

Mitutoyo



MEASURING INSTRUMENTS CATALOG





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



IP Codes (series 342-271-30, 342-371-30, 342-451-20)

Level 6: Dust-proof.

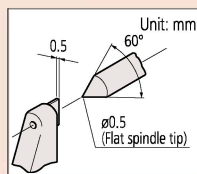
No ingress of dust allowed.

Level 5: Protected against water jets.

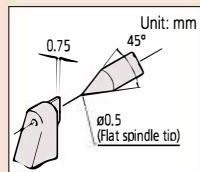
Water projected in jets against the enclosure from any direction shall have no harmful effects.



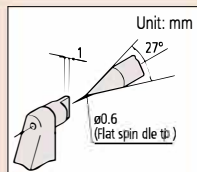
Anvil and spindle tip detail



342-271-30, 342-371-30, 112-401



342-451-20



142-402, 142-403

Technical Data

- Battery for series 342 SR44 (1 pc.), 938882, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for series 342-271-30/342-371-30) Approx. 5 years under normal use
- Length standard: Electromagnetic rotary sensor (for series 342-271-30/342-371-30) Electrostatic capacity absolute sensor (for series 342-451-20)
- Standard accessories: Spanner (301336), 1 pc. (except for series 342-451-20)

Optional Accessories

- Connecting cables (Digimatic model, Quickmike) 1 m: 05CZA662 2 m: 05CZA663
- USB Input Tool Direct USB-ITN-B (2 m): 06AFM380B
- U-WAVE-T dedicated connection cable (for series 342-271-30/342-371-30 and 342-451-20) 160 mm: 02AZD790B For foot switch: 02AZE140B

Wireless Data Output* U-WAVE™

- U-WAVE-TM 264-622 (IP67 type) 264-623 (Buzzer type)
- U-WAVE-TMB Transmitter Mitutoyo Bluetooth® U-WAVE 264-626 (IP type) 264-627 (Buzzer type) Refer to page A-16 for details.
- Connecting unit for U-WAVE-TM/TMB 02AZF310 (IP67/buzzer type common specification) Refer to pages A-16 and A-18 for details. * 342-271-30 and 342-371-30 can be attached. Not available for 342-451-20.

Crimp Height Micrometers Series 342,112,142

- Measures the height of crimp contacts.
- Equipped with Ratchet Stop for constant measuring force.
- IP65 water/dust protection (Digimatic model).

- Model 342-451-20 is a Quickmike type model with spindle feed of 10 mm per thimble rotation.



Digimatic (LCD)
342-271-30



Quickmike type (LCD)
342-451-20



ABSOLUTE™



112-401

SPECIFICATIONS

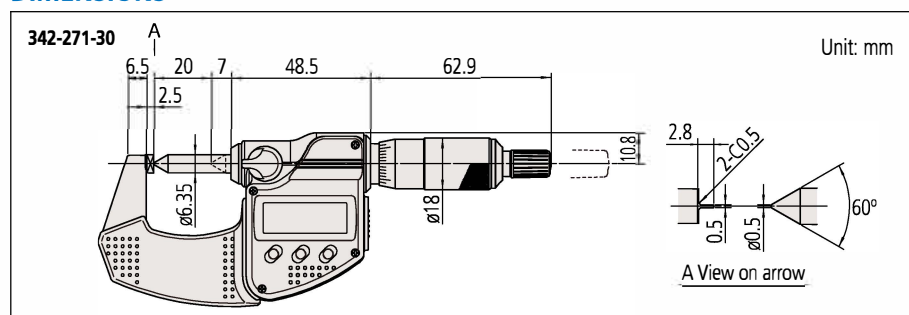
Metric			
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error JMF (μm)
Digimatic (LCD)			
342-271-30	0 - 20	0.001	±3
Quickmike (LCD)			
342-451-20	0 - 15	0.001	±3

Metric			
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error JMF (μm)
Mechanical counter model			
142-402	0 - 25	0.01	±3
142-403		0.001	

Metric			
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error JMF (μm)
Analog			
112-401	0 - 25	0.01	±3

Inch / Metric			
Order No.	Range (in)	Resolution	Maximum permissible error JMF (in)
Digimatic (LCD)			
342-371-30	0 - 0.8	0.00005 in / 0.001 mm	±0.00015

DIMENSIONS



Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Blade Micrometers SERIES 422, 122 — Non-Rotating Spindle Type

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

- The anvil and spindle are blade-shaped for measuring the groove diameter of shafts, keyways, and other hard-to-reach features.
- Carbide-tipped measuring faces are available.
- Non-rotating spindle type.
- Equipped with Ratchet Stop for constant measuring force.



Digimatic (LCD)
422-230-30



122-101-10



Quickmike Type (LCD)

422-411-20

IP65
ABSOLUTE™

SPECIFICATIONS

Metric					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark
Digimatic (LCD)					
422-230-30	0 - 25	0.001	±3	3	Type A
422-231-30	25 - 50				
422-232-30	50 - 75		±4	4	Type B
422-233-30	75 - 100				
422-260-30	0 - 25		±3	3	Type C
422-261-30	25 - 50				Type D
422-270-30	0 - 25				
422-271-30	0 - 25				

Metric Quickmike type					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark
Digimatic (LCD)					
422-411-20	0 - 30	0.001	±3	3	Type A
422-412-20	25 - 55				

Metric								
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark			
Analog								
122-101-10	0 - 25	0.01	±3	3	Type A			
122-102-10	25 - 50							
122-103-10	50 - 75		±4	4				
122-104-10	75 - 100							
122-105-10	100 - 125		±5	5				
122-106-10	125 - 150							
122-107-10	150 - 175		±6	6				
122-108-10	175 - 200							
122-109-10	200 - 225		±3	3	Type B			
122-110-10	225 - 250							
122-111-10	250 - 275	0.01	±3	3	Type C			
122-112-10	275 - 300							
Analog (With carbide tip)								
122-161-10	0 - 25			0.01		±3	3	Type D
122-162-10	25 - 50							
122-141-10	0 - 25							
122-142-10	25 - 50							

Note: A heat shield is provided with Digimatic (LCD) and 122-101-10, 122-111-10, 122-125-10, 122-135-10, 122-141-10, 122-151-10 as standard.

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink.



IP Codes (series 422 Quickmike type)

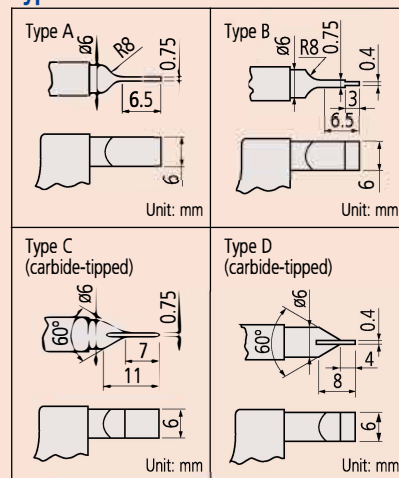
Level 6: Dust-proof.

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.

Type and Dimensions



Inch/Metric					
Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Digimatic (LCD)					
422-330-30	0 - 1	0.00005 in/ 0.001 mm	±0.00015	0.00015	Type A
422-331-30	1 - 2				
422-332-30	2 - 3		±0.0002	0.0002	Type B
422-333-30	3 - 4				
422-360-30	0 - 1		±0.00015	0.00015	Type C
422-361-30	1 - 2				Type D
422-370-30	0 - 1				
422-371-30	0 - 1				

Inch/Metric Quickmike type					
Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Digimatic (LCD)					
422-421-20	0 - 1.2	0.00005 in/ 0.001 mm	±0.00015	0.00015	Type A

Inch					
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Analog					
122-125-10	0 - 1	0.0001	±0.00015	0.00015	Type A
122-126-10	1 - 2				
122-127-10	2 - 3		±0.0002	0.0002	
122-128-10	3 - 4				
122-135-10	0 - 1		±0.00015	0.00015	Type B
122-151-10	0 - 1				Type D

Note: A heat shield is provided with Digimatic (LCD) and 122-125-10, 122-135-10, 122-151-10 as standard.

Mitutoyo

Mitutoyo reserves the right to change any or all aspects of any product specification, including prices, designs and service content, without notice.

Dial Test Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SERIES 513 — Dial Test Indicator Features

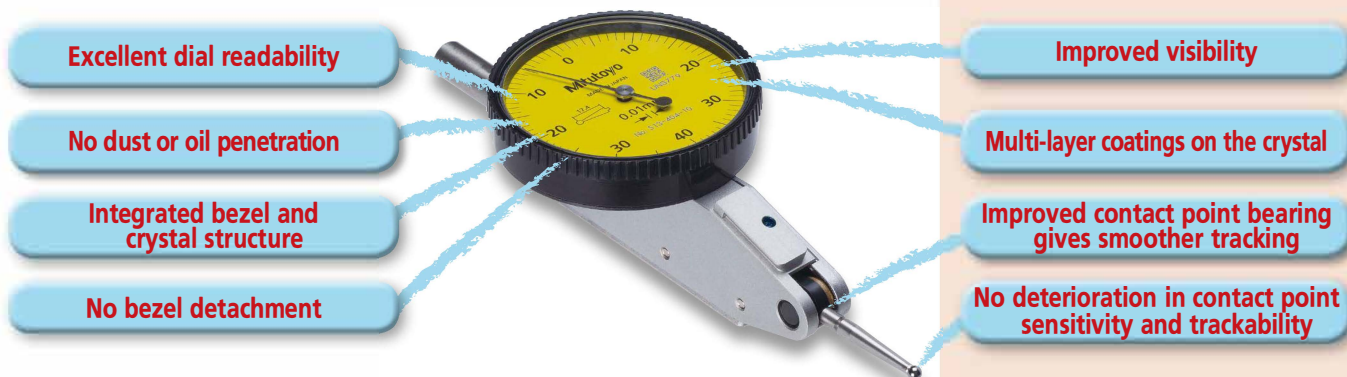
- Designed to probe surfaces that cannot be reached with a normal dial gage. Useful both for alignment and for measurement purposes.
- Mitutoyo's proprietary new design permits smooth pointer operation.
- Strong frame provides excellent rigidity and durability.
- The pointer and carbide contact point are only slightly magnetizable*, and so they are hardly affected by a magnetic environment. In addition, models with a ruby contact point are available. The ruby contact point also has several times the abrasion resistance of carbide contact point and is safely usable with an electric discharge machine thanks to its being a non-conductor.
- Clear and concise wide dial face allows excellent visibility.
- The surface of the crystal is hard-coated for excellent scratch resistance.
- Flat crystal makes graduations easy to read. Moreover, the O-ring sealing method used for the bezel prevents water or oil penetration. (Note that this type is NOT waterproof.)
- The main unit is equipped with three dovetails to which the stem with dovetail groove $\varnothing 6$ (standard accessory) can be attached. This greatly improves convenience as the attachment location can be adjusted as needed.
- Five types are available: horizontal, horizontal (20° tilted face), vertical, parallel, and universal, allowing users to select according to their needs.
- Completed products are inspected according to JIS B 7533:2015. Horizontal, horizontal (20° tilted face), and vertical types are inspected with the dial face in the upward orientation, while the parallel type is inspected with the dial face in the vertical orientation to guarantee their accuracy.

* Magnetic material is used for some internal parts.



Feature icons

Icon	Feature description
	High accuracy
	With revolution counter
	Long contact point
	Standard
	Double scale spacing
	Compact
	Carbide contact point (Slightly magnetic)
	Ruby contact point (Non-conductive and abrasion resistant)



Horizontal



Vertical



Horizontal
(20° Tilted face)



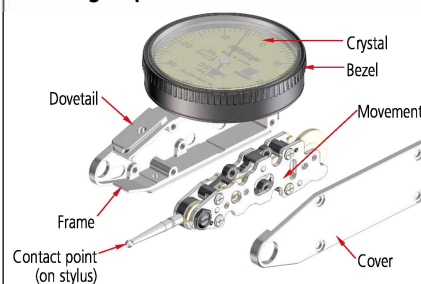
Parallel



Universal



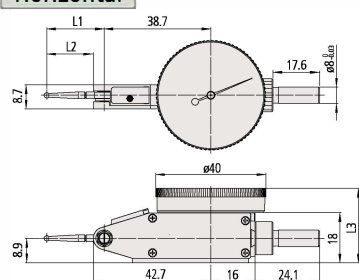
Naming of parts



DIMENSIONS

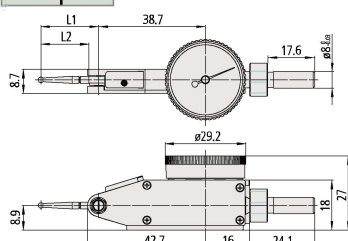
Horizontal

unit: mm



Order No.	L1	L2	L3
513-401-10E	14.7	11.2	27
513-471-10E			
513-405-10E/A/T			
513-475-10E	18.7	15.2	28
513-425-10E/A			
513-404-10E/A/T	20.9	17.4	27
513-474-10E			
513-424-10E/A/T	22.2	18.7	28
513-426-10E/A			
513-478-10E			
513-414-10E/A/T	37.4	33.9	27
513-415-10E/A/T			
513-477-10E	44.5	41.0	

Compact



Type	Order No.	L1	L2
Compact	513-465-10E	18.7	15.2
	513-464-10E	20.9	17.4
	513-466-10E	22.2	18.7

Note: A slight difference may occur depending on the center of the contact point, graduation plate, and stem fixing position, etc.

Special Set: 513-908-10E (Metric)

513-404-10E: Dial test indicator
7014-10: Mini magnetic stand

513-907-10E (inch)

513-402-10E: Dial test indicator
7014E-10: Mini magnetic stand



Dial Test Indicator SERIES 513 — Horizontal Type



513-404-10E
Contact point No. 103006



513-415-10E
Contact point No. 136013

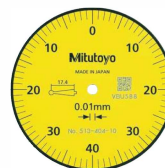


513-465-10E
Contact point No. 103011



513-402-10E
Contact point No. 133195

Note: 513-4XX-10 is indicated on the dial face. But the Order No. for the Special Set provided with the stem etc. has a suffix (E or T) at the end.

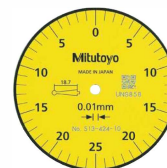


Graduation: 0.01 mm
Range: 0.8 mm

513-404-10E / 10A / 10T

Standard

Carbide contact point
(Slightly magnetic)

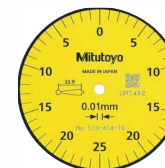


Graduation: 0.01 mm
Range: 0.5 mm

513-424-10E / 10A / 10T

Standard

Double scale spacing
Carbide contact point
(Slightly magnetic)



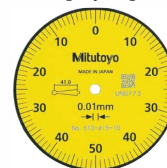
Graduation: 0.01 mm
Range: 0.5 mm

513-414-10E / 10A / 10T

Long stylus

Carbide contact point
(Slightly magnetic)

Double scale spacing

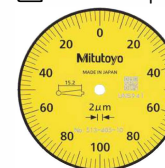


Graduation: 0.01 mm
Range: 1.0 mm

513-415-10E / 10A / 10T

Long stylus

Carbide contact point
(Slightly magnetic)

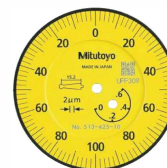


Graduation: 0.002 mm
Range: 0.2 mm

513-405-10E / 10A / 10T

Standard

Carbide contact point
(Slightly magnetic)

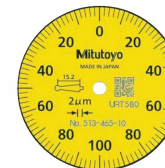


Graduation: 0.002 mm
Range: 0.6 mm

513-425-10E / 10A

With revolution counter

Carbide contact point
(Slightly magnetic)

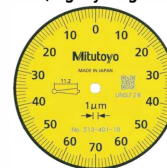


Graduation: 0.002 mm
Range: 0.2 mm

513-465-10E

Compact

Carbide contact point
(Slightly magnetic)



Graduation: 0.001 mm
Range: 0.14 mm

513-401-10E

High accuracy

Carbide contact point
(Slightly magnetic)



Graduation: 0.0005 in
Range: 0.03 in

513-402-10E / 10T

Standard

Carbide contact point
(Slightly magnetic)



Graduation: 0.0001 in
Range: 0.008 in

513-403-10E / 10T

Standard

Carbide contact point
(Slightly magnetic)

Dial Test Indicators

Comparison measuring instruments which ensure high quality, high accuracy and reliability.

SPECIFICATIONS

Metric																				
Order No.			Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)									
Basic set	Plus set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis											Repeatability
513-424-10E	513-424-10A	513-424-10T	0.01	0.5	0-25-0	6	-	5	4	3	45	0.3 or less								
513-478-10E	-	-																		
513-466-10E	-	-																		
513-414-10E	513-414-10A	513-414-10T				10														
513-426-10E	513-426-10A	-		1.5	0-40-0	9	10	5	4	3	45	0.2 or less								
513-404-10E	513-404-10A	513-404-10T																		
513-474-10E	-	-																		
513-464-10E	-	-																		
513-415-10E	513-415-10A	513-415-10T		0.8	0-50-0	10	-	5	4	3	41	0.3 or less								
513-477-10E	-	-																		
513-405-10E	513-405-10A	513-405-10T	1.0																	
513-475-10E	-	-																		
513-455-10E	513-455-10A	513-455-10T	0.002	0.2	0-100-0	4	2	3	1	45	0.2 or less									
513-475-10E	-	-																		
513-455-10E	513-455-10A	513-455-10T																		
513-425-10E	513-425-10A	-				0.6						7	5	4	41	0.3 or less				
513-401-10E	-	-	0.001	0.14	0-70-0	4	-	3	3	1	45	0.4 or less								
513-471-10E	-	-																		

Inch																			
Order No.			Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point (Slightly magnetic)	Ruby contact point	
Basic set	Plus set	Full set				One rev.	Hysteresis	Repeatability											
513-402-10E	—	513-402-10T	0.0005	0.03	0-15-0	±0.0005	0.0002	±0.0002	45	0.3 or less									
513-472-10E	—	—																	
513-412-10E	—	513-412-10T								0.2 or less									
513-479-10E	—	—																	
513-462-10E	—	—	0.00005	0.008	0-4-0	±0.0001	0.0001	±0.00004	45	0.3 or less									
513-407-10E	—	513-407-10T																	
513-403-10E	—	513-403-10T								0.2 or less									
513-473-10E	—	—																	
513-463-10E	—	—	0.0001						41										

Metric/Inch																			
Order No.			Graduation	Range	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point (Slightly magnetic)	Ruby contact point
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-409-10E	—	513-409-10T	0.002 mm / 0.0001 in	0.2 mm / 0.0076 in	0-10-0 / 0-38-0	4	2	3	1	45	0.3 or less								

Inch / Metric																			
Order No.			Graduation	Range	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)	 High accuracy	 With revolution counter	 Long contact point	 Standard	 Double scale spacing	 Compact	 Carbide contact point (Slightly magnetic)	 Ruby contact point	
Basic set	Plus set	Full set				One rev.	Hysteresis	Repeatability											
513-406-10E	–	513-406-10T	0.0005 in / 0.01 mm	0.03 in / 0.7 mm	0-15-0 / 0-35-0	±0.0005	0.0002	±0.0002	45	0.3 or less									

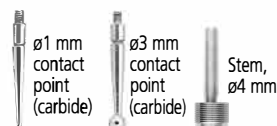
* We guarantee the accuracy of completed products by inspecting them with the dial face facing upward.
Note: Stem with dovetail groove is not included in the mass.

Set Configuration: Metric and Metric/Inch

Full set



Plus set

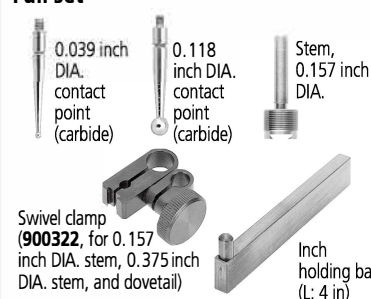


Basic set

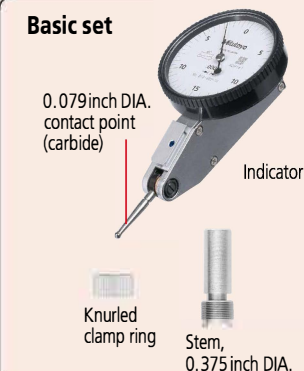


Set Configuration: Inch and Inch/Metric

Full set



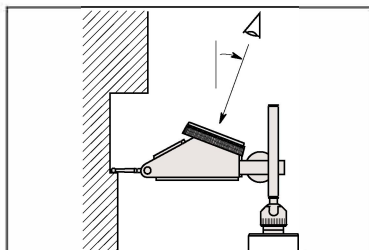
Basic set



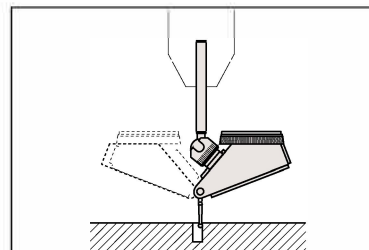


Dial Test Indicator SERIES 513 — Horizontal (20° Tilted Face), Vertical, and Parallel Types

- Specially designed for easy viewing of dial.



- The dial face obliquely faces upward, allowing users to read the graduations from the user's side. It is convenient when probing on the side of a large workpiece and the workbench is high.

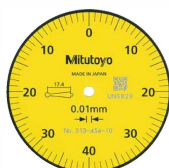


- Using the universal holder allows easy hole centering. The dial face always faces upward when the indicator is rotated, which makes reading easy.



513-454-10E/10A/10T

Contact point No. 103006



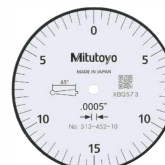
Graduation: 0.01 mm
Range: 0.8 mm

- ☒ Carbide contact point (Slightly magnetic)



513-452-10E/10T

Contact point No. 133195



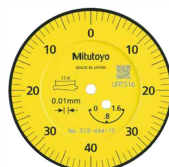
Graduation: 0.0005 in
Range: 0.03 in

- ☒ Carbide contact point (Slightly magnetic)



513-444-10E/10A/10T

Contact point No. 103006



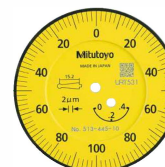
Graduation: 0.01 mm
Range: 1.6 mm

- ☒ With revolution counter
- ☒ Carbide contact point (Slightly magnetic)



513-445-10E/10A/10T

Contact point No. 103011



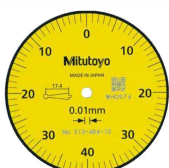
Graduation: 0.002 mm
Range: 0.4 mm

- ☒ With revolution counter
- ☒ Carbide contact point (Slightly magnetic)



513-484-10E/10A/10T

Contact point No. 103006



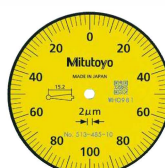
Graduation: 0.01 mm
Range: 0.8 mm

- ☒ Carbide contact point (Slightly magnetic)



513-485-10E

Contact point No. 103011



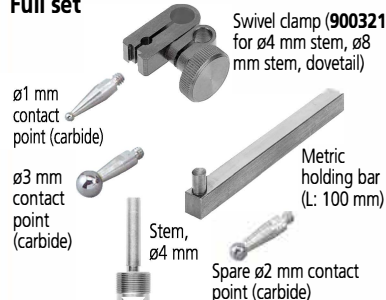
Graduation: 0.002 mm
Range: 0.2 mm

- ☒ Carbide contact point (Slightly magnetic)

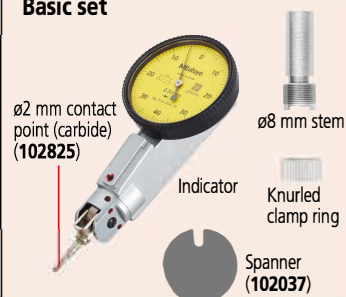
Note: 513-4XX-10 is indicated on the dial face. But the Order No. for the set provided with the stem etc. has a suffix (E or T) at the end.

Set Configuration: Metric

Full set

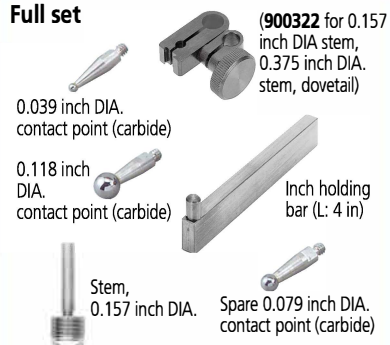


Basic set

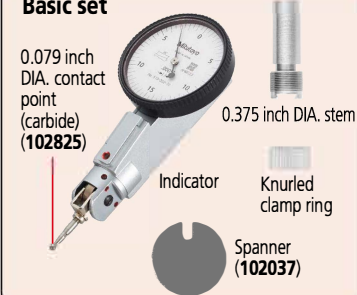


Set Configuration: Inch

Full set



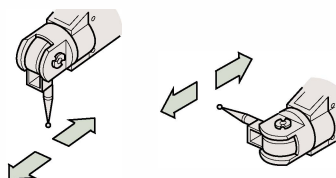
Basic set



Optional Accessories

- Swivel clamps (See page F-75)
- Holding bars (See page F-75)
- Stems (See page F-75)
- 102824:** ø1 mm contact point (carbide)
- 102825:** ø2 mm contact point (carbide)
- 102826:** ø3 mm contact point (carbide)

Dial Test Indicator SERIES 513 — Universal Type



- The direction of the probe movement can be freely changed by rotating the contact point section of the indicator.



513-304-10E

SPECIFICATIONS

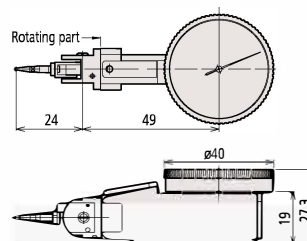
Metric											
Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	
Basic set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis			
513-304-10E	513-304-10T	0.01	0.8	0-40-0	9	—	5	4	3	71	0.3 or less
											☒ High accuracy ☒ With revolution counter ☒ Long contact point ☒ Standard ☒ Double scale spacing ☒ Compact ☒ Dustproof ☒ Carbide contact point (Slightly magnetic) ☒ Ruby contact point

Inch											
Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)		
Basic set	Full set				One rev.	Hysteresis	Repeatability				
513-302-10E	513-302-10T	0.0005	0.03	0-15-0	±0.0005	0.0003	±0.0003	71	0.3 or less		
											☒ High accuracy ☒ With revolution counter ☒ Long contact point ☒ Standard ☒ Double scale spacing ☒ Compact ☒ Dustproof ☒ Carbide contact point (Slightly magnetic) ☒ Ruby contact point

* We guarantee the accuracy of completed products by inspecting them with the dial face facing upward.

Note: 513-3XX-10 is indicated on the dial face. But the Order No. for the set provided with the stem etc. has a suffix (E or T) at the end.

DIMENSIONS



513-304-10E

Note: A slight difference may occur depending on the center of the contact point, graduation plate, and stem fixing position, etc.

Unit: mm

Dial Test Indicators

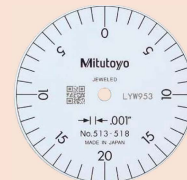
Comparison measuring instruments which ensure high quality, high accuracy and reliability.

Pocket Type Dial Test Indicator SERIES 513

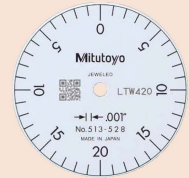
- Slim design is suited for measurement in deep holes.
- Jeweled bearings assure higher sensitivity and accuracy.

Indicator can be mounted by clamping the stem or the body (except for **513-517WE** and **513-517WT**).

- Bezel is sealed with an O-ring to keep out water and oil. (Note that this type is NOT waterproof.)
- Clutch type (with a clutch lever)
- With $\varnothing 2$ mm Carbide contact point
- Jeweled bearing
- Completed products are inspected according to JIS B 7533:1990.



513-518



513-528



513-512



513-504



513-517E
513-517WE



513-515T



513-514E



513-503E



513-501E

Optional Accessories

- Swivel clamps (See page F-75)
- Holding bars (See page F-75)
- Stems (See page F-75)
- Contact point (See page F-75)

Set C

Full set

Swivel clamp
(900321),
for ø4 mm, ø8 mm,
dovetail)

Metric holding bar
(L: 100 mm)

Stem,
ø4 mm

ø8 mm
holding bar
(900211)

Basic set

ø2 mm contact
point (carbide)

Indicator

Stem,
ø8 mm

Spanner **(301336)**

Full set

- 0.039 inch DIA. contact point (carbide)
- 0.118 inch DIA. contact point (carbide)
- Stem, 0.157 inch DIA.
- Swivel clamp (**900322**, for 0.157 inch DIA., 0.375 inch DIA., dovetail)
- Inch holding bar (L: 4 in)
- 0.315 inch DIA holding bar (**900211**)

Basic set

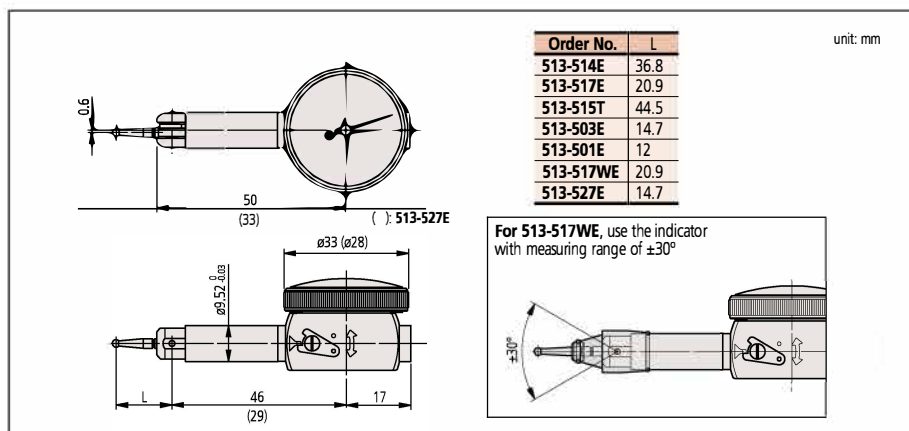
- 0.079 inch DIA. contact point (carbide)
- Indicator
- Spanner (**301336**)
- Stem, 0.375 inch DIA.



Metric

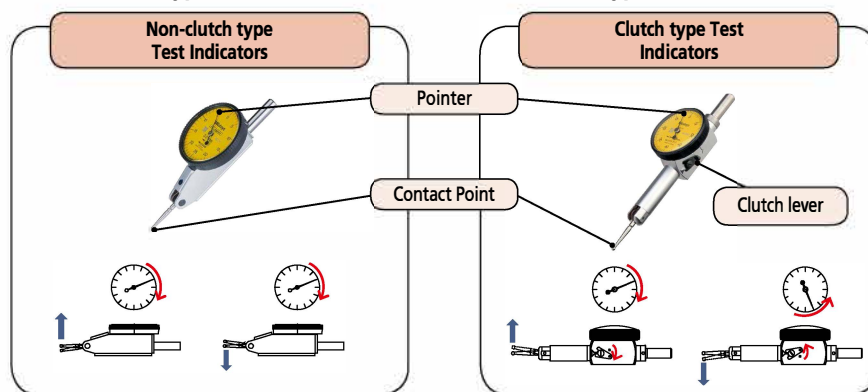
Order No.		Graduation (mm)	Range (mm)	Accuracy (μ m)	Dial reading	Measuring force (N)					—	—
Basic set	Full set											
513-514E	513-514T	0.01	0.5	10	0-25-0	0.3 or less	✓	✓				
513-517E	513-517T	0.01	0.8	8	0-40-0	0.3 or less		✓				
513-517WE	513-517WT	0.01	0.8	8	0-40-0	0.3 or less		✓		✓		
513-527E	513-527T	0.01	0.8	8	0-40-0	0.3 or less		✓	✓			
—	513-515T	0.01	1	10	0-50-0	0.3 or less	✓	✓				
513-503E	513-503T	0.002	0.2	3	0-100-0	0.3 or less		✓				
513-501E	513-501T	0.001	0.14	3	0-70-0	0.4 or less		✓				

Order No.		Graduation (in)	Range (in)	Accuracy (in)	Dial reading	Measuring force (N)				—	—	—
Basic set	Full set											
513-518	513-518T	0.001	0.04	±0.001	0-20-0	0.3 or less	✓					
513-528	513-528T	0.001	0.04	±0.001	0-20-0	0.3 or less	✓	✓	✓			
513-512	513-512T	0.0005	0.02	±0.0005	0-10-0	0.3 or less	✓					
513-504	513-504T	0.0001	0.01	±0.0002	0-5-0	0.3 or less	✓					



The non-clutch type (without a clutch lever) and the clutch type (with a clutch lever)

The non-clutch type (without a clutch lever) and the clutch type (with a clutch lever)

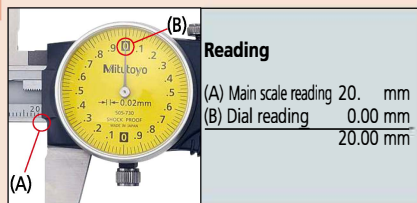


In the clutch type, if the clutch lever is set in one position the contact point moves in the upward direction and the pointer rotates clockwise. Conversely, if the lever is set in the other position the contact point moves in the downward direction and the pointer rotates counterclockwise.

Mitutoyo reserves the right to change any or all aspects of any product specification, including prices, designs and service content, without notice.



An inspection certificate is supplied as standard.
Refer to page U-11 for details.



Dial Caliper SERIES 505

- Newly designed dial movement for ultra-smooth sliding.
- Easy-to-read yellow dial.
- Large finger-rest aids ease-of-use.
- Jaw tips are relieved for easy measurement of thin parts.
- Allows step measurement.



505-730

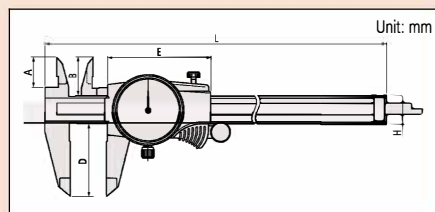


505-731



505-745

DIMENSIONS



Range (mm)	A	B	D	E	H	L
0 - 150	16.5	21	40	57.2	16	231
0 - 200	20	24.5	50			288
0 - 300	22	27.5	64	70.2	20	404

SPECIFICATIONS

Metric				
Order No.	Range (mm)	Graduation (mm)	Accuracy (mm)	Remarks
505-730	0 - 150	0.02, 2/rev	±0.03	Carbide-tipped jaws for outside measurement
505-734				Carbide-tipped jaws for outside and inside measurement
505-735		0.01, 1/rev	±0.02	
505-732*	0 - 200	0.02, 2/rev	±0.03	—
505-731		0.01, 1/rev		
505-733*		0.02, 2/rev	±0.04	
505-745	0 - 300	0.02, 2/rev	±0.04	

* Silver cover type

Inch				
Order No.	Range (in)	Graduation (in)	Accuracy (in)	Remarks
505-740J	0 - 6	0.001, 0.2/rev	±0.001	
505-742J*			±0.001	
505-742-56J			±0.001	
505-742-51J		0.001, 0.1/rev	±0.001	Carbide-tipped jaws for outside measurement
505-736*			±0.001	Carbide-tipped jaws for outside and inside measurement
505-738*	0 - 8	0.001, 0.2/rev	±0.001	Carbide-tipped jaws for outside measurement
505-744			±0.002	
505-741J		0.001, 0.1/rev	±0.002	—
505-743J*			±0.002	Carbide-tipped jaws for outside measurement
505-737*		0.001, 0.2/rev	±0.002	Carbide-tipped jaws for outside and inside measurement
505-739*	0 - 12	0.001, 0.2/rev	±0.002	
505-749			±0.002	
505-746*			±0.002	
505-750		0.001, 0.1/rev	±0.002	Carbide-tipped jaws for outside measurement
505-747*			±0.002	Carbide-tipped jaws for outside and inside measurement
505-748*		0.001, 0.1/rev	±0.002	Carbide-tipped jaws for outside and inside measurement

* Silver cover type

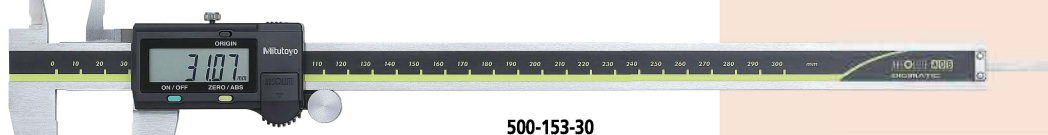
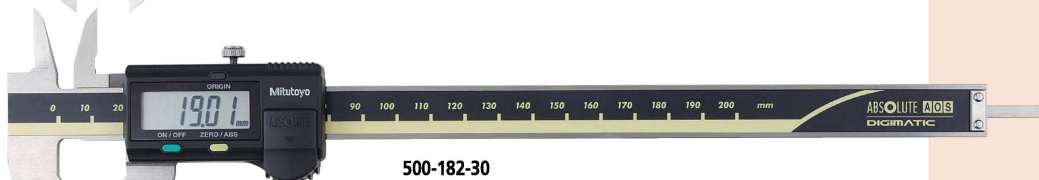
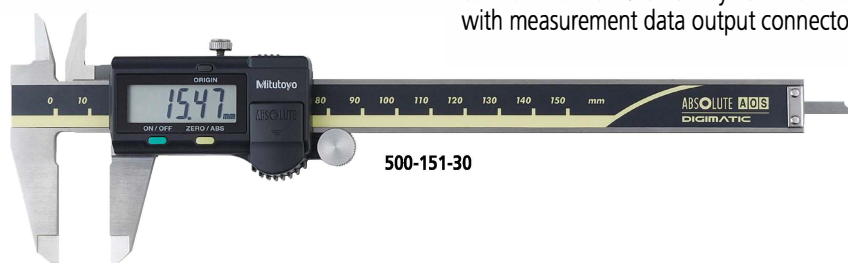
Calipers

An industry standard measuring tool

ABSOLUTE Digimatic Caliper SERIES 500 — with exclusive ABSOLUTE Encoder Technology

MeasurLinkTM ENABLED
Data Management Software by Mitutoyo

- An ABSOLUTE electromagnetic induction linear encoder system is incorporated.
- New ergonomic design with finger rest.
- The ZERO/ABS button allows the display to be Zero-Set at any slider position along the scale for comparison measurements. Scale overspeed-error has been eliminated for maximum reliability.
- Large and clear LCD readout.
- Smooth slider movement makes for comfortable operation.
- Extended battery life of Approx. 5 years due to low current integrated circuit (except for 0 to 300 mm/0 to 12 inch models).
- Allows step measurement.
- Carbide-tipped jaw calipers are optimal for rough finished parts, castings, grinding stones, etc.
- Allows integration into statistical process control and measurement systems for models with measurement data output connector.



MeasurLinkTM ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink

ABSOLUTETM

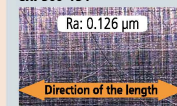
Technical Data

- Accuracy: ± 0.02 mm (≤ 200 mm), ± 0.03 mm (≤ 300 mm) (excluding quantizing error)
- Resolution: 0.01 mm or 0.0005 in/0.01 mm
- Repeatability: 0.01 mm
- Scale type: ABSOLUTE electromagnetic induction linear encoder
- Max. response speed: Unlimited
- Battery: SR44 (1 pc), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 5 years under normal use

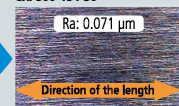
Smooth slider movement makes for comfortable operation.

High quality guide surface finish for smooth slider movement

Conventional ex. 500-151

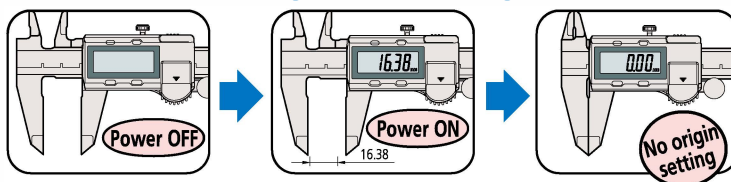


ABSOLUTE Digimatic Caliper ex. 500-151-30



D

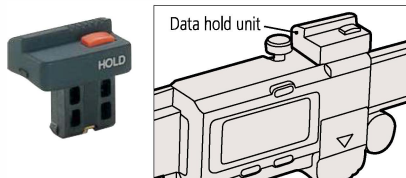
No need to reset the origin after switching on



Optional accessories

Dedicated for the models equipped with a digimatic output function.

959143: Data hold unit



Connecting cables for IT/DP/MUX

959149: SPC cable with data button (1 m)

959150: SPC cable with data button (2 m)

USB Input Tool Direct

06AFM380C: SPC cable for USB-ITN-C (2 m)

Connecting cables for U-WAVE-T

02AZD790C: SPC cable with data button (160 mm)

02AZE140C: SPC cable for foot switch

Wireless data output U-WAVETM
U-WAVE-TC: 264-621 (Buzzer type)

• U-WAVE-TCB Transmitter
(Mitutoyo Bluetooth[®] U-WAVE)
264-625 (Buzzer type)

Connecting unit for U-WAVE-TC/TCB 02AZF300 (Buzzer type)



Remarkably easy to read display



Mitutoyo

Functions

Absolute measurement: After power is turned ON, measurement can be started without zero-setting if origin-setting was previously performed. The Absolute origin position can be changed by the ORIGIN button.

Incremental measurement: Display can be set to zero at any arbitrary position for comparative measurements.

Low-voltage alert: If the battery voltage becomes low, a "B" appears in the display to alert the user before measurement is no longer possible. A battery change advisory alert precedes this alert.

Data output: By using the connecting cable (optional), measurement data can be output.

Data hold: By using the data hold unit (optional), the displayed value can be held. This cannot be used with the data output function.

SPECIFICATIONS

Metric						
Order No.	Range (mm)	Accuracy (mm)*2	Mass (g)	Depth bar	Fine adjustment	Remarks
500-150-30	0 - 100	±0.02	143	ø1.9 mm rod	with thumb roller	—
500-180-30*1					—	
500-151-30					—	
500-154-30	0 - 150	±0.02	168	Blade	with thumb roller	Carbide-tipped jaws for outside measurement
500-155-30				ø1.9 mm rod	—	Carbide-tipped jaws for outside and inside measurement
500-158-30						
500-181-30*1	0 - 200	±0.02	198	Blade	—	—
500-152-30					with thumb roller	Carbide-tipped jaws for outside measurement
500-156-30					—	Carbide-tipped jaws for outside and inside measurement
500-157-30						
500-182-30*1						
500-153-30	0 - 300	±0.03	350	—	with thumb roller	—

*1 Without SPC data output

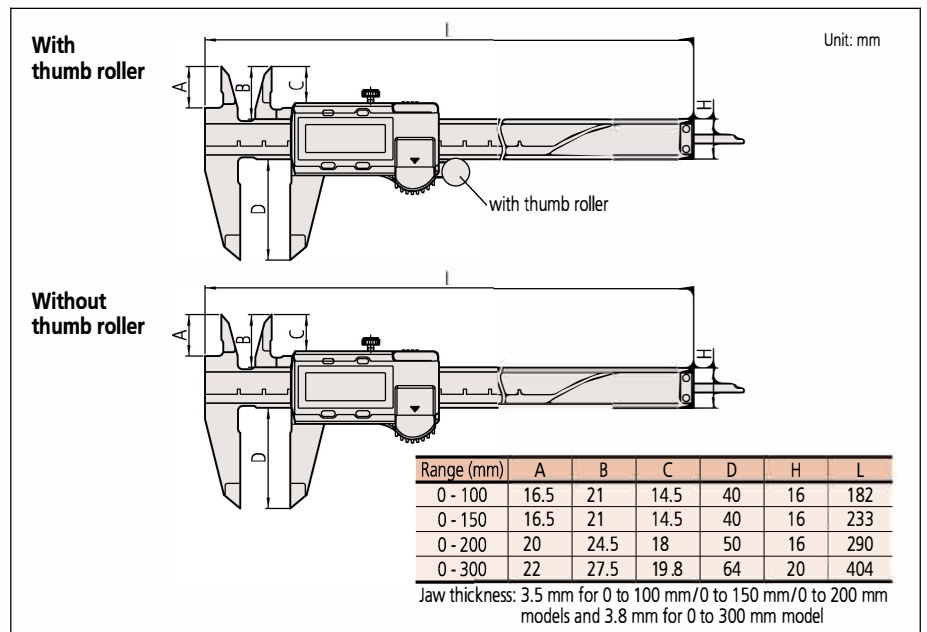
*2 Excluding quantizing error of ±1 count in LSD

Inch / Metric						
Order No.	Range (in)	Accuracy*2	Mass (g)	Depth bar	Fine adjustment	Remarks
500-170-30	0 - 4	±0.001 in/ ±0.02 mm	137	0.075 inch rod	with thumb roller	—
500-195-30*1						—
500-171-30						—
500-174-30	0 - 6		162	0.075 inch rod		Carbide-tipped jaws for outside measurement
500-175-30						Carbide-tipped jaws for outside and inside measurement
500-178-30						—
500-196-30*1	0 - 8		192	Blade		Carbide-tipped jaws for outside measurement
500-159-30*1						Carbide-tipped jaws for outside and inside measurement
500-160-30*1						—
500-172-30	0 - 12		350	Blade		Carbide-tipped jaws for outside measurement
500-176-30						Carbide-tipped jaws for outside and inside measurement
500-177-30						—
500-197-30*1	0 - 12	±0.0015 in/ ±0.03 mm	350	Blade	Carbide-tipped jaws for outside measurement	
500-163-30*1					Carbide-tipped jaws for outside and inside measurement	
500-164-30*1					—	
500-173-30	0 - 12	±0.0015 in/ ±0.03 mm	350	Blade	Carbide-tipped jaws for outside measurement	
500-167-30					Carbide-tipped jaws for outside and inside measurement	
500-168-30					—	
500-193-30*1	0 - 12	±0.0015 in/ ±0.03 mm	350	Blade	Carbide-tipped jaws for outside measurement	
500-165-30*1					Carbide-tipped jaws for outside and inside measurement	
500-166-30*1					—	

*1 Without SPC data output

*2 Excluding quantizing error of ±1 count in LSD

DIMENSIONS



Calipers

An industry standard measuring tool

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink

MeasurLinkTM ENABLED
Data Management Software by Mitutoyo

ABSOLUTETM

Long ABSOLUTE Digimatic Caliper SERIES 500 — with Exclusive ABSOLUTE Encoder Technology

MeasurLinkTM ENABLED
Data Management Software by Mitutoyo

- Long Digital caliper incorporating an ABSOLUTE scale and available with a measuring range from 450 mm to 1000 mm.
- Allows step measurement.
- Allows integration into statistical process control and measurement systems for models with measurement data output connector. (Refer to page A-3.)
- For details of the Absolute scale and its function, refer to page D-6.



500-502-10

500-501-10

500-500-10

SPECIFICATIONS

Metric

Order No.	Range (mm)	Accuracy* (mm)	Resolution (mm)	Repeatability (mm)	Mass (g)
500-500-10	0 - 450	±0.05	0.01	0.01	1170
500-501-10	0 - 600				1350
500-502-10	0 - 1000	±0.07			3300

* Excluding quantizing error.
Note: Without SPC data output

Inch / Metric

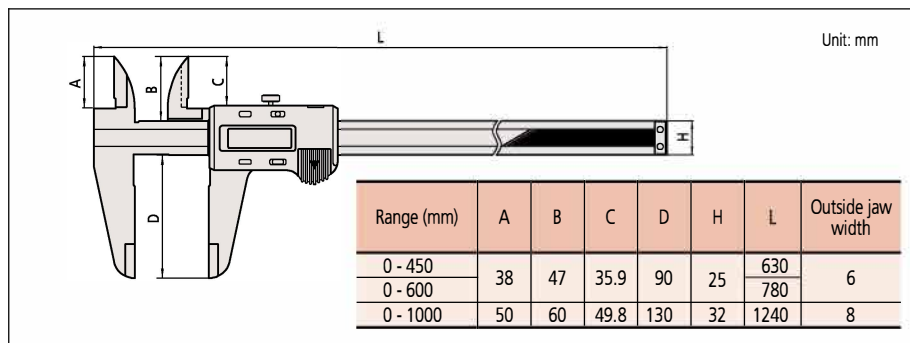
Order No.	Range (in)	Accuracy* (mm)	Resolution	Repeatability (mm)	Mass (g)
500-505-10	0 - 18	±0.05	0.0005 in/0.01 mm	0.01	1170
500-506-10	0 - 24				1350
500-507-10	0 - 40	±0.07			3300

* Excluding quantizing error.
Note: Without SPC data output

Technical Data

- Battery: SR44 (1 pc), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 3.5 years under normal use
- Max. response speed: Unlimited

DIMENSIONS



Micrometer

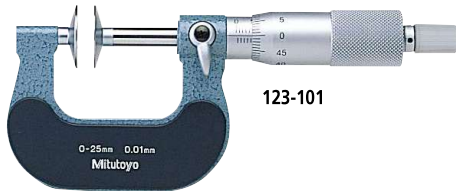
The origin of Mitutoyo's trustworthy brand of small tool instruments

Disk Micrometers SERIES 323, 223, 123

MeasurLink ENABLED
Data Management Software by Mitutoyo

- Measures "root tangent length" of spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page B-72.

- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard (except for 0 to 25 mm/0 to 1 in measuring range).



123-101



323-250-30



123-103

SPECIFICATIONS

Metric					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Anvil dia. (mm)	Measurable module
Digimatic (LCD)					
323-250-30	0 - 25	0.001	±4	ø20	0.5 - 6
323-251-30	25 - 50		±6		
323-252-30	50 - 75				
323-253-30	75 - 100				

Metric					
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Anvil dia. (mm)	Measurable module
Mechanical counter model					
223-101	0 - 25	0.01	±4	ø20	0.5 - 6
223-102	25 - 50				
Analog					
123-101	0 - 25	0.01	±4	ø20	0.5 - 6
123-113*					
123-102	25 - 50				
123-114*					
123-103	50 - 75				
123-115*					
123-104	75 - 100				
123-116*					
123-105	100 - 125		±7	ø30	0.7 - 11
123-106	125 - 150				
123-107	150 - 175	±8			
123-108	175 - 200				
123-109	200 - 225	±9			
123-110	225 - 250				
123-111	250 - 275				
123-112	275 - 300				

* The measuring disks have carbide tips.

Optional connecting cable is available only for water-proof type (Digimatic model).

Note 2: Root tangent length measurement is not available for some types of gears.

Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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



IP Codes (series 323)

Level 6: Dust-proof.

No ingress of dust allowed.

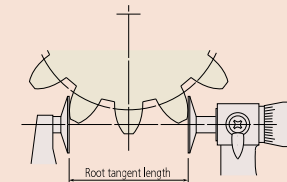
Level 5: Protected against water jets.

Water projected in jets against the enclosure from any direction shall have no harmful effects.

Technical Data

- Flatness:
 - Measuring range 0 to 100: 1 μm
 - Measuring range 100 to 300: 1.6 μm
- Parallelism:
 - Measuring range 0 to 50: 4 μm
 - Measuring range 50 to 100: 6 μm
 - Measuring range 100 to 150: 7 μm
 - Measuring range 150 to 225: 8 μm
 - Measuring range 225 to 300: 9 μm

Root Tangent Length of Gear (En)



Technical Data

- Battery for series 323
 - SR44 (1 pc.), 938882, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for series 323)
- Length standard: Electromagnetic rotary sensor (for series 323)
- Standard accessories: Reference bar, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
- Spanner (301336), 1 pc.

Optional Accessories for Series 323

- Connecting cables
 - 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

Wireless Data Output U-WAVE

- U-WAVE-TM 264-622 (IP67 type)
 - 264-623 (Buzzer type)
- U-WAVE-TMB Transmitter
 - Mitutoyo Bluetooth® U-WAVE
 - 264-626 (IP type)
 - 264-627 (Buzzer type)
 - Refer to page A-16 for details.
- Connecting unit for U-WAVE-TM/TMB
 - 02AZF310 (IP67/buzzer type common specification)

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



293-230-30



293-252-30



293-234-30
With ratchet thimble

MeasurLink ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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.
(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 μm /0.000012 in
- Dust/water protection level: IP65 (IEC 60529)*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 to 25 mm (0 to 1 in) models)
Spanner (**301336**), 1 pc.

*1 Rustproofing shall be applied after use.

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**



Wireless Data Output **U-WAVE** TM

U-WAVE-TM 264-622 (IP67 type)
264-623 (Buzzer type)

- **U-WAVE-TMB** Transmitter
Mitutoyo Bluetooth® U-WAVE
264-626 (IP type)
264-627 (Buzzer type)

- Connecting unit for **U-WAVE-TM/TMB**
02AZF310 (IP67/buzzer type common specification)



The origin of Mitutoyo's trustworthy brand of small tool instruments

MeasurLink® **ENABLED**
Data Management Software by Mitutoyo

- Use by installing a suitable interchangeable anvil/spindle tip pair.
- Direct reading of screw pitch diameter (no need for calculation).
- **Series 326** is a protection grade IP65, waterproof Digimatic screw thread micrometer with interchangeable anvil/spindle tip.
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard for adjusting zero point for metric (unified) 60° threads.
- Interchangeable anvils/spindle tips are optional.



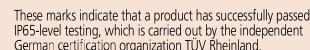
Metric				Inch / Metric			
Order No.	Range (mm)	Resolution (mm)	Spindle feed error (µm)	Order No.	Range (in)	Resolution	Spindle feed error (in)
Digimatic (LCD)				Digimatic (LCD)			
326-251-30	0 - 25	0.001	3	326-351-30	0 - 1	0.00005 in/ 0.001 mm	0.00015
326-252-30	25 - 50			326-352-30	1 - 2		
326-253-30	50 - 75			326-353-30	2 - 3		
326-254-30	75 - 100			326-354-30	3 - 4		
Metric				Inch			
Order No.	Range (mm)	Graduation (mm)	Spindle feed error (µm)	Order No.	Range (in)	Graduation (in)	Spindle feed error (in)
Analog				Analog			
126-125	0 - 25	0.01	3	126-137	0 - 1	0.001	0.00015
126-126	25 - 50			126-138	1 - 2		
126-127	50 - 75			126-139	2 - 3		
126-128	75 - 100			126-140	3 - 4		
126-129	100 - 125			126-141	4 - 5		
126-130	125 - 150			126-142	5 - 6		
126-131	150 - 175			126-143	6 - 7		
126-132	175 - 200						
126-133	200 - 225						
126-134	225 - 250						
126-135	250 - 275						
126-136	275 - 300						

Optional connecting cable is available only for water-proof type (Digimatic model).

Unit: mm

Technical drawing of the 1000 Series Interchangeable Anvil and Tip. The drawing shows a side view of the tool with dimensions: 18, d, 27.5, 14.5, 3, 47, 17, and b. A detail view shows the mounting holes with dimensions: Ø6.35, Ø18, and Ø6.7. A note indicates "Ø3.5 holes for mounting the interchangeable anvils and tips".

Range (mm)	b	d
0 - 25	25	39
25 - 50	32	64
50 - 75	45	89.5
75 - 100	65	115.1
100 - 125	79	140.1
125 - 150	93	165.1
150 - 175	105	190
175 - 200	118	214
200 - 225	131	240
225 - 250	144	265
250 - 275	156	290
275 - 300	169	314



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.



- Battery for **series 326**
SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for **series 326**)
- Length standard: Electromagnetic rotary sensor (for **series 326**)

Standard Accessories Spanner (**301336**), 1 pc.

Optional Accessories for Series 326

- Connecting cables
1 m: **05CZA662** 2 m: **05CZA663**
 - USB Input Tool Direct
USB-ITN-B (2 m): **06AFM380B**
- ## Wireless Data Output **U-WAVETM**
- **U-WAVE-TM** 264-622 (IP67 type) 264-623 (Buzzer type)
 - **U-WAVE-TMB** Transmitter
Mitutoyo Bluetooth® U-WAVE
264-626 (IP type) 264-627 (Buzzer type)
 - Connecting unit for **U-WAVE-TM/TMB**
02AZF310 (IP67/buzzer type common specification)

Sets of interchangeable anvils/spindle tips

- For Metric/Unified threads (pair)

Order No.	Matching anvils/spindle tips included (mm)
126-801	0.4 - 0.5/64 - 48TPI
126-802	0.6 - 0.9/44 - 28TPI
126-803	1 - 1.75/24 - 14TPI
126-804	2 - 3/13 - 9TPI
126-805	3.5 - 5/8 - 5TPI
126-806	5.5 - 7/4.5 - 3.5TPI
126-800	Set with one each of 126-801 to 126-806

- For Whitworth threads (pair)

Order No.	Matching anvils/ spindle tips included (mm)	Order No.	Matching anvils/ spindle tips included (mm)
126-811	64 - 48TPI	126-817	14 - 10TPI
126-812	48 - 40TPI	126-818	10 - 7TPI
126-813	40 - 32TPI	126-819	7 - 4.5TPI
126-814	32 - 24TPI	126-820	4.5 - 3.5TPI
126-815	24 - 18TPI	126-810 Set with one each of 126-811 to 126-820	
126-816	18 - 14TPI		

- Anvils/spindle tips

- Allowable error of the angle of anvils and spindle tips

Type	Metric (Unified)	Whitworth (Unified)	Half angle error
Pitch (mm), Nominal designation of threads per inch		W1	±30'
	M1 (U1)	W2	±30'
		W3	±20'
	M2 (U2)	W4	±20'
		W5	±15'
	M3 (U3)	W6	±15'
	M4 (U4)	W7	±10'
		W8	±10'
	M5 (U5)	W9	±10'
	M6 (U6)	W10	±10'

Note: This chart indicates the difference between the angle made by anvil's contact faces and spindle's axes and the half angle with error α .
Metric/Unified $\theta=60^\circ$
Whitworth $\theta=55^\circ$

Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Disk Micrometers SERIES 323, 223, 123

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

- Measures "root tangent length" of spur gears and helical gears.

- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard (except for 0 to 25 mm/0 to 1 in measuring range).



123-101



323-250-30



123-103

SPECIFICATIONS

Metric					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Anvil dia. (mm)	Measurable module
Digimatic (LCD)					
323-250-30	0 - 25	0.001	±4	ø20	0.5 - 6
323-251-30	25 - 50				
323-252-30	50 - 75		±6		
323-253-30	75 - 100				

Metric					
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Anvil dia. (mm)	Measurable module
Mechanical counter model					
223-101	0 - 25	0.01	±4	ø20	0.5 - 6
223-102	25 - 50				
Analog					
123-101	0 - 25	0.01	±4	ø20	0.5 - 6
123-113*					
123-102	25 - 50				
123-114*					
123-103	50 - 75				
123-115*					
123-104	75 - 100				
123-116*					
123-105	100 - 125		±7	ø30	0.7 - 11
123-106	125 - 150				
123-107	150 - 175	±8			
123-108	175 - 200				
123-109	200 - 225	±9			
123-110	225 - 250				
123-111	250 - 275				
123-112	275 - 300				

* The measuring disks have carbide tips.

Inch / Metric					
Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Anvil dia. (in)	Measurable module
Digimatic (LCD)					
323-350-30	0 - 1	0.00005 in/ 0.001 mm	±0.0002	0.787	0.5 - 6
323-351-30	1 - 2				
323-352-30	2 - 3		±0.0003		
323-353-30	3 - 4				

Inch					
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Anvil dia. (in)	Measurable module
Mechanical counter model					
223-125	0 - 1	0.001	±0.0002	0.787	0.5 - 6
Analog					
123-125	0 - 1	0.001	±0.0002	0.787	0.5 - 6
123-126	1 - 2				
123-127	2 - 3		±0.0003		
123-128	3 - 4				

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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



IP Codes (series 323)

Level 6: Dust-proof.

No ingress of dust allowed.

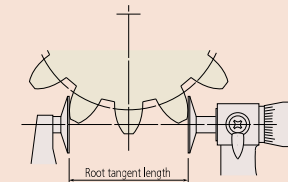
Level 5: Protected against water jets.

Water projected in jets against the enclosure from any direction shall have no harmful effects.

Technical Data

- Flatness:
 - Measuring range 0 to 100: 1 μm
 - Measuring range 100 to 300: 1.6 μm
- Parallelism:
 - Measuring range 0 to 50: 4 μm
 - Measuring range 50 to 100: 6 μm
 - Measuring range 100 to 150: 7 μm
 - Measuring range 150 to 225: 8 μm
 - Measuring range 225 to 300: 9 μm

Root Tangent Length of Gear (En)



Technical Data

- Battery for series 323
 - SR44 (1 pc.), 938882, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for series 323)
- Length standard: Electromagnetic rotary sensor (for series 323)
- Standard accessories: Reference bar, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
- Spanner (301336), 1 pc.

Optional Accessories for Series 323

- Connecting cables
 - 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

Wireless Data Output U-WAVE^{fit}

- U-WAVE-TM 264-622 (IP67 type)
 - 264-623 (Buzzer type)
- U-WAVE-TMB Transmitter
 - Mitutoyo Bluetooth[®] U-WAVE
 - 264-626 (IP type)
 - 264-627 (Buzzer type)
- Connecting unit for U-WAVE-TM/TMB
 - 02AZF310 (IP67/buzzer type common specification)

Mitutoyo

Mitutoyo reserves the right to change any or all aspects of any product specification, including prices, designs and service content, without notice.

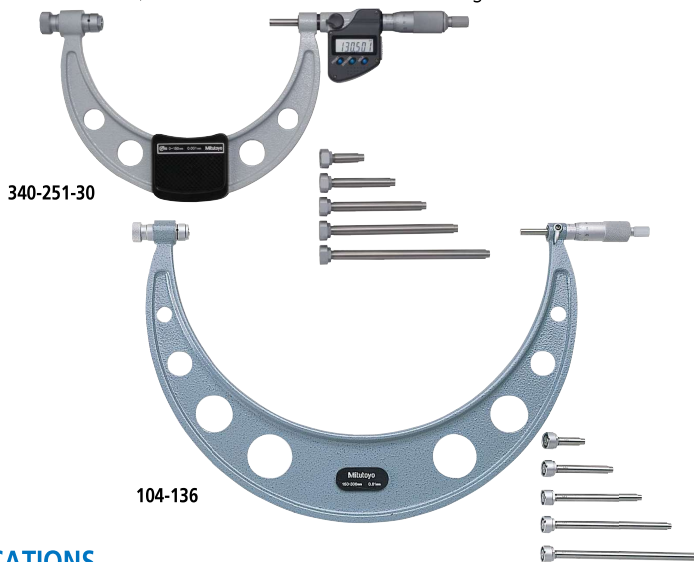
Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Outside Micrometers SERIES 340, 104 — with Interchangeable Anvils

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

- Wide measuring range with interchangeable anvils.
- Measuring face of the spindle is carbide tipped (standard model).
- IP 65 water/dust protection (340-251-30, 340-252-30, 340-351-30, 340-352-30).
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric						
Order No.	Range (mm)	Resolution (mm)	Interchangeable anvils	Setting Standard Qty	Size (mm)	Micrometer head stroke (mm)
Digimatic (LCD)						
340-251-30	0 - 150	0.001	6 pcs.	5	25 - 125	25
340-252-30	150 - 300			6	150 - 275	
340-520	300 - 400		4 pcs.	4	300 - 375	
340-521	400 - 500				400 - 475	
340-522	500 - 600				500 - 575	
340-523	600 - 700				600 - 675	
340-524	700 - 800				700 - 775	
340-525	800 - 900				800 - 875	
340-526	900 - 1000				900 - 975	

Metric						
Order No.	Range (mm)	Graduation (mm)	Interchangeable anvils	Setting Standard Qty	Size (mm)	Micrometer head stroke (mm)
Analog						
104-171*	0 - 50	0.01	1 pc.	1	25	25
104-139A	0 - 100		4 pcs.	3	25 - 75	
104-135A	0 - 150		6 pcs.	5	25 - 125	
104-161A	50 - 150		4 pcs.	4	50 - 125	
104-140A	100 - 200				100 - 175	
104-136A	150 - 300		6 pcs.	6	150 - 275	
104-141A	200 - 300		4 pcs.	4	200 - 275	
104-142A	300 - 400				300 - 375	
104-143A	400 - 500				400 - 475	
104-144A	500 - 600				500 - 575	
104-145A	600 - 700				600 - 675	
104-146A	700 - 800				700 - 775	
104-147A	800 - 900				800 - 875	
104-148A	900 - 1000				900 - 975	

* The frame is fitted with a heat shield.

Inch / Metric						
Order No.	Range (in)	Resolution	Interchangeable anvils	Setting Standard		Micrometer head stroke (in)
				Qty	Size (in)	
Digimatic (LCD)						
340-351-30	0 - 6	0.00005 in/ 0.001 mm	6 pcs.	5	1 - 5	1
340-352-30	6 - 12	0.0001 in/ 0.001 mm		6	6 - 11	
340-720	12 - 18				12 - 17	
340-721	18 - 24				18 - 23	
340-722	24 - 30				24 - 29	
340-723	30 - 36				30 - 35	

Inch						
Order No.	Range (in)	Interchangeable anvils	Graduation (in)	Setting Standard		Micrometer head stroke (in)
				Qty	Size (in)	
Analog						
104-165	0 - 2	1 pc.	0.0001	1	1	1
104-149	0 - 4	4 pcs.	0.001	3	1 - 3	
104-137	0 - 6	6 pcs.		5	1 - 5	
104-162	2 - 6	4 pcs.		4	2 - 5	
104-150	4 - 8				4 - 7	
104-138	6 - 12	6 pcs.		6	6 - 11	
104-151	8 - 12	4 pcs.		4	8 - 11	
104-152	12 - 16				12 - 15	
104-201	12 - 18	6 pcs.		6	12 - 17	
104-153	16 - 20	4 pcs.		4	16 - 19	
104-202	18 - 24	6 pcs.		6	18 - 23	
104-154	20 - 24	4 pcs.		4	20 - 23	
104-155	24 - 28				24 - 27	
104-203	24 - 30	6 pcs.		6	24 - 29	
104-156	28 - 32	4 pcs.		4	28 - 31	
104-204	30 - 36	6 pcs.		6	30 - 35	
104-157	32 - 36	4 pcs.		4	32 - 35	
104-158	36 - 40				36 - 39	
104-205	36 - 42	6 pcs.		6	36 - 41	

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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



IP Codes (340-251-30, 340-252-30, 340-351-30, 340-352-30)

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

- Spindle feed error: 3 μ m/0.00015 in
- Flatness
 - Measuring range 0 to 300: 0.6 μ m
 - Measuring range 300 to 1000: 1.0 μ m
- Parallelism
 - Measuring range 0 to 75: 2 μ m
 - Measuring range 75 to 150: 3 μ m
 - Measuring range 150 to 1000 (2+R/100) μ m, R=max. range (mm) (fraction rounded up)

Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Outside Micrometers SERIES 103

- Baked-enamel-finished frame.
- Measuring faces: Carbide.
- Equipped with Ratchet Stop for constant measuring force.



Technical Data

- Parallelism:
($2+R/100$) μm , $R=\text{max, range (mm)}$
[$0.00008+0.00004 (R/4)$] in, $R=\text{max, range (inch)}$
fraction rounded down
- Standard accessories: Reference bar, 1 pc.
(except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (**301336**), 1 pc.
(for maximum measuring range up to 300 mm (12 in))
Spanner (**200154**), 1 pc.
(for maximum measuring range 325 mm (13 in) or over)

Metric	With ratchet stop				
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Measuring force (N)	Flatness (μm)
103-129	0 - 25	0.001	± 2	5 - 10	0.6
103-130	25 - 50	0.001			
103-139-10	50 - 75	0.001			
103-140-10	75 - 100	0.01	± 3	5 - 10	0.6
103-141-10	100 - 125				
103-142-10	125 - 150				
103-143-10	150 - 175	0.01	± 4	5 - 10	0.6
103-144-10	175 - 200				
103-145-10	200 - 225				
103-146-10	225 - 250	0.01	± 5	5 - 10	0.6
103-147-10	250 - 275				
103-148-10	275 - 300				
103-149	300 - 325	0.01	± 6	10 - 15	1
103-150	325 - 350				
103-151	350 - 375				
103-152	375 - 400	0.01	± 7	10 - 15	1
103-153	400 - 425				
103-154	425 - 450				
103-155	450 - 475	0.01	± 8	10 - 15	1
103-156	475 - 500				
103-157	500 - 525				
103-158	525 - 550	0.01	± 9	10 - 15	1
103-159	550 - 575				
103-160	575 - 600				
103-161	600 - 625	0.01	± 10	10 - 15	1
103-162	625 - 650				
103-163	650 - 675				
103-164	675 - 700	0.01	± 11	10 - 15	1
103-165	700 - 725				
103-166	725 - 750				
103-167	750 - 775	0.01	± 12	10 - 15	1
103-168	775 - 800				
103-169	800 - 825				
103-170	825 - 850	0.01	± 13	10 - 15	1
103-171	850 - 875				
103-172	875 - 900				
103-173	900 - 925	0.01	± 14	10 - 15	1
103-174	925 - 950				
103-175	950 - 975				
103-176	975 - 1000	0.01	± 15	10 - 15	1

Inch	With ratchet stop				
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Measuring force (N)	Flatness (in)
103-177	0 - 1	0.001	± 0.0001	5 - 10	0.00024
103-131		0.0001			
103-178		0.001			
103-132	1 - 2	0.0001	± 0.00015	5 - 10	0.00024
103-179	2 - 3	0.001			
103-180	3 - 4				
103-181	4 - 5	± 0.0002	5 - 10	0.00024	
103-182	5 - 6				
103-183	6 - 7				
103-184	7 - 8	± 0.00025	5 - 10	0.00024	
103-185	8 - 9				
103-186	9 - 10				
103-187	10 - 11	± 0.0003	10 - 15	0.00004	
103-188	11 - 12				
103-189	12 - 13				
103-190	13 - 14	± 0.00035	10 - 15	0.00004	
103-191	14 - 15				
103-192	15 - 16				
103-193	16 - 17	± 0.0004	10 - 15	0.00004	
103-194	17 - 18				
103-195	18 - 19				
103-196	19 - 20	± 0.00045	10 - 15	0.00004	
103-197	20 - 21				
103-198	21 - 22				
103-199	22 - 23	± 0.0005	10 - 15	0.00004	
103-200	23 - 24				
103-201	24 - 25				
103-202	25 - 26	± 0.00055	10 - 15	0.00004	
103-203	26 - 27				
103-204	27 - 28				
103-205	28 - 29	± 0.0006	10 - 15	0.00004	
103-206	29 - 30				
103-207	30 - 31				
103-208	31 - 32	± 0.00065	10 - 15	0.00004	
103-209	32 - 33				
103-210	33 - 34				
103-211	34 - 35	± 0.0007	10 - 15	0.00004	
103-212	35 - 36				
103-213	36 - 37				
103-214	37 - 38	± 0.00075	10 - 15	0.00004	
103-215	38 - 39				
103-216	39 - 40				

Metric	With ratchet stop				
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Measuring force (N)	Flatness (μm)
103-137	0 - 25	0.01	± 2	5 - 10	0.6
103-138	25 - 50	0.01			

Inch	With friction thimble				
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Measuring force (N)	Flatness (in)
103-135	0 - 1	0.0001	± 0.0001	5 - 10	0.00024
103-136	1 - 2				

* Maximum permissible error of the indication measured by contacting the full measuring face with the object to be measured. J_{MPE} is a term specified by JIS B 7502: 2016 which has been prepared based on ISO 3611: 2010 with some modifications of the technical contents.
The measurement method has not been changed from JIS B 7502: 1994.

Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Point Micrometers SERIES 342, 112, 142

MeasurLink ENABLED
Data Management Software by Mitutoyo

- Measures trough diameters, such as drill web diameters.
- The measuring points (carbide tipped) have approximately 0.3 mm radius.
- Series 342:** IP65 Digimatic micrometers.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric				
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{1978} (μm)	Point
Digimatic (LCD) (With carbide tip)				
342-251-30	0 - 25	0.001	±2	15°
342-252-30	25 - 50			
342-253-30	50 - 75		±3	15°
342-254-30*	75 - 100			
342-261-30	0 - 25		±2	30°
342-262-30	25 - 50			
342-263-30	50 - 75			
342-264-30*	75 - 100		±3	

* Made to order.

Metric				
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{1978} (μm)	Point
Analog				
112-153	0 - 25		±3	15°
112-154	25 - 50			
112-155	50 - 75		±4	15°
112-156	75 - 100			
112-201	0 - 25		±3	30°
112-202	25 - 50			
112-203	50 - 75			
112-204	75 - 100			
Analog (With carbide tip)				
112-165	0 - 25	0.01	±3	15°
112-166	25 - 50			
112-167	50 - 75		±4	15°
112-168	75 - 100			
112-213	0 - 25		±3	30°
112-214	25 - 50			
112-215	50 - 75			
112-216	75 - 100			
Mechanical counter model				
142-153	0 - 25		±3	15°
142-201				30°

Note: For functional details of **series 342** refer to page B-8.

Optional connecting cable is available only for water-proof type (Digimatic model).

Inch / Metric				
Order No.	Range (in)	Resolution	Maximum permissible error J_{1978} (in)	Point
Digimatic (LCD) (With carbide tip)				
342-351-30	0 - 1	0.00005 in/ 0.001 mm	±0.0001	15°
342-352-30	1 - 2			
342-353-30	2 - 3		±0.00015	15°
342-354-30	3 - 4			
342-361-30	0 - 1		±0.0001	30°
342-362-30	1 - 2			
342-363-30	2 - 3			
342-364-30	3 - 4		±0.00015	

Inch				
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{1978} (in)	Point
Analog				
112-177	0 - 1		± 0.00015	15°
112-178	1 - 2			
112-225	0 - 1			30°
112-226	1 - 2			
Analog (With carbide tip)				
112-189	0 - 1	0.001	± 0.00015	15°
112-190	1 - 2			
112-191	2 - 3			30°
112-237	0 - 1			
112-238	1 - 2			
Mechanical counter model				
142-177	0 - 1		± 0.00015	15°
142-225				30°

Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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



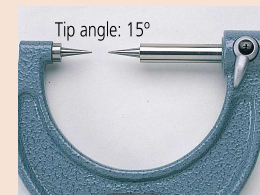
IP Codes (series 342)

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

- Battery for **series 342**
SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for **series 342**)
- Length standard: Electromagnetic rotary sensor (for **series 342**)
- Standard accessories: Reference bar, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (**301336**), 1 pc.

Optional Accessories

- Connecting cables for **series 342**
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**

Wireless Data Output **U-WAVE fit**

- U-WAVE-TM** **264-622** (IP67 type)
264-623 (Buzzer type)
- U-WAVE-TMB** Transmitter
Mitutoyo Bluetooth® U-WAVE
264-626 (IP type)
264-627 (Buzzer type)
Refer to page A-16 for details.
- Connecting unit for **U-WAVE-TM/TMB**
02AZF310 (IP67/buzzer type common specification)
Refer to pages A-16 and A-18 for details.

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Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Screw Thread Micrometers SERIES 326, 126 — Interchangeable Anvil/Spindle Tip Type

MeasurLink ENABLED
Data Management Software by Mitutoyo

- Use by installing a suitable interchangeable anvil/spindle tip pair.
- Direct reading of screw pitch diameter (no need for calculation).
- **Series 326** is a protection grade IP65, waterproof Digimatic screw thread micrometer with interchangeable anvil/spindle tip.
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard for adjusting zero point for metric (unified) 60° threads.
- Interchangeable anvils/spindle tips are optional.



Interchangeable anvils/
spindle tips (optional)

SPECIFICATIONS

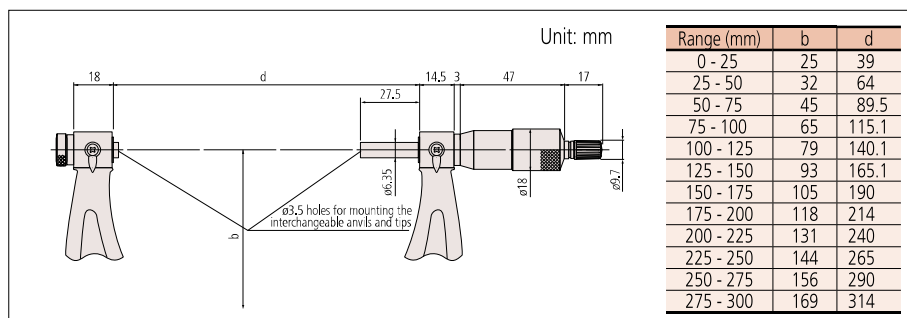
Metric			
Order No.	Range (mm)	Resolution (mm)	Spindle feed error (μm)
Digimatic (LCD)			
326-251-30	0 - 25	0.001	3
326-252-30	25 - 50		
326-253-30	50 - 75		
326-254-30	75 - 100		

Inch / Metric			
Order No.	Range (in)	Resolution	Spindle feed error (in)
Digimatic (LCD)			
326-351-30	0 - 1	0.00005 in/ 0.001 mm	0.00015
326-352-30	1 - 2		
326-353-30	2 - 3		
326-354-30	3 - 4		

Metric			
Order No.	Range (mm)	Graduation (mm)	Spindle feed error (μm)
Analog			
126-125	0 - 25	0.01	3
126-126	25 - 50		
126-127	50 - 75		
126-128	75 - 100		
126-129	100 - 125		
126-130	125 - 150		
126-131	150 - 175		
126-132	175 - 200		
126-133	200 - 225		
126-134	225 - 250		
126-135	250 - 275		
126-136	275 - 300		

Inch			
Order No.	Range (in)	Graduation (in)	Spindle feed error (in)
Analog			
126-137	0 - 1	0.001	0.00015
126-138	1 - 2		
126-139	2 - 3		
126-140	3 - 4		
126-141	4 - 5		
126-142	5 - 6		
126-143	6 - 7		

DIMENSIONS



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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink



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



IP Codes (series 326)

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

- Battery for series 326
SR44 (1 pc), 938882, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for series 326)
- Length standard: Electromagnetic rotary sensor (for series 326)

Standard Accessories Spanner (301336), 1 pc.

Optional Accessories for Series 326

- Connecting cables
1 m: 05CZA662 2 m: 05CZA663
- USB Input Tool Direct
USB-ITN-B (2 m): 06AFM380B

Wireless Data Output U-WAVE

- U-WAVE-TM 264-622 (IP67 type) 264-623 (Buzzer type)
- U-WAVE-TMB Transmitter
Mitutoyo Bluetooth® U-WAVE
264-626 (IP type) 264-627 (Buzzer type)

- Connecting unit for U-WAVE-TM/TMB
02AZF310 (IP67/buzzer type common specification)

Optional Accessories

Sets of interchangeable anvils/spindle tips

- For Metric/Unified threads (pair)

Order No.	Matching anvils/spindle tips included (mm)
126-801	0.4 - 0.5/64 - 48TPI
126-802	0.6 - 0.9/44 - 28TPI
126-803	1 - 1.75/24 - 14TPI
126-804	2 - 3/13 - 9TPI
126-805	3.5 - 5/8 - 5TPI
126-806	5.5 - 7/4.5 - 3.5TPI
126-800	Set with one each of 126-801 to 126-806

- For Whitworth threads (pair)

Order No.	Matching anvils/spindle tips included (mm)	Order No.	Matching anvils/spindle tips included (mm)
126-811	64 - 48TPI	126-817	14 - 10TPI
126-812	48 - 40TPI	126-818	10 - 7TPI
126-813	40 - 32TPI	126-819	7 - 4.5TPI
126-814	32 - 24TPI	126-820	4.5 - 3.5TPI
126-815	24 - 18TPI	126-810	Set with one each of 126-811 to 126-820
126-816	18 - 14TPI		

Technical description

- Anvils/spindle tips

- Allowable error of the angle of anvils and spindle tips

Type	Metric (Unified)	Whitworth (Unified)	Half angle error
Pitch (mm), Nominal designation of threads per inch	M1 (U1)	W1	±30'
	M2 (U2)	W2	±30'
	M3 (U3)	W3	±20'
	M4 (U4)	W4	±20'
	M5 (U5)	W5	±15'
	M6 (U6)	W6	±15'
	M7 (U7)	W7	±10'
	M8 (U8)	W8	±10'
	M9 (U9)	W9	±10'
	M10 (U10)	W10	±10'
	M11 (U11)	W11	±10'
	M12 (U12)	W12	±10'

Note: This chart indicates the difference between the angle made by anvil's contact faces and spindle's axes and the half angle with error α.
Metric/Unified θ=60°
Whitworth θ=55°

Surftest

Performs brilliantly in many situations such as in the quality control room, on the factory floor and on the production line.

Surftest SJ-210 SERIES 178 — On-site Surface Roughness Tester

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo



Compact type all-in-one surface roughness tester has evolved by meeting customer demands

- The color LCD can display not only calculation results and measurement conditions, but also surface roughness waveforms. In addition, bigger character size contributes to visibility.
- Built-in rechargeable battery allows measurement without a mains power supply connection.

Mitutoyo

SPECIFICATIONS

Model No.	Standard drive unit		Retractable drive unit		Transverse tracing drive unit	
	SJ-210 (0.75 mN type)	SJ-210 (4 mN type)	SJ-210 (0.75 mN type)	SJ-210 (4 mN type)	SJ-210 (0.75 mN type)	SJ-210 (4 mN type)
Order No.	mm 178-560-11	mm 178-560-12	mm 178-562-11	mm 178-562-12	mm 178-564-11	mm 178-564-12
	inch/mm 178-561-11	inch/mm 178-561-12	inch/mm 178-563-11	inch/mm 178-563-12	inch/mm 178-565-11	inch/mm 178-565-12
Measuring range	16.0 mm					
X axis	360 µm (-200 µm to +160 µm)					
Detector	360 µm/0.02 µm, 100 µm/0.006 µm, 25 µm/0.002 µm					
Measuring force/Stylus tip shape	Depends on the Order No.: 0.75 mN/2 µmR 60° (when the Order No. ends with "-11") 4 mN/5 µmR 90° (when the Order No. ends with "-12")					
Applicable standards	JIS 1982/JIS 1994/JIS 2001/ISO 1997/ANSI/VDA					
Assessed profile	Primary profile, Roughness profile, DF profile, Roughness motif profile					

Surftest SJ-310 SERIES 178 — On-site Surface Roughness Tester

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo



Advanced handheld tester that is easy to operate and meets a variety of needs

- Equipped with a large, touch-screen color graphic LCD for intuitive operation and excellent ease of use.
- Equipped with a high-speed thermal printer (approx. 1.5 times faster than conventional models) as standard, allows for printing of BAC and ADC curves in addition to calculation results (including pass/fail judgments) and assessment profiles. The printer can also print horizontally to match the content displayed on the LCD, and has an easy-to-understand layout.

SPECIFICATIONS

Model No.	Standard drive unit		Retractable drive unit		Transverse tracing drive unit	
	SJ-310 (0.75 mN type)	SJ-310 (4 mN type)	SJ-310 (0.75 mN type)	SJ-310 (4 mN type)	SJ-310 (0.75 mN type)	SJ-310 (4 mN type)
Order No.	mm 178-570-11	mm 178-570-12	mm 178-572-11	mm 178-572-12	mm 178-574-11	mm 178-574-12
	inch/mm 178-571-11	inch/mm 178-571-12	inch/mm 178-573-11	inch/mm 178-573-12	inch/mm 178-575-11	inch/mm 178-575-12
Measuring range	16.0 mm					
X axis	360 µm (-200 µm to +160 µm)					
Detector	360 µm/0.02 µm, 100 µm/0.006 µm, 25 µm/0.002 µm					
Measuring force/Stylus tip shape	Depends on the Order No.: 0.75 mN/2 µmR 60° (when the Order No. ends with "-11") 4 mN/5 µmR 90° (when the Order No. ends with "-12")					
Applicable standards	JIS 1982/JIS 1994/JIS 2001/ISO 1997/ANSI/VDA					
Assessed profile	Primary profile, Roughness profile, DF profile, Roughness motif profile, Waviness motif profile					

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Optional Accessories for Surftest SJ-210/310

Unit: mm

• Standard detectors

Order No.	Measuring force	Stylus profiles*	Remarks
178-296	0.75 mN	2 $\mu\text{mR}/60^\circ$	Dedicated to the standard/retractable drive unit
178-390	4 mN	5 $\mu\text{mR}/90^\circ$	
178-387	0.75 mN	2 $\mu\text{mR}/60^\circ$	Dedicated to the transverse tracing drive unit
178-386	4 mN	5 $\mu\text{mR}/90^\circ$	
178-391	4 mN	10 $\mu\text{mR}/90^\circ$	Dedicated to the standard/retractable drive unit

* Tip radius / Tip angles

• Gear-tooth surface detectors

Order No.	Measuring force	Stylus profiles*
178-388	0.75 mN	2 $\mu\text{mR}/60^\circ$
178-398	4 mN	5 $\mu\text{mR}/90^\circ$

* Tip radius / Tip angles

Detector

• Small hole detectors

Order No.	Measuring force	Stylus profiles*	Remarks
178-383	0.75 mN	2 $\mu\text{mR}/60^\circ$	Minimum measurable hole diameter: $\phi 4.5\text{ mm}$
178-392	4 mN	5 $\mu\text{mR}/90^\circ$	

* Tip radius / Tip angles

• Extra small hole detectors

Order No.	Measuring force	Stylus profiles*	Remarks
178-384	0.75 mN	2 $\mu\text{mR}/60^\circ$	Minimum measurable hole diameter: $\phi 2.8\text{ mm}$
178-393	4 mN	5 $\mu\text{mR}/90^\circ$	

* Tip radius / Tip angles

• Deep groove detectors

Order No.	Measuring force	Stylus profiles*	Remarks
178-385	0.75 mN	2 $\mu\text{mR}/60^\circ$	Not available for the transverse tracing drive unit
178-394	4 mN	5 $\mu\text{mR}/90^\circ$	

* Tip radius / Tip angles

Optional Accessories for Drive Units

• Nosepiece for flat surfaces

Nosepiece for flat surfaces 12AAA217	12AAA217 • Standard accessory for the standard/retractable drive unit of the SJ-310 Series • Not available for the transverse tracing drive unit
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• Nosepiece for cylindrical surfaces

Nosepiece for cylindrical surfaces 12AAA218	12AAA218 • Standard accessory for the standard/retractable drive unit of the SJ-310 Series • Not available for the transverse tracing drive unit
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• V-type adapter

12AAE644 • Transverse tracing type standard accessory. • Dedicated to the transverse tracing drive unit.	
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• Point-contact adapter

12AAE643 • Transverse tracing type standard accessory. • Dedicated to the transverse tracing drive unit.	
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• Extension rod (50 mm) (Note: Only one rod can be used.)

12AAA210 • Not available for the transverse tracing drive unit	• Not applicable to upward measurement.
--	---

Extension rod 50 mm
12AAA210

• Extension cable (1 m) (Note: Only one rod can be used.)

12BAA303 • For the connection between the calculation display unit and drive unit

• Adapter for flat surface

12AAA219 • Not available for the transverse tracing drive unit	Adapter for flat surface 12AAA219
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• Support feet set

Support feet set 12AAA216 12AAA216 • Standard accessory for the standard/retractable drive unit of the SJ-310 Series • Not available for the transverse tracing drive unit • Adjustment range is 28 mm from bottom face.	
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• Magnetic stand adapter

12AAA221 Mounting spigot diameter is 8 mm.	12AAA220 Mounting spigot diameter is 9.5 mm.
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Magnetic stand adapter
12AAA221

• Height gage adapter

Note: Suitable for a height gage holder designed for 9x9 mm section scribes. 12AAA222	Height gage adapter 12AAA222
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Surftest

Performs brilliantly in many situations such as in the quality control room, on the factory floor and on the production line.

Surftest SJ-410 SERIES 178 — Compact Surface Roughness Tester



MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

SPECIFICATIONS

Model No.		SJ-411		SJ-412	
Order No.	mm inch/mm	178-580-11 178-581-11	178-580-12 178-581-12	178-582-11 178-583-11	178-582-12 178-583-12
Measuring range	X axis Z axis (detector)	25 mm 800 μm, 80 μm, 8 μm		50 mm Up to 2,400 μm when using an optional stylus.	
Detector	Detection method	Differential inductance			
	Resolution	0.01 μm (800 μm range), 0.001 μm (80 μm range), 0.0001 μm (8 μm range)			
	Stylus tip shape (Angle/Radius)	60°/2 μm	90°/5 μm	60°/2 μm	90°/5 μm
	Measuring force	0.75 mN	4 mN	0.75 mN	4 mN
	Radius of skid curvature	40 mm			
Drive unit (X axis)	Measuring methods	Skidless/Skidded (switchable)			
	Measuring speed	0.05, 0.1, 0.2, 0.5, 1.0 mm/s			
	Drive speed	0.5, 1, 2, 5 mm/s			
Up/down inclination unit	Straightness	0.3 μm/25 mm		0.5 μm/50 mm	
	Vertical travel	10 mm			
Applicable standards	Inclination adjustment angle	±1.5°			
		JIS 1982/JIS 1994/JIS 2001/ISO 1997/ANSI/VDA			
Parameter		Ra, Rq, Rz, Ry, Rp, Rt, R3z, Rsk, Rku, Rc, R _{PC} , R _{SM} , R _{max} *1, Rz1 _{max} *2, S, HSC, RzJIS*3, R _{ppi} , RΔa, RΔq, R _{lr} , R _{mr} , R _{mr} (c), Rσc, Rk, R _{pk} , R _{vk} , Mr1, Mr2, A1, A2, Vo, λa, λq, Lo, R _{pm} , tp*4, Htp*4, R, Rx, AR, W, AW, Wx, Wte Customizable			
Filtered profile		Primary profile, Roughness profile, DF profile, Waviness profile, Roughness motif profile, Waviness motif profile			
Analysis graph		Material ratio curve, Profile height amplitude distribution curve			
Data compensation functions		Parabola, Hyperbola, Ellipse, Circle, Tilt, No compensation			
Filter		2CR, PC75, Gaussian			
Cutoff value	λc λs *5	0.08, 0.25, 0.8, 2.5, 8 mm 2.5, 8, 25 μm			
Sampling length		0.08, 0.25, 0.8, 2.5, 8, 25 mm			
Number of intervals		x1, x2, x3, x4, x5, x6, x7, x8, x9, x10, x11, x12, x13, x14, x15, x16, x17, x18, x19, x20			
Arbitrary length		0.1 to 25 mm		0.1 to 50 mm	
Calculation display unit	Customization	Selection of display/evaluation roughness parameter			
	Simplified contour analysis function	Step, Step quantity, Area, Coordinate difference			
	DAT (Digimatic Adjustment Table) function	Helps to level workpiece prior to skidless measurement			
	Real sampling function	Inputs the displacement of the detector while stopping the drive unit			
	statistical processing	Calculates the maximum value, minimum value, average value, standard deviation, pass rate and histogram for each parameter.			
	Judgment*6	Maximum value rule, 16 % rule, mean value rule, standard deviation (1σ, 2σ, 3σ)			
	Storing measurement condition	Max. 10 (calculation display unit)			
	Print function (Built-in thermal printer)	Measurement condition/Calculation result/Judgment result/Calculation result per segment/Tolerance value/Evaluation curve/Graphic curve/Material ratio curve/Profile height amplitude distribution curve/Environmental setting items/Statistical result (Histogram)			
	Display language	16 languages (Japanese, English, German, French, Italian, Spanish, Portuguese, Korean, Chinese (simplified/traditional), Czech, Polish, Hungarian, Turkish, Swedish, Dutch)			
	Storage function	Built-in memory: Measurement condition (Up to 10) Memory card (optional): 500 measurement conditions, 10000 measured profiles, 500 display images, 10000 text files, 500 statistical data, 1 backup file of device setting data, 10 data of Trace 10			
Power supply	External I/O functions	USB I/F, Digimatic output, RS-232C I/F, Foot switch I/F			
	Battery	Built-in battery (rechargeable Ni-MH battery)/AC adapter			
	Charging time/Endurance	Charging time of the built-in battery: about 4 hours (may vary due to ambient temperature) Endurance: about 1000 measurements (differs slightly due to use conditions/environment)			
External dimensions (WxDxH)	Max. power consumption	50 W			
	Calculation display unit	275x198x109 mm			
	Up/down inclination unit	130.9x63x99 mm			
Mass	Drive unit	128x35.8x46.6 mm		154.5x35.8x46.6 mm	
	Calculation display unit	1.7 kg			
	Up/down inclination unit	0.4 kg			
Standard Accessories	Drive unit	0.6 kg		0.64 kg	
	Detector*7/Standard stylus*8	178-601 Roughness specimen (Ra3 μm) 270732 Receipt paper (Standard type: 5-roll set) 12BAL402 Protective sheet for the LCD (x1 sheet) 12BAR507 Touch pen 12AAN041 Carrying case			
		AC adapter, Power cable, Flat-blade screwdriver, Phillips screwdriver, Hex wrench, Strap for the touch pen, Operation manual, One-sheet manual, Warranty card			

*1 Calculation is available only when selecting the VDA, ANSI, or JIS 1982 standards.

*2 Calculation is available only when selecting the ISO 1997 standard. *3 Calculation is available only when selecting the JIS 2001 standard.

*4 Calculation is available only when selecting the ANSI standard. *5 Not available when selecting the JIS 1982 standard.

*6 Only the mean value rule is available for the ANSI standard. 16 % rule is not available when selecting the VDA standard.

*7 Depending on the Order No. of the SJ-410 Series main unit, 178-396 or 178-397 is provided as standard.

*8 Standard stylus (12AAC731 or 12AAB403) supporting the provided detector is provided as standard.

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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLin



An inspection certificate is supplied as standard.

Dramatic improvement on compact type surface roughness testers

- Equipped with a large, touch-screen color graphic LCD to achieve both intuitive operation and high operability.
- Skidded and skidless measurement are switchable to perform optimum evaluation according to the measurement setup.
- A wide-range, high-resolution detector and a very accurate drive unit provide superior high-accuracy measurement in its class.

• Detector

Measuring range: 800 µm

Resolution: 0.0001 µm (when the measuring range is 8 µm)

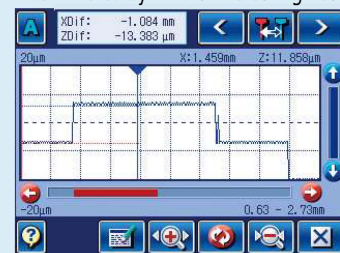
• Drive unit

Straightness/Drive length: 0.3 µm/25 mm (SJ-411)

Straightness/Drive length: 0.5 µm/50 mm (SJ-412)

- Simplified contour analysis (Step, Step quantity, Area, Coordinate difference) is available using the point cloud data collected to evaluate the surface roughness.

Allows the evaluation of detailed shapes that cannot be achieved by contour measuring instruments.



- Allows the evaluation of surface roughness in a circumferential direction using the skidless measurement and R-surface compensation functions.
- Conforms to the latest ISO standard and ANSI/VDA standard in addition to the JIS standard (2001/1994/1982).
- Achieves the performance of a desktop type surface roughness tester in combination with the simplified stand and associated optional accessories.

Optional Accessories for SJ-410 Consumables

- Receipt paper Standard type (5-roll set) **270732**
- Receipt paper High-durability paper (5-roll set) **12AAA876**
- Protective sheet for the touch panel (x10 sheets) **12AAN040**
- Memory card (2 GB) **12AAW452**

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An inspection certificate is supplied as standard.

High precision and high performance type surface roughness tester with a dedicated control unit, offering a user-friendly display and simple operation.

- Equipped with a 7.5-inch, color TFT LCD, color icons and touch panel controls, the display unit is easy to read and simple to operate.
- A built-in joystick on the control unit allows quick and easy positioning. The manual adjustment knob allows fine positioning of a small stylus for measuring small holes.
- In addition to the roughness parameters compliant with ISO/JIS/ANSI/VDA surface roughness standards, contour analysis is also available.

SPECIFICATIONS

Model No.	SJ-500	SV-2100M4*1	SV-2100S4*1	SV-2100H4*1	SV-2100W4*1
Stand type	(Optional)*2	Manual stand		Motorized stand	
Measuring range			800 µm, 80 µm, 8 µm		
Z1 axis (detector)					
X axis	50 mm			100 mm	
X axis			0.05 µm		
Resolution			0.01 µm (800 µm), 0.001 µm (80 µm), 0.0001 µm (8 µm)		
Z1 axis (detector)					
Z2 axis (column)	—	—		1 µm	
Assessed profile	Primary profile, Roughness profile, Waviness profile, DF profile, Roughness motif profile, Waviness motif profile				

*1 While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

*2 Stand for SJ-500 is optional.

Surftest SJ-500/SV-2100 SERIES 178 — Dedicated Control Unit Type Surface Roughness Tester



A superior data processing tester with PC data analysis for higher efficiency.

Surftest SJ-500P/SV-2100M4 Data Processing Unit (PC) Surface Roughness Testers



FORMTRACEPAK: Best-selling Surface Roughness Analysis Program

Best-selling dedicated software for surface roughness measurement and analysis. Features a flexible printer format and creation of an original inspection certificate.

SPECIFICATIONS

Type of data processing unit	PC type	
Model No.	SJ-500P	SV-2100M4*2
Elevating shaft mechanism of stand	—*1	Manual operation only
Measuring range	50 mm	100 mm
X axis		
Z1 axis (detector)		800 µm, 80 µm, 8 µm
Z2-axis (column) travel range	—	350 mm
X axis		0.05 µm
Resolution		0.01 µm (800 µm), 0.001 µm (80 µm), 0.0001 µm (8 µm)
Z1 axis (detector)		
Z2 axis (column)	—	—
Applicable standards	JIS 1982/JIS 1994/JIS 2001/ISO 1997/ANSI/VDA	
Assessed profile	Primary profile, Roughness profile, Waviness profile, Filtered waviness profile, Rolling circle waviness profile, Rolling circle center line waviness profile, Envelope residual profile, DIN4776 profile, Roughness motif profile, Waviness motif profile	

*1 The simplified stand or manual column stand is available as an optional accessory.

*2 While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

Surftest

Performs brilliantly in many situations such as in the quality control room, on the factory floor and on the production line.

Surftest Extreme SV-3000CNC/SV-M3000CNC SERIES 178 — CNC Surface Roughness Testers

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink.



An inspection certificate is supplied as standard.



SV-3000CNC
(Inclinable drive unit + Y-axis table)



SV-M3000CNC
(Surface Roughness Tester with built-in Y axis.)
(The photo represents a special specification model.)

SV-3000CNC SPECIFICATIONS

Model No.	SV-3000CNC	
X1 axis (drive unit)	Measuring range	200 mm
	Resolution	0.05 μ m
	Scale type	Reflective-type linear encoder
	Drive speed	CNC mode Joystick mode
	Measuring speed	Max. 200 mm/s 0 to 50 mm/s
	Measuring direction	0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0 mm/s Backward
	Straightness	0.5 μ m/200 mm
Y axis (table)	Measuring range	200 mm
	Resolution	0.05 μ m
	Drive speed	CNC mode Joystick mode
	Maximum table loading	Max. 200 mm/s 0 to 50 mm/s 20 kg
Z2 axis (column)	Travel range	Z2 axis (column, type S) Z2 axis (column, type H)
	Resolution	300 mm 500 mm
	Scale type	0.05 μ m Reflective-type linear encoder
	Drive speed	CNC mode Joystick mode
	Base size (widthxdepth)	Max. 200 mm/s 0 to 50 mm/s 750x600 mm
Base unit	Base material	Granite

Note: While the appearance of the natural stone measuring table varies according to the source, the high stability for which this material is known can always be relied upon.

SV-M3000CNC SPECIFICATIONS

Model No.	SV-M3000CNC	
X1 axis (drive unit)	Measuring range	200 mm
	Resolution	0.05 μ m
	Scale type	Reflective-type linear encoder
	Drive speed	CNC mode Joystick mode
	Measuring speed	Max. 200 mm/s 0 to 50 mm/s
	Straightness	0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0 mm/s 0.5 μ m/200 mm
	When using a standard detector	
Z2 axis (column)	Measuring range	500 mm
	Resolution	0.05 μ m
	Scale type	Reflective-type linear encoder
	Drive speed	CNC mode Joystick mode
	Maximum table loading	Max. 200 mm/s 0 to 50 mm/s 300 kg
Y axis	Measuring range	800 mm
	Resolution	0.05 μ m
	Scale type	Reflective-type linear encoder
	Drive speed	CNC mode Joystick mode
	Measuring speed	Max. 200 mm/s 0 to 50 mm/s 0.02 to 2 mm/s
	Straightness	When using a standard detector holder
	Narrow range	0.5 μ m/50 mm Wide range 2 μ m/800 mm
Base unit	Base size (widthxdepth)	600x1500 mm
	Base material	Steel
	Maximum table loading	300 kg

- The X1, Y and Z2 axes have a maximum drive speed of 200 mm/s. This permits high-speed positioning that can potentially result in a large increase in the throughput of multiple-profile/multiple-workpiece measurement tasks.
- Capable of inclined plane measurement through 2 axis simultaneous control in X and Y.
- Models equipped with the α axis allow continuous measurement on horizontal and inclined surfaces by power-tilting the X1 axis.
- It is possible to expand the measuring range for multiple workpieces through positioning in Y.
- All connecting cables are contained within the measuring instrument to eliminate any inconvenience during measurement.
- Since the Z1-axis detector incorporates an anti-collision safety device, the detector unit will automatically stop if it touches a workpiece or fixture.
- Surftest Extreme **SV-M3000CNC** (CNC Surface Roughness Tester with a movable Y-axis table) that handles measurement of large/heavy workpieces, such as engine blocks or crankshafts, is also available.
- Optional external control function (Ext I/O) through bidirectional communication (RS-232C) with the PLC (programmable logic controller) is available.

Mitutoyo

Refer to the CNC Form Measuring Instrument Series Brochure (E15021) for more details.

Mitutoyo

Mitutoyo reserves the right to change any or all aspects of any product specification, including prices, designs and service content, without notice.

Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

Tube Micrometers SERIES 395, 115, 295

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- Measuring faces: Carbide.
(**115-101**: only the spindle is carbide tipped.)
- series 395**: IP65 digital spherical-flat anvil type micrometer.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric				
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μ m)	ϕ D
Digimatic (LCD)				
395-251-30	0 - 25	0.001	± 2	$\phi 15$
395-252-30	25 - 50			$\phi 19$
395-253-30	50 - 75		± 3	$\phi 20$
395-254-30	75 - 100			$\phi 20$

Metric				
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	øD
Analog				
115-101	0 - 15	0.01	±3	ø5.5
115-115	0 - 25			ø10
115-116	25 - 50			ø11
115-117	50 - 75			ø17
115-118	75 - 100		±4	ø18
Mechanical counter model				
295-115	0 - 25		±3	ø10

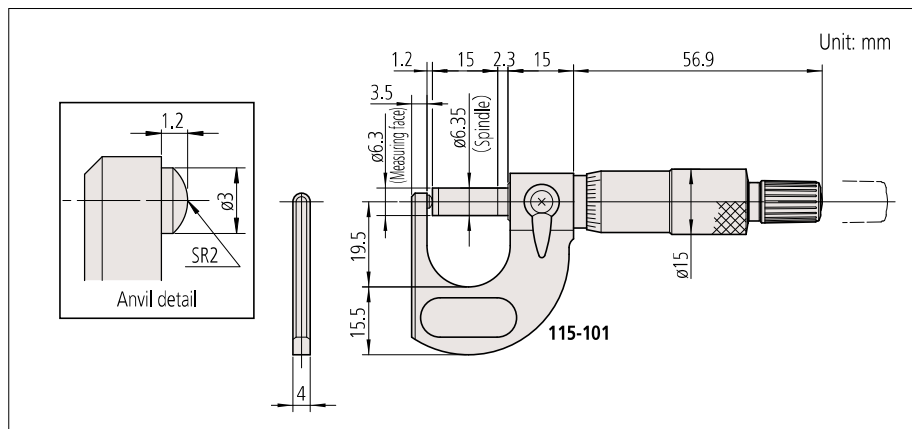
Note: For functional details of **series 395** refer to page B-8.

Optional connecting cable is available only for water-proof type (Digimatic model).

Inch / Metric				
Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	ϕ D (in)
Digimatic (LCD)				
395-351-30	0 - 1	0.00005 in/ 0.001 mm	± 0.0001	$\phi 0.59$
395-352-30	1 - 2			$\phi 0.75$
395-353-30	2 - 3		± 0.00015	$\phi 0.79$
395-354-30	3 - 4			$\phi 0.79$

Inch				
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	ϕ D (in)
Analog				
115-153	0 - 1	0.0001	± 0.00015	$\phi 0.40$
Mechanical counter model				
295-153	0 - 1	0.0001	± 0.00015	$\phi 0.40$

DIMENSIONS



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



IP Codes (series 395)

Level 6: Dust-proof.

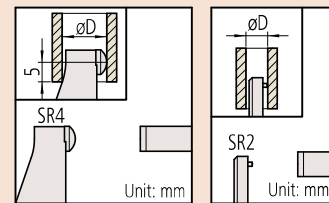
No ingress of dust allowed.

Level 5: Protected against water jets.

Water projected in jets against the enclosure from any direction shall have no harmful effects.

Technical Data

- Flatness: 0.6 μ m/0.000024 in (**series 115 & 295**)
0.3 μ m/0.000012 in (**series 395**)



Other than **115-101**

115-101

Technical Data

- Battery for **series 395**
SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use (for **series 395**)
- Length standard: Electromagnetic rotary sensor (for **series 395**)
- Standard accessories: Reference bar, 1 pc.
(except for measuring range 0 to 15 mm/0 to 25 mm (0 to 1 in) models)
Spanner (**200168**), 1 pc. (for **series 115-101**)
Spanner (**301336**), 1 pc. (for models other than **series 115-101**)

Optional Accessories

- Connecting cables for **series 395**
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**

Wireless Data Output **U-WAVE** fit

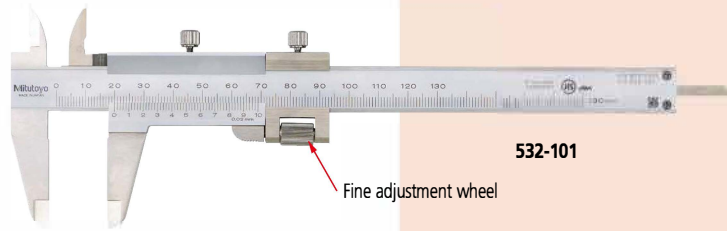
- U-WAVE-TM** 264-622 (IP67 type)
264-623 (Buzzer type)
- U-WAVE-TMB** Transmitter
Mitutoyo Bluetooth® U-WAVE
264-626 (IP type)
264-627 (Buzzer type)
- Connecting unit for **U-WAVE-TM/TMB**
02AF310 (IP67/buzzer type common specification)

Calipers

An industry standard measuring tool

Vernier Caliper SERIES 532 — with fine adjustment

- Fine-adjustment aids slider positioning.
- Allows step measurement.



532-101

Fine adjustment wheel

SPECIFICATIONS

Metric				
Order No.	Range (mm)	Maximum Permissible Error* ¹ (mm) • EMPE (outside measurement) • SMPE (inside measurement)	Depth bar	Remarks
532-101* ²	0 - 130	±0.03	Blade	with fine adjustment
532-102* ²	0 - 180	±0.03		
532-103* ²	0 - 280	±0.04		

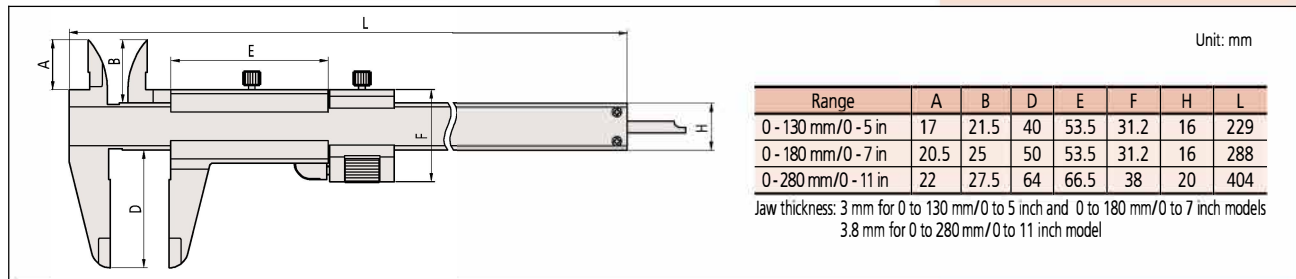
*1 Partial Measuring Face Contact Error EMPE/Scale Shift Error SMPE are terms (notations) used in JIS B 7507: 2016, revised based on ISO 13385-1: 2011. The measurement method is the same as before.

*2 Graduation: 0.02 mm

Metric/Inch with metric/inch double scale

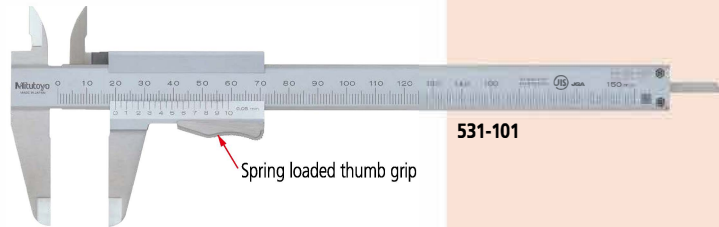
Order No.	Range (mm)	Accuracy (mm)	Depth bar	Graduation	Remarks
532-119	0 - 130	±0.03	Blade	0.02 mm (0.001 in)	with fine adjustment
532-120	0 - 180	±0.03			
532-121	0 - 280	±0.04			

DIMENSIONS



Vernier Caliper 531 Series — with thumb grip

- The slider moves only when the spring-loaded thumb grip is depressed.
- Allows step measurement.



531-101

Spring loaded thumb grip

SPECIFICATIONS

Metric				
Order No.	Range (mm)	Maximum Permissible Error* ¹ (mm) • EMPE (outside measurement) • SMPE (inside measurement)	Depth bar	Remarks
531-101* ²	0 - 150	±0.05	Blade	—
531-102* ²	0 - 200			
531-103* ²	0 - 300	±0.08		

*1 Partial Measuring Face Contact Error EMPE/Scale Shift Error SMPE are terms (notations) used in JIS B 7507: 2016, revised based on ISO 13385-1: 2011. The measurement method is the same as before.

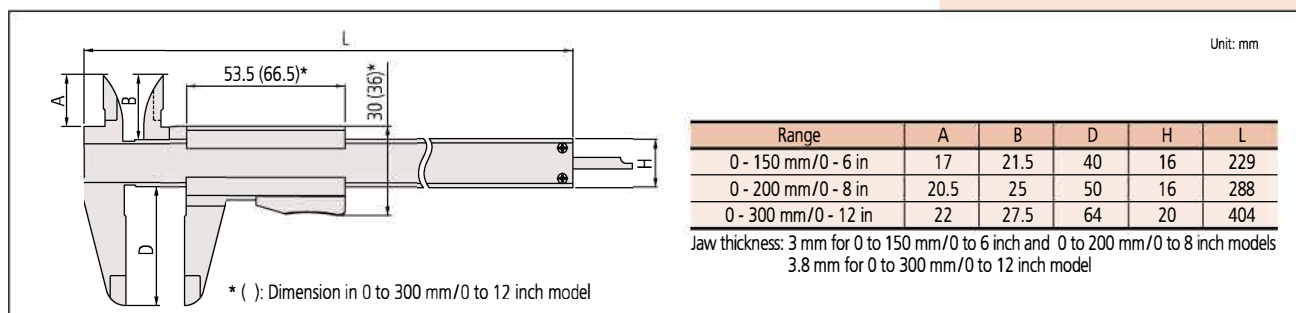
*2 Graduation: 0.05 mm

Metric/Inch with metric/inch double scale

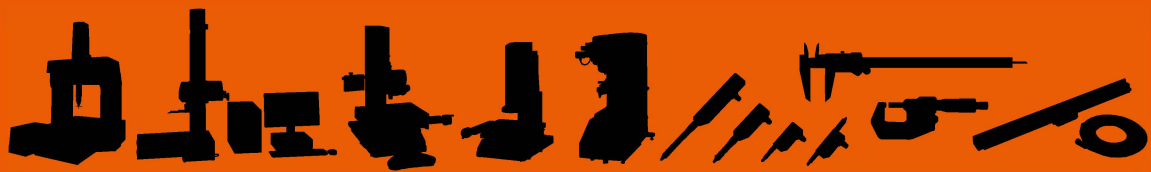
Order No.	Range (mm)	Accuracy (mm)	Depth bar	Graduation	Remarks
531-122	0 - 150	±0.05	Blade	0.05 mm (1/128 in)	with inch/mm conversion label
531-128	0 - 200	±0.03		0.02 mm (0.001 in)	High accuracy model
531-108		±0.05		0.05 mm (1/128 in)	—
531-129	0 - 300	±0.03		0.02 mm (0.001 in)	High accuracy model
531-109		±0.08		0.05 mm (1/128 in)	—
531-112		±0.04		0.02 mm (0.001 in)	High accuracy model

Jaw thickness: 3 mm for 0 to 150 mm/0 to 6 inch and 0 to 200 mm/0 to 8 inch models
3.8 mm for 0 to 300 mm/0 to 12 inch model

DIMENSIONS



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