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

- Based on new water-proof structural technology, these micrometers provide IP65 protection levels, enabling use in environments that include cutting oil, etc*.
- * Anti-corrosion treatment is required after use.
- ±1µm instrumental error (75mm/3" or less measuring range models).
- Measuring data output function is available with a water-resistant connecting cable to realize IP65.
- Oil-resistant materials are used in all plastic components.
- Further-Increased operability thanks to easyto-read LCD with 30% more character area.

- Auto power ON/OFF function.
- 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



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 IX 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/.000012"

Dust/water protection level: IP65 (IEC60529) *2

Measuring force: 5 to 10N

SR44 (1 pc), **938882**, for initial operational checks Battery:

(standard accessory)

Battery life: Approx. 1.2 years under normal use

Standard accessories: Reference bar, 1 pc

(except for 0-25mm (0-1") models) Spanner (**301336**), 1 pc

*2 Rustproofing shall be applied after use.

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 A-21 for details.

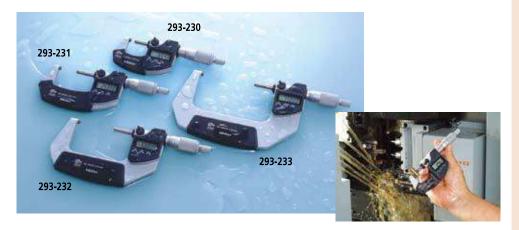




*3 These are dedicated connecting cables for Coolant Proof micrometers.







SPECIFICATIONS

	Wictife						
	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass
with SPC data output	293-230	0 - 25mm	0.001mm	±1µm	1µm	With ratchet stop	270g
	293-231	25 - 50mm					330g
	293-232	50 - 75mm			2μm		470g
	293-233	75 - 100mm					625g
	293-250-10	100 - 125mm		±2µm	3µm		600g
	293-251-10	125 - 150mm					740g
	293-252-10	150 - 175mm		±3µm			800g
	293-253-10	175 - 200mm			- 4μm		970g
	293-254-10	200 - 225mm					1100g
	293-255-10	225 - 250mm		±4µm			1270g
	293-256-10	250 - 275mm					1340g
	293-257-10	275 - 300mm			5µm		1540g
	293-234	0 - 25mm		±1µm	1µm	- With ratchet thimble	275g
	293-235	25 - 50mm					335g
	293-236	50 - 75mm			2um		475g
	293-237	75 - 100mm		±2µm	2µm		630g
	293-238	0 - 25mm		±1µm	1µm	With friction thimble	275g
	293-962	1 pc of 293-230 &	293-231& 293-23		_		
	293-963	1 pc of 293-230 &	293-231 & 293-23		_		
	293-240	0 - 25mm	0.001mm	±1µm	1µm	- With ratchet stop	270g
without SPC data output	293-241	25 - 50mm					330g
	293-242	50 - 75mm			2µm		470g
	293-243	75 - 100mm		±2µm	Ζμιιι		625g
	293-244	0 - 25mm		±1µm	1µm	- With ratchet thimble	275g
	293-245	25 - 50mm					335g
	293-246	50 - 75mm			2µm		475g
	293-247	75 - 100mm		±2µm	ΖμΙΙΙ		630g
	293-248	0 - 25mm		±1µm	1µm	With friction thimble	275g

		25 50111111		piiii			0009
with SPC data output	293-232	50 - 75mm	0.001mm		2	With ratchet stop	470g
	293-233	75 - 100mm			2µm		625g
	293-250-10	100 - 125mm		±2µm			600g
	293-251-10	125 - 150mm		±3µm	3μm - 4μm		740g
	293-252-10	150 - 175mm					800g
	293-253-10	175 - 200mm					970g
	293-254-10	200 - 225mm		±4µm			1100g
	293-255-10	225 - 250mm					1270g
	293-256-10	250 - 275mm					1340g
	293-257-10	275 - 300mm		±1µm	5µm	With ratchet thimble	1540g
	293-234	0 - 25mm			1µm		275g
	293-235	25 - 50mm			тріп		335g
	293-236	50 - 75mm			Zum		475g
	293-237	75 - 100mm		±2µm	Ζμιτι		630g
	293-238	0 - 25mm		±1µm	1µm	With friction thimble	275g
							_
			293-231 & 293-23	32 & 293-233			
					1um		270g
			mm ±3μm With ratchet stop ### ±4μm	±1µm	Тріті	With ratchet ston	330g
				470g			
with SPC data output 293-255-10				±2µm	Ζμιιι		625g
		1um		275g			
				±1µm		With ratchet thimble	335g
					2µm		475g
		0 - 25mm		630g			
		0 - 25mm		±1µm	1µm	With friction thimble	275g
* Excluding (• A ll- Digit pr	eset type: mode	ls over 125mm (5")	measuring range				
	Order No	Range	Resolution	Accuracy*	Para ll elism	Constant-force device	Mass
	202 220	0 11		· ·			270

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 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 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.

	Inch/Metric						
	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass
with SPC data output	293-330	0 -1"	.00005" /0.001mm	±.00005"	.00004"	With ratchet stop	270g
	293-331	1" - 2"					330g
	293-332	2" - 3"			.00008"		470g
	293-333	3" - 4"		±.0001"			625g
	293-350-10	4" - 5"	.0001" /0.001mm		.00012"		600g
	293-351-10	5" - 6"					740g
	293-352-10	6" - 7"		±.00015"			800g
	293-353-10	7" - 8"			.00016"		970g
	293-354-10	8" - 9"					1100g
	293-355-10	9" -10"		±.0002"			1270g
	293-356-10	10" - 11"					1340g
	293-357-10	11" - 12"			.0002 "		1540g
	293-334	0 -1"	.00005" - /0.001mm	±.00005"	.00004"	With ratchet thimble	275g
	293-335					With friction thimble	
	293-336	1" - 2"					335g
	293-960		293-331& 293-33	With ratchet stop			
	293-961		293-331 & 293-23	'			
without SPC data output	293-340	0 -1"	.00005" - /0.001mm	±.00005"	.00004"	- With ratchet stop - With ratchet thimble	270g
	293-341	1" - 2"					330g
	293-342	2" - 3"		. 0001#			470g
	293-343	3" - 4"		±.0001"			625g
	293-344	0 -1"		±.00005"	.00004"		275g
	293-345						335g
	293-346	2" - 3"					475g
	293-347 293-348	3" - 4" 0 - 1"		±.0001" ±.00005"	00004"	With friction thimble	630g
4 F 1 P	guantizing error	0 -1		±.00005	.00004"	with inction thimble	275g

Excluding quantizing error

DIMENSIONS

Functions

to ABS mode.

Hold:

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

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

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**:

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.

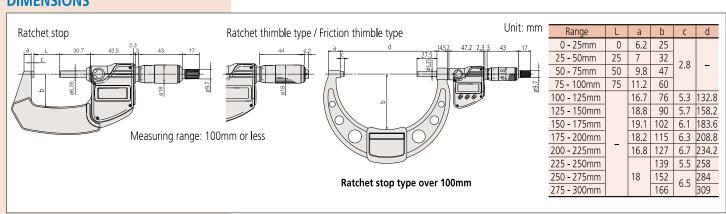
before the reading can be recorded. **Data output***4:

causes the reading to reappear.

*5: All-digit preset type only

Error alarm:

unusable. Function lock*5:



[•] All-Digit preset type: models over 125mm (5") measuring range