M series small manual probe station

A Lab Based (4"/6") Simple and Small Probe Station

1、Product Description

The M series probe station is simple and lightweight, takes up little space, and is easy to move. Under the premise of ensuring test accuracy, it is also very cost-effective and suitable for performing experiments in colleges and universities. If the PAD size of the test device is larger than 30μm, the M series is one of the main pieces of equipment. The device is capable of various DC, RF to 67GHz, MEMS, and other test applications.

Main Feature

UPStart™ modular design provides corresponding modules configuration according to the test requirements; a variety of configuration options, including chucks, needle holders, fixtures, probes, and microscopes, with the option of a shock table system and shielding box.

The closed mobile platform is dust-proof, misuse-proof, and long-lasting. It adopts a precision screw drive, linear movement, no-gap backlash difference design, and more accurate positioning.

POMaterTM Self-adaptive shock-isolation base is a material imported from Germany to enhance elastic support and improve test stability.

Test Application

测试器件			test application		
	Wafer level diode and triode test	●		DC / (IV, CV, I-t, V-t)	●
	Power device (IGBT, MOSFET) test	●		DC /low current (100fA class) test	●
	MEMS device testing	●		1/f noise test	●
	LD (VSCEL) PD, LED optoelectronic device testing	●		FA test	○
	PCB component testing	●		Device Characterization Test	●
	LCD-TFT test	●		WLR , aging test	●
	Memory Device (Fast Pulse Test) Test	●	RF radio frequency	Up to 67GHz RF test	●
	Two-dimensional material device testing	●		mmW/sub-THz test	○
	RF device	●		THz and load pull testing	○
	Silicon Photonics Device Testing	○		Silicon photonics/optical coupling testing	○
				High power/high current /high voltage test	○
				High/Low temperature test	◐
				Ultra-high vacuum and extremely low temperature testing	○

●Supported, ◐ supported but not recommended, ○not supported N/A

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2、Product Structure

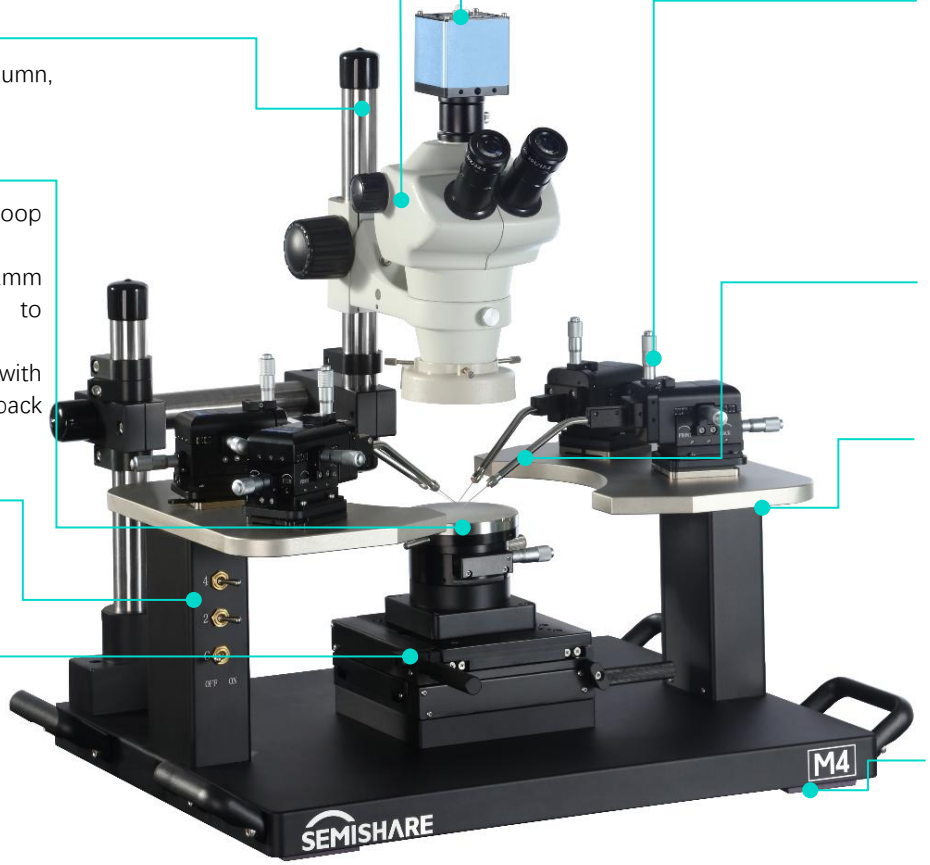
Stereomicroscope
- Eyepiece magnification: 20 times
- Objective lens zoom ratio: 0.8 times to 5 times
- Microscope focusing mechanism: Z-axis movement stroke 50.8 mm
- Magnification: 16X~100X
- Optional video microscope

360° rotating microscope stand
- The microscope is designed to rotate around the column, supporting 360° fast rotation and movement

Chuck
- 2 kinds of adsorption methods to hold samples (loop adsorption and porous adsorption)
- The central adsorption hole of the standard chuck is 1mm in diameter, which can be customized according to customer requirements
- The chuck is electrically independent and suspended, with a banana plug socket, which can be used as a back electrode

Chuck Vacuum Adsorption Control
Each vacuum channel of the chuck can be independently controlled

Chuck X/Y stroke adjustment
- The chuck table adopts a convenient adjustment mode. The stroke in the X/Y direction is 4 inches. Accuracy: 10μm, all with locking knobs
- The X/Y axis of the chuck moves without clearance, and the linear movement of each rotation is 1mm
- Chuck rotation angle: 360 degrees with fine-tuning accuracy of 0.002°



CCD
- HDMI interface high-definition (2 million pixels) CCD
- Resolution up to 1920*1080
- Frame rate 60fps
- Equipped with SD card interface, can store uncompressed BMP format pictures
- With HDMI video cable, it can be connected to the display for real-time observation

Various Micropositioner Options
- Magnetic adsorption, with magnetic switch
- The movement stroke in the X-Y-Z direction is 12mm respectively
- Linear movement, Swiss made precision toothbrush
- Adjustable spot measurement angle: 0-30°
- 3 needle holders with different precision are optional (0.1 μm/0.7μm/10μm)

Probe Fixture Optional
- Coaxial fixture 10PA,
- Optional three-axis fixture 100fA
- American GGB probe

Micropositioner platform
- Up to 6-8 DC micropositioners can be placed
- Thick alloy steel material provides stability.
- The new Ni surface treatment process has a stronger adsorption ability than the chrome-plated needle seat. The probe is designed with thickened alloy steel material, which improves test accuracy and stability.

POMater™ Adaptive Isolation Base
- Imported shock-isolating materials from Germany enhance the elastic support to achieve rigidity and load-bearing range, improving the stability of equipment testing

*Specifications and designs are subject to change without notice.

3、Specifications

Model		M4	M6 mini	M6
Size（L*W*H）		650*490*620mm	650*490*620mm	650*490*620mm
Weight（KG）		About 45kg	About 47kg	About 52kg
Electricity demand		220VC,50~60Hz		
Chuck Room temperature standard	Chuck size	4"	6"	6"
	Sample fixation method	Ring vacuum adsorption (porous adsorption can be customized)		
	Back electrode test function	Yes/sample stage is electrically independent		
	Chuck material	Stainless Steel/Copper Nickel Plated or Gold Plated		
Chuck mobile platform	X-Y travel	100*100mm	150*150mm	150*150mm
	Movement accuracy	10μm		
	Theta itinerary	360° rotation (coarse adjustment); fine adjustment range ±8°, fine adjustment accuracy 0.002°		
	Chuck lifting	N/A		
	Chuck quick pull out	N/A		
	Control method	small knob drive		
Micropositioner	Size（L*W)	540mm*310mm		
	Chuck to platform distance	8mm (the upper surface of the chuck and the lower surface of the micropositioner)		
	Number	Up to 6 pins can be placed (DC×6/RF×4,DC×2)		
	Micropositioner lift	N/A		
	Micropositioner fixing	Magnetic adsorption or vacuum adsorption		
Optical properties	Microscope Specifications	Standard stereo microscope (optional video microscope)		
	Gain	16~100X		
	CCD pixel	3 kinds of CCD optional: 200W (digital)/500W (digital)/650W (digital)		
	Microscope control stroke	Microscope focus frame control can be rotated 360 degrees, Z axis: 50.8mm		
	Microscope movement accuracy	N/A		
	Lens switching method	N/A		
Probe Specifications	X-Y-Z travel	12mm-12mm-12mm		
	Mechanical precision	10μm/2μm/0.7μm		
	Leakage accuracy	Coaxial 1pA/V @25° C; Triaxial 100fA/V @25° C; Triaxial 10pA@3kv @25° C,Test conditions: grounded shielded dry environment (air dew point below -40° C)		
	Interface form	Banana head/Alligator clip/Coaxial/Triaxial interface		

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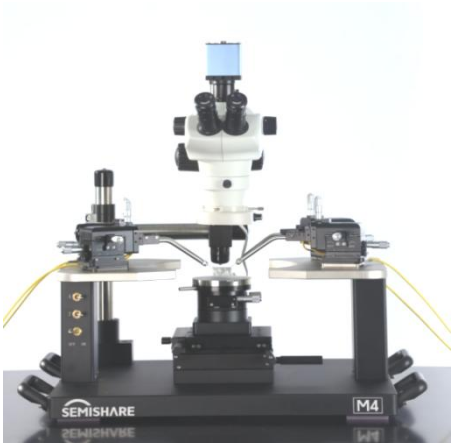
4、Product Selection Guide

1、Microscope - 2 microscope options



1.1 Stereomicroscope

>Product Features

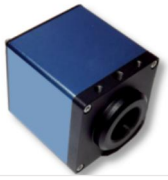
- The continuous zoom ratio is 6.3:1
- In the optical system, the continuous zoom range is 0.8X ~ 5X
- Eyepiece magnification: 20X
- Objective lens magnification: 2X, working distance: 34mm; (this item is optional)
- Total magnification: 16X-100X
- The binocular observation is inclined at 45 degrees, and the interpupillary distance adjustment range is 52-75mm.
- Ring-shaped lighting source.
- The adjustment range of the microscope in the Z axis is 50.8mm
- CCD interface: C MOUNT
- Anti-static function: the stand, zoom lens tube, 20X eyepiece, auxiliary objective lens, etc., all have an anti-static function. This function is very useful when observing samples that require anti-static (semiconductor chips). Using this function, static charge can pass through the back of the stand and microscope connects with the ground socket.
- Sealing function: the zoom lens tube and 20X eyepiece have a sealing function, which can be used more conveniently when the microscope is in an environment with high humidity, such as oil and water vapor.
- It has the characteristics of high definition, a large field of view, and a long working distance. The innovative ergonomic design ensures comfortable operation for a long time.

1.2 Video microscope/70XL

>Product Features

- Continuous zoom ratio 7:1
- Microscope optical magnification range: 0.75–5.25X, with a 19 inch monitor magnification can reach 216X
- Resolution: 72–240 lp/mm,
- Highest resolution better than 4μm NA value: 0.0240–0.080 Depth of Field: 0.98 – 0.09 mm Field of view at low power: 6.40 x 8.53 mm Field of view at high power: 0.91 x 1.22 mm
- Working distance: 89mm
- 150W high-power white light source (continuous brightness adjustment)
- Microscope focusing mechanism: Z-axis movement stroke 50.8 mm

2、CCD camera - 2 options

Model		
	O200C	ZX-201HC
Pixel size	2.75 (H)μm * 2.75(V)μm	3.75 (H)μm * 3.75(V)μm
Optical size	1/2.5 inch	1/2.8 inch
Resolution	1920 * 1080	1920 * 1080
Output color	8:8:8 24-bit true color	12/12/12 36-bit true color
Output frame rate	60fps	60fps
Output method	HDMI pure digital output	HDMI pure digital output
Adjustment	OSD menu adjustment	Mouse operation UI adjustment
Storage method	SD card	U disk
Wide dynamic	3 levels of wide dynamic range adjustable	1-10 level adjustable
Edge enhancement	3 levels of edge enhancement	1-10 level adjustable
Exposure method	Manual / Auto	Manual / Auto
White balance	One key white balance	One key white balance
Color adjustment	R, G, B are adjustable separately	R, G, B are adjustable separately
Lens mount	C-Mount	C-Mount
Supply voltage	DC-5V	12V/1A
Physical dimension	61mm*61mm*72mm	98mm*65mm*50mm
Working humidity	20%~80%	20%~80%
Operating	0~80°C	0~80°C
Weight	270g	350g

Features	• Image sampling frame rate: 60fps/second high-speed image capture, no smear or delay; • New color algorithm to ensure true reproduction of image colors; • 8:8:8 --24bits true color image; • HDMI pure digital high-definition output, support 16:9 display; • Color can be adjusted independently unique multi-level wide dynamic (HDR) function; • With cross center line, movable line function, superposition function, and edge enhancement mode to enhance special image effects;	• Adopt Sony's new generation high dynamic range CMOS 1/2 inch image sensor with 2 million pixels • Support photo and video recording, built-in latest V3.0 measurement software • Support manual one-key exposure and manual one-key white balance with red, green, and blue color adjustment • Provide 100 line drawing functions, line color, and position adjustment • Take pictures without shaking to provide a clear image. • Support Chinese and English menu languages (default English) • Support parameter saving upon shutdown

3、Ambient Standard Chuck Options

3.1 Room temperature coaxial chuck(Coax)

Technical Parameters(Coax)	
Interface Type	Coax BNC(m)
Product diameter	4“/6”
Material	Stainless Steel/Copper Nickel Plated or Gold Plated
Chuck surface	Flat center pinhole and vacuum groove
Vacuum Hole Section Diameter	4” chuck: 4, 27, 45, 69, 93, 117 mm 6” chuck: 4, 27, 45, 69, 93, 117, 141 mm
vacuum drive	3-stage vacuum adsorption control
Supported DUT sizes	Single grain 4×4mm, or 50mm to 150mm wafer
surface planarity	< ±5μm
rigidity	<15μm/10N at chuck edge
Electrical specification(Coax)	
Operating Voltage	Operates from -200V to +200V DC
The maximum voltage between chuck surface and GND	500v DC
insulation	>2GΩ

3.2 Room temperature three-axis chuck(Triax)

Technical Parameters(Triax)	
Interface Type	Triax(m)
Product diameter	4“/6”
Material	Stainless Steel/Gold Plated Brass (Gold Plating Optional)
Chuck surface	Plane center vacuum suction pinhole (0.5mm)
Vacuum Hole Section Diameter	4”chuck：4, 27, 45, 69, 93, 117 mm 6”chuck：4, 27, 45, 69, 93, 117, 141 mm
vacuum drive	3-stage vacuum adsorption control
Supported DUT sizes	Single grain 4×4mm, or 50mm to 150mm wafer
surface planarity	＜±5μm
Rigidity	<15μm/10N near disk edge
Electrical specification(Triax)	
Chuck insulation	Measure >100 at 10V DC
Force to guard	>2TΩ
Guard to shield	>7TΩ
Force to shield	>15TΩ

4、High Temperature Chuck Options

Specifications	Coaxial heating chuck	Triaxial heating chuck
Temperature range	+25°C to +200°C	+25°C to +200°C
Temperature control method	Resistance heater	Resistance heater
cooling method	water	water
Minimum Temperature Adjustment Resolution	0.1°C	0.1°C
Temperature display resolution	0.01°C	0.01°C
Touch screen operation	Yes	Yes
Temperature stability	±0.1°C	±0.1°C
Temperature accuracy	±0.5°C	±0.5°C
Control Method	Low Noise DC/PID Power Supply	Low Noise DC/PID Power Supply
Communication Control Interface	RS232C	RS232C
Test cable interface	Coaxial cable（BNC）	Triaxial cable（Triax）
Chuck surface coating	Nickel/Gold Plating	Nickel/Gold Plating
Temperature Sensor	RTD	RTD
Temperature uniformity	Heating from 25 degrees to 200 degrees, ±1%, Above 200 degrees, ± 1.5%	Heating from 25 degrees to 200 degrees, ±1%, Above 200 degrees, ± 1.5%
Surface roughness	<±10μm	<±10μm
Electrical insulation, coaxial BNC(m)/SHV three-axis	>5TΩ	>5TΩ
Heating rate	25°C to 200°C <28min 200°C to 300°C < 40min	25°C to 200°C < 28min
Cooling rate	200°C to 25°C <15min 300°C to 200°C <20min	200°C to 25°C <15min
Leakage current at 10V Kelvin triaxial @25℃ Test conditions: dry environment with grounded shield (air dew point below -40° C)	N/A	<100fA
residual capacitance	N/A	<200fF
The maximum voltage between chuck surface and GND	500V	500V
Vacuum type	Ring adsorption (optional porous adsorption)	Ring adsorption (optional porous adsorption)
Vacuum area	Central adsorption, 2"/4"/6" plate surface	Central adsorption, 2"/4"/6" plate surface

3、Micropositioner-3 different precision options

Model			
	SS-700 Submicron Circuit/RF	SS-100 Submicron Circuit/RF	SS-40 Photoelectric test
	Sub-micron process integrated circuit testing	Sub-micron process integrated circuit testing	Affordable
	Linear, recoilless movement	Linear, recoilless movement	linear movement
	Can be used with coaxial/triaxial probe holders	Can be used with coaxial/triaxial probe holders	I/O Pad Browsing Test
	Tungsten probes can be used	Tungsten probes can be used	Optical device spot measurement
	Can be configured for four directions of east/south/west/north RF probe holders	Can be configured for east/south/west/north directions	Small footprint
	RF test capability: DC to 40GHz ~ 120GHz	RF probe holders	Can be used with coaxial/three-axis probe fixtures
	Can be used with calibration sheet and calibration software	RF test capability: DC to 40GHz ~ 120GHz	/
	Probe interface and cable 45 degree connection	Can be used with calibration sheet and calibration software	/
	No need for L-shaped adapters	Probe interface and cable 45 degree connection.	/
	Probe can be disassembled for maintenance	No need for L-shaped adapters	/

Specification				
	X-Y-Z Trip	8 x 8 x 8mm	12 x 12x 12mm	12 x 12x 12mm
	Movement method	Linear movement	Linear movement	Linear movement
	Screw accuracy	700 Thread / Inch	100 Thread / Inch	40 Thread / Inch
	Movement accuracy	0.1 μm	0.7μm	10μm
	Size（L*W*H）	148*120*140	115*100*112	64*47*55
	Weight（g）	1500	1000	175

4、Probe Fixture - 4 different fixture options

SEMISHARE	**Triax Tip Holder for triaxial interface**	
T2H	Shield box with leakage accuracy up to 100FA	
	Wire length 2m	
	One-way screwdriver for probe installation	
SEMISHARE	**Coax (male) Tip Holder**	
C2H	Leakage accuracy up to 10PA	
	Wire length 2m	
	Screwdriver for probe installation	
SEMISHARE	**L shape Triax Tip Holder**	
T2L	Leakage accuracy up to 100FA with shield box	
	Wire length 2m	
	Screwdriver for probe installation	
SEMISHARE	**L-shape Coax (male) Tip Holder**	
C2L	Leakage accuracy up to 10PA	
	Wire length 2m	
	Screwdriver for probe installation	

5、Probe - DC/RF/Large Voltage Probe Options

5.1 DC Probe Selection Guide

Specification	Coaxial probes	Triaxial probes	Kelvin probes
Maximum Voltage	500V	500V	500V
Temperature Range	150°C	150°C	-60°C 至 300°C
Leakage current	<10pA	<100fA	<20fA
Interface Type	Coaxial male connector	Triaxial male connector	SSMC female to triaxial connector male

Characteristic impedance	50Ω	50Ω	50Ω
Residual Capacitance	<200fF	<200fF	<200fF
Probe holder material	Brass	Brass	Brass
Probe material	Tungsten wire alloy	Tungsten wire alloy	Tungsten wire alloy
Probe tip size	0.2μm–25μm	0.2μm–25μm	1μm–100μm

5.2 RF Probe Selection Guide

	40a	50a	67a	110A	145A
Usage frequency	DC Power -40GHz	DC Power -50GHz	DC Power -67GHz	DC Power -110GHz	DC Power -145GHz
Connection	2.92mm	2.4mm	1.85mm	1.0mm	0.8mm
Needle tip configuration	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GS/SG/GSG	GSG
Pitch range	50μ-2540μ	50μ-1250μ	50μ-1250μ	50μ-1250μ	50μ-200μ
Insertion loss	<.8db	<1.0db	<1.1db	<1.5db	<1.75db
Loop loss	>18db	>18db	>14db	>15db	>15db

> Calibration substrates

GSG	CS-5	CS-9	CS-10	SC-18
PAD Size	50μX50μ	100μX100μ	150μX150μ	300μX300μ
	100μX100μ			
	150μX150μ			
Pitch range	75μ-250μ	250μ-600μ	600μ-1250μ	1250μ-2540μ
GS	**CS-8**	**CS-14**	**CS-11**	**CS-17**
PAD Size	50μX50μ	100μX100μ	150μX150μ	300μX300μ
	100μX100μ			
	150μX150μ			
Pitch range	50μ-200μ	200μ-400μ	400μ-1250μ	750μ-2540μ
GSG>110GHz	**CS-15**			
PAD Size	25μX25μ			
Pitch range	40μ-150μ(SOLT)			
	30μ-150μ(LRM)			

6、Vacuum Pumps

>Specifications

◆Voltage：AC220V
◆Flow rate：7L/min
◆Vacuum level：-60KPa
◆Weight：0.7Kg

>Functions

◆Provides a vacuum source.
◆Combine with the vacuum adsorption hole on the CHUCK to hold the sample in place.
◆Use with vacuum adsorption-type probe holder to fix the probe holder.

>Features

◆Oil-free and silent, especially suitable for laboratory and clean room use
◆7 L/min for 24-hour uninterrupted operation

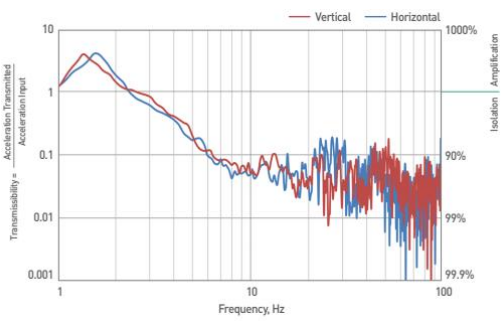
7、Air-floating automatic balance anti-vibration table

(1) High precision type

The pneumatic support frame is designed and manufactured with a special two-chamber system design to ensure that the natural vibration frequency is kept low, excellent vibration isolation in both vertical and horizontal directions, and excellent damping with leveling valve design provides automatic leveling.

>Specifications

Reference Size（L*W*H）	600*900*600mm
Isolation System	Pneumatic isolation
Resonance frequency	Vertical/horizontal = 1.2 - 3.0 Hz
10 Hz Isolation	Vertical/horizontal = 80 - 99%
Leveling repeatability	Standard leveling valve = ±1.0 mm (0.04 in.)
Maximum load capacity	Precision leveling valve = ±0.05 mm (0.002 in.)
Automatic leveling	500 kg
Height adjustment	Yes
Required air supply	±20 mm



(2) Economy type

Through a series of design improvements of shock absorption systems, such as the shape and material of the air spring, the volume of the spring chamber and the volume of the auxiliary tank, the damping aperture, and the level adjustment valve, etc., it provides good overall stability.

>Specifications

•Size：L*W*H(800*800*700mm) (Custom sizes available)

•Load-bearing：500kg

Note: Anti-vibration table can be matched with an economic optical flat panel or high-precision honeycomb panel according to the budget. either one of the two

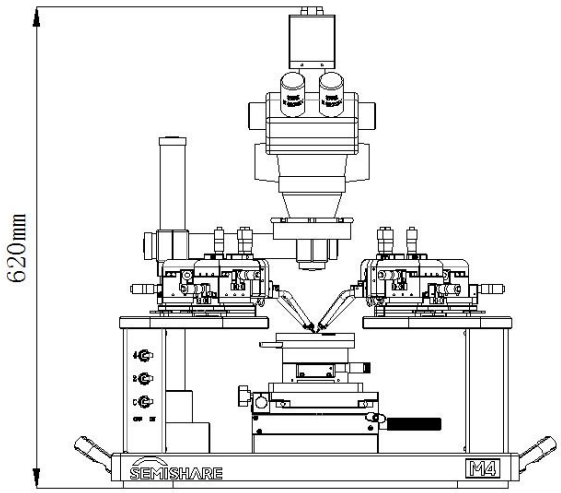
8、Shielding box

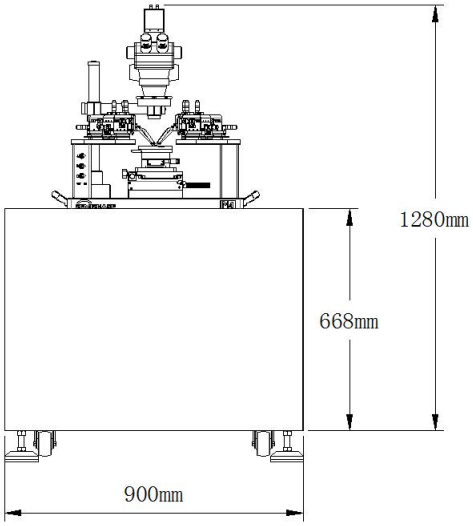
>Specifications and Features

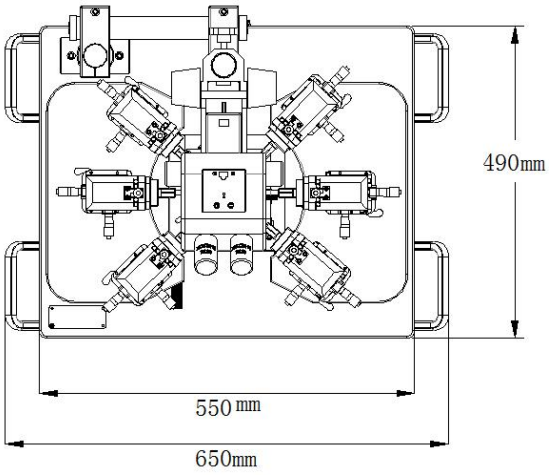
◆Size（L*W*H）：900*800*1000mm（**Custom sizes available**）
◆With grounding terminal
◆Shielding box door opening method: up-and-over door opening structure (as shown in the figure)
◆The Left and right sides have 8 holes each for the adapter mounting plate
◆The concealed cable outlet at the back
◆Shielding box independent of the anti-vibration platform design
◆Shielding light and electromagnetic interference.
◆Matching probe table and anti-vibration table design.
◆The probe fixture can test the electrical signal leakage accuracy to 100fa and resist 2000V high voltage.
◆The shielding box is equipped with adapters to facilitate the good connection of lines inside and outside the box when the shielding box is closed.

9、Dimension

>Size：650mmX490mmX620mm







5、Product Service

Solution consulting service

Our experienced technical experts will provide professional advice on system testing according to your application requirements to help you quickly select satisfactory equipment to purchase.

Warranty service

All SEMISHARE's products have passed strict factory inspection, and we also provide you with professional warranty service.

Technical Training

To help you better understand SEMISHARE products and execute additional application solutions, we can provide customized, systematic technical skills training according to your specific requirements. Please apply to the website or contact us by phone if you require our service.

Product Upgrade Service

Our technology provides value-added services for your products. SEMISHARE can provide hardware and software upgrade services when your testing needs change to help you get more value out of your equipment.

Service Promise

SEMISHARE is committed to responding quickly to your requirements. We will value your every need if you contact us by any means. Online support: 7*24h customer response supported by a professional FAE technical team.
Onsite Support：
1）For customers in Shenzhen, after-sales service personnel should arrive at the customer site within 4 hours
2） For customers in Guangdong Province, after-sales service personnel should arrive at the customer site within 24 hours
3）For customers outside Guangdong Province, after-sales service personnel shall arrive at the customer site within 48 hours

Service Contact

You can easily reach us or our partners wherever you are.

After-sales Service

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Customer Complaint
Telephone: 0755-2690 6952 to 808
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