High-Accuracy Digimatic Micrometer
MDH-25MB
HIGH ACCURACY

World's First
0.1 μm* Resolution Digital Micrometer

*0.1 μm = 0.0001 mm

"d2" is a generic name for Mitutoyo Digimatic output compatible with up to 8 digits of I/O data.
Delivering a Maximum Permissible Error (MPE) of ±0.5 μm accuracy at 0.1 μm resolution means Mitutoyo’s MDH-25MB is the most accurate digital micrometer available*, and this instrument will enable you to easily and rapidly measure workpieces that require very-high-accuracy measurement. This remarkable performance has been attained thanks to Mitutoyo’s proprietary ABS (absolute) rotary encoder and high-accuracy thread cutting technology.

*Mitutoyo’s research as of July, 2018

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**MDH-25MB**

Easy, Rapid and High-accuracy Measurement of Workpieces That Require an Accuracy of 1 μm or Less

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**Position and Merits of MDH-25MB**

- Measuring accuracy equivalent to a laser micrometer
- No jig, etc. needed to be fabricated
- Simple measurement enabled even for very small parts
- Portable and compatible with standard workpiece measurement techniques, similar to conventional micrometers
- Economical - low investment in equipment compared with other choices

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*Mitutoyo’s research as of July, 2018*
APPLICATION

Beyond the Usual Micrometer!
Many More Kinds of High-accuracy Parts Now Measurable.

This micrometer allows easy, rapid and high-accuracy measurement of workpieces that require a measuring accuracy of 1 μm or less, such as medical parts, precision instruments and auto-parts regarded as difficult to be accurately measured with conventional micrometers.

APPLICATION

Hypodermic needle measurement
Pin gage measurement

To reduce injection pain as much as possible, the outside diameter of hypodermic needle tips has become much thinner. Some needles have a tip diameter of just 0.2 mm, thus requiring high-accuracy measurement.

Pin gages are widely used for measurement of the diameter or center-to-center distance of holes. The periodic calibration of a high-precision pin gage requires high-accuracy measurement.
Automobile/office equipment

Fiber optics measurement

The optical-transmission cylindrical "core" made of quartz glass is 0.01 to 0.05 mm in diameter. Since its thickness is similar to a strand of hair, high accuracy is required for its measurement.

Gap gage calibration

Gap gages are widely used for easy measurement of small gaps in assemblies. Periodic gage calibration is indispensable for accuracy control to detect undue wear.

Electric/electronic devices

Gear tooth measurement

As gears decrease in size and weight, the MDH allows for convenient high accuracy evaluation. MDH simply enables accuracy evaluation with it on hand for the customer demand of high accuracy.

Medical care

Implant measurement

An abutment is used for dental implants. Abutments have various lengths, angles, and materials. Each abutment needs to be made and measured very accurately.

Medical care

Catheter measurement

High-accuracy measurement is needed when manufacturing the fine tubing widely used in the medical field, such as a catheter that plays a crucial part in dilating a blood vessel.

Automobile and machine tools

Optical film measurement

Optical films are widely used to display still images or moving images on a car navigation device or LCD TV. The micrometer accuracy is a must for measuring film thickness.

Machine tools

Cutting tool measurement

The diameter of extremely small drills used for manufacturing precision tools and instruments requires high accuracy measurement.

Automobile/office equipment

Bearing measurement

High-accuracy measurement is required for the component parts of anti-friction ball and roller bearings that are required to support vibration-free rotation in high-quality products.
TECHNOLOGY

Ratchet thimble with an anti-friction bearing

Measurement repeatability has been improved by changing from sliding to rolling friction to dramatically reduce the torque needed to operate the constant-force device. This makes measurement even more consistent, even for operators new to this micrometer.

Heat transfer reduction with a heat shield

The influence of heat transferred to the micrometer frame through hands has been reduced during measurement with this micrometer by fitting the supplied heat shield. The graph below shows that the heat shield almost eliminates thermally induced error by minimizing thermal expansion of the frame.

ABS (absolute) rotary encoder with a resolution of 0.1 μm and high-accuracy thread cutting technology

The development of a 5000-division rotary encoder has achieved the unprecedented resolution of 0.1 μm in a hand-held micrometer. The commercialization of this ABS (absolute) encoder has also improved its reliability. Additionally, since the spindle-thread pitch accuracy directly affects measuring accuracy, Mitutoyo has developed a series of technologies from thread cutting technology to thread evaluation technology, thereby guaranteeing the achievement of high accuracy.

Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preset (ABS measurement system)</td>
<td>The measurement origin can be preset to any value within the display range for convenience in measuring.</td>
</tr>
<tr>
<td>Zero-setting (INC measurement system)</td>
<td>The display can be zeroed at any position of the spindle, making comparison measurement easier. Returning to the absolute-measurement mode is easily accomplished.</td>
</tr>
<tr>
<td>Hold</td>
<td>The displayed value is held while the spindle is withdrawn and the micrometer moved so that the display can be read at the operator’s convenience.</td>
</tr>
<tr>
<td>Resolution switching</td>
<td>The resolution of the display can be switched. If 0.1 μm measurement is not required, the resolution can be switched to 0.5 μm.</td>
</tr>
<tr>
<td>Function lock</td>
<td>Functions such as preset or zero-set can be locked to avoid inadvertently changing the origin position.</td>
</tr>
<tr>
<td>On/off</td>
<td>The power can be turned off after measurement is complete. Even after the power is turned off, the origin or last zero-set position remains in the memory.</td>
</tr>
<tr>
<td>Auto power off</td>
<td>Even if the power is left on, the power turns off automatically if the micrometer is not used within a 20-minute period.</td>
</tr>
<tr>
<td>Measurement data output</td>
<td>Measurement data can be output, allowing easy incorporation of this instrument into a statistical process control or measurement system.</td>
</tr>
<tr>
<td>Error alarm</td>
<td>In the unlikely event of a display overflow or calculation error, an error message is displayed and measurement stops. Measurement cannot continue until the error is corrected. Also, if the battery voltage drops below a certain point, the battery indicator will turn on before measurement becomes impossible, warning the user that the battery needs to be replaced.</td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>Metric</th>
<th>Inch/Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>293-100-10</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 – 25 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.0001 mm/0.0005 mm (switchable)</td>
</tr>
<tr>
<td>Maximum permissible error J MPE</td>
<td>±0.5 μm</td>
</tr>
<tr>
<td>J MPE</td>
<td>0.3 μm/0.6 μm</td>
</tr>
<tr>
<td>Measuring surface</td>
<td>ø3.2 mm</td>
</tr>
<tr>
<td>Measuring force</td>
<td>7 to 9 N</td>
</tr>
<tr>
<td>Measuring system</td>
<td>Electromagnetic induction type ABS rotary sensor</td>
</tr>
<tr>
<td>Mass</td>
<td>400 g (440 g with heat shield attached)</td>
</tr>
<tr>
<td>Power supply</td>
<td>Lithium battery (CR2032) x 1</td>
</tr>
<tr>
<td>Battery life</td>
<td>Approx. two years when used under normal conditions</td>
</tr>
</tbody>
</table>

Dimensions

![Dimensions diagram]
USABILITY

Reliable operation

The sound of the ratchet provides a reliable operation and repeatable measurements.

Absolute encoder

The ABS (absolute) rotary encoder eliminates the need for origin point setting at every power-on, allowing immediate starting of measurement. This encoder achieves high reliability without causing an overspeed error.

Wear-resistant carbide tip

The Ø3.2 mm carbide tip on the measuring face is highly resistant to wear, allowing accurate measurement for an extended period of time.

Zero-setting function

This function allows the displayed to be zero set at any position, thus facilitating comparative measurement. Also the absolute value from the origin can be restored.

Built-in “Hold” function

This function can hold (freeze) the displayed value. Enables the micrometer to be removed from a workpiece when the readout is not easily viewable so that the measurement value can be read at your convenience.

Versatile functionality enhances productivity and ease of use

This micrometer is equipped with many useful and time-saving functions such as resolution switching (0.0001 mm/0.0005 mm), function lock, and presetting.

■ Measurement Data Recording Tools (Optional)

Mini-printer equipped with data logger function

Digimatic mini processor DP-1VA LOGGER No. 264-505
(See Catalog No. E12041)

The data logger function allows data output to a PC and automatic logging of measurement data in an Excel-format inspection certificate using Mitutoyo USB-ITPAK. It provides significant potential for efficiency improvement in the QC function.

■ Standard accessories

• Heat shield (04AA8969A: 293-100-10 04AA8969B: 293-130-10) x 1
• Lithium battery (CR2032: Battery supplied is for testing purpose only) x 1
• Spanner (200877) x 1
• Screwdriver (04AAB985) x 1
• Lens paper
• Inspection certificate

■ Optional accessories

• Lens paper x 1,000 (04AZB581)

■ Wired Connection to PC via USB Input Tool Series (Refer to Catalog E12007)

USB-ITN-B
USB-ITN-B (2 m): 06AFM380B
IT-016U
IT-016U: 264-016-10

■ Wireless Connection to PC via U-WAVE (Refer to Catalog E12000)

U-WAVE-T (IP67): 02AZD730G
U-WAVE-T (with buzzer): 02AZD880G

■ Connecting cables specific to output-function equipped models

1 m: 05CZA662
2 m: 05CZA663

• For standard use (160 mm): 02AZD790B
• For foot switch use: 02AZE140B
Whatever your challenges are, Mitutoyo supports you from start to finish.

Mitutoyo is not only a manufacturer of top quality measuring products but one that also offers qualified support for the lifetime of the equipment, backed up by comprehensive services that ensure your staff can make the very best use of the investment.

Apart from the basics of calibration and repair, Mitutoyo offers product and metrology training, as well as IT support for the sophisticated software used in modern measuring technology. We can also design, build, test and deliver bespoke measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

Find additional product literature and our product catalogue

http://www.mitutoyo.co.jp/global.html

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