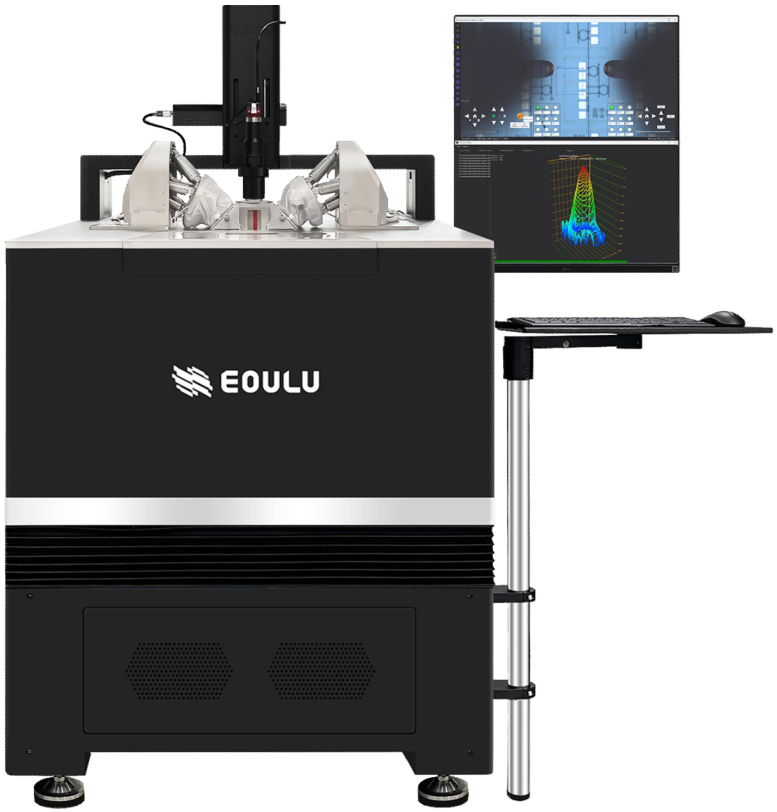
Eoulu F1 SiPh Probe Station

Novel Features

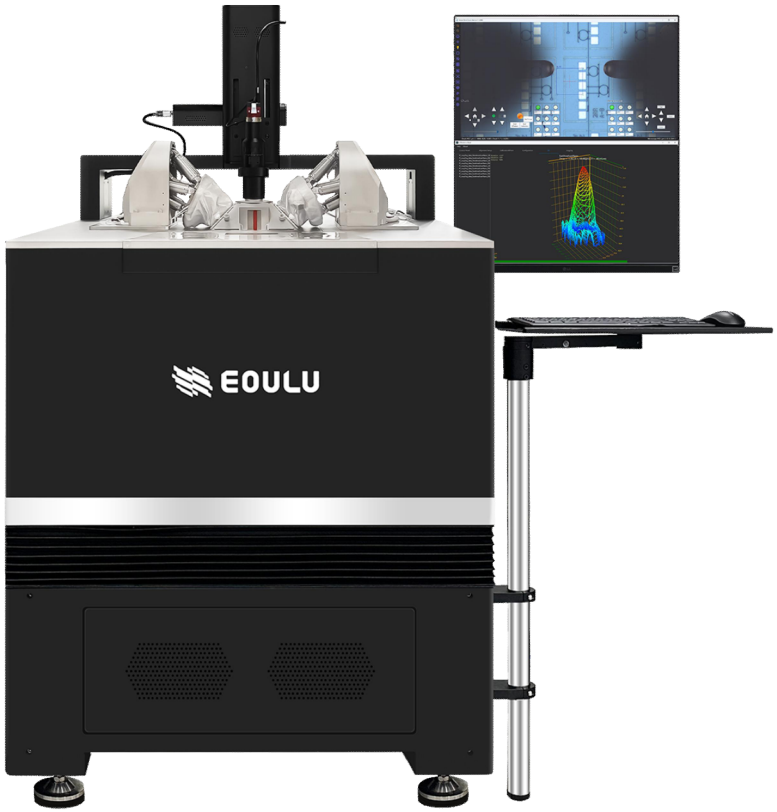
- The world's first evolvable and able-to-learn SiPh probe station, for which Eoulu owns 100% intellectual property rights
- Eoulu's patented design for new digital 3.0 system makes the probe station simpler and lighter
- Eoulu's patented design for SiPh AutoCal calibration software, combined with unique optical calibration kits and algorithms, enables precise positioning and rapid calibration
- With Eoulu’s thermal system, the F1 SiPh probe station can realize variable temperature test from multi-angle single fiber to fiber array, from vertical coupling to edge coupling
- The world's smallest 12-inch SiPh probe station, only 1m wide, saving the clean room cost, and making it easy to move
- The world's lightest 12-inch SiPh probe station, and the main body only weighs 500 kg, so that the site can easily meet the requirement of bearing capacity



Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Novel Features

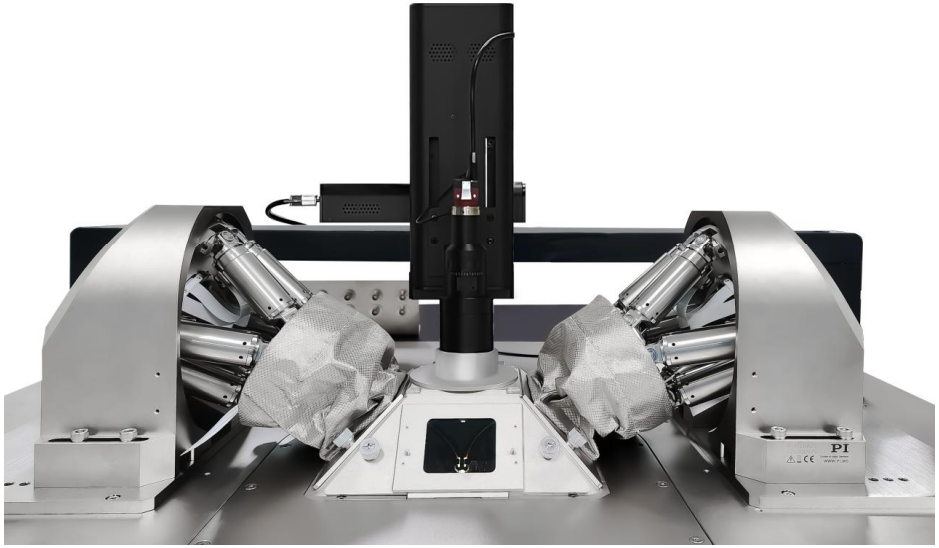
- A dynamic map and static map system with Eoulu's copyright and patent makes the probe station faster and more accurate
- Eoulu's patented "Zero Error (C0)" and "Virtual Ruler (VR)" technologies, specially used for uneven wafers
- The F1 architecture completely solves the problem of inaccurate probing, it is a model that all peers will surely follow



Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Product Description

- The world's first digital probe station launched by Eoulu
- F1 takes its name from two English words,
  Formula 1, which means to be as fast as F1 car
  Focus 1, which means that all probe station are focused on this one
- Unlike all traditional probe station, it is no longer a probe station, but a probe platform
- From the wafer to the data, there is little manual work involved. You don’t have to worry about inaccurate probing
- Featuring a powerful SiPh automation software and hardware integration solution
- Supporting multiple testing applications including O-O, O-E, E-O, and E-E
- futureC provides mass instrument interfaces and applications, making it easy for F1 to test wafers integrated with instruments
- Eoulu's futureD data system and background monitoring technology can be used to easily trace the data of each chip



Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Mechanical Performance

No.	Item	Chuck			
		X-axis	Y-axis	Z-axis	Theta axis
1	Travel	301 mm	301 mm	20 mm	10°
2	Maximum positioning accuracy *	≤ 0.05 μm	≤ 0.05 μm	≤ 1 μm	± 0.003°
3	Speed **	≥ 50 mm/s	≥ 50 mm/s	≥ 20 mm/s	/
4	Maximum speed	150 mm/s	150 mm/s	35 mm/s	/
5	Wafer roughness adaptability *	100 μm			
6	Average time of mapping ***	Minimum value	Typical value	Maximum value	
		< 500 ms	< 1 s	< 3 s ****	
7	XY position locking *****	Minimum value	Typical value	Maximum value	
		0.02 μm	0.038 μm	1.5 μm	
8	Z position locking ******	Minimum value	Typical value	Maximum value	
		0.65 μm	3.5 μm	15 μm	

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Mechanical Performance

* When C0 and VR are enabled

** The speed at which F1 chuck moves varies depending on the chuck size chosen by the customer, the chuck construction (Coax or Triax), and whether the chuck supports high and low temperatures

*** This time only refers to the mechanical movement time and does not include alignment time. There will be some variation depending on the size of the DUT, movement precision, and stability requirements

*** High speed and high stability cannot be achieved simultaneously. Eoulu can provide services to optimize test accuracy or test speed according to the customer's wafer and measurement application. For more information, please contact sales for hardware and software upgrade solutions

**** In the case of 8-inch, room temperature, and triax chuck, F1 adopts the highest accuracy and most stable speed mode, 1000 μm * 1000 μm chip movement time

***** It varies according to the configuration and the customer's requirements for accuracy and speed. The minimum value of XY position locking can be achieved by selecting CCD, which cannot be achieved by standard CCD.

****** The standard deviation of the probe scrub mark length σ is ≤ 5μm. We can refer to the futureD product data of Eoulu to measure more than 2,000 DUTs of 8-inch wafers. Under the high-precision wafer running mode, the probe scrub mark length difference from DUT to DUT is guaranteed to be within 3σ

****** The standard deviation of the starting position of the probe mark σ is ≤ 8μm. We can refer to the futureD product data of Eoulu to measure 2000 DUTs of 8-inch wafer. Under the high-precision and low-speed wafer running mode, the difference in starting position from DUT to DUT is guaranteed to be within 3σ

****** The above data indicators are not lower than the level of peers, refer to the article published by the peer on August 22, 2022

F1 Shielding Capability

No.	Shielding and Noise Capability *	
1	Light attenuation	≥ 150 dB **
2	EMI shielding	≥ 20 dB 0.5~20 GHz (typical)
3	Spectral noise floor	≤ -150 dBVrms/rtHz (≤ 1 MHz)
4	System AC noise	≤ 15 mVp-p (≤ 1 GHz)

* In addition to the system capability, environmental conditions should also be considered. This project is not verified on the client side, and can be arranged to be verified in Suzhou laboratory of Eoulu

* The fully-automated probe station does not have Microchamber, this parameter is not applicable

** The single-photon test requires additional shielding devices, this parameter is not applicable

** The test light path refers to the perpendicular incident light from 90° directly above the microscope

** The light shielding wavelength is 200 ~ 2000 nm

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Vibration Isolation Capability

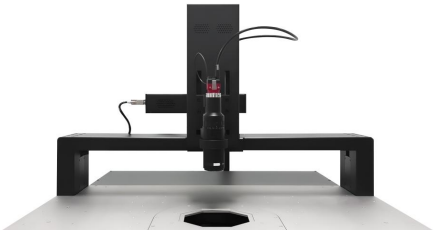
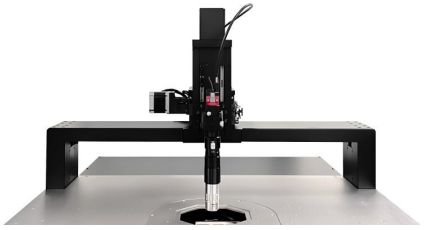
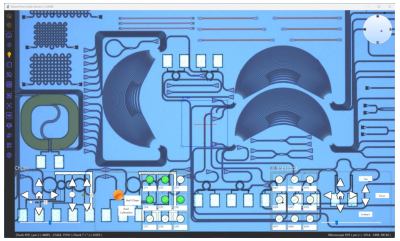
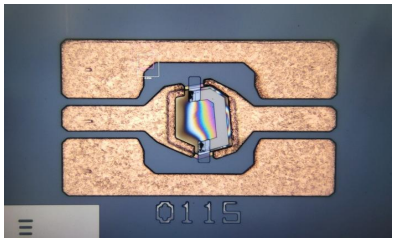
No.	Vibration Isolation Capability *	
1	Natural frequency (vertical)	2.5 ~ 2.7 Hz
2	Natural frequency (horizontale)	2.0 ~ 4.5 Hz
3	Vertical damping (adjustable)	6% ~ 20%
4	Horizontal damping	5% ~ 6%
5	Air pressure	0.3 ~ 0.5 Mpa
6	Maximum load	1600 kg
7	Isolation efficiency	5% ~ 6%
8	Response time to external excitation	< 1 s
9	Vibration isolation level	VC-C

* For the F1 vibration isolation table related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Microscope

Microscope Bridge				
No	Item	X-axis	Y-axis	Z-axis
1	Travel	50 mm	50 mm	90 mm
2	Maximum positioning accuracy	± 2 μm	± 2 μm	± 2 μm
3	Speed	60 mm/s	60 mm/s	120 mm/s

Microscope *			
No	Item	Large FOV	High Resolution
4	Typical magnification **	225 X	500 ~ 2000X or higher
5	Typical optical lens resolution ***	3.0 μm	≤ 1.5 μm
6	Product picture		
7	futurel image		

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Microscope

* The F1 probe station is available in both Large FOV and High Resolution microscope configurations, you can choose according to your test requirements

** When the CCD configuration is different, the color and magnification will be different

** When the objective lens is different (5X, 10X, 20X, 50X, 100X), the magnification will be different

*** When the lens configuration is different, the resolution will be different

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Chuck

No.	Item	Chuck size			
		8-inch		12-inch	
1	Temperature range	Room temperature	High and low temperature	Room temperature	High and low temperature
2	Maximum operating temperature range *	-	-60 ~ 300°C	-	-60 ~ 300°C
3	Typical temperature range **	-	-60 ~ 150°C -60 ~ 200°C -60 ~ 300°C -40 ~ 150°C -40 ~ 200°C -40 ~ 300°C 0 ~ 100°C 0 ~ 200°C Room temperature ~ 150°C Room temperature ~ 200°C Room temperature ~ 300°C	-	-60 ~ 150°C -60 ~ 200°C -60 ~ 300°C -40 ~ 150°C -40 ~ 200°C -40 ~ 300°C 0 ~ 100°C 0 ~ 200°C Room temperature ~ 150°C Room temperature ~ 200°C Room temperature ~ 300°C

* Users can choose in these temperature ranges according to test requirements

** For other temperature ranges, please contact Eoulu's sales

** The larger the temperature range, the higher the purchase cost. Testing below room temperature requires cooling, and the lower the temperature, the higher the purchase cost. Please select the appropriate temperature range according to the actual test requirements

** Automatic wafer testing in high and low temperature,it is recommended to use motorized positioners

F1 Chuck

No.	Item	Chuck size	
		8-inch	12-inch
4	Temperature accuracy	± 1°C	± 1°C
5	Temperature resolution	0.1°C	0.1°C
6	Triax chuck leakage (non-thermal)	≤ 132 fA	≤ 231 fA
7	Triax chuck noise (non-thermal)	≤ 30 fA	≤ 42 fA
8	Cooling mode	Liquid cool and air cool are optional	
9	Typical transition time*** (Liquid cool)	- 60°C → 25°C：23 min 25°C → 300°C：28 min 300°C → 25°C：25 min 25°C → -60°C：37 min	- 60°C → 25°C：23 min 25°C → 300°C：28 min 300°C → 25°C：25 min 25°C → -60°C：37 min
10	Typical transition time*** (Air cool)	- 60°C → 25°C：9 min 25°C → 300°C：25 min 300°C → 25°C：12 min 25°C → -60°C：29 min	- 60°C → 25°C：9 min 25°C → 300°C：25 min 300°C → 25°C：12 min 25°C → -60°C：29 min

*** Measured in 20°C~24°C,40%~50% humidity

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Chuck

No.	Item	Chuck size	
		8-inch	12-inch
11	Maximum heating power	5.5 kW	
12	Maximum cooling power	12.5 kW	
13	Maximum refrigerant flow	5 m/s	
14	Maximum transport pressure	4 bar	
15	Maximum voltage (high power option) ***	10000 V	
16	Maximum current (high power option) ***	800 A	

*** High voltage and high current cannot be reached at the same time

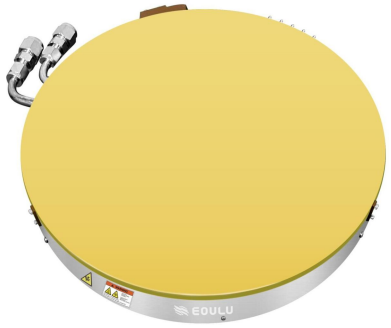
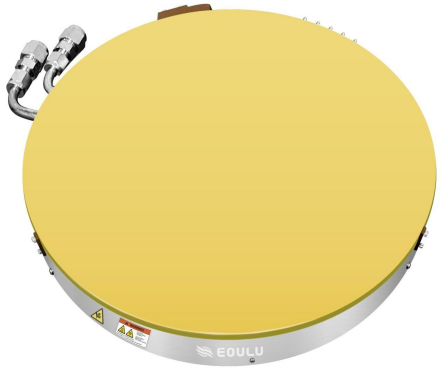
*** Higher voltage or higher current need to be customized

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Chuck

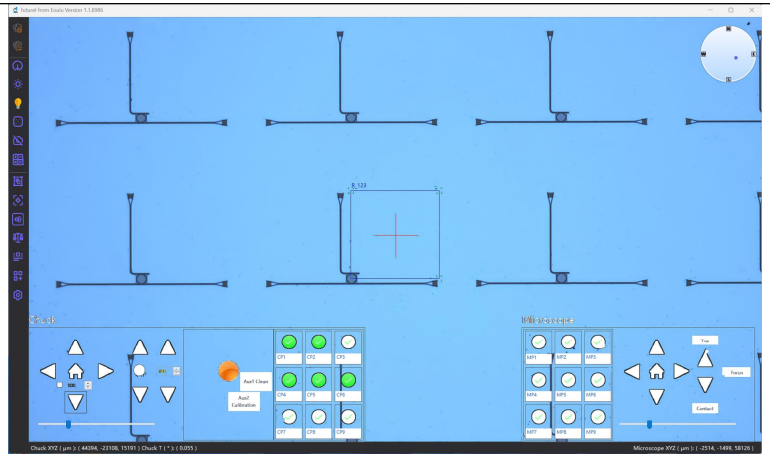
No.	Item	Chuck size	
		8-inch	12-inch
17	Statement	● It shall be operated and stored strictly in accordance with the temperature and humidity specified in "Environmental conditions" in this Manual. ● Before the probe station leaves the factory, wafers shall be placed on chuck for performance verification and reliability test. Therefore, the scratches on the surface of chuck or the movable plate cannot be completely avoided. The scratches do not affect the use of the probe station and are not considered as a quality problem. ● Before the thermal probe station leaves the factory, heating and cooling test shall be conducted on the thermal system and thermal chuck. Therefore, the baking marks on the surface of the chuck (e.g. chuck color change and water vapor mark) cannot be completely avoided. The baking marks do not affect the use of the equipment and are not considered as a quality problem.	
18	Cleaning	● Clean the probe station once a month. Use a soft dust-free cloth to remove the dirt from chuck. If lots of dust and debris are generated during use, the cleaning frequency shall be increased. ● Do not use isopropyl alcohol(IPA) or any other chemicals on the chuck, as improper use of solvents or grinding agents may damage the probe station.	
19	Maintenance	● No items can be placed on the chuck except the device under test. ● If the screws are loose, promptly tighten them carefully and evenly according to the torque requirements. If necessary, contact the Eoulu's after-sales team for treatment. ● For the fully-automated probe station, ensure that the power supply has been properly shut down during maintenance or when not in use, and ensure they do not accidentally restart before maintenance is completed or before use.	
20	Service	● For probe station with a high utilization rate, it is recommended to conduct operational inspection and service of the chuck once a year. ● The following services can only be executed by Eoulu's team: 1. Leveling and calibration of the chuck X/Y/Z/Theta stage 2. Disassembly and installation of the chuck	

F1 Chuck

No.	Item	Chuck size	
		8-inch	12-inch
21	Eoulu high performance thermal Chuck		

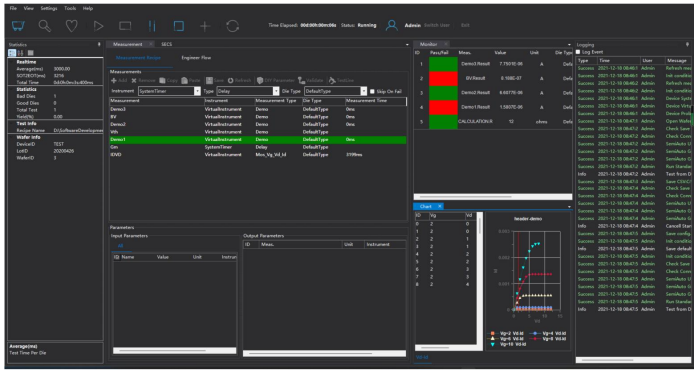
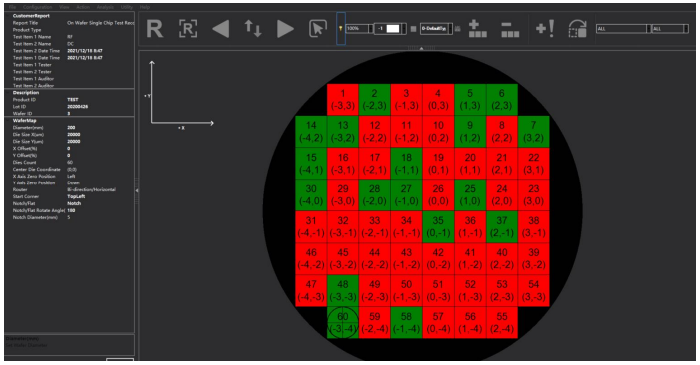
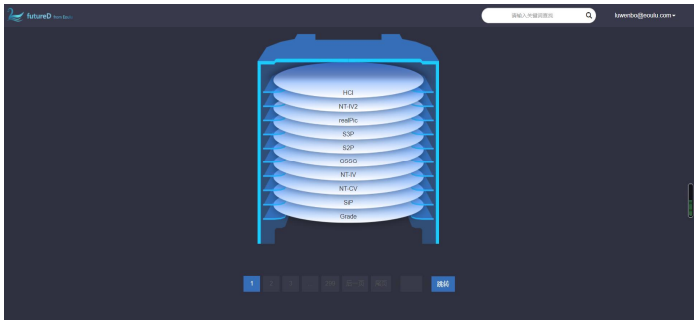
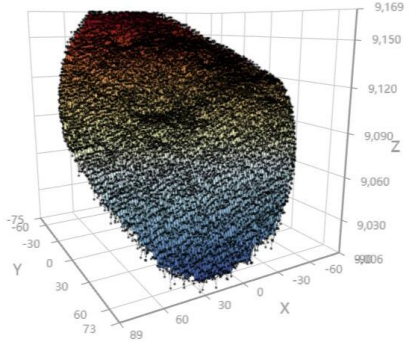
Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Control Software future interface (futurel)

No.	Item	futurel function
1	Single-page operation	Included
2	Autofocus	Included
3	2 Points Align	Included
4	Auto Align	Included
5	AutoZ	Included
6	High speed AutoZ	Optional
7	Twin-rudder operation *	Microscope and chuck movement
8	futurel interface *	

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

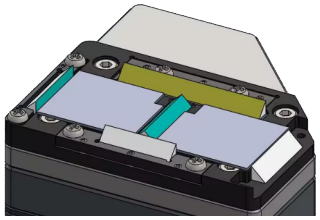
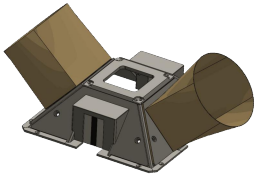
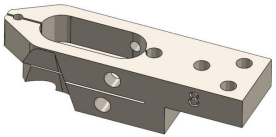
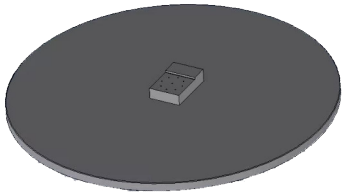
F1 Control Software future interface (futureI)

9	futureI and Eoulu integration software futureC seamless connection makes test easier *		
10	futureI and Eoulu data software futureD seamless connection makes data processing easier *		

* Eoulu copyright

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 SiPh Accessories

No.	Name	Feature	External View
1	AUX Chuck for SiPh Calibration	• Advanced calibration technologies, real-time calibration • Supports single fiber calibration • Supports fiber array calibration	
2	TopHat	• Supports high and low temperature testing • Temperature range：-40°C ~ 125°C	
3	Fiber Holder	• Supports edge coupling • Supports vertical coupling • Provides multi-angle vertical fiber holder: 8°~ 20°	
4	Chip Holder	• Customizable • Strong compatibility to match different chip sizes	

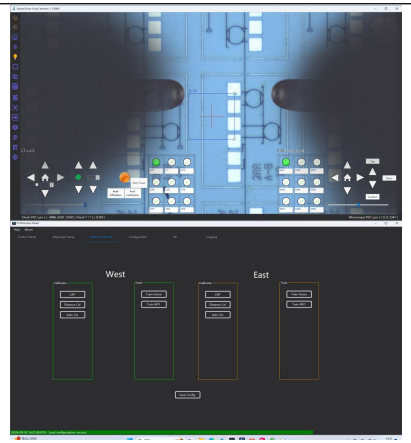
Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 SiPh Accessories

No.	Name	Feature	External View
5	Detector	• Wavelength Range: 800 nm ~ 1700 nm • Peak Wavelength: 1550 nm • Damage Threshold: 18 mW • Storage Temperature: 0°C ~ 40°C • Operating Temperature: 0°C ~ 40°C	

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 SiPh Calibration Software

No.	Name	Feature	External View
1	AutoCal Calibration Software	• Hexapod calibration • Nanocube calibration • Fiber calibration • Distance calibration • One-click automatic calibration to simplify operation and reduce training costs • Accurate positioning, fast calibration, reduced testing cycle • Supports calibration without Capsensor • Typical automatic calibration time ≤ 5 min	

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 High-Precision Double-Sided Fiber Alignment System *

No.	Item	A-005	Unit
1	Number of active axes	18	-
Coarse positioning with spindle-driven axes			
2	Active axes	X, Y, Z, θX, θY, θZ	-
3	Travel range in X, Y, Z **	± 6.5, ± 16, ± 8.5	mm
4	Travel range in θX, θY, θZ **	± 14.5, ± 10, ± 10	°
5	Minimum incremental motion in X, Y, Z	0.1	μm
6	Max. velocity in X, Y, Z	10	mm/s
7	Sensor type	Rotary encoder	-
8	Drive type	Brushless DC motor	-
Fine positioning with piezo-driven axes			
9	Active axes	X, Y, Z	-
10	Travel range in X, Y, Z, closed loop	100	μm
11	Min. incremental motion, open-loop	0.3	nm
12	Min. incremental motion, closed-loop	2.5	nm

** The maximum travel ranges of the individual coordinates (X, Y, Z, θX, θY, θZ) are interdependent. The data for each axis shows its maximum travel range when all other axes are in the zero position of the nominal travel range and the default coordinate system is in use, or rather when the pivot point is set to 0,0,0. Changing the pivot point will reduce the travel range in θX, θY, θZ. Changing the orientation of the coordinate system, will change the travel range in X, Y, and Z

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 High-Precision Double-Sided Fiber Alignment System *

No.	Item	A-005	Unit
13	Linearity error, for the entire travel range ***	2	%
14	Repeatability (bidirectional) 10% travel range	2	nm
15	Sensor type	Incremental	-
16	Drive type	PICMA®	-
	Alignment		
17	Scanning time of spiraled area scan 500 µm Ø ****	< 5	s
18	Scanning time of spiraled area scan 100 µm Ø ****	< 1	s
19	Scanning time of spiraled area scan 10 µm Ø ****	< 0.5	s
20	Signal optimization with gradient search, randomized with ±5 µm(repeatability < 0.01 dB) *****	< 0.3	s
	Miscellaneous		
21	Operating temperature range, mechanics	0 to 50	°C
22	Operating temperature range, controller	5 to 40	°C
23	Cable length	2	m

*** without polynomial linearization

**** typical time span for scanning the entire area and moving to the highest intensity

***** reaching the global maximum after first light has been found

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 High-Precision Double-Sided Fiber Alignment System *

No.	Item	A-005	Unit
Requirements for the optical power meter			
24	Output signal	Analog output	-
25	Output voltage range, max.	-5 to 5	V
26	Bandwidth, min.	1	kHz
27	Noise level, max.	-60	dBm

* The related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Hexapod Motion Controller *

No.	Item	C-887.521
1	Input voltage range	-5 to 5 V
2	Resolution ADC	16 bit
3	Bandwidth	5 kHz
4	Input impedance	15 kohm
5	Connector	BNC
6	Processor	Intel Atom dual core (1.8 GHz)
7	Reference switch input	TTL
8	Communication interfaces	TCP/IP
9	Command set	futureC command set
10	User software	futureC
11	Output voltage	24 V
12	Peak output current	6000 mA
13	Operating voltage	24 V(ext. power adapter included)
14	Maximum current consumption	8 A
15	Operating temperature range	5 to 40 °C
16	Mass	2.8 kg

* The related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Hexapod *

No.	Item	H-811K044	Unit	Tolerance
1	Active axes	X, Y, Z, θX, θY, θZ	-	-
Motion and positioning				
2	Travel range in X, Y, Z **	± 17, ± 16, ± 6.5	mm	-
3	Travel range in θX, θY, θZ **	± 10, ± 10, ± 21	°	-
4	Single-actuator design resolution	10	nm	-
5	Min. incremental motion X, Y	0.1	µm	typ.
6	Min. incremental motion Z	0.05	µm	typ.
7	Min. incremental motion θX, θY, θZ	1	µrad	typ.
8	Backlash X, Y	0.2	µm	typ.
9	Backlash Z	0.06	µm	typ.
10	Backlash θX, θY	4	µrad	typ.
11	Backlash θZ	4	µrad	typ.
12	Repeatability X, Y	± 0.15	µm	typ.
13	Repeatability Z	± 0.06	µm	typ.
14	Repeatability θX, θY	± 2	µrad	typ.

** The maximum travel ranges of the individual coordinates (X, Y, Z, θX, θY, θZ) are interdependent. The data for each axis shows its maximum travel range when all other axes are in the zero position of the nominal travel range and the default coordinate system is in use, or rather when the pivot point is set to 0,0,0. Changing the pivot point will reduce the travel range in θX, θY, θZ. Changing the orientation of the coordinate system, will change the travel range in X, Y, and Z

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Hexapod *

No.	Item	H-811K044	Unit	Tolerance
15	Repeatability θZ	± 3	µrad	typ.
16	Max. velocity X, Y, Z	10	mm/s	-
17	Max. velocity θX, θY, θZ	250	mrad/s	-
18	Typ. velocity X, Y, Z	5	mm/s	-
19	Typ. velocity θX, θY, θZ	120	mrad/s	-
Mechanical properties				
20	Stiffness X, Y	0.7	N/µm	-
21	Stiffness Z	8	N/µm	-
22	Load (base plate horizontal / any orientation)	5 / 2.5	kg	max.
23	Holding force, de-energized (base plate horizontal / any orientation	15 / 2.5	N	max.
24	Motor type	Brushless DC motor	-	-
Miscellaneous				
25	Operating temperature range	0 to 50	°C	-
26	Material	Stainless steel, aluminum	-	-
27	Mass	2.2	kg	± 5%
28	Cable length	2	m	± 10 mm

* The related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Modular Digital Piezo Controller *

No.	Item	E-712K255
1	Axes	6
2	Processor	PC-based, 600 MHz, real-time operating system
3	Sampling rate, servo control	20 kHz
4	Sampling rate, sensor	20 kHz
5	Controller type	P-I, two notch filters
6	Sensor type	Capacitive
7	Sensor channels	6
8	Sensor bandwidth (-3 dB)	10 kHz
9	Sensor resolution	18 (interpolated: 20) bits
10	External synchronization	Yes
11	Output voltage	-30 to 135 V
12	Amplifier channels	8
13	Peak output power / channel*	25 W
14	Average output power / channel	8 W
15	Current limitation	Short-circuit proof
16	Resolution DAC	20 bit
17	Temperature sensor	Yes

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Modular Digital Piezo Controller *

No.	Item	E-712K255
18	Communication interfaces	TCP/IP
19	Piezo / sensor connector	Sub-D Mix 25W3
20	Digital inputs/outputs	MDR20: 8 × TTL
21	Command set	futureC command set
22	User software	futureC
23	Application programming interfaces	C / C++ / C# / VB.NET / MATLAB / Python, drivers for NI LabVIEW
24	Supported functions	Wave generator, trigger I/O, macros
25	Linearization	4th-order polynomials, DDL option (Dynamic Digital Linearization)
26	Operating temperature range	5 to 40°C
27	Overheat protection	Max. 75 °C, deactivation of the voltage output75 °C
28	Max. power consumption	225 W
29	Operating voltage	100 ~ 240 VAC, 50 ~ 60 Hz
30	Input voltage range	± 10 V
31	Resolution ADC	18 bit
32	Bandwidth	25 kHz
33	Input impedance	150 kohm
34	Connector	LEMO EPG.00.302.NLN

* The related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

Nanocube *

No.	Item	P-616K001	Unit	Tolerance
Motion and Positioning				
1	Active axes	X, Y, Z	-	-
2	Open-loop travel, -20 to 120 V	120 / axis	µm	+ 20% / -0%
3	Closed-loop travel	100 / axis	µm	+ 20% / -0%
4	Min. incremental motion, closed-loop	2.5	nm	typ.
5	Linearity error, (for the entire travel range)	2%	-	typ.
6	Bidirectional repeatability	2	nm	typ.
Sensor				
7	Sensor type	Optical incremental sensors	-	-
Mechanical properties				
8	Stiffness	0.5	N/µm	± 10%
9	Unloaded resonant frequency X, Y, Z	700	Hz	± 10%
10	Resonant frequency with 30 g load X, Y, Z	380	Hz	± 20%
11	Push force capacity (any orientation)	15	N	max.
12	Holding force; passive (any orientation)	15	N	max.
13	Maximum permissible torque for XYZ motion platform X, Y, Z	0.4	Nm	max.

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

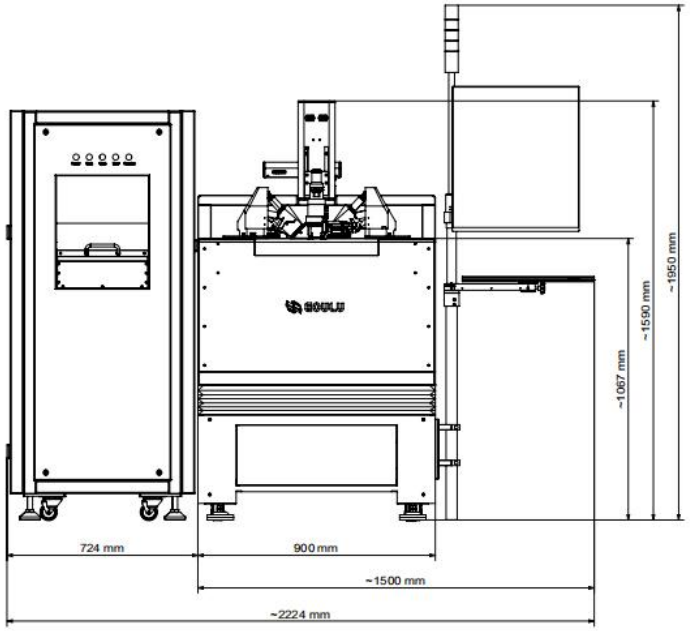
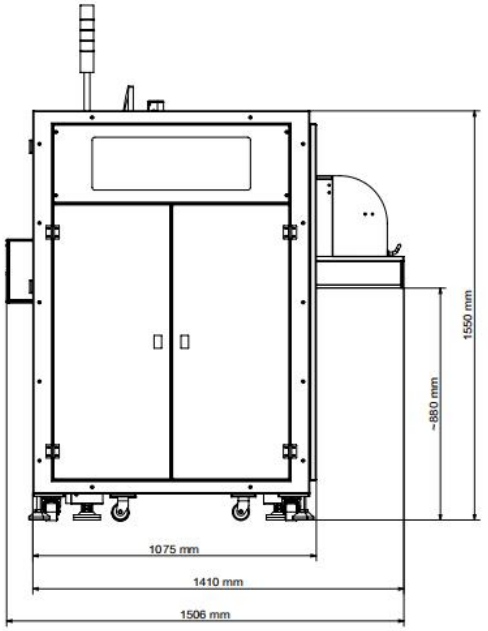
Nanocube *

No.	Item	P-616K001	Unit	Tolerance
Drive Properties				
14	Drive type	PICMA® P-885.50	-	-
15	Electrical capacitance	1.5 / axis	µF	± 20%
16	Dynamic operating current coefficient	1.9	µA/(Hz x µm)	± 20%
Miscellaneous				
17	Operating temperature range	-20 ~ 80	°C	-
18	Material	Aluminum, steel	-	-
19	Dimensions	40 × 40 × 40	mm	-
20	Mass without cable	0.13	kg	-
21	Mass with cable	0.32	kg	-
22	Cable length	3	m	± 10 mm
23	Sensor / driver connection	Sensor: HD D-Sub 26 (f) Driver:: D-Sub 25W3 (m)	-	-

* The related parameters, please refer to the manufacturer traceability index. This project is not verified on the client side

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

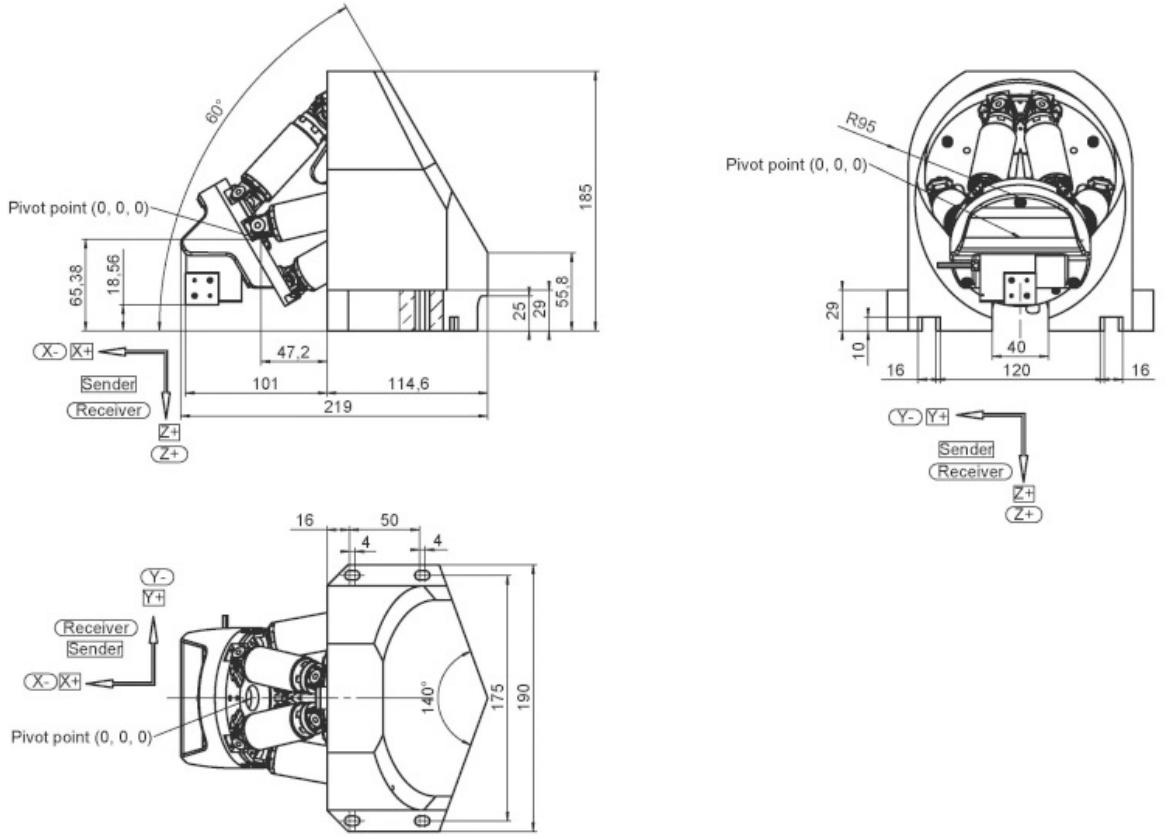
F1 Dimensions and Weight

No.	Item	Semi-automated	Fully-automated
1	Typical dimensions (W x D x H)	~ 1500 x 1115 x 1530 mm *	~ 2224 x 1506 x 1950 mm **
2	Maximum dimensions (W x D x H)	~ 1750 x 1465 x 1600 mm	~ 2534 x 1506 x 2000 mm
3	Main dimensions	 	

* These dimensions include the adjustable stands for LCD, mouse and keyboard. The dimensions are only typical values

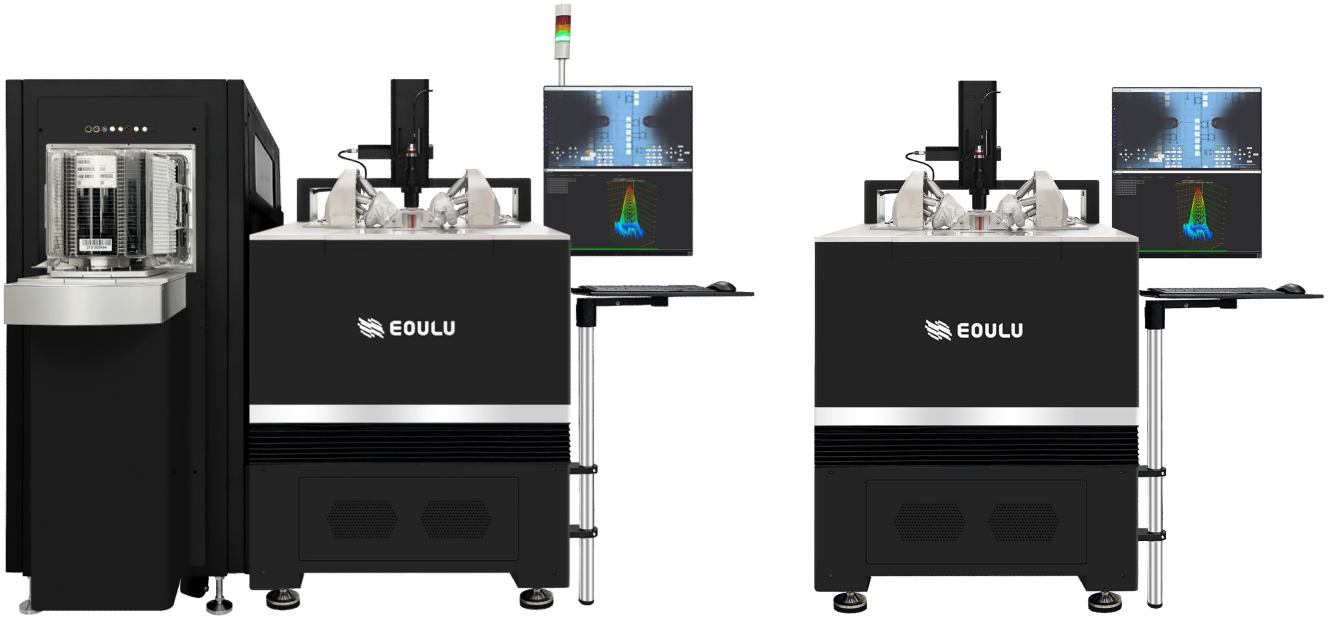
** These dimensions include the adjustable stands for LCD, mouse and keyboard, and the tricolor light. The dimensions are only typical values

F1 Dimensions and Weight

No.	Item	Double-Sided Fiber Alignment System
4	Main dimensions（Unit mm）	

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Dimensions and Weight

<table>
<tr><td>5</td><td>External view</td><td colspan="4">  </td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Weight</td><td>Probe station</td><td>Thermal system（Liquid Cooling)</td><td>Thermal system（Air Cooling)</td><td>Loader</td></tr>
<tr><td>~ 540 kg</td><td>~ 245 kg</td><td>~ 295 kg</td><td>~ 345 kg</td></tr>
</table>

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Facility Planning

1	Environmental conditions	Operating	• Ambient temperature: 17°C ~ 25°C, ± 0.5°C • Relative humidity: 20% ~ 60%
		Storage	• Ambient temperature: 10°C ~ 30°C • Relative humidity: ≤ 50% • Storage time: ≤ 6 months (When the storage time exceeds 6 months, it needs to be powered on for 24 hours)
		Ambient vibration (including floor)	• On the horizontal floor, equivalent uniform live load ≥ 200 kg/㎡ • Maximum level 100 micrometers/sec,rms (ISO Operating Theatre level) * • Laboratory cleanliness: General laboratory (The requirements for the F1 operating and storage environment described in this Manual must be met) Recommended to be placed in Class-10,000 clean room and above **
2	Power	Semi-automated probe station	• Probe station: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, 1800 VA, GB 10A socket • LCD, computer host, and vacuum pump: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, 1000 VA, GB 10A socket (3-way, power strip)
		Fully-automated probe station	• Probe station: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, 1800 VA, GB 10A socket • LCD, computer host, and vacuum pump: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, 1000 VA, GB 10A socket (3-way, power strip) • Loader: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, 1000 VA, GB 10A socket
		Thermal system	• Controller: single-phase 220 VAC (+7%, -10%) ***, 50/60 Hz, GB 10A socket • Chiller (Liquid cool): three-phase 380 VAC (+7%, -7%) ***, 50/60 Hz, GB 32A 5-core aviation socket • Chiller (Air cool): three-phase 380 VAC (+7%, -7%) ***, 50/60 Hz, GB 32A 5-core aviation socket

F1 Facility Planning

3	Clean Dry Air ****** (CDA)	Room-temperature probe station	• Air pressure: 4.5 ~ 8 bar (65 ~ 116 psi) • Dew point: ≤ -20°C • Connector *****: Semi-automated: 8 mm OD (CDA 1) Fully-automated: 8 mm OD (CDA 1) and 8 mm OD (CDA 2)
		High and low-temperature probe station	Testing at low and high temperatures, the following conditions must be met to keep Chuck frost-free: • Air pressure: 4.5 ~ 8 bar (65 ~ 116 psi) • Continuous flow: Liquid cool: ≥ 100 l/min @ 4.5 bar Air cool: ≥ 400 l/min @ 4.5 bar • Dew point: ≤ -70°C (when the lowest test temperature is -60°C) • Oil less than 0.01 mg/m³ **** • Connector *****: Semi-automated: 8 mm OD (CDA 1) Fully-automated: 8 mm OD (CDA 1) and 8 mm OD (CDA 2)
4	Vacuum******	Air pressure (absolute vacuum)	≤ 0.4 bar @ 10 l/min
		Air pressure (relative vacuum)	≤ - 0.6 bar @ 10 l/min
		Continuous flow	≥ 10 l/min
		Connector *****	• Semi-automated: 8 mm OD (VAC 1) • Fully-automated: 8 mm OD (VAC 1) and 8 mm OD (VAC 2)

F1 Facility Planning

5	Accessories	Air compressor	**Temperature range (liquid cool)**	**Part Number**
			Room temperature	I-001
			-60 ~ 150°C	I-002
			-60 ~ 200°C	
			-60 ~ 300°C	
			-40 ~ 150°C	
			-40 ~ 200°C	
			-40 ~ 300°C	
			0 ~ 100°C	
			0 ~ 200°C	
			Room temperature ~ 150°C	
			Room temperature ~ 200°C	
			Room temperature ~ 300°C	
		Vacuum pump	-	K-001

* Refer to Gen*eric vibration criteria for vibration-sensitive equipment*

** Refer to the international standard ISO 14644-1

**** According to the requirements of the national standard GB/T 156-2007

***** According to the requirements of the international standard ISO8573-1

**** Refer to the international standard ISO 14743:2020

***** For the positions of interfaces CDA 1, CDA 2, VAC 1 and VAC 2, see the following CDA and VAC Connectors diagram

***** Measured in laboratory at Standard Ambient Temperature And Pressure (SATP)

F1 Facility Planning

6	CDA and VAC Connectors

F1 Service Center *

Service category	Service content	Part Number
Hardware service (Installation)	• System installation (mass production mode)	SRV-301
	• System installation (analysis mode)	SRV-501
	• Accessory installation	SRV-305
	• System reinstallation	SRV-306
	• Instrument connection	SRV-307
	• Ground connection	SRV-308
Hardware service (Calibration)	• Accuracy calibration	SRV-503
	• Temperature calibration	SRV-505
	• Loader calibration	SRV-506
Hardware service (Training)	• Probe station operation (mass production mode)	SRV-303
	• Probe station operation (analysis mode)	SRV-502
	• RF calibration	SRV-202
	• Instrument operation	SRV-203
Hardware service (Others)	• Probe station PM	PM-F1
	• Probe station relocation	RELO-F1
	• Accompanying service	SRV-201

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Service Center *

Service category	Service content	Part Number
Software service (Installation)	• On-site installation	SRV-101
	• Remote installation	SRV-103
Software service (Update)	• Platform function	SRV-607
	• Platform version	SRV-606
	• Test script	SRV-608
	• Instrument driver	SRV-609
	• Plug-in update	SRV-701
Software service (Training)	• Software operation	SRV-605
	• Driver development	SRV-603
	• Script development	SRV-702
Software service (Others)	• Operation consultation	SRV-706
	• Troubleshooting	SRV-703
	• Accompanying service	SRV-705

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776

F1 Service Center *

Service category	Service content	Part Number
Application service	• IV test	SRV-707
	• CV test	SRV-708
	• RF test	SRV-709
	• SiPh test	SRV-801
	• Blue tape test	SRV-802
	• Fixture test	SRV-803
	• MMIC test	SRV-805
	• Automatic test	SRV-806

Service category	Service content	Part Number
Delivery service	• Urgent service	SRV-807
	• Insurance	SRV-808
	• Unloading	SRV-809
	• Exclusive vehicle	SRV-901
	• Storing	SRV-902
	• Upstairs delivery	SRV-903
	• Cleanup	SRV-905

* For details of service quotation, please contact Eoulu's sale.

Web: www.eoulu.com Email: info@eoulu.com Tel: 4008808776