CHOTEST

PRODUCT CATALOGUE

From **nanometer** to **hectometer**

we provide professional precision measurement solutions

CHOTEST

Chotest Technology Inc.

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WEBSITE

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Quality and Service comes as our standard

CHOTEST

Since established in 2002, Chotest Technology Inc. is focusing on the designing and manufacturing of precision dimensional measurement and calibration instruments.

With more than decade professional technology accumulation, Chotest has accumulated rich practical experience and set up a strong team who is specialized in optics, machinery, electronics and information technology. At present, CHOTEST has more than 100 technology patents and software intellectual property rights. With competence in Micro-Nano motion, 3D Reconstruction of Micro-Nano measurement, 3D Form and Surface Analysis of Micro-Nano measurement, Large-scale 3D Measurement, Precision Sensing Probe and Image processing technology, Chotest is capable to provide the customers with professional precision measurement solution in domains from Nanometer to Hectometer.

Our products are widely used by public metrology labs and quality inspection workshops in the automotive, aerospace, machinery, metallurgy, power, and petrochemical industries. Chotest`s service network is covered more than 30 provinces in China, and is also focusing on the development in overseas markets like Europe and APAC.

The goal of Chotest is to provide high-end dimensional measurement equipment to manufacturing industry all over the world.

CONTENTS

From **nanometer** to **hectometer**

we provide professional precision measurement solutions

10^{-10} Nanometer scale | 10^{-9} | 10^{-6} | 10^{-3} | 10^{-1} | 10^{-1} | 10^{-0} | 10^{1} | 10^{2} Hectometer scale

1nm

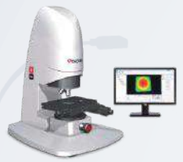
Confocal Microscope

Automated Dial Indicator Tester

1-2μm

Automatic Video Measuring Machine

Stylus Nano Profiler



Nano 3D Optical Profilometer

Universal Length Measuring Machine

Universal Thread Measuring Machine

White Light Interferometer

2D Profilometer

Flash Measuring Machine

2μm

CMM

3D Line-Scanning Profilometer

Flash Measuring Machine

0.5μm

Machine Tool Probes

Wireless Ballbar

Laser Interferometer

Microscopic Measuring Machine

Rotary Axis Calibrator

Laser Tracker

Unpatterned Wafer 3D Inspection System

High-Precision Laser Rangefinder

Measurement Solutions for Full-Scale Chain

We are committed to providing full-scale chain solutions for different customers and different industries. With our expertise, technologies, various instruments and software, we can reduce costs and increase efficiency for our customers, at the same time, continuously improve product quality, which helps customers to enhance their market competitiveness.

Aviation/Aerospace/Shipbuilding Industry Application

As an important part of the equipment manufacturing industry, the aerospace and shipbuilding industry is an important field for implementing the innovation-driven development strategy and an important support for building a manufacturing power. Chotest provides a full range of dimension measurement solutions in the industrial chain system including the whole machine manufacturing, power system, key components, key basic materials, etc

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P89

For parts such as aero-engines and gear blades, Chotest Coordinate Measuring Machines can provide high-efficient and precise dimensional inspection

CMM,coming

With the high measurement accuracy and large measurement range, Chotest GTS laser tracker is used in various assembly application scenarios such as airplane & rocket & vessel assembly and profile measurement.

P71

Chotest Video Measuring Machines/ Flash Measuring Machines support non-contact fast and magnified measurement. The software Vision X has more than 90 measurement functions, and has special measurement tools for sealing rings, springs, gears, threads and other workpieces. It can perform simple, fast and accurate measurement, and it is the best measurement method for small parts or small-size features, thin-walled parts, and soft parts.

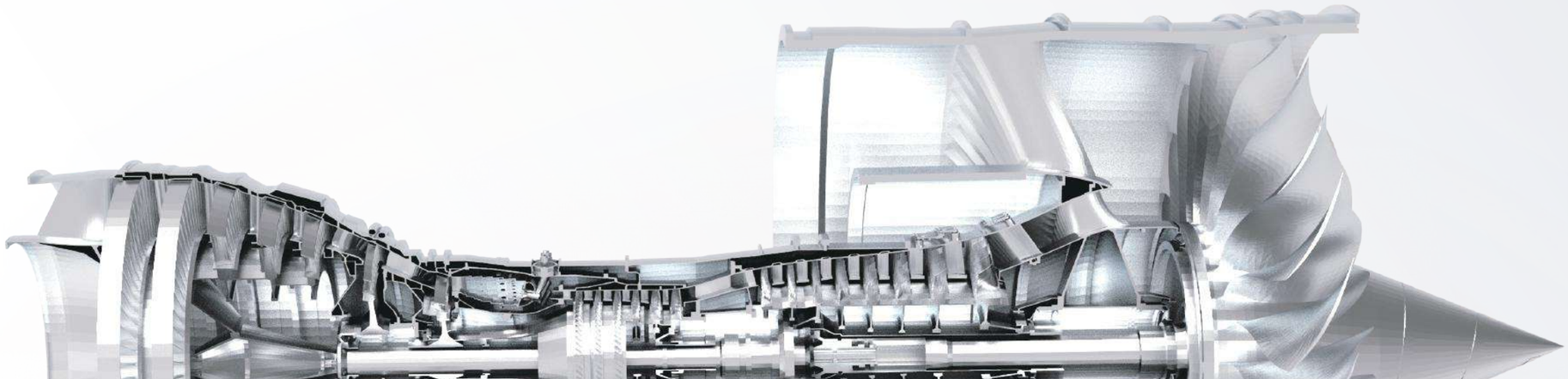
P21/P36

Chotest high-precision Profilometer SJ5730, with 2 in 1(roughness and profile) measurement module, is often used to measure the surface profile shape and roughness of the engine fuel nozzles and engine crankshaft connecting rods.

P95

Chotest universal length measuring machine SJ5100 is often used to calibrate measuring gauges in aerospace metrology labs and to measure the ultra-high-precision piston rods, which is one of the core components of aero- engines.

P121



Automotive/New Energy Industry Application

The automotive and new energy industries are witnessing rapid growth, driven by the rapid expansion of new energy vehicles. Chotest provides solutions for various dimension measurements in the entire production process, from battery production stages, modules, battery packs, electric motor components, electronic control modules, to complete vehicle bodies.

Automotive Research Institute

Chotest Universal Thread Measuring Machines can calibrate the full parameters of the thread, helping the precision manufacturing of automobiles.

P125

Chotest universal length measuring machine SJ5100 is used to calibrate the gauges and other measuring tools, which are widely used in major automobile research institutes.

P121

Chotest fully automatic dial indicator testing machines SJ2000 Series can automatically calibrate various plunger dial indicators, digital dial indicators, dial test gauges, dail bore gauges, mechanical comparators, etc.

P129

Bodywork

Chotest Coordinate measuring machines support high precision and high speed measurement for car body.

CMM,coming

Chotest Laser tracker is a flexible and large-range measurement method for the car body, and has been recognized and accepted by the automobile OEM and their supporting factories. As a supplement to the Chotest Coordinate Measuring machine, Chotest Laser Tracker is appearing more and more in the workshops of automobile OEM.

P71

Chotest Coordinate measuring machine is used in the design and trial production of new models.

CMM,coming

Chotest Video Measuring Machines can measure the sizes of various auto parts.

P21

Chotest 2D profilometers SJ5700 series can inspect the tiny dimensions of auto parts, and ensure the high processing accuracy of parts.

P91

Powertrain

Chotest Coordinate Measuring machine is crucial to ensuring the quality and performance of the powertrain and even the entire vehicle.

CMM,coming

Chotest 2D profilometers SJ5700 series can measure the tiny dimensions of automobile engines, gearboxes and other parts.

P91

Chotest Video Measuring Machines / Flash Measuring Machines can quickly and accurately measure the XY sizes of small auto parts.

P21/P34

Automotive parts

Chotest Coordinate Measuring machine is an ideal solution for geometric measurement and quality control of cylinder parts.

CMM,coming

Chotest 2D profilometers SJ5700 series can measure the tiny dimensions of automobile cylinder head parts.

P89

Chotest Video Measuring Machines/ Flash Measuring Machines can efficiently measure the diameter and center distance of the connecting rod.

P21/P36

Chotest horizontal Flash Measuring Machine VX5000 series can easily measure the size of shaft parts, making the measurement process simple, efficient and accurate.

P53

Chotest Nano 3D Optical Surface Profilometers can measure the surface profile of the fuel injector at the sub-nanometer level.

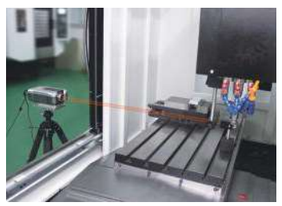
P57

Chotest 2D profilometers SJ5700 series can measure both roughness and profile of the workpieces.

P89

Chotest Machine tool probes PO series can control the machining process of auto parts, and realize large-scale on-line measurement of parts after machining, ensure machining accuracy.

P107



Chotest Laser interferometer SJ6000 can calibrate and compensate CNC machine tools for the position accuracy (positioning accuracy repeatability, positioning accuracy, etc.) and geometric accuracy (pitch and yaw angle, straightness, verticality, etc.).

P77

Camera/LIDAR

Chotest Laser interferometer SJ6000 can calibrate and compensate CNC machine tools for the position accuracy (positioning accuracy repeatability, positioning accuracy, etc.) and geometric accuracy (pitch and yaw angle, straightness, squareness, etc.).

P77

Chotest Nano 3D Optical Surface Profilometers can measure the surface flatness & roughness and 3D shape of the radar chip.

P57

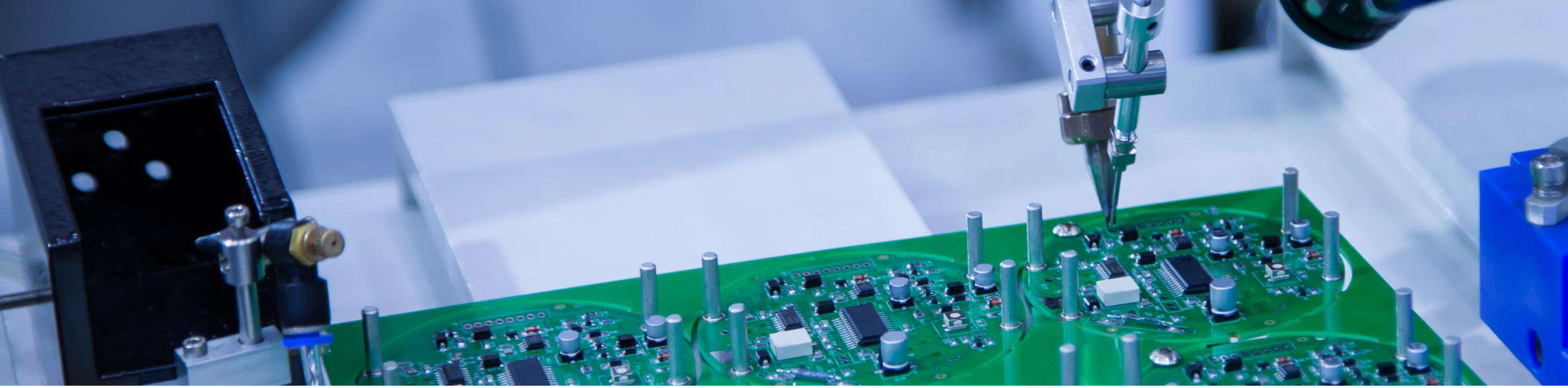
Power Battery

Chotest Coordinate Measuring machine achieves precision measurement of length & width , flatness, assembly hole position and step height of battery pack.

CMM,coming

Chotest Flash Measuring Machines/ Video Measuring Machines provide a precision and stable measurement solution for top covers of power battery.

P21/P36



3C Electronics Industry Application

Chotest provides a series of measurement equipment to control the product processing quality in the 3C industry. The software presents datafication results, which can be used to improve design and re-producing.

The adjoint geometric measurement system solves the geometric measurement problems in the whole production process, and realizes the systematic and efficient process control and quality management.

Chotest Flash Measuring Machines/ Video Measuring Machines can realise high-precision measurements of different sizes and varying structures by one click .

P21/P36

Chotest machine tool probes PO series are 100% tested by self -developed inspection equipment to ensure quality and stability. Completely replaceable with international famous probes. Laser interferometer SJ6000 and Rotary axis calibrator WR50 are used to calibrate the guide rail of CNC machine tools. Moreover, Chotest Wireless ballbar MT21 can diagnose CNC machine tools` performance quickly.

P107

Measurement head + automation module + customized 2D and 3D automatic dimensional measurement functions constitute a efficient measurement solution for some special & difficult scenarios.

P111

Chotest Nano 3D Optical Surface Profilometers can measure the roughness, flatness and step height of sapphire screens, phone glass screens, ink screens, etc.

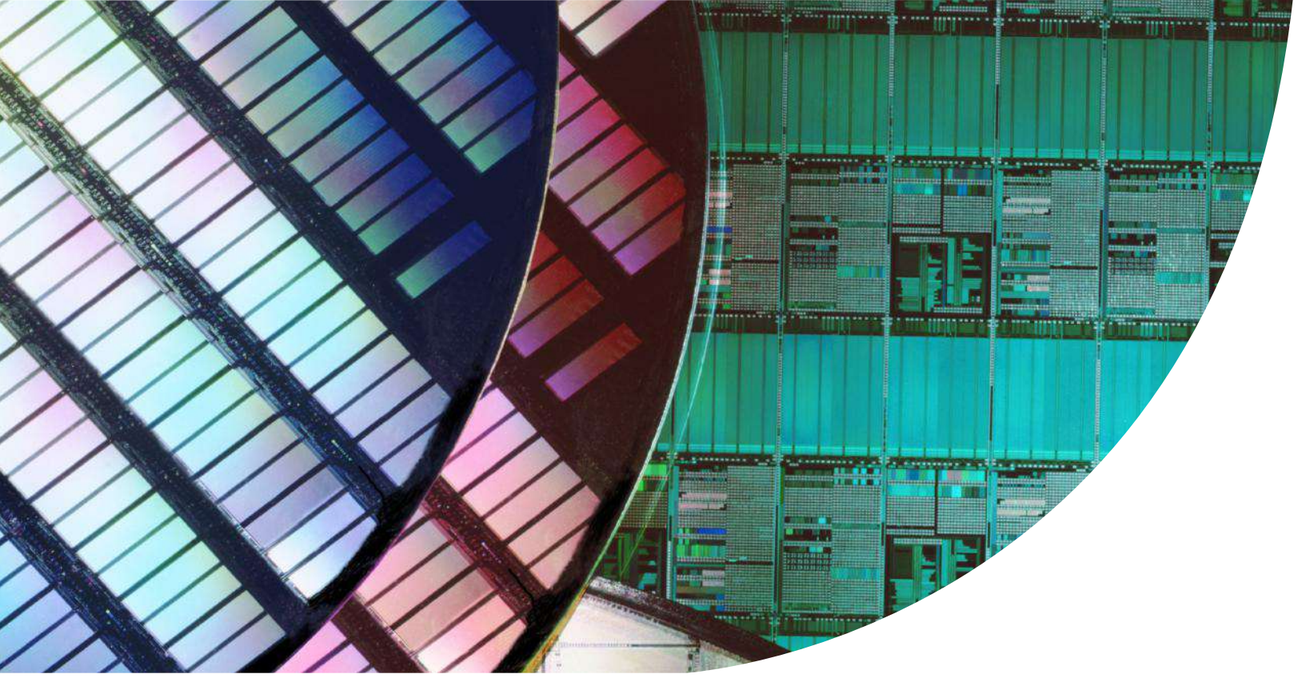
P57

Chotest 2D profilometers SJ5730 series, with micro measuring force and high precision performance, is suitable for fast measurement of easy-to-scratch surfaces, such as the thickness of screen-printing ink on the front cover of mobile phones.

P95

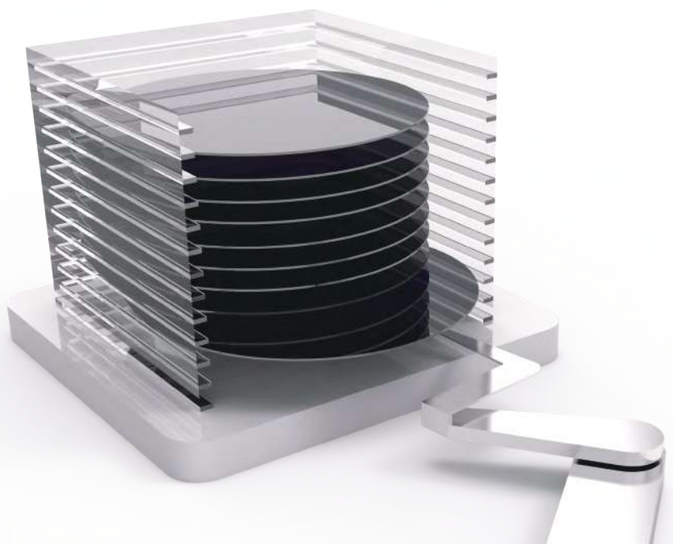
In the 3C field, Chotest coordinate measuring machine is not only used in inspection of the plane sizes and GD &T, but also used in measurement of the curved surfaces, mobile phone screen corners, chamfers. etc.

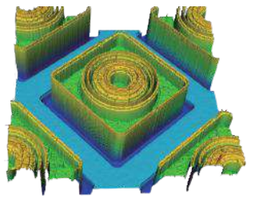
CMM,coming



Semiconductor Industry Application

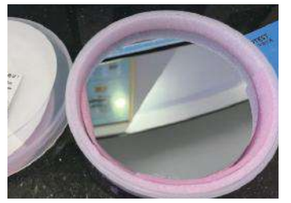
In recent years, with higher and higher requirements to product quality in the chip manufacturing industry, more sophisticated measurement instruments are required to ensure product quality. Integrating self-developed software algorithms, Chotest precision measurement equipment perfectly caters for this kind of demands.





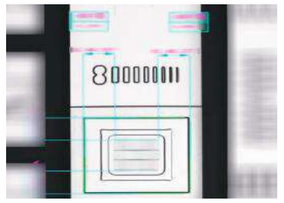
Chotest Nano 3D Optical Surface Profilometer is a non-contact scanning method to achieve 3D re-construction of the sample surface with ultra-high repeatability & accuracy, and obtains relative 2D and 3D measurement data.

P57



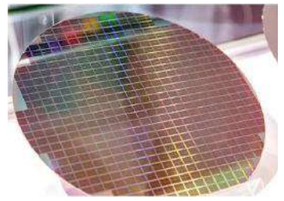
Unpatterned Wafer 3D Inspection System WD4000 adopts white light confocal probes and white light interferometry probe to scan and reconstruct 3D surface topagraphy of the wafer, then obtains the relative 2D and 3D parameters of thickness, BOW, WARP, flatness, line roughness, and total thickness variation (TTV).

P111



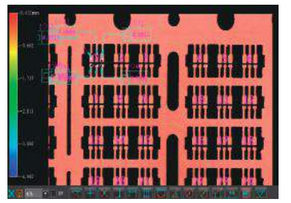
Patterned Wafer Critical Dimension & Overlay Measurement System can not only inspect the critical dimensions of wafer and the offset of overlay, but also measure the 3D surface form and roughness of wafer at the sub-nanometer level. Automatic robot arm can load and upload the test objects aumatically, which helps to achieve fully automated production in the workshop.

P115



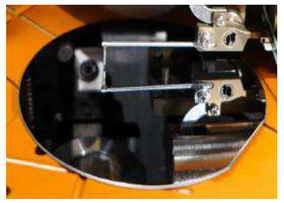
Chotest Confocal Microscope VT6000 series can reconstruct surface 3D topography by non-contact scanning, and has better imaging effects on surface with large slopes. It is be widely used in semiconductor manufacturing and packaging process inspection.

P67



Chotest Video Measuring Machines/-Flash Measuring Machines are mainly used in semiconductor packaging process, and they measure the substrates, lead frames, ceramic parts efficiently by one-click.

P21/P36



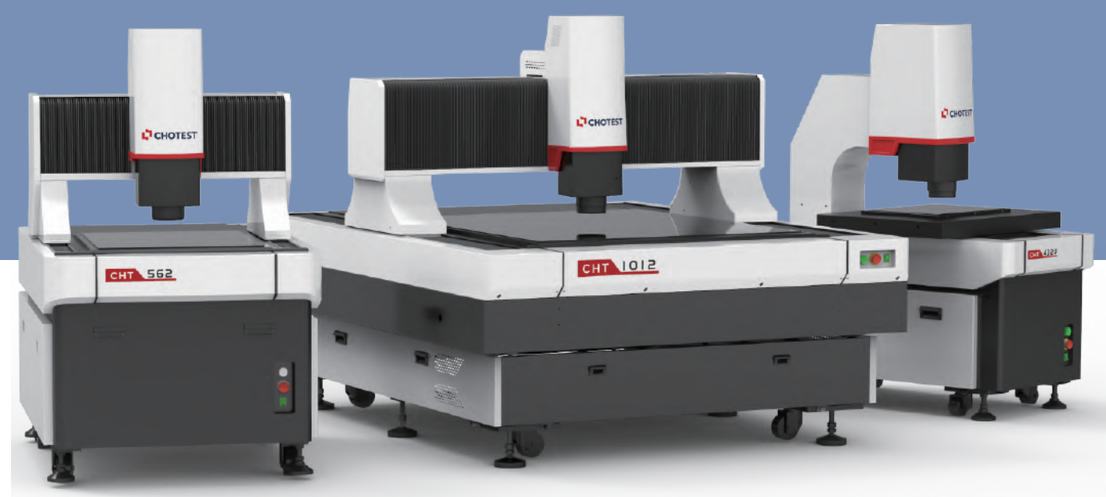
Chotest Stylus Nano Profiler NS200 can measure the film thickness & step height, surface topography and surface waviness & roughness by contact scanning. Thanks to micro measuring force, NS200 absolutely does not scratch the surface of test object at all.

P105

Optical Measuring Instrument

Automatic Video Measuring Machines CHT Series

Precision, Versatile

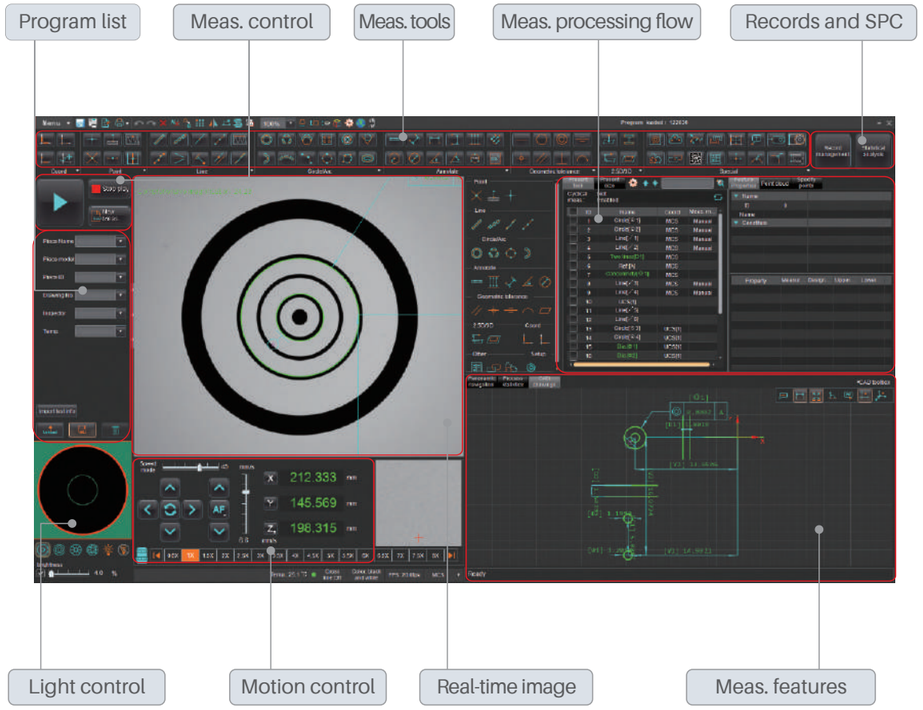


Description

Automatic video measuring machines CHT series covers different measurement ranges and offers powerful functionality. It can perform precise measurements of surface dimensions, contours, angles, positions, and geometric tolerances for various complex parts.

Automatic video measuring machines CHT series can be used in machinery, electronics, mold, injection molding, hardware, rubber, low-voltage electrical appliances, magnetic materials, precision stamping, connection Plug-ins, connectors, terminals, mobile phones, home appliances, printed circuit boards, medical equipment, clocks, knives, measurement and testing, etc.

Software Interface



User-Friendly Operation Interface

Auto data export

- Support exporting data to designated excel file according to designated template in real time.
- Can output Excel, Word, PDF, TXT reports and AutoCAD files.
- Support Q-DAS transmission according to designated format.
- Support data exchanging via HTTP or socket protocol.
- Output SPC analysis report, which includes statistical values (such as CA, PPK, CPK, PP, etc.) and control charts (such as mean and range charts, mean and standard deviation charts, median and range charts, single value and moving range chart).

Easy to operate

With user-friendly software,
anyone can be trained to use it quickly

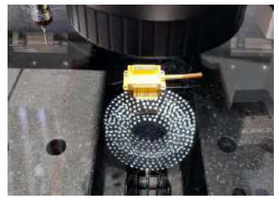
Programming	Place objects	Batch meas.
Save program	Place test objects on object table	Measure all features by one-click

Measurement function

Extraction Tools	Scanning to extract edge points, multi-segment edge point extraction,circular edge point extraction, ellipse extraction, frame selection to extract contour lines, focus points, closest points, etc.
Annotation Tools	Point, line, circle (center coordinates, radius, diameter), arc, center, angle, distance, line width, hole position, aperture, number of holes, distance from hole to hole, distance from hole to edge, distance from arc center to hole, the distance from the center of the arc to the side, the distance from the high point of the arc to the high point of the arc, and the distance from the intersection to the intersection, etc.
Construction	Intersection point, center point, extreme point, end point, line connecting two points, parallel line, perpendicular line, tangent line, bisector,Centerlines, line segment fusion, radius circle, three-line inscribed circle, two-line radius inscribed circle, etc.
GD&T	Straightness,roundness,position,parallelism,symmetry, perpendicularity, concentricity , profile and position tolerance evaluation.
Coordinate	Instrument coordinate system, point to line, point to point, line to line and other workpiece coordinate systems; image registration coordinate system;Can translate, rotate, manually adjust the coordinate system.
Special Tools	R angle,horizontal pitch,circumferential pitch,screen,slot,contour comparison,spring,O-ring and other special tools for rapid measurement .
	Support tolerance batch setting, scale classification, and color custom management.

Flexible shooting and precise calculation

Support segmental programming control of surface light, transmitted light and coaxial light , automatically identify the measurement position, and obtain uniform and stable measurement results every time.

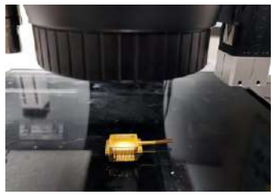


Ring light

Surface features are clear

Back light

Easy to measure profile features

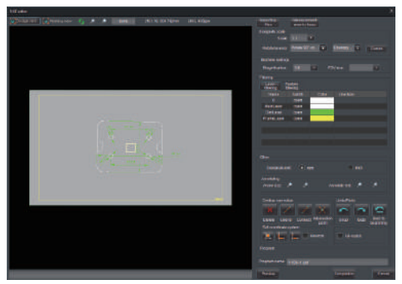


Coaxial light

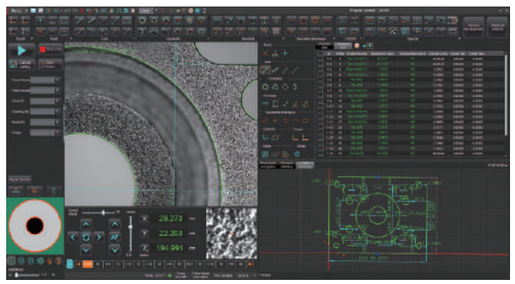
Measure diameter of blind hole

Auto batch measurement

- The program matches the coordinate system of the workpiece, automatically executes the measurement process,supports the import of CAD drawings and Gerber drawings, and coordinates system matching measurement;
- In the CNC fixed coordinate system mode, batch measurement can be performed quickly and accurately.



Import CAD drawing to build a program

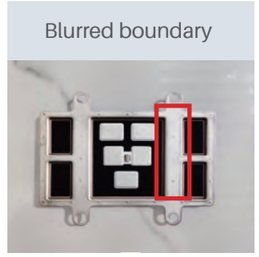


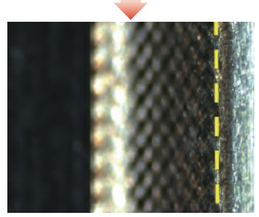
CNC batch measurement

Intelligent AI edge-finding technology

The AI measurement software has powerful algorithms and strong training capabilities. It can measure and store images at the same time, continuously optimize and iterate the model A, and can cope with scenarios where traditional measurement methods cannot automatically measure, such as warped and incomplete boundaries, blurred contours, many interferences on boundaries, and blurred boundaries. Compared to traditional manual measurement, it significantly enhances efficiency and repeatability.

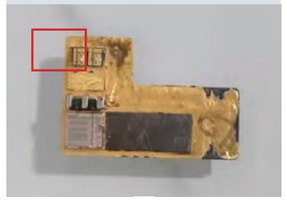
Blurred boundary

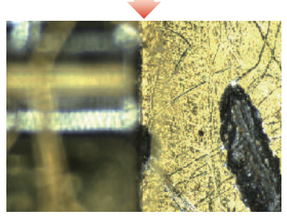




Multiple boundaries, low contrast

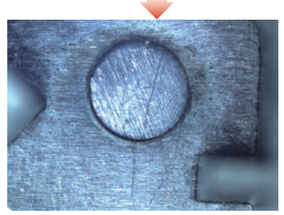
Excessive burrs, warped and incomplete boundaries



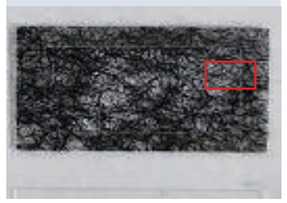


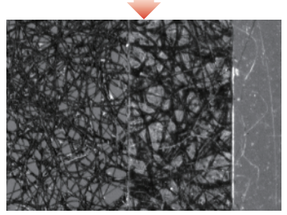
Low contrast

Unclear edge contour



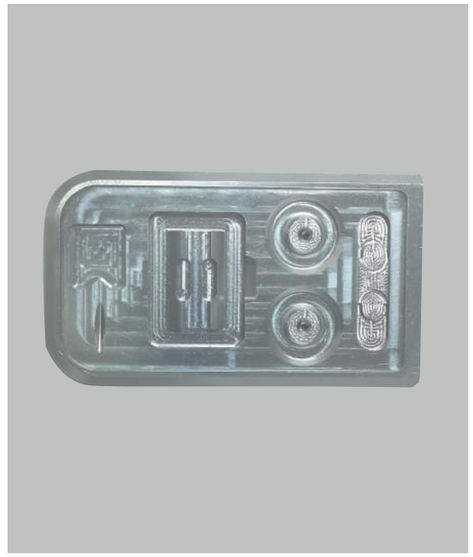
Excessive boundary interference

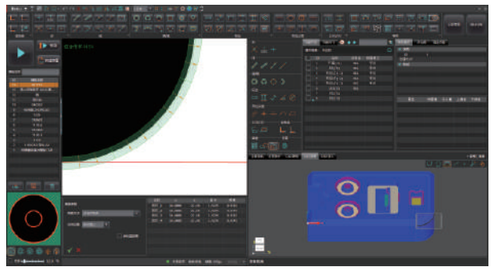


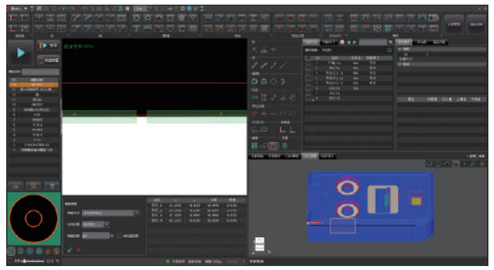


3D offline programming

- Without an actual VMM, the programming of measurement programs can be completed on 3D images, effectively improving the practical efficiency of using VMM.
- The interface is intuitive, easy to learn and operate.

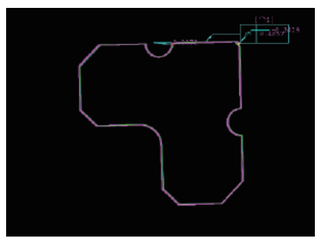


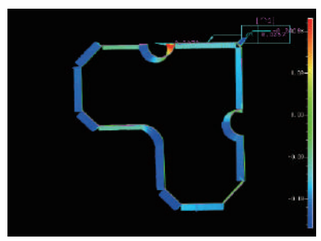


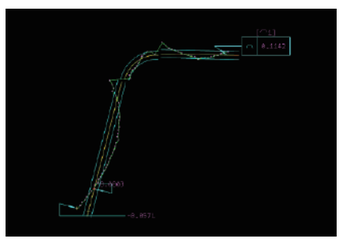


Profile tolerance

Multiple profile-extracting tools can be used to extract profile with complex edges, as well as import a set of profile points at specified locations for extraction. Can evaluate profile by non reference, single reference, and double references. Errors are displayed with color bands, which are intuitive and clear.

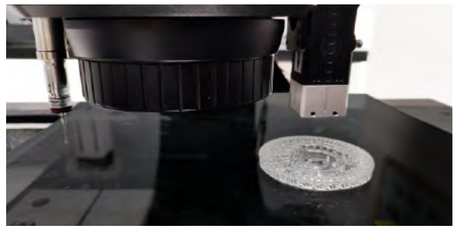




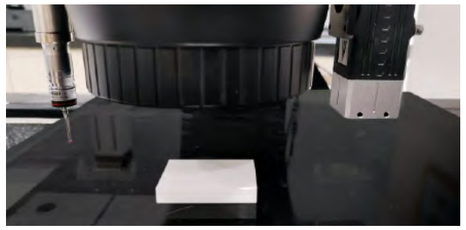


Various accessories

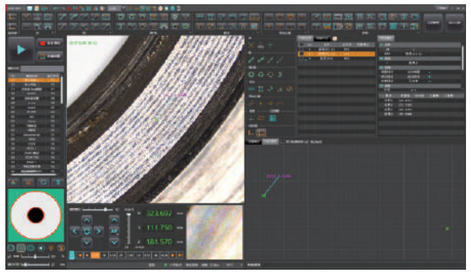
- Equips a touch probe or optical probe to measure height and flatness and realize 2.5D space measurement.
- Supports external input from digital calipers and height gauges.
- Supports label printers.



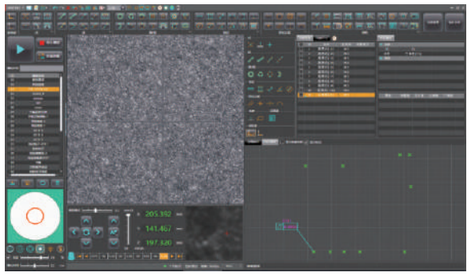
Height measurement



Flatness measurement



Height result

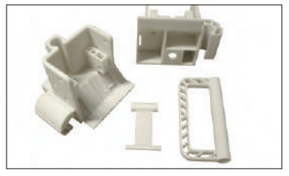


Flatness result

Application

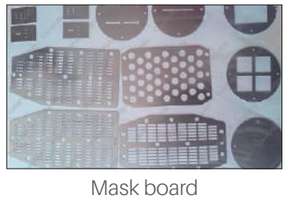
Phone accessories

Machining parts

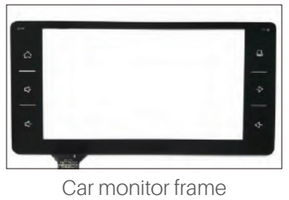


Plastic injection parts

Rigid PCB

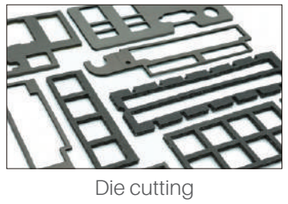


Mask board

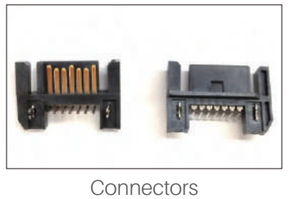


Car monitor frame

Small metal parts



Die cutting



Connectors

Parameters

Model No.			CHT322A	CHT432A
Travel Range	X		300 mm	400 mm
	Y		200 mm	300 mm
	Z		200 mm	200 mm
Structure Type			Column	
Base Material			Granite	
Monitor			24" LCD(1920×1080)	
Image Sensor			1.6MP High definition colorful industrial camera	
Resolution of Glass Scale			0.5μm	
Lens			6.5X manual lens	
Magnification			Optical Zoom: 0.7X~4.5X, Image Zoom: 32~206X	
Light	Back Light		Telecentric transmission illumination	
	Ring Light		5 rings and 8 segments (256 levels) surface light	
	Coaxial Light		LED(Optional)	
Accuracy*1	X/Y		(2.5+L/200)μm	
	X⊥Y		(3.0+L/200)μm	
	Z*2		(5.0+L/200)μm	
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		200*200mm	300*300mm
	Max Depth/Diameter(H/Φ)		1.64	
	Dia. of Beam		Φ100μm(Φ18μm optional)	
	Resolution		0.25μm	
	Z Non-movement	Range(Z)	±2mm	
		Accuracy	±2μm	
	Z Movement	Range(Z)	200mm	
		Accuracy	±(6+0.01H)μm, H is Z movement height in mm	
Max Speed	XY		500 mm/s	
	Z		200 mm/s	
Size			760x1150x1630mm	860x1300x1630mm
Weight			600 kg	650 kg
Loading Capacity			25 kg	
Power			1500W	2000W
Sensor Option			(1)Touch probe; (2)Optical probe	
Motion Control			Servo control system	
Software			VisionX	
Input			AC200~240V, 50/60Hz	
Working Environment			Temp. 20°C ±2°C, Humidity 20~80%, Vibration<0.002g, Less than15Hz	

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table in mm.
*2 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

Parameters

Model No.		CHT322U	CHT432U
Travel Range	X	300 mm	400 mm
	Y	200 mm	300 mm
	Z	200 mm	200 mm
Structure Type		Column	
Base Material		Granite	
Monitor		24" LCD(1920×1080)	
Image Sensor		1.6MP High definition colorful industrial camera	
Resolution of Glass Scale		0.1μm	
Lens		8.3X motorized lens	
Magnification		Optical Zoom: 0.6~5.0X, Image Zoom: 27~229X	
Light	Back Light	Telecentric transmission illumination	
	Ring Light	6 rings and 8 segments (256 levels) surface light	
	Coaxial Light	LED	
Accuracy*1	X/Y	(2.0+L/200)μm	
	X⊥Y	(3.0+L/200)μm	
	Z*2	(4.5+L/200)μm	
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)	200*200mm	300*300mm
	Max Depth/Diameter(H/Φ)	1.64	
	Dia. of Beam	Φ100μm(Φ18μm optional)	
	Resolution	0.25μm	
	Z Non-movement Range(Z)	±2mm	
	Z Non-movement Accuracy	±2μm	
	Z Movement Range(Z)	200mm	
	Z Movement Accuracy	±(6+0.01H)μm, H is Z movement height in mm	
Max Speed	XY	500 mm/s	
	Z	200 mm/s	
Size		760×1150×1630 mm	860×1300×1630 mm
Weight		600 kg	650 kg
Loading Capacity		25 kg	
Power		1500W	2000W
Sensor Option		(1)Touch probe; (2)Optical probe	
Motion Control		Servo control system	
Software		VisionX	
Input		AC200~240V, 50/60Hz	
Working Environment		Temp. 20℃ ±2℃, Humidity 20~80%, Vibration<0.002g, Less than15Hz	

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table in mm.
*2 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

Parameters

Model No.			CHT433S	CHT432S
Travel Range	X		400 mm	400 mm
	Y		300 mm	300 mm
	Z		300 mm	200 mm
Structure Type			Column	
Base Material			Granite	
Monitor			24" LCD(1920×1080)	
Image Sensor			5MP High definition colorful industrial camera	
Resolution of Glass Scale			0.1μm	
Lens			13.3X motorized lens	
Magnification*1			Optical Zoom: 0.6~8.0X, Image Zoom: 17~380X	
Light	Back Light		Telecentric transmission illumination	
	Ring Light		6 rings and 8 segments (256 levels) surface light(or RGB surface light, Optional)	
	Coaxial Light		LED	
Accuracy*1	X/Y		(1.8+L/250)μm	
	X⊥Y		(2.2+L/250)μm	
	Z*2		(3.0+L/200)μm	
Fly-Shooting Mode			Support	
Navigation Camera			Support	
Sensor Option			(1)Touch probe; (2)Optical probe	
Max Speed	XY		500 mm/s	
	Z		200 mm/s	
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		300*300mm	300*300mm
	Max Depth/Diameter(H/Φ)		1.64	
	Dia. of Beam		Φ100μm(Φ18μm optional)	
	Resolution		0.25μm	
	Z Non-movement	Range(Z)	±2mm	
		Accuracy	±2μm	
	Z Movement	Range(Z)	200mm	
		Accuracy	±(6+0.01H)μm, H is Z movement height in mm	
Size			860×1300×1800 mm	860×1300×1630 mm
Weight			750 kg	680 kg
Loading Capacity			25 kg	
Power			2000W	2000W
Motion Control			Servo control system	
Software			VisionX	
Input			AC200~240V, 50/60Hz	
Working Environment			Temp. 20℃ ±2℃, Humidity 20~80%, Vibration<0.002g, Less than15Hz	

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table (mm)
*2 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

Parameters

Model No.			CHT452	CHT562	CHT682
Travel Range	X		400 mm	500 mm	600 mm
	Y		500 mm	600 mm	800 mm
	Z		200 mm	200 mm	200 mm
Structure Type			Bridge		
Base Material			Granite		
Monitor			24" LCD(1920×1080)		
Image Sensor			1.6MP High definition colorful industrial camera		
Resolution of Glass Scale			0.1μm		
Lens			8.3X motorized lens		
Magnification			Optical Zoom: 0.6~5.0X, Image Zoom: 27~229X		
Light	Back Light		Telecentric transmission illumination		
	Ring Light		6 rings and 8 segments (256 levels) surface light		
	Coaxial Light		LED		
Accuracy*1	X/Y		(2.5+L/200)μm		
	X⊥Y		(3.0+L/200)μm		
	Z*2		(4.5+L/200)μm		
Max Speed	XY		500 mm/s		
	Z		200 mm/s		
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		300*500mm	400*600mm	500*800mm
	Max Depth/Diameter(H/Φ)		1.64		
	Dia. of Beam		Φ100μm(Φ18μm optional)		
	Resolution		0.25μm		
	Z Non-movement	Range(Z)	±2mm		
		Accuracy	±2μm		
	Z Movement	Range(Z)	200mm		
		Accuracy	±(6+0.01H)μm, H is Z movement height in mm		
Size(mm)			1030×1400×1630	1080×1500×1630	1230×1700×1630
Weight			1100 kg	1400 kg	1700 kg
Loading Capacity			25kg		
Power			2000W	2500W	2500W
Sensor Option			(1)Touch probe; (2)Optical probe		
Motion Control			Servo control system		
Software			VisionX		
Input			AC200~240V, 50/60Hz		
Working Environment			Temp. 20°C ±2°C Humidity 20~80%, Vibration<0.002g, Less than15Hz		

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table in mm.
*2 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

Automatic Video Measuring Machines CHT Series
Optical Measuring Instruments

Parameters

Model No.			CHT0810	CHT1012	CHT1216
Travel Range	X		800 mm	1000 mm	1200mm
	Y		1000 mm	1200 mm	1600mm
	Z		200 mm	200 mm	200 mm
Structure Type			Bridge		
Base Material			Granite		
Monitor			24" LCD(1920×1080)		
Image Sensor			1.6MP High definition colorful industrial camera		
Resolution of Glass Scale			0.1μm		
Lens			8.3X motorized lens(13.3X Optional)		
Magnification			Optical Zoom: 0.6~5.0X, Image Zoom: 27~229X		
Light	Back Light		Telecentric transmission illumination		
	Ring Light		6 rings and 8 segments (255 levels) surface light		
	Coaxial Light		LED		
Accuracy*1	X/Y		(3.0+L/200)μm	(3.5+L/200)μm	
	X⊥Y		(4.0+L/200)μm	(4.5+L/200)μm	
	Z*2		(4.5+L/200)μm	(4.5+L/200)μm	
Max Speed	XY		500 mm/s		
	Z		200 mm/s		
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		700*1000mm	900*1200mm	1100*1500mm
	Max Depth/Diameter(H/Φ)		1.64		
	Dia. of Beam		Φ100μm(Φ18μm optional)		
	Resolution		0.25μm		
	Z Non-movement	Range(Z)	±2mm		
		Accuracy	±2μm		
	Z Movement	Range(Z)	200mm		
		Accuracy	±(6+0.01H)μm, H is Z movement height in mm		
Size(mm)			1600×2020×1700	1830×2300×1700	2000×2700×1700
Weight			2400 kg	3800 kg	4200kg
Loading Capacity			50kg		
Power			2500W	2500W	2500W
Sensor Option			(1)Touch probe; (2)Optical probe		
Motion Control			Servo control system		
Software			VisionX		
Input			AC200-240V, 50/60Hz		
Working Environment			Temp. 20°C ±2°C, Humidity 20~80%, Vibration<0.002g, Less than15Hz		

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table in mm.
*2 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

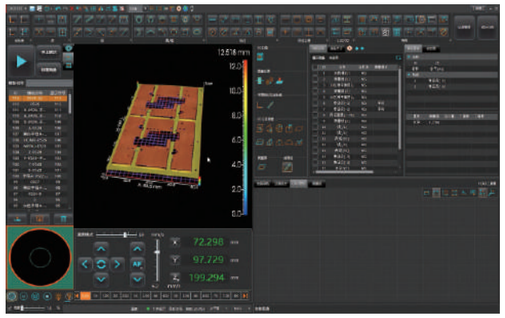
Automatic Video Measuring Machines Novator Series

Functions

1. Measurement tools: Extracting edge points by scanning, extracting edge points by multi-segment, extracting edge points by circle, ellipse extraction, extracting contour line by frame selection, focus point, nearest points, etc.
2. Measure geometric features: Point, line, circle (center coordinate, radius, diameter), arc, center, angle, distance, line width, hole site, aperture, number of holes, distance from hole to hole, hole to edge, distance from the arc center to the hole, distance from the arc center to the edge, distance from the arc high point to the other arc high point, distance from the intersection to the intersection, etc.
3. Construction features: Intersection, center point, extreme point, endpoint, two-point connection, parallel line, perpendicular line, tangent, bisector, center line, line segment fusion, drawing circle by radius, drawing inscribed circle among three lines, drawing inscribed circle by two lines & radius , etc.
4. Geometric tolerance: Straightness, roundness, contour, position, parallelism, symmetry, perpendicularity, concentricity, profile and position tolerance evaluation.

Features

Replaceable RGB surface light



Integrate 3D topography measurement

- **Stable moving stage , high measurement accuracy**
  1. Precision marble body, good stability and high precision.
  2. Precision linear slide rail and servo control system, smooth and silent movement.
  3. Three axes x/y/z programmable, realize batch inspection for complex features.
- **Laser scanning imaging, 3D composite measurement**
  1. Support spot-type laser probe to scan profile in height direction.
  2. Support 3D line-scanning laser probe.
  3. VisionX supports a variety of contour measurements and 3D spatial measurements, seamlessly connecting 2D/3D hybrid measurements.
- **Strobe lighting source, high speed fly-shooting**
  1. Equipped with strobe lighting source, support strobe and normal lighting modes.
  2. Support fly-shooting measurement mode, measurement efficiency is increased by 5~10 times.
  3. Support the stitching measurement function of the flash measuring machines.
- **Replaceable RGB surface light, independent lifting up and down**
  1. RGB and white light can be replaced to adapt to a variety of complex colors and material surfaces.
  2. The surface light can be lifted independently to better observe the sample surface.
  3. Support programmable back light, coaxial light and 6 rings and 8 segments of the surface light.
- **Automatic and fast batch measurement**
  1. The program matches the workpiece coordinate system and automatically executes the measurement process.
  2. Support CAD drawing and Gerber drawing import.
  3. Can execute quickly and accurate batch measurement in CNC fixed coordinate system mode.
- **Easy operation, hassle-free**
  1. Equipped with a large FOV navigation camera for fast workpiece positioning.
  2. Mechanical lens anti-collision function
  3. User-friendly operation interface, anyone can easily set and measure.

Parameters

Model No.		Novator333	Novator342	Novator562	Novator682
Travel Range	X	300 mm	300 mm	500 mm	600 mm
	Y	300 mm	400 mm	600 mm	800 mm
	Z	300 mm	200 mm	200mm	200 mm
Structure Type		Bridge			
Base Material		Granite			
Monitor		24" LCD(1920×1080)			
Image Sensor		5MP High definition colorful industrial camera			
Resolution of Glass Scale		0.1μm			
Lens		13.3X motorized lens			
Magnification		Optical Zoom: 0.6X~8.0X, Image Zoom:17X~380X			
F.O.V.		Max: 13x11mm; Min:1.0x0.8mm			
Light	Back Light	Telecentric transmission illumination			
	Ring Light	6 rings and 8 segments (256 levels) surface light(or RGB surface light, Optional)			
	Coaxial Light	LED			
Accuracy*1	X/Y	(1.4+L/250)μm	(1.4+L/250)μm	(1.8+L/250)μm	(2.0+L/250)μm
	X⊥Y	(1.8+L/250)μm	(1.8+L/250)μm	(2.2+L/200)μm	(2.5+L/200)μm
	Z	(3.0+L/200)μm	(3.0+L/200)μm	(3.0+L/200)μm	(3.0+L/200)μm
3D Scanning*2 (Optional)	Z Measuring Range*3	5mm			
	Scanning Width*4	30mm			
	Repeatability*5	±1μm			
	Z Accuracy*5	±0.1%F.S.			
	Scanning Speed	10~80mm/s			
Fly-Shooting Mode		Support			
Navigation Camera		Support			
Sensor Options		(1)Touch probe; (2)Optical probe			
Max Speed	XY	500 mm/s			
	Z	200 mm/s			
Size		860×1140×1885mm	860×1350×1685mm	1100×1500×1685mm	1200×2160×1685mm
Weight		900kg	900kg	1700kg	2120kg
Loading Capacity		25kg	25kg	50kg	50kg
Power		2000W	2000W	2500W	2500W
Motion Control		Servo control system			
Software		VisionX			
Input		AC200~240V, 50/60Hz			
Working Environment		Temp. 20℃ ±2℃, Humidity 20~80%, Vibration<0.002g, Less than15Hz			

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less;
L is the moving range of the table (mm)
*2 Optional line-scanning probe is required.
*3 Measuring range 5mm~40mm optional.
*4 Scanning width 30mm~145mm optional.
*5 Environment temperature is +20 °C ± 1.0 °C

Flash Measuring Machines VX Series

One Touch Measurement

Efficient Accurate

VX8000 series

VX1000 series

VX5000 series

VX3500 / VX8500

VX4000 series

Efficient measurement

5000+pcs

Once up to
5000+features

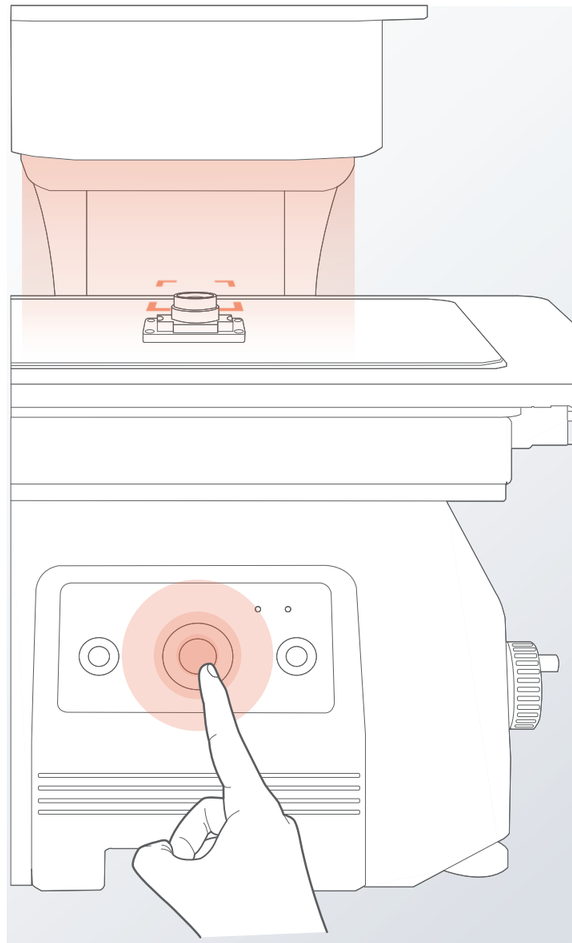
- Auto illumination
- Auto focusing

1024 pcs

Once up to
1024 workpieces

2 secs

In 2 seconds
Finish the
measurement



Load program

Support importing DXF file

Place workpiece

Place anywhere on table

One-Touch measurement

Touch Measure button

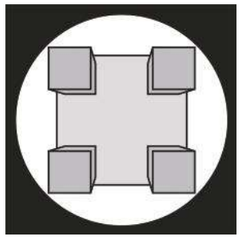
Dedicated Optical Lens

Normal Lens

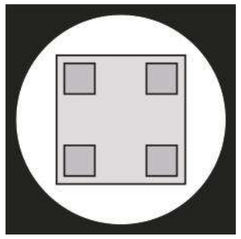
Our Dedicated lens

Clear image even if there are stages

Equipped with a high depth optical lens and automatic focusing, the flash measuring machine only needs to focus at the tested object once. Even if there are variations in height, the images remain clear.



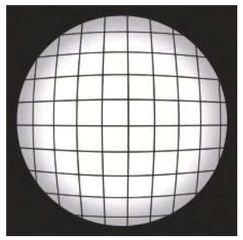
Normal Lens



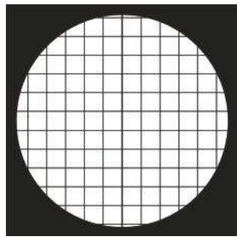
Our Dedicated lens

Always real size even if there are stages

With a double telecentric optical lens, the size of objects in the image is always real and accurate, even features that are located at edge of the field of view.



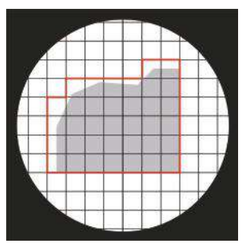
Normal Lens



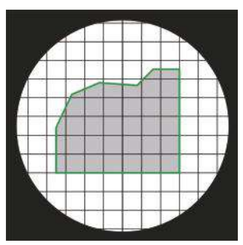
Our Dedicated lens

Zero distortion in the full field of view

Thanks to the double telecentric optical lens with high depth of field and high resolution, it is almost zero distortion of the image in the full field of view. Test result is always the same in any position of the object table.



Normal Lens



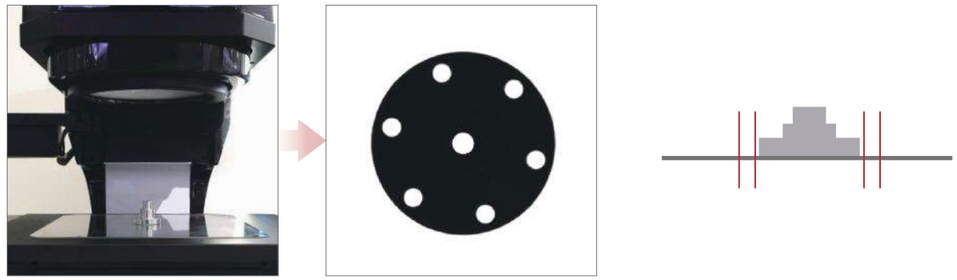
Our Dedicated lens

Sub-pixel processing of edges

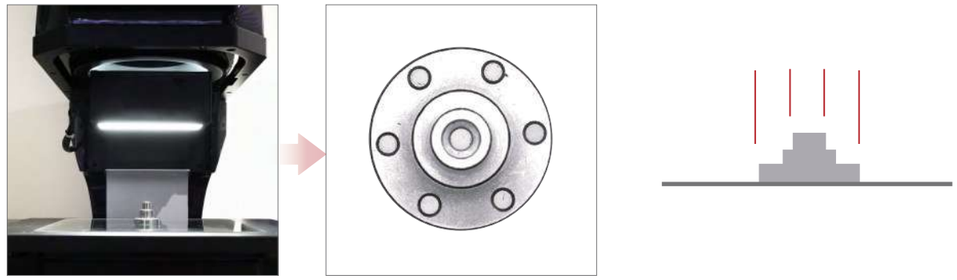
With algorithms of high-order interpolation and numerical fitting, the software can perform sub-pixel processing of the edges.

Light Source

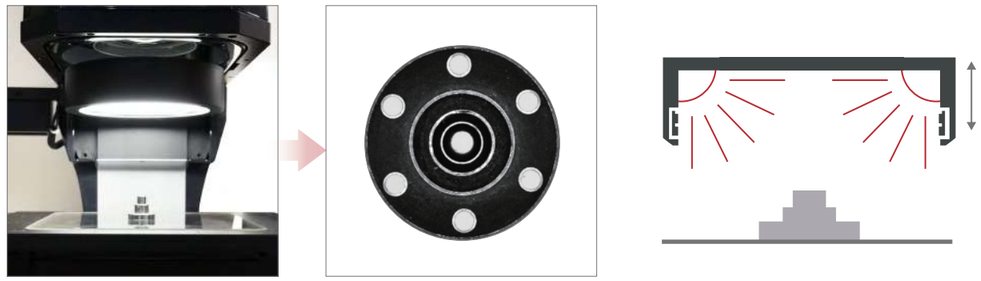
Back light



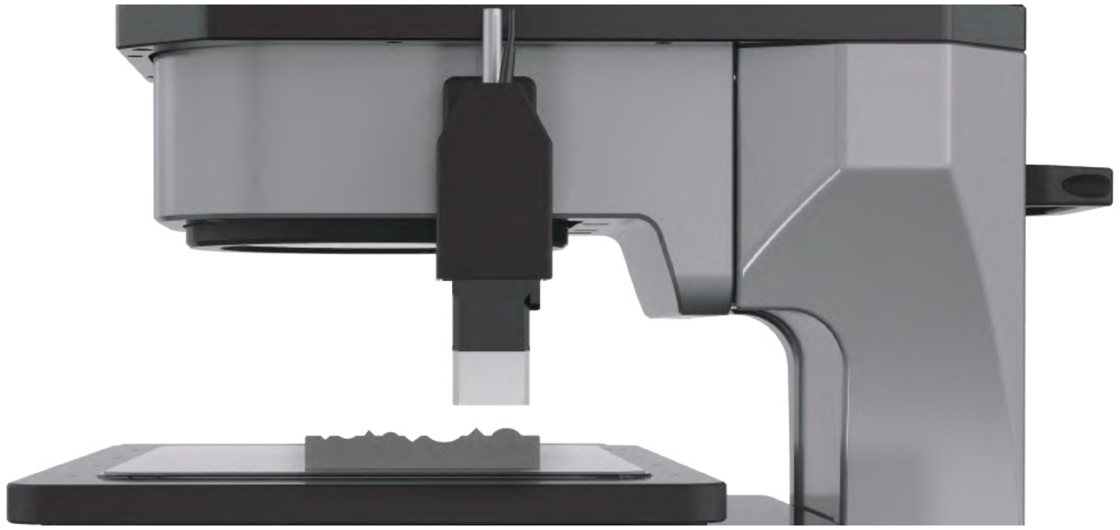
Coaxial light

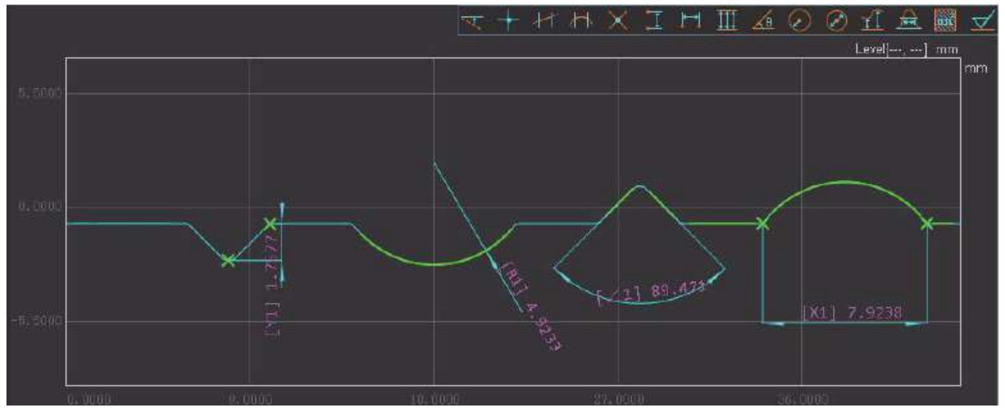


75°Ring light



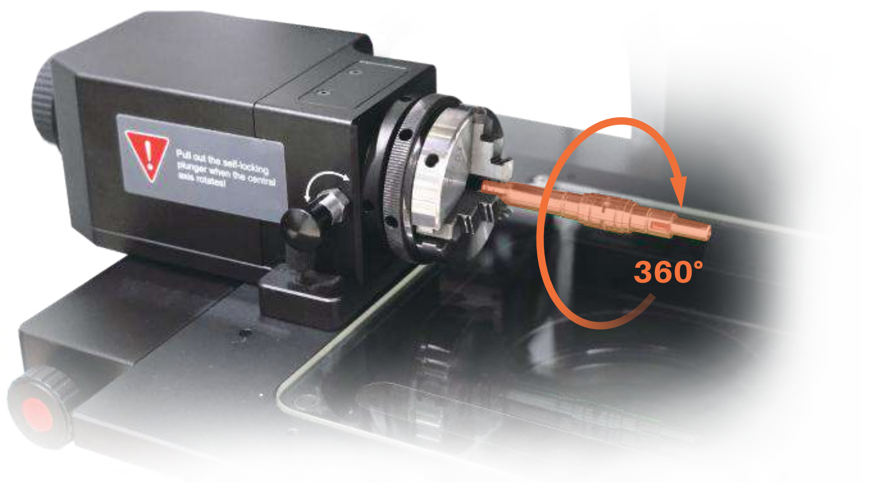
Height probe

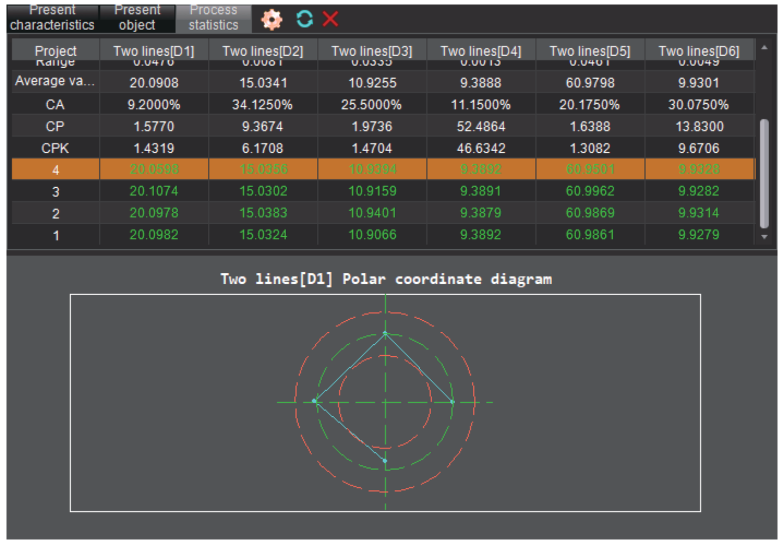




It is a white light confocal probe, and can be used to measure thickness, height difference, flatness, parallelism, etc. Moreover, this probe can scan the contour of the sample.

Rotary chuck

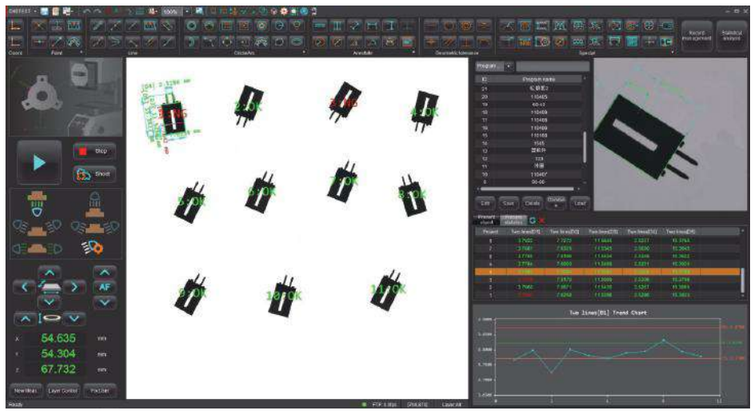



Present characteristics
Present object
Process statistics
Project | Two lines[D1] | Two lines[D2] | Two lines[D3] | Two lines[D4] | Two lines[D5] | Two lines[D6]
Average va... | 20.0908 | 15.0341 | 10.9255 | 9.3888 | 60.9798 | 9.9301
CA | 9.2000% | 34.1250% | 25.5000% | 11.1500% | 20.1750% | 30.0750%
CP | 1.5770 | 9.3674 | 1.9736 | 52.4864 | 1.6388 | 13.8300
CPK | 1.4319 | 6.1708 | 1.4704 | 46.6342 | 1.3082 | 9.6706
4 | 20.0598 | 15.0356 | 10.9394 | 9.3892 | 60.9501 | 9.9328
3 | 20.1074 | 15.0302 | 10.9159 | 9.3891 | 60.9962 | 9.9282
2 | 20.0978 | 15.0383 | 10.9401 | 9.3879 | 60.9869 | 9.9314
1 | 20.0982 | 15.0324 | 10.9066 | 9.3892 | 60.9861 | 9.9279
Two lines[D1] Polar coordinate diagram

Rotary chuck can rotate 360°. It is convenient to measure the sizes in different section according to rotation angle specified by the operator. It is an ideal solution to measure all kinds of cylindrical parts, such as shaft, etc.

Software

VisionX professional visual measurement software is completely independently developed by CHOTEST, and CHOTEST has independent intellectual property rights. VisionX has friendly user interface, convenient operation, powerful and practical functions, support more than 80 kinds of extraction and analysis tools, including feature extraction tool, auxiliary tool, annotation tool and special application tool, etc. Moreover, functions can be customized according to user's need, so as to improve work efficiency more effectively.



Home Interface

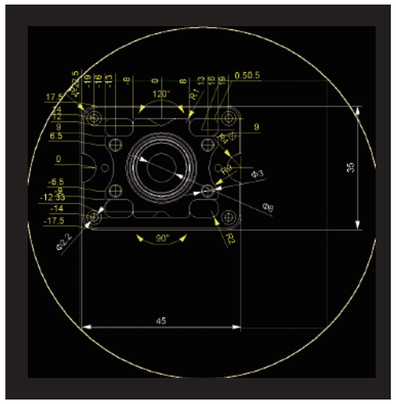
Features

Geometric Tolerance	Straightness, Roundness, Concentricity, Symmetry, Positional Tolerance, Parallelism, Perpendicularity, Profile Tolerance, etc.
CNC Mode	Modify CNC program anytime, as well as adding or reducing features OK or NG is concluded according to tolerance in CNC program
Automatic	Only need to select the measuring features, after placing the workpiece, measuring results can be obtained quickly by one key
Coordinate System	Can create coordinate system by Point-line, Line-line, and translate & rotate coordinate system, as well as create multi-coordinate system
Special tools	Rounded corner, Contour, Thread, Slot, Perimeter, Pitch distance, Thickness, Chamfer, Spring, Gear, Sealing gasket, Area, Pitch Angle, Boundary width

DXF Import

Measurement data can be obtained from CAD drawings. Even if the test object is not physically available, you can still create measurement programs quickly.The system can automatically assign features and dimensions from the DXF drawing to the sample, including surface dimensions.

Sample



Automatically assign DXF features to the sample

Work with Robot

Measurement data is transmitted to the MES system of the customer via socket or HTTP protocols in real time.

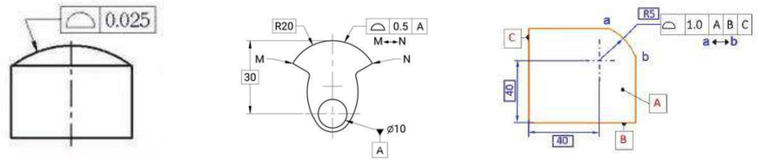
VisionX also could receive commands from the external server to load the program and begin measurement, so it is compatible with robotic arms to achieve unmanned measurements.

Robotic loading and uploading

MES data collection

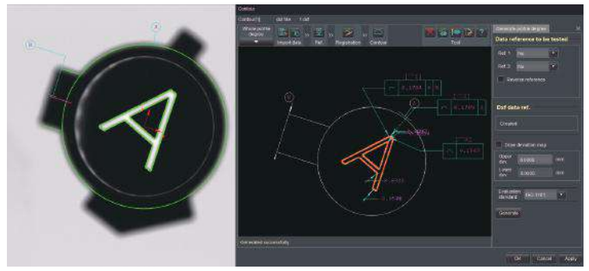
Profile tolerance

- This tool has three evaluation methods: No reference (only shape error evaluation), Single reference, Multiple references.



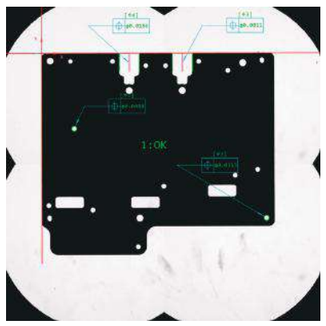
- Multiple annotations: Multiple profile tolerance can be annotated in a single program.No need to establish a coordinate system: Just need to enter the reference in the drawing .Measurement of profile tolerance in different coordinate systems can be achieved in a single program.

- Multiple types: Evaluate the profile tolerance by scanning the entire contour; Or evaluate the profile tolerance by measuring point with specifying coordinate values.



Position Tolerance

It can measure both point position tolerance and line position tolerance. Evaluation can be performed by XY coordinates in Cartesian coordinate system or radius & angle in polar coordinate system.

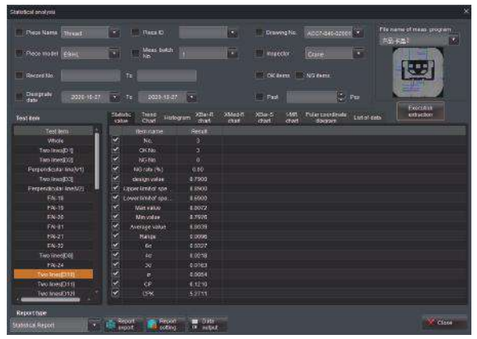


Statistical Analysis

The statistical analysis interface has the tabs of [Statistical Value], [Trend Chart], [Histogram] and [Data List]

Automatic recording and sorting

Measurement results and its main statistical information (e.g. average value, σ, 3σ, 6σ, Ca, Cp, Cpk etc) will be automatically recorded and saved. Operator could search records by different conditions.



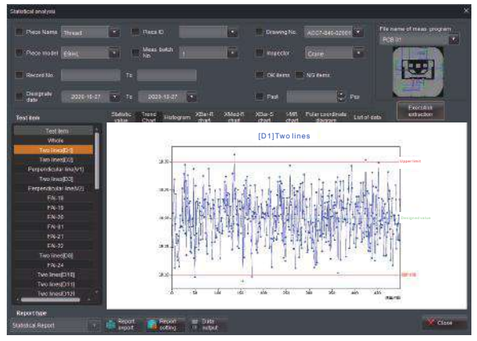
Statistic

Tabled data

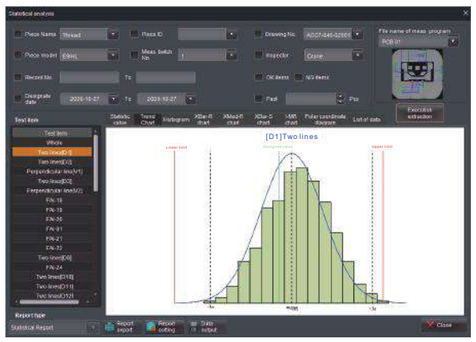
Control production process and improve product quality

The trend chart monitors the abnormalities of generating equipment and production process by regularly changing trend of measured values. Such as the monotonic and periodic changes of the measured values.

The histogram reflects the fluctuation and distribution of product quality, and transmits information about process quality, which can be used to judge and predict product quality and unqualified rate.



Trend Chart



Histogram

Application

Flash measuring machines are widely used in industry of machinery, electronics, mold, injection molding, hardware, rubber, low-voltage electrical appliances, magnetic materials, precision stamping, connectors, connectors, terminals, mobile phones, home appliances, printed circuit boards, medical equipment, watches, tools, etc.


Phone case


Phone accessories


Watch inner parts


Watch chain


Machining parts


Stamping parts


Sheet metal parts


Plastic injection parts


Magnetic component


Cutting tools

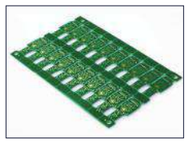

Small metal parts


Gear


Rubber ring

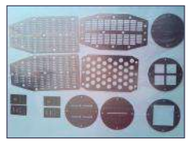

Spring

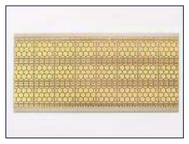

Thread, Shaft


Rigid PCB

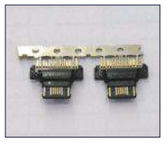

Soft PCB


Shielding case

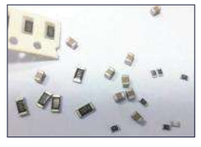

Mask board

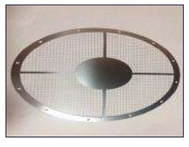

Ceramic plate

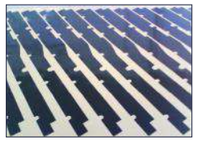

Car monitor frame

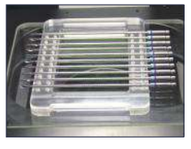

Connectors


Battery


Resistors


Filter mesh


Die cutting

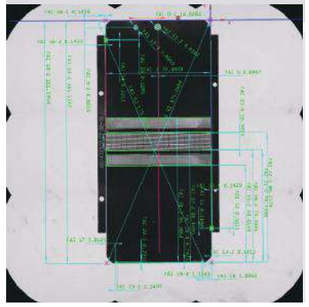

Medical drill


Sieve


Radius gauge

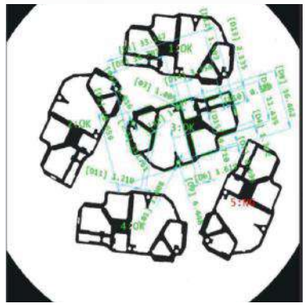

Thread template

Foldable Screen of Mobile Phone

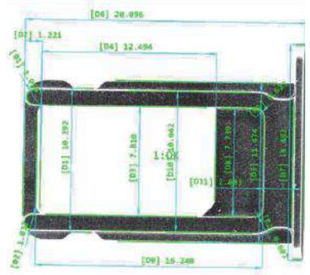


Phone Casing

Shielding Covers

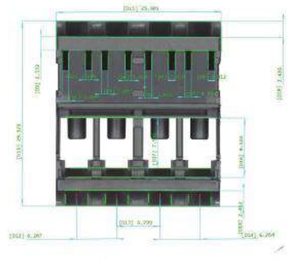


Shield slot

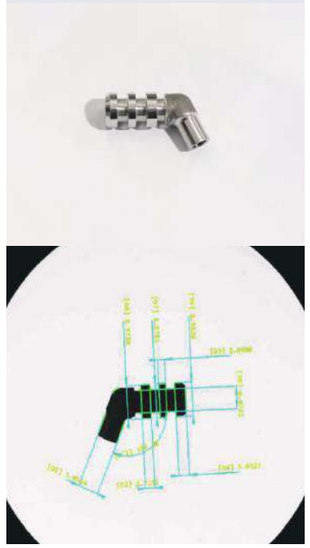


Back Cover Glass of Mobile Phone

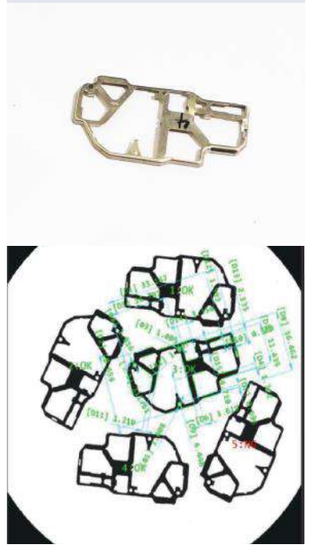
Plastic



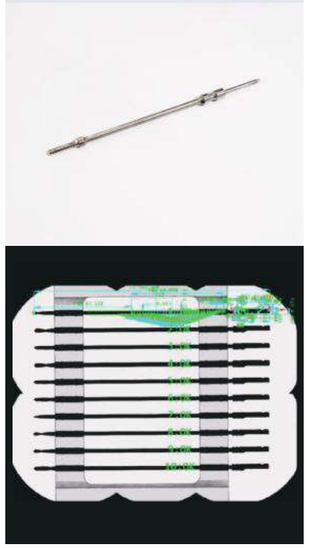
Terminal



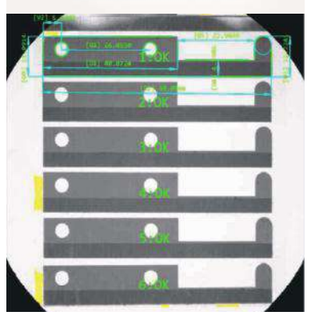
Shielding Covers



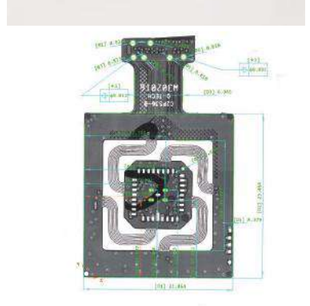
Medical drill



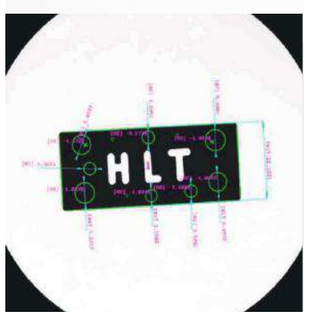
Die Cutting



Soft PCB



Filter



Parameters

Model No.			VX8100	VX8200	VX8300	VX8306D
Image Senor			20MP CMOS			
Monitor	Built-in		10.4" LCD (XGA: 1024x768)			
	Outside		24" LCD XGA(1920x1080)(Optional)			
Acceptance Lens			Double Telecentric Lens			
Light	Ring Light		Four-segment illumination(White Light)			
	Back Light		Telecentric transmission illumination(Green Light)			
	Coaxial Light(Optional)		LED parallel light			
F.O.V.	Wide Field(mm)		200x100 (4 Angles R50)	200x200 (4 Angles R50)	300x200 (4 Angles R50)	230x130
	High Precision(mm)		130x20	130x130	230x130	216x116
Resolution			0.1μm			
Repeatability of Image Meas.	Wide Field	Without Stitching*1	±1μm			±0.5μm
		With Stitching*2	±2μm			±1μm
	High Precision	Without Stitching*1	±0.5μm			±0.1μm
		With Stitching*2	±1.5μm			±0.5μm
Accuracy of Image Meas.	Wide Field	Without Stitching*1	±3μm			±2μm
		With Stitching*2	±(5+0.02L)μm			±(4+0.02L)μm
	High Precision	Without Stitching*1	±1.5μm			±0.7μm
		With Stitching*2	±(3+0.02L)μm			±(2+0.02L)μm
Horizontal Rotary Unit (Optional)	Rotation Angle		———	Range 360°, Resolution 0.02°		
	Rotation Speed		———	0.2~2rev/s		
	Max Diameter		———	Φ60mm		
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		———		120*110mm	
	Max Depth/Diameter(H/Φ)		———		1.64	
	Dia. of Beam		———		Φ100μm(Φ18μm optional)	
	Resolution		———		0.25μm	
	Z Non-movement	Range(Z)	———		±2mm	
		Accuracy	———		±2μm	
	Z Movement	Range(Z)	———		75mm	
		Accuracy	———		±(6+0.01H)μm, H is Z movement height in mm	
XY Object Table	X Travel Range		110mm		210mm	
	Y Travel Range		/	110mm		
	Loading Capacity		2kg	7.5kg		
Z-Axis Travel Range			35mm	75mm		
Size(LxWxH) mm			500x280x670	531x386x731	531x503x731	
Weight			30kg	49kg	75kg	
Input			AC100~240V, 50/60Hz, 2A, 300W			
Working Environment			Temp.10 °C~35 °C, Humidity 20~80% , Vibration<0.002g, Less than15Hz			

Note:
*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C
*2 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 2 kg or less;
L is the moving range of the table (mm)

Parameters

Model No.		VX1100
Image Senor		20MP CMOS
Monitor		24" LCD(XGA:1920×1080)
Acceptance Lens		Double Telecentric Lens
Light	Ring Light	Four-segment illumination(White Light, Manual up & down)
	Back Light	Telecentric transmission illumination(Green Light)
F.O.V.		Φ100mm
Repeatability of Image Meas.		±1μm
Accuracy of Image Meas.*1		±3μm
Software		VisionX
Resolution		0.1μm
Z Axis Travel Range		35mm
Loading Capacity		5kg
Size(L×W×H)		500×280×670mm
Weight		25kg
Input		AC100~240V, 50/60Hz, 2A, 300W
Working Environment		Temp.10°C~35°C, Humidity 20~80%, Vibration<0.002g, Less than15Hz

Note:

*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C

Parameters

Model No.	VX4230S	VX4230
Image Senor	25MP CMOS	12MP CMOS
Outside Monitor	24" LCD (XGA:1920×1080)	
Acceptance Lens	Double Telecentric Lens	
Back Light	Parallel transmission illumination(White Light)	
F.O.V	Φ230mm	200x150mm
Depth of Field	50mm	50mm
Working Distance	400mm	
Repeatability	±2μm	
Accuracy of Image Meas.*1	±5μm	
Z Axis Rravel Range	65mm	100mm
Software	VisionX	
Resolution	0.1μm	
Loading Capacity	15kg	
Size(L×W×H)	830×605×1500mm	
Weight	375kg	
Input	AC100~240V, 50/60Hz, 4A, 600W	
Working Environment	Temp.10°C~35°C, Humidity 20~80%, Vibration<0.002g, Less than15Hz	

Note:

*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C

Parameters

Model No.		VX5100
Image Senor		5MP CMOS
Outside Monitor		24" LCD (XGA: 1920×1080)
Acceptance Lens		Double Telecentric Lens
Back Light		Telecentric transmission illumination
F.O.V.		Φ100mm
Repeatability		±2μm
Accuracy *1		±5μm
Software		VisionX
Resolution		0.1μm
Motorized XY Object Table (Optional)	Rotational Speed	0.2 ~2 Revolutions/s
	Diameter	Φ60mm
	Capacity	3kg
Size(L×W×H)		736×200×325mm
Weight		25kg
Input		AC100~240V, 50/60Hz, 1.3A, 150W
Working Environment		Temp.10 °C~35 °C, Humidity 20~80%, Vibration<0.002g, Less than15Hz

Note:

*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C

Parameters

Model No.			VX 3500	VX 8500
Image Senor			5MP CMOS	20MP CMOS
Monitor			24"LCD(XGA :1920x1080)	
Acceptance Lens			Double Telecentric Lens	
Light	Ring Light		Four-segment illumination(White Light/Green Light)	
	Back Light		Telecentric transmission illumination(Green Light)	
F.O.V.	Large Field		500x400mm(4 Angles R50)	
	High Precision		430x330mm	
Resolution			0.1μm	
Repeatability of Image Meas.	Wide Field	Without Stitching*1	±1μm	±1μm
		With Stitching*2	±2μm	±2μm
	High Precision	Without Stitching*1	±0.5μm	±0.5μm
		With Stitching*2	±1.5μm	±1.5μm
Accuracy of Image Meas.	Wide Field	Without Stitching*1	±5μm	±3μm
		With Stitching*2	±(7+0.02L)μm	±(5+0.02L)μm
	High Precision	Without Stitching*1	±2μm	±1.5μm
		With Stitching*2	±(4+0.02L)μm	±(3+0.02L)μm
Horizontal Rotary Unit (Optional)	Rotation Angle		Range 360°, Resolution 0.02°	
	Rotation Speed		0.2~2rev/s	
	Max Diameter		Φ60mm	
Height Meas. (Optical Probe) (Optional)	Measuring Range(X*Y)		300*300mm	
	Max Depth/Diameter(H/Φ)		1.64	
	Dia. of Beam		Φ100μm(Φ18μm optional)	
	Resolution		0.25μm	
	Z Non-movement	Range(Z)	±2mm	
		Accuracy	±2μm	
	Z Movement	Range(Z)	200mm	
		Accuracy	±(6+0.01H)μm, H is Z movement height in mm	
XY Object Table	X Travel Range		410mm	
	Y Travel Range		310mm	
	Loading Capacity		20kg	
Z- Axis Travel Range			200mm	
Size(LxWxH)			900x1340x1600mm	
Weight			950kg	
Input			AC100~240V, 50/60Hz, 10A, 2500W	
Working Environment			Temp.10 °C~35 °C , Humidity 20~80%, Vibration<0.002g, Less than15Hz	

Note:

*1 In the focus position, the environment temperature is +20 °C ± 1.0 °C
*2 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 2 kg or less;
L is the moving range of the table (mm)

Flash Measuring Machines Hybrid Series

Description

Composite Flash Measuring Machine Hybrid series is an advanced fully automatic image measuring instrument. It adopts a hybrid architecture of an electric zoom lens and a large double-telecentric lens, offering high precision measurement for the small & complicated features by the electric zoom lens and efficient measurement for the big & easy features by the large double-telecentric lens, so it achieves an optimized combination of precise and efficient measurement.

Composite Flash Measuring Machine Hybrid series can be used in machinery, electronics, molds, injection molding, hardware, rubber, low-voltage electrical appliances, magnetic materials, precision stamping, connectors, connectors, terminals, mobile phones, home appliances, printed circuit boards, medical equipment, watches and clocks , cutting tools, measurement and testing and other fields.

Parameters

Model No.		Hybrid432	Hybrid562	Hybrid682
Travel range	X	400 mm	500mm	600 mm
	Y	300 mm	600mm	800 mm
	Z	200 mm	200mm	200 mm
Structure Type		Column	Bridge	Bridge
Base Material		Granite		
Monitor		24" LCD (1920x1080)		
Resolution of Glass Scale		0.1μm		
Guide Rail		Precision linear guide rail		
High-resolution Electric Zoom Lens	Lens	13.3X Motorized lens		
	Magnification*1	Optical zoom：0.6~8.0X，Image Zoom：17~232X		
	Image Sensor	HD colorful industrial camera		
	Single F.O.V.	1mm×1mm~12mm×12mm		
	Measuring Range	360×310mm	410×600mm	610×800mm
	Meas. Accuracy (XY)*2	(1.8+L/200)μm	(2.0+L/200)μm	(2.2+L/200)μm
	Meas. Accuracy (Z)*3	(2.8+L/200)μm		
	Bottom	Telecentric transmission Illumination (Green Light)		
	Ring	6 rings and 8 segments light (White light)		
	Coaxial Light	LED light		
Double Telecentric Wide F.O.V Optical Lens	Lens Spec.	Φ100mm double telecentric lens		
	Single F.O.V.	90×90mm		
	Measuring Range	460X330mm (4 Angles R50)	480X600mm (4 Angles R50)	580X800mm (4 Angles R50)
	Accuracy of Single F.O.V.*4	±4μm		
	Stitching Accuracy*2	(4+L/200)μm	(5+L/200)μm	(6+L/200)μm
	Back Light	Telecentric transmission Illumination (Green)		
	Ring Light	4 segments illumination (White light, 75°), directional ring light (Green light, 0°)		
Max Speed	XY	500 mm/s		
	Z	100 mm/s		
Size		910×1350×1700mm	1450×1520×1700mm	1600×1860×1700mm
Weight		700kg	1900kg	2300kg
Loading Capacity		25kg	50kg	50kg
Power Supply		2000W	2500W	2500W
Motion Control		Servo control system		
Software		Vision X		
Input		AC200~240V，50/60Hz		
Working Environment		Temp. 20°C±2°C, Humidity 20~80%, Vibration<0.002g, Less than 15HZ		

Note：

*1 Image magnification is approximate and depends on monitor size and resolution.

*2 In the focus position, the environment temperature is +20 °C ± 1.0 °C, and the load on the table is 5 kg or less; L is the moving range of the table in mm.

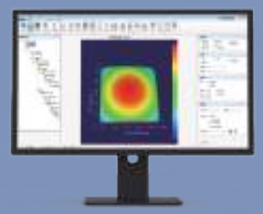
*3 It is mechanical accuracy, and actual accuracy depends on object surface where lens focuses.

*4 In the focus position, the environment temperature is +20 °C ± 1.0 °C.

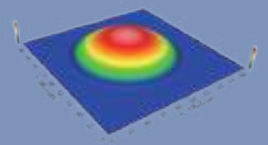
SuperView W1
3D Optical Surface Profilometer

White Light Interferometry

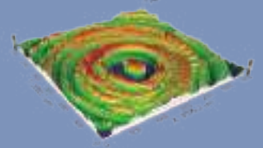
Nano 3D Surface Form and Roughness



Unique re-establishment algorithm can filter noises of surface of test object.



Super smooth lens



Abraded surface

Interference Lens

Different magnification lenses are selectable for various test objects with smooth or coarse surface

Vacuum Object Table

Vacuum Object Table is specially customized for semi-conducting wafers, so influence from feeble air flowing to test object is eliminated in measurement

Air-Bearing Isolation System

Built-in air bearing isolation system can isolate the vibration. Air pressure of the machine can be supplied by air compressor or inflators.

Sonic Vibration Isolation

The shell is separated from the internal motion unit, which effectively isolates the transmission of sound wave vibration.

Easy Level

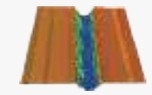
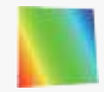
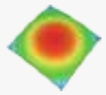
Improve the re-establishment accuracy and adjust stripe width by adjusting tilt of object table

Convenient joystick

Easy to control X/Y/Z movement, speed and light source brightness; Emergency stop button

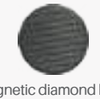
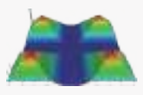
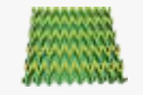
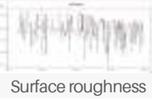
Application

It is used for measurement and analysis of surface roughness and profile of precision components from industries of semi-conductor, 3C Electronics, ultraprecise machining, optical machining, micro-nano materials, micro-electro-mechanical system.

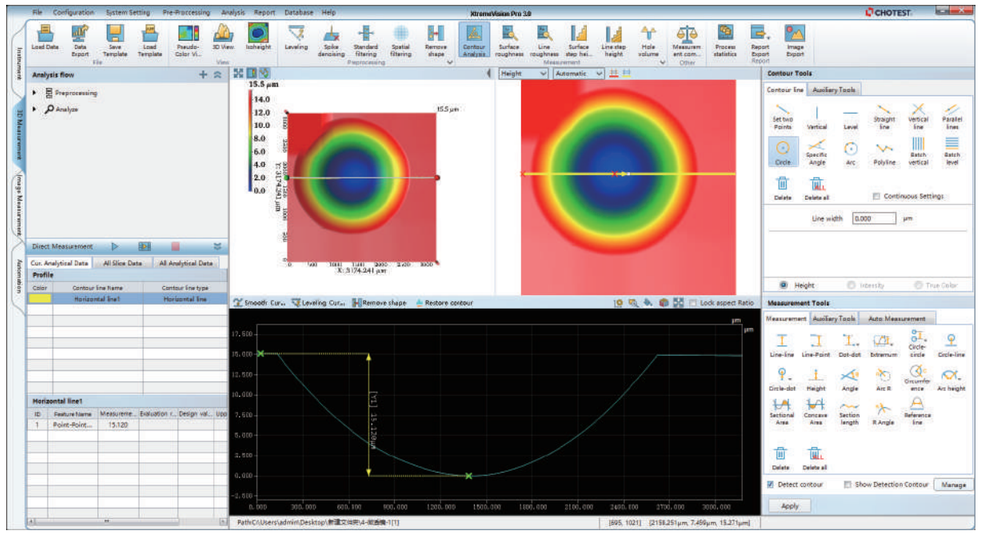
SemiConductor	Cut sheet, coated sheet, wafer IC	Roughness, microcosmic	
3C Electronics	Sapphire screen, glass screen, Ink screen	Roughness, flatness, step height	
Optics	Precision mould, optical lens	Roughness, flatness,profile, radius of curvature	
MicroNano Materials	Film on PET substrate	Film roughness, film thickness	
Tribology	CSM friction/Abraded components	Surface profile , Surface roughness, area, volume	

Application Cases

Measurement and analysis for various products, components and materials`surface form and profile characteristics, such as flatness, roughness, waviness, appearance, surface defect, abrasion, corrosion, gap,hole, stage, curvature, deformation, etc.

Surface form  Magnetic diamond head		Pyramid angle 
Profile sizes  Diffractive component		Profile curve 
Surface roughness  Engine blade of aircraft		Surface roughness 

XtremeVision 3D Software



The second-generation self-developed microscopic 3D measurement software integrates four modular functions: Image scanning, 3D analysis, Image measurement, and Automated measurement,It can perfectly adapt to all microscopic 3D machine models of CHOTEST W series & VT series & WT series, and can independently identify the type of model. Especially, the software can automatically switch scanning modes between white light interferometry and confocal microscopy on 2-in-1 Hybrid 3D Optical Profilometer.
Xtremevision Pro has transplanted the successful experience of CHOTEST in the field of image flash measurement, which can automatically match and measure XY plane dimensions such as point-line distance, angle, radius, etc.

Lens Specification

Zoom ratio of lens			2.5x	5x	10x	20x	50x	100x
Numerical hole diameter			0.075	0.13	0.3	0.4	0.55	0.7
Optical resolution @550nm(μm)			3.7	2.1	0.92	0.69	0.5	0.4
Depth of focus(μm)			48.6	16.2	3.04	1.71	0.9	0.56
Working distance(mm)			10.3	9.3	7.4	4.7	3.4	2.0
F.O.V. H×V (mm)	Video system 1024x1024	0.375x	5.2x5.2	2.6x2.6	1.3x1.3	0.65x0.65	0.26x0.26	0.13x0.13
		0.5x	3.84x3.84	1.92x1.92	0.96x0.96	0.48x0.48	0.192x0.192	0.096x0.096
		0.75x	2.56x2.56	1.28x1.28	0.64x0.64	0.32x0.32	0.128x0.128	0.064x0.064
		1x	1.92x1.92	0.96x0.96	0.48x0.48	0.24x0.24	0.096x0.096	0.048x0.048

Parameters

Model No		SuperView W1	SuperView W1-Pro	SuperView W1-Ultra	SuperView W1-Lite
Light Source		White LED			
Video System		1024×1024			
Objective Lens		Standard: 10X(Optional: 2.5X, 5X, 20X, 50X, 100X)			
Optical Zoom		Standard: 0.5X Optional: 0.375X, 0.75X,1X			Standard: 0.5X Optional: 0.375X, 0.75X
Standard Field of View		0.98×0.98 mm		1.1×1.1 mm	0.98×0.98 mm
Lens Turret		Manual 3 holes turret(Optional: Motorized 5 holes turret)			Motorized 5 holes turret
XY Object Table	Size	320×200mm	300×300mm	320×200mm	220×220mm
	Travel Range	140×100mm	200×200mm	140×100mm	100×100mm
	Load Capacity	10kg			
	Control Method	Motorized			
Tilt(manual)		±4°	±4°	±4°	±3°
Z Axis	Travel Range	100mm	100mm	100mm	50mm
	Control method	Motorized			
Z Stroke Scanning Range		10mm			
Surface Form Repeatability*1		0.1nm			
Roughness RMS Repeatability*2		0.005nm			0.01nm
Step Height Measurement*3		Accuracy: 0.3%; Repeatability: 0.08%(1σ)			Accuracy: 0.7% Repeatability: 0.1%(1σ)
Scanning Speed@0.1nm Resolution		1.85μm/s	1.85μm/s	16μm/s	1.65μm/s
Weight		140 kg	170 kg	140 kg	50 kg
Size(L*W*H)mm		700×600×900	750×650×950	700×600×900	500×400×700
Operating Environment	Temperature	0°C~30°C, fluctuation <2°C/60min			
	Humidity	5%~95% RH, no condensation			
	Vibration	VC-C or better			
	Software Noise Evaluation*4	3σ≤4nm			
	Compressed Air	0.6Mpa oil-free, water-free, 6mm diameter of hose			
		AC100~240V, 50/60Hz			
	Power Supply	200W	200W	200W	120W
	Other	No strong magnetic field, No corrosive gas			

Note:
*1 Use EPSI mode to measure Sa 0.2nm silicon wafer in the laboratory environment; Single stripe, 80μm filter for full field of view.
*2 Measure Sa 0.2nm silicon wafer in a laboratory environment according to the ISO 25178.
*3 Measure standard 5μm steps height block in a laboratory environment according to the ISO 1060-1:2009.
*4 When the software noise evaluation is 4nm≤3σ≤10nm, the Roughness RMS repeatability is revised down to 0.015nm, the Step height measurement accuracy is revised down to 0.7%, and the step height measurement repeatability is revised down to 0.12%; When the software noise evaluation is 3σ>10nm, the environment does not meet the requirement for usage of the equipment, and need to change the site.

SuperView W3
3D Optical Surface Profilometer

Large-scale microscopic 3D form and roughness

- Large table
- Applicable for 12" wafer
- One-key automatic measurement

Dedicated Functions for Semiconductor Field

- Measure profile trenches after laser grooving in the dicing process.
- Measure film step-height of wafer ranging from 1nm~1mm.
- Measure roughness of silicon cut sheet after grinding process, and can measure dozens of small areas to obtain the average value by one click.
- Support 6", 8" and 12" wafer measurement, and easy switch between 3 sizes of vacuum chucks by one click automatically.

Parameters

Model No		SuperView W3	SuperView W3-Ultra
Light Source		White LED	
Video System		1024×1024	
Objective Lens		Standard: 10X(Optional: 2.5X, 5X, 20X, 50X, 100X)	
Optical Zoom		Standard: 0.5X Optional: 0.375X, 0.75X,1X	
Standard Field of View		0.98×0.98 mm	1.1×1.1 mm
Lens Turret		Motorized 5 holes turret	
XY Object Table	Size	450×450mm	
	Travel Range	300×300mm	
	Load Capacity	10kg	
	Control Method	Motorized	
Tilt		±5° Motorized	
Z Axis	Travel Range	100mm	
	Control method	Motorized	
Z Stroke Scanning Range		10mm	
Surface Form Repeatability*1		0.1nm	
Roughness RMS Repeatability*2		0.005nm	
Step Height Measurement*3		Accuracy: 0.3%; Repeatability: 0.08%(1σ)	
Scanning Speed@0.1nm Resolution		1.85μm/s	16μm/s
Weight		750 kg	
Size(L*W*H)mm		1000×800×1550	
Operating Environment	Temperature	0°C~30°C, fluctuation <2°C/60min	
	Humidity	5%~95% RH, no condensation	
	Vibration	VC-C or better	
	Software Noise Evaluation*4	3σ≤4nm	
	Compressed Air	0.6Mpa oil-free, water-free, 6mm diameter of hose	
	Power Supply	AC100~240V, 50/60Hz, 300W	
	Other	No strong magnetic field, No corrosive gas	

Note:
*1 Use EPSI mode to measure Sa 0.2nm silicon wafer in the laboratory environment; Single stripe, 80μm filter for full field of view.
*2 Measure Sa 0.2nm silicon wafer in a laboratory environment according to the ISO 25178.
*3 Measure standard 5μm steps height block in a laboratory environment according to the ISO 1060-1:2009.
*4 When the software noise evaluation is 4nm≤3σ≤10nm, the Roughness RMS repeatability is revised down to 0.015nm, the Step height measurement accuracy is revised down to 0.7%, and the step height measurement repeatability is revised down to 0.12%; When the software noise evaluation is 3σ>10nm, the environment does not meet the requirement for usage of the equipment, and need to change the site.

SuperView WT Series
Hybrid 3D Optical Profilometer

Description

The Hybrid 3D optical profilometer Superview WT series is used for sub nanometer measurement of surfaces of various precision components and materials. It integrates the performance characteristics of two high-precision 3D measuring instruments, white light interferometer and confocal microscope, and can perform non-contact scanning of the samples surface then re-establish 3D surface image. When measuring the ultra smooth and transparent surfaces, white light interferometry mode can be used to obtain high-precision and distortion-free images, and analyze parameters such as roughness. When measuring coarse surfaces with sharp angle features, confocal microscopy mode can reconstruct large angle 3D topography images, and 2D & 3D parameters reflecting surface quality are obtained by data processing and analysis of surface 3D images through software.

Technical Parameters

Adding W-Ultra high-speed scanning module can increase scanning speed by several times.

Model		SuperView WT3000	SuperView WT3200
Light Source		White Light LED	
Video System		1024x1024	
Interference Objective Lens		10X(2.5X, 5X, 20X, 100X optional)	
Confocal Objective Lenses		10X, 50X(5X, 20X, 100X optional)	
Standard Field of View		1.2x1.2mm (10X)	
Lens Turret		Motorized 5-hole turret	
XY Object Table	Size	200x200mm	300x300mm
	Travel Range	100x100mm	200x200mm
	Load Capacity	10kg	
	Control Mode	Motorized	
Tilt		±3°	
Z-axis	Travel Range	100mm	
	Control Mode	Motorized	
Z stroke scanning Range		10mm	
Surface Topography Repeatability STR*1		0.1nm (White light interferometry)	
Roughness RMS Repeatability*2		0.005nm (White light interferometry)	
Step Height Measurement*3		Accuracy: 0.5%; Repeatability: 0.1% (1σ) (White light interferometry)	
Weight		70kg	160kg
Size (L x W x H)		400x480x750mm	600x700x850mm
Operating Environment	Temperature	0 ° C~30 ° C, fluctuation <2 ° C/hour	
	Humidity	5% -95% RH, no condensation	
	Vibration	VC-C or better	
	Software Noise Evalution*4	3σ ≤4nm	
	Compressed Air	0.6Mpa oil-free and water-free, 6mm diameter of hose	
	Power Supply	AC100-240V, 50/60Hz, 4A, Power 120W	
	Others	No strong magnetic field, no corrosive gas	

Note:
*1 Use EPSI mode to measure Sa 0.2nm silicon wafer in the laboratory environment; Single stripe, 80μm filter for full field of view
*2 Measure Sa 0.2nm silicon wafer in a laboratory environment according to the ISO 25178
*3 Measure standard 5μm steps height block in a laboratory environment according to the ISO 10610-1:2009
*4 When the software noise evaluation is 4nm≤3σ≤10nm, the Roughness RMS repeatability is revised down to 0.015nm, the Step height measurement accuracy is revised down to 0.7%, and the step height measurement repeatability is revised down to 0.12%;

SuperView WX100
White Light Interferometry Probe

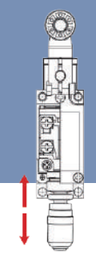
In-line roughness and 3D profile inspection

Double anti-collision protection

Software ZSTOP and hardware electronic sensors.Besides it could accept external anti-collision electronic signals.

Four DOF motorized tilt

Provides an electric tilt adjustment design with four degrees of freedom in pitch and yaw, which greatly reduces the manufacturing difficulty of the customer's measuring stage.



Z travel range 30mm

Capable to measure samples with different height. Users need not to prepare a moving Z axis

SDK

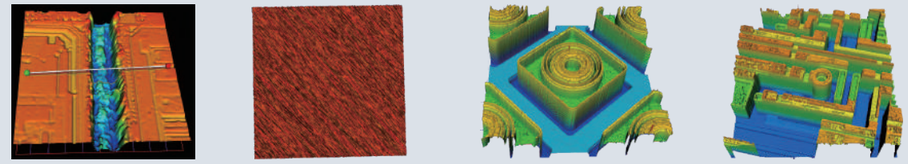
Provide the software package for customers to carry out secondary development, so that customers can develop the software program to control the probe for automatic measurement and analysis.

Functions

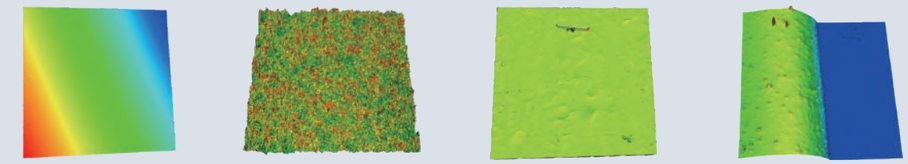
- Measurement function: it can realize high precision Z scanning of sample surface and obtain 3D image.
- Analysis function: It can obtain 2D and 3D data such as surface roughness, micro-nano-level contour size, etc.
- Programming function: Support pre-configured data processing and analysis tool steps, one-click to complete the whole process from measurement to analysis.
- Batch analysis: Data processing and analysis templates can be customized according to the customer demands, and one-click batch analysis can be realized for the same type of parameter data.

Application

Semiconductor, polished silicon wafer, thin silicon wafer, wafer IC



3C electronics, sapphire glass roughness, metal shell mold defects, glass screen height difference

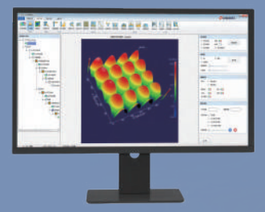


Parameters

Model No.		SuperView WX100
Light Source		White LED
Video System		1024×1024
Objective Lens		10X(2.5X, 5X, 20X, 50X, 100X optional)
F.O.V.		0.98×0.98mm(10X)
Lens Turret		Single hole / 3 holes manual
Size		230×200×380mm
Tilt		±2° Motorized
Z Travel Range		30mm
Z Scanning Range		10mm(Depend on Lens)
Z Resolution		0.1nm
Roughness RMS Repeatability*1		0.01nm
Step Height Measurement	Accuracy*2	0.5%
	Repeatability*2	0.1% 1σ

Note:
*1 Measure Sa 0.2nm silicon wafer in a laboratory environment according to the ISO 25178.
*2 Measure standard 5μm steps height block in a laboratory environment according to the ISO 10610-1:2009.

VT6000 Series Confocal Microscope



VT6100

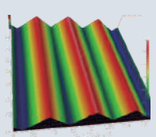
VT6200

VT6300

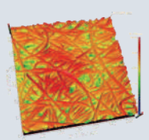
Description

Confocal Microscope VT6000 is dedicated for micro-nano level measurement of various precision components and material surfaces. It can measure the surface of various objects from smooth to rough, low reflectivity to high reflectivity, and the roughness, flatness, micro-geometric profile, curvature, etc.Total more than 300 kinds of 2D and 3D parameters as per four major domestic and foreign standards ISO/ASME/EUR/GBT are provided as evaluation standards.

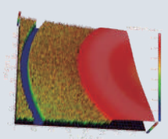
Surface with sharp slope



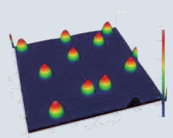
Surface with any reflectivity



One-key analysis for batch



Support 300 kinds of 2D and 3D parameters



Features

1. High precision and high repeatability

1) Based on the rotating confocal optical system, combined with high stability structural design and excellent 3D reconstruction algorithm, the measurement system is jointly composed to ensure thehigh measurement accuracy of the instrument.

2) The unique shock isolation design can reduce the vibration noise of the bottom surface, the instrument is stable and reliable in most environments, and has good measurement repeatability.

2. All-in-one operation of measurement analysis software

1) The measurement and analysis are operated on the same interface without switching, and the measurement data is automatically counted, realizing the function of rapid batch measurement.

2) The visualization window is convenient for users to observe the scanning process in real time.

3) Combined with the automatic measurement function of the custom analysis template, the multi-region measurement and analysis can be automatically completed.

4) Five functional modules of geometric analysis, roughness analysis, structural analysis, frequency analysis and functional analysis.

5) One-key analysis, multi-file analysis, free combination analysis items are saved as analysis templates, one-key analysis of batch samples, and data analysis and statistical chart functions are provided.

6) More than 300 kinds of 2D and 3D parameters can be measured according to ISO/ASME/EUR/GBT.

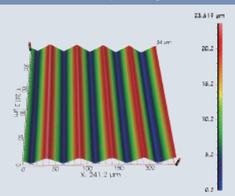
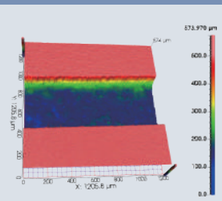
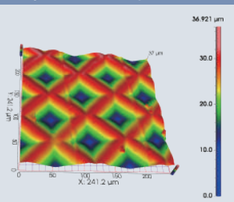
3. Precision joystick

The joystick integrated with the displacement adjustment functions in the three directions of X, Y, and Z can quickly complete the pre-measurement works such as stage translation and 2-way focusing etc.

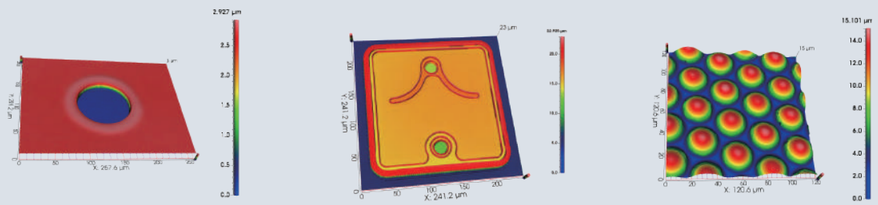
4. Double anti-collision protection measures

In addition to the software ZSTOP setting the lower limit of the Z-direction displacement for anti-collision protection, a mechanical and electronic sensor is designed on the Z-axis. When the lens touches the surface of the sample, the instrument automatically enters an emergency stop state to protect the instrument to the greatest extent and reduce the risk of human operation.

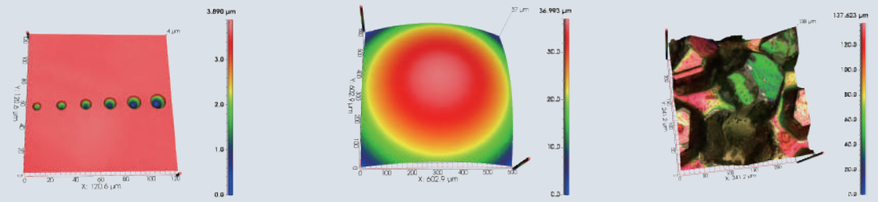
Application

V-shaped groove	Trench	Pyramid shape
		

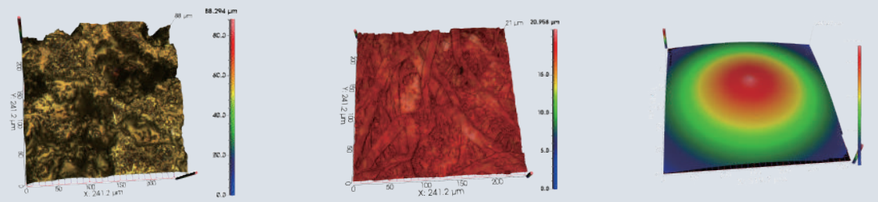
Laser hole | Patterned Wafer | Microlens matrix



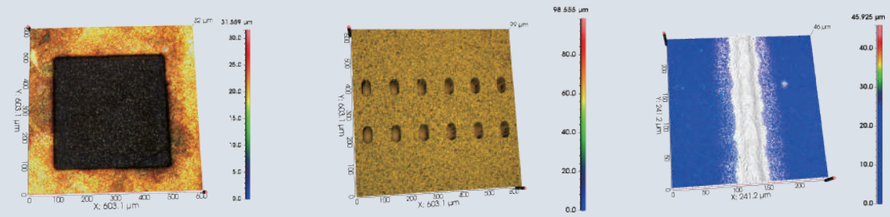
Taper hole | Optical lens | Diamond drill



Conductive ceramics | Paper fiber | Ultra-precision metal tip



PCB | Gold plated micro-holes | Grid line of solar plate



Parameters

Model No.		VT6100	VT6200	VT6300
Size		520×380×600mm	720×580×1500mm	1000×900×1500mm
Weight		50kg	400kg	600kg
Principle		Spinning disk confocal optical system		
Objective Lens		10X, 50X(Optional: 5X, 20X, 100X APO)		
Field of View		120×120 μm~2.4×2.4 mm		
Step Height Measurement	Repeatability(1σ)	≤12nm		
	Accuracy*1	≤ ± (0.15+L/100) μm		
	Display Resolution	0.1nm		
Width Measurement	Repeatability(1σ)	40nm		
	Accuracy*2	± 2%		
	Display Resolution	1nm		
XY Object Table	Size	200x200mm	230x230mm	450x450mm
	Travel Range	100x100mm	200x200mm	300x300mm
	Load Capacity	10kg		
	Control Method	Motorized		
Z-Axis	Travel Range	100 mm		
	Control Method	Motorized		
Lens Turret		Motorized 5 holes turret		
Light Source		White LED		
Operating Environment	Power Supply	AC100~240V, 50/60Hz, Power 120W		
	Working Temp.	15°C~30°C, fluctuation < 2°C/60min		
	Humidity	5%~95%RH, no condensation		
	Vibration	VC-C or better		
	Other	No strong magnetic field,no corrosive gas		

Note:
*1 Measure standard 5μm steps height block by 50X Objective lens in a laboratory environment.
*2 Measure standard engraved line block by 50X Objective lens in a laboratory environment.

Laser Tracker GTS Series

Large-scale space measurement

Integrated Measurement Head

Powerful CPU processing capability, compact control system are built into the laser head, and this integrated design greatly reduces the product volume and number of connection cables.

Automatic Locking

The camera will automatically search for the SMR in a certain area when the beam interrupts, and automatically lock the SMR after find it. The whole process does not require human operation.

HiADM

Absolute Distance Meter(ADM) and laser interferometer(IFM) fusion technology (HiADM) ensures excellent measurement accuracy and realizes Re-establish Beam Interruptions.

Integrated Environmental Weather Station

The integrated environmental weather station automatically monitors the environmental meteorological parameters, and compensates the influence of temperature, air pressure and humidity in real time.

MultiComm Communication

The instrument and computer can communicate with each other through hardware trigger, wired network or WIFI. The max measurement data output speed is 1000 points/second.

Portable

The laser head and accessories are packed well in portable boxes, making it easy to transport between different work sites.

IP54 Protection

IP54 protection level ensures that the host is protected from dust and other pollutants, and has strong environmental applicability.

Steady Tripod

The stable triangular support system avoids the loss of accuracy caused by environmental vibrations.

6D Attitude Probe iProbe

- Machine vision spatial attitude measurement
- It can measure the geometric structure of internal features and hidden features
- Thanks to dual probe design, it is efficient to measure complex features
- Wireless transmission

6D Attitude Smart Sensor iTracker

- The attitude sensor automatically follows and locks the laser beam, which has high measurement flexibility
- The pitch angle and yaw angle are not limited by the receiving angle of the optical receiver
- Simple interface connection, easy to install on machine tools or robots, high repeatability and precision
- Dedicated band laser beam and filter design, not sensitive to ambient light
- The highest sampling speed is 200 points/second

Application

Airplane Assembly

Train Assembly

Nuclear Generator Assembly

Vessel Assembly

Wind-Driven Generator Assembly

Rocket Assembly

Hydroelectric Generator Assembly

Robot Arm Calibration

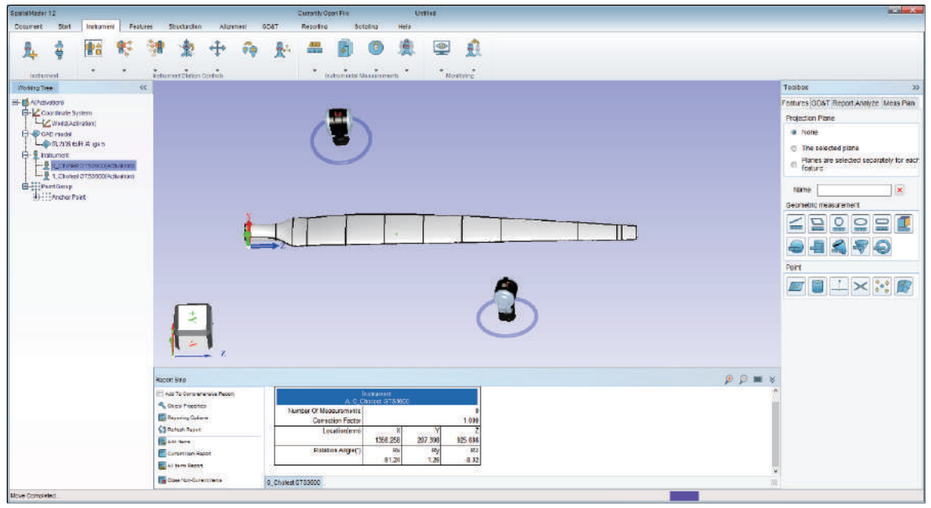
TBM Assembly

Car Assembly

Large Weapon Assembly

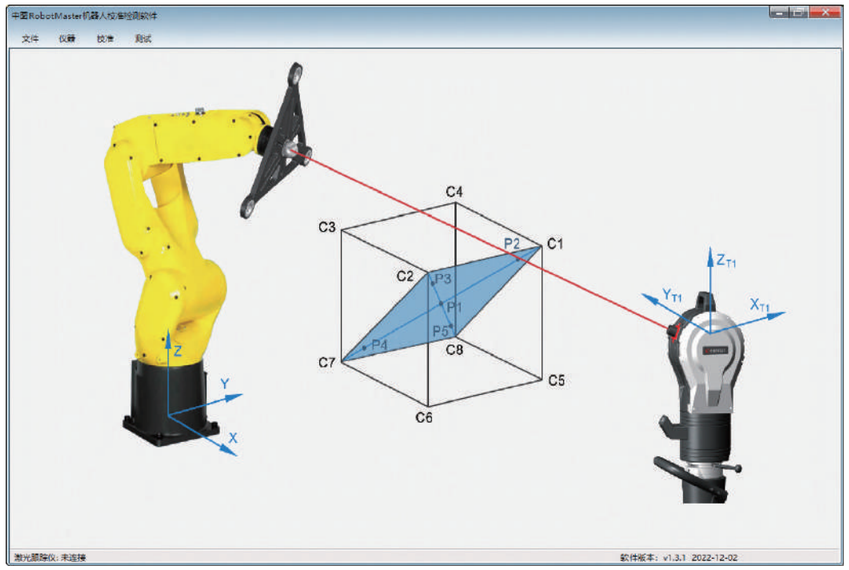
Large Machine tool Calibration

Spatial Measurement Software SpatialMaster



- Traceability, faithfully record the measurement information of all measurement points of all instruments.
- Rich geometry construction methods and accurate fitting algorithms, certified by Gauss and Chebyshev double PTB.
- Multiple registration and alignment methods such as optimal fitting, sequential registration, and comprehensive alignment.
- Provides powerful analysis functions, geometric relationship measurement functions, including professional GD &T evaluation.
- The convenient monitoring function can provide efficient assembly and adjustment services for the actual production assembly process.
- Self-controllable, visible and available report format, meeting various report format requirements.
- Automatic measurement, In-line measurement, Guide point measurement, Batch point measurement functions improve measurement efficiency.
- Support multi-station simultaneous measurement, and can carry out unified spatial measurement and analysis of multi-tracker multilateral method.
- Provide SDK interface, support user independent programming.

Robot Calibration Software RobotMaster



RobotMaster Software

The RobotMaster kit provides an absolute position accuracy calibration and performance test for industrial robots. RobotMaster supports not only enhanced solutions based on 6D attitude smart sensors, but also supports economic solutions based on SMR.

Robot Calibration Software

According to the DH parameters of the robot, the robot calibration mathematical model is established, and the robot zero position calibration, the robot DH parameter calibration, and the robot TCP center point accuracy calibration are performed. Without changing any structure and hardware size of the existing robot, the absolute pose accuracy of the robot can be effectively improved through the robot calibration software.

Robot performance testing software

According to the ISO 9283 industrial robot performance specification and its experimental method, the robot performance test is completed. The test content includes: robot pose accuracy, pose repeatability, multi-directional pose accuracy change, distance accuracy, distance repeatability, position stabilization time , position overshoot, pose characteristic drift, interchangeability, trajectory accuracy, trajectory repeatability, corner deviation, trajectory velocity characteristics, static compliance, etc.

GTS3000 Series Parameters

Model No.		GTS3300	GTS3600	GTS3800
Basic Spec.	Head Size	220×280×512mm		
	Head Weight	21Kg		
	Controller	Integrated		
	Laser Generator*1	633nm, 1mW/CW | Class 1		
	Support 6D	No		
	Protection Level	IP54		
Measuring Range	Max Distance(Radius)	30m	60m	80m
	Horizontal	±360°	±360°	±360°
	Vertical	-145°~+145°	-145°~+145°	-145°~+145°
Accuracy*2	Spatial Accuracy	15μm+6μm/m	15μm+6μm/m	15μm+6μm/m
	IFM Accuracy	0.5μm/m	0.5μm/m	0.5μm/m
	ADM Accuracy	10μm(Entire range)	10μm(Entire range)	10μm(Entire range)
	Level Accuracy	2.0"(Optional 1.0")	2.0"(Optional 1.0")	2.0"(Optional 1.0")
Data Output Rate		1000 points/sec.	1000 points/sec.	1000 points/sec.
Communication	Cable Connection	TCP/IP(Cat5)		
	Wireless Connection	WLAN(IEEE 802.11N)		
Working Environment	Operating Temperature	0°C~40°C		
	Altitude	-500~+3500m		
	Relative Humidity	0~95%, no condensation		
Power Supply		AC100~240V, 50/60Hz, 4A, 220W		

Note:
*1 According to IEC60825-1(2014-5), it meets the radiation performance standard.
*2 The accuracy index is the maximum permissable error (MPE), using the standard 1.5" SMR, excluding the influence of air temperature variations.

Parameters of 6D Attitude Sensor

6D Attitude Sensor iTracker		
Measuring Range	Max Range(Radius)	20m(Optional 30m)
	Pitch	-55°~+60°
	Yaw	±180°
	Roll	±360°
Basic Spec.	Weight	1.32kg
	Size	105×98×168mm
Accuracy	Attitude Angular Accuracy	0.03°
	Repeatability	0.005°
Transmission	Max Transmission Speed	200Hz
	Connection Type	Cable
Power Supply		From laser tracker

GTS6000 Series Parameters

Model No.		GTS6300	GTS6600	GTS6800
Basic Spec.	Head Size	220×256×480mm		
	Head Weight	16Kg		
	Controller	Integrated		
	Laser Generator*1	633nm, 1mW/CW | Class 1		
	Support 6D	Yes		
	Protection Level	IP54		
Measuring Range	Max Distance(Radius)	30m	60m	80m
	Horizontal	±360°	±360°	±360°
	Vertical	-145°~+145°	-145°~+145°	-145°~+145°
Accuracy*2	Spatial Accuracy	15μm+6μm/m	15μm+6μm/m	15μm+6μm/m
	IFM Accuracy	0.5μm/m	0.5μm/m	0.5μm/m
	ADM Accuracy	10μm(Entire range)	10μm(Entire range)	10μm(Entire range)
	Level Accuracy	1.0"	1.0"	1.0"
Data Output Rate		1000 points/sec.	1000 points/sec.	1000 points/sec.
Communication	Cable Connection	TCP/IP(Cat5)		
	Wireless Connection	WLAN(IEEE 802.11N)		
Working Environment	Operating Temperature	0°C~40°C		
	Altitude	-500~+3500m		
	Relative Humidity	0~95%, no-condensation		
Power Supply		AC100~240V, 50/60Hz, 4A, 220W		

Note:
*1 According to IEC60825-1(2014-5), it meets the radiation performance standard.
*2 The accuracy index is the maximum permissable error (MPE), using the standard 1.5"SMR, excluding the influence of air temperature variations.

Parameters of 6D Attitude Probe

6D Attitude Probe iProbe		
Measuring Range	Max Range(Radius)	15m
	Pitch	±45°
	Yaw	±45°
	Roll	0°~360°
Basic Spec.*1	Weight/Size	0.62kg, 222×128×122mm
Accuracy*2	Probe Accuracy	35μm
	Spatial Accuracy	50μm+6μm/m
Measuring Rod	Ball Diameter	3mm, 6mm
	Rod Length	40mm, 100mm, 200mm, 400mm
Transmission	Max Transmission Speed	200Hz
	Connection Type	IR
Power Supply	Type	Li-ion battery
	Working Duration	≥8 hours

Note:
*1 Does not include measuring rod.
*2 Uses 100mm measuring rod.

Laser Interferometer SJ6000

Calibration of Guide Rail

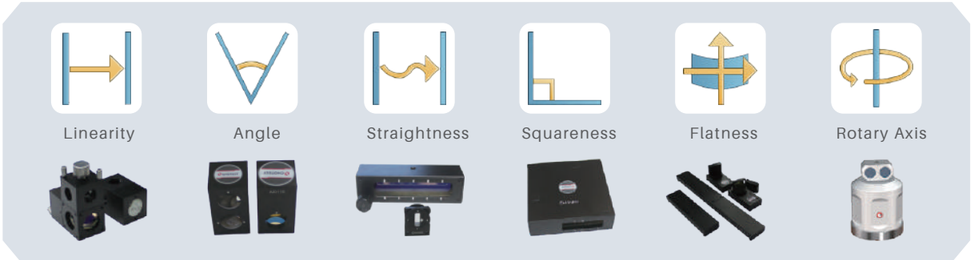
Structure of the case

Portable case and tripod

Software

Environmental compensation device

Prism Modules



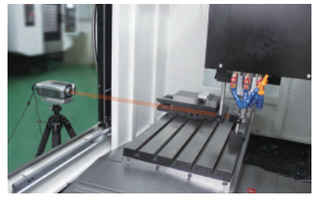
Laser interferometer is recognized as a high precision, high sensitive measuring method by applying light wavelength as criterion, and is widely used in high-end manufacturing industries.

Laser interferometer SJ6000 insists of high-frequency Helium-Neon laser generator from an USA supplier, high-precision environmental compensation modules, high-precision laser interference signal processing system, high-performance computer control system. By applying with thermal frequency stabilization technology of laser dual-longitudinal mode and geometric parameters interference optical path design,SJ6000 can output long-term stable and high-precision(0.05ppm) laser quickly(about 6 minutes) which has powerful anti-interference performance. With different prism modules, it can measure linearity, angle, straightness, flatness and perpendicularity, besides it can also analyze dynamic characteristics.

Functions

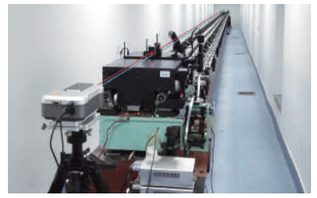
1. Calibrate motion accuracy of guide rail quickly and accurately.
2. Measure and analyze many kinds of dynamic parameters, such as displacement, velocity, acceleration and amplitude frequency.
3. Built-in variety of general standards of machine tools.

Application

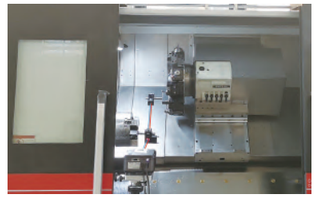


Linear meas. of machine tool

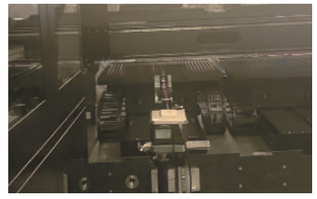
Linear meas. of stage module



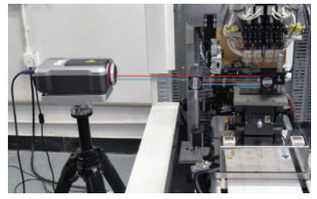
Lab length reference



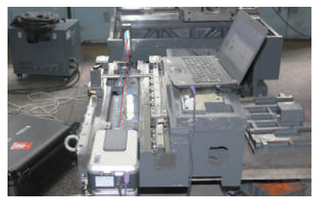
Linear meas. of machine tool



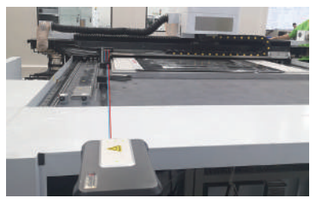
Angle meas. of stage module



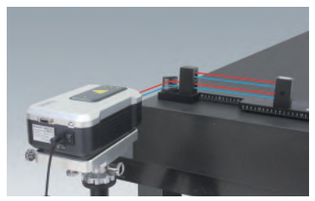
Angle meas. of DC motor



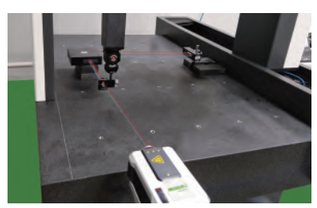
Parallelism meas. of two guide rails



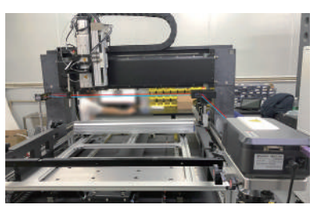
Straightness meas. of equipment



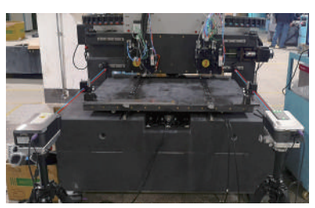
Flatness meas. of Granite table



Squareness meas. of CMM



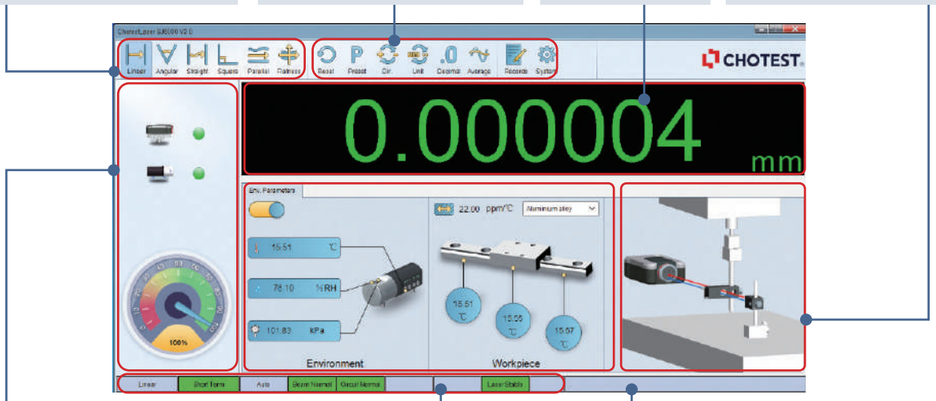
Perpendicularity meas. of equipment



Twin guide rails meas. of equipment

Software

Meas. Module | **Tools** | **Value window** | **Installation guide**



Signal:
Display connection status and signal strength.

Info:
Display the current meas.item, sampling method and device status.

Environment compensation:
Display ambience and object`s temp., manual environment compensation is also available.

Dynamic Measurement Application

Time based

Motion performance evaluation

* Control parameter test and setting of motion controller PID.
* Stability test and evaluation after high-speed motion.
* Small steps test of high-performance motion controller.

Vibration monitoring

* Scanning application:

Applied for the situation when positioning accuracy is not important but constant speed is critical for high quality imaging.

* Machine tool applications:

Applied for the situation when slow and smooth contour movement of cutting tool is critical for high quality machning.

Vibration frequency analysis

* Vibration frequency analysis of the measured object
* FFT fast Fourier transform analysis

Distance based

In distance-based dynamic measurement, laser interferometer SJ6000 "flies" along the axis, that means SJ6000 samples data at designated points without stopping.

Pulse Trigger Mode

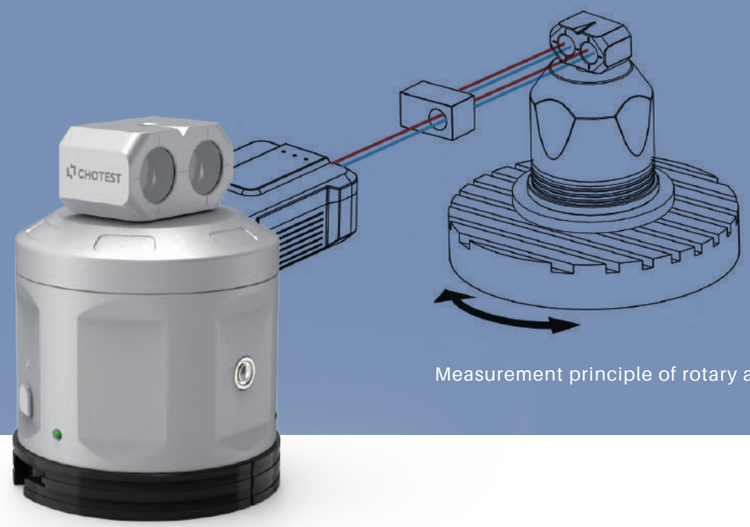
Pulse trigger CT70 is compatible with glass scales, encoders and controllers. Equipped with Pulse trigger CT70, laser interferometer SJ6000 can sample data in pulse trigger mode. Even if the axis does not stop, laser interferometer SJ6000 could sample data at designated points or continuously sample data.

Pulse trigger CT70

Parameters

System parameters:				
1. Measuring method: single frequency				
2. Laser frequency accuracy: 0.05ppm				
3. Dynamic capture rate: 50kHz				
4. Warm-up time: about 6 min				
5. Operating temperature: (0~40)°C				
6. Environment temperature: (0~40)°C, humidity: 0-95%				
7. Storage temperature: -20°C~70°C				
Environmental sensors:				
1. Atmospheric temperature sensor : ±0.1°C(0~40)°C, resolution: 0.01°C				
2. Material temperature sensor: ±0.1°C (0~55)°C, resolution: 0.01°C				
3. Atmospheric humidity sensor: ±6%RH (0~95%)				
4. Atmospheric pressure sensor: ±0.1kPa (65~115)kPa				
Linear measurement:				
1. Measuring range: (0~80)m				
2. Measuring accuracy: 0.5ppm (0~40)°C				
3. Measuring resolution: 1nm				
4. Maximum measuring speed: 4m/s				
Angle measurement:				
1. Axial range: (0~15)m				
2. Measuring range: ±10°				
3. Measuring accuracy: ±(0.02%R+0.1+0.24M)" (R is indicating value, unit: "; M is measured length in meters)				
4. Measuring resolution: 0.01"				
Flatness measurement:				
1. Axial range: (0~15) m				
2. Flatness measuring range: ±1.5 mm				
3. Measuring accuracy: ±(0.2%R+0.02M^2) um (R is indicating value in um; M is measured length in meters)				
4. Substrate size: 180mm adjustable, 360mm adjustable				
5. Measuring resolution: 0.1 um				
Straightness measurement:				
Item	Axis range	Measuring range	Accuracy	Resolution
Short straightness	(0.1~4)m	±3.0mm	±(0.5+0.25%R+0.15M^2)μm	0.01μm
Long straightness	(1~20)m	±3.0mm	±(5.0+2.5%R+0.015M^2)μm	0.1μm
Note: R is indicating value in um; M is measured length in meters				
Squareness measurement:				
Item	Axis range	Measuring range	Accuracy	Resolution
Short straightness	(0.1~3)m	±3/M mm/m	±(2.5+0.25%R+0.8M)μm/m	0.01μm/m
Long straightness	(1~15)m	±3/M mm/m	±(2.5+2.5%R+0.08M)μm/m	0.01μm/m
Note: R is indicating value in um; M is measured length in meters				
Rotary axis measurement:				
1. Measuring range of angle: 0~360°				
2. Max axis rotation speed: No limit(<5°), 10rpm(>5°)				
3. Pitch accuracy of precision turntable: ±1"				
4. Resolution : 0.01"				

Rotary Axis Calibrator WR 50



Measurement principle of rotary axis

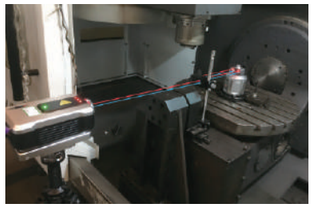
Measurement Principle

Equipped with Rotary axis calibrator WR50 and Angle prism, Laser interferometer SJ6000 is capable to calibrate rotary axis 0~360°. Rotary axis calibrator WR50 is intalled to the rotary axis as an angle master.

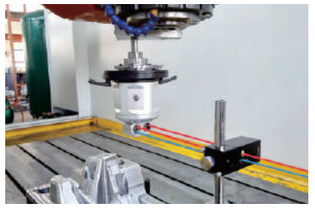
Parameters

Model No.	WR50	Weight	1.9kg
Measuring Range	(0~360)°	Height	148mm
Measuring Accuracy	±1″	Diameter	112mm
Resolution	0.01″	Communication Type	Bluetooth
Max Axis Rotation Speed	10rpm	Power Supply	Li-battery
Max Tracking Speed	2rpm		

Application

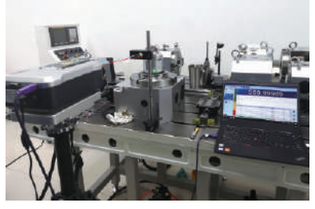


Rotary axis measurement of CNC

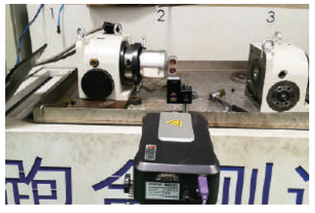


Electric spindle measurement of CNC

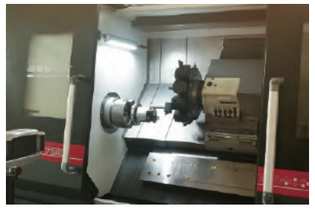
Swing axis measurement of CNC



Angle measurement of CNC index plate

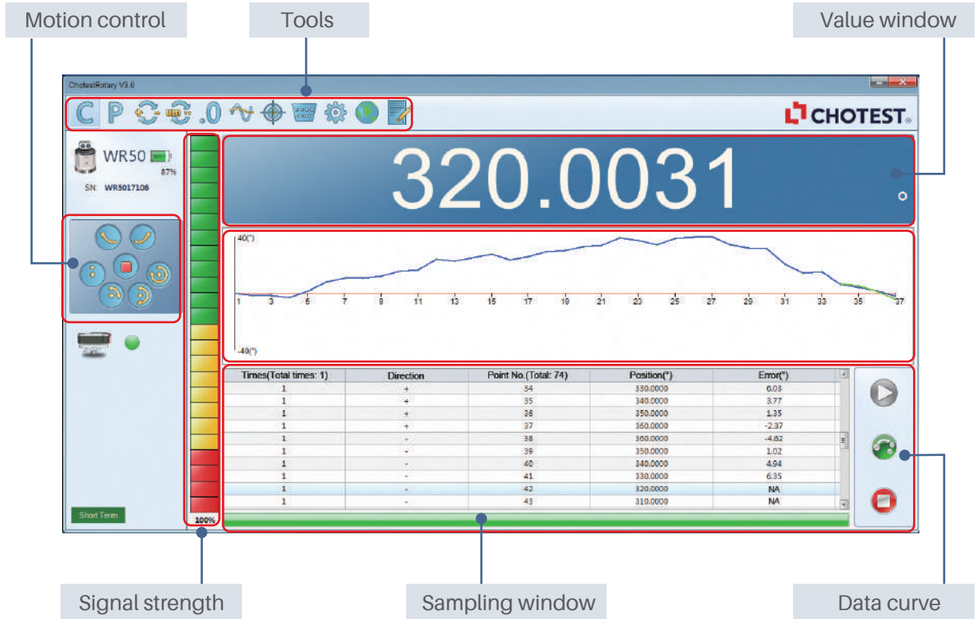


Angle measurement of turntable



Angle measurement of CNC turntable

Software



Eccentric Axis Measurement

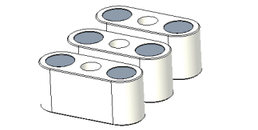
Equipped with angle prism, precision turntable WR50, dedicated jig and dedicated software, SJ6000 is capable to calibrate eccentric axis rotation accuracy.

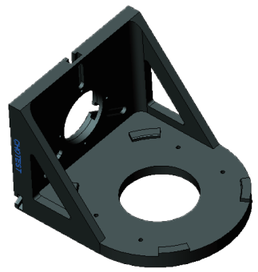
Eccentric axis meas. kit:

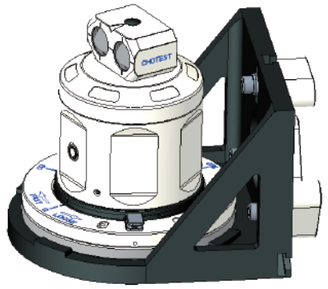
1.Magnet, 3pcs

2.90° Jig

3.Dedicated software

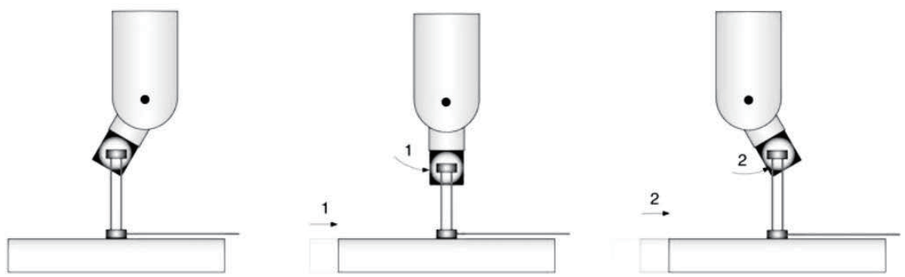




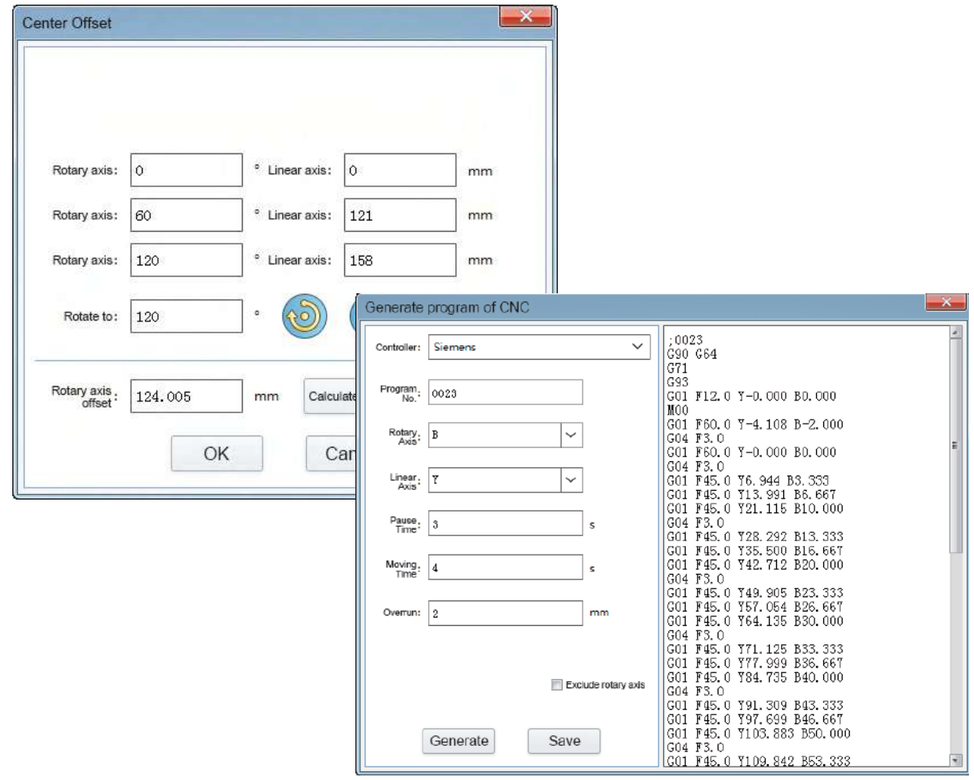


Measurement Principle

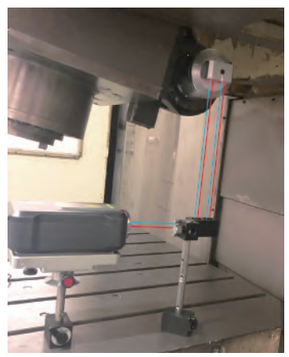
The measurement principle is to use the synchronous movement of the object table and the main spindle, as shown in the figure below. It is important to make sure that angle prism should be always aligned with WR50.

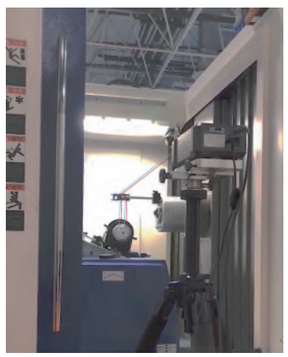


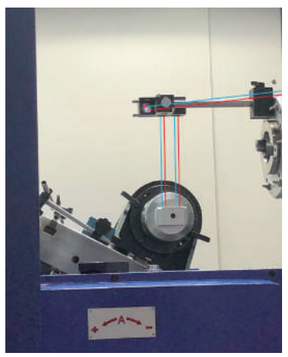
Software Settings



Application







Eccentric axis measurement

Wireless Ballbar MT21

Fast Diagnosis for Machine Tools

MT21 Wireless Ballbar is a simple, fast, economical and efficient solution to diagnose performance of machine tools, and helps to improve the machining quality of machine tools.

Feature

Simple, Fast

The measurement software with guided operation can generate the machine running program automatically. With simple setting, the round track test on three orthogonal planes can be completed in 10~15 minutes.

Powerful Function

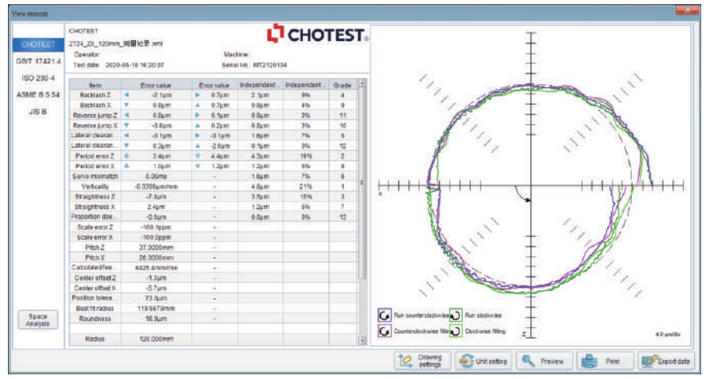
Comprehensive diagnosis report provides a full and professional assessment of machine performance. Taking 360 degree measurement at the XY plane as an example, it can analyze: backlash X, backlash Y, reverse jump X, reverse jump Y, lateral gap X, lateral gap Y, period error X, period error Y, servo Mismatch, perpendicularity, straightness X, straightness Y, proportional mismatch, scale error X, scale error Y, thread pitch X, thread pitch Y, feed rate, center offset X, center offset Y, position tolerance, the best fitting radius, roundness.

Wireless

Data is transmitted to the laptop computer via Bluetooth in real time.

Software

MT21 software with guided operation can implement the round track test on three orthogonal planes quickly and simply. After measurement, software calculates the overall measurement values (roundness, roundness deviation) of the positional accuracy automatically, then generates the analysis report with the graphic format according to GB17421-4, ISO230-4. MT21 achieves the real spatial diagnosis for machine tools.



Error Analysis Report

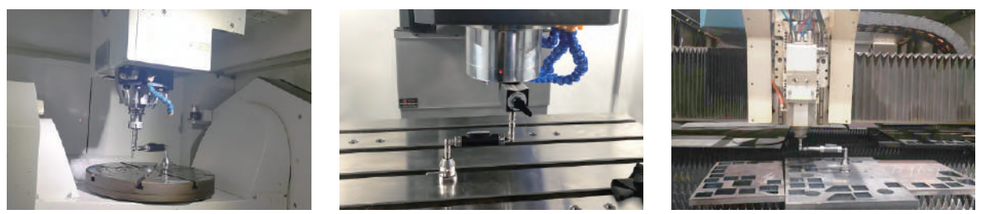
Parameters

Communication: Bluetooth(Typical 10m)
Power Supply: Li-battery
Resolution: 0.1μm
Measuring Accuracy: ±(0.7+0.3%L)μm
Measuring Range: ±1.0mm
Sensor Range: ±2.0mm
Sample Rate: 1000Hz
Working Temperature: (0~40)°C
Size: 120×26×21mm

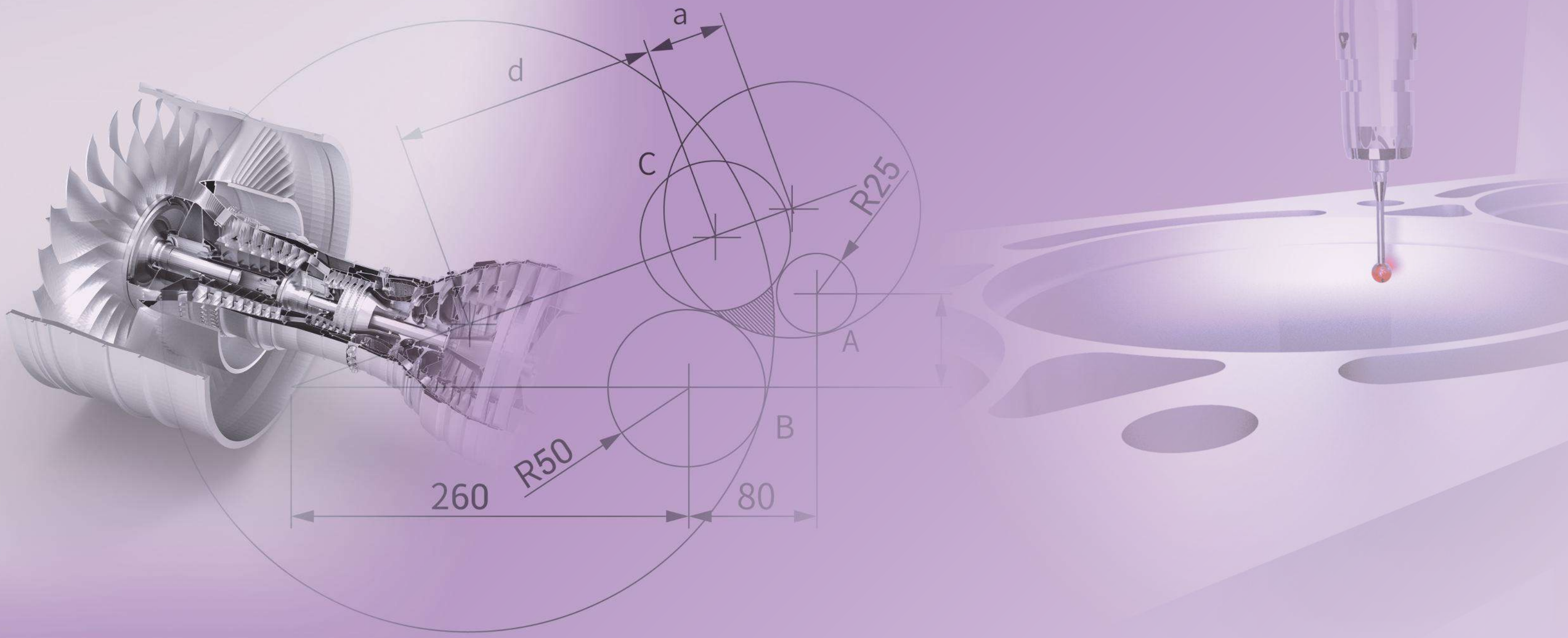
Configuratioin

1. MT21 Wireless Ballbar	1pc
2. Master gauge	1pc
3. Offset setting ball	1pc
4. Centric holder	1pc
5. Tool cup	1pc
6. Extension bar 50, 100, 150mm	1pc of each
7. Software	
8. Portable suitcase	
9. User Manual	

Application



Roundness inspection of machine tools



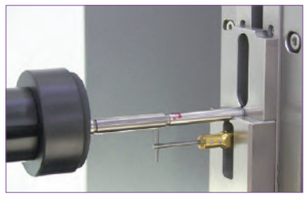
Contact Measurement Instruments

SJ5780 Series Intelligent Profilometer

Multi-Sided Scanning
Dedicated for Cylindrical and Threaded workpieces

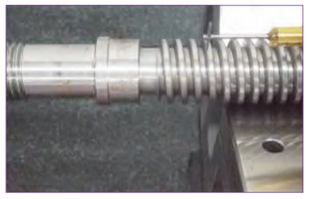
Roughness module
Easy replacement

Application



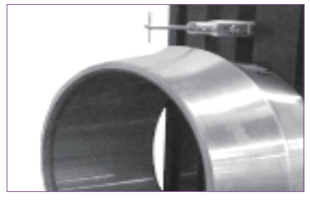
Coaxiality of lead screw

Thread gauge

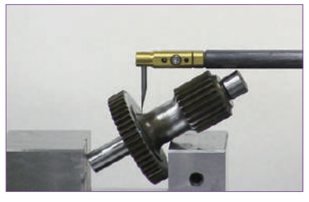


Trapezoidal lead screw

Ballscrew



Cylindrical workpiece



Gear

Features

1. Two-sided profile scanning function

It obtains profile of object by scanning the surface with T-shaped stylus, then software can calculate the 2D sizes and GD & T based on the profile.

2. Thread scanning function

It can scan ordinary thread ring/plug gauges, tapered thread ring/plug gauges, plain ring/plug gauges, trapezoidal thread, sawtooth thread, multi-head threaded workpieces, lead screws, etc. Then the software can analyze their comprehensive parameters such as internal and external diameter, profile parameters, etc.

Parameters

Model No.			SJ5780-200	SJ5780-300	SJ5780-400
Basic Spec.	Measuring Range	X	0~235mm	0~325mm	0~400mm
		Z	0~235mm	0~325mm	0~400mm
	Min Resolution		0.001μm		
	Scanning Speed		0.1~2mm/s		
	Measuring Force		10~150mN(Adjustable)		
	Max Slope		Uphill 78°, downhill 87°		
	Y Direction Object Table		Travel range 25mm, Overall height 85mm(Motorized table is optional)		
Thread Meas.	Thread Measuring Range		Internal: M3~M200, External: M3~M200(Determined by optional jigs)		
	Accuracy(Maj., Pit., Min. Diamter)		≤±(4+L/100)μm, L is measured length in mm		
	Accuracy(Thread Pitch)		≤±(1 +L/100)μm, L is measured length in mm		
Contour Meas.	Diameter Measuring Range		Internal: ϕ3~ϕ200, External: ϕ3~ϕ200(Determined by optional jigs)		
	Diameter Measuring Accuracy		≤±(3+L/100)μm, L is measured length in mm		
	Profile Degree Accuracy		≤±(2 +L/100)μm, L is measured length in mm		
Roughness Meas. (Optional)	Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D		
	Ra Measuring Range		Ra0.1μm~Ra64μm		
	Accuracy		5%		
	Filter		2RC filtering, Gaussian filtering and Zero phase filtering		
	Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0, 25mm selectable		
	Evaluation Length		Automatic calculation		
	Cutoff Wavelength		0.25/0.8/2.5(mm) or User-defined cut-off		
Size(L×W×H)			1200×490×980mm	1200×490×1180mm	1200×490×1180mm
Weight			240kg	260kg	260kg

SJ5720-OPT Series
Profilometers for Optics Surface

SJ5720-OPT100

SJ5720-OPT200

Description

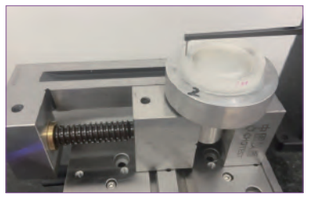
The SJ5720-OPT series is a capable to measure both surface roughness and profile after once scanning. Moreover, there is a dedicated software module for measurement and analysis of large aspheric surface, so this series is an ideal measurement solution for the optical lens industry.

It can also be used for profile and roughness measurement for large curved surface, such as bearings, artificial joints, precision molds, gears, blades, etc. Consequently, it is widely used in precision machining, automobiles, bearings, machine tools, molds, precision hardware and other industries.

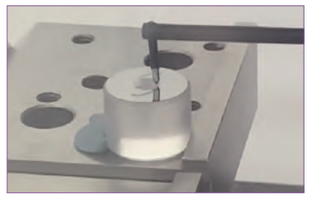
Features

1. Evaluate profile and roughness parameters at the same time after once scanning
2. High precision, high stability, and high repeatability
3. Aspheric optical software module
4. Intelligent management and advanced software analysis system
5. Intelligent protection system during scanning
6. Flexible manual control
7. High stability vibration isolation system

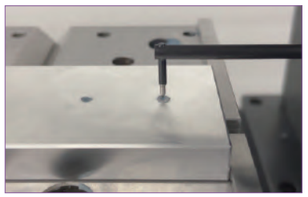
Application



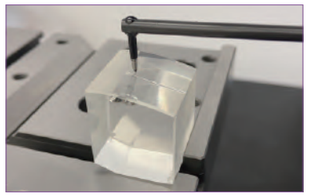
Lens



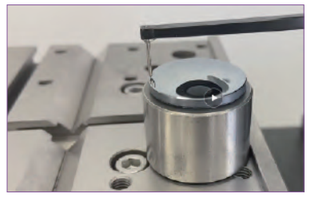
Intraocular lens mold



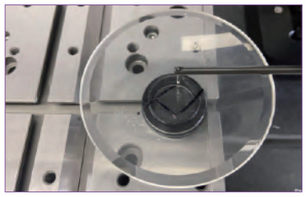
Vehicle Lens



Infrared lens



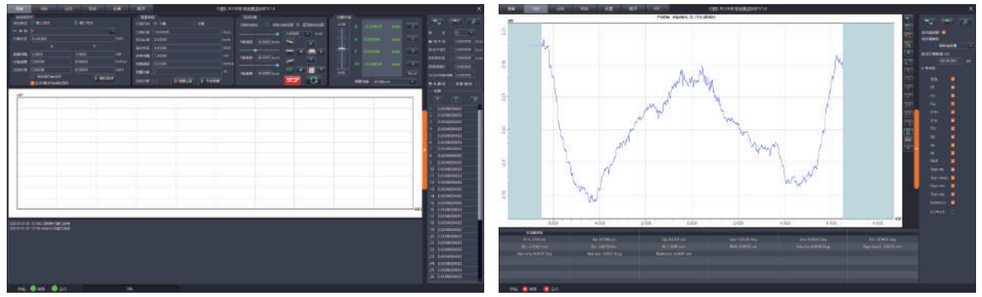
Optical mold



Lens

Software

- Professional aspheric surface measurement software can analyze all aspheric surface.
- parameters. There are some self-checking parameters in the software, so the correctness of the input formula can be determined by self-checking.



Aspheric surface measurement interface

Parameters

Model No.			SJ5720-OPT100
Contour Measurement	Measuring Range	X	0~100mm
		Z	0~300mm
		Z1	±6mm （Optional: ±12mm）
	Resolution		0.001μm
	Accuracy	Z1*1	≤±(0.5+0.03 H) μm (H, mm)
		Pt*2	Pt≤0.2μm
		Standard Ball*3	≤±(1+R/20) μm (R, mm)
		Angle*4	≤±1′
	Moving Speed	X	0~20mm/s
		Z	0~20mm/s
	Scanning Speed		0.05～5mm/s
	X Straightness*5		≤0.15μm/100mm
	Measuring Force		0.5mN，0.75mN，1mN，2mN，3mN(Adjustable)
Roughness Measurement	Ra Masurement Range		Ra0.012μm~Ra12.5μm (Large range is optional)
	Accuracy*6		Ra0.012μm ~ Ra3 . 2 μm: ≤±(3nm+2.0%A),A(Ra)μm Ra3.201μm ~ Ra12.5μm : ≤±(3nm+3.5%A),A(Ra)μm
	Repeatability (1δ)*7		1δ≤1nm
	Measurement Residual*8		Rq≤3nm
	Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
	Aspheric Masurement Parameters		Micro profile parameters: Pt, Pa, Fig;Inclination parameters: Smx , Smn ; Horizontal axis angle parameter: Tilt; Distance parameters between the optical axis and the contour: Xp , Xv , Xt ; Root mean square roughness parameter: RMS; Slope parameters: Slpe mx , Slpemx (x), Slperms, Slpe are ; Vertex radius error parameter: Radius Err
	Filter		Gaussian filter, 2RC filter, zero phase filter
	Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm Selectable
	Evaluation Length		Auto calculation
Size(L×W×H)			600×350×890mm
Weight			tt

Note:
*1 The accuracy is based on the measurement standard gauge block.
*2 The accuracy is based on the Pt test of standard ball smaller than diameter 25mm.
*3 The accuracy is based on the verification of the Φ 50mm standard ball with the arc exceeds 90 degrees.
*4 The accuracy is based on the measurement of the angle of polygonal prism.
*5 The accuracy is based on the measurement of optical flat.
*6 The accuracy is based on the measurement of standard roughness block.
*7 The repeatability is based on the measurement of 0.1-0.2μm square wave roughness block and standard step height block.
*8 The accuracy is is based on the measurement of 1nm level roughness block and optical flat.

Profilometers for Optics Surface
Contact Measurement Instruments

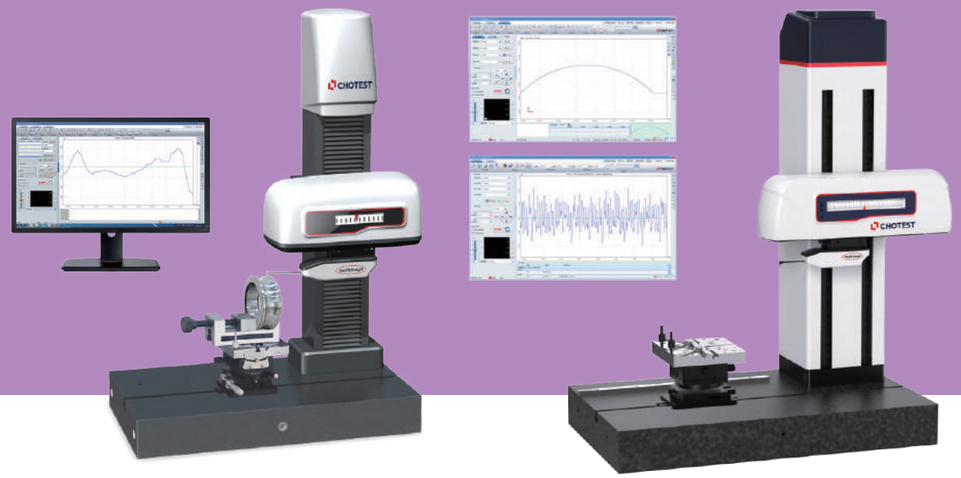
Parameters

Model No.			SJ5720-OPT200
Contour Measurement	Measuring Range	X	0~200mm
		Z	0~500mm
		Z1	±6mm (Optional: ±12mm)
	Resolution		0.001μm
	Accuracy	Z1*1	≤±(0.5+0.03 H) μm (H, mm)
		Pt*2	Pt≤0.2μm
		Standard Ball*3	≤±(1+R/20) μm (R, mm)
		Angle*4	≤±1′
	Moving Speed	X	0~20mm/s
		Z	0~20mm/s
	Scanning Speed		0.05～5mm/s
	X Straightness*5		≤0.25μm/200mm
	Measuring Force		0.5mN，0.75mN，1mN，2mN，3mN(Adjustable)
Roughness Measurement	Ra Masurement Range		Ra0.012μm~Ra12.5μm
	Accuracy*6		Ra0.012μm ~ Ra3 . 2 μm: ≤±(3nm+2.0%A),A(Ra)μm Ra3.201μm ~ Ra12.5μm : ≤±(3nm+3.5%A),A(Ra)μm
	Repeatability (1δ)*7		1δ≤1nm
	Measurement Residual*8		Rq≤3nm
	Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
	Aspheric Masurement Parameters		Micro profile parameters: Pt, Pa, Fig;Inclination parameters: Smx , Smn ; Horizontal axis angle parameter: Tilt; Distance parameters between the optical axis and the contour: Xp , Xv , Xt ; Root mean square roughness parameter: RMS; Slope parameters: Slpe mx , Slpemx (x), Slperms; Vertex radius error parameter: Radius Err
	Filter		Gaussian filter, 2RC filter, zero phase filter
	Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm Selectable
	Evaluation Length		Auto calculation
Size(L×W×H)			800×500×1080mm
Weight			265kg

Note:
*1 The accuracy is based on the measurement standard gauge block.
*2 The accuracy is based on the Pt test of standard ball smaller than diameter 25mm.
*3 The accuracy is based on the verification of the Φ 50mm standard ball with the arc exceeds 90 degrees.
*4 The accuracy is based on the measurement of the angle of polygonal prism.
*5 The accuracy is based on the measurement of optical flat.
*6 The accuracy is based on the measurement of standard roughness block.
*7 The repeatability is based on the measurement of 0.1-0.2μm square wave roughness block and standard step height block.
*8 The accuracy is is based on the measurement of 1nm level roughness block and optical flat.

Profilometer SJ5730

Once Scanning for both Profile and Roughness



SJ5730-100

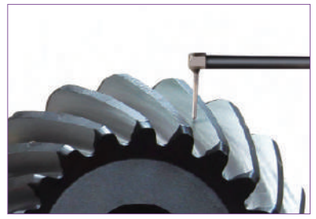
SJ5730-200

Parameters

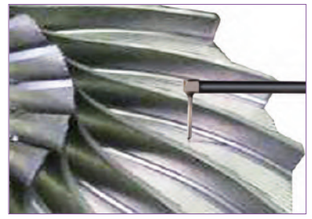
Parameter classification		Parameters
Roughness Measurement	Contour Evaluation	P(Original profile), R(Surface roughness profile), W(Waviness)
	Rougness Evaluation	Ra, Rp, Rv , Rz, Rt, Rmax , Rq , Rsk , Rku , RSm , RPc , Rdq , Rdc , Rmr , Motif parameters, RCore parameters, P parameters, W parameters
	Filter	2RC filtering, Gaussian filtering and Zero phase filtering
	Cut-off Wavelength λs	0.008, 0.025, 0.08, 0.25, 0.8, 2.5, 8mm selectable
	λs	0.25, 0.8, 2.5, 8, 25um selectable, comply with the specifications of JJF 1099-2018, ISO 4288-1996, GBT 1031-2009
	Shape Error	Aspheric surface shape error measurement, linear shape error measurement, arc surface shape error measurement
	Standard	DIN EN ISO 4287:2010, ASME B46.1-2002, JIS B 0601:2013, GB/T 3505-2009, ISO 4287:1997, ISO 13565-2:1996, ISO 1302:2002
Contour Measurement	Common tools	Provides 76 tools, including coordinate creation, construction tools, auxiliary tools, annotations, and geometric tolerances
	CNC Function	Provide CNC measurement mode for batch measurement
	Custom Meas.	Customize the measurement process according to the characteristics of the workpiece (such as surface with hole in the center), avoids the unnecessary measurement area and perform discontinuous measurement.
	Special Tools	Ball screw measurement (corrected helix angle), thread measurement, stage height, groove depth, groove width, area, convexity etc

Application

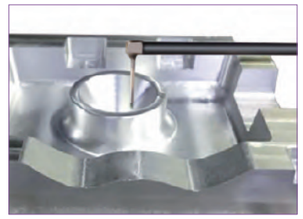
Pt & Ra of bearing raceway



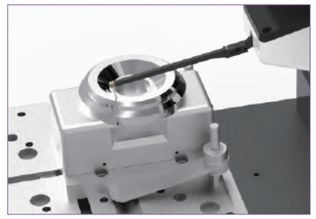
Ra of gear tooth surface



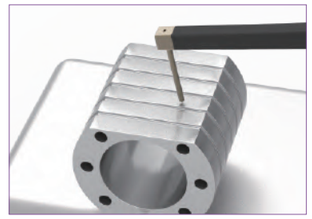
Ra of engine blade



Ra & Profile of mold



Profile & Roughness of car parts



Profile & Roughness of workpiece

Features

1. Evaluate Contour and roughness parameters at the same time after once scanning
2. High precision, high stability, and high repeatability
3. Intelligent management and advanced software analysis system
4. Intelligent protection system during scanning
5. Flexible manual control
6. Nano-scale large roughness measuring range
7. Plug-in probe, easy to replace probe
8. Extremely small measuring force to avoid scratching the surface

Parameters

Model No.			SJ5730-100
Contour Measurement	Measuring Range	X	0~100mm
		Z	0~300mm
		Z1	±6mm （Optional: ±12mm）
	Resolution		0.001um
	Accuracy	Z1*1	≤±(0.5+0.03 H) μm (H, mm)
		Pt*2	Pt≤0.4μm
		Standard Ball*3	≤±1μm(R≤10mm)；≤±(0.17+R/12) μm (10<R≤200mm)
		Angle*4	≤±1′
	Moving Speed	X	0~20mm/s
		Z	0~20mm/s
	Scanning Speed		0.05~5mm/s
	X Straightness*5		≤0.2μm/100mm
	Measuring Force		0.5mN,0.75mN,1mN,2mN,3mN(Adjustable)
Roughness Measurement	Ra Masurement Range		Ra0.012μm~Ra12.5μm
	Accuracy*6		Ra0.012μm ~ Ra3 . 2 μm: ≤±(3nm+2.0%A),A(Ra)μm Ra3.201μm ~ Ra12.5μm : ≤±(3nm+3.5%A),A(Ra)μm
	Repeatability (1δ)*7		1δ≤1nm
	Measurement Residual*8		Rq≤3nm
	Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
	Filter		Gaussian filter, 2RC filter, zero phase filter
	Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm Selectable
	Evaluation Length		Auto calculation
Roller analysis			Roller convexity, position distance, logarithmic roller busbar, X-mirror curve coincidence, segmented different tolerances
Input			AC100-240V, 50/60Hz, 130W
Size(L×W×H)			600×350×890mm
Weight			110kg

Note:
*1 The accuracy is based on the measurement standard gauge block.
*2 The accuracy is based on the Pt test of standard ball smaller than diameter 25mm.
*3 The accuracy is based on the verification of the Φ 50mm standard ball with the arc exceeds 90 degrees.
*4 The accuracy is based on the measurement of the angle of polygonal prism.
*5 The accuracy is based on the measurement of optical flat.
*6 The accuracy is based on the measurement of standard roughness block.
*7 The repeatability is based on the measurement of 0.1-0.2μm square wave roughness block and standard step height block.
*8 The accuracy is is based on the measurement of 1nm level roughness block and optical flat.

Profilometers

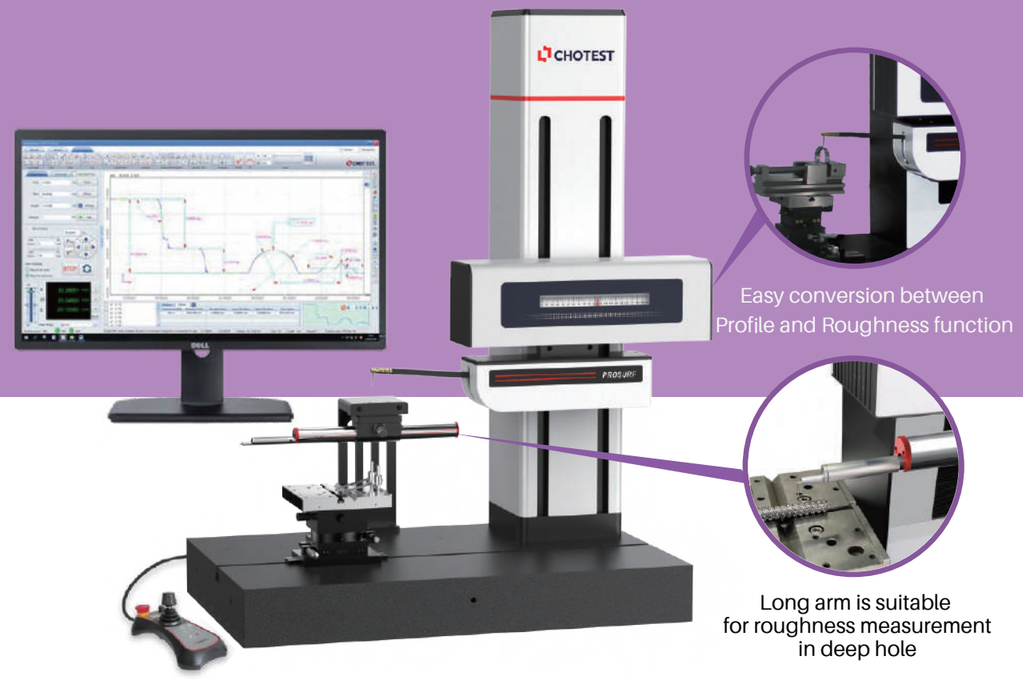
Parameters

Model No.			SJ5730-200
Contour Measurement	Measuring Range	X	0~200mm
		Z	0~500mm
		Z1	±6mm (Optional: ±12mm)
	Resolution		0.001um
	Accuracy	Z1*1	≤±(0.5+0.03 H) μm (H, mm)
		Pt*2	Pt≤0.4μm
		Standard Ball*3	≤±1μm(R≤10mm)；≤±(0.17+R/12) μm (10<R≤200mm)
		Angle*4	≤±1′
	Moving Speed	X	0~20mm/s
		Z	0~20mm/s
	Scanning Speed		0.05~5mm/s
	X Straightness*5		≤0.35μm/200mm
	Measuring Force		0.5mN,0.75mN,1mN,2mN,3mN(Adjustable)
Roughness Measurement	Ra Masurement Range		Ra0.012μm~Ra12.5μm
	Accuracy*6		Ra0.012μm ~ Ra3 . 2 μm: ≤±(3nm+2.0%A),A(Ra)μm Ra3.201μm ~ Ra12.5μm : ≤±(3nm+3.5%A),A(Ra)μm
	Repeatability (1δ)*7		1δ≤1nm
	Measurement Residual*8		Rq≤3nm
	Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
	Filter		Gaussian filter, 2RC filter, zero phase filter
	Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm Selectable
	Evaluation Length		Auto calculation
Roller analysis			Roller convexity, position distance, logarithmic roller busbar, X-mirror curve coincidence, segmented different tolerances
Input			AC100-240V, 50/60Hz, 130W
Size(L×W×H)			800×500×1080mm
Weight			180kg

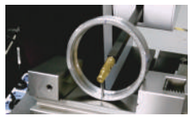
Note:
*1 The accuracy is based on the measurement standard gauge block.
*2 The accuracy is based on the Pt test of standard ball smaller than diameter 25mm.
*3 The accuracy is based on the verification of the Φ 50mm standard ball with the arc exceeds 90 degrees.
*4 The accuracy is based on the measurement of the angle of polygonal prism.
*5 The accuracy is based on the measurement of optical flat.
*6 The accuracy is based on the measurement of standard roughness block.
*7 The repeatability is based on the measurement of 0.1-0.2μm square wave roughness block and standard step height block.
*8 The accuracy is is based on the measurement of 1nm level roughness block and optical flat.

Profilometer SJ5760 Series

Independent Profile and Roughness Measurement Module

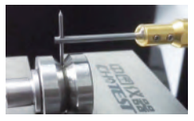


Application

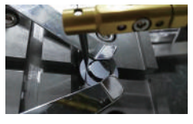

Bearing


Railway part


Thread workpiece


Car parts

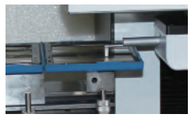

Ballscrew


Stamping part


Thread workpiece


Gear

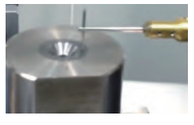

Machining part


Roughness specimen


Plastic part


Engine cylinder


Custom bearing

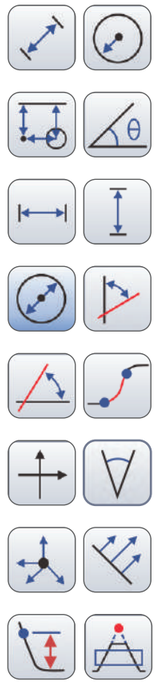

Mold


Die casting

Software

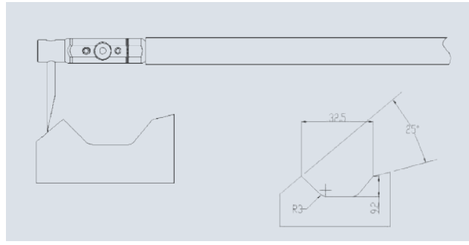
Surf & Rough X is an user-friendly and powerful software, which is completely developed by Chotest. It can analyze not only surface contour, but also evaluate surface roughness. Surf & Rough X contains 76 kinds of utility tools, such as coordinate system, construction tools, geometric tolerance, surface roughness assessment tools, etc. CNC measurement mode is a convenient function for batch measurement, and it improves measurement efficiency greatly. Moreover, discontinuous measurement function is also available for the special workpieces.

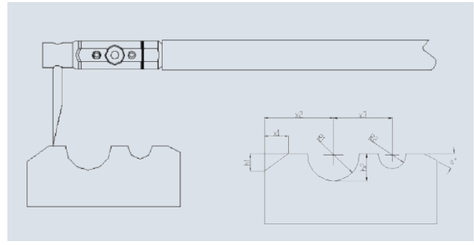
Functions



GD & T	Straightness, roundness, position degree, parallelism, perpendicularity, profile tolerance, etc.
Custom Program	The measurement process can be customized according to the characteristics of the workpiece (Set the probe to jump deep holes, steep slopes or obstacles).
CNC Mode	The one-key measurement program can be built for batch measurement. If the tolerance is also entered to the program, the measurement result will be automatically judged as OK or NG.
Coordinate system	Coordinate system could be established by point-line or line-line, and it could be translated and rotated.
Special Tool	Ball screw shaft measurement(corrected helix angle),thread measurement, step height, groove depth, groove width, area, curvature, etc.
Report	Export report in .doc, .xls or .pdf, and support user-defined report template.
Contour Comparison	After import CAD drawing to the software, the user can compare the difference between drawing and scanning contour.
Roughness	Ra, Rp, Rv, Rz, Rt, Rmax, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Pa,Pq, Pt, Pp, Pv, Psm, Psk, Pku, Pdq, Plq, Pdc, PHSC, Ppc, PMr, Waviness of Profile, Motif, etc.

Profile Example





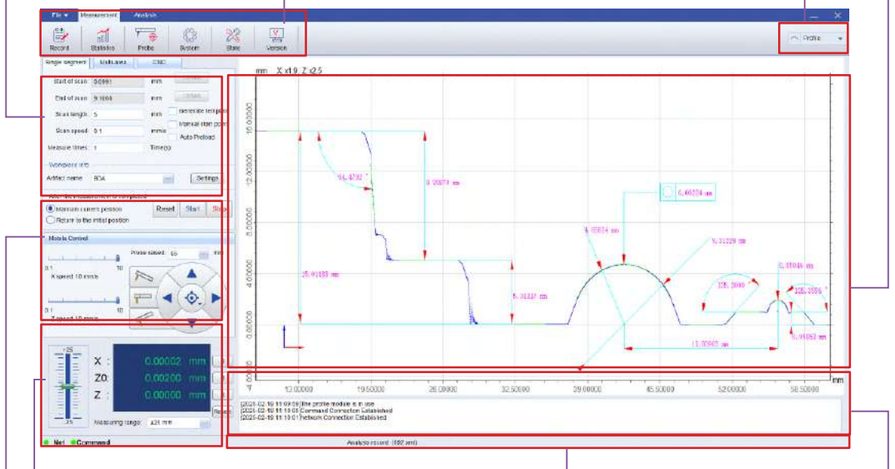
Software

Scanning Settings:
Set measuring conditions,Inspection info andscanning positions.

System Setting:
Differenet function modules.

Switch meas. function:
Switch between profile measurement and roughness measurement.

Scanning graph window:
Display the scanning graph and perform the analysis operation.



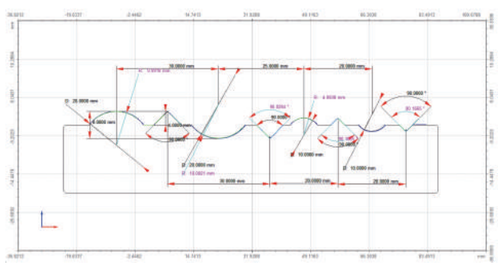
Motion control:
Control probe to move ↑, ↓, ←, →, and stop,reset.

Coordinate display:
Display the coordinates of current probe position.

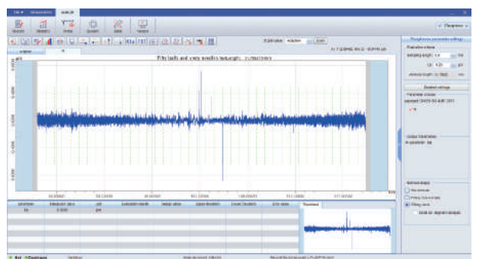
Status Bar:
Network, serial port, unit,operation tips, login time,user name, etc.

Analysis data:
List features, measured data and tolerance.

Measurement Interface



Contour measurement



Roughness measurement

Parameters

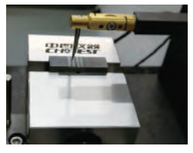
Model No.		SJ5760-PR
Travel Range	X	0~200mm
	Z	0~450mm
Size(L×W×H)		800×450×1100mm
Weight		220Kg
Contour Measurement(SJ5760-P)		
Measuring Range	Z1	±25mm
	Resolution	0.001μm
Indication Error	X	±(0.6+0.015L)μm(L , mm)
	Z1	±(0.6+0.05H)μm(H , mm)
	Standard Ball	≤±(1+R/15)μm(R , mm)
	Angle error	≤±1′
Moving speed	X	0~20mm/s
	Z	0~20mm/s
Scanning Speed		0.05~5mm/s
Max Slope		Uphill 77°, downhill 88°
Straightness		≤1μm/200mm
Scanning Force		10~70mN Adjustable(Larger force is optional)
Roughness Measurement(SJ5760-R)		
Measuring Range	Z0	±400μm(Optional:±1000μm)
	Sensor Type	Railless
	Ra Range	Ra0.1μm~Ra64μm
Scanning Force		1mN
Resolution	Z0	0.001um
Indication Error		≤±(5nm+2.5%A)μm, A(Ra)μm
Repeatablity		≤1nm
Scanning Speed		0.05~0.5mm/s
Measurement Residual		≤0.005μm
Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
Filter		2RC filtering, Gaussian filtering and Zero phase filtering
Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm selectable
Evaluation Length		Auto calculation
Film Thickness Measurement	Measuring Range	60μm or less

SJ5718 Series Economic Profilometers

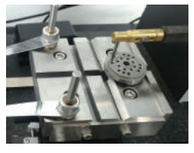
Long arm is suitable for roughness measurement in deep hole

Easy conversion between Profile and Roughness function

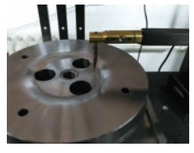
Application



Mechanical part



Metallurgy part

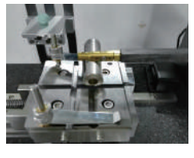


Car wheel

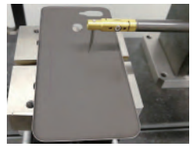
Die casting part

Bearing

Thread part



Battery housing



Phone housing

Machining part

Gearbox pulley

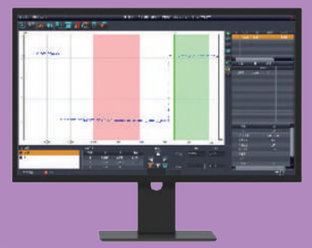
Parameters

Model No.		SJ5718-PR
Travel Range	X	0~100mm
	Z	0~300mm
Size(L×W×H)		600×350×890mm
Weight		120Kg
Contour Measurement(SJ5718-P)		
Measuring Range	Z1	±30mm
	Resolution	0.001um
Indication Error	X	±(0.6+0.02L)μm(L,mm)
	Z1	±(0.6+0.05H)μm(H,mm)
	Standard Ball	≤±(1.2+R/15)μm(R,mm)
	Angle error	≤±1′
Moving speed	X	0~20mm/s
	Z	0~20mm/s
Scanning Speed		0.05~5mm/s
Max Slope		Uphill 77°, downhill 88°
Straightness		≤0.5μm/100mm
Scanning Force		30mN
Roughness Measurement(SJ5718-R)		
Measuring Range	Z0	±400μm(Optional:±1000μm)
	Sensor Type	Railless
	Ra Range	Ra0.1μm~Ra64μm
Scanning Force		1mN
Resolution	Z0	0.001um
Indication Error		≤±(5nm+2.5%A)μm, A(Ra)μm
Repeatablity		≤1nm
Scanning Speed		0.05~0.5mm/s
Measurement Residual		≤0.005μm
Roughness Parameters		R roughness: Rp, Rv, Rz, Rc, Rt, Ra, Rq, Rsk, Rku, RSm, RPc, Rdq, Rdc, Rmr, Rmax, Rpm, tp, Htp, Pc, Rda, Ry, Sm, S, Rpq, Rvq, Rmq, RzJ, Rv1max, Rp1max, Rz1max, Rmr(Rz/4), maxRa, R5z, R3z, Rh, Dq, Lq, SD Key roughness: Rcore: Rk, Rpk, Rvk, Mr1, Mr2, A1, A2 Profile: Pa, Pq, Pt, Pz, Pp, Pv, PSm, Psk, Pku, Pdq, Pdc, Pc, PPc, Pvq, Pmr, Pmq, Rad, PzJ, Pmax, StpHt, TIR, Avg, Slope, Area+, Area-, Area, Profl, Edge, StpWd, Bumpht Waviness of profile: Wa, Wq, Wt, Wz, Wp, Wv, WSm, Wsk, Wku, Wdq, Wdc, Wmr, Wpc, Wc, Wh, Wmr(WZ/4) Motif: R, AR, W, AW, Rx, Wx, Wte, Nr, Ncrx, Nw, Cpm, CR, CF, CL ISO5436: Pt5436, D
Filter		2RC filtering, Gaussian filtering and Zero phase filtering
Sampling Length		0.008, 0.08, 0.25, 0.8, 2.5, 8.0 or 25mm Selectable
Evaluation Length		Auto calculation
Film Thickness Measurement	Measuring Range	60μm or less

Stylus Nano Profiler NS200

Surface micro-nano profile measurements

- Powerful data collection and analysis system
- Excellent repeatability and reproducibility



Constant micro force sensor: 1-50mg adjustable

Ultra-flat object table

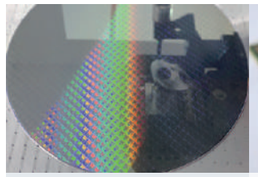
Visual navigation system, 5MP colorful camera

Motorized X/Y/Z stage, Motorized 360° rotation

Description

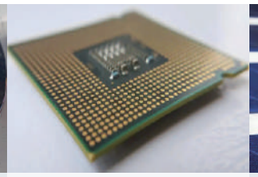
Stylus Nano Profiler NS200/NS200-D is an ultra-precision contact measuring instrument for measurement of surface roughness and microscopic profile, such as micro-nano step height, film thickness. The NS200 uses a displacement sensor with sub-angstrom resolution, ultra-low noise signal acquisition, ultra-fine motion control, and calibration algorithms technology with excellent performance. Its contact force is extremely small, and there are no special requirements for measuring surface reflection characteristics, material types, and material hardness, consequently, it is widely used to measure microscopic surface for industries of semiconductors and compound semiconductors, high-brightness LEDs, solar energy, MEMS micro-electromechanical systems, touch screens, automotive and medical equipment.

Application



Semiconductor

- Step height of deposited film
- Step height of thin Film Resist
- Etch rate measurement
- Chemico-mechanical polishing (corrosion, pitting, bending)



Large Substrate

- PCB protrusion, step height
- Window coating
- Wafer mask
- Wafer chuck coating
- Polishing plate

Glass substrate and display

- AMOLED
- Step height measurement during LCD screen development
- Thickness measurement for touch panel film
- Solar coating thin film

Film on flexible component

- Organic photodetector
- Organic films printed on film and glass
- Touch screen copper traces

Parameters

Model No.		NS200	NS200-D
Sample Observation	Front View Navigation	5MP Colorful Camera F.O.V.: 2.2x1.7mm	5MP Colorful Camera F.O.V.: 10x13.4mm
	Side View Navigation	/	5MP Colorful Camera F.O.V.: 2x2.68mm
Sensor		Ultra low Inertia, LVDC sensor	
Measuring Force		1-50mg Adjustable	
Stylus		Tip radius 2μm, angle 60°, Magnetic mounting	
XY Travel Range		Motorized X/Y (150mm150mm), manually adjustable leveling	
Sample R-θ Stage		Motorized, 0~360° continuous rotation	
Vacuum Chuck		8-inch vacuum chuck	
Single Scan Length		55mm	
Max Scanning Range		150(XY travel) + 55mm scaning range, max range is 8 inches	
Max Sample Height		50mm	
Max Wafer Size		200mm(8")	
Step Height Repeatability*1		5 Å @ Range 330μm/ 10 Å @ Range 1050μm (Measure step height 1μm, 1δ)	
Sensor Range*2		330μm or 1050μm	
Scanning Speed		2μm/s~10mm/s	
Max Scan Sampling Points		12000	
Size(L×W×H)		630×610×500mm	640×650×530mm
Weight		40kg	
Input		AC100~240V, 50/60 Hz, 200W	
Working Environment		Humidity: 30~40% RH(No condensation), Temp.: 16~25°C(Fluctuation < 2°C/h), Ground vibration: 6.35μm /s(1~ 100Hz), Audio noise: ≤80dB Air laminar flow: ≤ 0.508 m/s(Downward flow)	

Note:

*1 Repeatability data was measured in a laboratory environment that meets VC-C standards and it is equipped with an anti-vibration table. If these conditions are not met, the repeatability data will be doubled.

*2 The sensor range can only be selected between 330μm and 1050μm. Probes are installed by magnetic mounting. If there are no features requiring an ultra-large range probe, it is recommended to use the 330μm one.

Machine Tool Probes PO Series

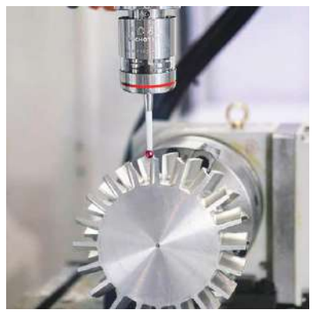
Precision, Reliable

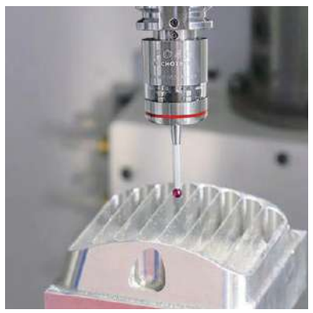
PO60 PO40 PO40L

PO series contains 3-point trigger unit inside the probe, which is the most stable structure. When the stylus is moved radially or axially by external force, the trigger unit is triggered. Then the circuit inside of probe sends a triggering signal to the receiver, and the receiver transmits it to the machine tool, consequently the present coordinates of each axis of the machine tool are recorded automatically. Finally measurement results are calculated according to the coordinate records of related points.

Features

- High repeatability: One-way repeatability <1μm
- Long standby time: As long as 6 months
- Omnidirectional energy-absorbing design: 360° omnidirectional energy-absorbing design, which helps to cushion the spindle in impact when an operating accident occurs
- Waterproof design: IP68 for probe and receiver
- Intelligent LED indicators: Show current working status of the probe





Parameters

1) Storage temperature: (-25~70)°C

2) Working temperature: (5~55)°C

Model No.	PO40	PO60	PO40L
Size	Φ40mm×L50mm	Φ63mm×L76mm	Φ40mm×L52mm
Weight(Without Holder)	260g	880g	280g
Transmission Type	360° IR	360° IR	360° IR
Transmission Distance	5m	6m	5m
Starting Mode	Code M	Code M, Revolve	Code M
Rotational Speed	Max 1000rev/min	Max 1000rev/min	Max 1000rev/min
Power Supply	1/2AA 3.6V battery×2	AA1.5V/3.6V battery×2	1/2AA 3.6V battery×2
Triggering Direction	±X/±Y/-Z	±X/±Y/-Z	±X/±Y/-Z
Repeatability of One-way triggering 2δ*1	1μm	2μm	1μm
Max overrun*2	XY:12.5mm +Z:6mm	XY:21mm +Z:11mm	XY:12mm +Z:6mm
XY Trigger Force*3	0.5N~ 0.9N	0.5N~1.6N Adjustable	0.3N~1.6N Adjustable
Z Trigger Force	5.8N	3.5N~14N Adjustable	4N~10N Adjustable
Application	Small and mediumsized 3-axis, 5-axis machining center	Large gantry machine tool, horizontal machining center	CNC lathe or turning-milling composite machining center

Note: .
*1: Test with a 50mm straight stylus under speed 480mm/min
*2: Test with a 50mm straight stylus
*3: Test with a 50mm straight stylus under speed 480mm/min

Parameters of Receiver

1) Transmission type: IR, 360°

2) Working range: Max 8m

3) Weight: 926g

4) Input voltage: 12V~ 30V

5) Input current: <100mA, receiving <40mA

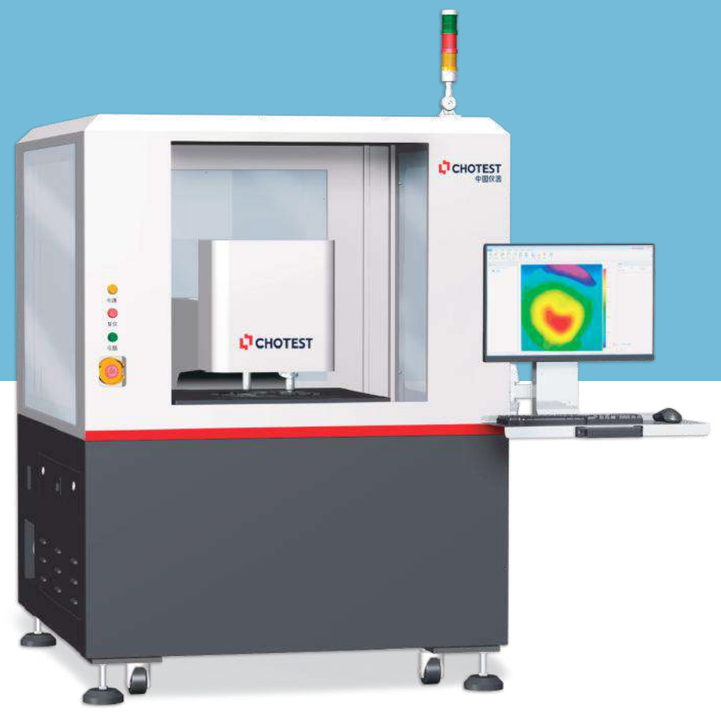
6) Cable to machine controller: dedicated 13PIN shielded cable, 8 meters or 15 meters

7) Storage temperature: (-25~70)°C, working temperature: (5~55)°C

COMI Receiver

Professional Inspection Equipment

WD4000 Series
Unpatterned Wafer 3D Inspection System

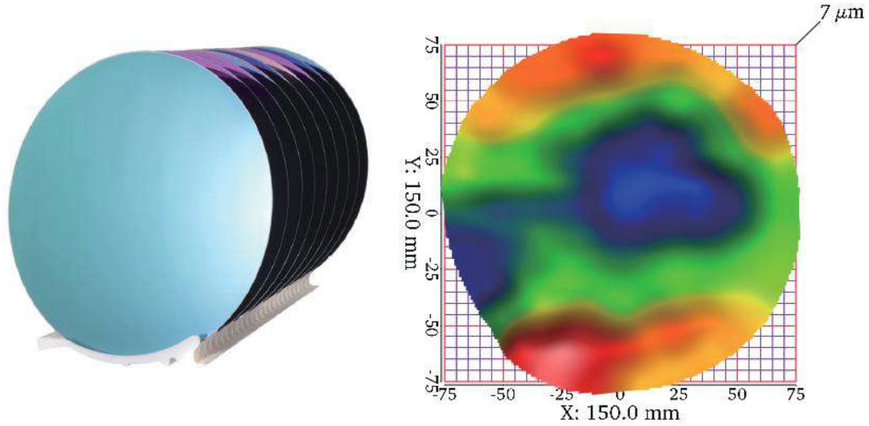


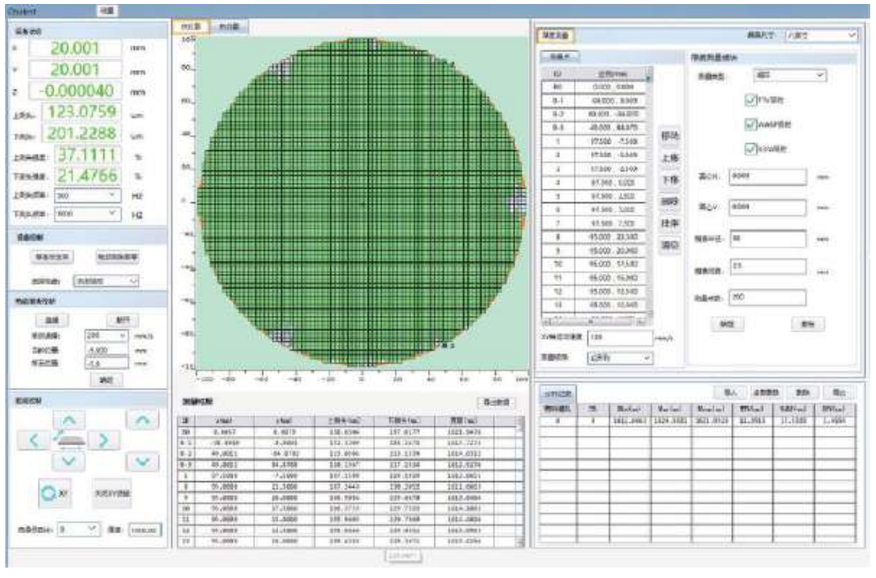
Description

Unpatterned Wafer 3D Inspection System WD4000 series can automatically measure wafer thickness, surface roughness, and micro-nano 3D microtopography at a time. Use white light confocal probes to measure wafer thickness, TTV, LTV, BOW, WARP, line roughness; use white light interferometry probe to scan the Wafer surface to create a 3D profile image of the surface , then analyze the roughness and relevant 2D and 3D parameters according to ISO/ASME/EUR/GBT standards.

Application

Thickness and warpage measurement for unpatterned wafer





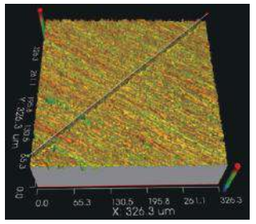
Measurement results of wafer thickness and warpage

The 3D shape based on the upper and lower surfaces of the wafer is reconstructed by non-contact measurement. The powerful measurement and analysis software ensures the stable calculation for the thickness, roughness, total thickness variation(TTV) of the wafer.

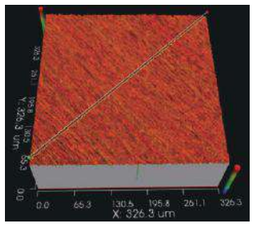
Application

Roughness measurement for unpatterned wafer

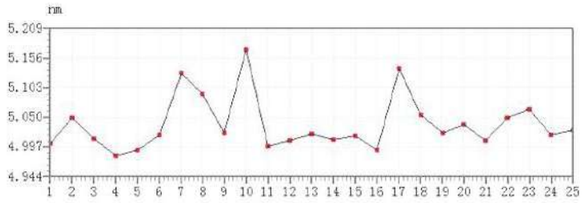
Thinned silicon wafer



3D image of
rough grinding silicon wafer



3D image of
fine grinding silicon wafer



Sa curve of 25 times measurement data for fine grinding wafer

文件			3D参数分析				
序号	名称	图标	Sq[高度参数][I...	Sp[高度参数][I...	Sv[高度参数][IS...	Sz[高度参数][IS...	Sa[高度参数][I...
1	sa_1		7.597	25.179	319.103	344.283	5.004
2	sa_2		8.288	24.684	319.429	344.113	5.050
3	sa_3		7.092	24.394	316.239	340.633	5.012
4	sa_4		6.772	25.329	320.325	345.654	4.982
5	sa_5		6.999	24.388	318.774	343.162	4.992
6	sa_6		7.330	24.164	316.117	340.280	5.019
7	sa_7		9.190	24.424	308.329	332.754	5.129
8	sa_8		8.700	24.930	319.010	343.961	5.092
9	sa_9		7.583	25.466	313.352	338.818	5.022
10	sa_10		9.636	24.834	318.285	343.119	5.171
11	sa_11		7.269	25.343	318.515	343.858	4.998
12	sa_12		7.149	25.556	318.074	343.630	5.009
13	sa_13		7.425	24.911	318.300	343.211	5.021
14	sa_14		7.481	25.519	318.559	344.078	5.011
15	sa_15		7.340	24.668	318.259	342.927	5.017
16	sa_16		6.986	24.730	312.806	337.536	4.992
17	sa_17		9.301	24.702	313.648	338.350	5.137
18	sa_18		7.826	25.271	314.494	339.766	5.054
19	sa_19		7.294	24.503	313.570	338.472	5.022
20	sa_20		7.684	24.940	316.623	341.563	5.038
21	sa_21		7.250	25.037	310.442	335.479	5.009
22	sa_22		7.757	25.130	315.120	340.250	5.049
23	sa_23		8.493	24.773	316.354	341.127	5.064
24	sa_24		7.373	24.986	316.743	341.729	5.018
25	sa_25		7.545	25.111	316.822	341.933	5.028
	统计	平均	7.734	24.935	316.292	341.227	5.038

Multi-file analysis of 25 times measurement data for fine grinding wafer

During rough grinding and fine grinding process for the Wafer thinning, the surface roughness Sa values and their stability are used to evaluate the processing quality. When the thinned silicon wafer is measured in the strong noise environment of the production workshop, the roughness Sa values of the fine grinding silicon wafers are ranging around 5nm, and the repeatability is 0.046987nm based on 25 times of measurement data which proves the measurement stability is good.

Parameters

Model No.	WD4100	WD4200
Wafer Size	4", 6", 8", 12"	
Wafer Table	Vacuum chuck	
Loading and Unloading	Manual(Auto robot arm is optional)	
XYZ Travel Range	400mm/400mm/75mm	
Max Moving Speed	500mm/s	
Main Frame	Marble	
Anti-Vibration	Air-floating anti-vibration system	
Loading Capacity	≤3kg	
Overall Size	1500×1500×2000mm	
Weight	About 1500kg	
Compressed Air	0.6MPa; 60L/min	
Working Environment	Temp. 20°C±1°C/hour, RH 30~80%	
Ambient Vibration	VC-C or better	
Thickness Measurement System		
Material of Object	Arsenide, nitride, phosphorus, germanium, phosphorurate, lithium crickets, sapphire, silicon, silicon carbide, glass, etc.	
Sensor	High-precision white light confocal sensors	
Measuring Range	100μm~2000μm	
Scanning Path	Full map area scanning, Union Jack path, free multi-point	
Accuracy	±0.25μm	
Repeatability(σ)	0.2μm	
Resolution	25nm	
Measurement Parameters	Thickness, TTV (Total thickness variation), LTV, BOW, warp, flatness, line roughness	
3D microtopography Measurement System		
Measurement Principle	——	White light interferometry
Light Source	——	White LED
Objective Lens	——	10X(2.5X, 5X, 20X, 50X optional)
Field of View	——	0.96 mm×0.96 mm
Lens Turret	——	Single hole
Level Adjustment	——	±2°
Z-axis Scanning Range	——	5mm
Z-axis Resolution	——	0.1nm
Lateral Resolution	——	0.5~3.7μm
Scanning Speed	——	2.5~5.0μm/s
Characters of Test Object	——	Reflectivity 0.05%~100%
Roughness RMS Repeatability*1	——	0.08nm
Step Height Measurement*2 — Accuracy	——	1%
Step Height Measurement*2 — Repeatability	——	0.2%1σ
Measurement Parameters	——	Microtopography, line/surface roughness, spatial frequency, etc.

Note:
*1 Roughness performance is obtained by measuring SQ parameters for a 0.2nm SA silicon wafer in the laboratory environment according to ISO 25178.
*2 Step height performance is obtained by measuring a standard 4.7μm stage block in the laboratory environment according to ISO 5436-1: 2000.

Patterned Wafer Critical Dimension & Overlay Measurement System BOKI_1000

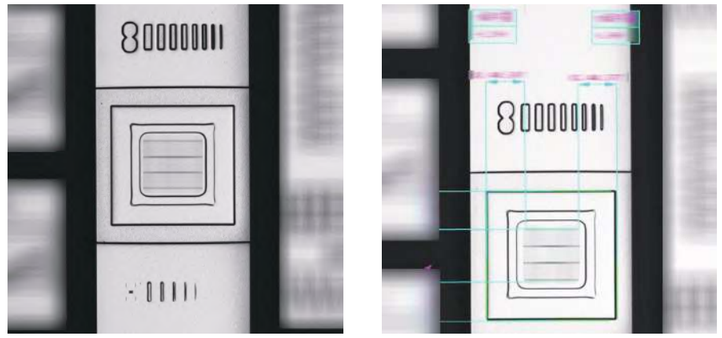
Description

Patterned Wafer Critical Dimension & Overlay Measurement System is an optical inspection instrument that can perform both high-precision XY plane dimension inspection and sub-nanometer surface 3D topography measurement. It can scan multiple regions on a large surface accurately and automatically with excellent repeatability, which significantly increases the measurement efficiency and reduces human error.

Equipping high-resolution optical lens, combining high-precision image analysis algorithm, in CNC mode the system can automatically position & recognize the measuring objects, then automatically measure and evaluate all sizes according to program. At the same time, it integrates white light interferometry measurement system, which can scan the wafer surface to create a 3D profile image of the surface, then analyze Z-direction sizes in nanometer level.

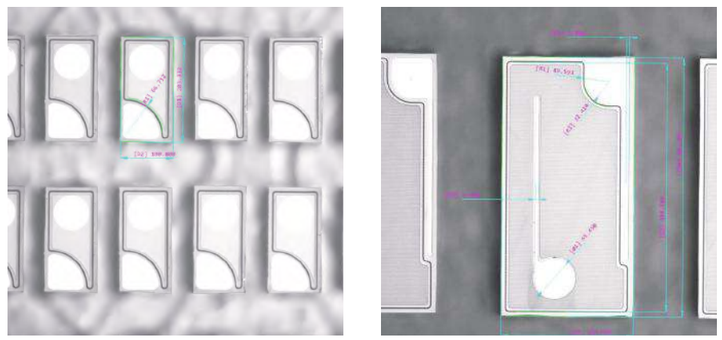
It is widely used in ultra-precision machining industries such as semiconductor manufacturing and packaging process inspection, optical processing, MEMS components, etc.

Application



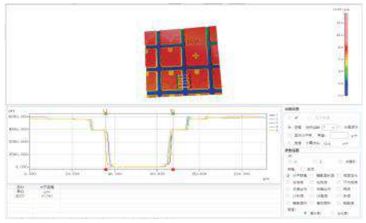
Overlay Offset Measurement

During wafer manufacturing, the offset of the overlay after photoetching process is measured in Photo area, exposure of wafer, and compensation values based on the measurement are imported into the lithography machine to optimize the stability of the wafer photoetching process.



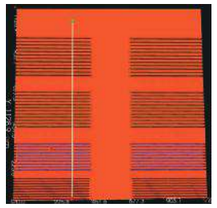
Key Dimensions Measurement

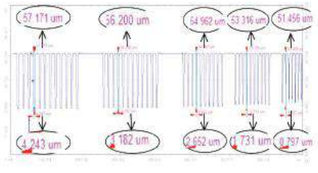
During wafer manufacturing, it requires to control critical dimensions of Die in multiple processes, and SuperView automatically extracts the feature edges of Die, and at the same time it measures all features according to program efficiently and accurately.



3D Dimensions Measurement

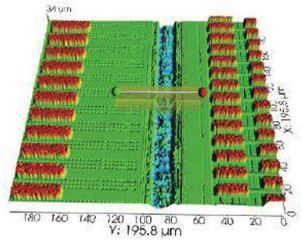
During wafer manufacturing, it is necessary to measure the bottom width of the grooves to check whether the distance between dies is qualified after the previous process in Photo area. The software automatically select multiple parabolas to obtain average value for target positions after auto scanning, then the parameters of the exposure machine is adjusted based on the measurement result in order to meet the process requirements.

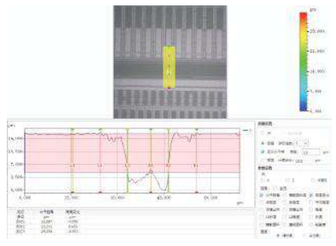




Etch Depth Measurement and Profile Analysis

Reconstruct the 3D image of the wafer, and extract the cross-sectional profile of the groove lines for analysis, then evaluate the integrity of the grooves profile and observe the defect at the bottom of grooves.





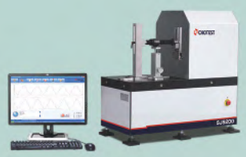
Laser Groove Depth and Width Measurement

After the laser engraving process, laser U-groove depth and width should be measured. The software can customize the width of the lasso to extract mean value profile curve of the groove, then calculate the average depth & width values of the groove. The parameters of the laser machine is adjusted to meet the process requirements based on measurement results.

Parameters

Model No.		BOKI_1000	
Loading Bin		4 pcs of Cassette, size is customizable	
Feeding Sensor		With anti-skid function	
Light Source		White/Green LED (single or double is optional)	
Barcode Scanner		Barcode recognition	
Video System		1024X1024	
Micro Objective Lens		10×, 20×, 50×	
Measurement Accuracy		10X:±0.5μm; 20X:±0.4μm; 50X:±0.3μm	
Repeatability(σ)*1		10X:±0.2μm; 20X:±0.2μm; 50X:±0.1μm	
Interferometric Objective Lens		2.5×, 5×, 10×, 20×, 50×, 100×	
Z Axis Resolution		0.1nm	
Lateral Resolution (0.5λ/NA)		100X~2.5X: 0.5μm~3.7μm	
Roughness RMS Repeatability*2		0.02nm	
Surface Profile Repeatability		0.1nm	
Step Height Measurement*3		Repeatability	Accuracy
		0.2% 1σ	0.8%
Software		SuperView	
Field of View		0.49×0.49mm（@Optical Zoom 0.75×）	
Max Field of View		6×6mm	
Lens Turret		Manual 3 holes turret(Optional: Motorized 5 holes turret)	
Object Table	XY Travel Range	300×300mm	
	Load Capacity	5kg	
	Flatness	＜10μm	
	Control Mode	Motorized	
Z-Axis	Travel Range	30mm	
	Control Mode	Motorized	
Vacuum Chuck(Optional)		Negative pressure ≤-80KPa	
Overall Dimension(L×W×H)		1800×1400×1710mm	
Dustproof Device FFU		Class 1000	
Required Dust-Free Environment Level		Class 1000	
Oil-Proof Device		All guide rails must be provided with oil shields, and oil stains and other substances cannot fall out.	
Equipment Weight		800KG	
Power Supply		AC 220V,50/60HZ,13~14A,3000W	
Compressed Air		1.Air-floating anti-vibration system: Max flow 1.5LPM; Average flow 1LPM; Pressure 0.6MPa; Hose diameter 6mm; 2.Vacuum chuck: Max flow 250LPM; Average flow 180LPM; Pressure ≤ -80kpa; Hose diameter 8mm;	
Working Environment		Temp.: 15~30°C, humidity : 30~80% (no condensation)	
Safety		The equipment has door magnetic interlocking function, and the automatic door is equipped with safety grating.	

Note:
*1 Accuracy and repeatablity are obtained by measuring Standard Resolution Test Board.
*2 Roughness Performance is obtained by measuring SQ parameters of a Sa 0.2nm silicon wafer in the laboratory environment according to ISO 25178.
*3 Step height performance is obtained by measuring a standard 4.7 μ m stage block in the laboratory environment according to ISO 5436-1: 2000.



Dimensional Calibrators

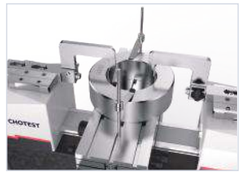
SJ5100 Series
Universal Length Measuring Machine

Absolute measurement over entire measuring range

Functions

1. Measure gauge blocks, thread gauges, plain gauges, Taper thread/plain gauges, pin gauge, caliper, spline gauges, setting bars, snap gauges, internal/external micrometers, feeler gauges, Dial indicators, dial bore gauge, dial test gauges, internal micrometer three points, etc.
2. Measure various gauges according to GB, ISO, BS, ANSI, DIN, JIS, API standards. With comprehensive and professional standards in database, it meets requirements of most customers.
3. Conform to a variety of verification regulations & measuring standards. All test results are generated according to relevant regulations and standards.
4. User-friendly software.
5.With centralized database management for measuring records, the operator can query and manage the measuring records according to object type , testing institution, manufacturing number, inspector, submitted institution, equipment number, inspection date and effective date.
6. Support to print multiple selected test records or test certificates from database at once time.
7. Support to export test data to Word, Excel, PDF files.
8. Data backup and restore.
9. Support user-defined template of report.
10. Support user-defined standard/tolerance.

Application


Big plain ring gauge


Spline plug gauge

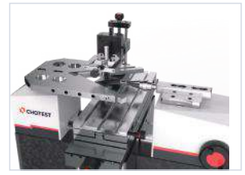

Spline ring gauge

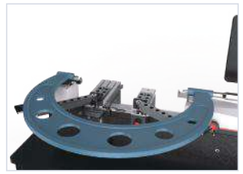

Taper thread ring gauge

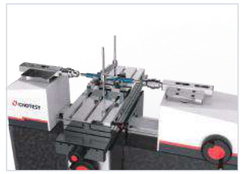

Thread ring gauge


Snap gauge

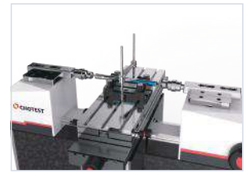

Caliper


Micrometer 3 points


External micrometer


Setting bar


Small plain ring gauge


Internal micrometer


Long gauge block


Pin gauge


Inner ring of bearing


Taper thread plug gauge


Dial test gauge


Depth micrometer


Digital radius gauge


Carbon fiber comparison gauge

Main Accessories


Workholder for taper gauge


Workholder for gauge block


Workholder for micrometer


One-coordinate floating table


V-shaped block


Five-axis object table


Workholder for micrometer 3 points


Measuring jaw

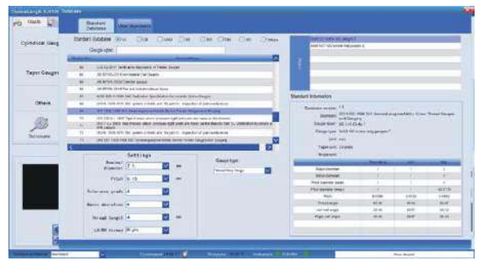

Inside measuring device


Ruby probes


Plain/Blade anvil


Spherical anvil & Measuring bar

Software



Parameters

Model No.		SJ5100-UP300	SJ5100-UP600	SJ5100-UP1000
Absolute measurement	External Range	0-340mm	0-640mm	0-1040mm
	Internal Range	0.7~200mm	0.7~500mm	0.7 ~900mm
Indication Error		±(0.09+L/1500)μm (Note: L is measured length in mm)		
Repeatability (2s)		≤0.06μm		
Resolution		0.01μm		
Max Pitch Diameter		200mm(Ring)/250mm(Plug)		
Measuring Force		0.1N, 0.3N, 0.5N, (1~10)N continuously adjustable by hand		
Operation Environment		20±0.5°C, fluctuation≤0.2°C /hour, Relative Humidity: 20~60%		
Dimension		1400×400×450mm	1400×400×450mm	1700×400×450mm
Weight		150kg	150kg	180kg
Five-axis Object Table	Z-axis Range	0~50mm		
	Y-axis Range	±25mm		
	X-axis Floation	±10mm		
	Z-axis Rotation	±3°		
	Y-axis Yaw	±3°		
	Loading capacity	≤30kg		
	Dimension	350mm×125mm		

Model No.		SJ5100-300A/B	SJ5100-600A/B	SJ5100-1000A/B	SJ5100-1500A/B	SJ5100-2000A/B	SJ5100-3000A/B
Absolute measurement	External Range	0~340mm	0~640mm	0~1040mm	0~1540mm	0~2040mm	0~3040mm
	Internal Range	0.7~200mm	0.7~500mm	0.7~900mm	0.7~1400mm	0.7~1900mm	0.7~2900mm
Indication Error		A series: ±(0.12+L/1000)μm; B series: ±(0.20+L/1000)μm (Note: L is measured length in mm)			A series: ±(0.25+L/1000)μm; B series: ±(0.4+L/1000)μm (Note: L is measured length in mm)		
Repeatability (2s)		A Series≤0.08μm; B Series≤0.10μm			A Series≤0.15μm; B Series≤0.20μm		
Resolution(μm)		0.01μm					
Max Pitch Diameter(mm)		200 mm(Ring)/250mm(Plug)					
Measuring Force		0.05N, 0.1N, 0.3N, 0.5N, (1~10)N continuously adjustable by hand					
Operation Environment		A series: 20±1 ℃, fluctuation≤0.2 ℃ /hour, Related Humidity: 20~60% B series: 20±2 ℃, fluctuation≤0.5 ℃/hour, Related Humidity: 20~60%					
Dimension(mm)		1400×400×450	1400×400×450	1700×400×450	2200×400×450	2700×400×450	3700×400×450
Weight		150kg	150kg	180kg	310kg	360kg	410kg
Five-axis object table	Z-axis Range	0~50mm					
	Y-axis Range	±25mm					
	X-axis Floation	±10mm					
	Z-axis Rotation	±3°					
	Y-axis Yaw	±3°					
	Loading Capacity	≤50kg					
	Dimension	350mm×125mm					

SJ5200/SJ5500 Series Universal Thread Measuring Machines

SJ5200

SJ5500

Functions

1. Full-automatic measurement for comprehensive parameters of cylindrical thread plug gauges, cylindricalthread ring gauges, taper thread plug gauges, taper thread ring gauges, plain ring gauges, plain pluggauges and other gauges with internal & external dimensions, including virtual pitch diameter, single pitchdiameter, basic pitch diameter, major diameter, minor diameter, thread pitch, thread angle, half of threadangle, flank straightness, lead angle, taper, etc.

2. Can measure trapezoidal thread gauges, buttress thread gauges, sawtooth thread gauges and otherlarge-slope thread gauges.

3. Can measure comprehensive parameters of single thread and multiple thread.

4. Can measure various thread gauges according to GB, ISO, BS, ANSI, DIN, JIS, API standards. Withcomprehensive and professional thread standards in database, it meets requirements of most customers.

5. Automatically generate test report according to selected standard.

6. After once measurement, the software can calculate various parameters of thread and display data of anyposition, it also could generate the thread curve, relevant parameters and analysis chart automatically.

7. Measuring probe and workholder are identified automatically, which avoids collision of measuring probecaused by misoperation.

8. One-sided or two-sided measurement and analysis for gauges.

9. Controller for measuring pin positioning: with an easy-to-use buttons control box, the operation is moreflexible.

10. User-friendly software, simple and easy-to-use.

11. Test results are saved automatically with name of measuring series number + size of measuring gauge+ type of measuring gauge. With centralized database management for measuring records, the user canquery and manage the measuring records according to object type, testing institution, manufacturingnumber, inspector, submitted institution, equipment number, inspection date, effective date, etc.

12. Can print multiple selected test records or test certificates from database at once time.

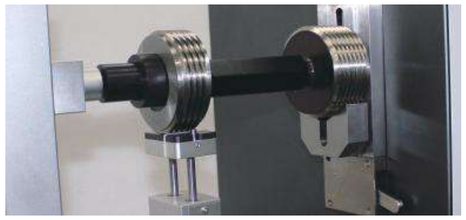
13. Can export test data to Word, Excel, AutoCAD (optional) files.

14. Data backup and restore.

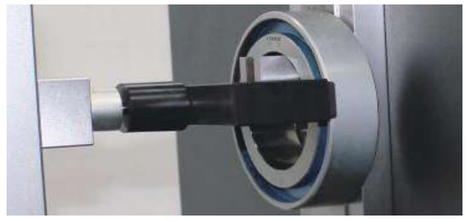
15. Can output reports in a variety of formats in Word or PDF, moreover the report format can becustomized.

16. Support user-defined standards.

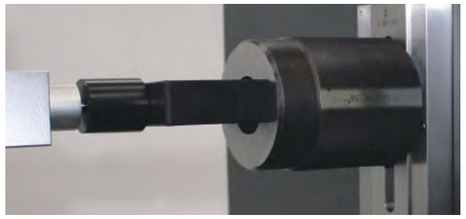
SJ5200 Application



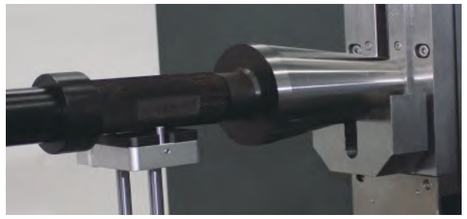
Thread plug gauge



Plain ring gauge



Taper plain ring gauge



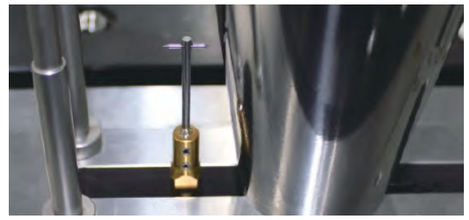
Taper plain plug gauge

SJ5200 Parameters

Model No.	SJ5200-60	SJ5200-100	SJ5200-160
External measuring range	(1.0-50)mm	(1.0-90)mm	(1.0-150)mm
Internal measuring range	(2.5-60)mm	(2.5-100)mm	(2.5-160)mm
Max scanning range	60mm(Optional 75mm)	60mm(Optional 75mm)	60mm(Optional 75mm)
Min pitch	0.1mm	0.1mm	0.1mm
Weight	200kg	250kg	300kg
Size	1000×450×1000mm	1000×450×1000mm	1000×450×1130mm
Measurement Uncertainty			
Cylindrical or Taper thread ring gauge(Minor diameter>2.5mm,half of thread angle≥27°)			
Minor diameter(μm)	2.5 + L/200	2.5 + L/200	2.5 + L/200
Actual pitch diameter(μm)	2.5 + L/200	2.5 + L/200	2.5 + L/200
Pitch(μm)	0.75 + L/200	0.75 + L/200	0.75 + L/200
Cylindrical or Taper thread plug gauge(Major diameter>1mm,half of thread			
Major diameter(μm)	2.0 + L/200	2.5 + L/200	2.5 + L/200
Actual pitch diameter(μm)	2.0 + L/200	2.5 + L/200	2.5 + L/200
Pitch(μm)	0.75 + L/200	0.75 + L/200	0.75 + L/200
Cylindrical or Taper plain gauge(Diameter from 1mm to 10mm)			
Diameter(μm)	1.5 + L/200	2.0+ L/200	2.0+ L/200
Cylindrical or Taper plain gauge(Diameter>10mm)			
Diameter(μm)	1.0+ L/200	1.5+ L/200	1.5+ L/200

SJ5500 Application

Thread plug gauge



Taper plain plug gauge

API gauge

API gauge

SJ5500 Parameters

Model No.	SJ5500-200	SJ5500-300	SJ5500-400	SJ5500-500	SJ5500-600
External measuring range	(1.0-250)mm	(1.0-350)mm	(1.0-450)mm	(1.0-550)mm	(1.0-620)mm
Internal measuring range	(2.5-250)mm	(2.5-350)mm	(2.5-450)mm	(2.5-550)mm	(2.5-620)mm
Max scanning range	250mm				
Min pitch	0.1mm				
Weight	2000kg				
Size	2000×900×910mm				
Measurement Uncertainty					
Cylindrical or Taper thread ring gauge(Minor diameter>2.5mm,half of thread angle≥27°)					
Minor diameter(μm)	3.0 + L/200				
Actual pitch diameter(μm)	3.0 + L/200				
Pitch(μm)	0.8 + L/200				
Cylindrical or Taper thread plug gauge(Major diameter>1mm,half of thread					
Major diameter(μm)	2.9 + L/200				
Actual pitch diameter(μm)	2.9 + L/200				
Pitch(μm)	0.8 + L/200				
Cylindrical or Taper plain gauge(Diameter from 1mm to 10mm)					
Diameter(μm)	2.0 + L/200				
Cylindrical or Taper plain gauge(Diameter>10mm)					
Diameter(μm)	2.0 + L/200				

SJ2018/2620 Automated Dial Indicator Testing Machines

Precision, Versatile, Efficient

SJ2018

SJ2620

Parameters

Model No.	SJ2018	SJ2620
Measuring range	(0-50)mm	
Resolution	0.01μm	
Repeatability	0.1μm	
Reading accuracy	1/60 of division value for Resolution 0.01mm dial indicator 1/30 of division value for Resolution 0.001mm dial indicator	
Indication Error	Random 1mm≤0.6μm Random 2mm≤0.6μm Random 10mm≤0.8μm Random 30mm≤0.9μm 50mm≤1μm	
Hysteresis	≤0.5μm	
Interface	RS232 (Can convert to USB)	
Input voltage	AC100~240V , 50~60Hz	
Operating environment	Temp.(20±2)℃ , RH(50~70)%	
Dimension	640×240×530mm	300×235×640mm
Weight	35kg	

Functions

1. Measure dial indicators, micrometer dial indicators, dial test indicators, dial bore indicators,automatically according to the elevant regulations and standards.
2. Measure the above gauges with digital display automatically.
3. Measure the above gauges with imperial system automatically.
4. Support semi-auto testing mode.
5. Automatic zeroing after click "Start".
6. Overtolerance hinting during measuring process.
7. Process and qualify the measured data automatically.
8. Can search and manage the test records according to object type, manufacturer, serial No.,inspector, applicant, equipment No., inspection date or effective date etc.
9. Can print or export former test records including error sheet or curve.
10. Can print or export multiple selected test records from database once time.
11. Can export test data in CSV, EXCEL, WORD.
12. Data backup and restore.
13.Can customize format of test report according to requirements of customer.
14. Support user-defined testing program and tolerance.

Application

Digital dial indicator

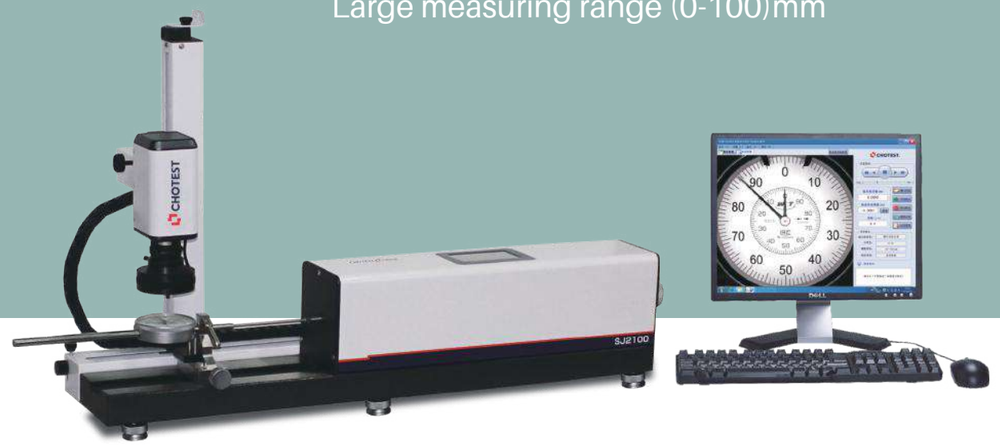
Dial test indicator

Dial bore indicator

Mechanical comparator

SJ2100
Automated Dial Indicator Testing Machines

Large measuring range (0-100)mm



Parameters

Model No.	SJ2100
Measuring Range	(0-100)mm
Resolution	0.1μm
Repeatability	0.1μm
Reading Accuracy	1/60 of division value for Resolution 0.01mm dial indicator 1/30 of division value for Resolution 0.001mm dial indicator
Indication Error	Random 1mm≤1μm, Random 2mm≤1μm, Random 10mm≤1.5μm Random 30mm≤2μm, Random 50mm≤2.5μm, 100mm≤4μm
Hysteresis	≤0.5μm
Interface	RS232 (Can convert to USB)
Input Voltage	AC100~240V, 50~60Hz
Operating Environment	Temp. (20±2)°C, RH(50~70)%
Dimension	700×205 ×165mm
Weight	30Kg

Workholder for plunger dial indicator

Item No.: SJ20D,SJ20A
Function: For testing of regular dial indicators
Stem diameter of indicator: Φ8mm

Workholder for lever-type indicator and bore dial indicator

Item No.: SJ20B
Function: For testing of dial test indicators and dial bore indicators
Stem diameter of indicator: Φ4, Φ6, Φ8mm(dial test indicators); Φ6~Φ28mm(dial bore indicators)

Extension bar for camera

Item No.: SJ22
Function: For testing of dial bore indicators with long stem

Three balls object table