

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



293-234-30
With ratchet thimble

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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.



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 to 25 mm (0 to 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-27 for details.



Wireless Data Output **u-WAVE^{fit}**

U-WAVE-TM 264-622 (IP67 type)
264-623 (Buzzer type)

- **U-WAVE-TMB** Transmitter
Mitutoyo Bluetooth[®] U-WAVE
264-626 (IP type)
264-627 (Buzzer type)
Refer to page A-16 for details.
- Connecting unit for **U-WAVE-TM/TMB**
02AZF310 (IP67/buzzer type common specification)
Refer to pages A-16 and A-18 for details.



SPECIFICATIONS

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.

Metric

	Order No	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μ m)	Parallelism (μ m)	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			470					
	293-233-30	75 - 100			625					
	293-250-30	100 - 125		3	± 2		600			
	293-251-30	125 - 150					740			
	293-252-30	150 - 175		4	± 3		800			
	293-253-30	175 - 200					970			
	293-254-30	200 - 225					1100			
	293-255-30	225 - 250					1270			
	293-256-30	250 - 275		5	± 4		1370			
	293-257-30	275 - 300					1590			
	without SPC data output	293-234-30		0 - 25	0.001		± 1	1	With ratchet thimble	280
		293-235-30		25 - 50						340
293-236-30		50 - 75	2	± 2		480				
293-237-30		75 - 100				635				
293-240-30		0 - 25	1	± 1		With ratchet stop	270			
293-241-30		25 - 50					330			
293-242-30		50 - 75					470			
293-243-30		75 - 100	2	± 2		625				
293-244-30		0 - 25				280				
293-245-30		25 - 50	1	± 1		With ratchet thimble	340			
293-246-30	50 - 75	480								
293-247-30	75 - 100	2	± 2	635						

Note: All digits of models over 125 mm (5 in) measuring range are presettable.

Inch/Metric

	Order No	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Constant-force device	Mass (g)		
with SPC data output	293-330-30	0 - 1	0.0005 in / 0.001 mm	± 0.00005	0.00004	With ratchet stop	270		
	293-331-30	1 - 2					330		
	293-332-30	2 - 3			470				
	293-333-30	3 - 4			625				
	293-350-30	4 - 5		0.0001	± 0.0001		0.00012	600	
	293-351-30	5 - 6						740	
	293-352-30	6 - 7		0.00015	± 0.00015		0.00016	800	
	293-353-30	7 - 8						970	
	293-354-30	8 - 9						1100	
	293-355-30	9 - 10						1270	
	293-356-30	10 - 11		± 0.0002	0.0002		0.0002	1370	
	293-357-30	11 - 12						1590	
	293-334-30	0 - 1		0.00005 in / 0.001 mm	± 0.00005		0.00004	With ratchet thimble	280
	293-335-30	1 - 2							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		± 0.0001	0.00008		470		
	293-343-30	3 - 4					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						480	
	293-347-30	3 - 4						635	
	293-348-30	0 - 1		± 0.00005	0.00004		With friction thimble	275	

Note: All digits of models over 125 mm (5 in) measuring range are presettable.

DIMENSIONS

Unit: mm

Range (mm)	Order No.	L	a	b	c
0 - 25	293-230-30/293-240-30	0	6.5	25	
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	2.5
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	18	152	6.5
275 - 300	293-257-30	275	16	166	