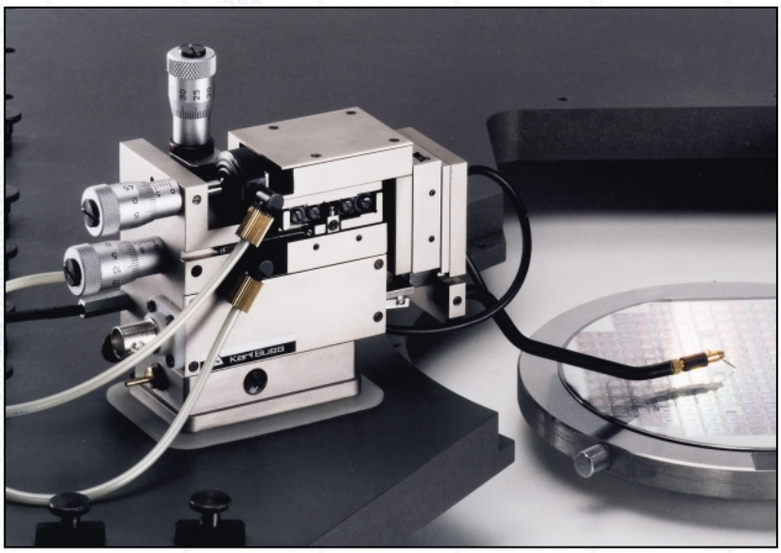
Technical data:
SUSS PM 8 Manual Probe System

Wafer/Substrate size	**up to 8“/200 mm**
Wafer Stage	
Planarity over 8“	< 5 µm
Resolution	< 1 µm
Range of coarse travel	200 x 200 mm
Range of fine travel	10 x 10 mm
Independent X-Y braking	
Load stroke Z axis	10 mm
Theta range of travel	± 9°
Chuck	
Adjustable vacuum diameters	
Vertical rigidity 8“	< 15 µm/10 N
Planarity	3 µm

Data can depend on equipment configuration

Probehead Platen	
Manual or Motorized	
Vacuum, magnetic, mechanical fixation or High Frequency	
Range of travel	45 mm
Contact/separation stroke	0.4 mm
Repeatability	< 1 µm
Rigidity vertical/horizontal	< 5 µm/10 N
Utilities	
Power	115 V/60 Hz, 230 V/50 Hz
Vacuum	– 0.8 bar
Compressed air (Pneumatic lift only)	4 bar
Dimensions and Weight	
Width x Depth x Height	740 x 600 x 550 mm, 29 x 23.6 x 21.6“
Weight	110 kg/242.5 lb



Manual submicron probehead

Whatever your application, SUSS will help you find a solution. Our success is based on more than forty years of experience in production and research with a track record of proven quality.

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SUSS. Our Solutions Set Standards.

Probe Systems

Karl Suss

PM 8

The Flexible System Solution

The SUSS PM 8 Analytical Prober is the new bench mark in manual submicron semiconductor failure analysis and in-process testing. This innovative system meets customers' needs for precision, reliability and lower cost of ownership. Flexibility in optics and microscope travel options encourage configuration of the system according to the actual needs and budget constraints

Features and Benefits

The SUSS modular design minimizes the initial investment and supplies a logical upgrade path for future system expansion including ProberBench software, ProbeShield® for low noise and low temperature probing, laser capabilities as well as various microscope movements and platen options.

- Submicron precision and stability
- Fine-Glide chuck stage
- Large microscope travel
- Flexible accessories
- Ergonomic operation
- Quick test change overs
- Noise-free and frost-free measurements from –65 °C to 400 °C with SUSS ProbeShield®
- DC and High Frequency configurations
- Probecard and package part applicable

Mask Aligners
Substrate Bonders
Flip Chip Bonders
Spin Coaters
Probe Systems

SUSS. Our Solutions Set Standards.

KSM Karl Suss

Challenges ...

Analytical Probing

The PM 8 provides the stability and resolution required for precise probe positioning. The SUSS modular design concept provides an upgrade path for future development.

SUSS PM 8 microscope options include stereo zoom, high magnification and emission microscopy.

Microscope travel options vary from the very simple manual movements to complete automation using the powerful SUSS ProberBench operating system.

The microscope lifts manually or pneumatically with a minimum of three inches clearance. This creates clear and easy access to the probes and device under test (DUT).

The platen has enough area and heavy mass to provide extreme rigidity and accessibility to the probeheads. Stability is achieved by a four corner support system.

Platen Z travel has 45 mm (1.7“) of linear motion with a 400 micron contact /separation stroke. This provides flexible clearance options from wafers to packaged parts mounted on large test boards. The Z travel can either be manual or motorized.

The Fine-Glide chuck stage is as fast as a motorized stage, but has the simplicity and resolution of a manual system. Along with an 8“ X-Y motion, the chuck Z axis also has a 10 mm load stroke.

The chuck stage glides on top of a polished granite plate which is securely housed within a massive web cast frame.

All system controls are ergonomically designed and located for optimum operator comfort.

The SUSS PM 8 Probe System combines flexibility with sub micron resolution. The linear platen movement, rigid cast base and a stiff microscope bridge are qualities featured in all SUSS probers.

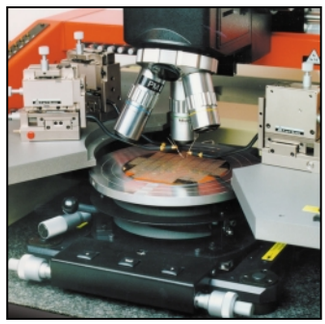
Probecard and Packaged Part Test

All SUSS probecard holders quickly insert directly into the platen opening. This creates a low profile environment allowing standard probeheads to probe easily over the top of the probe card to the DUT.

Because the PM 8 chuck stage has rapid independent X-Y movement and braking power, fast and accurate locations of random die are easily accomplished.

The PM 8 accepts packaged part adapters that either fix on top of the chuck by vacuum or mount directly in place of the vacuum chuck which gives extra clearance for high profile test boards.

SUSS’s unique bayonet locking system allows adapters and vacuum chucks to be easily exchanged by hand while maintaining system planarity.



Analytical DC test

Submicron Probing

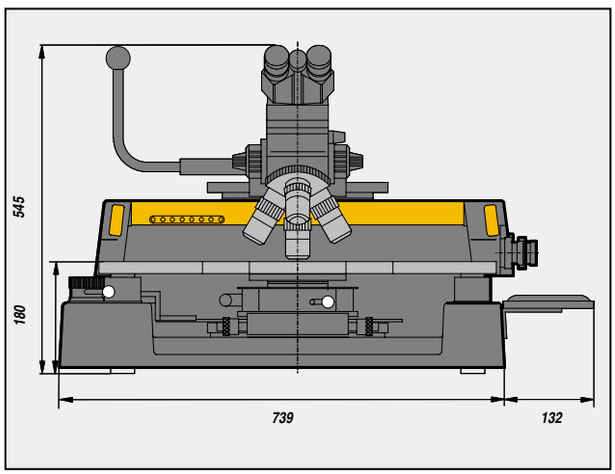
The rigid design of the SUSS PM8 is optimal for the stringent requirements of submicron probing. The SUSS MFI Probe uses AFM technology to enable the visualization and placement of the probe accurately on features below 0.2 microns.

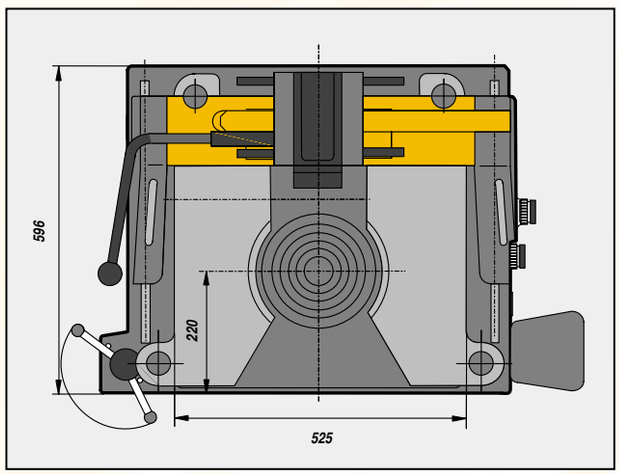
Submicron Probing

Flexible and Versatile

Accessories

Probes	Active, passive, HF, triaxial, coaxial, low impedance, Kelvin.
Probe tips	Tungsten, tungsten-carbide, palladium, copper shaft.
Probecards	SUSS supports all major probecard manufacturers.
Manual probeheads	Contacting bond pads & internal nodes down to 1 µm.
Remote controlled probeheads	For submicron probing, programmable.
Dark box	Light-tight, electrically shielded: also for keeping dry and frost-free or non-oxidizing atmospheres.
Laser cutter	Depassivating, cutting traces, trimming and blowing fuses.
Ultrasonic cutter	Depassivating brittle materials.
Utility pumps	Vacuum, pressure or combinations
Standard chucks	From 4“ to 8“, usually made of stainless steel.
Triaxial chucks	For low-signal measurements.
High insulation chucks	Power device test up to 6 kV, low capacitance demands
Microwave chucks	Designed for brittle III–IV compounds and high measurement stability. Auxiliary chucks for calibration and burnishing substrates.
Thermal chucks	Adaptor kits for all hot chucks are available on the market.
ProbeShield®/ProbeShield® EMC	Light-tight, gas-tight, electromagnetic shielded, and noise-free environment for ultra low-signal measurements. With thermal chucks for rapid cycling and frost-free low temperature probing down to –65 °C.
Material handling	Eliminates user handling, and possible damage to wafers.
Packaged device holders:	Held down by vacuum on the chuck’s surface.
Fixtures and chuck accessories	Quickly manufactured to hold down substrates, provide alignment pins, or allow bottom side probing.
Chuck surfaces	Standard: stainless steel. Options: gold plated, Teflon coated, aluminium hard coated, nickel plated.
Camera and monitors	Facilitates contact bond pads or internal nodes.
Tables	Vibration isolation tables.





The Design ...

PM8 HF Probing

FLEXIBILITY FOR LABORATORY USE

Laboratory applications require machine versatility at a moderate price. However, a lower price should not compromise resolution and stability.

MECHANICAL SUB-ASSEMBLIES

Base

The SUSS PM 8 combines stability and fine resolution with correct user ergonomics, a direct result of advanced mechanical engineering of the complete system.

Superior vibration attenuation and stability start at the base of the system.

This base is not the typical design. Unseen to the eye is the internal web design of the casting. This design evenly distributes the force over a 3-point foot system.

Platen Drive

This base houses the linear rotational mechanics of the platen drive, eliminating the need for awkward lever actuation.
The heavy duty linear platen drive distributes the force equally over all four corners. Each corner has its own separation column with guide bearings for precise and repeatable travel.

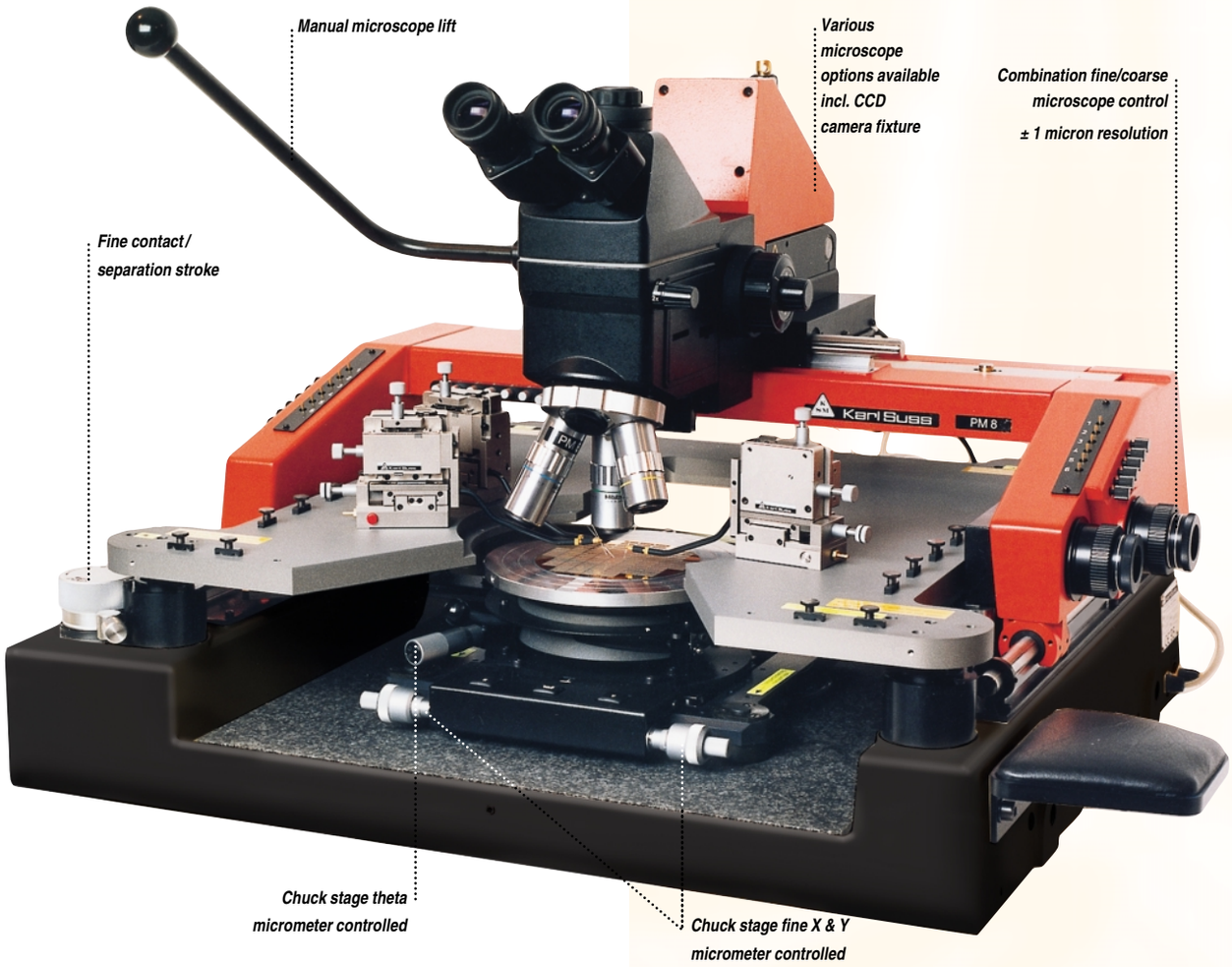
The large area platen surface is 20 millimeters thick and precision machine ground for flatness.

Wafer Stage

The versatile wafer stage design has fast and repeatable travel as well as ergonomic operation.

The wafer stage glides freely on the polished granite surface allowing fast independent X and Y indexing without turning any knobs. Once in the test position the stage automatically locks through vacuum and then provides a 10 x 10 millimeter X,Y fine travel.

Accuracy at your Fingertips



Microscope Stage

SUSS microscope stability starts with the massive bridge support system. The bridge spans the width of the probe system and is fastened to the base. This isolates the microscope stage from all other moving subassemblies.

The SUSS modular design concept gives the user an upgrade path from the simplest manual microscope stages to the newest programmable ProberBench model.

The most popular PM 8 microscope stage is the manual 4“x 6“ travel option with high resolution movement and independent X,Y braking. This braking system holds the microscope securely in place.

This design provides fast coarse travel, as well as an on-demand fine resolution control which is especially helpful in laser cutter applications.

Microscope lift options, manual or pneumatic, are easy to use and allow convenient access to the probes and DUT. Repeatability of returning to focus position is ± 1 micron.

All popular microscopes currently available on the market are adaptable to SUSS probers.

The PM 8 Modular Probe System

Microscope Stages

Stage type	Resolution	Travel	Access lift options	Recommend microscope	Application
Programmable	0.25 µm	50 x 50 mm	Standard 80 mm pneumatic	High magnification or stereo view	Internal die navigation and remote control
Manual	40 mm/rev.	50 x 50 mm	Fixed, manual or pneumatic tilt-back	High magnification or stereo view	Internal die
Manual coarse fine	88 mm/rev. 0.25 mm/rev	100 x 100 mm	Manual, tilt back	High magnification	Internal die, laser cutter, large substrates
Manual coarse fine	88 mm/rev. 0.25 mm/rev	200 x 200 mm	Manual, tilt back	High magnification	Internal die, laser cutter, large substrates
Manual coarse	88 mm/rev.	100 x 100 mm	Manual, tilt back	Stereo view	Large substrates
Manual coarse	88 mm/rev.	200 x 200 mm	Manual, tilt back	Stereo view	Large substrates
Adjustable		30 x 30 mm	Fixed	Stereo view	Minimal movement required

Microscopes

Microscope type	Models available	Application
Stereo view	Olympus SZ4045 Series, Leica M5-12 Series	Pad probing and internal features down to 5 microns
High magnification	Mitutoyo FS-60 Series, A-Zoom, Zeiss PSM	Offers the most flexibility and options for features down to 0.4 microns
Emission	Hamamatsu, Hypervision	Emission analysis from the front and back side of an IC chip

Probehead Platens

Probehead Mounts	Application
Vacuum	Most common, offers ease of use and flexibility
Magnetic	Offers more rigidity than vacuum. Commonly used when magnetic base probeheads are already used
Mechanical	Mechanical T-nut mount provides high rigidity
HF Universal	Offers vacuum, magnetic, bolt down and kinematic mounting. Kinematic requires additional kit
Customized	Custom designs are available for specialized applications, such as test head docking, substrates and MCM test

Software Interfaces

Application	Vendors
CAD Navigation	Knights Technology, Schlumberger
Emission Microscopy	Hypervision, Hamamatsu, EDO Barnes

... and solutions

Low Signal Mesurements

The quality of all low-signal and sensitive measurements depends on the noise floor of the measurement system. All the low-signal measurement concerns described above were taken into consideration in designing SUSS probe system equipment. This creates optimal noise reduction and superior performance. The PM 8 system with ProbeShield® is configured for demanding low-signal testing. The unique design of the SUSS ProbeShield® EMC guarantees a light-tight, gas-tight, electromagnetic shielded and noise-free environment during the test. It is the ideal equipment for ultra low-signal measurements in the femto Amp and micro volt range.

High Freqency Applications

The modular design of the SUSS PM 8 allows the choice of either a dedicated HF set-up or a combination with DC probes.
SUSS high frequency probing components can be easily added to existing standard configurations.
The new patented HF vacuum chuck has additional vacuum patterns for calibration substrates and burnishing pads. It can suppress the MSL-mode and substantial improve the performance of the CPW-Line up to 110 GHz.
The HF platen will accept all SUSS probeheads regardless of base type. These include vacuum, magnetic or bolt down bases.
The optional platen kinematic mount for the SUSS PH 250HF High Frequency ProbeHead gives valuable travel flexibility in the north, south, east and west directions. The SUSS PM8 is also the ideal platform for measurements up to 110 GHz when used in combination with the SUSS PH300 ProbeHead and HP 8510XF. This set-up ensures stable and precise HF probing with no relative movement between probe and testhead.

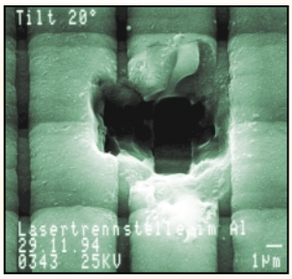
Low Temperature Probing

The SUSS ProbeShield® also provides an innovative approach for probing down to –65 °C. Frost-free low temperature probing requires the air surrounding the cold chuck to be pressurized, clean and dry. Just enough pressure is required to keep the ambient air out of the chamber. The air or nitrogen inside the chamber is dried so that its dew point is lower than the chuck temperature.

High Temperature Probing

For thermal low-signal applications, SUSS supplies a range of low leakage thermal chucks up to +400 °C.

High frequency test



Laser cutting

Failure analysis with emission microscopy