# Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

QuantuMike
### SERIES 293 — IP65 Coolant Proof Micrometer with 2mm/rev Spindle Feed

• Advanced pioneering technology has created the next generation of micrometer, the most revolutionary advance in micrometer technology since James Watt invented the instrument.

• Faster measurement is achieved by using a coarser thread which feeds the spindle by 2mm per revolution of the thimble. This increase in thread lead has been made possible thanks to new high precision thread-cutting and testing techniques.

	Spindle feed per revolution
1 revolution of thimble — Conventional model	0.5mm
QuantuMike	2.0mm
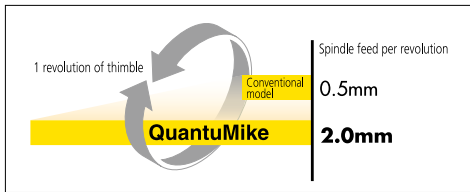
• QuantuMike is equipped with a function lock feature to prevent the origin point being moved by mistake during measurement.

Function lock

8.000

• A graduated scale is provided on the sleeve for use with a reference mark on the thimble so that every millimeter displacement can be checked to provide extra confidence.

Reference mark
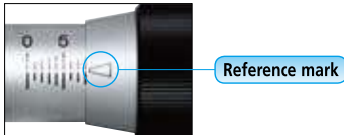
• The patented ratchet thimble mechanism* helps ensure repeatable results by transmitting microvibrations along the spindle to the contact face to provide a constant measuring force and encourage good contact with the workpiece. The ratchet works from the thimble as well as the speeder so it is always easy to use – even when making measurements one-handed. The sound of the ratchet provides the user with a sense of confidence and the speeder enables the rapid spindle feed needed when measuring widely different dimensions.
*Patent registered (in Japan, USA, China, Germany, UK and France)

Ratchet on thimble   Ratchet on speeder
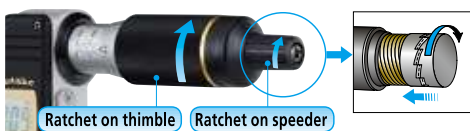
Ratchet-induced microvibrations along the spindle help ensure repeatable measurements.

293-140

293-140

293-142

293-141

293-143

•The models 293-140/141/145/146 won the Good Design Award 2008.
•The name QuantuMike is from Quantum and Micrometer, reflecting our belief this tool represents a quantum leap in micrometer ergonomics.

• A statistical process control system and a measurement network system can be established to share information regarding quality with a model equipped with the data output function. (Refer to page A-3 for details.)

• There is a lineup of convenient Interface Input Tools which enable the conversion of measurement data to keyboard signals and directly input them to cells in off-the-shelf spreadsheet software such as Excel. (Refer to page A-5 for details.)

• Excellent resistance against oil, water and dust (IP65 protection level) enables this product to be used in machining situations that include splashing coolant fluid.

• Measuring faces: Carbide.

IP Codes
Level 6: Dust -proof.
    No ingress of dust allowed.
Level 5: Protected against water jets.
    Water projected in jets against the enclosure
    from any direction shall have no harmful effects.

Technical Data
Dust/Water protection level: IP65 (IEC60529)*2
Measuring force: 7 to 12N
Battery: **SR44** (1 pc), **938882**,
    for initial operational checks
    (standard accessory)
Length standard: Electromagnetic rotary sensor
Battery life: Approx. 1.2 years under normal use
Standard accessories: Reference bar, 1 pc
    (except for 0-25mm (0-1") models)
    Spanner (**No. 301336**), 1 pc
*2 Rustproofing shall be applied after use.

Functions
Origin point setting (ABS length measurement system):
Pressing the ORIGIN button resets the ABS origin at
the current spindle position. Origin values can be set
depending on each size.
Zero setting (INC length measurement system):
A brief press on the ZERO/ABS button sets display to
zero at the current spindle position and switches to the
incremental (INC) measuring mode. A longer press resets
to the ABS measuring mode.
Hold:
Pressing the HOLD button freezes the current value
in the display. This function is useful for preserving a
measurement in situations of poor visibility when the
instrument must be moved away from the workpiece
before the reading can be recorded.
Function lock:
This function allows the ORIGIN (origin point setting)
function and the ZERO (zero setting) function to be locked
to prevent these points being reset accidentally.
Auto power ON/OFF:
The reading on the LCD disappears after this instrument
is idle for approx. 20 minutes, but the origin point is
retained. Turning the spindle causes the reading on the
LCD to reappear.
Data output*3:
Models equipped with this function have an output port
for transferring measurement data to a Statistical Process
Control (SPC) system.
Error alarm:
In case of an overflow on the LCD or a computing error,
an error message appears on the LCD, and the measuring
function stops. This prevents an instrument from giving
an erroneous reading. Also, when the battery voltage
drops to a certain level, the low-battery-voltage alarm
annunciator appears well before the micrometer becomes
unusable.
*3: Only for the models with SPC data output

Optional accessories
(Only for models with data output function)
Connecting cables with output switch
    1m: **No. 05CZA662**
    2m: **No. 05CZA663**
USB Input Tool Direct
    USB-ITN-B (2m): **No. 06ADV380B**
Connecting cables for **U-WAVE-T** (160mm)
    No. 02AZD790B
    For foot switch: **No. 02AZE140B**
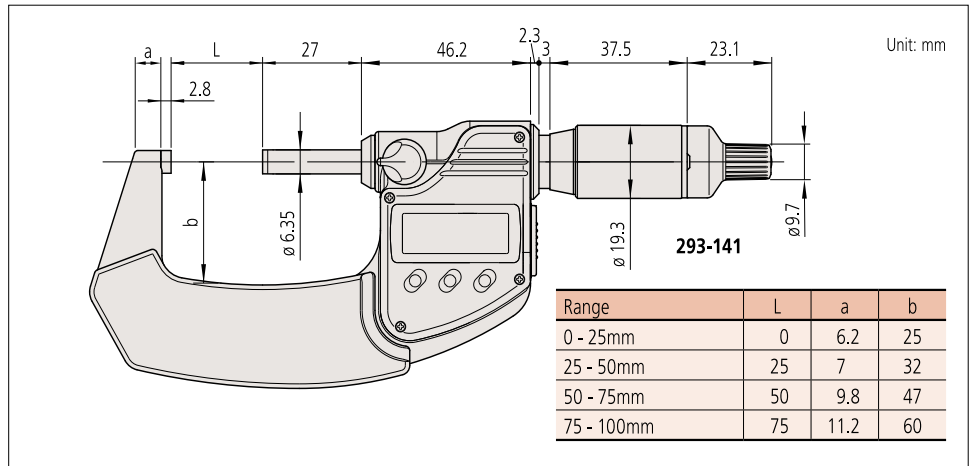   Refer to page A-21 for details.

SPECIFICATIONS

Metric

	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	**293-140**	0 - 25mm		±1µm		1µm	265g
	293-141	25 - 50mm					325g
	293-142	50 - 75mm				2µm	465g
	293-143	75 - 100mm	0.001mm	±2µm	0.3µm		620g
without SPC data output	**293-145**	0 - 25mm		±1µm		1µm	265g
	293-146	25 - 50mm					325g
	293-147	50 - 75mm				2µm	465g
	293-148	75 - 100mm		±2µm			620g

*1 Excluding quantizing error

Inch/Metric

	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	**293-180**	0 - 1"		±.00005"		.00004"	265g
	293-181	1" - 2"					325g
	293-182	2" - 3"				.00008"	465g
	293-183	3" - 4"	.00005"/ 0.001mm	±.0001"	.000012"		620g
without SPC data output	**293-185**	0 - 1"		±.00005"		.00004"	265g
	293-186	1" - 2"					325g
	293-187	2" - 3"				.00008"	465g
	293-188	3" - 4"		±.0001"			620g

*1 Excluding quantizing error

DIMENSIONS

Unit: mm

293-141

Range	L	a	b
0 - 25mm	0	6.2	25
25 - 50mm	25	7	32
50 - 75mm	50	9.8	47
75 - 100mm	75	11.2	60

Measuring time on a 6-stepped workpiece with one hand

Thanks to the quick movement, positioning times are
reduced by 60%* and measuring times by 35%*
compared with a conventional micrometer.
*According to Mitutoyo's comparison test data for measuring time on
typical workpieces.

Time needed to measure a multi-stepped
cylindrical workpiece (with one hand)

Time [s]

Positioning time
Measuring Time

53 sec.
41 sec.
12 sec.
22 sec.
10 sec.
12 sec.

Conventional model   QuantuMike

B

Mitutoyo