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

- 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-5 for details.)
- Two types of constant-force devices are available: Ratchet Stop and Ratchet Thimble.
- Measuring faces: Carbide

293-230-30

GOOD DESIGN AWARD 2014

293-252-30

293-233-30

293-231-30

293-230-30

293-232-30

293-234-30
With ratchet thimble

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.
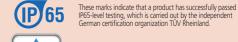
Technical Data
Flatness: 0.3μm/.000012″
Dust/water protection level: IP65 (IEC60529) *2
Measuring force: 5 to 10N (ratchet thimble type is 7 to 12N.)*3
Battery: **SR44** (1 pc), **938882**, for initial operational checks (standard accessory)
Battery life: Approx. 2.4 years under normal use
Length standard: Electromagnetic rotary sensor
Standard accessories: Reference bar, 1 pc (except for 0-25mm (0-1″) models) Spanner (**301336**), 1 pc

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

Optional accessories
(Only for models with data output function)
Connecting cables with output switch
  1m: **05CZA662**
  2m: **05CZA663**
USB Input Tool Direct
  USB-ITN-B (2m): **06ADV380B**
Connecting cables for **U-WAVE-T** (160mm)
  02AZD790B
  For foot switch: **02AZE140B**
  Refer to page B-68 for details.

These are dedicated connecting cables for Coolant Proof micrometers.

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SPECIFICATIONS

Metric

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

* Excluding quantizing error
• All-Digit preset type: models over 125mm (5") measuring range

Inch/Metric

	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass
with SPC data output	293-330-30	0 - 1"	.00005"/0.001mm	±.00005"	.00004"	With ratchet stop	270g
	293-331-30	1" - 2"					330g
	293-332-30	2" - 3"			.00008"		470g
	293-333-30	3" - 4"					625g
	293-350-30	4" - 5"	.0001"/0.001mm	±.0001"	.00012"		600g
	293-351-30	5" - 6"					740g
	293-352-30	6" - 7"					800g
	293-353-30	7" - 8"		±.00015"	.00016"		970g
	293-354-30	8" - 9"					1100g
	293-355-30	9" -10"					1270g
	293-356-30	10" - 11"		±.0002"			1370g
	293-357-30	11" - 12"			.0002"		1590g
	293-334-30	0 - 1"	.00005"/0.001mm	±.00005"	.00004"	With ratchet thimble	280g
	293-335-30	0 - 1"				With friction thimble	275g
	293-336-30	1" - 2"					335g
without SPC data output	293-340-30	0 - 1"	.00005"/0.001mm	±.00005"	.00004"	With ratchet stop	270g
	293-341-30	1" - 2"					330g
	293-342-30	2" - 3"			.00008"		470g
	293-343-30	3" - 4"		±.0001"			625g
	293-344-30	0 - 1"	.00005"/0.001mm	±.00005"	.00004"	With ratchet thimble	280g
	293-345-30	1" - 2"					340g
	293-346-30	2" - 3"			.00008"		480g
	293-347-30	3" - 4"		±.0001"			635g
	293-348-30	0 - 1"		±.00005"	.00004"	With friction thimble	275g

* Excluding quantizing error
• All-Digit preset type: models over 125mm (5") measuring range

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 (INC 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 where the instrument must be moved away from the workpiece before the reading can be recorded.
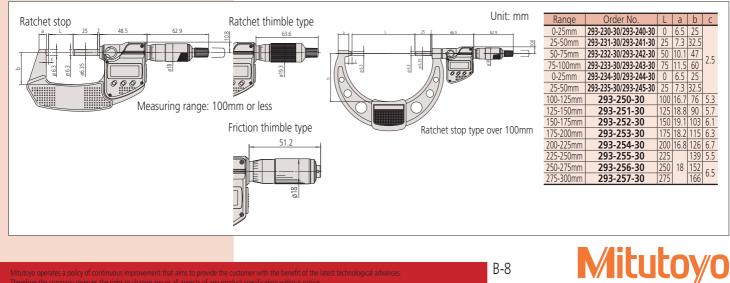
Data output*4 :
Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.
*4: Only models with the data output function

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.

B

DIMENSIONS

Ratchet stop — Measuring range: 100mm or less

Ratchet thimble type

Friction thimble type

Ratchet stop type over 100mm

Unit: mm

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

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