

Micrometers

SERIES 293 – IP65 Digimatic Micrometer

- Based on new waterproof structural technology, this micrometer provides IP65 protection levels, enabling use in environments that include cutting oil or coolant. *1
- $\pm 1 \mu\text{m}$ instrumental error (75 mm/3" or less measuring range models).
- Measuring data output function is available with a water-resistant data cable to maintain the IP65 protection level.
- Oil-resistant materials are used in all plastic components.
- Auto power ON/OFF function.
- Further-Increased operability thanks to easy-to-read LCD with 30% more character area.
- Models equipped with a Digimatic output port can form part of a statistical process control or networked measurement system.
- 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.
- Two types of constant-force devices are available: Ratchet Stop and Ratchet Thimble.
- Measuring faces: carbide.

*1 Anti-corrosion treatment is required after use.



Technical Data

Flatness:	.000012" / 0.3 μm
Dust/water	
protection level:	IP65 (IEC60529) *2
Measuring force:	5 to 10 N
Battery life:	Approx. 1.2 years under normal use
Standard accessories:	Setting standard, 1 pc (except for 0-25 mm (0-1") models) Button type silver oxide battery (SR44, 938882), 1 pc Spanner (301336), 1 pc

*2 Anti-corrosion treatment is required after use.

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

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 the unlikely event of a display overflow or calculation error, an error message is displayed and measurement stops. Measurement cannot continue until the error is corrected. Also, if the battery voltage drops below a certain point, the battery indicator will turn on before measurement becomes impossible, warning the user that the battery needs to be replaced.

Function lock*3:
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.

*3 All-digit preset type only.



Optional Accessories*1

Code No.	Description	
264-622	U-WAVE-TM transmitter	
02AZF310	U-WAVE-TM connection unit	
05CZA662	SPC data cable with pushbutton (1 m)	
05CZA663	SPC data cable with pushbutton (2 m)	
06AFM380B	USB input tool direct USB-ITN-B (2 m)	

*1 Only for models with data output function.



Specifications

Metric							
Code No.	Range	Resolution	Accuracy*2	Parallelism	Constant-force device	Mass	

With SPC data output

293-230-30	0 - 25 mm	0.001 mm	±1 μm	1 μm	Ratchet stop	270 g	
293-231-30	25 - 50 mm					330 g	
293-232-30	50 - 75 mm			2 μm		470 g	
293-233-30	75 - 100 mm		±2 μm			625 g	

Inch/Metric

Code No.	Range	Resolution	Accuracy*2	Parallelism	Constant-force device	Mass	
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With SPC data output

293-330-30	0 - 1" (0 - 25.4 mm)	.00005" (0.001 mm)	±.00005" (±1 μm)	.00004" (1 μm)	Ratchet stop	270 g	
293-331-30	1 - 2" (25.4 - 50.8 mm)					330 g	
293-332-30	2 - 3" (50.8 - 76.2 mm)			.00008" (2 μm)		470 g	
293-333-30	3 - 4" (76.2 - 101.6 mm)	.0001" (0.001 mm)	±.0001" (±2 μm)			625 g	
293-350-30	4 - 5" (101.6 - 127.0 mm)			.00012" (3 μm)		600 g	
293-351-30	5 - 6" (127.0 - 152.4 mm)		±.00015" (±3 μm)			740 g	
293-352-30	6 - 7" (152.4 - 177.8 mm)					800 g	
293-353-30	7 - 8" (177.8 - 203.2 mm)		±.0002" (±4 μm)			970 g	
293-354-30	8 - 9" (203.2 - 228.6 mm)			.00016" (4 μm)		1100 g	
293-355-30	9 - 10" (228.6 - 254.0 mm)					1270 g	
293-356-30	10 - 11" (254.0 - 279.4 mm)			.0002" (5 μm)		1340 g	
293-357-30	11 - 12" (279.4 - 304.8 mm)					1540 g	
293-334-30	0 - 1" (0 - 25.4 mm)	.00005" (0.001 mm)	±.00005" (±1 μm)	.00004" (1 μm)	Ratchet thimble	275 g	
293-335-30	0 - 1" (0 - 25.4 mm)				Friction thimble	275 g	
293-336-30	1 - 2" (25.4 - 50.8 mm)					335 g	

Without SPC data output

293-340-30	0 - 1" (0 - 25.4 mm)	.00005" (0.001 mm)	±.00005" (±1 μm)	.00004" (1 μm)	Ratchet stop	270 g	
293-341-30	1 - 2" (25.4 - 50.8 mm)					330 g	
293-342-30	2 - 3" (50.8 - 76.2 mm)		±.0001" (±2 μm)	.00008" (2 μm)		470 g	
293-343-30	3 - 4" (76.2 - 101.6 mm)				Ratchet thimble	625 g	
293-344-30	0 - 1" (0 - 25.4 mm)		±.00005" (±1 μm)	.00004" (1 μm)		275 g	
293-345-30	1 - 2" (25.4 - 50.8 mm)					335 g	
293-346-30	2 - 3" (50.8 - 76.2 mm)	±.0001" (±2 μm)		.00008" (2 μm)		475 g	
293-347-30	3 - 4" (76.2 - 101.6 mm)					639 g	
293-348-30	0 - 1" (0 - 25.4 mm)		±.00005" (±1 μm)	.00004" (1 μm)	Friction thimble	275 g	

*2 Excluding quantizing error.

Note: All-Digit preset type – models over 125 mm (5") measuring range.

Dimensions

Range	L	a	b	c
0 - 1"	0	2.8	9	25
1 - 2"	25.4	2.8	9.8	32
2 - 3"	50.8	2.8	12.6	47
3 - 4"	76.2	2.8	14	60
4 - 5"	101.6	5.3	16.7	76
5 - 6"	127.0	5.7	18.8	90
6 - 7"	152.4	6.1	19.1	102
7 - 8"	177.8	6.3	18.2	115
8 - 9"	203.2	6.7	16.8	127
9 - 10"	228.6	5.5	18	139
10 - 11"	254.0	6.5	18	152
11 - 12"	279.4	6.5	18	166

