

Micrometer

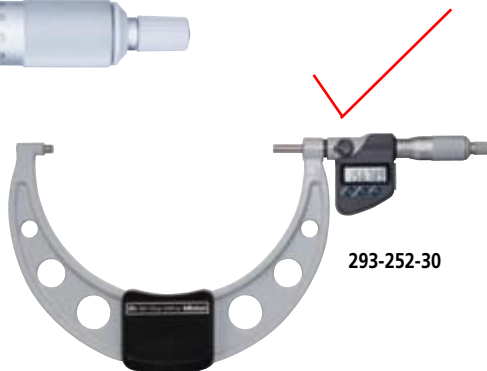
The origin of Mitutoyo's trustworthy brand of small tool instruments

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



293-252-30



293-234-30
With ratchet thimble



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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An inspection certificate is supplied as standard. Refer to page X for details.

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/0.00012"
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.

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.

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		±3μm	4μm		800g
	293-253-30	175 - 200mm					970g
	293-254-30	200 - 225mm		±4μm	5μm		1100g
	293-255-30	225 - 250mm					1270g
	293-256-30	250 - 275mm		1370g			
	293-257-30	275 - 300mm			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		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	2μm	470g	
	293-243-30	75 - 100mm			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					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"	.00012"	600g			
	293-351-30	5" - 6"			740g			
	293-352-30	6" - 7"	±.00015"	.00016"	800g			
	293-353-30	7" - 8"			970g			
	293-354-30	8" - 9"			1100g			
	293-355-30	9" - 10"			1270g			
	293-356-30	10" - 11"	±.0002"	.0002"	1370g			
	293-357-30	11" - 12"			1590g			
	293-334-30	0 - 1"	.00005" /0.001mm	±.00005"	.00004"		With ratchet thimble	280g
	293-335-30						With friction thimble	275g
without SPC data output	293-336-30	1" - 2"	.00005" /0.001mm	±.00005"	.00004"	With ratchet stop	335g	
	293-340-30	0 - 1"						270g
	293-341-30	1" - 2"			.00008"		330g	
	293-342-30	2" - 3"					470g	
	293-343-30	3" - 4"		±.0001"	.00004"	625g		
	293-344-30	0 - 1"				±.00005"	.00008"	280g
	293-345-30	1" - 2"		With ratchet thimble	340g			
	293-346-30	2" - 3"			480g			
	293-347-30	3" - 4"			±.0001"			.00004"
	293-348-30	0 - 1"				±.00005"	With friction thimble	

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

DIMENSIONS

