Micrometer

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

Coolant Proof Micrometers SERIES 293 — with Dust/Water Protection Conforming to IP65 Level

MeasurLink® ENABLED
Data Management Software by Mitutoyo

- World's highest performing micrometer overall.
- Extended battery life of approximately 2.4 years.
- Ergonomic anti-slip frame cover and front panel for more comfortable hand-held measurements.
- Ratchet thimble provides better operability for one-handed operation.
- Oil-resistant material used for all plastic parts.
- Models equipped with a Digimatic output port can form part of a statistical process control or networked measurement system. (Refer to page A-3 for details.)
- Interface Input Tools are available that enable the conversion of measurement data to keyboard signals that are then directly input to cells in off-the-shelf spreadsheet software such as Excel. (Refer to page A-13 for details.)
- Two types of constant-force devices are available: Ratchet Stop and Ratchet Thimble.
- Measuring faces: Carbide.

293-230-30

293-252-30

293-233-30
293-231-30
293-230-30
293-232-30

293-234-30
With ratchet thimble

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

These marks indicate that a product has successfully passed IP65-level testing, which is carried out by the independent German certification organization TÜV Rheinland.

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ID 0000040191

An inspection certificate is supplied as standard. Refer to page U-11 for details.
(Maximum measuring range up to 50 mm)

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

Flatness:	0.3 µm/0.000012 in
Dust/water protection level:	IP65 (IEC60529)*1
Measuring force:	5 to 10 N (ratchet thimble type is 7 to 12 N.)*2
Battery:	**SR44** (1 pc.), **938882**, for initial operational checks (standard accessory)
Battery life:	Approx. 2.4 years under normal use
Length standard:	Electromagnetic rotary sensor
Standard accessories:	Reference bar, 1 pc. (except for 0-25 mm (0-1 in) models) Spanner (**301336**), 1 pc.

*1 Rustproofing shall be applied after use.
*2 Refer to page B-6 for details.

Optional Accessories

(Only for models with data output function)
Connecting cables with output switch
1 m: **05CZA662**
2 m: **05CZA663**
USB Input Tool Direct
USB-ITN-B (2 m): **06AFM380B**
U-WAVE-T dedicated connection cable
160 mm: **02AZD790B**
For foot switch: **02AZE140B**
Refer to page A-25 for details.

Wireless Data Output U-WAVE fit

U-WAVE-TM **264-622** (IP67 type)
264-623 (Buzzer type)
Connecting unit for **U-WAVE-TM**
02AZF310 (IP67/buzzer type common specification)
Refer to page A-15 for details.

Functions

Origin point setting (ABS measurement system):
Resets the ABS origin at the current spindle position to the minimum value of the measuring range and switches to ABS mode.

Zero-setting:
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 where the instrument must be moved away from the workpiece before the reading can be recorded.

Data output[*1] :
Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.
*1 Only models with the data output function

Auto power ON / OFF:
The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading and measurement mode are retained. Turning the spindle causes the reading to reappear.

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.

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.

SPECIFICATIONS

Metric

	Order No	Range (mm)	Resolution (mm)	Accuracy* (μm)	Parallelism (μm)	Constant-force device	Mass (g)
with SPC data output	**293-230-30**	0 - 25	0.001	±1	1	With ratchet stop	270
	293-231-30	25 - 50					330
	293-232-30	50 - 75			2		470
	293-233-30	75 - 100		±2			625
	293-250-30	100 - 125			3		600
	293-251-30	125 - 150					740
	293-252-30	150 - 175		±3			800
	293-253-30	175 - 200			4		970
	293-254-30	200 - 225					1100
	293-255-30	225 - 250		±4			1270
	293-256-30	250 - 275					1370
	293-257-30	275 - 300			5		1590
	293-234-30	0 - 25		±1	1	With ratchet thimble	280
	293-235-30	25 - 50					340
	293-236-30	50 - 75			2		480
	293-237-30	75 - 100		±2			635
without SPC data output	**293-240-30**	0 - 25	0.001	±1	1	With ratchet stop	270
	293-241-30	25 - 50					330
	293-242-30	50 - 75			2		470
	293-243-30	75 - 100		±2			625
	293-244-30	0 - 25		±1	1	With ratchet thimble	280
	293-245-30	25 - 50					340
	293-246-30	50 - 75			2		480
	293-247-30	75 - 100		±2			635

* Excluding quantizing error of ±1 count
Note: All digits of models over 125 mm (5 in) measuring range are presettable.

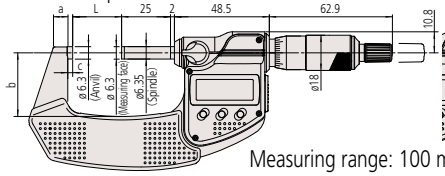
Inch / Metric

	Order No	Range (in)	Resolution	Accuracy* (in)	Parallelism (in)	Constant-force device	Mass (g)
with SPC data output	**293-330-30**	0 - 1	0.00005 in /0.001 mm	±0.00005	0.00004	With ratchet stop	270
	293-331-30	1 - 2					330
	293-332-30	2 - 3			0.00008		470
	293-333-30	3 - 4		±0.0001			625
	293-350-30	4 - 5	0.0001 in /0.001 mm		0.00012		600
	293-351-30	5 - 6					740
	293-352-30	6 - 7		±0.00015			800
	293-353-30	7 - 8			0.00016		970
	293-354-30	8 - 9					1100
	293-355-30	9 -10		±0.0002			1270
	293-356-30	10 - 11					1370
	293-357-30	11 - 12			0.0002		1590
	293-334-30	0 - 1	0.00005 in /0.001 mm	±0.00005	0.00004	With ratchet thimble	280
	293-335-30					With friction thimble	275
	293-336-30	1 - 2					335
without SPC data output	**293-340-30**	0 - 1	0.00005 in /0.001 mm	±0.00005	0.00004	With ratchet stop	270
	293-341-30	1 - 2					330
	293-342-30	2 - 3			0.00008		470
	293-343-30	3 - 4		±0.0001			625
	293-344-30	0 - 1		±0.00005	0.00004	With ratchet thimble	280
	293-345-30	1 - 2					340
	293-346-30	2 - 3			0.00008		480
	293-347-30	3 - 4		±0.0001			635
	293-348-30	0 - 1		±0.00005	0.00004	With friction thimble	275

* Excluding quantizing error of ±1 count
Note: All digits of models over 125 mm (5 in) measuring range are presettable.

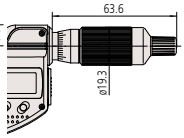
DIMENSIONS

Ratchet stop

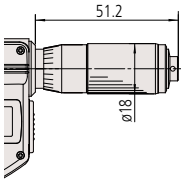


Measuring range: 100 mm or less

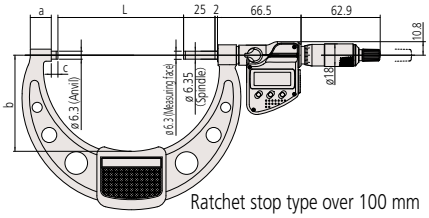
Ratchet thimble type



Friction thimble type



Unit: mm



Ratchet stop type over 100 mm

Range (mm)	Order No.	L	a	b	c
0-25	**293-230-30 / 293-240-30**	0	6.5	25	2.5
25-50	**293-231-30 / 293-241-30**	25	7.3	32.5	
50-75	**293-232-30 / 293-242-30**	50	10.1	47	
75-100	**293-233-30 / 293-243-30**	75	11.5	60	
0-25	**293-234-30 / 293-244-30**	0	6.5	25	
25-50	**293-235-30 / 293-245-30**	25	7.3	32.5	
100-125	**293-250-30**	100	16.7	76	5.3
125-150	**293-251-30**	125	18.8	90	5.7
150-175	**293-252-30**	150	19.1	103	6.1
175-200	**293-253-30**	175	18.2	115	6.3
200-225	**293-254-30**	200	16.8	126	6.7
225-250	**293-255-30**	225	18	139	5.5
250-275	**293-256-30**	250		152	6.5
275-300	**293-257-30**	275		166	