

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



293-231-30

293-233-30

293-232-30



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 μ m/0.00012 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 0-25 mm (0-1 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-25 for details.



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

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

264-623 (Buzzer type)

Connecting unit for **U-WAVE-TM**

02AZF310 (IP67/buzzer type common specification)

Refer to page A-15 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) | Accuracy* (μm) | Parallelism (μm) | 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 | | 600 | | | | | |
| | 293-251-30 | 125 - 150 | | 740 | | | | | |
| | 293-252-30 | 150 - 175 | | 800 | | | | | |
| | 293-253-30 | 175 - 200 | | 970 | | | | | |
| | 293-254-30 | 200 - 225 | | 1100 | | | | | |
| | 293-255-30 | 225 - 250 | | 1270 | | | | | |
| | 293-256-30 | 250 - 275 | | 1370 | | | | | |
| | 293-257-30 | 275 - 300 | | 1590 | | | | | |
| | 293-234-30 | 0 - 25 | | ±1 | 1 | | With ratchet thimble | 280 | |
| | 293-235-30 | 25 - 50 | | | | | | 340 | |
| 293-236-30 | 50 - 75 | 480 | | | | | | | |
| 293-237-30 | 75 - 100 | 635 | | | | | | | |
| without SPC data output | 293-240-30 | 0 - 25 | 0.001 | ±1 | 1 | With ratchet stop | | 270 | |
| | 293-241-30 | 25 - 50 | | | | | | 330 | |
| | 293-242-30 | 50 - 75 | | 470 | | | | | |
| | 293-243-30 | 75 - 100 | | 625 | | | | | |
| | 293-244-30 | 0 - 25 | | ±1 | 1 | | | With ratchet thimble | 280 |
| | 293-245-30 | 25 - 50 | | | | | | | 340 |
| | 293-246-30 | 50 - 75 | | 480 | | | | | |
| | 293-247-30 | 75 - 100 | | 635 | | | | | |

* Excluding quantizing error of ±1 count

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

Inch/Metric

| | Order No | Range (in) | Resolution | Accuracy* (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 | 0.00012 | | With ratchet stop | 600 | | | | |
| | 293-351-30 | 5 - 6 | | | | | | 740 | | | | |
| | 293-352-30 | 6 - 7 | | | 800 | | | | | | | |
| | 293-353-30 | 7 - 8 | | | 970 | | | | | | | |
| | 293-354-30 | 8 - 9 | | ±0.00015 | 0.00016 | | | With ratchet stop | 1100 | | | |
| | 293-355-30 | 9 - 10 | | | | | | | 1270 | | | |
| | 293-356-30 | 10 - 11 | | | 1370 | | | | | | | |
| | 293-357-30 | 11 - 12 | | | 1590 | | | | | | | |
| | without SPC data output | 293-334-30 | | 0 - 1 | 0.0005 in / 0.001 mm | | | | ±0.00005 | 0.00004 | With ratchet thimble | 280 |
| | | 293-335-30 | | 1 - 2 | | | | | | | | 275 |
| 293-336-30 | | 1 - 2 | 335 | | | | | | | | | |
| 293-340-30 | | 0 - 1 | ±0.00005 | 0.00004 | | With ratchet stop | | | | 270 | | |
| 293-341-30 | | 1 - 2 | | | | | | | 330 | | | |
| 293-342-30 | | 2 - 3 | | 470 | | | | | | | | |
| 293-343-30 | | 3 - 4 | | 625 | | | | | | | | |
| 293-344-30 | | 0 - 1 | ±0.00001 | 0.00008 | | | With ratchet stop | | 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 | | | |
| 293-349-30 | | 1 - 2 | | | | | | | 335 | | | |
| 293-350-30 | | 2 - 3 | | 470 | | | | | | | | |
| 293-351-30 | 3 - 4 | 625 | | | | | | | | | | |

* Excluding quantizing error of ±1 count

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 | |