

Micrometer

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

- Superior environmental resistance.
- Ratchet thimble provides better operability for one-handed operation.
- Measuring faces: Carbide.
- 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.)



SPECIFICATIONS

Metric									
	Order No.	Range (mm)	Resolution (mm)	Measuring force*1 (N)	Maximum permissible error J_{MPE} (μ m)	Parallelism (μ m)	Flatness (μ m)	Constant measuring force	Mass (g)
with SPC data output	293-230-30	0 - 25	0.001	5 - 10	± 1	1	0.3	With ratchet stop	270
	293-231-30	25 - 50							330
	293-232-30	50 - 75							470
	293-233-30	75 - 100							625
	293-234-30	0 - 25							280
	293-235-30	25 - 50							340
without SPC data output	293-236-30	50 - 75	0.001	7 - 12	± 2	2	0.3	With ratchet thimble	480
	293-237-30	75 - 100							635
	293-240-30	0 - 25							270
	293-241-30	25 - 50							330
	293-242-30	50 - 75							470
	293-243-30	75 - 100							625
without SPC data output	293-244-30	0 - 25	0.001	5 - 10	± 1	1	0.3	With ratchet stop	280
	293-245-30	25 - 50							340
	293-246-30	50 - 75							480
	293-247-30	75 - 100							635

Inch / Metric									
	Order No.	Range (in)	Resolution	Measuring force*1 (N)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Flatness (in)	Constant measuring force	Mass (g)
with SPC data output	293-330-30	0 - 1	0.00005 in / 0.001 mm	5 - 10	± 0.00005	0.00004	0.000012	With ratchet stop	270
	293-331-30	1 - 2							330
	293-332-30	2 - 3							470
	293-333-30	3 - 4							625
	293-334-30	0 - 1							280
	293-335-30	1 - 2							275
without SPC data output	293-336-30	1 - 2	0.00005 in / 0.001 mm	5 - 10	± 0.00005	0.00004	0.000012	With ratchet stop	335
	293-340-30	0 - 1							270
	293-341-30	1 - 2							330
	293-342-30	2 - 3							470
	293-343-30	3 - 4							625
	293-344-30	0 - 1							280
	293-345-30	1 - 2							340
	293-346-30	2 - 3							480
	293-347-30	3 - 4							635
	293-348-30	0 - 1							275

- Dust/water protection level: IP65 (IEC60529)*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: Setting standard, 1 pc. (except for 0 to 25 mm (0 to 1 in) models), Spanner (**301336**), 1 pc.
- *1 Measuring force when using the speeder ratchet (Apply a measuring force in the same condition as for measurement and then set the origin.)
- *2 Rustproofing shall be applied after use.
- Note: All digits of models over 125 mm (5 in) measuring range are presettable.

DIMENSIONS

Measuring range: 100 mm or less

Ratchet thimble type

Unit: 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	

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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*:

Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.

* 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 indicator 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.

Optional Accessories

Refer to page B-8.



Functions

Refer to page B-7.

Optional Accessories

Only for models with data output function

Order No.	Type	Description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67/ buzzer	Connecting unit for U-WAVE-TM/TMB

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293-252-30

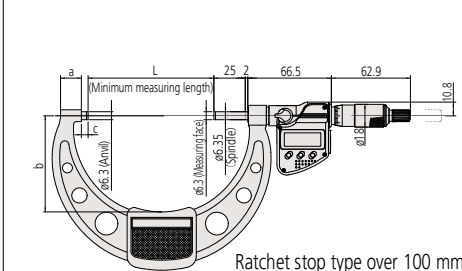
SPECIFICATIONS

		Metric								
	Order No.	Range (mm)	Resolution (mm)	Measuring force*1 (N)	Maximum permissible error J_{MPE} (μ m)	Parallelism (μ m)	Flatness (μ m)	Constant measuring force	Mass (g)	
with SPC data output	293-250-30	100 - 125	0.001	5 - 10	± 2	3	0.3	With ratchet stop	600	
	293-251-30	125 - 150							740	
	293-252-30	150 - 175				800				
	293-253-30	175 - 200				970				
	293-254-30	200 - 225			4	1100				
	293-255-30	225 - 250				1270				
	293-256-30	250 - 275			5	1370				
	293-257-30	275 - 300				1590				

		Inch / Metric								
	Order No.	Range (in)	Resolution	Measuring force*1 (N)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Flatness (in)	Constant measuring force	Mass (g)	
with SPC data output	293-350-30	4 - 5	0.0001 in / 0.001 mm	5 - 10	± 0.0001	0.00012	0.000012	With ratchet stop	600	
	293-351-30	5 - 6							740	
	293-352-30	6 - 7			± 0.00015	0.00016			800	
	293-353-30	7 - 8							970	
	293-354-30	8 - 9			± 0.0002	0.0002			1100	
	293-355-30	9 - 10							1270	
	293-356-30	10 - 11			0.0002	0.0002			1370	
	293-357-30	11 - 12							1590	

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DIMENSIONS



Range (mm)	Order No.	L	a	b	c
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		

Unit: mm