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

Dust/Water protection level: IP65 (IEC60529)*2
Measuring force: 7 to 12N*3
Battery: **SR44** (1 pc), **938882**, for initial operational checks (standard accessory)
Length standard: Electromagnetic rotary sensor
Battery life: Approx. 1.2 years under normal use
Standard accessories: Reference bar, 1 pc (except for 0-25mm (0-1") models)
Spanner (**No. 301336**), 1 pc

*2 Rustproofing shall be applied after use.
*3 Measuring force when using the speeder ratchet (Apply a measuring force in the same condition as for measurement and then set the origin.)

Functions

Origin point setting (ABS length measurement system):
Pressing the ORIGIN button resets the ABS origin at the current spindle position. Origin values can be set depending on each size.
Zero setting (INC length 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 when the instrument must be moved away from the workpiece before the reading can be recorded.
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.
Auto power ON/OFF:
The reading on the LCD disappears after this instrument is idle for approx. 20 minutes, but the origin point is retained. Turning the spindle causes the reading on the LCD to reappear.
Data output*4:
Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.
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.
*4: Only for the models with SPC data output

Optional accessories

(Only for models with data output function)
Connecting cables with output switch
1m: **No. 05CZA662**
2m: **No. 05CZA663**
USB Input Tool Direct
USB-ITN-B (2m): **No. 06ADV380B**
Connecting cables for **U-WAVE-T** (160mm)
No. 02AZD790B
For foot switch: **No. 02AZE140B**
Refer to page B-68 for details.

SPECIFICATIONS

Metric

	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	**293-140-30**	0 - 25mm	0.001mm	±1µm	0.3µm	1µm	265g
	293-141-30	25 - 50mm					325g
	293-142-30	50 - 75mm				2µm	465g
	293-143-30	75 - 100mm		±2µm			620g
without SPC data output	**293-145-30**	0 - 25mm		±1µm		1µm	265g
	293-146-30	25 - 50mm					325g
	293-147-30	50 - 75mm				2µm	465g
	293-148-30	75 - 100mm		±2µm			620g

*1 Excluding quantizing error

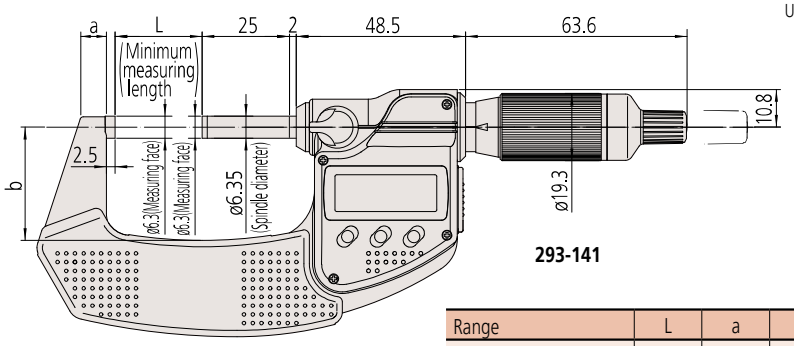
Inch/Metric

	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	**293-180-30**	0 - 1"	.00005"/ 0.001mm	±.00005"	.000012"	.00004"	265g
	293-181-30	1" - 2"					325g
	293-182-30	2" - 3"				.00008"	465g
	293-183-30	3" - 4"		±.0001"			620g
without SPC data output	**293-185-30**	0 - 1"		±.00005"		.00004"	265g
	293-186-30	1" - 2"					325g
	293-187-30	2" - 3"				.00008"	465g
	293-188-30	3" - 4"		±.0001"			620g

*1 Excluding quantizing error

DIMENSIONS

Unit: mm

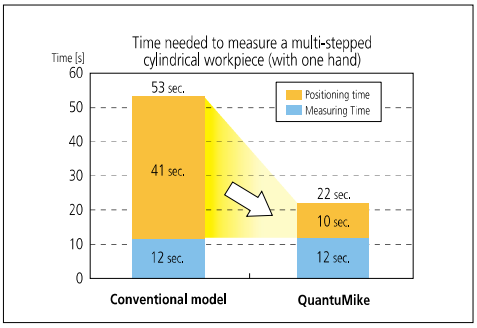


293-141

Range	L	a	b
0 - 25mm	0	6.5	25
25 - 50mm	25	7.3	32.5
50 - 75mm	50	10.1	47
75 - 100mm	75	11.5	60

Measuring time on a 6-stepped workpiece with one hand

Thanks to the quick movement, positioning times are reduced by 60%* and measuring times by 35%* compared with a conventional micrometer.
*According to Mitutoyo's comparison test data for measuring time on typical workpieces.



Mitutoyo

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

- 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-5 for details.)
- Two types of constant-force devices are available: Ratchet Stop and Ratchet Thimble.
- Measuring faces: Carbide

293-230-30

GOOD DESIGN AWARD 2014

293-252-30

293-234-30
With ratchet thimble

IP65

These marks indicate that a product has successfully passed IP65-level testing, which is carried out by the independent German certification organization TÜV Rheinland.

TÜVRheinland CERTIFIED
www.tuv.com ID 0000040191

PROPRIETARY INSPECTION CERTIFICATE

An inspection certificate is supplied as standard. Refer to page X 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 (ratchet thimble type is 7 to 12N.)*3
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 0-25mm (0-1") models) Spanner (**301336**), 1 pc

*2 Rustproofing shall be applied after use.
*3 Refer to page B-6 for details.

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 B-68 for details.

These are dedicated connecting cables for Coolant Proof micrometers.

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*4 :
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:
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.

SPECIFICATIONS

Metric

	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass
with SPC data output	**293-230-30**	0 - 25mm	0.001mm	±1µm	1µm	With ratchet stop	270g
	293-231-30	25 - 50mm					330g
	293-232-30	50 - 75mm			2µm		470g
	293-233-30	75 - 100mm		±2µm			625g
	293-250-30	100 - 125mm			3µm		600g
	293-251-30	125 - 150mm					740g
	293-252-30	150 - 175mm		±3µm			800g
	293-253-30	175 - 200mm			4µm		970g
	293-254-30	200 - 225mm					1100g
	293-255-30	225 - 250mm		±4µm			1270g
	293-256-30	250 - 275mm					1370g
	293-257-30	275 - 300mm			5µm		1590g
	293-234-30	0 - 25mm		±1µm	1µm	With ratchet thimble	280g
	293-235-30	25 - 50mm					340g
	293-236-30	50 - 75mm			2µm		480g
	293-237-30	75 - 100mm		±2µm			635g
without SPC data output	**293-240-30**	0 - 25mm	0.001mm	±1µm	1µm	With ratchet stop	270g
	293-241-30	25 - 50mm					330g
	293-242-30	50 - 75mm			2µm		470g
	293-243-30	75 - 100mm		±2µm			625g
	293-244-30	0 - 25mm		±1µm	1µm	With ratchet thimble	280g
	293-245-30	25 - 50mm					340g
	293-246-30	50 - 75mm			2µm		480g
	293-247-30	75 - 100mm		±2µm			635g

* Excluding quantizing error
• All-Digit preset type: models over 125mm (5") measuring range

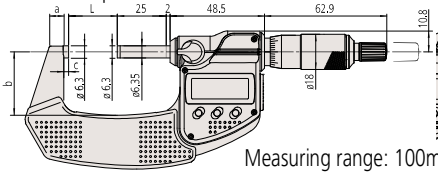
Inch/Metric

	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass
with SPC data output	**293-330-30**	0 - 1"	.00005" /0.001mm	±.00005"	.00004"	With ratchet stop	270g
	293-331-30	1" - 2"					330g
	293-332-30	2" - 3"			.00008"		470g
	293-333-30	3" - 4"		±.0001"			625g
	293-350-30	4" - 5"	.0001" /0.001mm		.00012"		600g
	293-351-30	5" - 6"					740g
	293-352-30	6" - 7"		±.00015"			800g
	293-353-30	7" - 8"			.00016"		970g
	293-354-30	8" - 9"					1100g
	293-355-30	9" -10"		±.0002"			1270g
	293-356-30	10" - 11"					1370g
	293-357-30	11" - 12"			.0002"		1590g
	293-334-30	0 - 1"	.00005" /0.001mm	±.00005"	.00004"	With ratchet thimble	280g
	293-335-30					With friction thimble	275g
	293-336-30	1" - 2"					335g
without SPC data output	**293-340-30**	0 - 1"	.00005" /0.001mm	±.00005"	.00004"	With ratchet stop	270g
	293-341-30	1" - 2"					330g
	293-342-30	2" - 3"			.00008"		470g
	293-343-30	3" - 4"		±.0001"			625g
	293-344-30	0 - 1"		±.00005"	.00004"	With ratchet thimble	280g
	293-345-30	1" - 2"					340g
	293-346-30	2" - 3"			.00008"		480g
	293-347-30	3" - 4"		±.0001"			635g
	293-348-30	0 - 1"		±.00005"	.00004"	With friction thimble	275g

* Excluding quantizing error
• All-Digit preset type: models over 125mm (5") measuring range

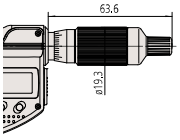
DIMENSIONS

Ratchet stop

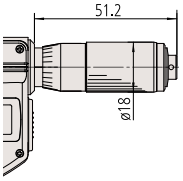


Measuring range: 100mm or less

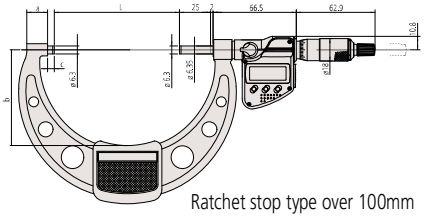
Ratchet thimble type



Friction thimble type



Unit: mm



Ratchet stop type over 100mm

Range	Order No.	L	a	b	c
0-25mm	**293-230-30/293-240-30**	0	6.5	25	2.5
25-50mm	**293-231-30/293-241-30**	25	7.3	32.5	
50-75mm	**293-232-30/293-242-30**	50	10.1	47	
75-100mm	**293-233-30/293-243-30**	75	11.5	60	
0-25mm	**293-234-30/293-244-30**	0	6.5	25	
25-50mm	**293-235-30/293-245-30**	25	7.3	32.5	
100-125mm	**293-250-30**	100	16.7	76	5.3
125-150mm	**293-251-30**	125	18.8	90	5.7
150-175mm	**293-252-30**	150	19.1	103	6.1
175-200mm	**293-253-30**	175	18.2	115	6.3
200-225mm	**293-254-30**	200	16.8	126	6.7
225-250mm	**293-255-30**	225	18	139	5.5
250-275mm	**293-256-30**	250		152	6.5
275-300mm	**293-257-30**	275		166	

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