Mitutoyo

Mitutoyo Quality

High-Accuracy Digimatic Micrometer
MDH-25MB

Small Tool Instruments and Data Management

Bulletin No. 2271

Mitutoyo

HIGH ACCURACY

World's First 0.1 µm* Resolution Micrometer

*0.1 µm=0.0001 mm

d2

"d2" is a generic name for Mitutoyo Digimatic output compatible with up to 8 digits of I/O data.

MDH-25MB

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

Delivering ±0.5 µm accuracy at 0.1 µm resolution means Mitutoyo's MDH-25MB is the most accurate hand-held micrometer available*, and this instrument will enable you to easily and rapidly measure workpieces that require very-high-accuracy measurement. This remarkable performance is attained due to Mitutoyo's proprietary ABS (absolute) rotary encoder and high-accuracy thread cutting technology.

*Mitutoyo's research as of March, 2018

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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APPLICATION

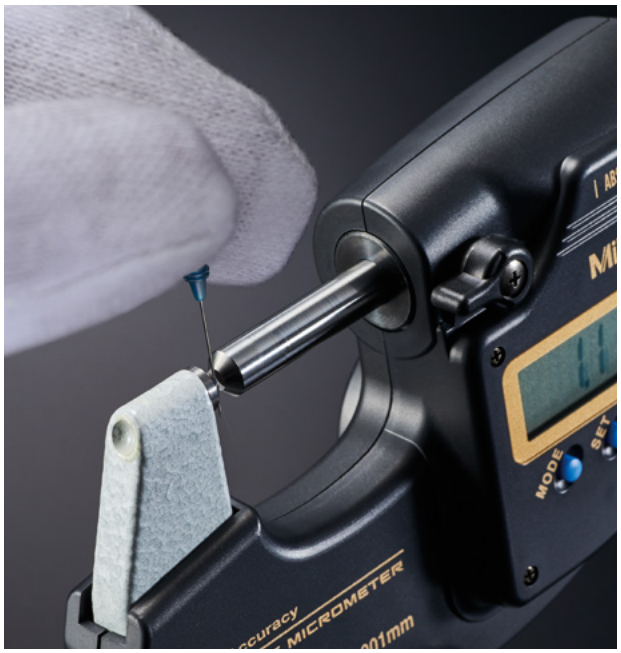
Beyond the Usual Micrometer!
Many More Kinds of High-accuracy Parts Now Measurable.

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 being difficult to accurately measure with conventional micrometers.

Manufacturing

Pin gage measurement

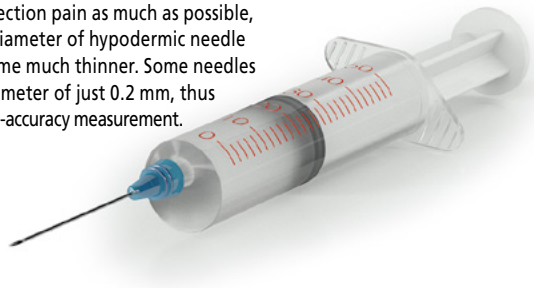
Pin gages are widely used for measurement of the diameter or center-to-center distance of holes. The periodic calibration of a high-precision pin gage requires high-accuracy measurement.



Medical care

Hypodermic needle 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.



Electric/electronic devices

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.

Manufacturing

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.

Automobile and machine tools

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

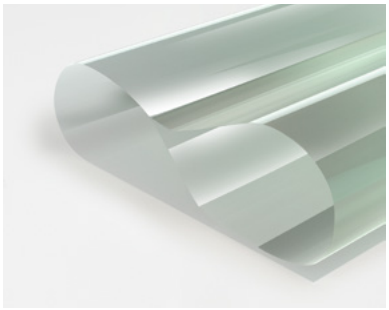
Implant measurement

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.



Electric/electronic devices

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

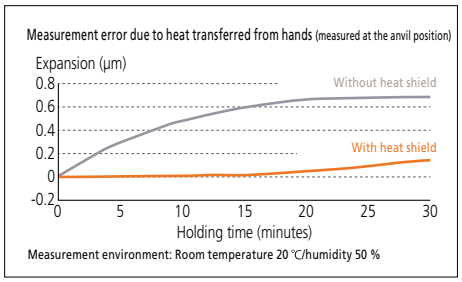
Measurement repeatability has been improved by changing from sliding to rolling friction to dramatically reduce the torque needed to operate the constant-force device. This makes measurement even more consistent even for operators new to this micrometer.

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 also improves 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.

Heat transfer reduction with a heat shield

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



■ Functions

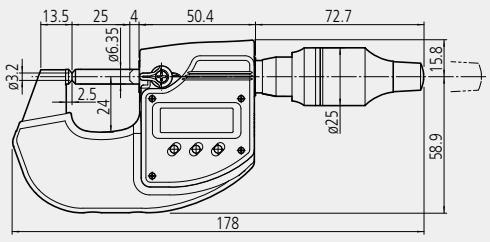
Preset (ABS measurement system):	The measurement origin can be preset to any value within the display range for convenience in measuring.
Zero-setting (INC measurement system):	The display can be zeroed at any position of the spindle, making comparison measurement easier. Returning to the absolute-measurement mode is easily accomplished.
Hold:	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. After cancelling the hold, the instrument returns to the previous measuring mode (absolute or incremental).
Resolution switching:	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.
Function lock:	Functions such as preset or zero-set can be locked to avoid inadvertently changing the origin position.
On/off:	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.
Auto power off:	Even if the power is left on, the power turns off automatically if the micrometer is not used within a 20-minute period.
Measurement data output:	Measurement data can be output, allowing easy incorporation of this instrument into a statistical process control or measurement system.
Error alarm:	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.

■ Specifications

	Metric	Inch/Metric
Order No.	293-100-10	293-130-10
Measuring range	0 – 25 mm	0 – 1 in
Resolution	0.0001 mm/0.0005 mm (switchable)	0.000005 in/0.00002 in 0.0001 mm/0.0005 mm (switchable)
Instrumental error (20 ℃) (excludes quantization error of ±1 count)	±0.5 µm	±0.00002 in
Flatness/Parallelism	0.3 µm/0.6 µm	0.000012 in/0.000024 in
Measuring surface	ø3.2 mm	
Measuring force	7 to 9 N	
Measuring system	Electromagnetic induction type ABS rotary sensor	
Mass	400 g (440 g with heat shield attached)	
Power supply	Lithium battery (CR2032) x 1	
Battery life	Approx. two years when used under normal conditions	

■ Dimensions

Unit (mm)



USABILITY

Reliable operation

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

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.

Enhances productivity, ease of use

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

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.

ABSOLUTE™

Zero-setting function

This function allows the display 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 the measurement value can be read at your convenience.

■ 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.

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

USB-ITN-B — USB

USB-ITN-B (2 m)**:06AFM380B**

Ⓐ IT-016U — USB

IT-016U:264-016-10

PC

Connecting cables specific to output-function equipped models

Ⓐ 1 m**: 05CZA662**
2 m**: 05CZA663**

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

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

Ⓑ U-WAVE-T

U-WAVE-R — USB

U-WAVE-R: 02AZD810D

PC

Ⓑ For standard use (160 mm)**: 02AZD790B**
For foot switch use**: 02AZE140B**

■ Standard Accessories

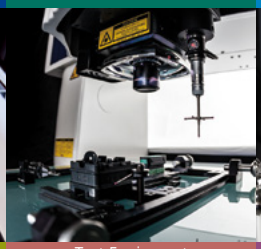
- Heat shield (04AAB969A: 293-100-10 04AAB969B: 293-130-10) x 1
- Lithium battery (CR2032: Battery supplied is for testing purpose only) x 1
- Spanner (200877) x 1
- Screwdriver (04AAB985) x 1
- Lens paper
- Inspection certificate

■ Optional Accessories

- Lens paper x 1,000 (04AZB581)

Coordinate Measuring Machines

Vision Measuring Systems



Form Measurement

Optical Measuring

Sensor Systems

Test Equipment and Seismometers

Digital Scale and DRO Systems

Small Tool Instruments and Data Management

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 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 measuring solutions and even, if deemed cost-effective, take your critical measurement challenges in-house on a sub-contract basis.

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