 10A, 真空:-70~-90Kpa, 正压:0.1~0.5Mp		

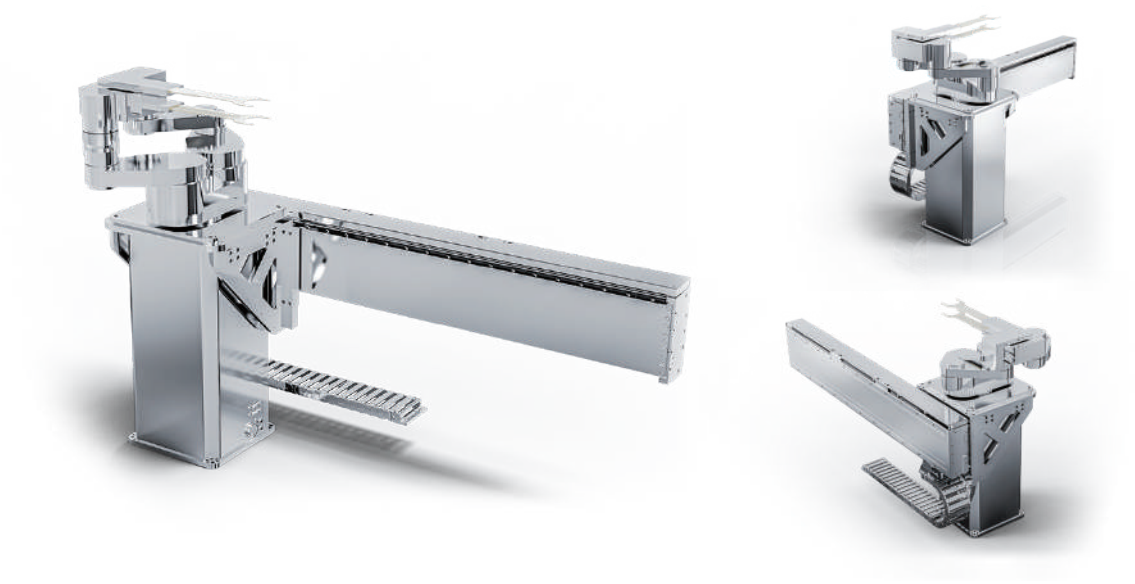
选配 TRACK 轴系列

Optional TRACK Axis Series

选配TRACK轴，可配合我司ROBOT适用于2-4LOADPORT传片

With the optional Track axis, it can be coordinated with Fortrend Robot to be suitable for 2-4 LOADPORT wafertransfer

侧挂式TRACK Side-Mounted TRACK



地轨式TRACK Floor-Mounted TRACK

