

# 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.



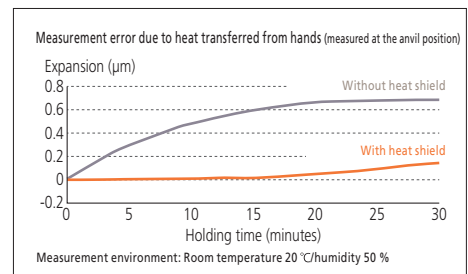
## ABS (absolute) rotary encoder with a resolution of 0.1 $\mu\text{m}$ and high-accuracy thread cutting technology

The development of a 5000-division rotary encoder has achieved the unprecedented resolution of 0.1  $\mu\text{m}$  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.



## 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.



## ■ Functions

<b>Preset (ABS measurement system):</b>	The measurement origin can be preset to any value within the display range for convenience in measuring.
<b>Zero-setting (INC measurement system):</b>	The display can be zeroed at any position of the spindle, making comparison measurement easier. Returning to the absolute-measurement mode is easily accomplished.
<b>Hold:</b>	The displayed value is held while the spindle is withdrawn and the micrometer moved so that the display can be read at the operator's convenience.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).
<b>Resolution switching:</b>	The resolution of the display can be switched. If 0.1 $\mu\text{m}$ measurement is not required, the resolution can be switched to 0.5 $\mu\text{m}$ .
<b>Function lock:</b>	Functions such as preset or zero-set can be locked to avoid inadvertently changing the origin position.
<b>On/off:</b>	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.
<b>Auto power off:</b>	Even if the power is left on, the power turns off automatically if the micrometer is not used within a 20-minute period.
<b>Measurement data output:</b>	Measurement data can be output, allowing easy incorporation of this instrument into a statistical process control or measurement system.
<b>Error alarm:</b>	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 °C) (excludes quantization error of $\pm 1$ count)	$\pm 0.5 \mu\text{m}$	$\pm 0.00002$ in
Flatness/Parallelism	0.3 $\mu\text{m}$ /0.6 $\mu\text{m}$	0.000012 in/0.000024 in
Measuring surface	$\varnothing 3.2$ 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

