

CONTOUR MEASUREMENT

Bulletin No. 1751



Mitutoyo contour measuring instruments — high precision for the most demanding applications from lab to production floor.

Mitutoyo

In quality control there is no compromise. . .

...only winners and losers.

CONTOUR MEASUREMENT

To win in today's competitive marketplace demands strict quality control in order to maintain the high manufacturing standards required for continued success. Not just today, but every day. . .without fail. And because quality control is based on measurement, your company's future depends on its ability to use the best measuring technology available, in the most cost-effective way possible.

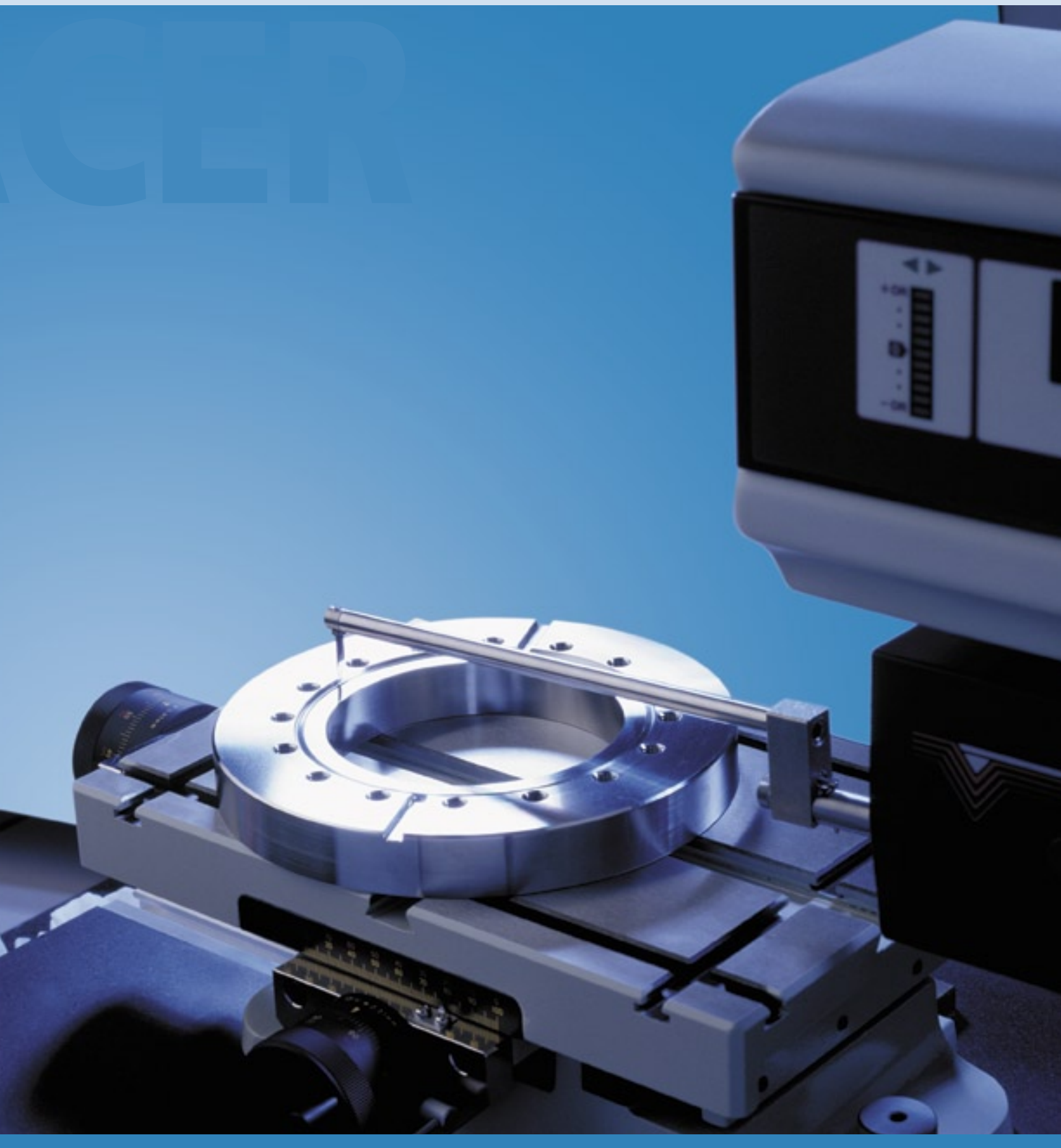
Tracing and evaluating product-contour characteristics put especially high demands on technology. As producer of the widest range of production measuring machines, instruments and systems in the world, Mitutoyo defines the standard for know-how and experience in this type of measurement, and offers you a solution for practically any application from shop floor to quality control room.

This brochure presents an overview of Mitutoyo's extensive range of contour measuring solutions — from a convenient, economical, portable instrument right up to the top-level system incorporating a laser Hologram technique based on the interference phenomenon of diffracted light. This brochure overview includes instrument specifications, configurations, additional equipment options and software solutions.

To provide detailed information on the system of your choice, single product brochures are available upon request.

Whichever model you choose, Mitutoyo's contour measuring instruments empower you with the experience, competence and high performance of a world leader in measurement technology. And, as always, with Mitutoyo you can be assured of first class, customer-friendly service.

CLER



Both off-the-shelf and custom contour measurement solutions with the unmatched precision and functionality of Mitutoyo

Model/Series

Profile

CONTRACER CV-1000

Portable device incorporating glass scales in both axes. For high-precision contour measurements in portable applications. The only system in its class to incorporate digital output in both axes for improved accuracy.



CONTRACER CV-1000

CONTRACER CV-2000

High-performance system for automatic measurement of workpieces. High accuracy in all axes for demanding benchtop contour measurements in the quality control room or laboratory.



CONTRACER CV-2000

CONTRACER CV-3000

High-performance system for automatic measurement of workpieces. High accuracy in all axes for demanding benchtop contour measurements in the quality control room or laboratory.



CONTRACER CV-3000

CONTRACER CV-4000

Highest performance level benchtop instrument with laser HoloScale technology for automatic workpiece measurement in the quality control room or laboratory. Remarkably tight straightness tolerance of just 0.8 μm .



CONTRACER CV-4000

FORMTRACER Series

Combination measuring instruments

The Formtracer series combines the technologies of surface and contour measurement in one single, space-saving system. With this series, you benefit from the advantage of high performance in both kinds of measurement — in a package that takes up the bench space of just one machine. You can read all about this efficient and economical solution in our Formtracer brochure.



FORMTRACER

Highlights

- High resolution over the entire measuring range
- Supplied with FORMPAK software package and PC link
- High-accuracy digital output in the X and Z axes

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- High-accuracy digital output in the X and Z axes
- Drive unit inclination range $\pm 45^\circ$

- Motor-driven Z axis
- High-accuracy digital output in the X and Z axes
- RS-232 interface for fast data transmission to the PC
- Supplied with FORMPAK measuring and analysis software package
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Model	X/Z-axis range	Height range and adjustment	Baseplate dimensions
CV-1000 N2	1.97"/1.98" (50/25mm)	optional	optional
CV-2000 M4	3.94"/1.57" (100/40mm)	12.60" (320mm)	man. 23.62"x17.72" (600x450mm)
CV-2000 S4	3.94"/1.57" (100/40mm)	12.60" (320mm)	mot. 23.62"x17.72" (600x450mm)
CV-3000 S4	3.94"/1.97" (100/50mm)	9.84" (250mm)	mot. 24.02"x17.72" (610x450mm)
CV-3000 H4	3.94"/1.97" (100/50mm)	17.72" (450mm)	mot. 24.02"x17.72" (610x450mm)
CV-3000 W4	3.94"/1.97" (100/50mm)	17.72" (450mm)	mot. 39.37"x17.72" (1000x450mm)
CV-3000 S8	7.87"/1.97" (200/50mm)	9.84" (250mm)	mot. 24.02"x17.72" (610x450mm)
CV-3000 H8	7.87"/1.97" (200/50mm)	17.72" (450mm)	mot. 24.02"x17.72" (610x450mm)
CV-3000 W8	7.87"/1.97" (200/50mm)	17.72" (450mm)	mot. 39.37"x17.72" (1000x450mm)
CV-4000 S4	3.94"/1.97" (100/50mm)	9.84" (250mm)	mot. 24.02"x17.72" (610x450mm)
CV-4000 H4	3.94"/1.97" (100/50mm)	17.72" (450mm)	mot. 24.02"x17.72" (610x450mm)
CV-4000 W4	3.94"/1.97" (100/50mm)	17.72" (450mm)	mot. 39.37"x17.72" (1000x450mm)
CV-4000 S8	7.87"/1.97" (200/50mm)	9.84" (250mm)	mot. 24.02"x17.72" (610x450mm)
CV-4000 H8	7.87"/1.97" (200/50mm)	17.72" (450mm)	mot. 24.02"x17.72" (610x450mm)
CV-4000 W8	7.87"/1.97" (200/50mm)	17.72" (450mm)	mot. 39.37"x17.72" (1000x450mm)

man.: manual
mot.: motor driven

Contracer CV-1000

Portable contour measurement packing
benchtop capabilities.

CV-1000

Measuring range

X axis 1.97" (50mm)

Z axis .98" (25mm)

Resolution

X axis 0.2 μ m

Z axis 0.4 μ m

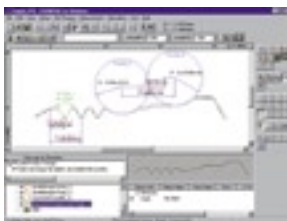
Accuracy

X axis $\pm (3.5+2L/100)\mu$ m

Z axis $\pm (3.5+4H/25)\mu$ m



FORMPAK Measurement screen



FORMPAK Evaluation screen

Contracer CV-1000

Provides advanced digital technology for portable tracing and evaluation of profile geometry, while offering the precision and performance of benchtop models.

- Quick and easy measurement as well as evaluation and printout of the measuring results
- Optimum measuring volume
- Extreme stability through FEM-aided design
- Straightness of X axis (drive unit) 3.5 μ m / 50mm
- Glass-scale equipped X axis (drive unit)
- Glass-scale equipped Z axis (stylus stroke)
- Z-axis scale matched to radial movement of stylus arm for optimum accuracy
- High-performance FORMPAK measuring and analysis software package supplied
- Integrated interface at measuring system
- Data transmission via RS-232-C interface
- Traced contours can be stored in the display unit in portable applications for later analysis (optional memory card required)
- Rechargeable battery for the display unit (optional)
- Optional metal-domed feet available for standing traverse unit on table
- Extensive range of accessories



portable



Contracer CV-2000

The state-of-the-art in economical measurement.

CV-2000

Measuring range

X axis 3.94" (100mm)

Z axis 1.57" (40mm)

Resolution

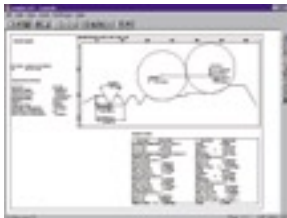
X axis 0.2 μ m

Z axis 0.5 μ m

Accuracy

X axis $\pm (3.5+2L/100)\mu$ m

Z axis $\pm (3.5+4H/25)\mu$ m



FORMPAK Report editor

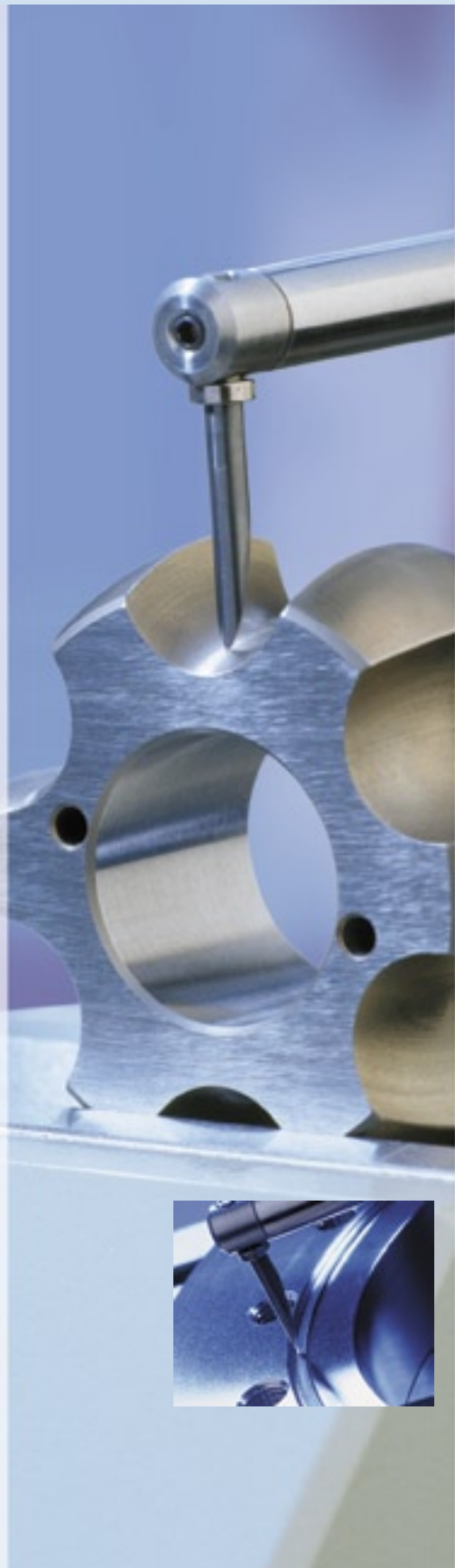
Contracer CV-2000

Benchtop contour measuring instrument with an impressive price/performance ratio. For cost-effective use in the quality control room or laboratory.

- Quick and easy measurement as well as evaluation and printout of the measuring results
- Optimum measuring volume
- Extreme stability through FEM-aided design
- Drive unit inclination $\pm 45^\circ$
- Quick positioning along the X axis (drive unit)
- Straightness of X axis (drive unit) 3.5 μ m / 100mm
- Glass-scale equipped X axis (drive unit)
- Glass-scale equipped Z axis (stylus stroke)
- Z-axis scale matched to radial movement of stylus arm for optimum accuracy
- High-performance FORMPAK measuring and analysis software package supplied
- Integrated interface at measuring system
- Data transmission via RS-232-C interface
- Complete with manual column and stand
- Extensive range of accessories



precise



Contracer CV-3000

The state-of-the art in automatic contour measurement.

CV-3000

Measuring range

X axis	3.94" (100mm)
	7.87" (200mm)
Z axis	1.97" (50mm)

Resolution

X axis	0.05 μ m
Z axis	0.2 μ m

Accuracy

X axis	$\pm (1.0+2.0L/100)\mu$ m
Z axis	$\pm (3.0+2H/25)\mu$ m



FORMPAK
graphic nominal/actual value comparison

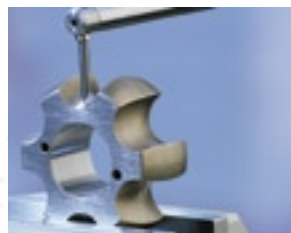
Contracer CV-3000

High-performance benchtop system for automatic workpiece measurement in the quality control room or laboratory. Motor-driven Z column, ceramic guides for high straightness in the X axis, plus automatic lifting and lowering of the stylus tip.

- Quick and easy measurement as well as evaluation and printout of the measuring results
- Optimum measuring volume
- Extreme stability through FEM-aided design
- Drive unit inclination $\pm 45^\circ$
- High X-axis (drive unit) straightness/accuracy due to ceramic guides
- Straightness of X axis (drive unit) 1μ m / 100mm
- Glass-scale equipped X axis (drive unit)
- Glass-scale equipped Z axis (stylus stroke)
- Motor-driven column
- Z-axis scale matched to radial movement of stylus arm for optimum accuracy
- Automatic lifting/lowering of stylus tip
- Adjustable limit switch for stylus deflection
- Joystick
- High-performance FORMPAK measuring and analysis software package supplied
- Data transmission via RS-232-C interface
- Extensive range of accessories



automatic



Contracer CV-4000

Performance without compromise. Laser HoloScale technology delivers unprecedented accuracy of $(0.8+0.5H/25) \mu\text{m}$ in the Z axis (probe stroke) – with resolution to match.

CV-4000

Measuring range

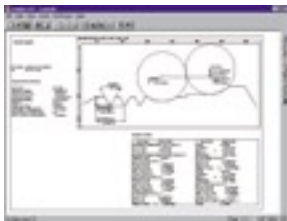
X axis	3.94" (100mm)
	7.87" (200mm)
Z axis	1.97" (50mm)

Resolution

X axis	0.05 μm
Z axis	0.05 μm

Accuracy

X axis	$\pm (0.8+2.0L/100)\mu\text{m}$
Z axis	$\pm (0.8+0.5H/25)\mu\text{m}$



FORMPAK Report editor

Contracer CV-4000

High-end benchtop system with laser HoloScale technology and an X-axis straightness of $0.8 \mu\text{m} / 100 \text{mm}$. The no-compromise solution for automatic workpiece measurement with maximum precision.

- Laser HoloScale technology on Z axis
- Quick and easy measurement as well as evaluation and printout of the measuring results
- Optimum measuring volume
- Extreme stability through FEM-aided design
- Drive unit inclination $\pm 45^\circ$
- High X-axis (drive unit) straightness/accuracy due to ceramic guides
- X-axis (drive unit) straightness $0.8\mu\text{m} / 100\text{mm}$
- Digital glass scale on X axis
- Motor-driven Z axis
- Z-axis scale matched to radial movement of stylus arm for optimum accuracy
- Automatic lifting/lowering of stylus tip
- Adjustable limit switch for stylus deflection
- Joystick
- High-performance FORMPAK measuring and analysis software package supplied
- Data transmission via RS-232-C interface
- Extensive range of accessories



high precision



FORMPAK Software. World-class, full-featured.

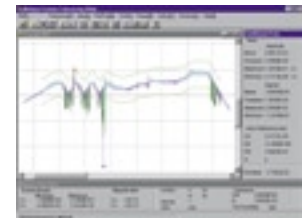
Software

Measurement, evaluation and documentation performed, processed and presented exactly as required by FORMPAK, the high-performance software package from Mitutoyo. FORMPAK is another of the value added features (including operator training) supplied with all CONTRACER systems, to help you make professional, cost-effective contour measurements.

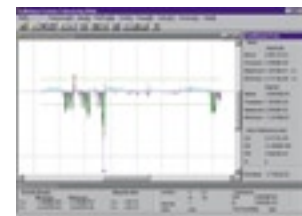
- Utilizes Windows® operating system
- Reads DXF and IGES formats
- Outputs DXF and IGES formats
- Includes graphic nominal/actual value comparison
- Evaluates measured data in comparison with DXF or IGES nominal contours within a part program
- Creates individual reports
- Imports bitmap files
- Runs part programs automatically
- Part-program editing
- User-defined settings
- Graphical display during contour tracing
- Measuring system control via software and joystick
- Individual output of results (report, ASCII, CSV)
- Connection of individual contours
- Display and evaluation of several contours on one display



Report editor



Graphic nominal/actual value comparison



Execution of graphic nominal/actual value comparison

Accessories

Optional

Measuring arms

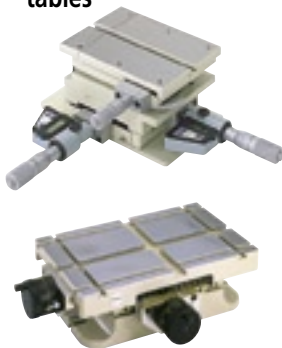
CV-1000 CV-2000 CV-3000 CV-4000

Measuring arms		CV-1000	CV-2000	CV-3000	CV-4000
Straight					
Angular					
For small diameters				—	—
For small diameters		—	—		

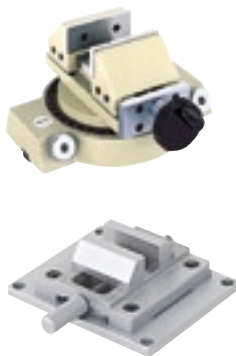
Probes

Probes		CV-1000	CV-2000	CV-3000	CV-4000
Bevelled on one side					
Cross-ground					
Conical					
Probe tip					
Ball					
Diamond tip					
For small diameters				—	—
				—	—
				—	—
		—	—		
		—	—		
		—	—		

Cross travel / levelling tables



Vices



Center supports



V blocks



Additional overview brochures on Mitutoyo's form, surface and contour measuring solutions are available upon request.

FORM MEASUREMENT

Individual solutions for all your needs in the area of high-performance measurement of rotation-symmetric workpieces. From the ergonomic and easy-to-handle portable instrument with built-in printer, to the high-precision, reference-level model.

SURFACE MEASUREMENT

A wide range of surface measuring solutions — from cost-effective and versatile hand-held portable instruments to a high-precision desktop reference model. All models are suitable for measuring surface roughness and waviness either in the laboratory or on the production line.

COMBINATION OF CONTOUR AND SURFACE MEASUREMENT: FORMTRACER

The Formtracer series combines the technologies of surface and contour measurement in one single, space-saving system. This gives you the advantage of high-performance measurement in a package that takes up the bench space of just one machine. The optimum combination of efficiency and economy.

Note:

All our product details, in particular the illustrations, drawings, dimension and performance details and other technical specifications contained in this publication are to be considered approximate average values. To this extent, we reserve the right to make changes in design, technical data, dimensions and weight. Our specified standards, similar technical rules and technical specifications, descriptions and illustrations of the products are correct at the time of printing. The current version of our general terms and conditions also apply. Only offers which we have submitted can be considered to be definitive.

Coordinate Measuring Machines	_____
Vision Measuring Systems	_____
Surface, Form and Contour Measurement	_____
Optical Measuring	_____
Sensor Systems	_____
Hardness Measuring	_____
Digital Scale and DRO Systems	_____
Small Tool Instruments and Data Management	_____

Mitutoyo America Corporation

www.mitutoyo.com

Michigan

(734) 459-2810

Illinois

(630) 978-5385

California

(626) 961-9661

Massachusetts

(978) 692-8765

Indiana

(317) 577-6070

No. Carolina

(704) 875-8332

Mitutoyo

Precision is our Profession