BENCHMIKE 283 SERIES

Off-Line ID/OD/Wall measurement systems for pipe and tube samples

► Measure manufactured parts or cut samples fast and with the highest accuracy
► Perform reliable, non-contact measurements from run to run
► Benefit from easy-to-use features for simple setup and operation

NEW! Larger High-Resolution Display

Making Light Work
The Beta LaserMike line of products operate on the cutting edge of measurement technology. In 1973, our innovative laser measurement technique was patented (the first of its kind in the world), and today we continue to improve our designs by making them easier to use while maintaining precision accuracy.

Laser technology allows BenchMike to measure multiple product dimensions without touching, deforming, scratching, or damaging the part. Unlike other micrometers and mechanical indicators that can err in zero setting, end play, calibration, or sensitivity of the user, BenchMike gives repeatable measurements regardless of the operator. With the Beta LaserMike BenchMike, there is nothing to adjust between part measurements and nothing to wear out.

**Innovative Technology**

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**No Field Calibration Required**

BenchMike uses a combination of built-in, auto-calibration and dual-differentiation technology providing unmatched accuracy, without field calibration. Never has it been easier to incorporate precision measurement on the production line, and since every system includes a programmable RS-232C interface, collecting and sending data to your storage and control system is almost effortless.

Contact your local NDC Sales Representative and start seeing the benefits of improved quality, increased production yield, and decreased material cost on the bottom line today.
Simple Touch-Screen Interface Lets You Easily Access BenchMike Features and Functions

BenchMike’s touch-screen graphical user interface (GUI) gives operators a quick and simple means of viewing dimensional measurements, accessing gauge and system information, and changing parts. Screen layouts are customized for the needs of the user or application and the “look and feel” is simple for any user familiar with Windows.

**Data Display:**
BenchMike has advanced display capabilities allowing you to display measurement data, access menus to configure BenchMike, and display general information such as presence or absence of error conditions.

**Magnified Display**
Magnify measurement items on the screen for visibility from a distance.

**Pop Up Menus**
Quickly, easily access BenchMike features and functions via clear pop-up menus.

**Library (Part) Selection**
Use BenchMike libraries to store and recall how the measurements are to be taken, and manage other system setup information via separate libraries. By defining libraries for each product or different fixtures, you can shorten set-up times for various parts or applications.

**Rotational Cross-Section Display**
When using a rotary ID/OD/Wall fixture, create a rotary graph that displays the size, position, and minimum and maximum data for measurements taken at multiple points around the product.

**Rotational Deviation/Variation Graphs**
Create Deviation and Variation graphs when using an intelligent fixture. The graphs show the deviation from nominal at each position and size variation between positions.

**Robust Reporting**
Easily generate Sample, Batch, and Fixture reports. Use the Sample Report when taking a single measurement of multiple parts. Use the Batch report to summarize statistical results for all measured parts. Use the Fixture reports to generate similar sample and batch details when using automated part-positioning fixtures.
The BenchMike 283 series is the ideal solution for fast, simple, and accurate measurements of cut samples of extruded pipe or tube. BenchMike is used worldwide on extrusion plant floors and quality control (QC) laboratories to give operators and technicians immediate feedback of product dimensions.

Pipe and tube manufacturers must ensure that the dimensions of their products are maintained within tight specifications to ensure the quality of the product and the profitability of the company. To satisfy this need, the BenchMike utilizes the latest in laser gauging technology to provide high-precision measurements of the OD, ID, wall thickness, concentricity, and ovality of a pipe or tube within specifications of less than 1µm (0.00004 in.).

**OD Measurement**

For precision OD measurements, simply place your pipe or tube sample on the V-block fixture and BenchMike will instantly measure it. Using the V-block and BenchMike, an operator can measure dozens of parts per minute and with a much higher level of accuracy than any other method available for sample inspection. And with the use of laser technology, the measurements will be repeatable from one operator to another.

**ID/OD/Wall Measurement**

For precision ID, OD, and wall thickness measurements, simply place a pipe or tube sample on the ID/OD/Wall fixture and BenchMike will calculate all of the dimensions. The ID/OD/Wall fixture can also automatically rotate a sample to a pre-defined number of positions for measurements at multiple points around the product. This rotation also allows for the calculation of concentricity and ovality of the product. The graphical user interface has options to view the rotational cross section of the product and a graph that shows deviation or variation at the various rotational degrees of measurement.

**Step 1:** Master on reference edge and mandrel

**Step 2:** Place product on mandrel and take measurements

- Wall = A - B
- OD = C
- ID = OD - (2 x Wall)

**Step 3:** Rotate the product to attain multiple points of measurement as well as concentricity and ovality

- Concentricity = \( \Delta (A - B) \)
- Ovality = \( \Delta C \)
Specifications

Measurement Specifications

<table>
<thead>
<tr>
<th></th>
<th>Model 283-10</th>
<th>Model 283-20</th>
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</thead>
<tbody>
<tr>
<td>Measurement Range¹</td>
<td>0.100 to 25.4 mm (0.004 to 1.0 in.)</td>
<td>0.254 to 50 mm (0.010 to 2.0 in.)</td>
</tr>
<tr>
<td>Repeatability²</td>
<td>±0.25 µm (0.000010 in.)</td>
<td>±0.5 µm (0.000020 in.)</td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.9 µm (±0.000036 in.)</td>
<td>±1.5 µm (±0.000060 in.)</td>
</tr>
<tr>
<td>Measurement Area Depth Of Field</td>
<td>±.75 x 25 mm (±0.030 x 1.0 in.)</td>
<td>±1.5 x 50 mm (±0.060 x 2.0 in.)</td>
</tr>
<tr>
<td>Laser Beam Spot Size</td>
<td>100 µm (0.004 in.)</td>
<td>250 µm (0.010 in.)</td>
</tr>
<tr>
<td>Laser Beam Velocity</td>
<td>50 m/sec. (2,000 in./sec.)</td>
<td>100 m/sec. (4,000 in./sec.)</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>&lt;0.2 µm/°C (&lt;0.000004 in./°F)</td>
<td></td>
</tr>
<tr>
<td>Calibration</td>
<td>Factory calibrated</td>
<td></td>
</tr>
<tr>
<td>Scan Rate</td>
<td>100/sec</td>
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¹For ID/OD/Wall applications, maximum OD is dependent on product.
²Accuracy of ID/OD/Wall measurement is dependent on product.

General Specifications

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<tr>
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<tbody>
<tr>
<td>Operating Temperature</td>
<td>7° to 36° C (45° to 97° F) at &lt; 90% relative humidity</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-20° to 60° C (-4° to 140° F)</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>254 x 635 x 228 mm (10 x 25 x 9 in.)</td>
</tr>
<tr>
<td>Weight</td>
<td>17 kg (38 lb.)</td>
</tr>
<tr>
<td>LaserSource</td>
<td>HeNe gas laser; &lt;1 mW output</td>
</tr>
<tr>
<td>Display</td>
<td>177.8 mm (7 in.) capacitive touch</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>100-240 volts AC (+5% to -10%), 50/60 Hz (+/-2 Hz) 100 watts total power</td>
</tr>
</tbody>
</table>

Input/Output

BenchMike provides a variety of input/output connectors to allow flexible integration with other devices. The available BenchMike I/O includes:

- Serial port to link with computers or data gathering devices
- Parallel port to connect to printers for printed reports
- Digital I/O port for connection of alarm outputs to indicate out-of-tolerance conditions and other errors, as well as digital inputs to activate functions remotely
- Fixture port for connection to intelligent fixtures capable of moving and rotating the test pieces
- Scan output BNC port for diagnostic access to the laser scan signal
### Modular Fixtures

#### Ready-To-Mount Flexibility

We offer an extensive line of ready-to-mount modular fixtures from simple manual fixtures to fully automatic and intelligent fixtures. These fixtures hold workpieces properly and effectively for any gauging need. Simply attach these easy-to-install fixtures to your BenchMike for precise, reliable measurements without calibration.

We provide a full line of heavy-duty fixtures to measure small and large parts, along with automatic motorized fixtures for part translation and rotation. For your custom needs, our Special Engineering group excels at developing fixtures for special applications.

<table>
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<tr>
<th>Fixture</th>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>V-Block: General Purpose, Fixed</strong></td>
<td>Used for measuring parts positioned on their outside diameter.</td>
<td>83855 (283-10) 83854 (283-20)</td>
</tr>
<tr>
<td><strong>V-Block: General Purpose, Adjustable</strong></td>
<td>Designed for fine wire or other material that must be centered for best measurement accuracy. Holds wires in the range of 0.001 to 0.400 in. (0.025 to 10.16 mm).</td>
<td>84260</td>
</tr>
<tr>
<td><strong>V-Block: General Purpose, Full-Range, Adjustable</strong></td>
<td>Enables part centering and measurement over the full measuring range of the BenchMike Series.</td>
<td>83976</td>
</tr>
<tr>
<td><strong>V-Block: Adjustable</strong></td>
<td>Supports parts that must be held on their outside diameters. Must be mounted on a slide.</td>
<td>83609</td>
</tr>
<tr>
<td><strong>Slide: Universal Manual</strong></td>
<td>Used to linearly position parts by hand. Available in 18, 25 or 32 in. (457, 635 or 829 mm) lengths.</td>
<td>83610 (18 in.) 83611 (25 in.) 83618 (32 in.)</td>
</tr>
<tr>
<td><strong>Slide: Digital Readout</strong></td>
<td>Used to linearly position parts to predetermined positions for measurement, and/or measure the points distance between two on a part. Available in 18, 25 or 32 in. (457, 635 or 829 mm) lengths.</td>
<td>83616 (18 in.) 83617 (25 in.) 83863 (32 in.)</td>
</tr>
<tr>
<td><strong>ID/OD/Wall: Small Tube &amp; Hose, Auto-Rotating</strong></td>
<td>Automatically rotates enabling inside diameter, outside diameter, and wall thickness measurements of small tubular products such as medical tubing, hose, and glass. Can be supplied with a Force Gauge for measuring very small tubes.</td>
<td>84019  Force Gauge: GA5005-0013 (see page 7)</td>
</tr>
<tr>
<td><strong>ID/OD/Wall: Tube &amp; Hose, Manual</strong></td>
<td>Enables inside diameter, outside diameter, and wall thickness measurement of tubular products such as medical tubing, hose, and glass.</td>
<td>83921</td>
</tr>
<tr>
<td><strong>ID/OD/Wall: Large Tube &amp; Hose, Auto-Rotating</strong></td>
<td>Enables the inside diameter, outside diameter, and wall thickness measurement of large, heavy tubular products such as metal tube, hose, and glass.</td>
<td>84291</td>
</tr>
<tr>
<td><strong>Chuck: Auto-Rotating</strong></td>
<td>Motorized rotation of shafts or wires to detect variation in diameter around the circumference. Keyless precision chuck holds diameters 0.003 to 1.5 in. (75µm to 38 mm).</td>
<td>84007 (Zero) 84005 (1/8 in.) 84015 (1/2 in.) 84022 (1.5 in.)</td>
</tr>
</tbody>
</table>
**Options**

Special accessories are available to address certain non-standard applications or data needs.

- **Small Spot Size Option**
  Special measurement range from 25 µm (0.001 in.) to 10 mm (0.4 in.) (factory installed option)

- **Digital I/O Interface**
  High-current open collector outputs for Hi/Low/Go and Warning Limits. A footswitch accessory lets the user activate the gauge’s measure function or initiate single measurements.

- **Language Legends**
  Can be used worldwide with the display language option.

- **Transparent Object Measurement**
  Enables BenchMike to measure the diameter of transparent material, such as clear plastic tubing and glass rods.

**Other Measurement & Control Solutions**

In addition to our BenchMike off-line gauging system, we offer a complete portfolio of measurement and control solutions for on-line production applications. Our solutions enable manufacturers to realize a number of performance and production benefits, such as improved product quality, enhanced process reliability, increased productivity, and reduced manufacturing costs.

**AccuScan**
Two-Axis and Four-Axis High-Speed Diameter and Ovality Measurement Systems

**UltraScan**
Wall and Concentricity Measurement Systems

**LN Detectors**
Lump and Neckdown Measurement Systems

**LaserSpeed**
Non-Contact Length and Speed Measurement Systems

**InControl™**
Process Visualization and Control and System

**DataPro**
Process Control and Data Management Systems

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**Force Gauge (GA5005-0013)**
For precision ID, OD, and Wall Thickness measurements on thin-wall small diameter tubing, such as medical tubing, simply place a tube sample on the ID/OD/Wall fixture, apply the desired force on the sample, and BenchMike will calculate all the dimensions.

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**Making Light Work**
Precision Measurement & Control Solutions

The Beta LaserMike line of measurement and control solutions from NDC Technologies is designed to increase productivity, improve product quality, and reduce manufacturing costs. These solutions provide in-process dimensional monitoring, control, and sample/part inspection of products such as wire and cable, fiber optics, metals, rubber and plastic, flat rolled goods, tube and pipe, and other manufactured goods. Every system is backed by NDC’s world-class service and support organization. With offices around the globe, we’re committed to serving your unique measurement application needs.