Quality Assurance with Profile—
Contour Measuring Machines from Mitutoyo
Anyone who is unable to guarantee compliance with the most stringent standards will soon find themselves without a future in this competitive world. High performance measurement technology is therefore essential for lasting success.

The detection and evaluation of contours is particularly demanding work. As the most versatile supplier of production measuring technology in the world, Mitutoyo sets the standard in know-how and experience – with an intelligently-structured range of sophisticated solutions for modern contour measurement. Here users seeking high performance results will find a tailor-made configuration for high performance evaluation of profiles in production and in the laboratory.

This brochure gives you an overview of the Mitutoyo range of contour measurement machines – from practical mobile devices through high-end systems with holoscale technology for automatic, high-volume measurement. You will quickly be able to focus in on the best solution for your own particular measurement tasks. You can then request to see more detailed brochures covering the configuration of your choice, together with the varied range of accessories and software available.

Whatever you choose: with a Mitutoyo contour measuring system, you will secure the experience, competence and performance of an international technology leader, and customer-oriented service worth getting excited about.
Individual solutions, sophisticated technologies, effective concepts: contour measurement with Mitutoyo competence.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTRACER CV-1000</td>
<td>Transportable device with digital glass scale, also in the Z axis. For portable high precision contour measurement. Digital recording of measured values in the X and Z axes – the only system in its class.</td>
</tr>
<tr>
<td>CONTRACER CV-2000</td>
<td>Economic stationary contour measurement in production and in the laboratory. Compact, robust desk-top machine available in manual or automatic versions.</td>
</tr>
<tr>
<td>CONTRACER CV-3100</td>
<td>Powerful system for automatic high-volume measurement. With even greater precision in all axes for difficult stationary contour testing in the production environment or in the test room.</td>
</tr>
<tr>
<td>CONTRACER CV-4100</td>
<td>This system has a highly accurate laser holoscale in the Z1 axis. The length measurement deviation is ± (0.8+</td>
</tr>
</tbody>
</table>

Combined measurement machines:

FORMTRACER | The machines in Mitutoyo’s Formtracer series combine the technologies of surface and contour measurement in a single space-saving system. In this way you obtain the capabilities of both processes, even where space is restricted.
Mitutoyo offers a wide range of models for various applications.

Device-specific features

- High resolution throughout the measuring range
- Comes as standard with FORMPAK software and PC connection
- Digital recording of measured values in the X and Z axes
- Feed inclination adjustment ± 45°

- Comes as standard with FORMPAK software and PC connection
- Digital recording of measured values in the X and Z axes
- ABS scale in the Z axis

- Motorized Z axis
- Digital recording of measured values in the X and Z1 axes
- USB interface for rapid data transmission to the PC
- Including FORMPAK measurement and analytical software
- Feed inclination adjustment ± 45°
- Laser holoscale in the Z1 axis
- ABS scale in the Z axis

<table>
<thead>
<tr>
<th>Model</th>
<th>Measuring range X/Z axes</th>
<th>Height adjustment</th>
<th>Base plate dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-1000 N2</td>
<td>1.97&quot; x 0.98&quot; (50/25 mm)</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>CV-2000 S4</td>
<td>3.94&quot; x 1.57&quot; (100/40 mm)</td>
<td>12.60&quot; (320 mm)</td>
<td>mot. 23.62&quot; x 17.71&quot; (600/450 mm)</td>
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<td>CV-2000 M4</td>
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<tr>
<td>CV-3100 S4</td>
<td>3.94&quot; x 1.97&quot; (100/50 mm)</td>
<td>11.81&quot; (300 mm)</td>
<td>mot. 23.62&quot; x 17.71&quot; (600/450 mm)</td>
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<tr>
<td>CV-3100 H4</td>
<td>3.94&quot; x 1.97&quot; (100/50 mm)</td>
<td>19.69&quot; (500 mm)</td>
<td>mot. 23.62&quot; x 17.71&quot; (600/450 mm)</td>
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<tr>
<td>CV-3100 W4</td>
<td>3.94&quot; x 1.97&quot; (100/50 mm)</td>
<td>19.69&quot; (500 mm)</td>
<td>mot. 39.37&quot; x 17.71&quot; (1000/450 mm)</td>
</tr>
<tr>
<td>CV-3100 S8</td>
<td>7.87&quot; x 1.97&quot; (200/50 mm)</td>
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</tr>
</tbody>
</table>

man.: manual
mot.: motorized
Contracer CV-1000—Mobile contour measurement with stand-alone performance

**CV-1000**

**Measuring range:**
- X: 1.97 * (50 mm)
- Z: 0.98 * (25 mm)

**Resolution:**
- X axis: 0.2 μm
- Z axis: 0.4 μm

**Length measurement deviation:**
- X axis: (3.5+0.02L) μm
- Z axis: ± (3.5+ |H|/25) μm

**Contracer CV-1000**

Sophisticated digital technology for portable recording and evaluation of profiles – with the precision and performance of stationary systems.

- Simple, rapid measurement, evaluation and printing of measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Straightness deviation of the X axis 3.5 μm/50 mm
- Digital glass scale in the X axis (feed)
- Digital glass scale also in the Z axis (probe stroke)
- Glass scale on Z axis for optimized accuracy adapted to radial movement of the probe arm
- FORMPAK powerful measurement and analytical software
- Integral interface on the measurement system
- Data transmission via USB interface
- Display unit for interim storage of recorded contours in mobile use (optional)
- Optional stand for stationary use
- Wide range of accessories

**Measuring range:**
- X: 1.97 * (50 mm)
- Z: 0.98 * (25 mm)

**Resolution:**
- X axis: 0.2 μm
- Z axis: 0.4 μm

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- FORMPAK powerful measurement and analytical software
- Integral interface on the measurement system
- Data transmission via USB interface
- Display unit for interim storage of recorded contours in mobile use (optional)
- Optional stand for stationary use
- Wide range of accessories
mobile
Contracer CV-2000—
The state of the art in economical measuring

Contracer CV-2000
Stand-alone contour measuring machine with an attractive price-performance ratio. Efficient on the production floor or in the laboratory.

- Simple, rapid measurement, evaluation and printing of measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination ± 45°
- Rapid adjustment of the X axis (feed)
- Straightness deviation of the X axis 3.5 μm/100 mm
- Digital glass scale in the X axis (feed)
- Digital glass scale also in the Z axis (probe stroke)
- Glass scale on Z axis for optimized accuracy adapted to radial movement of the probe arm
- FORMPAK powerful measurement and analytical software
- Integral interface on the measurement system
- Data transmission via USB interface
- Wide range of accessories
- Manual or motorized versions

Measuring range:

<table>
<thead>
<tr>
<th>Axis</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3.94&quot; (100 mm)</td>
</tr>
<tr>
<td>Z</td>
<td>1.57&quot; (40 mm)</td>
</tr>
</tbody>
</table>

Resolution:

- X axis: 0.2 μm
- Z axis: 0.5 μm

Length measurement deviation:

- X axis: (3.5+0.02L) μm
- Z axis: ° (3.5+ H/25) μm

Software FORMPAK: Protokoll-Editor
precise
CONTRACER CV-3100—Leading technology for automatic contour measurement

CV-3100

**Measuring range:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3.94&quot; (100 mm) 7.87&quot; (200 mm)</td>
</tr>
<tr>
<td>Z1</td>
<td>1.97&quot; (50 mm)</td>
</tr>
<tr>
<td>Z2</td>
<td>11.81&quot; (300 mm) 19.69&quot; (500 mm)</td>
</tr>
</tbody>
</table>

**Range of travel:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1</td>
<td>11.81&quot; (300 mm)</td>
</tr>
<tr>
<td>Z2</td>
<td>19.69&quot; (500 mm)</td>
</tr>
</tbody>
</table>

**Resolution:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>0.05 μm</td>
</tr>
<tr>
<td>Z1</td>
<td>0.2 μm</td>
</tr>
<tr>
<td>Z2</td>
<td>1.0 μm</td>
</tr>
</tbody>
</table>

**Length measurement deviation:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>± (1+0.01L) μm</td>
</tr>
<tr>
<td>Z1</td>
<td>± (2+</td>
</tr>
</tbody>
</table>

**CONTRACER CV-3100**

Powerful stand-alone system for automatic high-volume use in measuring room and laboratory. Featuring motorized Z column, ceramic straightness guide on the X axis and automatic raising and lowering of the probe top.

- Simple, rapid measurement, evaluation and printing of measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination ± 45°
- Ceramic straightness guide on the X axis (feed)
- Straightness deviation of the X axis (0.8 μm/100 mm)
- Digital glass scale in the X axis (feed)
- Digital glass scale also in the Z1 axis (probe stroke)
- Motorized Z column
- Automatic raising and lowering of the probe tip
- Joystick
- FORMPAK powerful measurement and analytical software
- Data transmission via USB interface
- Wide range of accessories
- ABS scale in the Z2 axis
- Rapid traversing speed
- Automatic calibration function
- Collision prevention

FORMPAK software:
Graphic setpoint/actual comparison

Collision prevention
CONTRACER CV-4100—No compromise

CV-4100

This stationary high-end system has a laser holoscale in the Z1 axis that enables a length measurement tolerance of just \((0.8+0.5H/25)\mu m\).

- Simple, rapid measurement, evaluation and printing of measurement results
- Optimum measurement volume
- Absolute stability with FEM analysis
- Feed inclination ± 45°
- Ceramic straightness guide on the X axis (feed)
- Straightness deviation of the X axis (feed) 0.8 \(\mu m/100\) mm
- Digital glass scale in the X axis
- Laser holoscale in the Z1 axis
- Motorized Z column
- Automatic raising and lowering of the probe tip
- Joystick
- FORMPAK powerful measurement and analytical software
- Data transmission via USB interface
- Wide range of accessories
- ABS scale in the Z2 axis
- Automatic calibration function
- Fast traversing speed
- Collision prevention

**Measuring range:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3.94&quot; (100 mm)</td>
</tr>
<tr>
<td></td>
<td>7.87&quot; (200 mm)</td>
</tr>
<tr>
<td>Z</td>
<td>1.97&quot; (50 mm)</td>
</tr>
</tbody>
</table>

**Range of travel:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z2</td>
<td>11.81&quot; (300 mm)</td>
</tr>
<tr>
<td></td>
<td>19.69&quot; (500 mm)</td>
</tr>
</tbody>
</table>

**Resolution:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>X axis</td>
<td>0.05 (\mu m)</td>
</tr>
<tr>
<td>Z1 axis</td>
<td>0.05 (\mu m)</td>
</tr>
<tr>
<td>Z2 axis</td>
<td>1.0 (\mu m)</td>
</tr>
</tbody>
</table>

**Length measurement deviation:**

<table>
<thead>
<tr>
<th>Axis</th>
<th>Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X axis</td>
<td>((0.8+0.01L) \mu m)</td>
</tr>
<tr>
<td>Z1 axis</td>
<td>((0.8+0.5H/25) \mu m)</td>
</tr>
</tbody>
</table>

Collision protection

FORMPAK software: report editor
FORMPAK
Measuring, evaluation and complete documentation:
FORMPAK, the high-end software from Mitutoyo. Comes standard with all CONTRACER systems, at no extra cost and with an impressive range of features - a real bonus.
For professional contour measurement with best results.

- Runs under MS Windows
- Reading in of DXF and IGES formats is possible
- Outputting of DXF and IGES formats is possible
- Graphic setpoint/actual comparison
- Evaluation of measured data against DXF or IGES setpoint contours
- Individual preparation of reports
- Reading in of bitmap files
- Automatic parts program sequence
- Editing of parts programs
- User-defined settings
- Graphic representation during contour detection
- Control of the measurement system using software and joystick
- Individual outputting of results (report, ASCII, CSV)
- Linking of individual contours
- Representation and evaluation of several contours on one screen
- Best fit function for graphic setpoint/actual comparisons and parts program measurement
## Accessories

### Measuring arms

<table>
<thead>
<tr>
<th></th>
<th>CV-1000</th>
<th>CV-2000</th>
<th>CV-3100</th>
<th>CV-4100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straight</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Angular</td>
<td>.</td>
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<td>.</td>
<td>.</td>
</tr>
<tr>
<td>For small diameters</td>
<td>—</td>
<td>—</td>
<td>.</td>
<td>.</td>
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<tr>
<td>For extra small diameters</td>
<td>.</td>
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<td>—</td>
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</tr>
</tbody>
</table>

### Probes

<table>
<thead>
<tr>
<th>Probes</th>
<th>CV-1000</th>
<th>CV-2000</th>
<th>CV-3100</th>
<th>CV-4100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bevelled on one side</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Cross-ground</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Conical</td>
<td>.</td>
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<td>.</td>
</tr>
<tr>
<td><strong>Probe tip</strong></td>
<td>.</td>
<td>.</td>
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</tr>
<tr>
<td>Ball</td>
<td>.</td>
<td>.</td>
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<td>.</td>
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<tr>
<td>Diamond tip</td>
<td>.</td>
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<td>.</td>
</tr>
<tr>
<td>For small diameters</td>
<td>—</td>
<td>—</td>
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<td>.</td>
</tr>
</tbody>
</table>

### Crossed tables

### Vices

### Calibration set

For CV 3100/CV 4100
Note: All information regarding our products, and in particular the illustrations, drawings, dimensional and performance data contained in this printed matter as well as other technical data are to be regarded as approximate average values. We therefore reserve the right to make changes to the corresponding designs. The stated standards, similar technical regulations, descriptions and illustrations of the products were valid at the time of printing. In addition, the latest applicable version of our General Trading Conditions will apply. Only quotations submitted by ourselves may be regarded as definitive.

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