CONTOUR AND SURFACE MEASUREMENT

PRE1237(5)

FORMTRACER: Complete surface and contour measurement, combined in one space-saving system.

Mitutoyo

Intelligent combinations for efficient measuring.

COMBINED MEASURING MACHINES

FORM

Surface and contour measurement in a single device. No compromise, with all the options.

Meticulous surface and contour measurement to the highest quality standards requires enormous technical competence. As an international supplier of a wide range of production measurement technology, Mitutoyo sets the standard in knowledge and competence in its field. This applies in particular to the economical combination of both measuring processes into a single system that can be adapted to your requirements. FORMTRACER machines meet the requirements of unlimited capacity for surface and contour measurement – intelligently combined into one space-saving, economical device.

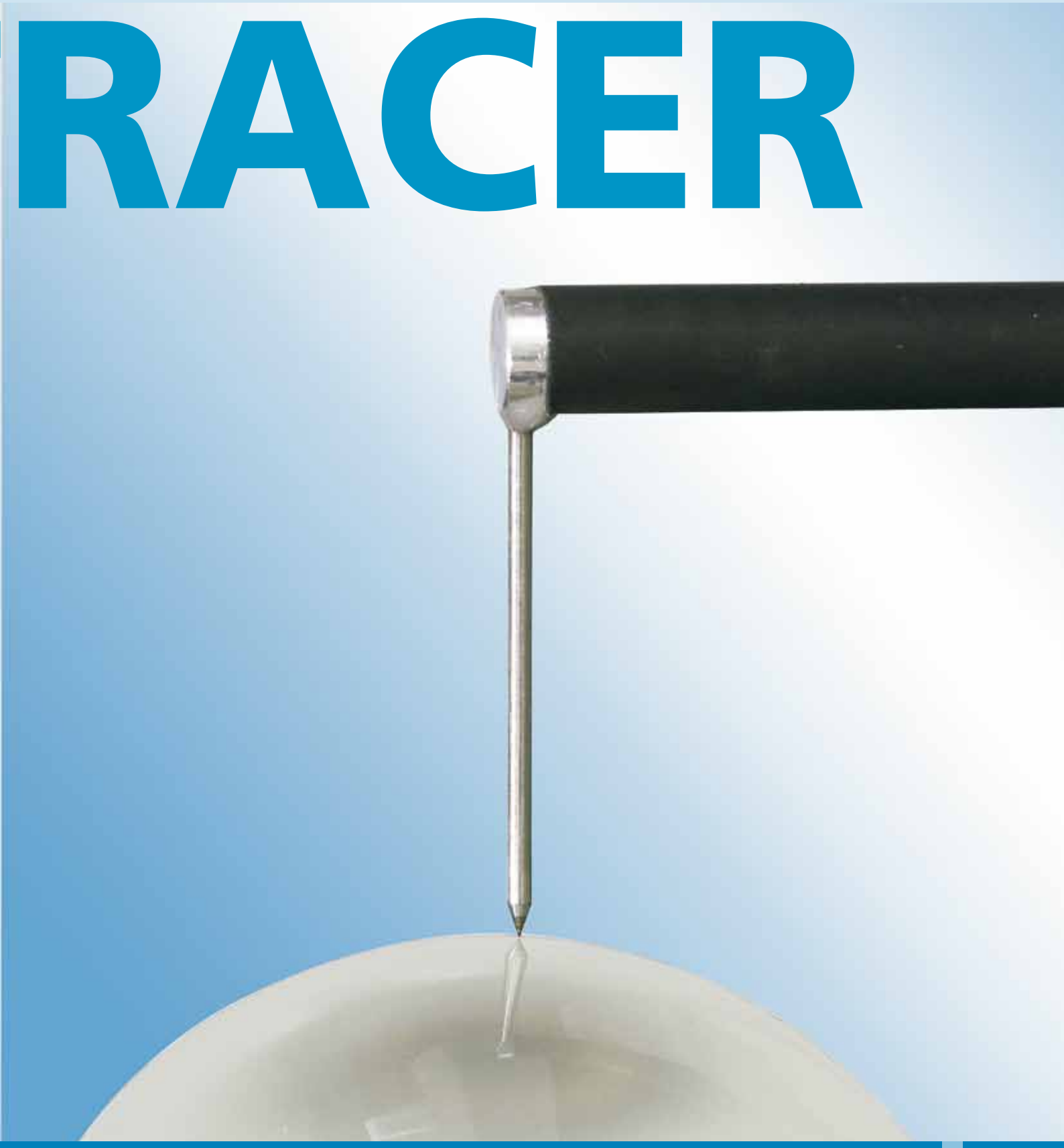
This brochure gives you an overview of the broad and intelligently structured Mitutoyo range of models for combined surface and contour measurement. Here you will find the perfect FORMTRACER configuration for roughness and waviness testing as well as for the evaluation of profiles on the production line itself, in the measuring room or in the test laboratory. From semi-automatic through to CNC-controlled high-performance systems, fast, safe and efficient guidance on the best solution for your specific measurement needs. You can request to see more detailed single-product brochures on the FORMTRACER of your choice, the range of accessories and software available.

Whatever you choose: with a Mitutoyo measuring system, you will secure the experience, competence and performance of an internationally successful technology leader, and customer-oriented service worth getting excited about.

Mitutoyo: all the benefits, intelligently combined!

FORMTRACER

RACER



The best connections for versatile applications. FORMTRACER variants.

Measuring method		Model	Brief profile
SV-C (separate sensor)	Semi-automatic	FORMTRACER SV-C 3200 Accuracy: X axis: ±(0.8+0.01L) µm [S4, H4, W4] ±(0.8+0.02L) µm [S8, H8, W8]	Intelligent combination of two complete systems for contour measurement and comprehensive surface analysis.
		FORMTRACER SV-C 4500 Accuracy: X axis: ±(0.8+0.01L) µm [S4, H4, W4] ±(0.8+0.02L) µm [S8, H8, W8]	For particularly stringent requirements in contour measurement in the measuring room and laboratory. With dual stylus system for upward/downward contour measurement.
	CNC	FORMTRACER EXTREME SV-C 3000 CNC / SV-C 4000 CNC Accuracy: X axis: ±(1+4L/200) µm	Powerful CNC-capable connection of two unlimited contour measurement and comprehensive surface analysis systems. With CNC control in all axes for efficient series testing.
CS (combined sensor)	Semi-automatic	FORMTRACER CS-3200 Accuracy: X axis: ±(0.8+0.01L) µm	Powerful device with combined sensor for efficient simultaneous measuring of contour and surface in one measuring process.
	CNC	FORMTRACER EXTREME CS-5000 CNC Accuracy: X axis: ±(0.3+0.002L) µm FORMTRACER CS-H 5000 CNC Accuracy: X axis: ±(0.16+0.001L) µm	CNC reference system with a large measuring range for maximum precision tasks in research, development and quality assurance. The high end system with integrated laser holoscale for maximum precision in the test room and laboratory.

SV-C

FORMTRACER SV-C 3200
FORMTRACER SV-C 4500

FORMTRACER EXTREME SV-C 3000 CNC
FORMTRACER EXTREME SV-C 4000 CNC

Mitutoyo has a wide range of models for different fields of application.

Specific features	Model	Measuring range X axis	Height adjustment	Base plate dimensions
• Two separate, interchangeable sensors • Digital scale • Motor-driven height-adjustment of the Z axis • Fully-automatic sequence of measuring programs	SV-C 3200 S4	100 mm	300 mm	600 x 450 mm
	SV-C 3200 H4	100 mm	500 mm	600 x 450 mm
	SV-C 3200 W4	100 mm	500 mm	1000 x 450 mm
	SV-C 3200 S8	200 mm	300 mm	600 x 450 mm
	SV-C 3200 H8	200 mm	500 mm	600 x 450 mm
	SV-C 3200 W8	200 mm	500 mm	1000 x 450 mm
• Two separate, interchangeable sensors • Dual stylus contour measuring unit • Motor-driven height adjustment of the Z axis • Fully automatic sequence of measuring programs	SV-C 4500 S4	100 mm	300 mm	600 x 450 mm
	SV-C 4500 H4	100 mm	500 mm	600 x 450 mm
	SV-C 4500 W4	100 mm	500 mm	1000 x 450 mm
	SV-C 4500 S8	200 mm	300 mm	600 x 450 mm
	SV-C 4500 H8	200 mm	500 mm	600 x 450 mm
	SV-C 4500 W8	200 mm	500 mm	1000 x 450 mm
• Two separate, interchangeable sensors • Digital scale (laser holoscale SV-C 4000 CNC) • Vibration-absorbing air bearings • Up to six axes CNC controlled	SV-C 3000 CNC S8	200 mm	300 mm	1000 x 450 mm
	SV-C 3000 CNC H8	200 mm	500 mm	1000 x 450 mm
	SV-C 4000 CNC S8	200 mm	300 mm	1000 x 450 mm
	SV-C 4000 CNC H8	200 mm	500 mm	1000 x 450 mm
• A combined sensor • Digital scale • Motor-driven height adjustment of the Z axis • Fully-automatic sequence of measuring programs	CS-3200 S4	100 mm	300 mm	600 x 450 mm
• A combined sensor • Laser holoscale • Vibration-absorbing air bearings • Up to six axes CNC controlled	CS-5000 CNC S8	200 mm	300 mm	1000 x 450 mm
	CS-5000 CNC H8	200 mm	500 mm	1000 x 450 mm
	CS-H 5000 CNC	200 mm	300 mm	1000 x 450 mm

FORMTRACER CS-3200

FORMTRACER CS-5000 CNC

FORMTRACER technology: Simply more capable.

TWO in ONE – two measuring processes in a single system

FORMTRACER machines open up the whole range of surface and contour measurement techniques – intelligence and compactness, combined in a single space-saving device. FORMTRACER machines, depending on the version, will also operate either with two separate measuring sequences for each process – or, with combined sensor, in a single measuring sequence for simultaneous surface and contour testing.

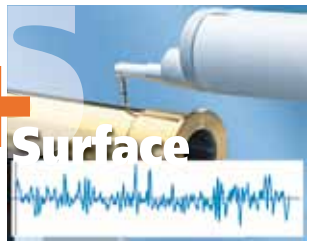
SV-C System

Measurement in two separate measuring sequences
FORMTRACER variants with SV-C system are fitted with two separate interchangeable sensors for separate surface and contour measurement. Evaluation and documentation of test results can either be separate or combined using Mitutoyo's FORMTRACEPAK software.

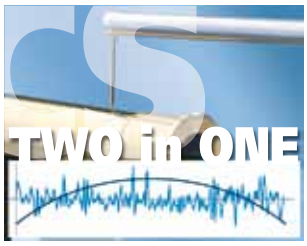
CS System

Measurement in a single measuring sequence
FORMTRACER CS machines check the surface and contour of a workpiece in a single measuring sequence. They have a combined sensor for both processes. The FORMTRACEPAK software can either carry out separate or joint evaluation and documentation.

Contour testing



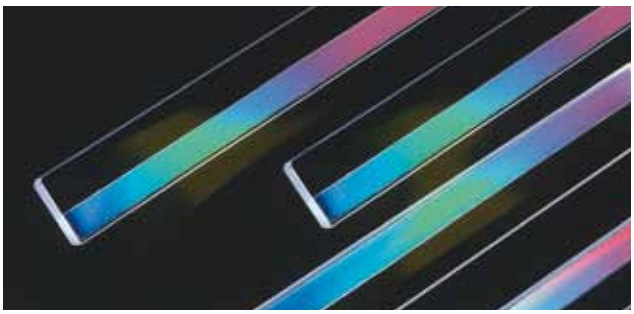
Surface testing



Contour and surface testing

Laser holoscale

Several models in the FORMTRACER series are fitted with highly sophisticated laser holoscales for maximum precision work. Laser holoscales are glass scales which use the diffraction phenomenon of light to make the measurement by projecting an interference pattern from a laser onto a holographic screen. A photoelement then transforms the pattern into an electrical sinusoidal wave. This innovative technology can achieve resolutions of up to 0.004 µm over the entire measuring range.



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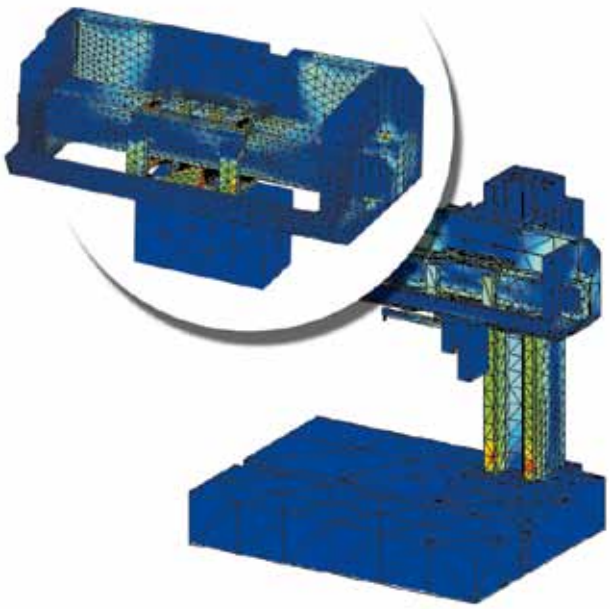
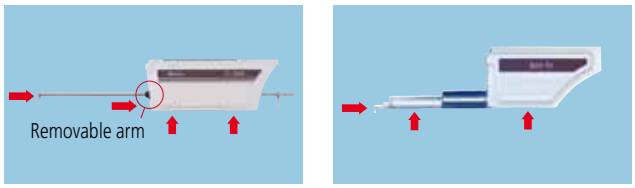
New design principles for even greater stability

Higher stability and guidance quality due to modern design processes: FORMTRACER measuring machines are designed using the finite element method (FEM). This ensures considerably greater rigidity and straightness of the guide elements and effective vibration reduction – essential factors in giving these systems their impressive power.



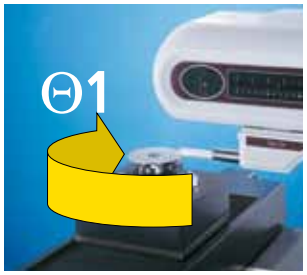
Collision prevention

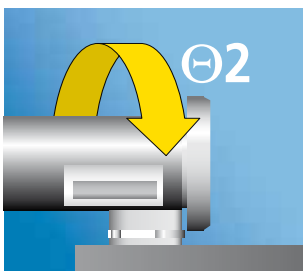


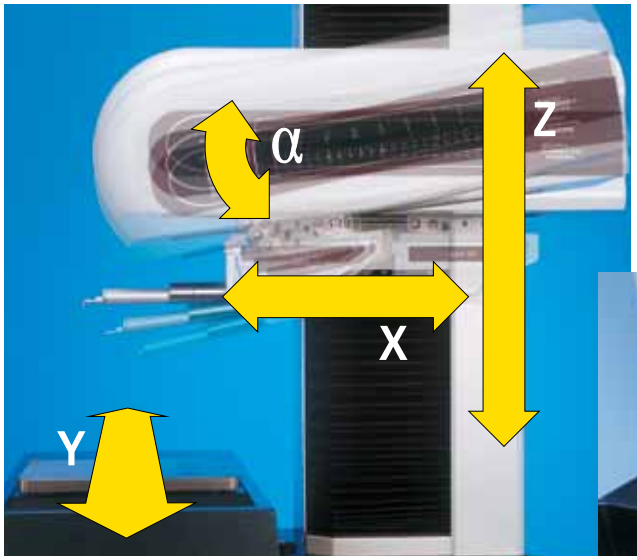
FORMTRACER machines in the SV-C, CS-3200 and CS-5000 CNC series are equipped with collision prevention.

Control in up to six axes

Control in up to six axes – including tilting and rotational movements – means that the CNC systems in the FORMTRACER series can position workpieces extremely quickly and therefore achieve optimum throughput rates during series measurements. Particularly useful is the option of controlling all axes via the double joystick supplied as standard.







Tilting of the measuring system

FORMTRACER SV-C 3200 and SV-C 4500. Double benefits, no compromise.

SV-C 3200

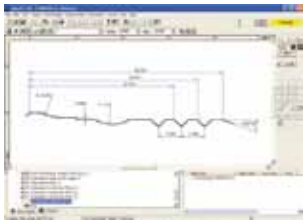
SV-C 4500

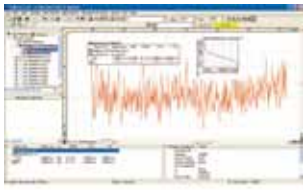
Measuring range [Resolution]:	
X axis	100/200 mm [0.05 µm]
Z2 axis	300/500 mm [1.00 µm]
CONTOUR MEASUREMENT:	
Measuring range Z1	60 mm
Resolution Z1	0.04 µm
Accuracy X [S4,H4,W4]	±(0.8+0.01L) µm
Accuracy X [S8,H8,W8]	±(0.8+0.02L) µm
Accuracy Z1	±(1.6+I2HI/100) µm
Straightness X	0.8 µm/100 mm
	2 µm /200 mm
SURFACE MEASUREMENT:	
Measuring range Z1	800/80/8 µm
Resolution Z1	up to 0.0001 µm
Straightn. X [SHW4]	(0.05+0.0001L) µm
Straightn. X [SHW8]	0.5 µm/200 mm

FORMTRACER SV-C 3200

As powerful as two separate specialized systems. Economically combined into a single device.

- Two separate sensors for contour and surface analysis
- Expanded contour measuring range of Z1 = 60 mm as standard
- Surface measurement range of 800 µm as standard
- Easy exchange of magnetic contour stylus arm gives excellent flexibility
- Measurement and analytical software FORMTRACEPAK
- Excellent accuracy and resolution
- Highest positioning speed up to 80 mm/s





Measuring and analytical software

SV-C 3200

Measuring range [Resolution]:	
X axis	100/200 mm [0.05 µm]
Z2 axis	300/500 mm [1.00 µm]
CONTOUR MEASUREMENT:	
Measuring range Z1	60 mm
Resolution Z1	0.02 µm
Accuracy X [S4,H4,W4]	±(0.8+0.01L) µm
Accuracy X [S8,H8,W8]	±(0.8+0.02L) µm
Accuracy Z1	±(0.8+I2HI/100) µm
Straightness X	0.8 µm/100 mm
	2 µm/200 mm
SURFACE MEASUREMENT:	
Measuring range Z1	800/80/8 µm
Resolution Z1	up to 0.0001 µm
Straightn. X [SHW4]	(0.05+0.0001L) µm
Straightn. X [SHW8]	0.5 µm/200 mm

FORMTRACER SV-C 4500

High accurate system for high-precision testing in measuring rooms and laboratories.

- Dual stylus contour measuring unit for upward / downward measurement at double sided contours
- Contour measuring range of Z1 = 60 mm as standard
- Surface measurement range of 800 µm as standard
- Measuring force controlled by software FORMTRACEPAK
- Easy exchange of magnetic contour stylus arm gives excellent flexibility
- Highest accuracy and resolution
- Highest positioning speed up to 80 mm/s

Mitutoyo

FORMTRACER

Semi-automatic

SV-C 4500

FORMTRACER EXTREME SV-C 3000 CNC.
Production-ready measurement competence.

SV-C 3000 CNC

Measuring range [Resolution]:	
X axis	200 mm [0.05 µm]
Z2 axis	300/500 mm [0.05 µm]

CONTOUR MEASUREMENT:	
Measuring range Z1	50 mm
Resolution Z1	0.2 µm
Accuracy X	±(1+4L/200) µm
Accuracy Z1	±(2+l4Hl/100) µm
Straightness X	2 µm/200 mm

SURFACE MEASUREMENT:	
Measuring range Z1	800/80/8 µm
Resolution Z1	up to 0.0001 µm
Straightness X	0.5 µm/200 mm

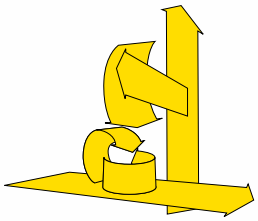
Traversing speed:	
CNC	max. 200 mm/s
Joystick	0-60 mm/s

Measuring and analytical software

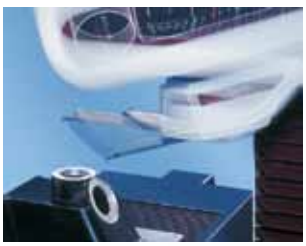
FORMTRACER EXTREME SV-C 3000 CNC

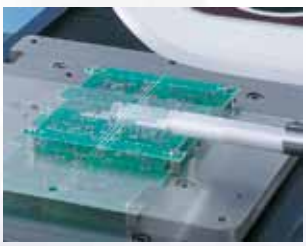
Perfect combination of two powerful systems for contour and surface analysis. With CNC control in six axes for comprehensive serial measurements.

- Two separate sensors
- High traversing speed
- Digital scale on the X and Z axes
- Straightness of the X axis (feed):
  for contour measurement 2 µm/200 mm
  for surface measurement 0.5 µm/200 mm
- Ceramic guides on the X axis (feed)
- Simultaneous movement in several axes is possible
- Driving in up to six axes is possible
- Automatic positioning of the workpiece by controllable rotary table and Y table
- Vibration-absorbing air bearings
- Double joystick for programming all six axes and for starting and stopping the measuring process, etc.
- Measuring and analytical software FORMTRACEPAK supplied as standard
- Data transmission via USB interface



Control in up to 6 axes





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FORMTRACER CNC

Surface Roughness drive unit

Contour drive unit

FORMTRACER CS-3200.
Double the value – half the cost.

CS-3200

Measuring range:	
X axis	100 mm
Z1 axis	5 mm
Accuracy:	
X axis	±(0.8+0.01L) µm
Z1 axis	±(1.5+|2H|/100) µm
Resolution:	
X axis	0.05 µm
Z1 axis	0.08 µm/5 mm
	0.0008 µm/0.05 mm

Measuring and analytical software

FORMTRACER CS-3200

Simultaneous surface and contour testing over a wide measuring range in a single pass. For maximum savings in time and cost.

- A combined sensor
- Inclination of the sensor up to ±45° possible
- Straightness of the X axis (feed): 0.2 µm/100 mm
- Ceramic guides on the X axis (feed)
- Inductive measuring system in the Z1 axis
- Motor-driven height adjustment of the Z2 axis
- Automatic raising and lowering of the probe tip
- Joystick operation for moving all axes and among other things for starting and stopping the measuring process
- Measurement and analytical software FORMTRACEPAK-6000 supplied as standard
- Data transmission via USB interface
- ABS scale in the Z2 axis
- High traversing speed
- Automatic calibration function
- Collision prevention

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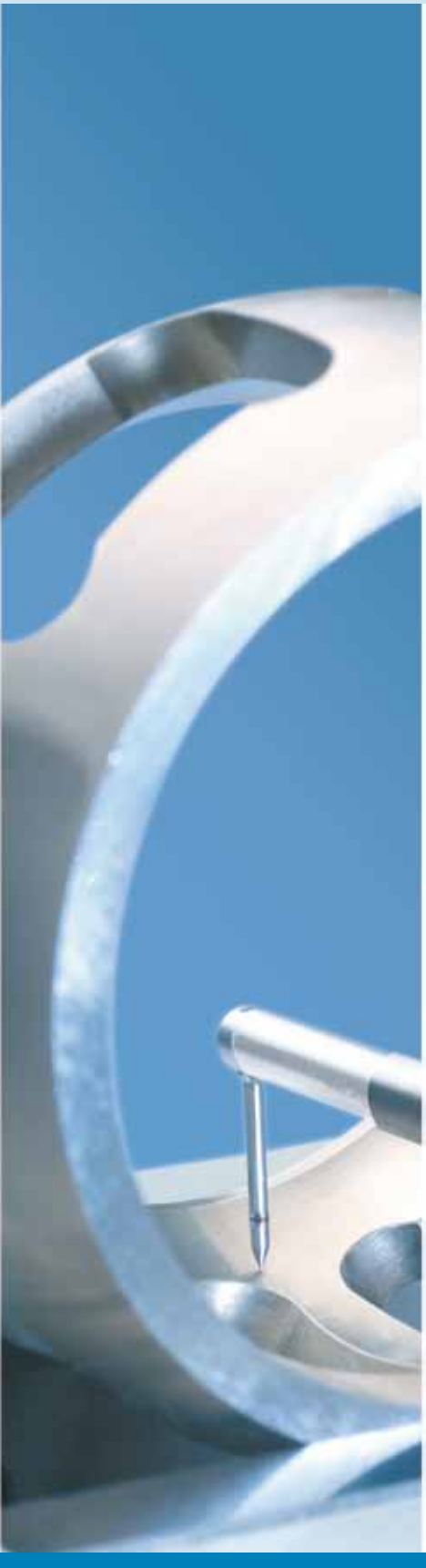
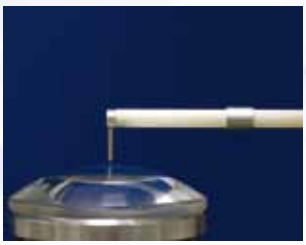
PLEASE NOTE: A start-up system (relocation detection sensor) is an integral security feature of this machine and will disable its operation if subject to relocation or strong vibration. Please be advised to contact your nearest Mitutoyo Service Centre as soon as possible or in advance of such circumstance.

FORMTRACER

Semi-automatic





FORMTRACER EXTREME CS-5000 CNC/CS-H 5000 CNC. Setting the standards.

CS-5000 CNC/CS-H 5000 CNC

CS-5000 CNC

Measuring range:

X axis	200 mm
Z1 axis	12 mm / 24 mm
Z2 axis	300 / 500 mm

Accuracy:

X axis	±(0.3+0.002L) µm
Z1 axis	±(0.3+|2H|/100) µm

Resolution:

X axis	0.00625 µm
Z1 axis	up to 0.004 µm

Traversing speed:

CNC	max. 200 mm/s
Joystick	0-50 mm/s

CS-H 5000 CNC

Measuring range:

X axis	200 mm
Z1 axis	12 mm / 24 mm

Accuracy:

X axis	±(0.16+0.001L) µm
Z1 axis	±(0.07+|0.02H|) µm

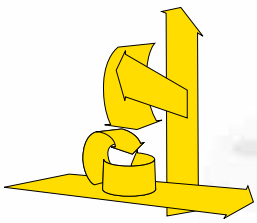
Resolution:

X axis	0.00625 µm
Z1 axis	to 0.004 µm

FORMTRACER EXTREME CS-5000 CNC/CS-H 5000 CNC

Perfect CNC precision for research, development, quality assurance and series testing. Better, high speed performance and a wide measuring range.

- A combined sensor
- Laser holoscale in the X and Z axes
- Ceramic guides on the X axis (feed)
- Drive is possible in up to six axes (CS-H up to 5 axes)
- Active control of the probe system
- Automatic positioning of the workpiece with controllable rotary table and Y table
- Vibration-absorbing air bearing
- Double joystick operation for programming all six axes and for starting and stopping the measuring process, etc.
- Measurement and analytical software FORMTRACEPAK supplied as standard
- Data transmission via USB interface
- Highest accuracy with CS-H 5000 CNC



Drive in up to 6 axes

Mitutoyo

FORMTRACER CNC

Software FORMTRACEPAK

MiCAT
Mitutoyo Intelligent Computer Aided Technology
the standard in world metrology software
FORM

FORMTRACEPAK

Software package

Expansion module

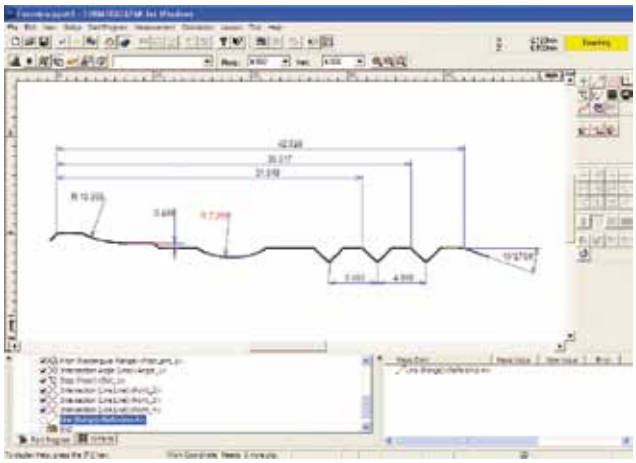
MeasurLink

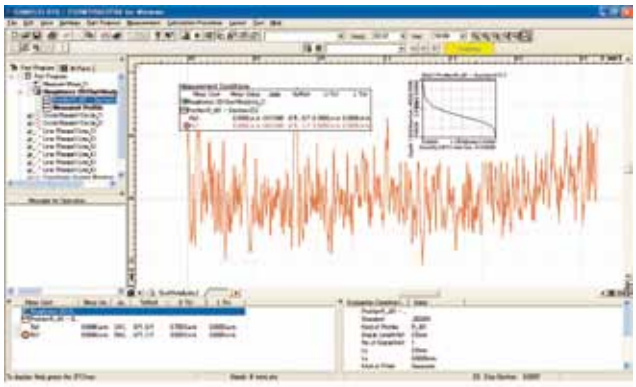
Module for statistical measurement data processing and analysis, and storage of measured data.

With all systems in the SV-C and CS series, multilanguage FORMTRACEPAK software covers machine control and the evaluation and documentation of test results. Depending on the system used, FORMTRACEPAK also controls the machine axes.

This software solution offers the user the full program of maximum efficiency surface and contour measurement with versatile evaluation and documentation options. Some examples follow:

- Automatic measurement program sequences
- Best fit for automatic measuring sequence
- Representation of results as a drawing and table
- Graphic representation of contour or surface profile
- Construction of help geometries
- Contour comparison
- Freely-definable tolerance ranges
- Editing function
- Automatic storage of the measurement results
- Layout editor for representation of the test results
- Automatic calibration function
- Archiving of calibration data





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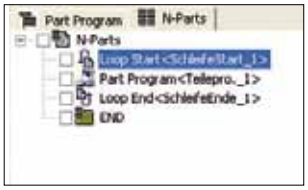
All FORMTRACER machines are supplied as standard with perfectly configured software tailored to the specific performance profiles.

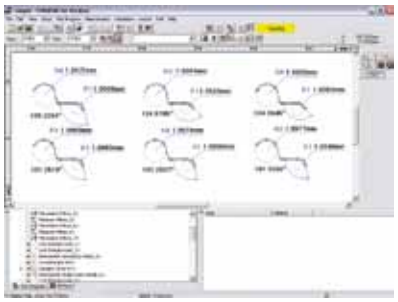
Measurement Control

- The Measurement Control screen has various command buttons appropriately arranged. They are required for creating and executing measurement procedures (part programs). Since the buttons and display areas not frequently used can be optionally set for display or no-display, the operator is permitted to arbitrarily customize the screen layout as easily as possible for operation.
- The "Workpiece Identification Function", for example, that detects the amount of offset brought up during datum setting and mechanically fine-adjusts each axis to the optimum setting position for the measurement, as well as the "Coordinate System Alignment" commands that generate the optimum coordinate system for each measurement part, allow fully automatic running.
- With the multi-axis translation command that simultaneously controls the movement along a maximum of six axes it is now possible to reduce the operation time required by the measuring instrument to a minimum and to further reduce the tracing time.
- For measuring multiple parts arranged on the palette, the use of the multiple-part loop function that repeats a set of movement, measurement, and analysis commands can reduce the time required to create the specific measurement steps.



Profile Analysis Function

- Various commands including the point command (10 kinds), line command (6 kinds), and circle command (6 kinds) are provided to cover the basic elements of analysis. Standard calculation commands that combine these elements for angle, pitch, and distance calculations are also provided.
  The display method used by additional commands that are not regularly used can be optionally tailored by the customization function, e.g. "Hide", can be applied to the calculation command button to suit the application environment.



- The step from performing a single measurement using the intuitive menu functions to creating a part program is easily done with a few mouse clicks.

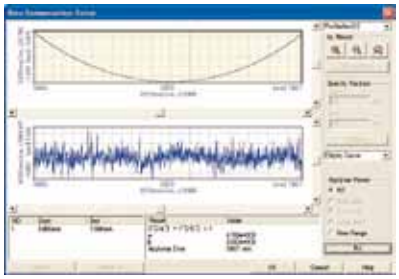
- Calculation results will be output as text (in the csv or txt format). The geometrical measurement data can be either output as a text file of point-series data or a CAD file (in the DXF or IGES format) or copied onto the clipboard. It is also possible to use some commercial documentation software and statistical processing software to share the data on a PC that is not equipped with Mitutoyo-original analysis software or if reverse engineering is intended with CAD.

Surface Roughness Analysis Function

- Using the surface roughness measurement data it is possible to conduct analysis that conforms to global standards including DIN EN ISO, VDA, JIS, ANSI, MOTIF, etc.

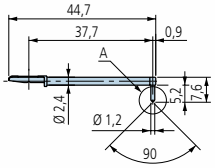
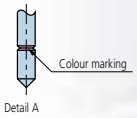
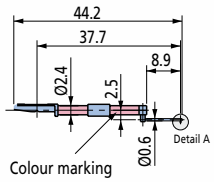
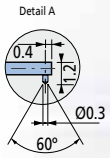
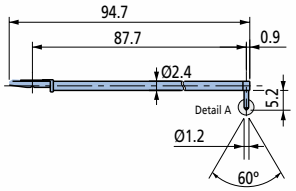
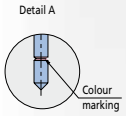
- This software has integrated not only parameter calculating functions but also comprehensive graphical analysis functions, which can be widely used in daily quality control and R&D operations.

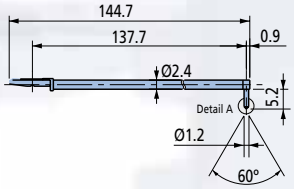
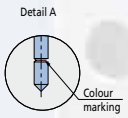
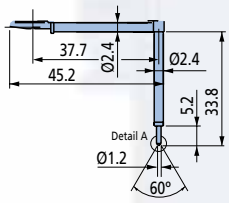
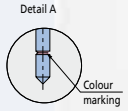
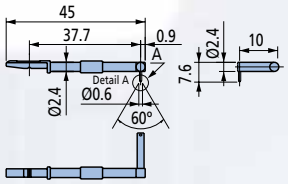
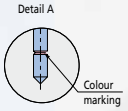
- Also enhanced with the data correction function (applicable to inclination and a curved surface) and data elimination function, etc.



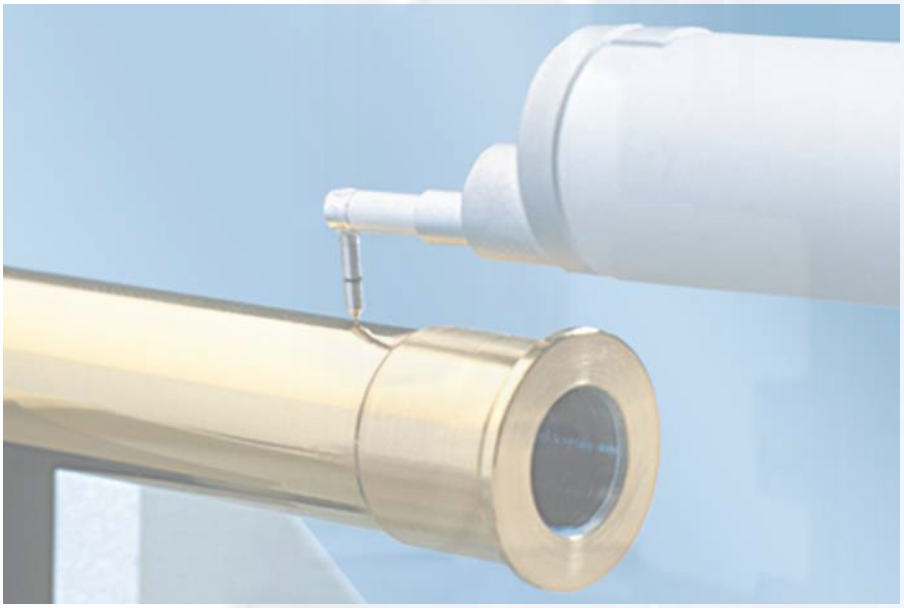
Possible combinations of probe components for the FORMTRACER models SV-C 3200, SV-C 4500 and SV-C 3000 CNC.

Probe tips for surface measurement*

Version	Dimensions	Tip detail
Standard 12AAC731 (2 µm) 12AAB403 (5 µm) 12AAB415 (10 µm)		
For small holes 12AAC733 (2 µm) 12AAB405 (5 µm) 12AAB417 (10 µm)		
For deep holes X 2 probes 12AAC740 (2 µm) 12AAB413 (5 µm) 12AAB425 (10 µm)		

Version	Dimensions	Tip detail
For deep holes X 3 probes 12AAC741 (2 µm) 12AAB414 (5 µm) 12AAB426 (10 µm)		
For deep grooves 12AAC737 (2 µm) 12AAB407 (5 µm) 12AAB419 (10 µm)		
Eccentric 12AAC739 (2 µm) 12AAB412 (5 µm) 12AAB424 (10 µm)		

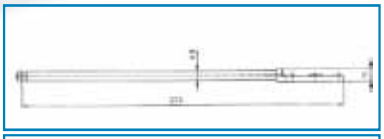
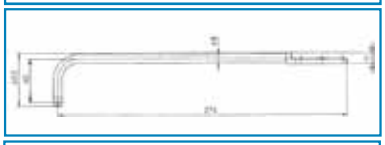
* Extract from the wide range of styli.



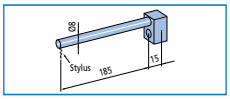
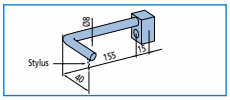
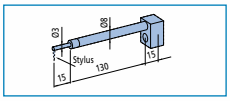
Mitutoyo

For contour measurement

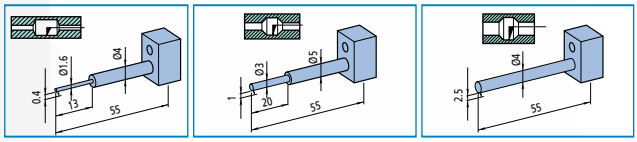
Applicable arms for SV-C3200, SV-C4500

Version	Dimensions	Designation
Straight 12AAM101		AB-31
Eccentric 12AAM102		AB-32
Small hole 12AAM103		AB-33

Applicable arms for SV-C3000CNC

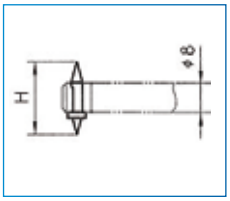
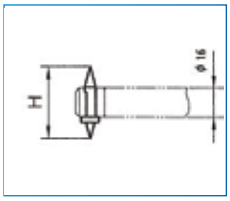
Straight		ABH-53 6 mm ABH-63 12 mm ABH-71 20 mm ABH-81 30 mm ABH-91 42 mm
Angled		ABH-52 6 mm ABH-62 12 mm ABH-72 20 mm ABH-82 30 mm ABH-92 42 mm
For small diameters		ABH-21

Applicable arms for small diameters for SV-C3000CNC

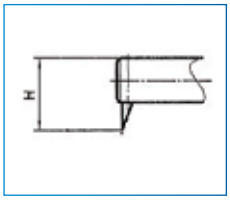


SPH-21	SPH-22	SPH-23

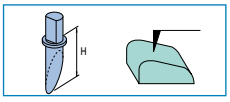
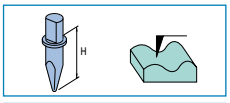
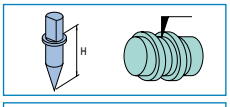
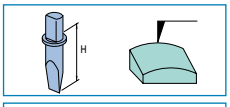
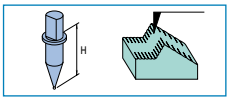
Applicable styli for SV-C4500

Version	Dimensions	Designation
Both sides conical 12AAM095		SPHW-56 20 mm
Both sides conical 12AAM096		SPHW-66 32 mm
Both sides conical 12AAM097		SPHW-76 48 mm
Both sides small hole 12AAM108		SPHW-31 2.4 mm
Both sides small hole 12AAM109		SPHW-32 5 mm
Both sides small hole 12AAM110		SPHW-33 9 mm

Applicable styli for SV-C3200, SV-C4500

Small hole		SPH-41 2 mm
Small hole		SPH-42 4 mm
Small hole		SPH-43 6.5 mm

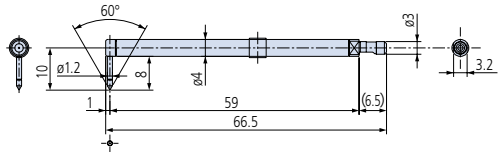
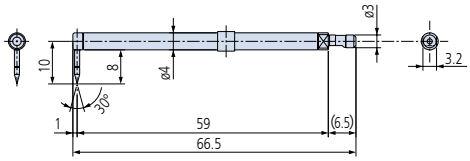
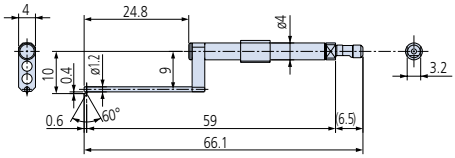
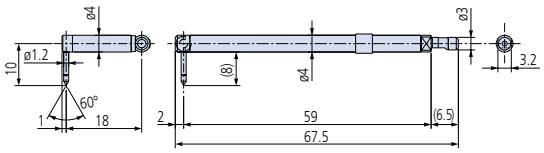
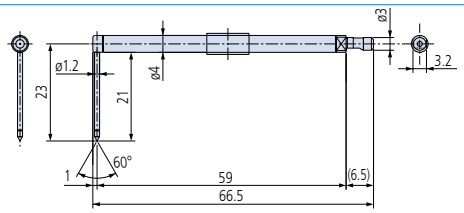
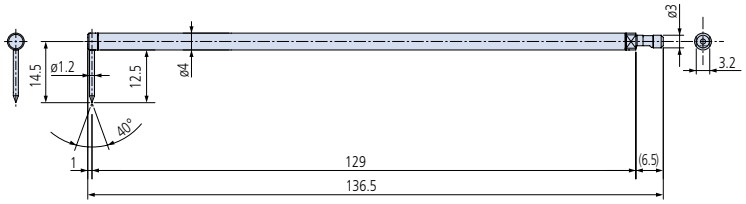
Applicable styli for SV-C3200, SV-C4500, SV-C3000CNC**

Flat on one side		SPH-51 6 mm SPH-61 12 mm SPH-71 * 20 mm SPH-81 30 mm SPH-91 42 mm
Cross-ground		SPH-52 6 mm SPH-62 12 mm SPH-72 20 mm SPH-82 30 mm SPH-92 42 mm
Conical		SPH-53 6 mm SPH-63 12 mm SPH-73 20 mm SPH-83 30 mm SPH-93 42 mm
Knife edge		SPH-54 6 mm SPH-64 12 mm SPH-74 20 mm SPH-84 30 mm SPH-94 42 mm
Ball		SPH-55 6 mm SPH-65 12 mm SPH-75 20 mm SPH-85 30 mm SPH-95 42 mm

* Standard accessory
** Extract from the wide range of styli.

Possible styli with the FORMTRACER model CS-3200.

Styli for surface and contour measurement

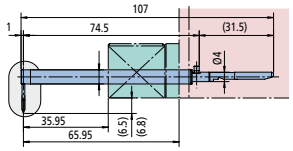
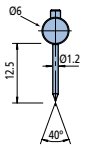
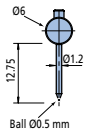
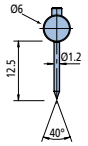
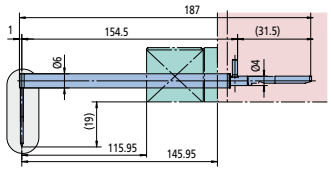
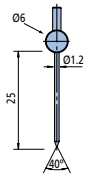
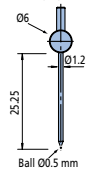
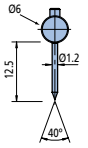
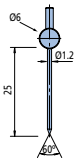
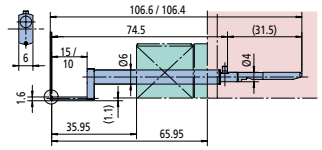
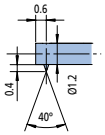
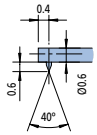
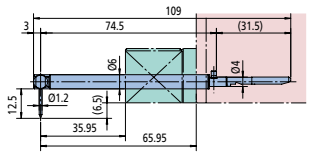
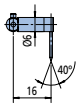
Type	Dimensions	Specifications
Standard stylus **(No.12AAD554)** Standard accessory		• Radius of tip curvature: 2 µm • Tip form: 60° cone • Tip material: Diamond • For contour/surface roughness measurement • Measurable depth: 7 mm max.
Cone stylus **(No.12AAD552)** Standard accessory		• Radius of tip curvature: 25 µm • Tip form: 30° cone • Tip material: Sapphire • For contour measurement • Measurable depth: 7 mm max.
Small hole stylus **(No.12AAD556)**		• Radius of tip curvature: 2 µm • Tip form: 60° cone • Tip material: Diamond • For contour/surface roughness measurement • Applicable hole: ø 2 mm min. • Measurable depth: 15 mm max.
Eccentric type stylus **(No.12AAD558)**		• Radius of tip curvature: 2 µm • Tip form: 60° cone • Tip material: Diamond • For contour/surface roughness measurement • Offset from center line: 15 mm
Deep groove stylus **(No.12AAD560)**		• Radius of tip curvature: 2 µm • Tip form: 60° cone • Tip material: Diamond • For contour/surface roughness measurement • Measurable depth: 20 mm max.
2x-long stylus*1 **(No.12AAD562)**		• Radius of tip curvature: 5 µm • Tip form: 40° cone • Tip material: Diamond • For contour/surface roughness measurement

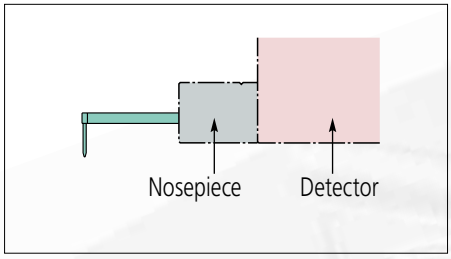
*1: Measuring force is 4mN and the Z1 measuring range and resolution is double that of the standard stylus.
Note: Styli shown on this page are for the CS-3200 standard detector unit. Cannot be used with contour detector units 3000/4000 (factory-set options).
Styli for contour measuring instrument CV-3100/4100 series can be used with contour detector unit 3000/4000.

Mitutoyo

Possible styli with the FORMTRACER models CS-5000 CNC and CS-H 5000 CNC.

Styli for surface and contour measurement

Type	Dimensions	Tip detail		Additional for CS-H5000CNC	
Standard		Standard 12AAD543 	Ball tip 12AAD544 	12AAJ037 	
Double length		Standard 12AAD545 	Ball tip 12AAD546 	12AAJ039 	12AAJ041 
For small holes		12AAD651 	12AAD652 		
Eccentric		12AAD653 			

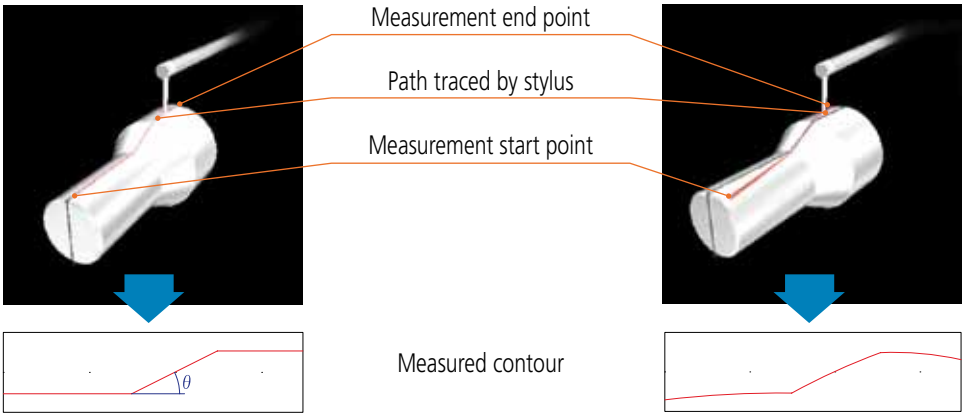


Accessories

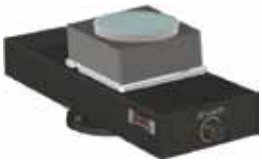
Manual three-axis adjustment table

Aligned

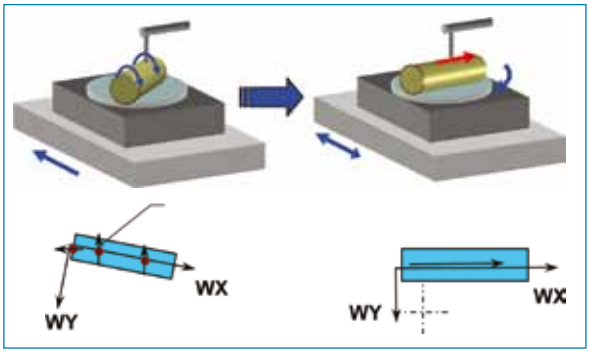
Not aligned



For significantly easier manual fine positioning of the workpiece using integral Digimatic micrometers. The information required for alignment is provided and displayed by the software. The triple-axis adjustment table also enables ideal alignment of cylindrical workpieces to the measurement axis – measurement errors by deviation from the axis of the parts tested can therefore be reliably avoided.



Combination Y table and θ1 axis

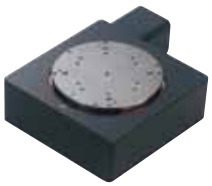


As an alternative to manual alignment, FORMTRACEPAK software, in combination with CNC accessories, will automatically align workpieces and ensure optimum measurement conditions.

Automatic leveling table

For automatically aligning the workpiece with the reference plane. After determining the workpiece inclination by the measuring system, the software calculates the optimal automatic setting of the levelling table.

Examples of accessories for CNC function support



θ1 axis

θ2 axis

Y table

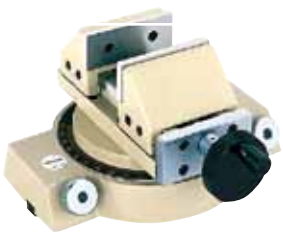
2D/3D auto-levelling table

Mitutoyo

218-001

XY table

218-003



Rotary vice

178-052-1

XY levelling table (DIGIMATIC)

178-009

Vice

Please ask for our other overview brochures!

FORM MEASUREMENT

Individual solutions for perfect measurement of rotationally-symmetrical workpieces – from particularly easy-to-operate compact instruments with an integral printer through to the high-accuracy class reference model.

CONTOUR MEASUREMENT

Contour measurement for performance-oriented results. Whether you choose the digital solution for mobile applications or stationary use, Mitutoyo offers individual systems, sophisticated technologies and impressive designs, based on world-recognised competence and experience.

SURFACE MEASUREMENT

Mitutoyo presents an intelligently structured product range of sophisticated solutions for modern surface testing. Discerning clients will find here the configuration to meet their needs, for thoroughly perfect roughness and waviness measurements – both in production and in the laboratory.

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