

# CONTOUR MEASUREMENT



Shaped to perfection for production, quality control rooms and laboratories.  
Contour measuring instruments from Mitutoyo

**Mitutoyo**

Quality control knows no ifs and buts...

**...only winners and losers.**

CONTRA

To win in today's competitive markets demands strict quality control to maintain the high manufacturing standards required for success. Not just today, but every day...without fail. As quality control is based on measurement, it follows that your company's future depends on the ability to deploy the best measuring technology available and, of course, use it in the most cost-effective way possible.

Tracing and evaluating product-contour characteristics makes 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 can offer a solution for practically any application from shop floor to quality control room.

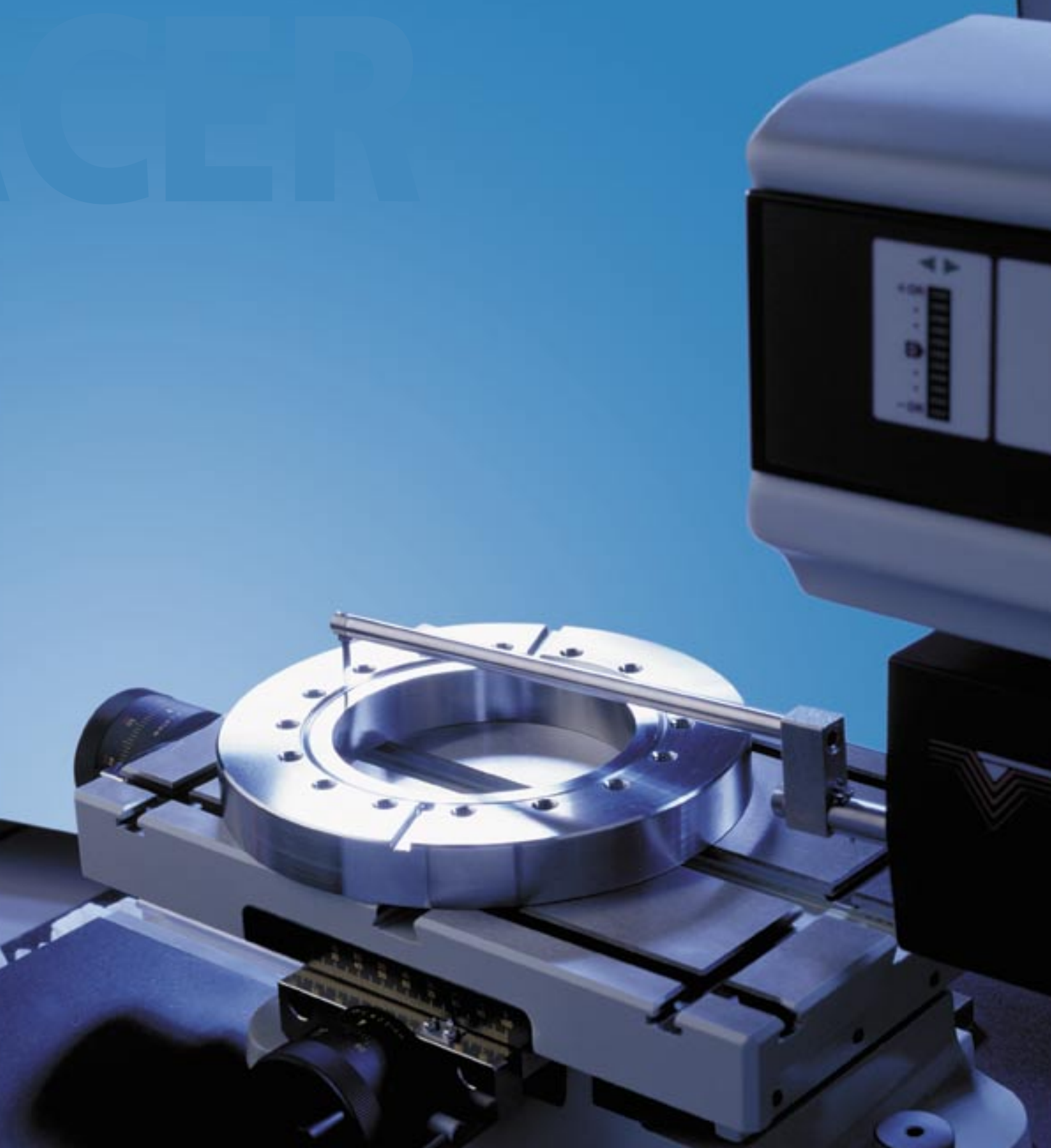
This brochure presents an overview of the extensive range of Mitutoyo's contour measuring solutions from a convenient, economical, portable instrument right up to the top-level system incorporating a laser Hologram technique based on the interference phenomenon of diffracted light. It shows instrument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

Single product brochures are also available to provide detailed information on the system of your choice.

Whichever model you choose, with a contour measuring instrument from Mitutoyo you can trust in the experience, competence and high performance of a world leader in measurement technology and be assured of first class, customer-oriented service.

CONTOUR MEASUREMENT

VELER



Individual or customised solutions and state-of-the-art technologies. Contour measurement delivered with the experience and competence 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 small straightness uncertainty of just 0.8  $\mu\text{m}$ .



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. This gives you the advantage of high performance in both kinds of measurement but in a package that takes up the bench space of just one machine. You can read all about this efficient and economical solution in the separate 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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- 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
- Drive unit inclination range  $\pm 45^\circ$

- Motor-driven Z axis
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- RS-232 interface for fast data transmission to the PC
- Supplied with FORMPAK measuring and analysis software package
- Drive unit inclination range  $\pm 45^\circ$

Model	X/Z-axis range	Height range and adjustment	Baseplate dimensions
<b>CV-1000 N2</b>	50 / 25 mm	optional	optional
<b>CV-2000 M4</b>	100 / 40 mm	320 mm	man. 600x450 mm
<b>CV-2000 S4</b>	100 / 40 mm	320 mm	mot. 600x450 mm
<b>CV-3000 S4</b>	100 / 50 mm	250 mm	mot. 610x450 mm
<b>CV-3000 H4</b>	100 / 50 mm	450 mm	mot. 610x450 mm
<b>CV-3000 W4</b>	100 / 50 mm	450 mm	mot. 1000x450 mm
<b>CV-3000 S8</b>	200 / 50 mm	250 mm	mot. 610x450 mm
<b>CV-3000 H8</b>	200 / 50 mm	450 mm	mot. 610x450 mm
<b>CV-3000 W8</b>	200 / 50 mm	450 mm	mot. 1000x450 mm
<b>CV-4000 S4</b>	100 / 50 mm	250 mm	mot. 610x450 mm
<b>CV-4000 H4</b>	100 / 50 mm	450 mm	mot. 610x450 mm
<b>CV-4000 W4</b>	100 / 50 mm	450 mm	mot. 1000x450 mm
<b>CV-4000 S8</b>	200 / 50 mm	250 mm	mot. 610x450 mm
<b>CV-4000 H8</b>	200 / 50 mm	450 mm	mot. 610x450 mm
<b>CV-4000 W8</b>	200 / 50 mm	450 mm	mot. 1000x450 mm

man.: manual  
mot.: motor driven

# Contracer CV-1000

Portable contour measurement with a benchtop performance profile.

## CV-1000

### Measuring range

X axis	50 mm
Z axis	25 mm

### Resolution

X axis	0.2 $\mu\text{m}$
Z axis	0.4 $\mu\text{m}$

### Accuracy

X axis	$\pm (3.5+2L/100)$ $\mu\text{m}$
Z axis	$\pm (3.5+4H/25)$ $\mu\text{m}$

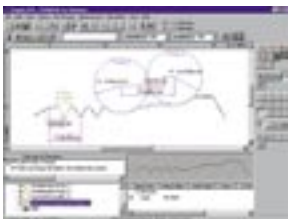
### Contracer CV-1000

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
- Enormous stability through FEM-aided design
- Straightness of X axis (drive unit) 3.5  $\mu\text{m}$  / 50 mm
- 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



FORMPAK Measurement screen



FORMPAK Evaluation screen



# portable



# Contracer CV-2000

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

## CV-2000

### Measuring range

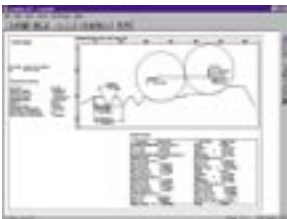
X axis	100 mm
Z axis	40 mm

### Resolution

X axis	0.2 $\mu\text{m}$
Z axis	0.5 $\mu\text{m}$

### Accuracy

X axis	$\pm (3.5+2L/100)$ $\mu\text{m}$
Z axis	$\pm (3.5+4H/25)$ $\mu\text{m}$



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
- Enormous 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  $\mu\text{m}$  / 100 mm
- 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
- Extensive range of accessories
- Complete with manual column and stand



# precise



# CONTRACER CV-3000

Top technology for automatic contour measurement.

## CV-3000

### Measuring range

X axis	100 mm
	200 mm
Z axis	50 mm

### Resolution

X axis	0.05 $\mu\text{m}$
Z axis	0.2 $\mu\text{m}$

### Accuracy

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



FORMPAK  
graphic nominal/actual value comparison

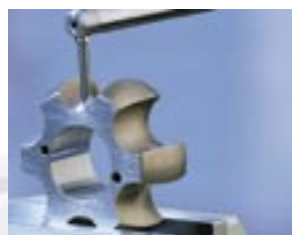
### CONTRACER CV-3000

**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 direction, 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
- Enormous stability through FEM-aided design
- Drive unit inclination  $\pm 45^\circ$
- High X-axis (drive unit) straightness due to ceramic guides
- Straightness of X axis (drive unit)  $1 \mu\text{m} / 100 \text{mm}$
- 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 Hologate technology delivers unprecedented accuracy of  $(0.8+0.5H/25) \mu\text{m}$  in the Z axis (probe stroke) with a resolution to match.

## CV-4000

### Measuring range

X axis	100 mm
	200 mm
Z axis	50 mm

### Resolution

X axis	0.05 $\mu\text{m}$
Z axis	0.05 $\mu\text{m}$

### 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 Hologate 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 accuracy and precision.**

- Laser Hologate technology on Z axis
- Quick and easy measurement as well as evaluation and printout of the measuring results
- Optimum measuring volume
- Enormous stability through FEM-aided design
- Drive unit inclination  $\pm 45^\circ$
- High X-axis (drive unit) straightness 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



**Mitutoyo**

# high precision



# FORMPAK

## Software for hard facts.

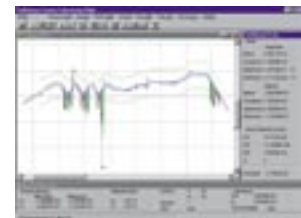
# Software

Measurement, evaluation and documentation performed, processed and presented exactly as required by FORMPAK, the high-performance software package from Mitutoyo. FORMPAK is another 'plus' feature supplied with all CONTRACER systems as standard equipment, including operator training, to help you make professional, cost-effective contour measurements.

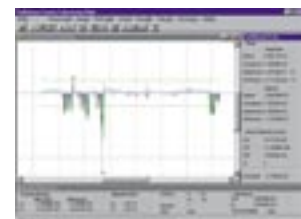
- Windows® operating system
- Reads DXF and IGES formats
- Outputs DXF and IGES formats
- Graphic nominal/actual value comparison
- Evaluates measured data in comparison with DXF or IGES nominal contours within a part program
- Creates individual reports
- Imports bitmap files
- Runs part-programs automatically
- Part-program editing
- User-definable 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
Straight					
Angular					
For small diameters				—	—
For small diameters		—	—		

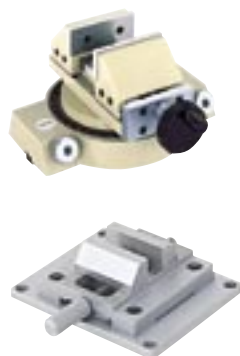
## Probes

Bevelled on one side	Cross-ground	Conical				
Probe tip	Ball	Diamond tip				
For small diameters					—	—
			—	—		

## Cross travel / levelling tables



## Vices



## Centre supports



## V blocks



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

#### FORM MEASUREMENT

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

#### SURFACE MEASUREMENT

A wide range extending from cost-effective and versatile hand-held portable instruments through to a high-precision desktop reference model. All equally 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 in both kinds of measurement but 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 to be 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

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