台灣富創得工程股份有限公司

FORTREND ENGINEERING (HsinChu) CORP

Innovation without Limitation

Fortrend USA

Fortrend China

Fortrend Taiwan

About Us

Fortrend Taiwan is founded in 1998 in Hsinchu city, Taiwan. Fortrend has always been the top leader in batch wafer transfer technologies, Standard Mechanical Interface (SMIF) technologies, ultra-clean automation solutions, and wafer surface curing processes for the semiconductor and PV industries. Fortrend SMIF products have become the crucial automation connections between process equipment and the factory delivery system and between different processing equipment. Fortrend's standard 200mm and 300mm front end automation modules are readily integrated into processing tools reliably and cost effectively. Fortrend's 3DIC thermal curing tools set the industrial standards for wafer surface curing processes. Fortrend offers not only standard automation and thermal curing modules, but also custom solutions allowing us to meet custom challenges and difficult configuration requirements quickly with a minimum of expenses. Contact Fortrend and experience our engineering excellence first hand.

What Set Us Apart

- Serving 200mm SMIF automation market since 1998 and the dominant solution provider for 200mm SMIF market
- Custom mini-environment solution provider. Specialized in ultra-clean, air-tight, humility controlled, airborne particle controlled, and chemical isolation mini-environments
- Complete 300mm wafer handling product lines (sorters, EFEM, clean room subtract handling robots, FOUP openers, and factory automation software) since 2008
- Worldwide leader in ultra-clean wafer baking oven for 3DIC and polymer curing applications since 2012
- IP developer in robotic solutions and control technologies with worldwide patent protection

200mm SMIF Solutions

Background Information

SMIF (Standard Mechanical Inter Face) technology is a material isolation technology pioneered by HP to provide class-1 wafer cassette transfer environment in a sub-class (class-1000 or better) IC manufacturing FAB. SEMI research data have proven that SMIF technology provides 100x, 30x, and 10x better cleanliness wafer protections compared to open cassette transfers in class -1000, class-10, and class-1 facilities, respectively. In addition, SMIF technology also enabled active material logistic controls to improve production managements and profitability. Consequently, over 100 200mm SMIF manufacturing facilities have been constructed since early 1990's. SEMI has formally adopted SMIF technology as the standard wafer isolation methods for 300mm IC manufacturing FABs.

Fortrend SMIF Advantages

- Fortrend introduced the first 200mm SMIF loader/Unloader (PLUS-500) and built the first 200mmSMIF manufacturing facility at HP-Corvallis facility in 1995
- Owns 7 USA and international SMIF patents
- Only SMIF provider offers total solution retrofit programs Flexible software and hardware configurations
- Compatible CIM integration to competitors
- Readily applicable to all existing tools
- Patented Technologies (granted)
- Integrated active ULPA Fan Filter Unit (FFU) for best environmental isolation
- Flexible configurations, two body designs and 4 robots to meet all custom applications
- Positive gripper design for easy cassette handling
- Tilt and rotate cassettes
- Smallest footprint
- E84 interface. Has successfully integrated with OHT system in two customers' fab since 2021.

PLUS 500 S-X

FEATURES

- *Less than 90-second cycle time maximizes production*
- *Small footprint saves valuable FAB floor-space*
- *Tilt and Straight end-effector meets special customer requirements*
- *Adjustable loading height provides ergonomic efficiency*
- *Built-in mini-environment and clean airflow system maintain Class 1 cleanliness*
- *CE and S2S8 certification*

Easy to Integrate

The fully automatic Fortrend Plus500S transfers 200mm cassettes from SMIF pods onto process stages in 90 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment.

With a total footprint not much larger than a SMIF pod, the Plus 500S-X is easy to integrate with AGV system and into small areas.

A programmable robotic arm with end-effector that tilts wafers into the vertical position accommodates a wide variety of process tools.

Simple to Maintain

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance.

Safe and Reliable

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages.

With many fail-safe features including pod present sensor, wafer protrusion sensor,cassette overload sensors, constant toque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 S-X is the best choice for both OEMs and system integrators.

Outstanding Support

Installation, on-site training, worldwide supports and variety choices of economical long-term maintenance contracts are available from Fortrend.

Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

Type Information

Plus 500 S–X

① -②

①: S - Standard type

②: Utility Side – View from operator side

R – Right Hand Side

L – Left Hand Side

Class 1 Cleanliness

<0.1 PWP @ 0.2 μm or greater size particles

<90-second cycle time

2,000 hours MTBF

Latches unlock the SMIF pod, Mini-environment rises and lifts the SMIF pod cover while maintaining Class 1 cleanliness inside SMIF pod. Robot arm picks up cassette and places it on to process tool stage. Process is reversed for unloading.

Cassette present and wafer protrusion sensors

Cassette overload sensor

Static-dissipative plastic windows

Fail-safe cassette gripper

Built-in diagnostics

PIO safety interlocks and programmable macros

Power failure recovery system automatically returns cassette to home position

Parallel I/0 (SEMI E23-96) 8 inputs / 8 outputs

EIA-RS232(SECS I/II)

50x35x184cm(20x13.7x72.4 inches)

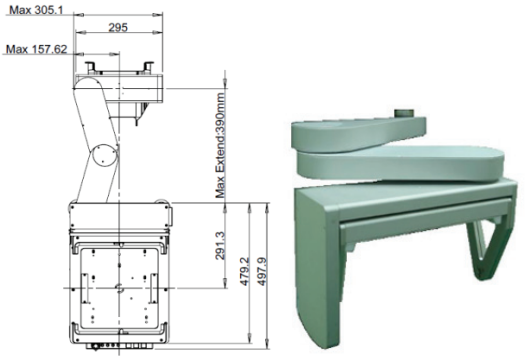
90cm standard load height, adjustable

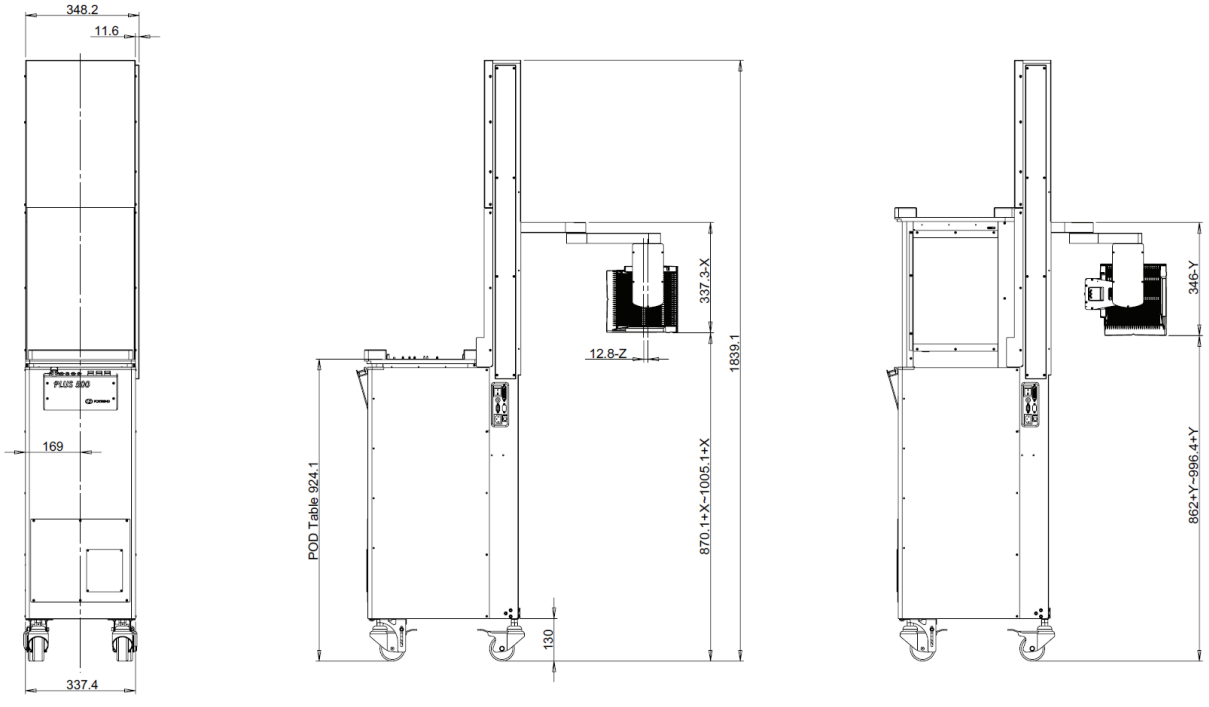
93kg(206 lbs) total weight

100~240v AC standard, single-phase, 50/60Hz, 3 amps

IR Link/RFID System/IR-RF combo(options)

Specifications subject to change without notice





Cassette Type	X(mm)	Y(mm)	Z(mm)	Cassette Type	X(mm)	Y(mm)	Z(mm)
K200-79MTH1-	0	0	0	K198-80MBRI	0	13.1	12.8
KA200-85MT	0	0	0	KA202-80SHH	0	10.8	12.8
K213-80SHHI	0	13.1	12.8	A192-80M-0215 PFA	0	12	12.8

PLUS 500 CX-X

FEATURES

- *Less than 90-second cycle time maximizes production*
- *Small footprint saves valuable FAB floor-space*
- *Tilt and Slide end effector meets special customer requirements*
- *Adjustable loading height provides ergonomic efficiency*
- *Built-in mini-environment and clean airflow system maintain Class 1 cleanliness*
- *CE and S2S8 certification*

Easy to Integrate

The fully automatic Fortrend Plus 500C model transfers 200mm cassettes from SMIF pods onto process stages in 90 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment.

With a total footprint not much larger than a SMIF pod, the Plus 500 Cx-X is easy to integrate with AGV system and into small areas.

A programmable robotic arm and end effector that can tilts 90˚ and do extra 85mm lateral movements supporta wide variety of process tools that cannot be used with standard models.

With 1507mm height, PLUS 500 Cx-X can connect to process tool without blocking operation panel or monitor screen right above the load lock.

Simple to Maintain

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance.

Safe and Reliable

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages.

With many fail-safe features including pod present sensor, wafer protrusion sensor,cassette overload sensors, constant toque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 Cx-X is the best choice for both OEMs and system integrators.

Outstanding Support

Installation, on-site training, worldwide supports and variety choices of economical long-term maintenance contracts are available from Fortrend.

Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

Type Information

Plus 500 Cx-X
①-③
①:Compact body with Slider option –
View from operator side
R –Right Hand (Slider moves to left)
L –Left Hand (Slider moves to right)
②:Utility Side – View from operator side
R – Right Hand Side
L – Left Hand Side

Class 1 Cleanliness

<0.1 PWP @ 0.2 μm or greater size particles

<90-second cycle time (with tilt and lateral movements)

2,000 hours MTBF

Latches unlock the SMIF pod, Mini-environment risesand lifts the SMIF pod cover while maintaining Class 1 cleanliness inside SMIF pod. Robot arm picks up cassette andplaces it on to process tool stage. Process is reversed forunloading.

Cassette present and wafer protrusion sensors

Cassette overload sensor

Static-dissipative plastic windows

Fail-safe cassette gripper

Built-in diagnostics

PIO safety interlocks and programmable macros

Power failure recovery system automatically returns cassette to home position

Parallel I/0 (SEMI E23-96) 8 inputs / 8 outputs

EIA-RS232(SECS I/II)

56x35x151.6cm (22x13.7x59.6 inches)

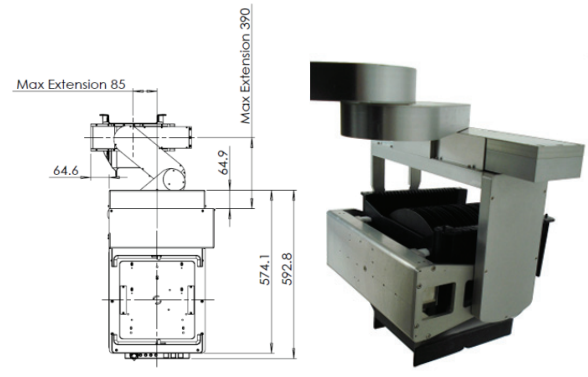
90cm standard load height, adjustable

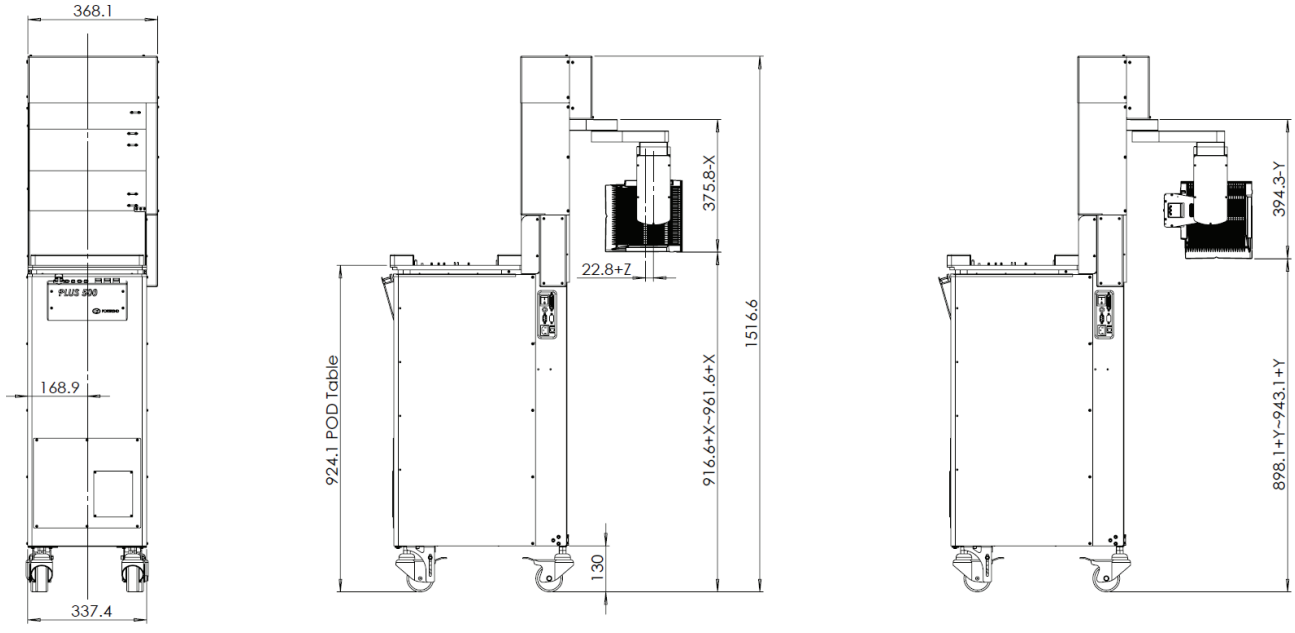
93kg(206 lbs) total weight

100~240v AC standard, single-phase, 50/60Hz, 3 amps

IR Link/RFID System/IR-RF combo(options)

Specifications subject to change without notice





Cassette Type	X(mm)	Y(mm)	Z(mm)	Cassette Type	X(mm)	Y(mm)	Z(mm)
K200-79MTH1-	0	0	0	K198-80MBRI	0	13.1	12.8
KA200-85MT	0	0	0	KA202-80SHH	0	10.8	12.8
K213-80SHHI	0	13.1	12.8	A192-80M-0215 PFA	0	12	12.8

PLUS 500 R-X

FEATURES

- *Less than 90-second cycle time maximizes production*
- *Small footprint saves valuable FAB floor-space*
- *Rotating end effector meets special customer requirements*
- *Adjustable loading height provides ergonomic efficiency*
- *Built-in mini-environment and clean airflow system maintain Class 1 cleanliness*
- *CE and S2S8 certification*

Easy to Integrate

The fully automatic Fortrend Plus 500 R-X transfers 200mm cassettes from SMIF pods onto process stages in 90 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment.

With a total footprint not much larger than a SMIF pod, the Plus 500 R-X is easy to integrate with AGV system and into small areas.

A programmable robotic arm and end effector that rotates 350° offers angled cassette placement and small chamber space that cannot be accessed by any other existing SMIF solutions. Plus 500R model illustrates another engineering excellence of Fortrend products.

Simple to Maintain

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance.

Safe and Reliable

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages.

With many fail-safe features including pod present sensor, wafer protrusion sensor,cassette overload sensors, constant toque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 R-X is the best choice for both OEMs and system integrators.

Outstanding Support

Installation, on-site training, worldwide supports and variety choices of economical long-term maintenance contracts are available from Fortrend.

Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

Type Information

Plus 500 R-X
①-②
①: R – Rotary Type
②: Utility Side – View from operator side
R – Right Hand Side
L – Left Hand Side

Class 1 Cleanliness

<0.1 PWP @ 0.2 μm or greater size particles

<90-second cycle time

2,000 hours MTBF

Latches unlock the SMIF pod, Mini-environment rises and lifts the SMIF pod cover while maintaining Class 1 cleanliness inside SMIF pod. Robot arm picks up cassette and places it on to process tool stage. Process is reversed for unloading.

Cassette present and wafer protrusion sensors

Cassette overload sensor

Static-dissipative plastic windows

Fail-safe cassette gripper

Built-in diagnostics

PIO safety interlocks and programmable macros

Power failure recovery system automatically returns cassette to home position

Parallel I/0 (SEMI E23-96) 8 inputs / 8 outputs

EIA-RS232(SECS I/II)

50x35x184cm(20x13.7x72.4 inches)

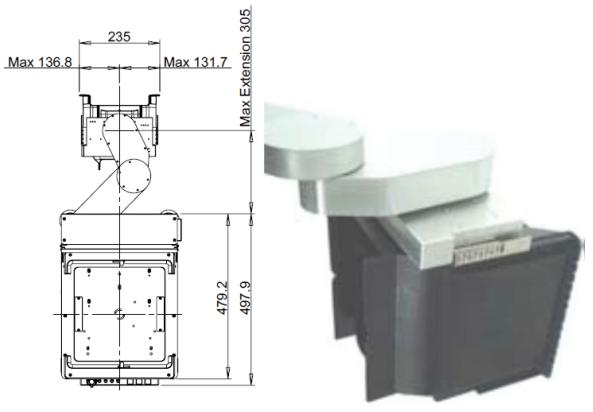
90cm standard load height, adjustable

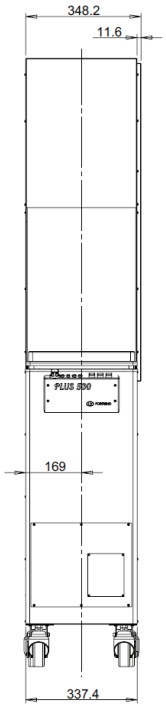
93kg(206 lbs) total weight

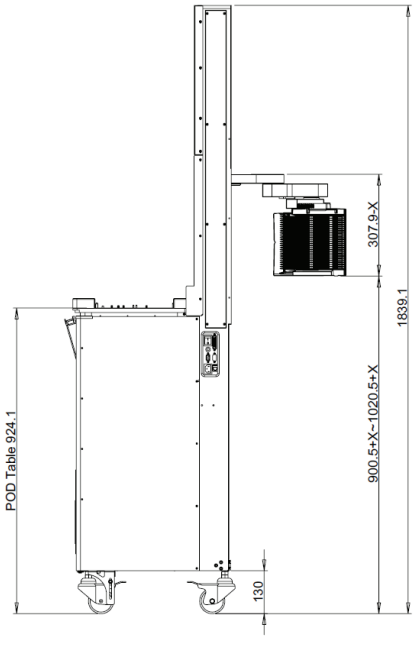
100~240v AC standard, single-phase, 50/60Hz, 3 amps

IR Link/RFID System/IR-RF combo(options)

Specifications subject to change without notice







Cassette Type	X(mm)	Cassette Type	X(mm)
K200-79MTH1-	0	K198-80MBRI	0
KA200-85MT	0	KA202-80SHH	0
K213-80SHHI	0	A192-80M-0215 PFA	0

PLUS 500 SX-X

FEATURES

- *Less than 90-second cycle time maximizes production*
- *Small footprint saves valuable FAB floor-space*
- *Tilt and Slide end effector meets special customer requirements*
- *Adjustable loading height provides ergonomic efficiency*
- *Built-in mini-environment and clean airflow system maintain Class 1 cleanliness*
- *CE and S2S8 certification*

Easy to Integrate

The fully automatic Fortrend Plus 500 Sx-X transfers 200mm cassettes from SMIF pods onto process stages in 90 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment.

With a total footprint not much larger than a SMIF pod, the Plus 500 Sx-X is easy to integrate with AGV system and into small areas.

A programmable robotic arm and end effector that can tilts 90° and does extra 85mm lateral movement supporta wide variety of process tools that cannot be used with standard models.

Simple to Maintain

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance.

Safe and Reliable

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages.

With many fail-safe features including pod present sensor, wafer protrusion sensor,cassette overload sensors, constant toque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 Sx-X is the best choice for both OEMs and system integrators.

Outstanding Support

Installation, on-site training, worldwide supports and variety choices of economical long-term maintenance contracts are available from Fortrend.

Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

Type Information

Plus 500 Sx-X

①-②

①: Standard body with Slider Option –View from operator side

SR –Right Hand (Slider moves to left)

SL –Left Hand (Slider moves to right)

②: Utility Side – View from operator side

R – Right Hand Side

L – Left Hand Side

Class 1 Cleanliness

<0.1 PWP @ 0.2 μm or greater size particles

<90-second cycle time (with tilt and lateral movements)

2,000 hours MTBF

Latches unlock the SMIF pod, Mini-environment risesand lifts the SMIF pod cover while maintaining Class 1 cleanliness inside SMIF pod. Robot arm picks up cassette andplaces it on to process tool stage. Process is reversed forunloading.

Cassette present and wafer protrusion sensors

Cassette overload sensor

Static-dissipative plastic windows

Fail-safe cassette gripper

Built-in diagnostics

PIO safety interlocks and programmable macros

Power failure recovery system automatically returns cassette to home position

Parallel I/0 (SEMI E23-96) 8 inputs / 8 outputs

EIA-RS232(SECS I/II)

50x35x184cm(20x13.7x72.4 inches)

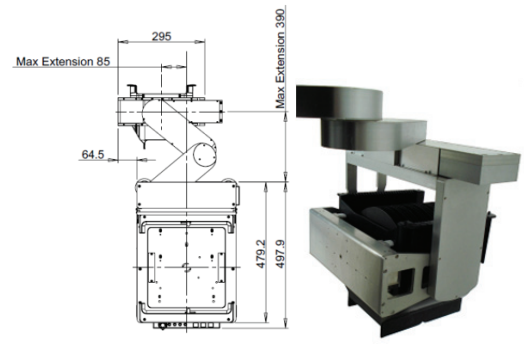
90cm standard load height, adjustable

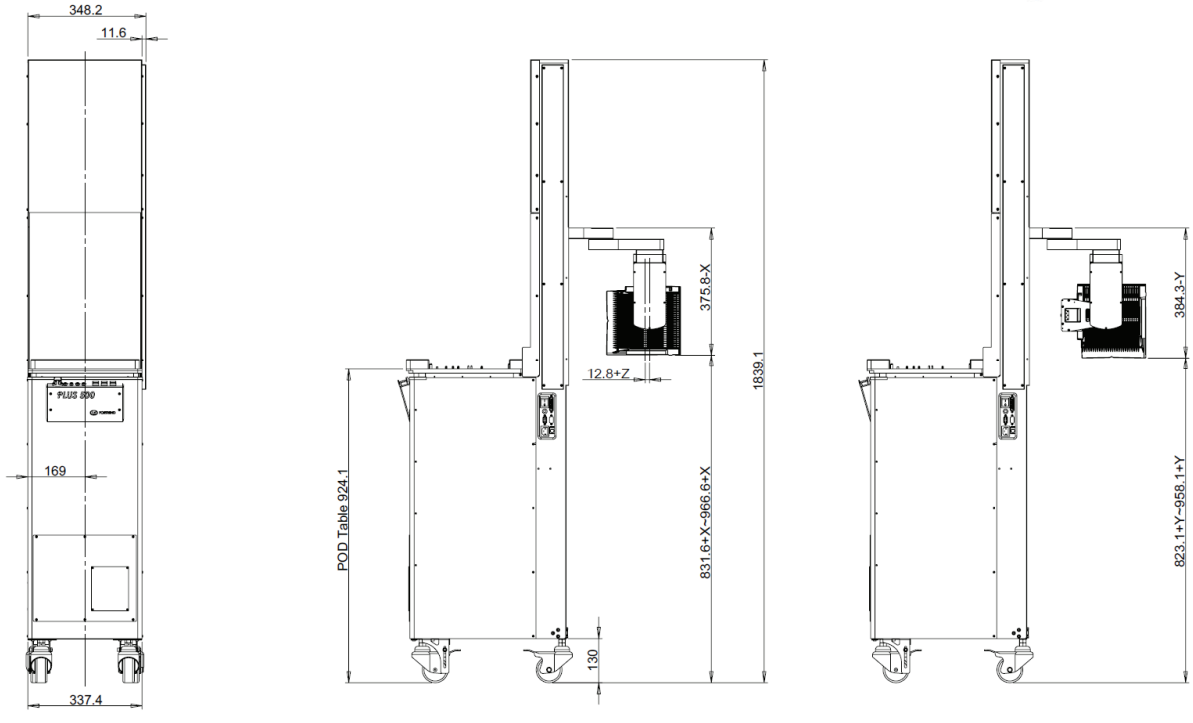
93kg(206 lbs) total weight

100~240v AC standard, single-phase, 50/60Hz, 3 amps

IR Link/RFID System/IR-RF combo(options)

Specifications subject to change without notice





Cassette Type	X(mm)	Y(mm)	Z(mm)	Cassette Type	X(mm)	Y(mm)	Z(mm)
K200-79MTH1-	0	0	0	K198-80MBRI	0	13.1	12.8
KA200-85MT	0	0	0	KA202-80SHH	0	10.8	12.8
K213-80SHHI	0	13.1	12.8	A192-80M-0215 PFA	0	12	12.8

PLUS 500 SD-X

FEATURES

- *Less than 90-second cycle time maximizes production*
- *Small footprint saves valuable FAB floor-space*
- *Ultra Thin end effector meets special customer requirements*
- *Adjustable loading height provides ergonomic efficiency*
- *Built-in mini-environment and clean airflow system maintain Class 1 cleanliness*
- *CE and S2S8 certification*

Easy to Integrate

The fully automatic Fortrend Plus 500 SD-X transfers 200mm cassettes from SMIF pods onto process stages in 90 seconds or less. The system can also be used to load cassettes into process tools in a non-SMIF environment.

With a total footprint not much larger than a SMIF pod, the Plus 500 SD-X is easy to integrate with AGV system and into small areas.

A programmable robotic arm and end effector are designed specifically for tools with special ultra thin space requirements that cannot be supported by any other existing SMIF solutions.

Simple to Maintain

All Plus 500 models feature a variety of tool interface options: diamond-pin interface plate with quick-release latches and stand-alone floor mount enabling reconnection to and from virtually any process tool within 15 minutes or less. Considering that during ramp-up a pod loader may be disconnected and reconnected as often as twice a day to adjust the process tooling, this feature significantly reduces downtime and simplifies preventive maintenance.

Safe and Reliable

A patented, built-in mini-environment and airflow control system help protect wafers from contamination, while the robot is transferring pod between SMIF pods and tool stages.

With many fail-safe features including pod present sensor, wafer protrusion sensor,cassette overload sensors, constant toque dc stepper motors (with encoder feedbacks) for accurate and reliable motion controls, the Plus 500 SD-X is the best choice for both OEMs and system integrators.

Outstanding Support

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Established in 1979, Fortrend's expertise in robotics, mechanics and software provide the optimum solution for semiconductor manufacturers who are driven to improve yield, increase throughput and reduce costs.

Type Information

Plus 500 SD-X

① -②

①: SD: Ultra thin gripper

②: Utility Side – View from operator side

R – Right Hand Side

L – Left Hand Side

Class 1 Cleanliness

<0.1 PWP @ 0.2 μm or greater size particles

<90-second cycle time

2,000 hours MTBF

Latches unlock the SMIF pod, Mini-environment risesand lifts the SMIF pod cover while maintaining Class 1 cleanliness inside SMIF pod. Robot arm picks up cassette andplaces it on to process tool stage. Process is reversed forunloading.

Cassette present and wafer protrusion sensors

Cassette overload sensor

Static-dissipative plastic windows

Fail-safe cassette gripper

Built-in diagnostics

PIO safety interlocks and programmable macros

Power failure recovery system automatically returns cassette to home position

Parallel I/0 (SEMI E23-96) 8 inputs / 8 outputs

EIA-RS232(SECS I/II)

50x35x184cm(20x13.7x72.4 inches)

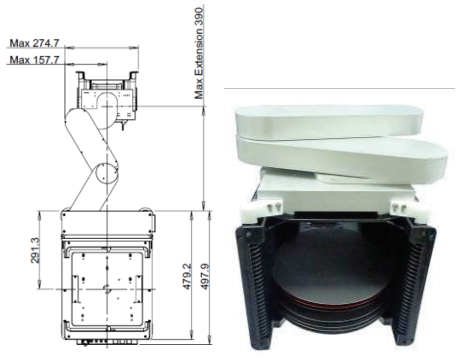
90cm standard load height, adjustable

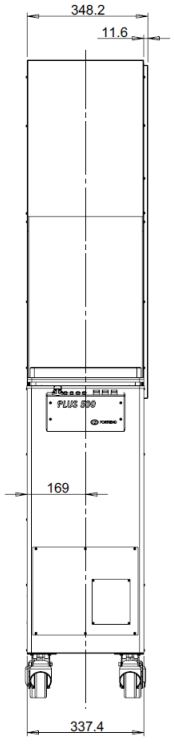
93kg(206 lbs) total weight

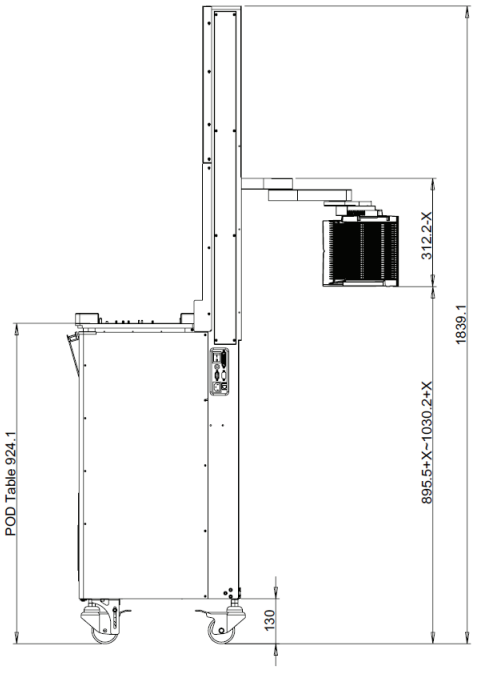
100~240v AC standard, single-phase, 50/60Hz, 3 amps

IR Link/RFID System/IR-RF combo(options)

Specifications subject to change without notice







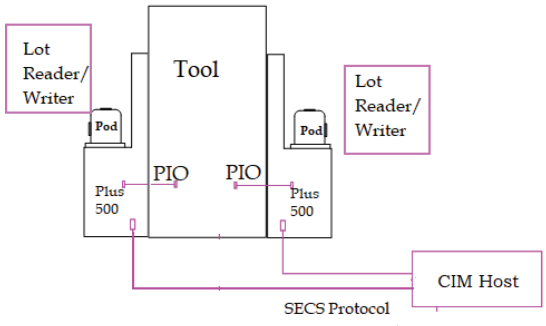
Cassette Type	X(mm)	Cassette Type	X(mm)
K200-79MTH1-	0	K198-80MBRI	0
KA200-85MT	0	KA202-80SHH	0
K213-80SHHI	0	A192-80M-0215 PFA	0

CIM/Tool/OHT Communication Scenario

- Fortrend supports SEMI standard SECS I/II remote control protocols
- Fortrend supports Asyst LPT-2200 and Brooks Ergospeed compatible tool interfaces
- Fortrend supports IR (SmartTag)/RFID lot tracking system using OEM specify custom protocols or customized SECS II messages
- Fortrend proprietary macro programming environment supports all PIO event sequence definitions required by OEM tools → 100% solutions for all EAP/PIO requirements

Standard Wiring Diagram

Each SMIF has one wire to CIM (Remote Host) and one wire to Tool (PIO signals)



Scenario 1: SMIF controlled by CIM

●All SMIF are controlled by CIM (remote host) via serial interface （SECS I/II）

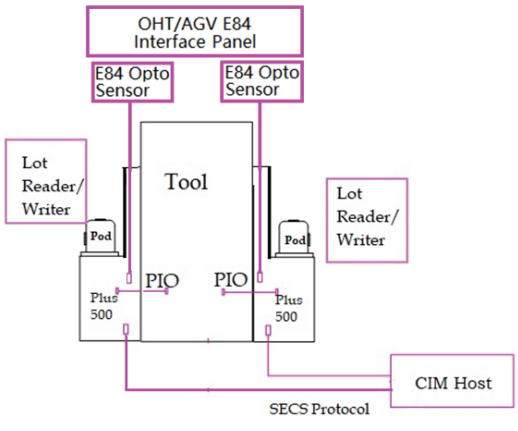
●SMIF sends lot ID information to Host via the same serial interface

●Each SMIF has one wire (PIO) to tool for safety interlocks

Scenario 2: SMIF controlled by Tool

- All SMIF are controlled by tool via defined PIO event sequences
- SMIF sends lot ID information and status messages to Host via the serial interface

E84 “OHT/AGV” Interface



- E84 embedded controller board was installed in each SMIF load port
- External E84 opto sensor was connected to the “E84 port” on each SMIF
- SMIF communicates directly with OHT/AGV via E84 opto interface
- SMIF passes E84 event status and messages to CIM and Tool via serial interface

PLM-200 SMIF Pod Opener for OEM Applications

Features and Benefits:

Class 1 cleanliness with active self-clean airflow design

- Support SEMI compliant 200mm wafer and reticle SMIF pods
- All electrical system with field programmable application software
- Wafer/Reticle protrusion sensor
- Four programmable Interlock signals
- Static dissipative transparent panels
- Substrate protrusion sensors protect reticles/wafers during operation
- Easy installation to all existing tools

Specifications:

Weight: ~51 lbs

Size: 431.2x 421.2 x 770.2 mm
(17"w x 16.6"d x 30.2"h)

Cycle Time: <10 seconds

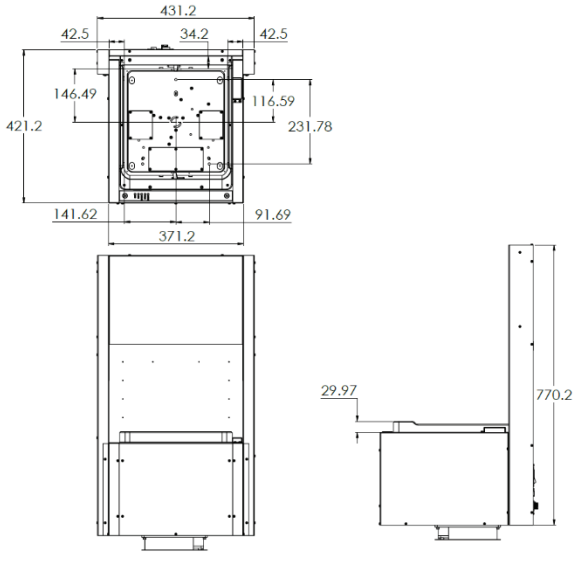
MCBF: 50,000 cycles

MTTR: Less than 1 hour

Power: 3 A max, 24VDC
Optional3 A max, single phase
50/60 Hz @ 110/220 VAC

Communications: Parallel, Serial
Optional SECS/GEM

Options: Wafer mapper, RFID, IR Link



Fortrend PLM-200 is a simple, reliable pod opener designed to open 200mm SMIF pods by lifting the shell. Wafer or Reticles remain in a sealed micro-environment where they can be accessed by a process tool's robot. Active airflow keeps the sealed micro-environment in better than class-1 cleanliness. Designed for quick installation and removal the PLM interfaces easily with most semiconductor tools. An optional reticle mapper protects against breakage during reticle handling operations. An integrated wafer/reticle protrusion sensor and provisions for tool interlock signals further prevent the pod cover from closing on protruding wafers/Reticles. Active pod present sensor and pod base/cover stiction detection algorithm detect the presence of the SMIF pod and faulty SMIF pods prevent mistaken pod operations assures optimal performance of the tools.

POS-200

Table Top Stand-alone SMIF Pod Opener

Features and Benefits:

- Class 1 cleanliness
- Support SEMI compliant 200mm wafer and reticle SMIF pods
- All electrical system with field programmable application software
- Four programmable Interlock signals
- Pod Clamp prevents shell from being removed for carrier logistic integrity
- Substrate protrusion sensors protect reticles/wafers during operation
- Easy installation and operations

Specifications:

Weight: ~51 lbs

Size: 336.6 x 485.6 x 695mm
(13.25”w x 19.11”d x 27.36”h)

Cycle Time: <8 seconds

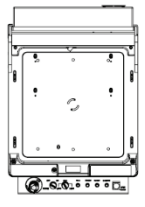
MCBF: 50,000 cycles

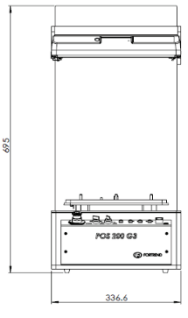
MTTR: Less than 1 hour

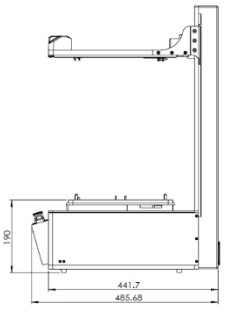
Power: 3 A max, single phase
50/60 Hz @ 110/220 VAC

Communications: Parallel, Serial
Optional SECS/GEM

Options: Subtract mapper, IR, RFID, Barcode reader, Foot switch







Fortrend PLM-200 is a simple, reliable pod opener designed to open 200mm SMIF pods by lifting the shell. Wafer cassette (or reticle) will expose to operators for easy removal or placements. Designed for quick installation and removal. The POM interfaces easily with most semiconductor tools. An integrated wafer/reticle protrusion sensor and provisions for tool interlock signals further prevent the pod cover from closing on protruding wafers/Reticles. Optional wafer (reticle) mapper allows additional functionalities as required by special applications. Active pod present sensor and pod base/cover sticktion detection algorithm detect the presence of the SMIF pod and faulty SMIF covers prevent mistaken pod operations assures optimal performance of the tools and safety of the sub straights

PLS 200

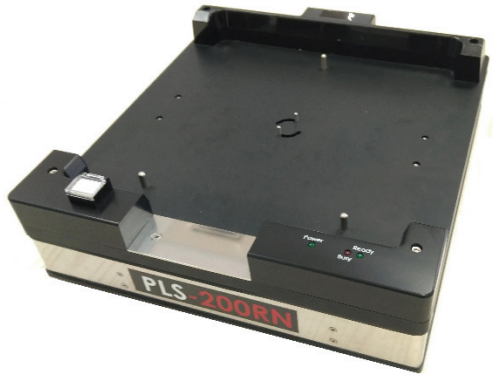
200mm SMIF Pod Opener

Features

- *Ultra small footprint saves valuable FAB floor space*
- *IR or RF ID read/write*
- *LED Statue Indicator*

Specification

General
Compliant with SEMI specification



- *Electric:*
- *110/220VAC, 50/60Hz, 20W*
- *Open/Close switch*
- *Led indicator*

- *Mechanical:*
- *Size: 340Wx 430Dx 119H*
- *Weight: 6.5Kg*
- *Load capacity: 12Kg*
- *Pod interface: E19.4-0697*
- *Open Pod < 6 second*
- *Close Pod < 6 second*
- *Lock accurate: +- 1 degree*

Fortrend Engineering Corp				
Patent List				
No.	**Country**	**Patent**	**Filing Date**	**Title**
1	USA	5,193,969	5/20/1991	Wafer transfer machine
2	USA	5,506,744	4/28/1994	Ionized airflow manifold for static reduction
3	USA	5,706,201	5/7/1996	Software to determine the position of the center of a wafer
4	USA	5,870,488	5/7/1996	Method and apparatus for prealigning wafers in a wafer sorting system
5	USA	5,934,991	2/1/1998	Pod loader interface improved clean air system
6	USA	5,885,045	3/11/1998	Integrated wafer pod-load/unload and mass-transfer system
7	USA	5,984,610	3/7/1995	Pod load interface
8	USA	6,086,323	6/29/1999	Method for supplying wafers to an IC manufacturing process
9	Taiwan	105,433	3/16/1998	Integrated wafer pod-load/unload and mass-transfer system
10	Taiwan	105,434	3/18/1998	Integrated wafer pod-load/unload and mass-transfer system
11	USA	6,610,993	6/21/1999	Load Port Door Assembly With Integrated Wafer Mapper
12	USA	6,013,920	11/25/1999	Wafer -mapping load post interface having an effector position sensing device
13	USA	6,193,459	3/12/1999	Integrated wafer pod-load/unload and mass-transfer system
14	USA	6,239,963	6/21/1999	Wafer support with electrostatic discharge bus
15	USA	6,396,072	4/3/2000	Load Port Door Assembly With Integrated Wafer Mapper
16	Taiwan	511,119	6/20/2000	Load Port Door Assembly With Integrated Wafer Mapper
17	USA	6,494,666	1/26/2001	Simplified and enhanced SCARA arm
18	USA	6,932,558	7/3/2002	Wafer Aligner
19	USA	6,616,034	9/9/2003	Radio Frequency Identification Device
20	Taiwan	I 228484	6/12/2003	Universal Reticle Transfer System
21	Europe	3,739,118	1/11/2005	Universal Reticle Transfer System

No.	Country	Patent	Filing Date	Title
22	USA	7,318,697 B2	6/12/2003	Universal Reticle Transfer System
23	USA	2005013684 (A1)	7/14/2004	Single Reticle Transfer System Provisional Patent Application
24	Taiwan	發明第 I 300585 號	9/11/2008	轉塔式光罩管理系統 (Carousel Type Reticle Stocker)
25	Taiwan	發明第 I 293939 號	3/1/2008	光罩盒搬運車 (Portable Reticle Transportation Cart)
26	Taiwan	新型第 M304619 號	1/11/2007	具識別及充氣裝置之氮氣櫃 (N2 Chamber with Lot Tracking Systems)
27	Taiwan	發明第 I 245225 號	12/11/2005	在製造環境下追蹤物品之系統及其方法 (Systems and Methods to Track Materials for Manufacturing)
28	Taiwan	新型第 M276318 號	9/21/2005	晶圓盒檢測機台 (Wafer Box Inspection System)
29	Taiwan	新型第 M272224 號	8/1/2005	半導體製程料號識別裝置 (Material ID Device for Semiconductor Manufacturing Process)
30	Taiwan	新型第 223405 號	5/1/2004	晶圓片推撥機構 (Wafer Seater Device)
31	Taiwan	新型第 217504 號	1/1/2004	晶圓片烘烤裝置 (Wafer Oven System)
32	Taiwan	新型第 217667 號	1/1/2004	雙軌式晶圓盒開盒機構 (Dual Track Wafer Pod Opening Device)
33	Taiwan	新型第 209032 號	8/11/2003	晶圓盒自動載入及開啟裝置 (Automated Wafer Cassette Transfer and Pod Opening System)
34	Taiwan	新型第 202968 號	4/21/2003	磁力牽引之晶圓盒泊靠裝置 (Magnetic Pod Moving Device)
35	Taiwan	新型第 198284 號	12/11/2002	可彈性擴張的定位裝置 (Elastic Inflation Type Positioning Device)
36	Taiwan	新型第 197981 號	11/21/2002	晶圓盒快速開啟裝置 (Fast Pod Cover Opening Device)
37	Taiwan	新型第 198752 號	11/21/2002	晶圓盒開啟裝置之承接面調整機構 (Pod Opener Mechanical Interface Device)
38	China	發明 200910010033.3	9/8/2010	翻轉式晶圓自動傳輸裝置
39	China	發明 200910010030.X	9/8/2010	旋轉式晶圓自動傳輸裝置
40	China	發明 200910010032.9	9/8/2010	緊湊式晶圓自動傳輸裝置
41	China	新型 200920010067.8	12/30/2010	平移翻轉式晶圓自動傳輸裝置
42	Taiwan	新型第 M376557 號	3/21/2010	晶片間距轉換裝置 (Chip space converter)

No.	Country	Patent	Filing Date	Title
43	Taiwan	新型第 M389928 號	10/1/2010	光罩儲存器 (Reticle storage)
44	Taiwan	新型第 M603197 號	10/21/2020	冷卻裝置及使用該冷卻裝置之真空烤箱 (Cooling device and vacuum oven using the cooling device)
45	Taiwan	新型第 M604058 號	11/11/2020	輸送模組及使用該輸送模組之設備前端模組 (Conveying module and equipment front-end module using the conveying module)
46	Taiwan	新型第 M604970 號	12/1/2020	自動化真空烤箱設備模組 (Automatic vacuum oven equipment module)
47	Taiwan	新型第 M630402 號	8/1/2022	邊緣夾持之晶圓翻轉裝置 (Wafer flipping device by holding edge)
48	Taiwan	發明第 I786019 號	12/1/2022	晶圓承載座及其使用方法 (WAFER HOLDER AND METHOD OF USING THE SAME)
49	Taiwan	發明第 I799261 號	4/11/2023	具晶圓承載座之上下料自動化作業設備 (AUTOMATIC LOADING AND UNLOADING APPARATUS WITH WAFER HOLDER)

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