

INDEX

Micrometers

Coolant-Proof Micrometer	B-2,3
Digimatic Micrometer	B-4
Digimatic Micrometer- MDC- Lite	B-4
MDH Micrometer	B-5
QuantuMike	B-6
ABSOLUTE Digimatic Micrometers	B-7
Quickmike	B-8
Outside Micrometers	B-9, 11-19
Ratchet-Thimble Micrometer	B-10
Spline Micrometers	B-20
Point Micrometers	B-21
Crimp Height Micrometers	B-22
V-Anvil Micrometers	B-23,24
Limit Micrometers	B-25
Pana Micrometers	B-26
Spherical Face Micrometers	B-27
Tube Micrometers	B-28
Uni-Mike	B-29
Uni-Mike	B-29
Sheet Metal Micrometers	B-30
Blade Micrometers	B-31
Disk Micrometers	B-32,34-35
Paper Thickness Micrometers	B-33
Gear-Tooth Micrometers	B-36
Screw Thread Micrometers	B-37,38
3-Wire Thread Measuring System	B-39
Can Seam Micrometers	B-40
Hub Micrometers	B-41
Wire Micrometers	B-41
Digital Outside Micrometers	B-42
Indicating Micrometers	B-43
Snap Meters	B-43
Dial Snap Meters	B-44
Caliper-Type Micrometers	B-45
Groove Micrometers	B-46
Small-Hole Gage Set	B-47
Telescoping Gage Set	B-47
Micrometer Stands	B-48
Color Ratchet & Color Speeder	B-49
Spindle Attachment Tip	B-49
Micrometer Oil	B-49
Optical Parallels	B-50
Optical Flats	B-50
Micrometer Standards	B-51
Standards for Screw Thread Micrometers	B-52
Standards for V-Anvil Micrometers	B-52
Tool Kits	B-53,54

Micrometer Heads

Micrometer Head Selection Guide	B-55
Digimatic Micrometer Heads	B-56,57
Micrometer Heads	B-58-72
Micro Jack	B-72
Precision Lead Screw	B-73
Fixtures for Micrometer Heads and Linear Gages	B-74,75
Quick Guide to Precision Measuring Instruments	B-76
Micro Jack	B-72
Precision Lead Screw	B-73
Fixtures for Micrometer Heads	B-74,75

Micrometers



Micrometer Heads



MDC Micrometer



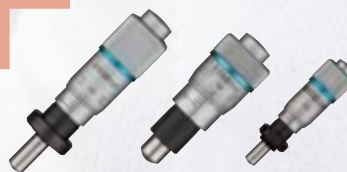
MDH Micrometer



QuantuMike



Digimatic Outside
Micrometer



Micrometer Heads
fine spindle feed

Coolant-proof Micrometer

SERIES 293 — with Dust/Water Protection Conforming to IP65 Level

FEATURES

- IP65 protection level, enabling use in environments exposed to cutting oil, etc*.
*Anti-corrosion treatment is required after use.
- Measurement data output function is available with a water-resistant connection cable.
- Auto power ON/OFF function.
- A nonslip surface is employed for the frame cover and surface panel to achieve stable handheld measurement.
- Certificate of inspection* is included.
(2" /50mm or less range models)**
*It is not the type used to obtain calibration certificates.
** except 293-349-30
- With a standard bar except for 0-1" /0-25mm model.
- Supplied in fitted case. Plastic case up to 6" /150mm, wooden box over 6" /150mm.



293-330-30



293-252-30



Oil-resistant materials are used in all plastic components.



Measurement data output function is available with a water-resistant connection cable.



Employed nonslip surface



Mitutoyo		CERTIFICATE OF INSPECTION / 検査成績書	
1. Item / 品名	Digital Micrometer	Model No. / 型番	293-330
2. Range / 測定範囲	0-1" / 0-25mm	Serial No. / 番付番号	0000000000
3. Date of Inspection / 検査日付	2013.08.01	Standard Temperature / 標準温度	20 °C
4. Inspector / 検査者	0000000000		
5. Date of Issuance / 発行日付	2013.08.01		
6. Date of Next Inspection / 次回検査日付	2014.08.01		
7. Date of Calibration / 校正日付	2013.08.01		
8. Date of Next Calibration / 次回校正日付	2014.08.01		
9. Date of Next Calibration / 次回校正日付	2014.08.01		
10. Date of Next Calibration / 次回校正日付	2014.08.01		
11. Date of Next Calibration / 次回校正日付	2014.08.01		
12. Date of Next Calibration / 次回校正日付	2014.08.01		
13. Date of Next Calibration / 次回校正日付	2014.08.01		
14. Date of Next Calibration / 次回校正日付	2014.08.01		
15. Date of Next Calibration / 次回校正日付	2014.08.01		
16. Date of Next Calibration / 次回校正日付	2014.08.01		
17. Date of Next Calibration / 次回校正日付	2014.08.01		
18. Date of Next Calibration / 次回校正日付	2014.08.01		
19. Date of Next Calibration / 次回校正日付	2014.08.01		
20. Date of Next Calibration / 次回校正日付	2014.08.01		
21. Date of Next Calibration / 次回校正日付	2014.08.01		
22. Date of Next Calibration / 次回校正日付	2014.08.01		
23. Date of Next Calibration / 次回校正日付	2014.08.01		
24. Date of Next Calibration / 次回校正日付	2014.08.01		
25. Date of Next Calibration / 次回校正日付	2014.08.01		
26. Date of Next Calibration / 次回校正日付	2014.08.01		
27. Date of Next Calibration / 次回校正日付	2014.08.01		
28. Date of Next Calibration / 次回校正日付	2014.08.01		
29. Date of Next Calibration / 次回校正日付	2014.08.01		
30. Date of Next Calibration / 次回校正日付	2014.08.01		
31. Date of Next Calibration / 次回校正日付	2014.08.01		
32. Date of Next Calibration / 次回校正日付	2014.08.01		
33. Date of Next Calibration / 次回校正日付	2014.08.01		
34. Date of Next Calibration / 次回校正日付	2014.08.01		
35. Date of Next Calibration / 次回校正日付	2014.08.01		
36. Date of Next Calibration / 次回校正日付	2014.08.01		
37. Date of Next Calibration / 次回校正日付	2014.08.01		
38. Date of Next Calibration / 次回校正日付	2014.08.01		
39. Date of Next Calibration / 次回校正日付	2014.08.01		
40. Date of Next Calibration / 次回校正日付	2014.08.01		
41. Date of Next Calibration / 次回校正日付	2014.08.01		
42. Date of Next Calibration / 次回校正日付	2014.08.01		
43. Date of Next Calibration / 次回校正日付	2014.08.01		
44. Date of Next Calibration / 次回校正日付	2014.08.01		
45. Date of Next Calibration / 次回校正日付	2014.08.01		
46. Date of Next Calibration / 次回校正日付	2014.08.01		
47. Date of Next Calibration / 次回校正日付	2014.08.01		
48. Date of Next Calibration / 次回校正日付	2014.08.01		
49. Date of Next Calibration / 次回校正日付	2014.08.01		
50. Date of Next Calibration / 次回校正日付	2014.08.01		
51. Date of Next Calibration / 次回校正日付	2014.08.01		
52. Date of Next Calibration / 次回校正日付	2014.08.01		
53. Date of Next Calibration / 次回校正日付	2014.08.01		
54. Date of Next Calibration / 次回校正日付	2014.08.01		
55. Date of Next Calibration / 次回校正日付	2014.08.01		
56. Date of Next Calibration / 次回校正日付	2014.08.01		
57. Date of Next Calibration / 次回校正日付	2014.08.01		
58. Date of Next Calibration / 次回校正日付	2014.08.01		
59. Date of Next Calibration / 次回校正日付	2014.08.01		
60. Date of Next Calibration / 次回校正日付	2014.08.01		
61. Date of Next Calibration / 次回校正日付	2014.08.01		
62. Date of Next Calibration / 次回校正日付	2014.08.01		
63. Date of Next Calibration / 次回校正日付	2014.08.01		
64. Date of Next Calibration / 次回校正日付	2014.08.01		
65. Date of Next Calibration / 次回校正日付	2014.08.01		
66. Date of Next Calibration / 次回校正日付	2014.08.01		
67. Date of Next Calibration / 次回校正日付	2014.08.01		
68. Date of Next Calibration / 次回校正日付	2014.08.01		
69. Date of Next Calibration / 次回校正日付	2014.08.01		
70. Date of Next Calibration / 次回校正日付	2014.08.01		
71. Date of Next Calibration / 次回校正日付	2014.08.01		
72. Date of Next Calibration / 次回校正日付	2014.08.01		
73. Date of Next Calibration / 次回校正日付	2014.08.01		
74. Date of Next Calibration / 次回校正日付	2014.08.01		
75. Date of Next Calibration / 次回校正日付	2014.08.01		
76. Date of Next Calibration / 次回校正日付	2014.08.01		
77. Date of Next Calibration / 次回校正日付	2014.08.01		
78. Date of Next Calibration / 次回校正日付	2014.08.01		
79. Date of Next Calibration / 次回校正日付	2014.08.01		
80. Date of Next Calibration / 次回校正日付	2014.08.01		
81. Date of Next Calibration / 次回校正日付	2014.08.01		
82. Date of Next Calibration / 次回校正日付	2014.08.01		
83. Date of Next Calibration / 次回校正日付	2014.08.01		
84. Date of Next Calibration / 次回校正日付	2014.08.01		
85. Date of Next Calibration / 次回校正日付	2014.08.01		
86. Date of Next Calibration / 次回校正日付	2014.08.01		
87. Date of Next Calibration / 次回校正日付	2014.08.01		
88. Date of Next Calibration / 次回校正日付	2014.08.01		
89. Date of Next Calibration / 次回校正日付	2014.08.01		
90. Date of Next Calibration / 次回校正日付	2014.08.01		
91. Date of Next Calibration / 次回校正日付	2014.08.01		
92. Date of Next Calibration / 次回校正日付	2014.08.01		
93. Date of Next Calibration / 次回校正日付	2014.08.01		
94. Date of Next Calibration / 次回校正日付	2014.08.01		
95. Date of Next Calibration / 次回校正日付	2014.08.01		
96. Date of Next Calibration / 次回校正日付	2014.08.01		
97. Date of Next Calibration / 次回校正日付	2014.08.01		
98. Date of Next Calibration / 次回校正日付	2014.08.01		
99. Date of Next Calibration / 次回校正日付	2014.08.01		
100. Date of Next Calibration / 次回校正日付	2014.08.01		

Certificate of inspection

Technical Data

- Accuracy: Refer to the list of specifications.
 Resolution: .00005" / 0.001mm or 0.001mm (up to 4" models)
 .0001" / 0.001mm (over 4" models)
 Flatness: .000012" / 0.3μm
 Parallelism: .00004" / 1μm for models up to 2" / 50mm
 .00008" / 2μm for models up to 4" / 100mm
 .00012" / 3μm for models up to 7" / 175mm
 .00016" / 4μm for models up to 11" / 275mm
 .0002" / 5μm for models over 12" / 300mm
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 2.4 years under normal use
 Dust/Water protection level: IP65

Function

- Origin-set, Zero / ABS, Hold, Auto power on/off,
 Data output (output models),
 inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error

Optional Accessories

- 05CZA662**: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)



SPC cable with data switch

SPECIFICATIONS

Metric With ratchet stop

Range	Resolution	Order No.	Accuracy
0 - 25mm	0.001mm	293-230-30 / 293-240-30*	±1μm
25 - 50mm	0.001mm	293-231-30 / 293-241-30*	±1μm
50 - 75mm	0.001mm	293-232-30 / 293-242-30*	±1μm
75 - 100mm	0.001mm	293-233-30 / 293-243-30*	±2μm
100 - 125mm	0.001mm	293-250-30	±2μm
125 - 150mm	0.001mm	293-251-30	±2μm
150 - 175mm	0.001mm	293-252-30	±3μm
175 - 200mm	0.001mm	293-253-30	±3μm
200 - 225mm	0.001mm	293-254-30	±3μm
225 - 250mm	0.001mm	293-255-30	±4μm
250 - 275mm	0.001mm	293-256-30	±4μm
275 - 300mm	0.001mm	293-257-30	±4μm

*without SPC data output

Metric With ratchet thimble

Range	Resolution	Order No.	Accuracy
0 - 25mm	0.001mm	293-234-30 / 293-244-30*	±1μm
25 - 50mm	0.001mm	293-235-30 / 293-245-30*	±1μm
50 - 75mm	0.001mm	293-236-30 / 293-246-30*	±1μm
75 - 100mm	0.001mm	293-237-30 / 293-247-30*	±2μm

*without SPC data output

Metric Micrometer Set

Range	Order No.	Included in set
0-50mm (2pcs. Set)	293-966-30	293-230-30, 293-231-30, 25mm CERA block, plastic case
0-75mm (3pcs. Set)	293-962-30	293-230-30, 293-231-30, 293-232-30, 2 standard bars, plastic case
0-100mm (4pcs. Set)	293-963-30	293-230-30, 293-231-30, 293-232-30, 293-233-30, 3 standard bars, wooden box

Inch/Metric With ratchet stop

Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	293-330-30 / 293-340-30*	±.00005"
1" - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	293-331-30 / 293-341-30*	±.00005"
2" - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	293-332-30 / 293-342-30*	±.00005"
3" - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	293-333-30 / 293-343-30*	±.0001"
4" - 5" / 101.6 - 127.0mm	.0001" / 0.001mm	293-350-30	±.0001"
5" - 6" / 127.0 - 152.4mm	.0001" / 0.001mm	293-351-30	±.0001"
6" - 7" / 152.4 - 177.8mm	.0001" / 0.001mm	293-352-30	±.00015"
7" - 8" / 177.8 - 203.2mm	.0001" / 0.001mm	293-353-30	±.00015"
8" - 9" / 203.2 - 228.6mm	.0001" / 0.001mm	293-354-30	±.00015"
9" - 10" / 228.6 - 254.0mm	.0001" / 0.001mm	293-355-30	±.0002"
10" - 11" / 254.0 - 279.4mm	.0001" / 0.001mm	293-356-30	±.0002"
11" - 12" / 279.4 - 304.8mm	.0001" / 0.001mm	293-357-30	±.0002"

*without SPC data output

Inch/Metric With ratchet thimble

Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	293-334-30 / 293-344-30*	±.00005"
0 - 1" / 0 - 25.4mm	.0001" / 0.001mm	293-349-30*	±.0001"
1" - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	293-345-30*	±.00005"
2" - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	293-346-30*	±.00005"
3" - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	293-347-30*	±.0001"

*without SPC data output

Inch/Metric With friction thimble

Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	293-335-30 / 293-348-30*	±.00005"
1" - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	293-336-30	±.00005"

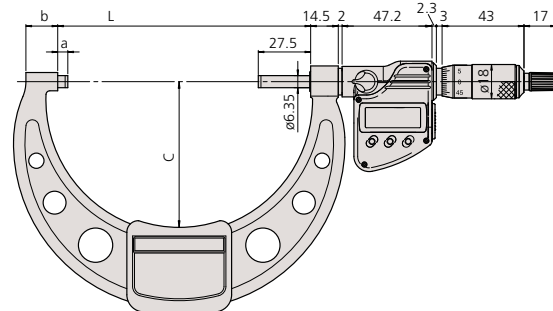
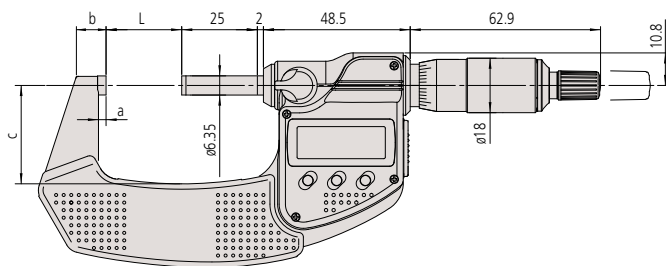
*without SPC data output

Inch/Metric Micrometer Set .00005" / 0.001mm graduation model

Range	Order No.	Included in set
0 - 3" / 0 - 76.2mm (3 pcs. set)	293-960-30	293-330-30, 293-331-30, 293-332-30, 2 standard bars, plastic case
0 - 4" / 0 - 101.6mm (4 pcs. set)	293-961-30	293-330-30, 293-331-30, 293-332-30, 293-333-30, 3 standard bars, wooden box

DIMENSIONS AND MASS

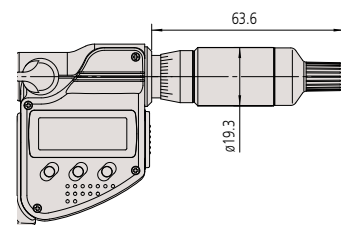
Ratchet-stop type (up to 100mm/4")



Ratchet stop type (over 100mm/4" to 300mm/12")

Ratchet-thimble type and friction-thimble type

Unit: mm



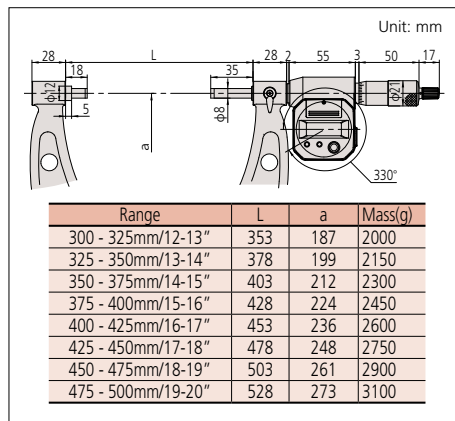
Range (Metric / Inch)	L	a	b	c	Mass (g)
0 - 25mm / 0-1"	0	2.5	9	(25)	270
25 - 50mm / 1-2"	25	2.5	9.8	(32.5)	330
50 - 75mm / 2-3"	50	2.5	12.6	(47)	470
75 - 100mm / 3-4"	75	2.5	14	(60)	625
100 - 125mm / 4-5"	132.8	5.3	16.7	(76.5)	600
125 - 150mm / 5-6"	158.2	5.7	18.8	(91)	740
150 - 175mm / 6-7"	183.6	6.1	19.1	(103.1)	800
175 - 200mm / 7-8"	208.8	6.3	18.2	(115.3)	970
200 - 225mm / 8-9"	234.2	6.7	16.8	(126.8)	1100
225 - 250mm / 9-10"	258	5.5	18	(139.8)	1270
250 - 275mm / 10-11"	284	18	28	(152.3)	1340
275 - 300mm / 11-12"	309	18	28	(166)	1540

Digimatic Micrometer

SERIES 293



DIMENSIONS



SPECIFICATIONS

Metric With ratchet stop			
Range	Resolution	Order No.	Accuracy
300 - 325mm	0.001mm	293-582	±6μm
325 - 350mm	0.001mm	293-583	±6μm
350 - 375mm	0.001mm	293-584	±6μm
375 - 400mm	0.001mm	293-585	±7μm
400 - 425mm	0.001mm	293-586	±7μm
425 - 450mm	0.001mm	293-587	±7μm
450 - 475mm	0.001mm	293-588	±8μm
475 - 500mm	0.001mm	293-589	±8μm

Inch/Metric With ratchet stop			
Range	Resolution	Order No.	Accuracy
12" - 13" / 304.8 - 330.2mm	.0001" / 0.001mm	293-782	±.0003"
13" - 14" / 330.2 - 355.6mm	.0001" / 0.001mm	293-783	±.0003"
14" - 15" / 355.6 - 381.0mm	.0001" / 0.001mm	293-784	±.0003"
15" - 16" / 381.0 - 406.4mm	.0001" / 0.001mm	293-785	±.00035"
16" - 17" / 406.4 - 431.8mm	.0001" / 0.001mm	293-786	±.00035"
17" - 18" / 431.8 - 457.2mm	.0001" / 0.001mm	293-787	±.00035"
18" - 19" / 457.2 - 482.6mm	.0001" / 0.001mm	293-788	±.0004"
19" - 20" / 482.6 - 508.0mm	.0001" / 0.001mm	293-789	±.0004"

Technical Data

Accuracy: Refer to the list of specifications.
 Resolution: .0001"/0.001mm or 0.001mm
 Flatness: .000024" / 0.6μm
 Parallelism: .0002"/5μm for models up to 15"/375mm
 .00024"/6μm for models up to 19"/475mm
 .00028"/7μm for models over 20"/500mm
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (2 pcs.), **938882**
 Battery life: Approx. 1.8 years under normal use

Function

Preset, Zero-setting, Power ON/OFF, Data hold, Data output, inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error

Optional Accessories

959149: SPC cable (40"/1m) Straight type
959150: SPC cable (80"/2m) Straight type
04AZB512: SPC cable L-type (40"/1m)
04AZB513: SPC cable L-type (80"/2m)



Digimatic Micrometer

SERIES 293 MDC-Lite

FEATURES

- Provided only with zero set and in/mm (inch/metric models only) keys.
- A ratchet stop or friction thimble for a constant measuring force.
- Measurement readout with large characters on the LCD.
- No spindle clamp. No data output.
- Supplied in fitted plastic case.



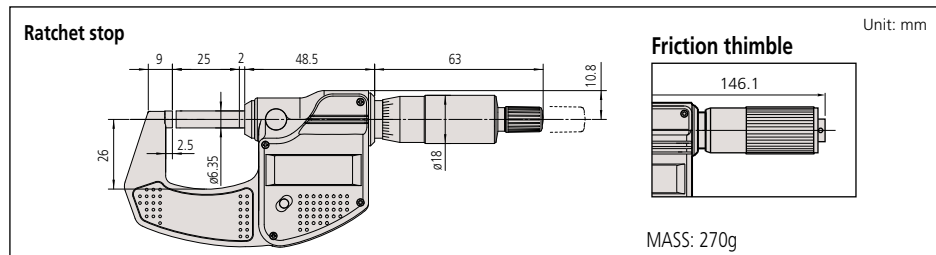
SPECIFICATIONS

Metric With ratchet stop			
Range	Resolution	Order No.	Accuracy
0 - 25mm	0.001mm	293-821-30	±2μm

Inch/Metric With ratchet stop			
Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	293-831-30	±.0001"

Inch/Metric With friction thimble			
Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	293-832-30	±.0001"

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications
 Resolution: .00005"/0.001mm or 0.001mm
 Flatness: .000012" / 0.3μm
 Parallelism: .00008" / 2μm
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 2.4 years under normal use

Function

Origin-set, Automatic power on/off, inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error

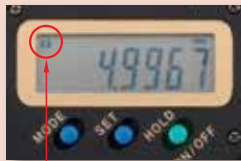


SERIES 293 — High-Accuracy Sub-Micron Digimatic Micrometer

Flatness: 0.3µm/.000012"
Parallelism: 0.6µm/.000024
Measuring force: 7 to 9N

Preset (ABS measurement system)
Zero-setting (INC measurement system)
Hold, Resolution switching, Function lock, On/off, Auto
power off, Measurement data output, Error alarm

05CZA662: SPC cable with data switch (1m/40")
05CZA663: SPC cable with data switch (2m/80")



Heat shield



- Enabling .000005"/0.1µm resolution measurement, this micrometer is ideal for customers who need to make highly accurate measurements with a handheld tool.
- A highly rigid frame and high-performance constant-force mechanism* enable more stable measurements, while the clicks emitted while the workpiece is being measured assure the operator that measurement is proceeding normally.

- Body heat transferred to the instrument is reduced by a (removable) heat shield, minimizing the error caused by thermal expansion of the frame when performing handheld measurements.
- The ABS (absolute) rotary sensor also eliminates the need to perform origin setting each time the power is turned on, letting you start measuring right away. With no possibility of overspeed errors, the High-Accuracy Digimatic Micrometer also delivers a high level of reliability.



Metric

Order No.	Range	Resolution	Accuracy	Measuring surface	Mass
293-100-10	0 - 25mm	0.0001mm/ 0.0005mm (switchable)	±0.5µm	ø3.2mm	400g (440g w/Heat shield)

Order No.	Range	Resolution	Accuracy	Measuring surface	Mass
293-130-10	0 - 1" 0 - 25.4mm	.000005"/.00002" 0.0001mm/0.0005mm (switchable)	±.00002"	ø3.2mm	400g (440g w/Heat shield)

[illegible]

QuantuMike

SERIES 293 — Coolant-proof Micrometer

FEATURES

- Faster measurement with 2mm per revolution instead of the standard 0.5mm.
- A patented ratchet thimble mechanism helps ensure repeatability.
- A function lock helps prevent error.
- IP-65 protection level.
- Certificate of inspection provided.
- With a standard bar except for 0-25mm/0-1" model.
- Supplied in fitted plastic case.



293-180-30



293-187-30

SPECIFICATIONS

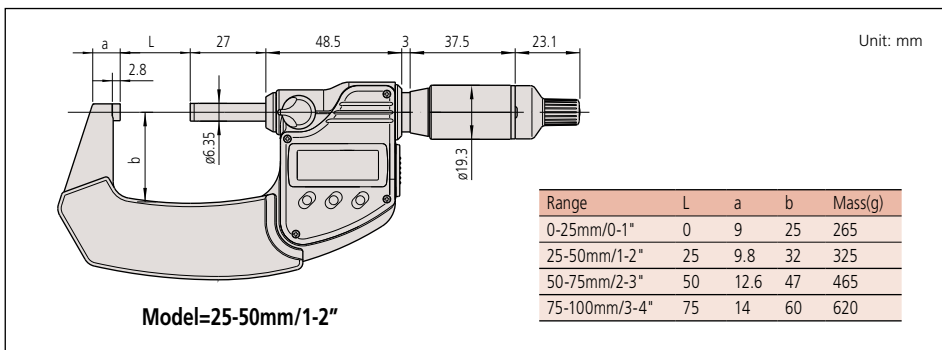
Metric			
Range	Resolution	Order No.	Accuracy
0-25mm	0.001mm	293-140-30	1μm
0-25mm	0.001mm	293-145-30*	1μm
25-50mm	0.001mm	293-141-30	1μm
25-50mm	0.001mm	293-146-30*	1μm
50-75mm	0.001mm	293-142-30	2μm
50-75mm	0.001mm	293-147-30*	2μm
75-100mm	0.001mm	293-143-30	2μm
75-100mm	0.001mm	293-148-30*	2μm

* without SPC data output

Inch/Metric			
Range	Resolution	Order No.	Accuracy
0-1"/0 - 25.4mm	.00005"/0.001mm	293-180-30	.00005"
0-1"/0 - 25.4mm	.00005"/0.001mm	293-185-30*	.00005"
1-2"/25.4 - 50.8mm	.00005"/0.001mm	293-181-30	.00005"
1-2"/25.4 - 50.8mm	.00005"/0.001mm	293-186-30*	.00005"
2-3"/50.8 - 76.2mm	.00005"/0.001mm	293-182-30	.0001"
2-3"/50.8 - 76.2mm	.00005"/0.001mm	293-187-30*	.0001"
3-4"/76.2 - 101.6mm	.00005"/0.001mm	293-183-30	.0001"
3-4"/76.2 - 101.6mm	.00005"/0.001mm	293-188-30*	.0001"

* without SPC data output

DIMENSIONS AND MASS



Certificate of inspection provided for 0-1" and 1-2" models only.

Technical Data

Accuracy: Refer to the list of specifications
 Resolution: 0.001mm or .00005"/0.001mm
 Flatness: 0.3μm/.000012"
 Parallelism: 1μm/.00004" for models up to 50mm/2"
 2μm/.00008" for models up to 100mm/4"
 Measuring force: 7-12N
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 2.4 years under normal use
 Dust/Water protection level: IP65

Function

Origin-set, Zero / ABS, Hold, Function lock, Auto power on/off, Data output (output models), inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error

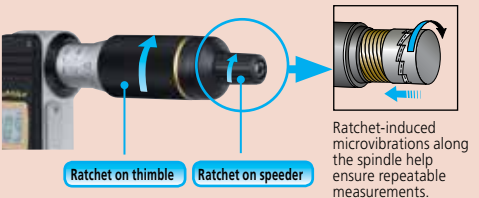
Optional Accessories

- 05CZA662:** SPC cable with data switch (1m/40")
05CZA663: SPC cable with data switch (2m/80")

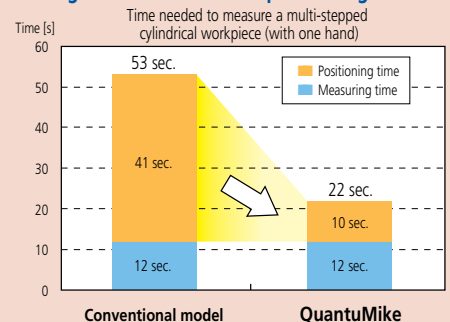


516-529-26 Inspection Gage Block Set
 Rectangular Steel Gage Block
 10 pc. blocks and 1 pc. optical parallel

516-319-26 Inspection Gage Block Set
 Rectangular Cera Gage Block
 10 pc. blocks and 1 pc. optical parallel



Significant reduction in positioning time



Technical Data

Accuracy: Refer to the list of specifications
 Resolution: .00005"/0.001mm or 0.001mm
 Flatness: .000012" / 0.3µm
 Parallelism: .00008" / 2µm
 Accuracy of selected measuring force:
 ± (0.1+selected measuring force/10)N
 for 0.5-2.5N models
 ± (0.4+selected measuring force/10)N
 for 2-10N models

Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 3 years under normal use
 (1 year for .6 - 1.2" / 15-30mm, .4 - .8" /
 10-20mm, .8-1.2" / 20-30mm range model)

Function

Origin, Hold / Data, ON/OFF, Zero / ABS,
 inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error

Optional Accessories

937387: SPC cable (40"/1m)
965013: SPC cable (80"/2m)



ABSOLUTE Digimatic Micrometers

SERIES 227 — with Adjustable Measuring Force

FEATURES

- Constant and low measuring force mechanism in the thimble.
- Adjustable measuring force* accommodates various types of work materials.
- The measurement-value hold function automatically retains the data at a specified measuring force, ensuring accuracy.
- Non-rotating spindle and the new ratchet friction thimble.
- Speedy spindle feed by .4"/rev and 10mm/rev for inch/metric model.
- With absolute linear scale.
- With SPC data output.
- With a standard bar to set the origin point (except for 0-15mm, 0-10mm, 0-.6", and 0-.4" models).
- Supplied in fitted plastic case.



SPECIFICATIONS

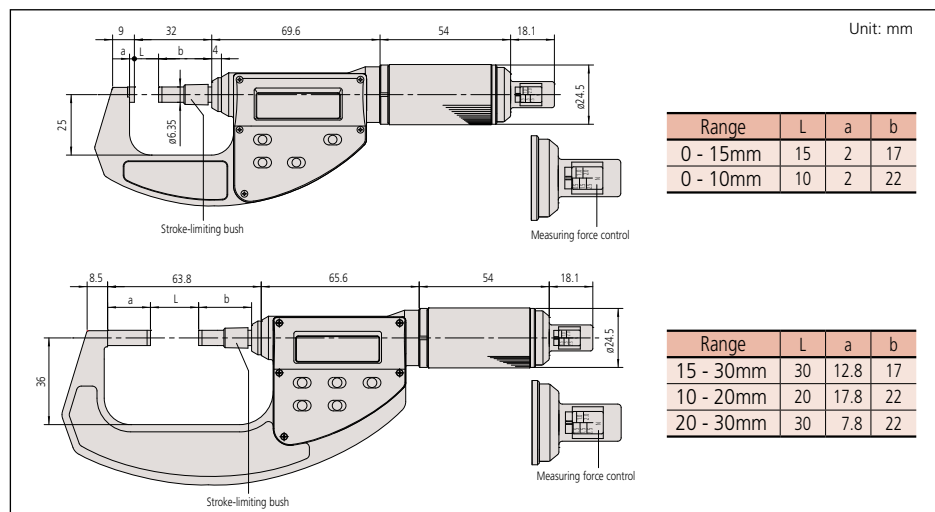
Metric

Order No.	Range	Resolution	Accuracy	Measuring Force	Mass(g)
227-201	0-15mm	0.001mm	±2µm	0.5-2.5 (0.5, 1.0, 1.5, 2, 2.5) N	300
227-203	15-30mm	0.001mm	±2µm	0.5-2.5 (0.5, 1.0, 1.5, 2, 2.5) N	380
227-205	0-10mm	0.001mm	±2µm	2-10 (2, 4, 6, 8, 10) N	340
227-206	10-20mm	0.001mm	±2µm	2-10 (2, 4, 6, 8, 10) N	425
227-207	20-30mm	0.001mm	±2µm	2-10 (2, 4, 6, 8, 10) N	415

Inch/Metric

Order No.	Range	Resolution	Accuracy	Measuring Force	Mass(g)
227-211	0-.6"	.00005"/0.001mm	±.0001"	0.5-2.5 (0.5, 1.0, 1.5, 2, 2.5) N	300
227-213	.6-1.2"	.00005"/0.001mm	±.0001"	0.5-2.5 (0.5, 1.0, 1.5, 2, 2.5) N	380
227-215	0-.4"	.00005"/0.001mm	±.0001"	2-10 (2, 4, 6, 8, 10) N	340
227-216	.4-.8"	.00005"/0.001mm	±.0001"	2-10 (2, 4, 6, 8, 10) N	425
227-217	.8-1.2"	.00005"/0.001mm	±.0001"	2-10 (2, 4, 6, 8, 10) N	415

DIMENSIONS AND MASS



Quickmike

SERIES 293 — IP-54 ABSOLUTE Digimatic Micrometers

The Quickmike provides a speedy spindle feed of 10mm / .4" per thimble rotation as compared to the conventional micrometer with 0.5mm / .025" per rotation. Its wide 30mm / 1.2" measuring range allows various workpieces with different shapes to be measured quickly.

FEATURES

- Non-rotating spindle and the new ratchet friction thimble.
- Speedy spindle feed by 10mm/rev and .4"/rev for inch/metric models.
- With absolute linear scale.
- IP54 dust/water protection (when not connected with data output cable).
- With SPC data output.
- With a standard bar to set the origin point (for models with a range over 30mm / 1.2").
- Supplied in fitted plastic case.



293-676



293-677



293-678



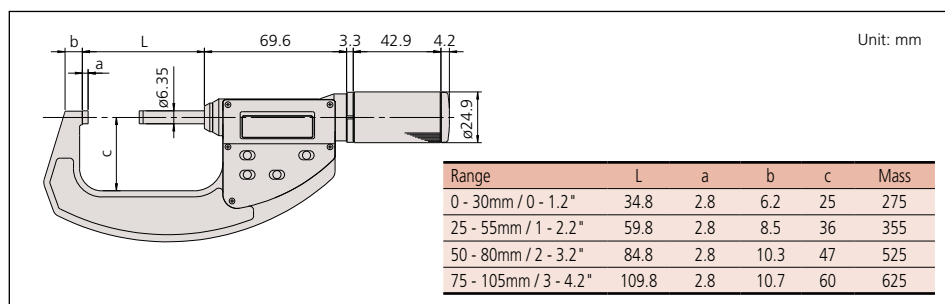
293-679

SPECIFICATIONS

Metric			
Range	Resolution	Order No.	Accuracy
0 - 30mm	0.001mm	293-666	±2μm
25 - 55mm	0.001mm	293-667	±2μm
50 - 80mm	0.001mm	293-668	±3μm
75 - 105mm	0.001mm	293-669	±3μm

Inch/Metric			
Range	Resolution	Order No.	Accuracy
0 - 1.2" / 0 - 30.48mm	.00005" / 0.001mm	293-676	±.0001"
1" - 2.2" / 25.4 - 55.88mm	.00005" / 0.001mm	293-677	±.0001"
2" - 3.2" / 50.8 - 81.28mm	.00005" / 0.001mm	293-678	±.00015"
3" - 4.2" / 76.2 - 106.68mm	.00005" / 0.001mm	293-679	±.00015"

DIMENSIONS AND MASS

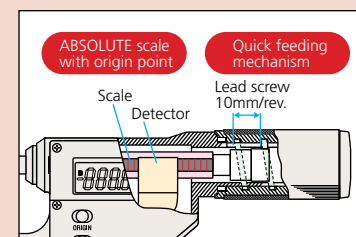


Technical Data

Accuracy: Refer to the list of specifications
 Resolution: 0.001mm or .00005"/0.001mm
 Flatness: 0.3μm / .000012"
 Parallelism: 2μm / .00008" for models up to 80mm / 3.2"
 3μm / .00012" for models up to 105mm / 4.2"
 Measuring force: 5-10N
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), 938882
 Battery life: Approx. 3 years under normal use
 (1 year for models over 30mm / 1.2")
 Dust/Water protection level: IP54

Function

Origin, Hold / Data, ON/OFF, Zero / ABS,
 inch/mm conversion (on inch/metric models only)
 Alarm: Low voltage, Counting value composition error



Optional Accessories

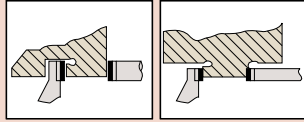
937387: SPC cable (1m / 40")
 965013: SPC cable (2m / 80")

Outside Micrometers

SERIES 101

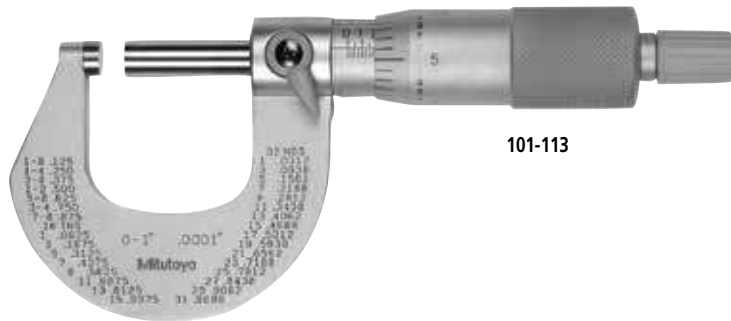
Technical Data

Graduation: .0001"
 Flatness: .000024"
 Parallelism: .00008" for models up to 3"
 .00012" for models over 3"
 Measuring faces: Carbide tipped

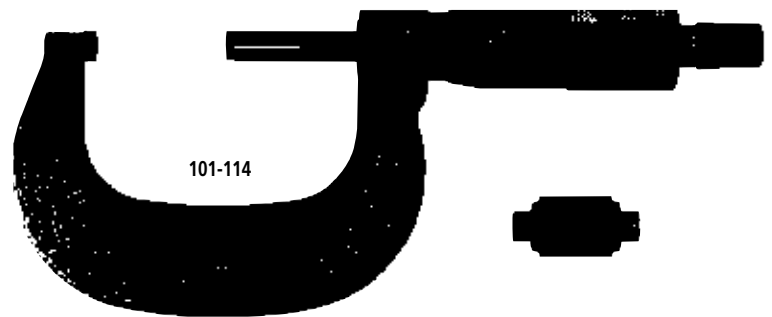


FEATURES

- Satin chrome-finished frame, tapered (on the anvil side) for hard-to-reach places.
- With a standard bar except for 0 - 1" models.
- Supplied in fitted plastic case.



101-113



101-114

SPECIFICATIONS

Inch With friction thimble

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.0001"	101-117*	±.0001"	180
1 - 2"	.0001"	101-118*	±.0001"	245

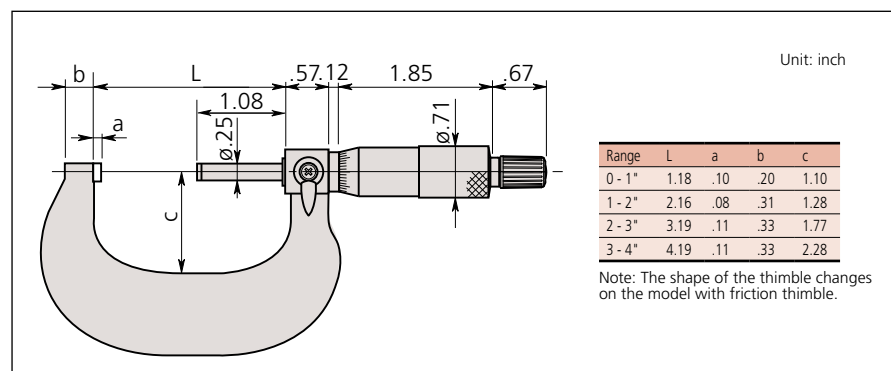
*.0001" reading is obtained with vernier.

Inch With ratchet stop

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.0001"	101-113*	±.0001"	180
1 - 2"	.0001"	101-114*	±.0001"	245
2 - 3"	.0001"	101-119*	±.0001"	410
3 - 4"	.0001"	101-120*	±.00015"	550

*.0001" reading is obtained with vernier.

DIMENSIONS



Ratchet Thimble Micrometer

SERIES 102 — New smoother action ratchet thimble

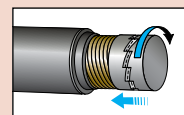
FEATURES

- Ratchet function works both from the thimble and the speeder, allowing easy one-handed operation.
- Clearly audible ratchet operation for reassurance that measurement is being performed at constant, preset force.
- Heat insulating frame minimizes thermal expansion.
- Provided with a Certificate of Inspection.
- With a standard bar except for 0 - 25mm and 0 - 1" models.
- Supplied in fitted plastic case.

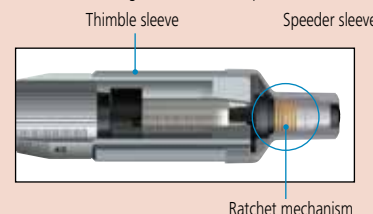


Technical Data

Graduation: 0.01mm, 0.001mm, .001" or .0001"
 Flatness: 0.6μm / .000024"
 Parallelism: 2μm / .00008"
 Measuring faces: Carbide tipped
 Measuring force: 5-10N



Rotating the thimble/speeder sleeve when the workpiece is between the anvil and spindle causes the ratchet mechanism to tap the spindle and apply a constant measuring force to the workpiece.



SPECIFICATIONS

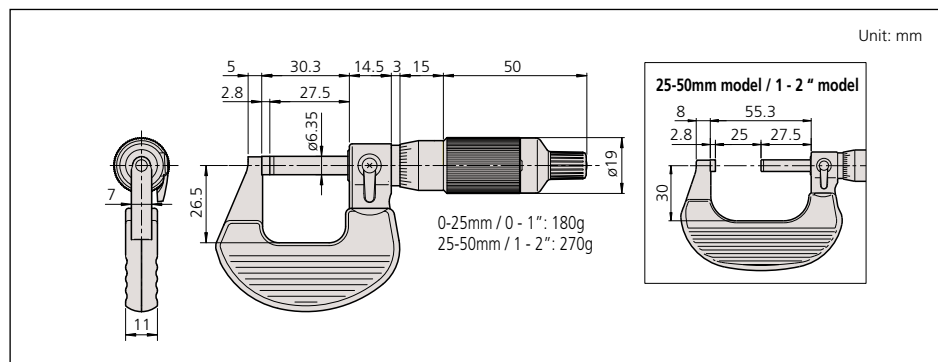
Metric			
Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	102-701	±2μm
0 - 25mm	0.001mm	102-707*	±2μm
25 - 50mm	0.01mm	102-702	±2μm
25 - 50mm	0.001mm	102-708*	±2μm

*0.001mm reading is obtained with vernier.

Inch			
Range	Graduation	Order No.	Accuracy
0 - 1"	.0001"	102-717*	±.0001"
1 - 2"	.0001"	102-718*	±.0001"

*.0001" reading is obtained with vernier.

DIMENSIONS AND MASS





Technical Data

Graduation: 0.01mm
 Flatness: 0.3μm
 Parallelism: 1μm for 25mm model
 3μm for models up to 100mm
 Measuring faces: Carbide tipped

Ratchet-stop type



Outside Micrometers

SERIES 102

FEATURES

- Heat-insulated frame, tapered (on the anvil side) for hard-to-reach places.
- With a standard bar except for 0 - 25mm model.
- A ratchet stop for a constant measuring force.
- Supplied in a fitted plastic case.



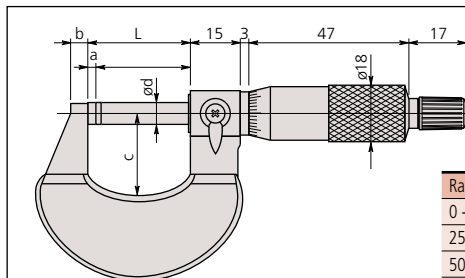
102-301

SPECIFICATIONS

Metric With ratchet stop			
Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	102-301	±2μm
25 - 50mm	0.01mm	102-302	±2μm
50 - 75mm	0.01mm	102-303	±2μm
75 - 100mm	0.01mm	102-304	±3μm

Metric Micrometer set 0.01mm Graduation model		
Range	Order No.	Included in set
0 - 100mm (4 pcs/set)	102-911-40	• 102-301 • 102-302 • 102-303 • 102-304 • 3 micrometer standards

DIMENSIONS AND MASS



Unit: mm

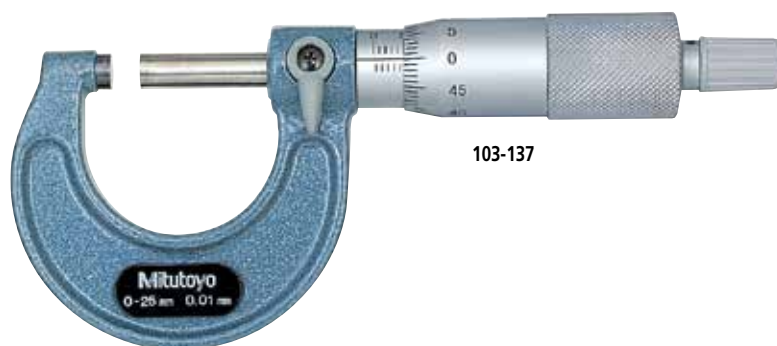
Range	L	a	b	c	d	Mass (g)
0 - 25mm	30.3	2.8	5	26	6.35	180
25 - 50mm	55.3	2.8	8	32	6.35	270
50 - 75mm	80.3	2.8	9	45	6.35	375
75 - 100mm	105.3	2.8	10	58	6.35	490

Outside Micrometers

SERIES 103

FEATURES

- Hammertone, baked-enamel-finished frame.
- Ratchet stop for exact repetitive readings.
- With a standard bar except for 0-25mm model.



103-137



Technical Data

Graduation: 0.01mm, 0.001mm
 Flatness: 0.6 μ m for models up to 300mm/12"
 1 μ m for models over 300mm/12"
 Parallelism: (2+R/100) μ m, R=max. range (mm)
 Measuring faces: Carbide tipped

SPECIFICATIONS

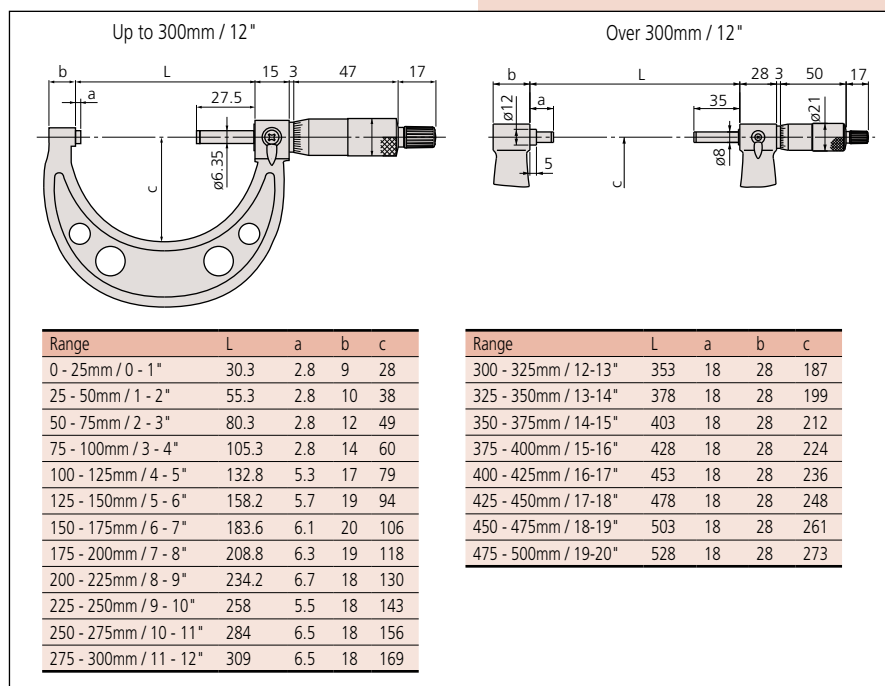
Metric With ratchet stop

Range	Order No.	Accuracy	Mass (g)
0 - 25mm	103-137	$\pm 2\mu$ m	175
	103-129*	$\pm 2\mu$ m	175
25 - 50mm	103-138	$\pm 2\mu$ m	215
	103-130*	$\pm 2\mu$ m	215
50 - 75mm	103-139-10	$\pm 2\mu$ m	315
75 - 100mm	103-140-10	$\pm 3\mu$ m	375
100 - 125mm	103-141-10	$\pm 3\mu$ m	515
125 - 150mm	103-142-10	$\pm 3\mu$ m	665
150 - 175mm	103-143-10	$\pm 4\mu$ m	720
175 - 200mm	103-144-10	$\pm 4\mu$ m	920
200 - 225mm	103-145-10	$\pm 4\mu$ m	1080
225 - 250mm	103-146-10	$\pm 5\mu$ m	1255
250 - 275mm	103-147-10	$\pm 5\mu$ m	1405
275 - 300mm	103-148-10	$\pm 5\mu$ m	1565
300 - 325mm	103-149	$\pm 6\mu$ m	1985
325 - 350mm	103-150	$\pm 6\mu$ m	2155
350 - 375mm	103-151	$\pm 6\mu$ m	2305
375 - 400mm	103-152	$\pm 7\mu$ m	2455
400 - 425mm	103-153	$\pm 7\mu$ m	2715
425 - 450mm	103-154	$\pm 7\mu$ m	2965
450 - 475mm	103-155	$\pm 8\mu$ m	3215
475 - 500mm	103-156	$\pm 8\mu$ m	3450

(Models with a range up to 1000mm are available.)

*0.001mm reading is obtained with vernier.

DIMENSIONS AND MASS



Metric Micrometer set

Range	Order No.	Included in set	Mass (g)
0 - 75mm (3 pc. set)	103-927-10	103-137, 103-138, 103-139-10 , 2 micrometer standards	750
0 - 150mm (6 pc. set)	103-913-50	103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10 , 5 micrometer standards	2260
150 - 300mm (6 pc. set)	103-915-10	103-143-10, 103-144-10, 103-145-10, 103-146-10, 103-147-10, 103-148-10 , 6 micrometer standards	7695
0 - 300mm (12 pc. set)	103-914-50	All micrometers of 103-913-50 and 103-915-10 in one set, 11 micrometer standards	9300



Outside Micrometers

SERIES 103— Inch Models

FEATURES

- Hammertone, baked-enamel-finished frame.
- Ratchet stop or friction thimble for exact repetitive readings.
- With a standard bar except for 0-1" model.



103-177



103-260

Technical Data (Inch Model)

Accuracy: Refer to the list of specifications

Graduation: .001" or .0001"

Flatness: .000024" for models up to 12"
.00004" for models over 12"

Parallelism: [.00008 + .00004 (L/4)]" L= max range (inch)

Measuring faces: Carbide tipped

SPECIFICATIONS

Inch With ratchet stop

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	103-177	±.0001"	175
1 - 2"	.001"	103-178	±.0001"	215
2 - 3"	.001"	103-179	±.0001"	315
3 - 4"	.001"	103-180	±.00015"	375
4 - 5"	.001"	103-181	±.00015"	515
5 - 6"	.001"	103-182	±.00015"	665
6 - 7"	.001"	103-183	±.0002"	720
7 - 8"	.001"	103-184	±.0002"	920
8 - 9"	.001"	103-185	±.0002"	1080
9 - 10"	.001"	103-186	±.00025"	1255
10 - 11"	.001"	103-187	±.00025"	1405
11 - 12"	.001"	103-188	±.00025"	1565
12 - 13"	.001"	103-189	±.0003"	1985
13 - 14"	.001"	103-190	±.0003"	2155
14 - 15"	.001"	103-191	±.0003"	2305
15 - 16"	.001"	103-192	±.00035"	2455
16 - 17"	.001"	103-193	±.00035"	2715
17 - 18"	.001"	103-194	±.00035"	2965
18 - 19"	.001"	103-195	±.0004"	3215
19 - 20"	.001"	103-196	±.0004"	3450
20 - 21"	.001"	103-197	±.0004"	4060
21 - 22"	.001"	103-198	±.00045"	4080
22 - 23"	.001"	103-199	±.00045"	4500
23 - 24"	.001"	103-200	±.00045"	4525
24 - 25"	.001"	103-201	±.0005"	4915
25 - 26"	.001"	103-202	±.0005"	4930
26 - 27"	.001"	103-203	±.0005"	5200
27 - 28"	.001"	103-204	±.00055"	5215
28 - 29"	.001"	103-205	±.00055"	5835
29 - 30"	.001"	103-206	±.00055"	5860
30 - 31"	.001"	103-207	±.0006"	6385
31 - 32"	.001"	103-208	±.0006"	6410
32 - 33"	.001"	103-209	±.0006"	6925
33 - 34"	.001"	103-210	±.00065"	6940
34 - 35"	.001"	103-211	±.00065"	7565
35 - 36"	.001"	103-212	±.00065"	7590
36 - 37"	.001"	103-213	±.0007"	8215
37 - 38"	.001"	103-214	±.0007"	8240
38 - 39"	.001"	103-215	±.0007"	8860
39 - 40"	.001"	103-216	±.00075"	8880

Inch With friction thimble

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.0001"	103-135*	±.0001"	175
1 - 2"	.0001"	103-136*	±.0001"	215

* .0001" Reading is obtained with vernier

Inch With ratchet stop

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.0001"	103-131*	±.0001"	175
1 - 2"	.0001"	103-132*	±.0001"	215
2 - 3"	.0001"	103-217*	±.0001"	315
3 - 4"	.0001"	103-218*	±.00015"	375
4 - 5"	.0001"	103-219*	±.00015"	515
5 - 6"	.0001"	103-220*	±.00015"	665
6 - 7"	.0001"	103-221*	±.0002"	720
7 - 8"	.0001"	103-222*	±.0002"	920
8 - 9"	.0001"	103-223*	±.0002"	1080
9 - 10"	.0001"	103-224*	±.00025"	1255
10 - 11"	.0001"	103-225*	±.00025"	1405
11 - 12"	.0001"	103-226*	±.00025"	1565

* .0001" Reading is obtained with vernier

Inch With Tapered Frame and Ratchet Stop

Range	Graduation	Order No.	Accuracy	Mass (g)
0-1"	.001"	103-259	±.0001"	175
0-1"	.0001"	103-260*	±.0001"	175
1-2"	.0001"	103-262*	±.0001"	215

* .0001" Reading is obtained with vernier

Outside Micrometers

SERIES 103 — Inch model set

Inch Micrometer Set .001" Graduation Model

Range	Order No.	Included in set	Mass (g)
0 - 3" (3pcs./set)	103-929	103-177, 103-178, 103-179, 2 Micrometer Standards	750
0 - 4" (4pcs./set)	103-930	103-177, 103-178, 103-179, 103-180, 3 Micrometer Standards	1600
0 - 6" (6pcs./set)	103-904-10	103-177, 103-178, 103-179, 103-180, 103-181, 103-182, 5 Micrometer Standards	2200
0 - 12" (12pcs./set)	103-905-10	103-177, 103-178, 103-179, 103-180, 103-181, 103-182, 103-183, 103-184, 103-185, 103-186, 103-187, 103-188, 11 Micrometer Standards	9000
6 - 12" (6pcs./set)	103-906	103-183, 103-184, 103-185, 103-186, 103-187, 103-188, 6 Micrometer Standards	7695



103-905-10

Inch Micrometer Set .0001" Graduation Model

Range	Order No.	Included in set	Mass (g)
0 - 3" (3pcs./set)	103-922	103-135, 103-136, 103-217, 2pcs. Micrometer Standards	705
0 - 4" (4pcs./set)	103-931	103-135, 103-136, 103-217, 103-218, 3pcs. Micrometer Standards	1600
0 - 6" (6pcs./set)	103-907-40	103-135, 103-136, 103-217, 103-218, 103-219, 103-220, 5 Micrometer Standards	2200
0 - 12" (12pcs./set)	103-908-40	103-135, 103-136, 103-217, 103-218, 103-219, 103-220, 103-221, 103-222, 103-223, 103-224, 103-225, 103-226, 11pcs. Micrometer Standards	9000
6 - 12" (6pcs./set)	103-909	103-221, 103-222, 103-223, 103-224, 103-225, 103-226, 6pcs. Micrometer Standards	6945



103-904-10

Outside Micrometers

SERIES 340, 104 — with Interchangeable Anvils, Inch model

FEATURES

- IP65 water/dust protection (Series 340*).
*Models with a range up to 12" / 300mm.
- Wide measuring range with interchangeable anvils.
- With a ratchet stop for constant force.
- Supplied with zero-setting standards bar for each range.
- With SPC output (Series 340).
- Supplied in fitted wooden case.

Technical Data

Accuracy: $\pm[.00016" + .00004 (L/3)"]$ L = Max Range (Inch)
Resolution*: .0001" / 0.001mm
(340-351-30: .00005" / 0.001mm)
Graduation**: .001" (104-165: is .0001")
Flatness: .000024" for models up to 12"
.00004" for models over 12"
Parallelism: .00008" for models up to 3"
.00012" for models up to 6"
 $\pm[.00008" + .00004 (L/4)"]$ L = Max range (inch)
Measuring faces: Carbide tipped (spindle only)
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 2.4 years (1.8 years for models over 300mm) years under normal use
Dust/Water protection level*: IP65 (up to 12" / 300mm)
*Digital models **Analog models

Function of Digital Model

Zero / ABS, Data hold, Preset, Data output,
inch/mm conversion (on inch/metric models only)
Function Lock, 2 Presets
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)
959149: SPC cable Straight type (40" / 1m)*
959150: SPC cable Straight type (80" / 2m)*
04AZB512: SPC cable L-type (40" / 1m)*
04AZB513: SPC cable L-type (80" / 2m)*
* models over 300mm



SPECIFICATIONS

Inch/Metric		Digital model			
Range	Resolution	Order No.	Mass (kg)	Remarks	
0-6" / 0-152.4mm	.00005" / 0.001mm	340-351-30	0.96	with 6 anvils & 5 standards	
6-12" / 152.4 - 304.8mm	.0001" / 0.001mm	340-352-30	1.88	with 6 anvils & 6 standards	
12-18" / 304.8 - 457.2mm	.0001" / 0.001mm	340-720	4.75	with 6 anvils & 6 standards	
18-24" / 457.2 - 609.6mm	.0001" / 0.001mm	340-721	6.62	with 6 anvils & 6 standards	
24-30" / 609.6 - 762.0mm	.0001" / 0.001mm	340-722	10.06	with 6 anvils & 6 standards	
30-36" / 762.0 - 914.4mm	.0001" / 0.001mm	340-723	11.98	with 6 anvils & 6 standards	

Inch					
Range	Graduation	Order No.	Mass(kg)	Remarks	
0-2"	.0001"	104-165*	0.32	with 1" anvil & 1 standard	
0-6"	.001"	104-137	1.35	with 6 anvils & 5 standards	
6-12"	.001"	104-138	2.65	with 6 anvils & 6 standards	
12-16"	.001"	104-152	3.31	with 4 anvils & 4 standards	
12-18"	.001"	104-201	4.69	with 6 anvils & 6 standards	
16-20"	.001"	104-153	4.81	with 4 anvils & 4 standards	
18-24"	.001"	104-202	6.51	with 6 anvils & 6 standards	
20-24"	.001"	104-154	6.35	with 4 anvils & 4 standards	
24-28"	.001"	104-155	7.72	with 4 anvils & 4 standards	
24-30"	.001"	104-203	9.95	with 6 anvils & 6 standards	
28-32"	.001"	104-156	9.08	with 4 anvils & 4 standards	
30-36"	.001"	104-204	11.87	with 6 anvils & 6 standards	
32-36"	.001"	104-157	10.41	with 4 anvils & 4 standards	
36-40"	.001"	104-158	11.78	with 4 anvils & 4 standards	
36-42"	.001"	104-205	13.68	with 6 anvils & 6 standards	

*.0001" reading is obtained with vernier.

Outside Micrometers

SERIES 340, 104 — with Interchangeable Anvils, Metric Model



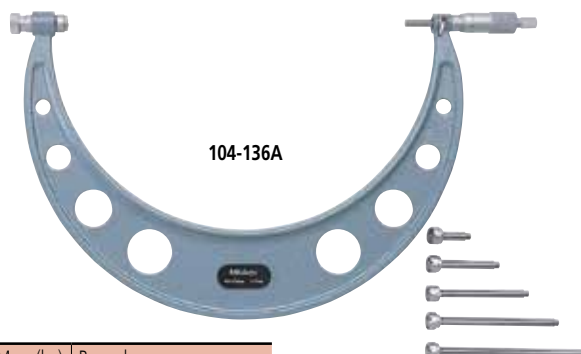
FEATURES

- IP65 water/dust protection (Series 340*).
*Models with a range up to 300mm.
- Wide measuring range with interchangeable anvils.
- With a ratchet stop for constant force.
- Supplied with zero-setting standards bar for each range.
- With SPC output (Series 340).
- Supplied in fitted wooden case.

Digital model



340-251-30



104-136A

SPECIFICATIONS

Metric Digital model

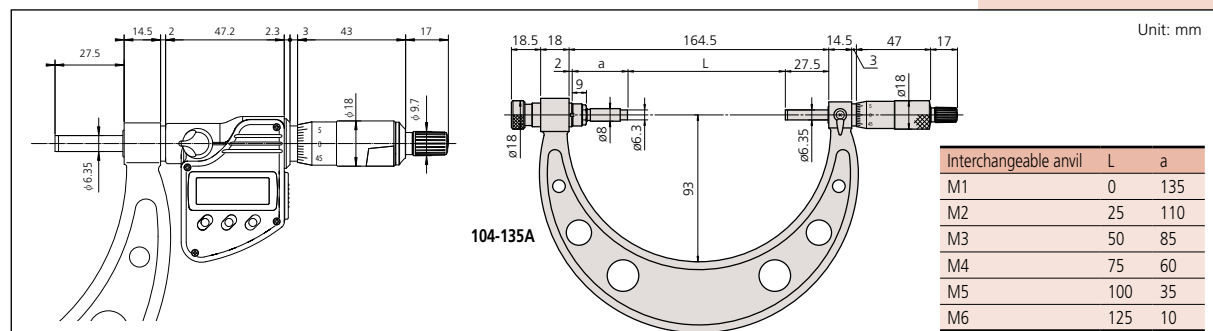
Range	Resolution	Order No.	Mass (kg)	Remarks
0 - 150mm	0.001mm	340-251-30	0.96	with 6 anvils & 5 standards
150 - 300mm	0.001mm	340-252-30	1.88	with 6 anvils & 6 standards
300 - 400mm	0.001mm	340-520	3.31	with 4 anvils & 4 standards
400 - 500mm	0.001mm	340-521	4.81	with 4 anvils & 4 standards
500 - 600mm	0.001mm	340-522	6.35	with 4 anvils & 4 standards
600 - 700mm	0.001mm	340-523	7.72	with 4 anvils & 4 standards
700 - 800mm	0.001mm	340-524	9.08	with 4 anvils & 4 standards
800 - 900mm	0.001mm	340-525	10.41	with 4 anvils & 4 standards
900 - 1000mm	0.001mm	340-526	11.78	with 4 anvils & 4 standards

Metric

Range	Graduation	Order No.	Mass (kg)	Remarks
0 - 50mm	0.01mm	104-171*	0.32	with 2 anvils & 1 standard
0 - 100mm	0.01mm	104-139A	0.79	with 4 anvils & 3 standards
0 - 150mm	0.01mm	104-135A	1.35	with 6 anvils & 5 standards
50 - 150mm	0.01mm	104-161A	1.35	with 4 anvils & 4 standards
100 - 200mm	0.01mm	104-140A	1.38	with 4 anvils & 4 standards
150 - 300mm	0.01mm	104-136A	2.65	with 6 anvils & 6 standards
200 - 300mm	0.01mm	104-141A	2.22	with 4 anvils & 4 standards
300 - 400mm	0.01mm	104-142A	3.31	with 4 anvils & 4 standards
400 - 500mm	0.01mm	104-143A	4.81	with 4 anvils & 4 standards
500 - 600mm	0.01mm	104-144A	6.35	with 4 anvils & 4 standards
600 - 700mm	0.01mm	104-145A	7.72	with 4 anvils & 4 standards
700 - 800mm	0.01mm	104-146A	9.08	with 4 anvils & 4 standards
800 - 900mm	0.01mm	104-147A	10.41	with 4 anvils & 4 standards
900 - 1000mm	0.01mm	104-148A	11.78	with 4 anvils & 4 standards

*The frame is in a heat-insulated cover.

DIMENSIONS



Technical Data

Accuracy: $\pm(4+R/75)\mu\text{m}$, R=max. range (mm)
 Resolution*: 0.001mm
 Graduation*: 0.01mm
 Flatness: 0.6 μm for models up to 300mm
 1 μm for models over 300mm
 Parallelism: 2 μm for models up to 75mm
 3 μm for models up to 150mm
 (2+R/100) μm for models over 150mm, R=max. range (mm)
 Measuring faces: Carbide tipped (spindle only)
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years (1.8 years for models over 300mm) years under normal use
 Dust/Water protection level*: IP65 (up to 300mm)
 *Digital models **Analog models

Function of Digital Model

Zero / ABS, Data hold, Preset, Data output,
 inch/mm conversion (on inch/metric models only)
 Function Lock, 2 Presets
 Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)
959149: SPC cable Straight type (40" / 1m)*
959150: SPC cable Straight type (80" / 2m)*
04AZB512: SPC cable L-type (40" / 1m)*
04AZB513: SPC cable L-type (80" / 2m)*
 * models over 300mm

Outside Micrometers

SERIES 105 — with Extension Anvil Collars

Technical Data

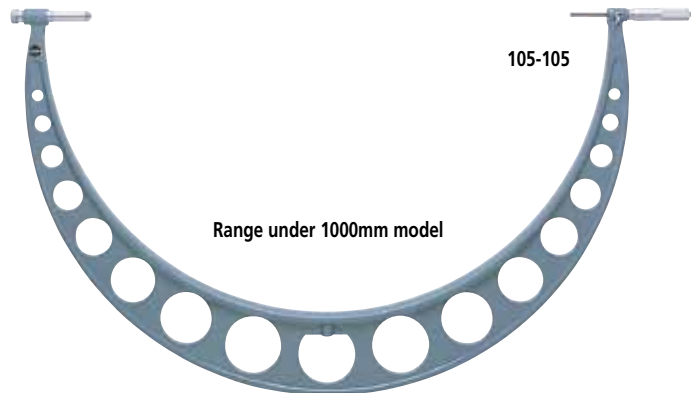
Accuracy: $\pm(6+R/75)\mu\text{m}$, R=max. range (mm)
 Graduation: .001" / 0.01mm
 Flatness: .000052" / 1.3 μm
 Parallelism: [.00016" + .00004 (L/4)"] L=max. range (inch)
 (2+R/100) μm , R=max. range (mm)
 Measuring faces: Carbide tipped

Extension anvil collar

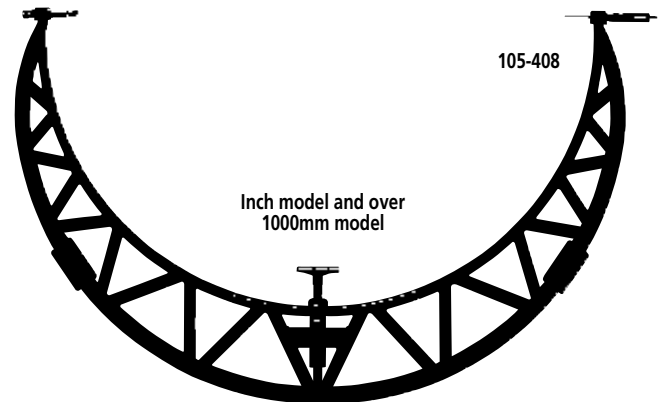


FEATURES

- Wide measuring range with extension anvil collars.
- 50mm spindle stroke.
- With ratchet stop for constant force.
- Supplied with zero-setting standards bar for each range.
- Square and round pipes are combined for light weight and rigid frame (for models over 1000mm range).
- Workpiece stopper (for models over 1000mm range).
- Supplied in a fitted wooden case.



Range under 1000mm model



Inch model and over 1000mm model

SPECIFICATIONS

Metric

Range	Order No.	Extension collars	Mass (kg)
500 - 600mm	105-103	50mm	5.53
600 - 700mm	105-104	50mm	6.35
700 - 800mm	105-105	50mm	7.17
800 - 900mm	105-106	50mm	7.99
900 - 1000mm	105-107	50mm	8.81
1000 - 1100mm	105-408	50mm	6.37
1100 - 1200mm	105-409	50mm	7.08
1000 - 1200mm	105-418	50mm, 100mm	13.77
1200 - 1300mm	105-410	50mm	7.79
1300 - 1400mm	105-411	50mm	8.50
1200 - 1400mm	105-419	50mm, 100mm	15.77
1400 - 1500mm	105-412	50mm	9.21
1500 - 1600mm	105-413	50mm	10.17
1400 - 1600mm	105-420	50mm, 100mm	17.91
1600 - 1700mm	105-414	50mm	11.13
1700 - 1800mm	105-415	50mm	12.09
1600 - 1800mm	105-421	50mm, 100mm	20.80
1800 - 1900mm	105-416	50mm	13.05
1900 - 2000mm	105-417	50mm	14.01
1800 - 2000mm	105-422	50mm, 100mm	22.76

Inch

Range	Order No.	Extension collars	Mass (kg)
40 - 44"	105-428	2"	10.0
44 - 48"	105-429	2"	10.9
48 - 52"	105-430	2"	11.4
52 - 56"	105-431	2"	11.9
56 - 60"	105-432	2"	12.6
60 - 64"	105-433	2"	13.2
64 - 68"	105-434	2"	14.1
68 - 72"	105-435	2"	14.9
72 - 76"	105-436	2"	15.8
76 - 80"	105-437	2"	16.7

Outside Micrometers

SERIES 406 — Non-Rotating Spindle Type

FEATURES

- With a standard bar except for 0 - 1" / 0 - 25mm model.
- With SPC output.
- Supplied in a fitted plastic case.
- Non-slip grip finish

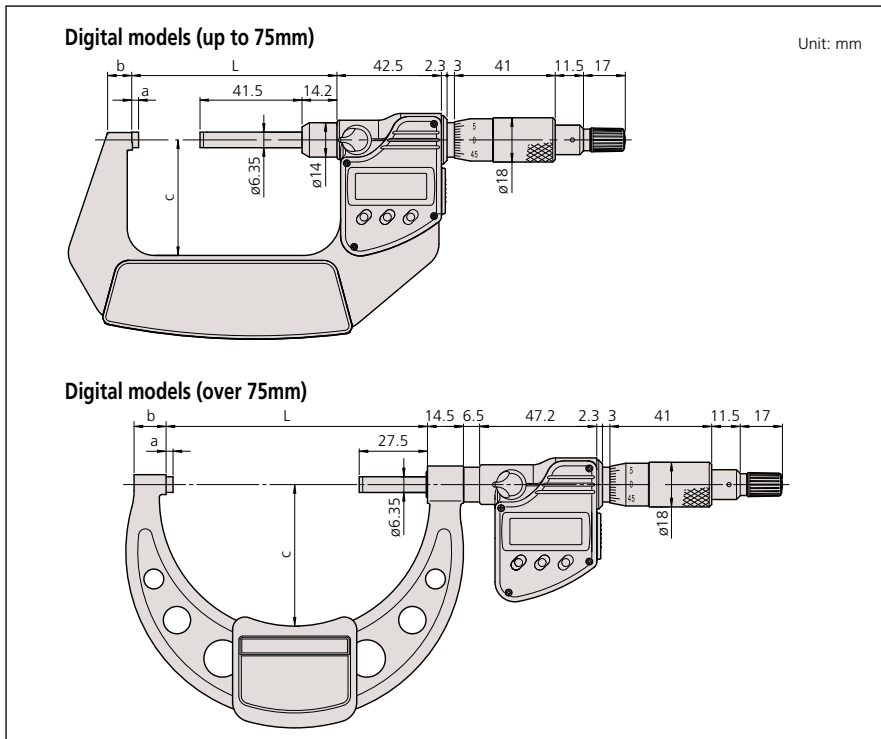


SPECIFICATIONS

Metric Digital model with ratchet stop			
Range	Resolution	Order No.	Accuracy
0 - 25mm	0.001mm	406-250-30	±3μm
25 - 50mm	0.001mm	406-251-30	±3μm
50 - 75mm	0.001mm	406-252-30	±3μm
75 - 100mm	0.001mm	406-253-30	±4μm

Inch/Metric Digital model with ratchet stop			
Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	406-350-30	±.00015"
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	406-351-30	±.00015"
2 - 3" / 50.8 - 72.6mm	.00005" / 0.001mm	406-352-30	±.00015"
3 - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	406-353-30	±.0002"

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications
 Resolution: .00005" / 0.001mm or 0.001mm
 Flatness: 0.3μm / .000012"
 Parallelism: .00012" / 3μm for models up to 3" / 75mm
 .00016" / 4μm for 4" / 100mm models
 Measuring faces: Carbide tipped
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 2.4 years under normal use

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output, inch/mm conversion (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)

Outside Micrometers

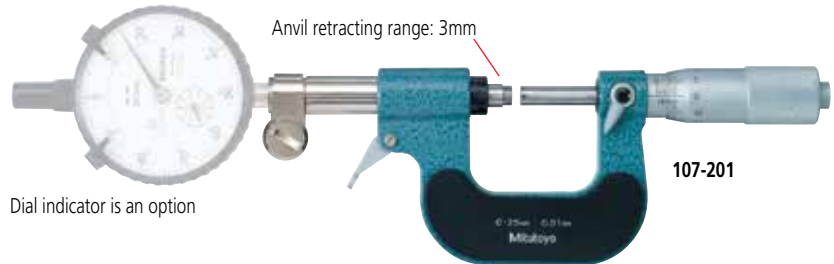
SERIES 107

FEATURES

- Uses dial indicator for direct go/no-go judgment for mass-produced parts.
- Anvil retracting trigger for quick measurement.
- With a standard bar except for 0 - 25mm models.
- Supplied in fitted plastic case.

Technical Data

Graduation: 0.01mm (thimble)
 Flatness: 0.6 μ m
 Parallelism: (2+R/100) μ m, R=max. range (mm)
 Measuring faces: Carbide tipped

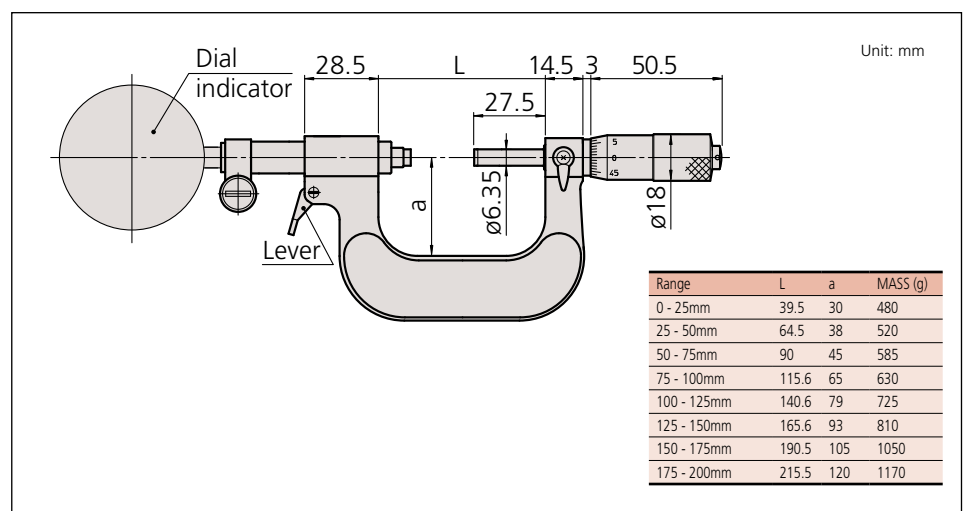


SPECIFICATIONS

Metric

Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	107-201	$\pm 2\mu$ m
25 - 50mm	0.01mm	107-202	$\pm 2\mu$ m
50 - 75mm	0.01mm	107-203	$\pm 2\mu$ m
75 - 100mm	0.01mm	107-204	$\pm 3\mu$ m
100 - 125mm	0.01mm	107-205	$\pm 3\mu$ m
125 - 150mm	0.01mm	107-206	$\pm 3\mu$ m
150 - 175mm	0.01mm	107-207	$\pm 4\mu$ m
175 - 200mm	0.01mm	107-208	$\pm 4\mu$ m

DIMENSIONS AND MASS



Spline Micrometers

SERIES 331, 111

FEATURES

- IP65 water/dust protection (Series 331).
- The anvil and spindle have a small diameter for measuring splined shafts, slots, and keyways.
- Non-slip grip finish (digital models)
- With ratchet stop for constant force.
- With SPC output (Series 331).
- With a standard bar except 0-1" and 0-25mm model.
- Supplied in fitted plastic case.

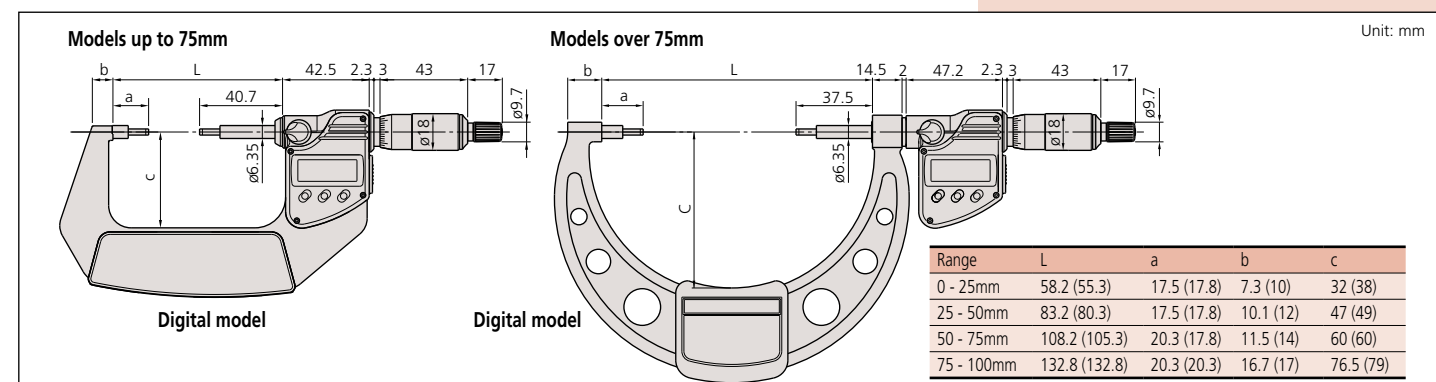


SPECIFICATIONS

Metric		Digital model			
Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.001mm	331-251-30	±2μm	Type A	330
		331-261-30	±2μm	Type B	330
25 - 50mm	0.001mm	331-252-30	±2μm	Type A	470
		331-262-30	±2μm	Type B	470
50 - 75mm	0.001mm	331-253-30	±2μm	Type A	625
		331-263-30	±2μm	Type B	625
75 - 100mm	0.001mm	331-254-30	±3μm	Type A	565
		331-264-30	±3μm	Type B	565

Metric		Digital model			
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	111-115	±3μm	Type A	205
		111-215	±3μm	Type B	205
25 - 50mm	0.01mm	111-116	±3μm	Type A	305
		111-117	±3μm	Type A	370
50 - 75mm	0.01mm	111-118	±4μm	Type A	500
		111-119	±4μm	Type A	655
125 - 150mm	0.01mm	111-120	±4μm	Type A	710
		111-121	±5μm	Type A	900
150 - 175mm	0.01mm	111-122	±5μm	Type A	1040
		111-122	±5μm	Type A	1040

DIMENSIONS



Technical Data

Accuracy: Refer to the list of specifications
 Resolution*: .00005" / 0.001mm or 0.001mm
 Graduation*: .0001" or 0.01mm, .001"
 Flatness: .000012" / 0.3μm
 Parallelism: (2+R/100)μm, R=max. range (mm)
 [.00008" + .00004" (L/4")]
 L = max. range (inch)
 Measuring faces: Carbide tipped
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years under normal use
 Dust/Water protection level*: IP65
 *Digital models **Analog models

Function of Digital Model

Origin-set, Zero-setting, Data hold, Data output, inch/mm conversion (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

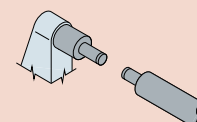
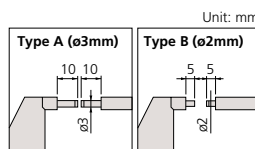
Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)

Inch/Metric		Digital model			
Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	331-351-30	±.0001"	Type A	330
		331-361-30	±.0001"	Type B	330
1 - 2" / 25.4-50.8mm	.00005" / 0.001mm	331-352-30	±.0001"	Type A	470
		331-362-30	±.0001"	Type B	470
2 - 3" / 50.8-76.2mm	.00005" / 0.001mm	331-353-30	±.0001"	Type A	625
		331-363-30	±.0001"	Type B	625
3 - 4" / 76.2-101.6mm	.00005" / 0.001mm	331-354-30	±.00015"	Type A	565
		331-364-30	±.00015"	Type B	565

Inch		Digital model			
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	111-166*	±.00015"	Type A	205

*.0001" reading is obtained with vernier.



Point Micrometers

SERIES 342, 142, 112

Technical Data

Accuracy: Refer to the list of specifications.
Resolution*: .00005" / 0.001mm or 0.001mm
Graduation**: .001" or 0.01mm
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 2.4 years under normal use
Dust/Water protection level*: IP65
*Digital models **Analog models

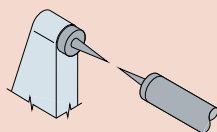
Function of Digital Model

Origin-set, Zero / ABS, Data hold,
inch/mm conversion (on inch/metric models only)
Function lock
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)

05CZA663: SPC cable with data switch (80" / 2m)



Tip angle: 15° (R0.3mm)



Tip angle: 30° (R0.3mm)



FEATURES

- IP65 water/dust protection (Series 342).
- Pointed spindle and anvil for measuring the web thickness of drills, small grooves, keyways, and other hard-to-reach dimensions.
- 15 degree and 30 degree measuring points are available.
- Non-slip grip finish (digital models).
- The measuring points have approximately 0.3mm / .012" radius.
- With ratchet stop for constant force.
- With SPC output (Series 342).
- With digit counter (Series 142).
- With a standard bar except 0 - 1" and 0 - 25mm model.
- Supplied in fitted plastic case.



342-351-30



112-201

SPECIFICATIONS

Metric Digital model (with carbide tip)					
Range	Resolution	Order No.	Accuracy	Point	Mass (g)
0 - 25mm	0.001mm	342-251-30	±2μm	15°	330
		342-261-30	±2μm	30°	330
25 - 50mm	0.001mm	342-252-30	±2μm	15°	470
		342-262-30	±2μm	30°	470
50 - 75mm	0.001mm	342-253-30	±2μm	15°	625
		342-263-30	±2μm	30°	625
75 - 100mm	0.001mm	342-254-30	±3μm	15°	565
		342-264-30	±3μm	30°	565

Inch/Metric Digital model (with carbide tip)					
Range	Resolution	Order No.	Accuracy	Point	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	342-351-30	±.0001"	15°	330
		342-361-30	±.0001"	30°	330
1" - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	342-352-30	±.0001"	15°	470
		342-362-30	±.0001"	30°	470
2" - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	342-353-30	±.0001"	15°	625
		342-363-30	±.0001"	30°	625
3" - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	342-354-30	±.00015"	15°	565
		342-364-30	±.00015"	30°	565

Metric Mechanical Counter Model					
Range	Graduation	Order No.	Accuracy	Point	Mass (g)
0 - 25mm	0.01mm	142-153*	±3μm	15°	260
		142-201*	±3μm	30°	260

*The points don't have carbide tips.

Metric Mechanical Counter Model					
Range	Graduation	Order No.	Accuracy	Point	Mass (g)
0 - 25mm	0.01mm	112-165	±3μm	15°	205
		112-153*	±3μm	15°	205
		112-213	±3μm	30°	205
		112-201*	±3μm	30°	205
25 - 50mm	0.01mm	112-166	±3μm	15°	305
		112-154*	±3μm	15°	305
		112-214	±3μm	30°	305
		112-202*	±3μm	30°	305
50 - 75mm	0.01mm	112-167	±3μm	15°	370
		112-155*	±3μm	15°	370
		112-215	±3μm	30°	370
		112-203*	±3μm	30°	370
75 - 100mm	0.01mm	112-168	±4μm	15°	500
		112-156*	±4μm	15°	500
		112-216	±4μm	30°	500
		112-204*	±4μm	30°	500

*The points don't have carbide tips.

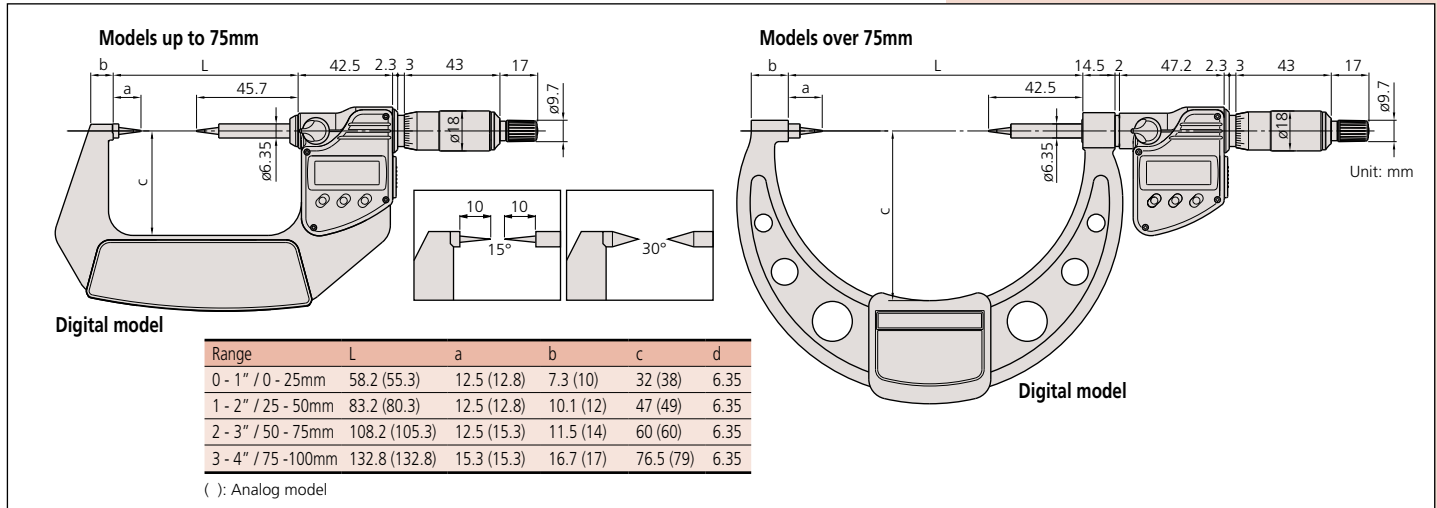
Inch Mechanical Counter Model					
Range	Graduation	Order No.	Accuracy	Point	Mass (g)
0 - 1"	.001"	142-177*	±.00015"	15°	260
		142-225*	±.00015"	30°	260

*The points don't have carbide tips.

Inch Mechanical Counter Model					
Range	Graduation	Order No.	Accuracy	Point	Mass (g)
0 - 1"	.001"	112-189	±.00015"	15°	205
		112-177*	±.00015"	15°	205
		112-237	±.00015"	30°	205
		112-225*	±.00015"	30°	205
1 - 2"	.001"	112-190	±.00015"	15°	305
		112-178*	±.00015"	15°	305
		112-238	±.00015"	30°	305
		112-226*	±.00015"	30°	305
2 - 3"	.001"	112-191	±.00015"	15°	370

*The points don't have carbide tips.

DIMENSIONS



Crimp Height Micrometers

SERIES 342, 142, 112 — Point Spindle and Blade Anvil

FEATURES

- IP54/65 water/dust protection (Series 342).
- Measures the height of crimp contacts.
- With ratchet stop for constant force.
- Non-slip grip finish (digital models)
- With SPC output (Series 342).
- With digit counter (Series 142).
- Supplied in fitted plastic case.



SPECIFICATIONS

Metric Digital model					
Range	Resolution	Order No.	Accuracy	Mass (g)	
0 - 20mm	0.001mm	342-271-30	±3µm	270	

Metric Quickmike type					
Range	Resolution	Order No.	Accuracy	Mass (g)	
0 - 15mm	0.001mm	342-451	±3µm	275	

Metric Mechanical counter model					
Range	Graduation	Order No.	Accuracy	Mass (g)	
0 - 25mm	0.01mm	142-402	±3µm	200	
0 - 25mm	0.001mm	142-403*	±3µm	200	

* 0.001mm reading is obtained with vernier.

Inch/Metric Digital model					
Range	Resolution	Order No.	Accuracy	Mass (g)	
0 - 0.8" / 0 - 20mm	.00005" / 0.001mm	342-371-30	±.00015"	270	

Metric					
Range	Graduation	Order No.	Accuracy	Mass (g)	
0 - 25mm	0.01mm	112-401	±3µm	165	



Technical Data

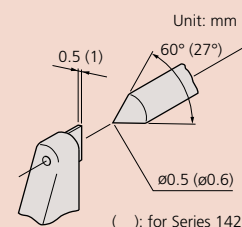
Accuracy: Refer to the list of specifications
 Resolution*: .00005" / 0.001mm or 0.001mm
 Graduation**: 0.01mm
 Display*: LCD
 Battery*: SR44 (1 pc.), 938882
 Battery life*: Approx. 2.4 years under normal use
 (3 years: Quickmike type)
 Dust/Water protection level*: IP65 / IP54
 *Digital models **Analog models

Function of Digital Model

Origin-set, Zero / ABS (342-271-30, 342-371-30),
 Data hold, Data output, inch/mm conversion
 (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
 05CZA663: SPC cable with data switch (80" / 2m)
 937387: SPC cable for Quickmike type (40" / 1m)
 965013: SPC cable for Quickmike type (80" / 2m)



V-Anvil Micrometers

SERIES 314, 114 — 3 Flutes and 5 Flutes

Technical Data

Accuracy: Refer to the list of specifications
 Resolution*: .00005" / 0.001mm or 0.001mm
 Graduation**: .001" or .0001", 0.01mm
 Flatness (spindle/anvil):
 Analog model: .000024" / 0.6μm, .00005" / 1.3μm
 Digital Model: .000012" / 0.3μm, .00004" / 1μm
 Spindle face: Carbide tipped
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years under normal use
 *Digital models **Analog models

Function of Digital Model

Zero / ABS, Data hold, Data output, Preset,
 inch/mm conversion (on inch/metric models only)
 Function lock, 2 Presets
 Alarm: Low voltage, Counting value composition error

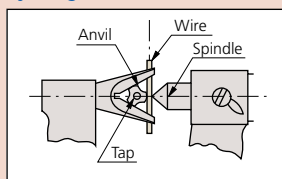
Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)

05CZA663: SPC cable with data switch (80" / 2m)



Pitch Diameter Measurement of Tap by Single-wire Method Inch/Metric



FEATURES

- Measures the outside diameter of cutting tools (such as taps, reamers, end mills) with an odd number of flutes.
- With ratchet stop for constant force.
- Supplied with setting standard.
- Non-slip grip finish (digital models).
- V-anvils with a centerline groove are available. They are useful for measuring pitch diameters of taps which have a small diameter by using single-wire method.
- With SPC output (Series 314).
- Supplied in fitted plastic case.



314-351-30



114-121



114-202



114-204

SPECIFICATIONS

Metric Digital model for 3 flutes cutting head

Range	Resolution	Order No.	Accuracy	Remarks	Setting Standard	Mass (g)
1 - 15mm	0.001mm	314-251-30	±4μm	w/Groove	ø5mm	275
		314-261-30	±4μm	—	ø5mm	275
10 - 25mm	0.001mm	314-252-30	±4μm	w/Groove	ø10mm	410
		314-262-30	±4μm	—	ø10mm	410
25 - 40mm	0.001mm	314-253-30	±5μm	—	ø25mm	465

Inch/Metric Digital model for 3 flutes cutting head

Range	Resolution	Order No.	Accuracy	Remarks	Setting Standard	Mass (g)
.05 - .6" / 1.27 - 15.24mm	.00005" / 0.001mm	314-351-30	±.0002"	w/Groove	ø.2"	275
		314-361-30	±.0002"	—	ø.2"	275
.4" - 1" / 10.16 - 25.4mm	.00005" / 0.001mm	314-352-30	±.0002"	w/Groove	ø.4"	410
		314-362-30	±.0002"	—	ø.4"	410
1" - 1.6" / 25.4 - 40.64mm	.00005" / 0.001mm	314-353-30	±.00025"	—	ø 1"	465

SPECIFICATIONS

Metric For 3 flutes cutting head

Range	Graduation	Order No.	Accuracy	Setting Standard	Remarks	Mass (g)
1 - 15mm	0.01mm	114-101	±4μm	ø5mm	w/Groove	120
		114-161	±4μm	ø5mm	—	120
10 - 25mm	0.01mm	114-102	±4μm	ø10mm	w/Groove	280
		114-162	±4μm	ø10mm	—	280
2.3 - 25mm	0.01mm	114-204*	±4μm	ø5mm	—	290
25 - 40mm	0.01mm	114-103	±5μm	ø25mm	—	400
40 - 55mm	0.01mm	114-104	±6μm	ø40mm	—	465
55 - 70mm	0.01mm	114-105	±6μm	ø55mm	—	675
70 - 85mm	0.01mm	114-106	±7μm	ø70mm	—	910

*Carbide-tipped anvil

Metric For 5 flutes cutting head

Range	Graduation	Order No.	Accuracy	Setting Standard	Remarks	Mass (g)
5 - 25mm	0.01mm	114-121	±4μm	ø5mm	w/Groove	255
		114-165	±4μm	ø5mm	—	255
2.3 - 25mm	0.01mm	114-137*	±4μm	ø5mm	—	220
25 - 45mm	0.01mm	114-122	±5μm	ø25mm	—	400
45 - 65mm	0.01mm	114-123	±6μm	ø55mm	—	540
65 - 85mm	0.01mm	114-124	±7μm	ø70mm	—	760

*Carbide-tipped anvil

Inch For 3 flutes cutting head

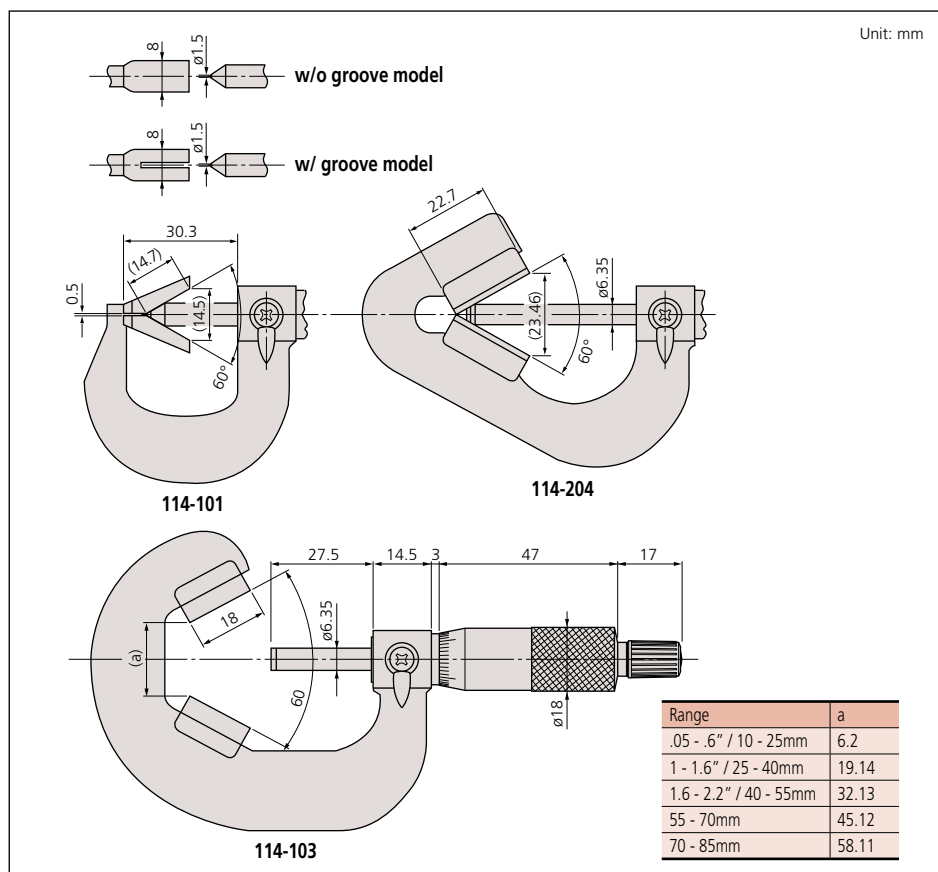
Range	Graduation	Order No.	Accuracy	Setting Standard	Mass (g)
.05 - .6"	.001"	114-163	±.0002"	ø.2"	120
.09 - 1"	.0001"	114-202*	±.0002"	ø.2"	280
1 - 1.6"	.001"	114-113	±.00025"	ø1"	400
1.6 - 2.2"	.001"	114-114	±.0003"	ø1.6"	465

*Carbide-tipped anvil and .0001" reading is obtained with vernier.

Inch For 5 flutes cutting head

Range	Graduation	Order No.	Accuracy	Setting Standard	Mass (g)
.09 - 1"	.0001"	114-135	±.0002"	ø.2"	255

DIMENSIONS



SERIES 113

- Can be used as a go/no-go gage by setting the upper and lower limits.
- Provided with a standard bar for 25mm - 50mm model.
- Supplied in fitted plastic case.



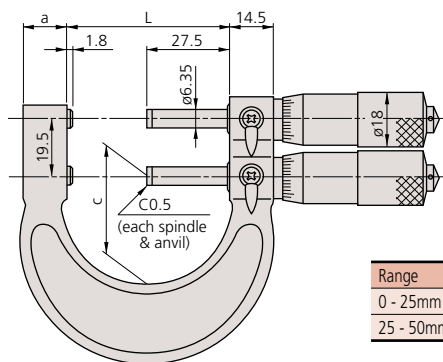
Graduation: 0.01mm
Flatness: 0.6µm
Parallelism: (3+R/100)µm, R=max. range (mm)
Measuring faces: Carbide tipped



Metric

Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	113-102	±3µm
25 - 50mm	0.01mm	113-103	±3µm

Unit: mm



Range	L	a	c	Mass (G)
0 - 25mm	29.3	15	23	340
25 - 50mm	54.3	15	37	380

Pana Micrometers

SERIES 116 — Interchangeable Anvil Type

FEATURES

- Non-rotating spindle with optional seven interchangeable anvils (flat, spline, spherical, point, knife-edge, disk and blade) for a wide range of applications.
- Interchangeable anvils (pair) are optional.
- With a standard bar except 0-1" and 0 - 25 mm model.
- V-anvils and conical spindle tips (matching pair) for screw thread measurement are also available.
- With ratchet stop for constant force.



116-101



116-105

Shown with optional anvils

SPECIFICATIONS

Metric			
Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	116-101	±4μm
25 - 50mm	0.01mm	116-102	±4μm

Inch			
Range	Graduation	Order No.	Accuracy
0 - 1"	.001"	116-105	±.0002"
1" - 2"	.001"	116-106	±.0002"

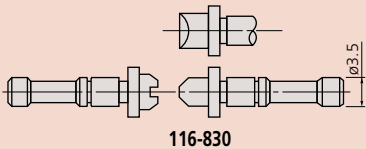
Technical Data

Graduation: .001" or 0.01mm
Spindle feed error: .00012" / 3μm

Optional Accessories

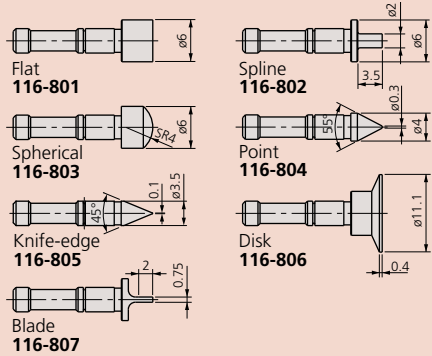
Interchangeable V-anvil and conical spindle tip set:
For Metric/Unified screw

Order No.	Assortment of anvils and tips
116-830	0.4 - 0.5mm/64 - 48TPI (116-831) 0.6 - 0.9mm/44 - 28TPI (116-832) 1 - 1.75mm/24 - 14TPI (116-833) 2 - 3mm/13 - 9TPI (116-834) 3.5 - 5mm/8 - 5TPI (116-835) 5.5 - 7mm/4.5 - 3.5TPI (116-836)



Interchangeable anvils set

Order No.	Assortment of anvils
116-800	Flat anvils (116-801) Spline anvils (116-802) Spherical anvils (116-803) Point anvils (116-804) Knife-edge anvils (116-805) Disk anvils (116-806) Blade anvils (116-807)





Spherical Face Micrometers

SERIES 395, 295, 115

Technical Data

Accuracy: Refer to the list of specifications
Flatness: .000024" / 0.6µm
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 2.4 years under normal use
Dust/Water protection level*: IP65
*Digital models **Analog models

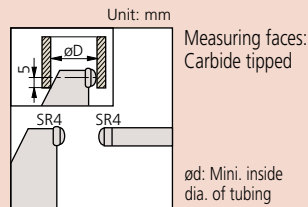
Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output,
inch/mm conversion (on inch/metric models only)
Function lock
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)

Spherical anvil-spindle type



FEATURES

- IP65 water/dust protection (Series 395).
- Designed to measure the wall thickness of various tubing.
- With ratchet stop for constant force.
- With SPC output (Series 395).
- Non-slip grip finish (digital models).
- With digit counter (Series 295).
- With a standard bar except 0 -1" and 0 - 25mm model.
- Supplied in fitted plastic case.



115-153



395-371-30

SPECIFICATIONS

Metric Digital model with spherical anvil					
Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.001mm	395-251-30^{S-F}	±2µm	D: 15mm	270
		395-271-30^{S-S}	±2µm	D: 15mm	270
25 - 50mm	0.001mm	395-252-30^{S-F}	±2µm	D: 15mm	330
		395-272-30^{S-S}	±2µm	D: 15mm	330
50 - 75mm	0.001mm	395-253-30^{S-F}	±2µm	D: 19mm	470
		395-273-30^{S-S}	±2µm	D: 19mm	470
75 - 100mm	0.001mm	395-254-30^{S-F}	±3µm	D: 20mm	625
		395-274-30^{S-S}	±3µm	D: 20mm	625

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Metric Mechanical counter model with spherical anvil					
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	295-115^{S-F}	±3µm	D: 10mm	220
		295-215^{S-S}	±3µm	D: 10mm	220

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Metric With spherical anvil					
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	115-115^{S-F}	±3µm	D: 10mm	180
		115-215^{S-S}	±3µm	D: 10mm	180
25 - 50mm	0.01mm	115-116^{S-F}	±3µm	D: 11mm	240
		115-216^{S-S}	±3µm	D: 11mm	240
50 - 75mm	0.01mm	115-117^{S-F}	±3µm	D: 17mm	315
		115-217^{S-S}	±3µm	D: 17mm	315
75 - 100mm	0.01mm	115-118^{S-F}	±4µm	D: 18mm	375
		115-218^{S-S}	±4µm	D: 18mm	375

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Inch/Metric Digital model with spherical anvil					
Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	395-351-30^{S-F}	±.0001"	D: .59"	270
		395-371-30^{S-S}	±.0001"	D: .59"	270
1" - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	395-352-30^{S-F}	±.0001"	D: .59"	330
		395-372-30^{S-S}	±.0001"	D: .59"	330
2" - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	395-353-30^{S-F}	±.0001"	D: .75"	470
		395-373-30^{S-S}	±.0001"	D: .75"	470
3" - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	395-354-30^{S-F}	±.00015"	D: .79"	625
		395-374-30^{S-S}	±.00015"	D: .79"	625

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Inch Mechanical counter model with spherical anvil					
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	295-153^{S-F*}	±.00015"	D: .40"	220
		295-253^{S-S*}	±.00015"	D: .40"	220

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle
*.0001" reading is obtained with vernier.

Inch With spherical anvil					
Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	115-153^{S-F*}	±.00015"	D: .40"	180
		115-253^{S-S*}	±.00015"	D: .40"	180
1 - 2"	.001"	115-242^{S-S}	±.00015"	D: .44"	240
2 - 3"	.001"	115-243^{S-S}	±.00015"	D: .67"	315

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle
*.0001" reading is obtained with vernier.

Tube Micrometers

SERIES 395, 295, 115— Spherical and Cylindrical Anvils

FEATURES

- IP65 water/dust protection (Series 395).
- Designed to measure the wall thickness of various tubing.
- The Tube Micrometers have two combinations of measuring faces (carbide-tipped): spherical-flat type.
- With ratchet stop for constant force.
- With SPC output (Series 395).
- With digit counter (Series 295).
- With a standard bar except 0 - 1" and 0 - 25mm model.
- Supplied in fitted plastic case.
- Non-slip grip finish (digital models).

Pin Anvil Type



395-261-30



SPECIFICATIONS

Metric Digital model with cylindrical anvil

Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.001mm	395-261-30	±3μm	Type A	270
		395-262-30	±3μm	Type B	270
		395-263-30	±3μm	Type C	310
		395-264-30	±3μm	Type D	310

Metric Mechanical counter model

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	295-302	±3μm	Type A	210

Metric With cylindrical anvil

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	115-302	±3μm	Type A	180
		115-308	±3μm	Type B	180
		115-315	±3μm	Type C	180
		115-316	±3μm	Type D	180
25 - 50mm	0.01mm	115-303	±3μm	Type A	240
		115-309	±3μm	Type B	240

Inch/Metric Digital model with cylindrical anvil

Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	395-362-30	±.00015"	Type B	270
		395-363-30	±.00015"	Type C	310
		395-364-30	±.00015"	Type D	310

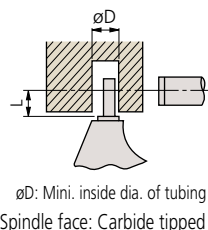
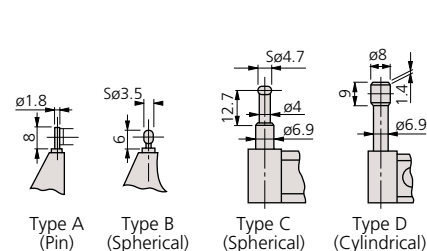
Inch Mechanical counter model

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	295-313	±.00015"	Type C	210
		295-314	±.00015"	Type D	210

Inch With cylindrical anvil

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	115-305	±.00015"	Type A	180
		115-313*	±.00015"	Type C	180
		115-314*	±.00015"	Type D	180

*.0001" reading is obtained with vernier.



Anvil	D	L
Type A	2	4
Type B	3.6	4
Type C	4.8	12
Type D	8.2	22



Technical Data

Accuracy: Refer to the list of specifications.
Flatness: .000024" / 0.6μm
Display*: LCD
Battery*: SR44 (1 pc.), 938882
Battery life*: Approx. 2.4 years under normal use
Dust/Water protection level*: IP65
*Digital models

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output, inch/mm conversion (on inch/metric models only)
Function lock
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)



Technical Data

Accuracy: Refer to the list of specifications.
Resolution*: .00005" / 0.001mm or 0.001mm
Graduation*: .0001" or 0.01mm
Spindle face: Carbide tipped
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 2.4 years under normal use
Dust/Water protection level*: IP65
*Digital models **Analog models

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output,
inch/mm conversion (on inch/metric models only)
Function Lock
Alarm: Low voltage, Counting value composition error

Optional Accessories

05CZA662: SPC cable with data switch (40" / 1m)*
05CZA663: SPC cable with data switch (80" / 2m)*
201218: V-anvil
950758: Disc. anvil for 1" / 25mm models

*Only for digital models.

Applications



Using flat anvil (201216)



With the disc. anvil (950758) Shown above, the Uni-Mike is used as a height micrometer.

"Uni-Mike"

SERIES 317, 117 — Interchangeable Anvil Type

FEATURES

- IP65 water/dust protection (Series 317).
- Measures tubing thickness, shoulder-edge distance, rivet head height, etc. with interchangeable anvils (flat anvil, rod anvil, V-anvil).
- Supplied with Flat Anvil (**201216**) and Rod Anvil: .118"/ø3mm dia. rod anvil (**201217**) for 0-1" / 0-25mm models, .197"/ø5mm (**201379**) for 1-2" / 25-50mm model.
- With special Disk Anvils. The Uni-Mike is used as a height micrometer. The disks have a lapped, mirror surface.
- With a standard bar except 0-1" and 0-25mm model.
- Supplied in fitted plastic case.
- Non-slip grip finish (digital models)



317-351-30



117-107

SPECIFICATIONS

Metric Digital model with ratchet stop

Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 25mm	0.001mm	317-251-30	±4μm	335
25 - 50mm	0.001mm	317-252-30	±4μm	360

Excluding quantizing error

Inch/Metric Digital model with friction thimble

Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	317-351-30	±.0002"	340
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	317-352-30	±.0002"	365

Excluding quantizing error

Metric With ratchet stop

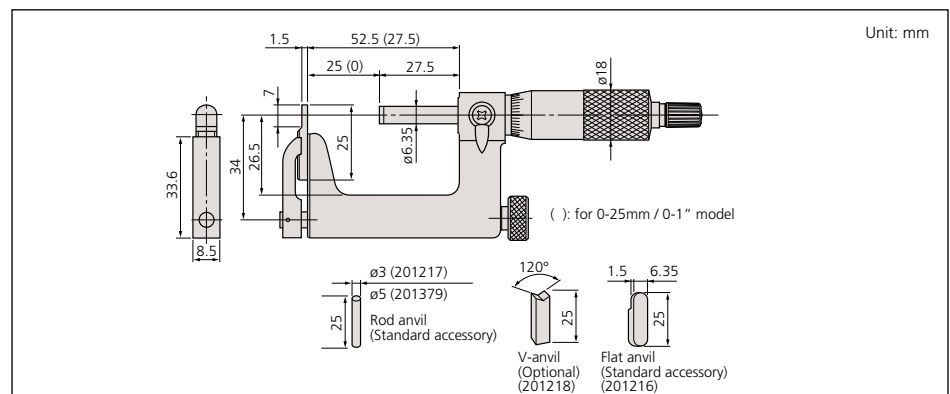
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	117-101	±4μm	255
25 - 50mm	0.01mm	117-102	±4μm	320

Inch With friction thimble

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.0001"	117-107*	±.0002"	255
1 - 2"	.0001"	117-108*	±.0002"	320

*.0001" reading is obtained with vernier.

DIMENSIONS



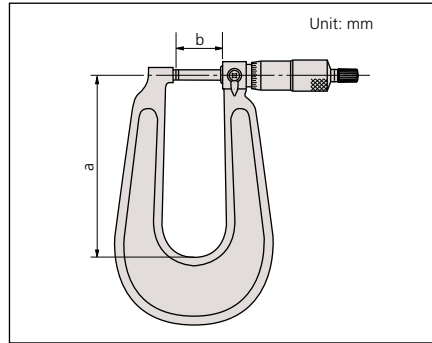
Sheet Metal Micrometers

SERIES 389, 119, 118

FEATURES

- Measures thickness of sheet metal, paper, plastic and rubber parts.
- With ratchet stop for constant force.
- With a standard bar except for 0 - 1" / 0 - 25mm model.
- IP65 water/dust protection (Series 389*).
- *Except for **389-514** / **389-714**.
- Supplied in fitted plastic case.
- Non-slip grip finish (digital models).

DIMENSIONS



SPECIFICATIONS

Metric		Digital model			
Range	Resolution	Order No.	Accuracy	a/b	
0 - 25mm	0.001mm	389-251-30	±4µm	160/27.5mm	
0 - 25mm	0.001mm	389-261-30^{S-F}	±4µm	160/27.5mm	
0 - 25mm	0.001mm	389-271-30^{S-S}	±4µm	160/27.5mm	
0 - 25mm	0.001mm	389-514	±5µm	330/35mm	
25 - 50mm	0.001mm	389-252-30	±4µm	165/27.5mm	
25 - 50mm	0.001mm	389-262-30^{S-F}	±4µm	165/27.5mm	
25 - 50mm	0.001mm	389-272-30^{S-S}	±4µm	165/27.5mm	

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Metric		Dial reading model			
Range	Graduation	Order No.	Accuracy	a/b	
0 - 25mm	0.01mm	118-101	±4µm	110/27.5mm	
0 - 25mm	0.01mm	118-102	±4µm	160/27.5mm	
0 - 25mm	0.01mm	118-114^{S-F}	±4µm	160/27.5mm	
0 - 25mm	0.01mm	118-118^{S-S}	±4µm	160/27.5mm	
0 - 25mm	0.01mm	118-103	±5µm	330/35mm	
25 - 50mm	0.01mm	118-110	±4µm	165/27.5mm	

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Metric		Dial reading model			
Range	Graduation	Order No.	Accuracy	Throat	
0 - 25mm	0.01mm	119-202^{S-F}	±4µm	50mm	

S-F: Spherical anvil and flat spindle



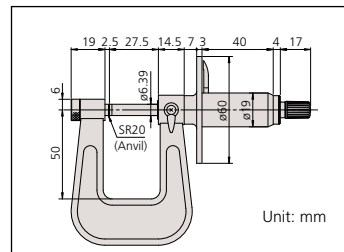
Inch/Metric		Digital model			
Range	Resolution	Order No.	Accuracy	a/b	
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	389-351-30	±.0002"	6.3"/1.08"	
		389-361-30^{S-F}	±.0002"	6.3"/1.08"	
		389-371-30^{S-S}	±.0002"	6.3"/1.08"	
		389-714	±.00025"	13"/1.38"	
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	389-352-30	±.0002"	6.5"/1.08"	
		389-362-30^{S-F}	±.0002"	6.5"/1.08"	
		389-372-30^{S-S}	±.0002"	6.5"/1.08"	

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle

Inch		Dial reading model			
Range	Graduation	Order No.	Accuracy	a/b	
0 - 1"	.0001"	118-129	±.0002"	6.3"/1.08"	
		118-116^{S-F}	±.0002"	6.3"/1.08"	
		118-120^{S-S}	±.0002"	6.3"/1.08"	
	.001"	118-107	±.00025"	13"/1.38"	
1" - 2"	.001"	118-112	±.0002"	6.5"/1.08"	

S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle
*.0001" reading is obtained with vernier.

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications
Resolution*: .00005"/0.001mm or 0.001mm
Graduation*: 0.01mm, .001" or .0001"
Flatness: .000024" / 0.6µm for models with 6" / 150mm throat
.00004" / 1µm for models with 12" / 300mm throat
Parallelism: .00012" / 3µm
Measuring faces: Carbide tipped
Display*: LCD
Battery*: SR44 [1 pc. (2 pcs.: **389-514** and **389-714**)], **938882**
Battery life*: Approx. 2.4 years under normal use
(1.8 years: **389-514** and **389-714**)
Dust/Water protection level*: IP65
*Digital models **Analog models

Function of Digital Model

Origin-set, Zero-setting, Data hold, Data output, inch/mm conversion (on inch/metric models only)
Function lock
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)
04AZB512: SPC cable for **389-514/389-714** (40" / 1m)
04AZB513: SPC cable for **389-514/389-714** (80" / 2m)

Anvil-Spindle Combinations



Standard, Flat-Flat



Spherical-Flat (S-F)



Spherical-Spherical (S-S)

The Series 119 is provided with a dial for making easy and quick readings.



Technical Data

Accuracy: Refer to the list of specifications
 Resolution*: .00005" / 0.001mm or 0.001mm
 Graduation**: .0001" or 0.01mm
 Parallelism: .00012" / 3μm for models up to 3" / 75mm
 (3+R/100)μm for models over 75mm,
 R=max. range (mm) .00016" for 4" models
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years under normal use
 *Digital models **Analog models

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output,
 inch/mm conversion (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (1m / 40")
05CZA663: SPC cable with data switch (2m / 80")
937387: SPC cable for Quickmike type (1m / 40")
965013: SPC cable for Quickmike type (2m / 80")



Blade Micrometers

SERIES 422,122 — Non-Rotating Spindle Type

FEATURES

- The anvil and the spindle have a blade for measuring the groove diameter of shafts, keyways and other hard-to-reach areas.
- With ratchet stop for constant force.
- Non-slip grip finish (digital models).
- Speedy spindle feed of .4"/10mm /rev. (Quickmike type).
- With a standard bar except 0 - 1" and 0 - 25mm model.
- Supplied in fitted plastic case.

Quickmike type



422-421



422-330-30



122-125

IP54

ABSOLUTE
 Absolute System Powered by Mitutoyo

SPECIFICATIONS

Metric Digital model

Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.001mm	422-230-30	±3μm	Type A	365
		422-260-30	±3μm	Type B	365
		422-270-30	±3μm	Type C	365
		422-271-30	±3μm	Type D	365
25 - 50mm	0.001mm	422-231-30	±3μm	Type A	565
		422-261-30	±3μm	Type B	565
50 - 75mm	0.001mm	422-232-30	±3μm	Type A	465
75 - 100mm	0.001mm	422-233-30	±4μm	Type A	580

Metric Quickmike type

Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 30mm	0.001mm	422-411	±3μm	350
25 - 55mm	0.001mm	422-412	±3μm	490

Metric

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 25mm	0.01mm	122-101	±3μm	Type A	260
		122-111	±3μm	Type B	260
		122-161	±3μm	Type C	275
		122-141	±3μm	Type D	275
25 - 50mm	0.01mm	122-102	±3μm	Type A	300
		122-112	±3μm	Type B	300
		122-162	±3μm	Type C	315
		122-142	±3μm	Type D	315
50 - 75mm	0.01mm	122-103	±3μm	Type A	360
75 - 100mm	0.01mm	122-104	±4μm	Type A	525
100 - 125mm	0.01mm	122-105	±4μm	Type A	670
125 - 150mm	0.01mm	122-106	±4μm	Type A	775
150 - 175mm	0.01mm	122-107	±5μm	Type A	950
175 - 200mm	0.01mm	122-108	±5μm	Type A	1140

Inch/Metric Digital model

Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	422-330-30	±.00015"	Type A	365
		422-360-30	±.00015"	Type B	365
		422-370-30	±.00015"	Type C	365
		422-371-30	±.00015"	Type D	365
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	422-331-30	±.00015"	Type A	565
		422-361-30	±.00015"	Type B	565
2 - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	422-332-30	±.00015"	Type A	465
3 - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	422-333-30	±.0002"	Type A	580

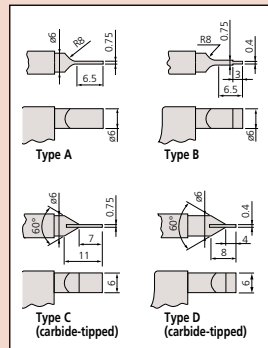
Inch/Metric Quickmike type

Range	Resolution	Order No.	Accuracy	Remarks	Mass (g)
0 - 1.2" / 0 - 30.48mm	.00005" / 0.001mm	422-421	±.00015"	Type A	350
1 - 2.2" / 25.4 - 55.88mm	.00005" / 0.001mm	422-422	±.00015"	Type A	490

Inch

Range	Graduation	Order No.	Accuracy	Remarks	Mass (g)
0 - 1"	.0001"	122-125	±.00015"	Type A	260
		122-135	±.00015"	Type B	260
		122-151	±.00015"	Type D	275
1 - 2"	.0001"	122-126	±.00015"	Type A	300
2 - 3"	.0001"	122-127	±.00015"	Type A	360
3 - 4"	.0001"	122-128	±.0002"	Type A	525

TYPE AND DIMENSIONS



Disk Micrometers

SERIES 323, 223, 123 - Rotating Spindle

FEATURES

- Diameter of measuring disk: .787" / 20mm.
- .028" / 0.7mm (1mm: models over 100mm) edge thickness to enter narrow recesses.
- With ratchet stop for constant force.
- Non-slip grip finish (digital models).
- With a standard bar except for 0 - 1" / 0 - 25mm model.
- With SPC output (Series 323).
- The Series 223 is provided with a mechanical digit counter for quick reading of measurements.
- Supplied in fitted plastic case. (Over 100mm models supplied wooden cases).



123-125



323-350-30



123-103



223-125

SPECIFICATIONS

Metric Digital model

Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 25mm	0.001mm	323-250-30	±4μm	290
25 - 50mm	0.001mm	323-251-30	±4μm	355
50 - 75mm	0.001mm	323-252-30	±6μm	555
75 - 100mm	0.001mm	323-253-30	±6μm	610

Metric Mechanical counter model

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	223-101	±4μm	260
25 - 50mm	0.01mm	223-102	±4μm	290

Metric

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	123-101	±4μm	200
		123-113*	±4μm	230
		123-114*	±4μm	270
25 - 50mm	0.01mm	123-102	±4μm	250
		123-115*	±6μm	320
50 - 75mm	0.01mm	123-103	±6μm	300
		123-116*	±6μm	375
75 - 100mm	0.01mm	123-104	±6μm	375
		123-116*	±6μm	390
100 - 125mm	0.01mm	123-105	±7μm	520
125 - 150mm	0.01mm	123-106	±7μm	570
150 - 175mm	0.01mm	123-107	±8μm	730
175 - 200mm	0.01mm	123-108	±8μm	890
200 - 225mm	0.01mm	123-109	±8μm	1000
225 - 250mm	0.01mm	123-110	±9μm	1200
250 - 275mm	0.01mm	123-111	±9μm	1410
275 - 300mm	0.01mm	123-112	±9μm	1680

*The measuring disks have carbide tips.
Note: The disk diameter of models over 100mm is 30mm.

Inch/Metric Digital model

Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	323-350-30	±.0002"	290
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	323-351-30	±.0002"	355
2 - 3" / 50 - 76.2mm	.00005" / 0.001mm	323-352-30	±.0003"	555
3 - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	323-353-30	±.0003"	610

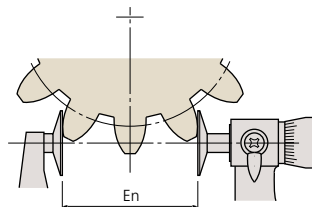
Inch Mechanical counter model

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	223-125	±.0002"	260

Inch

Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	123-125	±.0002"	200
1 - 2"	.001"	123-126	±.0002"	250
2 - 3"	.001"	123-127	±.0003"	300
3 - 4"	.001"	123-128	±.0003"	375

Root tangent length of gear (En)



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



Technical Data

Accuracy: Refer to the list of specifications
Resolution*: .00005" / 0.001mm or 0.001mm
Graduation**: .001" or 0.01mm
Flatness: .00004" / 1μm for models up to 4" / 100mm
.000063" / 1.6μm for models over 4" / 100mm
Parallelism: .00016" / 4μm for models up to 2" / 50mm
.00024" for models up to 4"
(4+R/50)μm for models up to 100mm
(5+R/75)μm for models over 100mm, R=max. range (mm)
Measurable module: 0.5-6 (0.7-11: models over 100mm)
Display*: LCD
Battery*: SR44 (1 pc.), 938882
Battery life*: Approx. 2.4 years under normal use
*Digital models **Analog models

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output, inch/mm conversion (on inch/metric models only)
Function lock
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

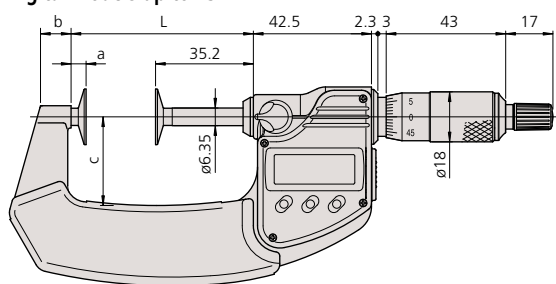
05CZA662: SPC cable with data switch (40" / 1m)
05CZA663: SPC cable with data switch (80" / 2m)



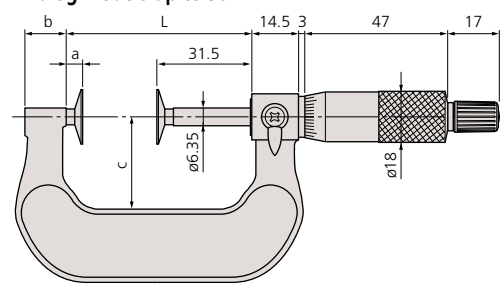
DIMENSIONS

Unit: mm

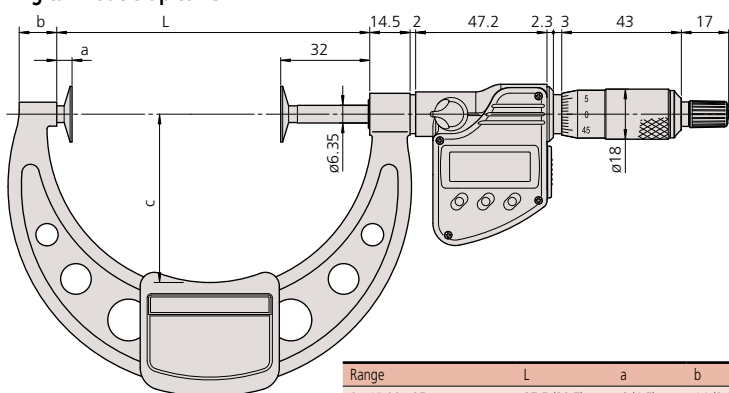
Digital models up to 75mm



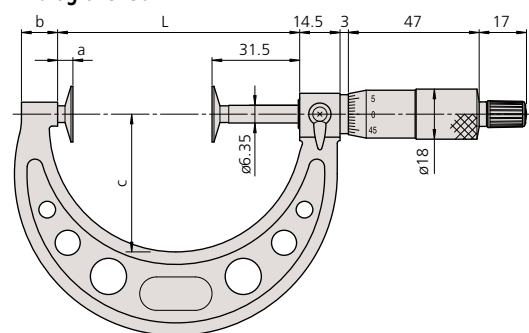
Analog models up to 50mm



Digital models up to 75mm

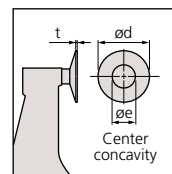


Analog over 50mm



Range	L	a	b	c	Ød	Øe	t
0 - 1" / 0 - 25mm	37.5 (39.7)	6 (4.5)	14 (9.2)	25 (25.4)	20	8 (9.8)	0.7
1 - 2" / 25 - 50mm	62.5 (65.6)	6 (5.4)	14 (11)	32 (31.9)	20	8 (9.8)	0.7
2 - 3" / 50 - 75mm	87 (90.7)	5.5 (5.5)	11 (12.2)	49 (50)	20	8 (9.8)	0.7
3 - 4" / 75 - 100mm	112 (112.5)	5.5 (5.5)	11 (13.5)	63 (60.5)	20	8 (9.8)	0.7
4 - 5" / 100 - 125mm	137.5	6	12	79	30	12	1
5 - 6" / 125 - 150mm	162.5	6	15	94	30	12	1
6 - 7" / 150 - 175mm	187.5	6	16	106	30	12	1
7 - 8" / 175 - 200mm	212.5	6	15	118	30	12	1
8 - 9" / 200 - 225mm	237.5	6	14	130	30	12	1
9 - 10" / 225 - 250mm	262.5	6	14	143	30	12	1
10 - 11" / 250 - 275mm	287.5	6	15	156	30	12	1
11 - 12" / 275 - 300mm	312.5	6	15	169	30	12	1

Data in () applies to those with carbide tipped disks.

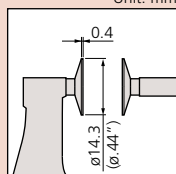


Technical Data

Graduation: .001" or 0.01mm
Flatness: .00004" / 1µm
Parallelism: .00012" / 3µm
Measuring Force: 8.02 ± 0.8N
53.9KPa ± 4.9 KPa



Unit: mm



() : Inch model

Paper Thickness Micrometers

SERIES 169 — Non-Rotating Spindle Type Designed for Paper Thickness Measurement

FEATURES

- Non-rotating spindle.
- With ratchet stop for constant force.
- Supplied in fitted plastic case.

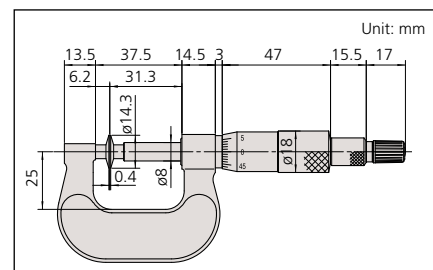


169-101

SPECIFICATIONS

Metric				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	169-101	±4µm	230g

DIMENSIONS



Unit: mm

Inch				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	169-103	±.0002"	230g

Mitutoyo

Disk Micrometers

SERIES 369, 227, 169 — Non-Rotating Spindle Type

FEATURES

- The Disk Micrometer is designed to easily measure root tangent length of spur gears and helical gears.
- Non-rotating spindle eliminates torque on workpiece.
- With standard bar except 0 - 15mm, 0 - .6" 0 - 25mm, 0 - 1", 0 - 30mm & 0 - 1.2" model.
- Speedy spindle feed of 10mm/rev. (Quickmike type).
- Diameter of measuring disk: .787" / 20mm
- With ratchet stop for constant force.
- With SPC output (Series 369).
- Supplied in fitted plastic case.
- Non-slip grip finish (digital models).



369-350-30



Quickmike type

369-421

Quickmike type with adjustable measuring force



227-221



169-201

ABSOLUTE
Absolute System Protected by USPTO

IP54

ABSOLUTE
Absolute System Protected by USPTO

SPECIFICATIONS

Metric		Digital model	
Range	Resolution	Order No.	Accuracy
0 - 25mm	0.001mm	369-250-30	±4μm
25 - 50mm	0.001mm	369-251-30	±4μm
50 - 75mm	0.001mm	369-252-30	±6μm
75 - 100mm	0.001mm	369-253-30	±6μm

Inch/Metric		Digital model	
Range	Resolution	Order No.	Accuracy
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	369-350-30	±.0002"
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	369-351-30	±.0002"
2 - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	369-352-30	±.0003"
3 - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	369-353-30	±.0003"

Metric		Quickmike type	
Range	Resolution	Order No.	Accuracy
0 - 30mm	0.001mm	369-411	±4μm
25 - 55mm	0.001mm	369-412	±4μm

Inch/Metric		Quickmike type	
Range	Resolution	Order No.	Accuracy
0 - 1.2" / 0 - 30.48mm	.00005" / 0.001mm	369-421	±.0002"
1 - 2.2" / 25.4 - 55.88mm	.00005" / 0.001mm	369-422	±.0002"

Metric		Quickmike type with adjustable measuring force		
Range	Resolution	Order No.	Accuracy	Measuring force
0 - 10mm	0.001mm	227-223	±4μm	2N - 10N
0 - 15mm	0.001mm	227-221	±4μm	0.5N - 2.5N

Metric			
Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	169-201	±4μm
25 - 50mm	0.01mm	169-202	±4μm
50 - 75mm	0.01mm	169-205	±6μm
75 - 100mm	0.01mm	169-207	±6μm

Inch			
Range	Graduation	Order No.	Accuracy
0 - 1"	.001"	169-203	±.0002"
1 - 2"	.001"	169-204	±.0002"
2 - 3"	.001"	169-206	±.0003"
3 - 4"	.001"	169-208	±.0003"

SPC

Technical Data

Accuracy: Refer to the list of specifications
 Resolution*: .00005" / 0.001mm or 0.001mm
 Graduation**: .001" or 0.01mm
 Flatness: .00004" / 1μm
 Parallelism: 4μm / .00016" for models up to 2" / 50mm
 6μm / .00024" for models over 2" / 50mm
 Measurable module: 0.5-6
 Display*: LCD
 Battery*: SR44 (1 pc.), 938882
 Battery life*: Approx. 2.4 years under normal use
 (1 year: Quickmike type, 3 years: Quickmike type with fine-loading)
 Series 227: Refer to page B-6 for more information.
 *Digital models **Analog models

Function of Digital Model

Origin-set, Zero / ABS, Data hold, Data output, inch/mm conversion (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

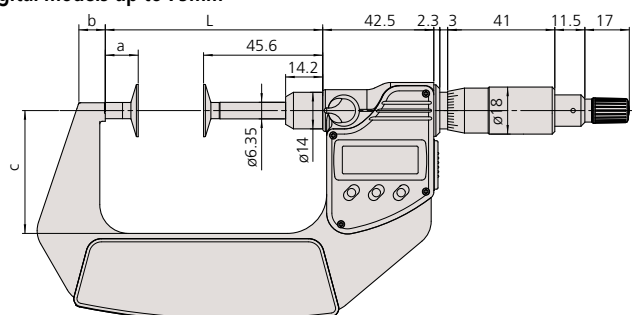
Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (40" / 1m)
 05CZA663: SPC cable with data switch (80" / 2m)
 937387: SPC cable for Quickmike type (40" / 1m)
 965013: SPC cable for Quickmike type (80" / 2m)

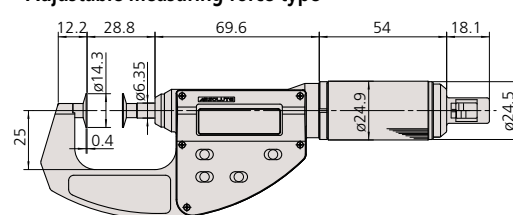
DIMENSIONS AND MASS

Unit: mm

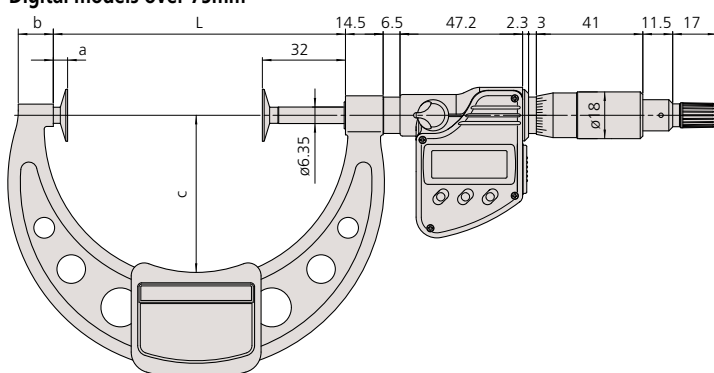
Digital models up to 75mm



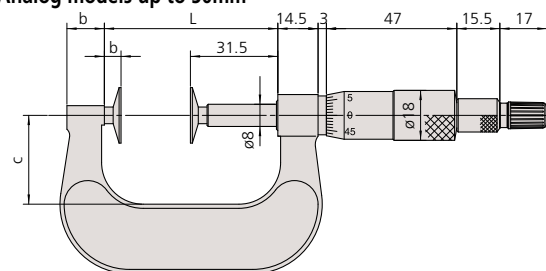
Adjustable measuring force type



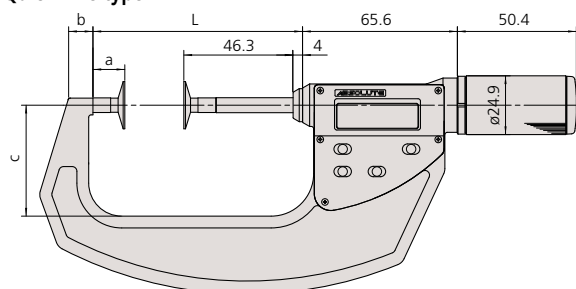
Digital models over 75mm



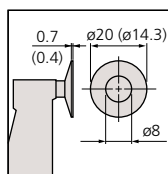
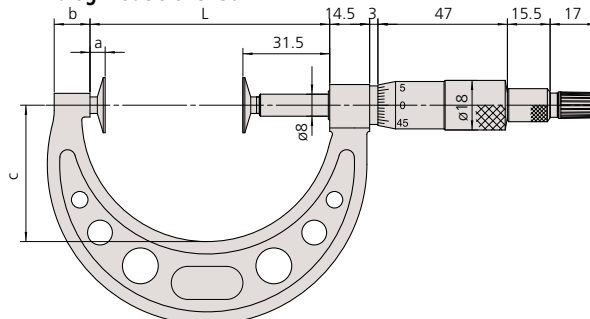
Analog models up to 50mm



Quickmike type



Analog models over 50mm



(): Adjustable measuring force type

Digital model

Range	L	a	b	c	Mass (g)
0 - 25mm / 0 - 1"	58.5	12.9	7	32	340
25 - 50mm / 1 - 2"	83.5	12.9	9.8	47	480
50 - 75mm / 2 - 3"	108.5	12.9	11.2	60	635
75 - 100mm / 3 - 4"	112.5	5.5	13.5	60.5	475
0 - 30mm* / 0 - 1.2"	63.8	13.5	8.5	36	360
25 - 55mm* / 1 - 2.2"	88.8	13.5	10.3	47	490

*Quickmike type

Analog model

Range	L	a	b	c	Mass (g)
0 - 25mm / 0 - 1"	37.5	6	13.5	25	230
25 - 50mm / 1 - 2"	62.5	6	13.5	32	280
50 - 75mm / 2 - 3"	87	5.5	13	49.5	315
75 - 100mm / 3 - 4"	112	5.5	13	63.5	400

Gear Tooth Micrometers

SERIES 324, 124 — Interchangeable Ball Anvil-Spindle Tip Type

FEATURES

- IP65 water/dust protection (Series 324).
- Measures over-pin diameter of gears with precision steel (carbide) ball-tipped measuring faces.
- With a standard bar except 0 - 25mm and 0 - 1" model
- Non-slip grip finish (digital models)
- Interchangeable ball anvil-spindle tips for various gear modules (0.5 - 5.25) are optional.
- With Ratchet Stop for constant force.
- With SPC output (Series 324).
- Supplied in fitted plastic case (Models over 150mm have wooden case).



SPECIFICATIONS

Metric Digital model				
Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 25mm	0.001mm	324-251-30	±4μm	400
25 - 50mm	0.001mm	324-252-30	±4μm	490
50 - 75mm	0.001mm	324-253-30	±4μm	530
75 - 100mm	0.001mm	324-254-30	±5μm	600

Inch/Metric Digital model				
Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 1" / 0 - 25mm	.00005" / 0.001mm	324-351-30	±.0002"	400
1 - 2" / 25 - 50mm	.00005" / 0.001mm	324-352-30	±.0002"	490
2 - 3" / 50 - 75mm	.00005" / 0.001mm	324-353-30	±.0002"	530
3 - 4" / 75 - 100mm	.00005" / 0.001mm	324-354-30	±.00025"	600

Metric				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	124-173	±4μm	295
25 - 50mm	0.01mm	124-174	±4μm	400
50 - 75mm	0.01mm	124-175	±4μm	460
75 - 100mm	0.01mm	124-176	±5μm	540
100 - 125mm	0.01mm	124-177	±5μm	640
125 - 150mm	0.01mm	124-178	±5μm	760
150 - 175mm	0.01mm	124-179	±6μm	900
175 - 200mm	0.01mm	124-180	±6μm	1060
200 - 225mm	0.01mm	124-181	±6μm	1230
225 - 250mm	0.01mm	124-182	±7μm	1430
250 - 275mm	0.01mm	124-183	±7μm	1620
275 - 300mm	0.01mm	124-195	±7μm	2070



DIMENSIONS AND MASS

Unit: mm			
() : 275-300mm model			
Range	L	a	Mass (g)
0 - 25mm	64.5	32	295
25 - 50mm	90	45	400
50 - 75mm	115.6	65	460
75 - 100mm	140.6	79	540
100 - 125mm	165.6	93	640
125 - 150mm	190.5	105	760
150 - 175mm	215.5	120	900
175 - 200mm	240.5	130	1060
200 - 225mm	265.5	147	1230
225 - 250mm	290.5	165	1430
250 - 275mm	315.5	171	1620
275 - 300mm	353	187	2070



Technical Data

Accuracy: Refer to the list of specifications
 Resolution*: 0.001mm or .00005"/0.001mm
 Graduation**: 0.01mm
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years under normal use
 Dust/Water protection level*: IP65
 *Digital models **Analog models

Function of Digital Model

Zero / ABS, Data hold, Data output, Preset, inch/mm conversion (on inch/metric models only)
 Function Lock, 2 Presets
 Alarm: Low voltage, Counting value composition error

Optional Accessories

05CZA662: SPC cable with data switch (1m / 40")*
05CZA663: SPC cable with data switch (2m / 80")*
 *Only for digital models

Interchangeable ball anvil-spindle tip set:

Diameter of ball anvil	Order No.	Gear module	Diametral pitch
0.8mm	124-801*	0.5 - 0.55	50
1mm	124-802*	0.6 - 0.65	45
1.191mm (3/64")	124-803*	0.7 - 0.8	35 - 30
1.5mm	124-821*	0.9 - 1	28 - 26
1.588mm (1/16")	124-804*	0.9 - 1	28 - 26
2mm	124-805*	1.25	22
2.381mm (3/32")	124-806	1.5	17
2.5mm	124-822	1.5	17
3mm	124-807	1.75	15
3.175mm (1/8")	124-808	—	14
3.5mm	124-823	2	13
3.969mm (5/32")	124-809	2	13
4mm	124-810	2.25	11
4.5mm	124-824	2.5	10
4.763mm (3/16")	124-811	2.5	10
5mm	124-812	2.75	9
5.556mm (7/32")	124-813	3.0 - 3.25	8
6mm	124-814	3.5	7
6.35mm (1/4")	124-815	3.75	7
7mm	124-816	4.0	6.5
7.144mm (9/32")	124-817	4.25	6
7.938mm (5/16")	124-818	4.5	5.5
8mm	124-819	4.75	5.5
8.731mm (11/32")	124-820	5.0 - 5.25	5

*Carbide-tipped type

Screw Thread Micrometers

SERIES 125

FEATURES

- Provided with a 60 degree V-anvil and conical spindle for easily measuring pitch diameters of metric or unified screw threads.
- With ratchet stop for constant force.
- With a standard bar for zero point adjustment except 0 - 25mm model.
- Supplied in fitted plastic case.



125-103

Technical Data

Accuracy: $\pm(2+R/75)\mu\text{m}$, R=max. range (mm)

Graduation: 0.01mm

Spindle feed error: 3 μm

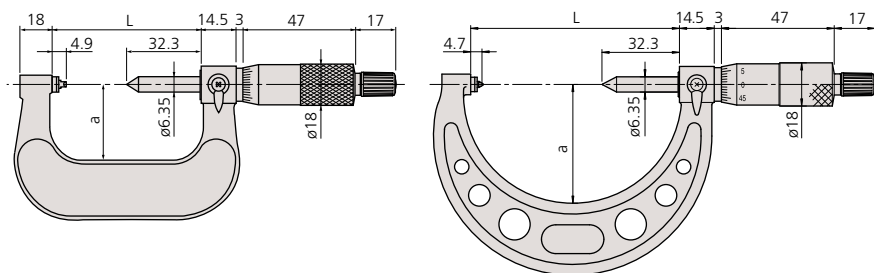


SPECIFICATIONS

Metric

Range	Graduation	Order No.	Screw to be measured (Metric/Unified)
0 - 25mm	0.01mm	125-101	0.4 - 0.5mm/64 - 48TPI
		125-102	0.6 - 0.9mm/44 - 28TPI
		125-103	1 - 1.75mm/24 - 14TPI
		125-104	2 - 3mm/13 - 9TPI
		125-105	3.5 - 5mm/8 - 5TPI
25 - 50mm	0.01mm	125-106	0.4 - 0.5mm/64 - 48TPI
		125-107	0.6 - 0.9mm/44 - 28TPI
		125-108	1 - 1.75mm/24 - 14TPI
		125-109	2 - 3mm/13 - 9TPI
		125-110	3.5 - 5mm/8 - 5TPI
50 - 75mm	0.01mm	125-111	0.6 - 0.9mm/44 - 28TPI
		125-112	1 - 1.75mm/24 - 14TPI
		125-113	2 - 3mm/13 - 9TPI
		125-114	3.5 - 5mm/8 - 5TPI
		125-115	5.5 - 7mm/4.5 - 3.5TPI
75 - 100mm	0.01mm	125-116	0.6 - 0.9mm/44 - 28TPI
		125-117	1 - 1.75mm/24 - 14TPI
		125-118	2 - 3mm/13 - 9TPI
		125-119	3.5 - 5mm/8 - 5TPI
		125-120	5.5 - 7mm/4.5 - 3.5TPI

DIMENSIONS AND MASS

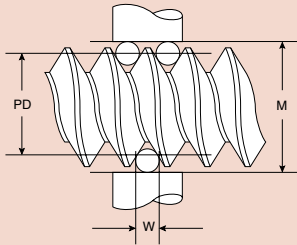


Unit: mm

Range	L	a	Mass (g)
0 - 25mm	37.2	25	200
25 - 50mm	62.2	32	250
50 - 75mm	87	49.5	260
75 - 100mm	112	63.5	330

3-Wire Thread Measuring System

Individual Holder and Wire Set



PD = Pitch Diameter
M = Measurement over wires
W = Wire diameter
C = Constant
C = .86603 x Pitch (inches) -3W
P.D. = M-C
W = .57735 x P

Applications

- Measure set of thread plug gages and working thread plug gages.
- Monitor the wear on working thread plug gages.
- Monitor and control pitch diameter variation during thread fabrication.
- Reduce measurement time to a fraction of the time normally taken using the traditional three wire method.
- Use in conjunction with go/no-go thread ring gages to control thread size to the most demanding specifications.
- Determine out of roundness and taper that may exist in threaded parts.
- Applications for preplating and post plating thread measurement.

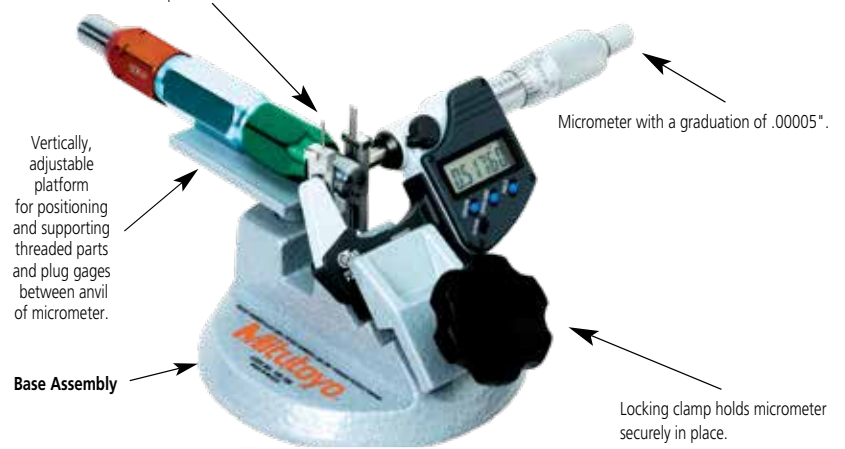
Tolerance of Wires:

- Diameter +/- .000010"
- Roundness +/- .000010"
- Surface finish 2 micro inches AA, lapped.
- Hardness HRC 59-64
- Certification of accuracy included.
- Traceable to NIST.
- Meets or exceeds all ANSI and ISO specs.

FEATURES

- Fast and accurate method of thread measuring available for use with micrometer

Wire holders and 3 thread measuring wires assembled for each thread pitch.



INCH STANDARD HOLDERS AND WIRES SETS

Order No. ^{1,2}	Threads Per Inch	Thread Measuring Wire Diameter
64AAA201	120	.00481
64AAA202	100	.00577
64AAA203	95	.00601
64AAA204	90	.00642
64AAA205	80	.00722
64AAA206	72	.00802
64AAA207	64	.00902
64AAA208	56	.01031
64AAA209	50	.01155
64AAA210	48	.01203
64AAA211	44	.01312
64AAA212	40	.01443
64AAA213	36	.01604
64AAA214	32	.01804
64AAA215	30	.01925
64AAA216	28	.02062
64AAA217	27	.02138
64AAA218	26	.02221
64AAA219	24	.02406
64AAA220	22	.02624
64AAA221	20	.02887
64AAA222	18	.03208
64AAA223	16	.03608
64AAA224	14	.04124
64AAA225	13	.04441
64AAA226	12	.04811
64AAA227	11.5	.05020
64AAA228	11	.05249
64AAA229	10	.05774
64AAA230	9	.06415
64AAA231	8	.07217
64AAA232	7.5	.07698
64AAA233	7	.08248
64AAA234	6	.09623
64AAA235	5.5	.10497
64AAA236	5	.11547

¹ For 6.35mm Spindle Diameter holder only, add "H" suffix to Order No. (i.e. 64AAA201H)

² For 8mm Spindle Diameter holder only, add "H8" suffix to Order No. (i.e. 64AAA201H8)

Compatible with micrometers with 0.25" anvils & spindles.

Stand Assembly
Order No. 156-106

METRIC HOLDERS AND WIRES SETS

Order No. ¹	Pitch	mm Diameter	Inch Diameter
64AAA251	.2mm	.1155	.00455
64AAA252	.225mm	.1299	.00511
64AAA253	.25mm	.1443	.00568
64AAA254	.30mm	.1732	.00682
64AAA255	.35mm	.2021	.00796
64AAA256	.40mm	.2309	.00909
64AAA257	.45mm	.2598	.01023
64AAA258	.50mm	.2887	.01137
64AAA259	.55mm	.3175	.01250
64AAA260	.60mm	.3464	.01364
64AAA261	.70mm	.4041	.01591
64AAA262	.75mm	.4330	.01705
64AAA263	.80mm	.4619	.01818
64AAA264	.85mm	.4907	.01932
64AAA265	.90mm	.5196	.02046
64AAA266	1.00mm	.5774	.02273
64AAA267	1.25mm	.7217	.02841
64AAA268	1.50mm	.8660	.03410
64AAA269	1.75mm	1.0104	.03978
64AAA270	2.00mm	1.1547	.04546
64AAA271	2.50mm	1.4434	.05683
64AAA272	3.00mm	1.7321	.06819
64AAA273	3.50mm	2.0207	.07956
64AAA274	4.00mm	2.3094	.09092

¹ For 6.35mm Spindle Diameter holder only, add "H" suffix to Order No. (i.e. 64AAA201H)

Can Seam Micrometers

SERIES 147

FEATURES

- Measures the width, height, and depth of can seams.
- Three types of micrometers are available for: steel cans, aluminum cans and sprayer cans.
- Supplied in fitted carton.



147-103

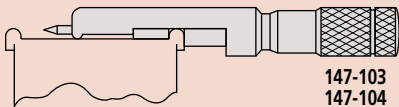
SPECIFICATIONS

Metric			
Range	Graduation	Order No.	Remarks
0 - 13mm	0.01mm	147-103	for steel cans
		147-105	for aluminum cans
		147-202	for sprayer cans

Inch			
Range	Graduation	Order No.	Remarks
0 - .5"	.001"	147-104	for steel cans
		147-106	for aluminum cans
		147-201	for sprayer cans

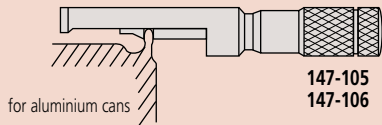
Technical Data

Accuracy: $\pm 0.00012"$ / $\pm 3\mu\text{m}$
Graduation: .001" / 0.01mm



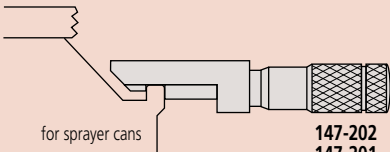
for cans
(for depth measurements up to 5mm)

147-103
147-104



for aluminium cans

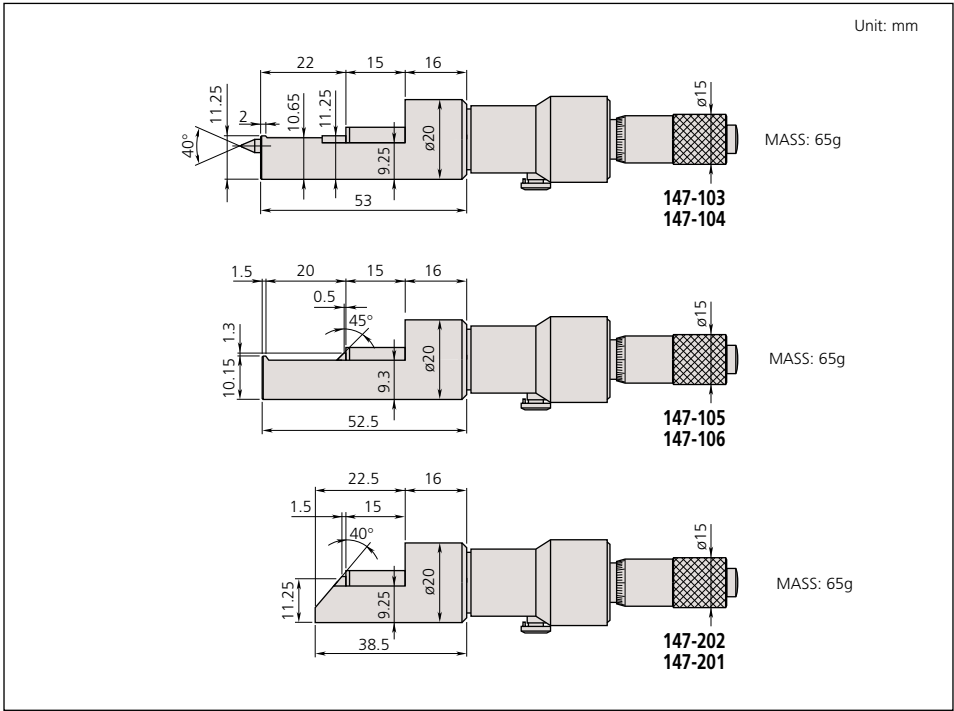
147-105
147-106



for sprayer cans

147-202
147-201

DIMENSIONS AND MASS

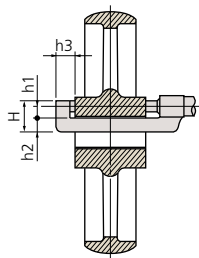


Hub Micrometers

SERIES 147

Technical Data

Accuracy: Refer to the list of specifications
 Graduation: 0.01mm / .001"
 Flatness: 0.6μm / .000024"
 Parallelism: (2+R/100)μm, R=max. range (mm)
 [.00008" + .00004" (L/4)]", L = Max. range (inch)
 Measuring faces: Carbide tipped



Unit: mm

Range	h1	h2	h3	H	Mass (g)
0 - 1" / 0 - 25mm	6	8.5	13.5	17.5	135
1 - 2" / 25 - 50mm	6.5	11	14	20.5	150
3 - 4" / 50 - 75mm	6.5	11	13	20.5	170
4 - 5" / 75 - 100mm	6.5	11	13	20.5	185

FEATURES

- Measures hub thickness and shoulders inside a bore.
- With ratchet stop for constant force.
- With a standard bar except for 0 - 1" / 0 - 25mm model.
- Supplied in fitted plastic case.



147-301



147-351

SPECIFICATIONS

Metric			
Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	147-301	±2μm
25 - 50mm	0.01mm	147-302	±2μm
50 - 75mm	0.01mm	147-303	±2μm
75 - 100mm	0.01mm	147-304	±3μm

Inch			
Range	Graduation	Order No.	Accuracy
0 - 1"	.001"	147-351	±.0001"
1 - 2"	.001"	147-352	±.0001"
2 - 3"	.001"	147-353	±.0001"
3 - 4"	.001"	147-354	±.00015"

Wire Micrometers

SERIES 147

FEATURES

- Designed for measuring wire thickness.
- Also used to measure the diameter of a small ball.
- Supplied in fitted plastic case.



147-402



147-401

SPECIFICATIONS

Metric				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 10mm	0.01mm	147-401	±3μm	65

Inch				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - .4"	.0001"	147-402*	±.00015"	65

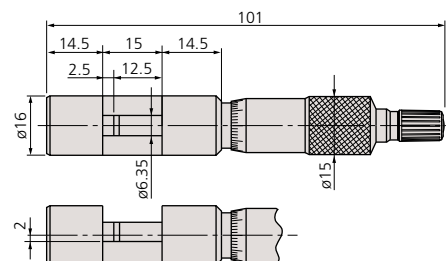
* .0001" reading is obtained with vernier.

Technical Data

Graduation: .0001" or 0.01mm
 Flatness: .000024" / 0.6μm
 Parallelism: .00005" / 1.3μm
 Measuring faces: Carbide tipped



DIMENSIONS AND MASS



Unit: mm
 MASS = 65g

Digital Outside Micrometers

SERIES 193

FEATURES

- Mechanical digit counter with 0.01mm or .001" reading for quick and error-free reading.
- With a standard bar except for 0-25mm / 0 - 1" model.
- Supplied in fitted plastic case.



193-211

SPECIFICATIONS

Metric With ratchet stop

Range	Graduation	Order No.	Accuracy
0 - 25mm	0.01mm	193-101	±2μm
	0.001mm	193-111*	±2μm
25 - 50mm	0.01mm	193-102	±2μm
	0.001mm	193-112*	±2μm
50 - 75mm	0.01mm	193-103	±2μm
	0.001mm	193-113*	±2μm
75 - 100mm	0.01mm	193-104	±3μm
	0.001mm	193-114*	±3μm

*0.001mm reading is obtained with vernier.

Metric Micrometer sets

Range	Order No.	Included in set
0 - 75mm (3 pcs./set)	193-901	• 193-101, 193-102, 193-103 • 2 micrometer standards
0 - 75mm (3 pcs./set)	193-915	• 193-111, 193-112, 193-113, • 2 micrometer standards
0 - 100mm (4 pcs./set)	193-902	• 193-101, 193-102, 193-103, 193-104 • 3 micrometer standards
0 - 100mm (4 pcs./set)	193-916	• 193-111, 193-112, 193-113, 193-114 • 3 micrometer standards

Inch With friction thimble

Range	Graduation	Order No.	Accuracy
0 - 1"	.0001"	193-211*	±.0001"
1 - 2"	.0001"	193-212*	±.0001"

*.0001" reading is obtained with vernier.

Inch With ratchet stop

Range	Graduation	Order No.	Accuracy
2 - 3"	.0001"	193-213*	±.0001"
3 - 4"	.0001"	193-214*	±.00015"

*.0001" reading is obtained with vernier.

Inch Micrometer sets

Range	Order No.	Included in set
0 - 3" (3 pcs./set)	193-923	• 193-211, 193-212, 193-213 • 2 micrometer standards

Technical Data

Counter reading: 0.01mm or .001"
 Graduation: 0.01mm, 0.001mm, .001" or .0001"
 Flatness: 0.6μm / .000024"
 Parallelism: (2+R/100)μm, R=max. range (mm)
 [.00008" + .00004" (L/4)]", L= max. range (inch)
 Measuring faces: Carbide tipped

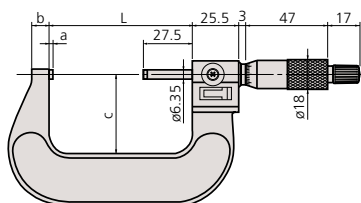


193-916

DIMENSIONS AND MASS

Models up to 100mm / 4"

Unit: mm



Range	L	a	b	c	Mass (g)
0 - 25mm / 0 - 1"	30	2.5	5	26	224
25 - 50mm / 1 - 2"	55	2.5	8	32	275
50 - 75mm / 2 - 3"	80	2.5	9	45	379
75 - 100mm / 3 - 4"	105	2.5	9	57	489

Note: The shape of the thimble changes on the model with friction thimble.

Indicating Micrometers

SERIES 510

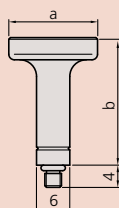
Technical Data

Spindle feed error: $3\mu\text{m} / .00012''$
 Dial indication accuracy: $1\mu\text{m} / .00004''$
 Dispersion of indication: $0.4\mu\text{m} / .00002''$
 Graduation: 0.001mm or $.0001''$
 Dial reading: 0.001mm or $.00005''$
 Flatness: $0.3\mu\text{m} / .000012''$
 Parallelism: $0.6\mu\text{m} / .000024''$ for models up to $50\text{mm} / 2''$
 $1\mu\text{m} / .00004''$ for models over $50\text{mm} / 2''$
 Measuring force: 5 - 10N (500 - 1000gf)
 Measuring faces: Carbide tipped

Optional Accessories

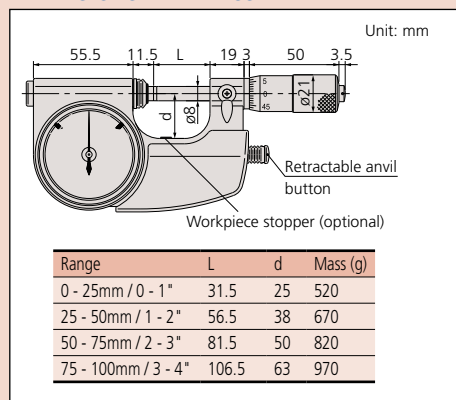
04AZA124: $\phi 16\text{mm} / \phi .63''$ workpiece stopper
 (not available for $25\text{mm} / 1''$ model)
04AZA125: $\phi 14\text{mm} / \phi .55''$ workpiece stopper
04AZA126: $\phi 14\text{mm} / \phi .55''$ workpiece stopper

Unit: mm



	a	b
04AZA124	16	23
04AZA125	14	20.5
04AZA126	14	15

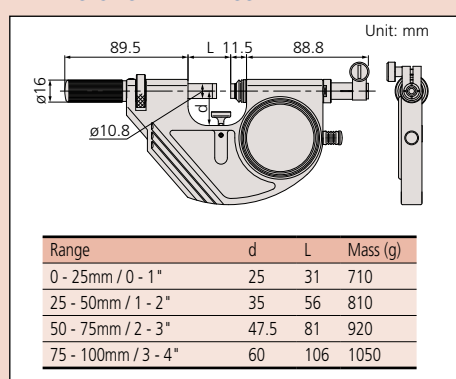
DIMENSIONS AND MASS



Technical Data

Flatness: $0.3\mu\text{m} / .000012''$
 Parallelism: $0.6\mu\text{m} / .000024''$ for models up to $50\text{mm} / 2''$
 $1\mu\text{m} / .00004''$ for models over $50\text{mm} / 2''$
 Measuring force: 5 - 10N (500 - 1000gf)
 Measuring faces: Carbide tipped

DIMENSIONS AND MASS



FEATURES

- Retractable anvil with indicator for three-wire measurements of pitch diameter of precision screws and parallelism measurements.
- With a standard bar except for 0 - 25mm / 0 - 1" model.
- IP protection level: 54
- Supplied in fitted plastic case.



510-131

SPECIFICATIONS

Metric			
Range	Graduation	Order No.	Indicating range
0 - 25mm	0.001mm	510-121* 510-141	$\pm 0.060\text{mm}$
25 - 50mm	0.001mm	510-122	$\pm 0.060\text{mm}$
50 - 75mm	0.001mm	510-123	$\pm 0.060\text{mm}$
75 - 100mm	0.001mm	510-124	$\pm 0.060\text{mm}$

*Retractable anvil button on the right side.

Inch			
Range	Graduation	Order No.	Indicating range
0 - 1"	.00005"	510-131* 510-151	$\pm .0023''$
1 - 2"	.00005"	510-132	$\pm .0023''$
2 - 3"	.00005"	510-133	$\pm .0023''$
3 - 4"	.00005"	510-134	$\pm .0023''$

*Retractable anvil button on the right side.

Snap Meters

SERIES 523

FEATURES

- Various types of indicators, LVDTs and linear gages can be selected according to the measurement applications.
- Supplied in fitted plastic case.

Indicator is optional.



523-141

SPECIFICATIONS

Metric			Gage stem dia 8mm
Range	Order No.	Anvil movement	
0 - 25mm	523-141	2mm	
25 - 50mm	523-142	2mm	
50 - 75mm	523-143	2mm	
75 - 100mm	523-144	2mm	

Inch			Gage stem dia 3/8"
Range	Order No.	Anvil movement	
0 - 1"	523-151	.078"	
1 - 2"	523-152	.078"	
2 - 3"	523-153	.078"	
3 - 4"	523-154	.078"	

Dial Snap Meters

SERIES 523

FEATURES

- Direct go/no-go judgment for mass-produced parts.
- Spindle diameter: .425" / 10.8mm
- IP protection level: 54
- Supplied in fitted plastic case.



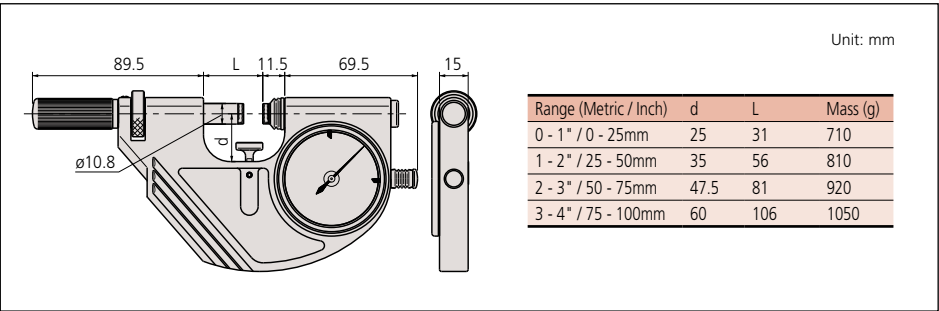
523-131

SPECIFICATIONS

Metric			
Range	Graduation	Order No.	Indicating range
0 - 25mm	0.001mm	523-121	±0.060mm
25 - 50mm	0.001mm	523-122	±0.060mm
50 - 75mm	0.001mm	523-123	±0.060mm
75 - 100mm	0.001mm	523-124	±0.060mm

Inch			
Range	Graduation	Order No.	Indicating range
0 - 1"	.00005"	523-131	±.0023"
1 - 2"	.00005"	523-132	±.0023"
2 - 3"	.00005"	523-133	±.0023"
3 - 4"	.00005"	523-134	±.0023"

DIMENSIONS AND MASS



Technical Data

Dial indication accuracy: .00005" / 1µm
Indication repeatability: .00002" / 0.4µm
Dial reading: .00005" or 0.001mm
Flatness: .000012" / 0.3µm
Parallelism: .000024" / 0.6µm for models up to 2" / 50mm
.00004" / 1µm for models over 2" / 50mm
Measuring force: 5 - 10N (500 - 1000gf)
Measuring faces: Carbide tipped

Caliper-type Micrometers

SERIES 343, 143

Technical Data

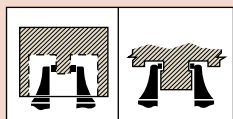
Accuracy: Refer to the list of specifications.
 Resolution*: 0.001mm or .00005"/0.001mm
 Graduation*: 0.01mm / .001"
 Flatness: 0.3μm / .000012"
 Parallelism: (3+R/75)μm, R=max. range (mm)
 [.00012" + .00004" (L/8)]"
 L = Max. range (inch)
 Measuring faces: Carbide tipped
 Display*: LCD
 Battery*: SR44 (1 pc.), **938882**
 Battery life*: Approx. 2.4 years under normal use
 *Digital models **Analog models

Function of Digital Model

Origin-set, Zero-setting, Data hold, Data output,
 inch/mm conversion (on inch/metric models only)
 Function lock
 Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

05CZA662: SPC cable with data switch (1m / 40")
05CZA663: SPC cable with data switch (2m / 80")



FEATURES

- With ratchet stop for constant force.
- With SPC output (Series 343).
- With a standard bar except 0 - 25mm and 0 - 1" model.
- Supplied in fitted plastic case.
- Non-slip grip finish (digital models).



143-121



343-250-30

SPECIFICATIONS

Metric		Digital model		
Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 25mm	0.001mm	343-250-30	±5μm	630
25 - 50mm	0.001mm	343-251-30	±6μm	650
50 - 75mm	0.001mm	343-252-30	±7μm	1040
75 - 100mm	0.001mm	343-253-30	±8μm	1090

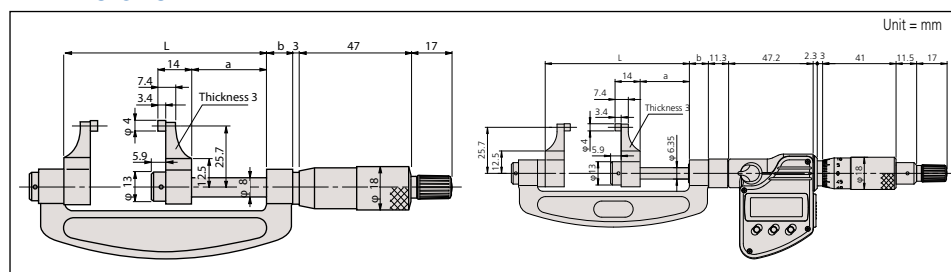
Inch / Metric		Digital model		
Range	Resolution	Order No.	Accuracy	Mass (g)
0 - 1" / 0 - 25.4mm	.00005" / 0.001mm	343-350-30	±.00025"	630
1 - 2" / 25.4 - 50.8mm	.00005" / 0.001mm	343-351-30	±.0003"	650
2 - 3" / 50.8 - 76.2mm	.00005" / 0.001mm	343-352-30	±.00035"	1040
3 - 4" / 76.2 - 101.6mm	.00005" / 0.001mm	343-353-30	±.0004"	1090

Metric				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 25mm	0.01mm	143-101	±5μm	210
25 - 50mm	0.01mm	143-102	±6μm	230
50 - 75mm	0.01mm	143-103	±7μm	280
75 - 100mm	0.01mm	143-104	±8μm	330

Models with a range up to 300mm are available.

Inch				
Range	Graduation	Order No.	Accuracy	Mass (g)
0 - 1"	.001"	143-121	±.00025"	210
1 - 2"	.001"	143-122	±.0003"	230
2 - 3"	.001"	143-123	±.00035"	280

DIMENSIONS



Groove Micrometers

SERIES 146

FEATURES

- Flanged spindle for measuring width, depth and location of grooves inside/outside bores, and tubes.
- Provided with two types of graduations for inside and outside measurements.
- Non-rotating spindle type has two-directional ratchet stop.
(Measuring force: 0.7 - 1.2N)



SPECIFICATIONS

Metric Rotating spindle type

Range Outside	Range Inside	Graduation	Order No.	Flange	Mass (g)
0 - 25mm	1.6 - 26.5mm	0.01mm	146-121	ø6.35mm	135
			146-122	ø12.7mm	185
25 - 50mm	26.5 - 51.5mm	0.01mm	146-123	ø12.7mm	175
50 - 75mm	51.5 - 76.5mm	0.01mm	146-124	ø12.7mm	165
75 - 100mm	76.5 - 101.5mm	0.01mm	146-125	ø12.7mm	160

Inch Rotating spindle type

Range Outside	Range Inside	Graduation	Order No.	Flange	Mass (g)
0 - 1"	.055" - 1.05"	.001"	146-131	ø.25"	135
			146-132	ø.5"	185
1" - 2"	1.05" - 2.05"	.001"	146-133	ø.5"	175
2" - 3"	2.05" - 3.05"	.001"	146-134	ø.5"	165
3" - 4"	3.05" - 4.05"	.001"	146-135	ø.5"	160

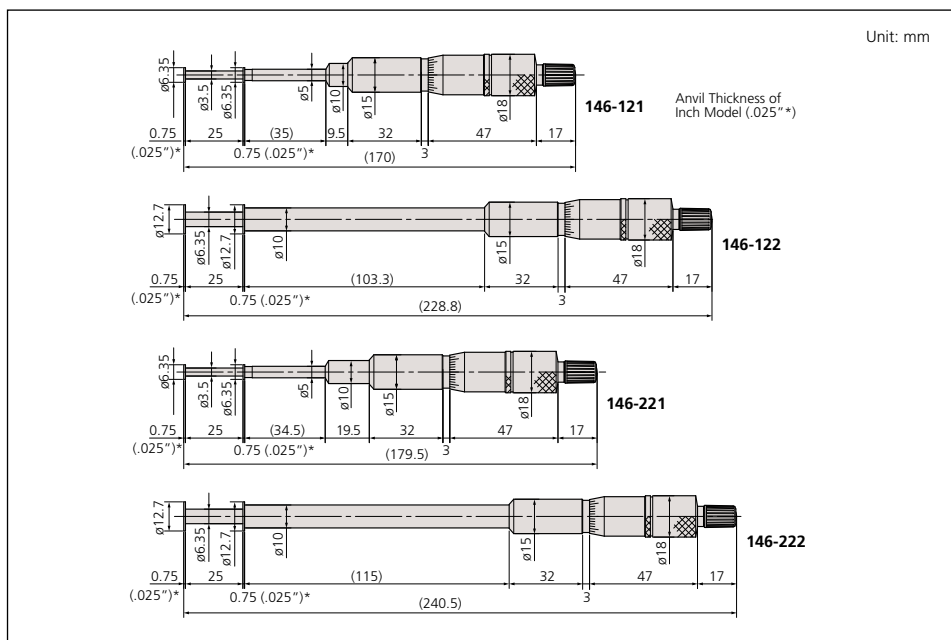
Metric Non-rotating spindle type

Range Outside	Range Inside	Graduation	Order No.	Flange	Mass (g)
0 - 25mm	1.6 - 26.5mm	0.01mm	146-221	ø6.35mm	135
			146-222	ø12.7mm	185
25 - 50mm	26.5 - 51.5mm	0.01mm	146-223	ø12.7mm	175
50 - 75mm	51.5 - 76.5mm	0.01mm	146-224	ø12.7mm	165
75 - 100mm	76.5 - 101.5mm	0.01mm	146-225	ø12.7mm	160

Inch Non-rotating spindle type

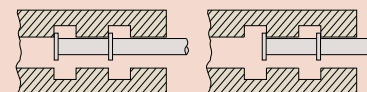
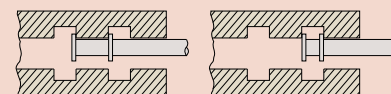
Range Outside	Range Inside	Graduation	Order No.	Flange	Mass (g)
0 - 1"	.055" - 1.05"	.001"	146-231	ø.25"	135
			146-232	ø.5"	185
1" - 2"	1.05" - 2.05"	.001"	146-233	ø.5"	175
2" - 3"	2.05" - 3.05"	.001"	146-234	ø.5"	165
3" - 4"	3.05" - 4.05"	.001"	146-235	ø.5"	160

DIMENSIONS



Technical Data

Accuracy: $\pm .0004"$ / $\pm 10\mu\text{m}$
 Parallelism: $.0004"$ / $10\mu\text{m}$



Small Hole Gage Set

SERIES 154

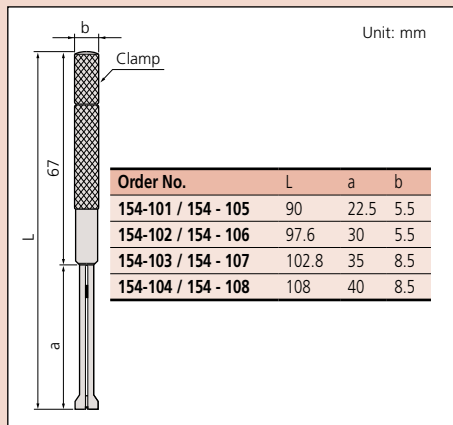
FEATURES

- Used with an outside micrometer for measuring inside diameter of bores.
- 4 sizes of gages are supplied in a fitted pouch.
- Extra long for gaging deep and shallow holes, slots and similar workpieces.
- Gaging surface is fully hardened to ensure long tool life.



154-901

DIMENSIONS



SPECIFICATIONS

Metric		
Total range	Set Order No.	Assortment of gages
ø3 - 13mm (4-gage set)	154-902	ø3 - 5mm gage (154-101) ø5 - 7.5mm gage (154-102) ø7.5 - 10mm gage (154-103) ø10 - 13mm gage (154-104)

Inch		
Total range	Set Order No.	Assortment of gages
.125 - .5" DIA. (4-gage set)	154-901	.125" - .2" DIA. gage (154-105) .2" - .3" DIA. gage (154-106) .3" - .4" DIA. gage (154-107) .4" - .5" DIA. gage (154-108)

Telescoping Gage Set

SERIES 155

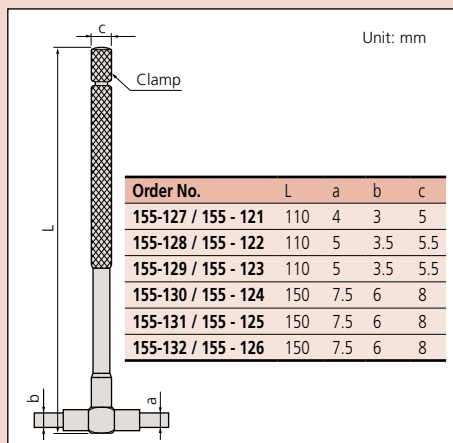
FEATURES

- Spring-loaded plunger expands within the bore (or groove), allowing determination of the internal diameter (or groove width).
- With a knurled clamp.
- Supplied in a fitted pouch.



155-903

DIMENSIONS



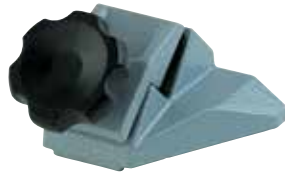
SPECIFICATIONS

Metric		
Total range	Set Order No.	Included in set
8 - 150mm (6-gage set)	155-905	8 - 12.7mm gage (155-127) 12.7 - 19mm gage (155-128) 19 - 32mm gage (155-129) 32 - 54mm gage (155-130) 54 - 90mm gage (155-131) 90 - 150mm gage (155-132)

Inch		
Total range	Set Order No.	Included in set
.313 - 6" (6-gage set)	155-903	.313" - .5" gage (155-121) .5" - .75" gage (155-122) .75" - 1.25" gage (155-123) 1.25" - 2.125" gage (155-124) 2.125" - 3.5" gage (155-125) 3.5" - 6" gage (155-126)
.50 - 6" (5-gage set)	155-904	155-122, 155-123, 155-124, 155-125, 155-126
.315 - 2.125" (4-gage set)	155-907	155-121, 155-122, 155-123, 155-124

SERIES 156

These stands are designed to allow bench-top use with hand micrometers or other gages.



156-105-10



156-106



156-101-10

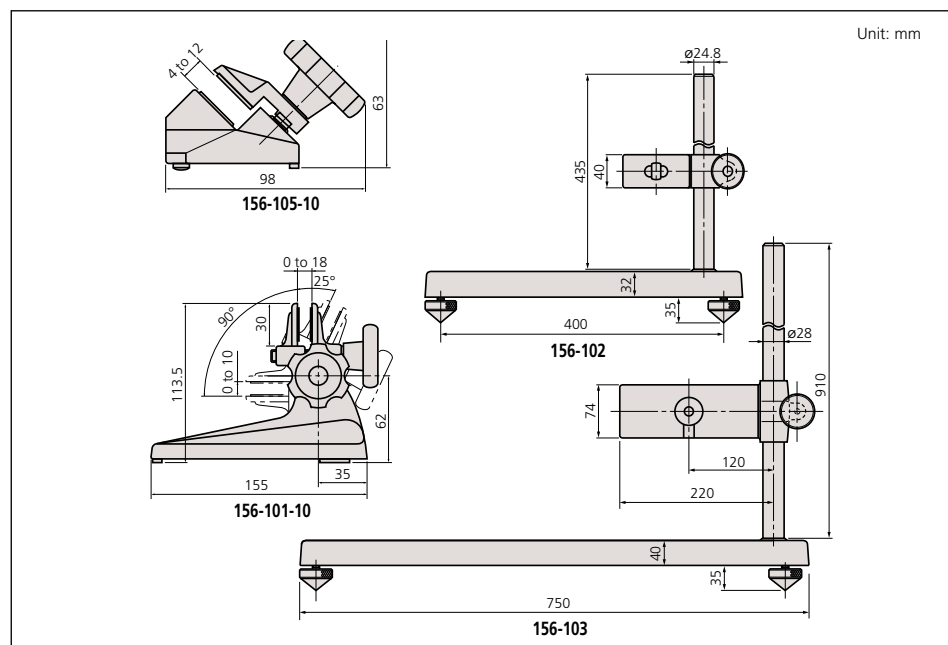


156-102

SPECIFICATIONS

Micrometer ranges	Order No.	Remarks
0-1" / 0-25mm, 1-2" / 25-50mm	156-105-10	Fixed angle type
Up to 4" / 100mm	156-101-10	Adjustable angle type
5-12" / 125-300mm	156-102	Vertical type
12-40" / 300-1000mm	156-103	Vertical type
0-1" / 0-25mm 1-2" / 25-50mm	156-106	Fixed angle with platform

DIMENSIONS



Color Ratchet & Color Speeder

Color ratchet



SPECIFICATIONS

Order No.	Color
985056	Black
985061	Red
985081	Blue
985071	Yellow
985076	Green
985066	Brown
04GZA241*	Gray
04GZA239**	Gray
04GZA243***	Gray

*for Series 293 digital model

** up to 300mm / 12"

*** over 300mm / 12"

Color Speeder for Ratchet Thimble Micrometer



SPECIFICATIONS

Order No.	Color
04GAA899	Black
04GAA900	Red
04GAA901	Yellow
04GAA902	Green
04GAA903	Blue
04AAB208	Gray

Technical Data

Tip length: metric type: 10mm $\pm 5\mu\text{m}$
inch type: .5" $\pm .0002$ "

Spindle Dia: *1 .250" / 6.35mm
*1 Spindle diameter for 101469
(.250" ball) is .315" / 8mm



To measure odd workpieces, several convenient anvil attachments are prepared by Mitutoyo. Among them the most often used one is the ball attachment.

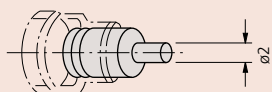
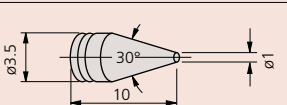
The ball attachments are hardened steel balls with .200" and .250" diameters which are placed on the .250" and .315" diameter anvils, respectively, by rubber caps. With these attachments, regular micrometers can measure cylindrical wall thickness, but, .200" or .250" must be subtracted from the readings.

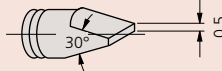
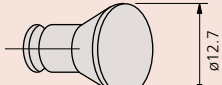
Other attachments shown here are either .500" or 10mm in length. The added amount must be subtracted from the reading.

Spindle Attachment Tip

Ball	Spline	Comparator	Blade	Knife-edge	Disk
					
101468 (.200" ball dia.) 101469 (.250" ball dia.)	208062* 208098	208063* 208099	208064* 208100	208065* 208101	208066* 208102

DIMENSIONS

Order No.	Dimension
208098 208062*	
208099 208063*	
208100 208064*	

Order No.	Dimension
208101 208065*	
208102 208066*	

* metric type

Micrometer Oil

207000 (30ml)



Mitutoyo

Optical Parallels

SERIES 157

FEATURES

- Designed to inspect parallelism and flatness of measuring faces of micrometers.
- Each set consists of 4 thicknesses.
- Supplied in fitted wooden case.



SPECIFICATIONS

Metric		
Range of micrometer to be checked	Order No.	Assortment of parallels (Thickness of parallel)
0-25mm	157-903	12.00mm (157-101) 12.12mm (157-102) 12.25mm (157-103) 12.37mm (157-104)
25-50mm	157-904	25.00mm (157-105) 25.12mm (157-106) 25.25mm (157-107) 25.37mm (157-108)

Inch		
Range of micrometer to be checked	Order No.	Assortment of parallels (Thickness of parallel)
0-1"	157-901	.5000" (157-109) .5062" (157-110) .5125" (157-111) .5187" (157-112)
1-2"	157-902	1.0000" (157-113) 1.0062" (157-114) 1.0125" (157-115) 1.0187" (157-116)

Optical Flats

SERIES 158

FEATURES

- Used for inspecting the flatness of micrometer's or gage block's measuring faces with high accuracy.
- Supplied in fitted wooden case.



SPECIFICATIONS

Metric		
Flatness	Order No.	Diameter/Thickness
0.2μm	158-117	45mm/12mm
	158-119	60mm/15mm
0.1μm	158-118	45mm/12mm
	158-120	60mm/15mm

Inch		
Flatness	Order No.	Diameter/Thickness
.000004"	158-122	1.8"/.5"
	158-124	2.4"/.6"

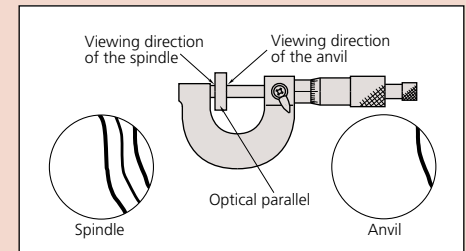
Technical Data

Flatness: .000004" / 0.1μm
Parallelism: .000008" / 0.2μm
Diameter: 1.18" / 30mm

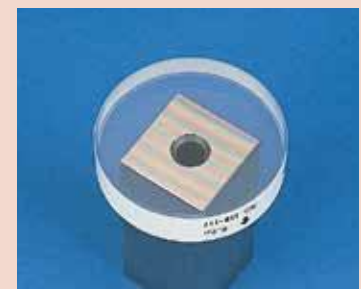
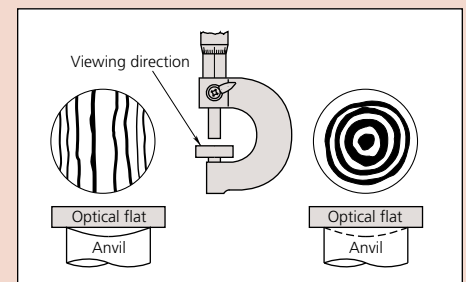
Parallelism check between measuring faces by means of interference fringe produced by an optical parallel.

The parallelism between the measuring faces can be determined as follows—place the optical parallel to the anvil and observe the number of interference fringes produced on the spindle side under the measuring force of the micrometers.

The parallelism is about 1μm (0.32μm x 3 = 0.96μm). Fringe on the anvil side must not be more than one.



Flatness check of measuring faces using interference fringe pattern produced by an optical flat.



Technical Data

Flatness: 0.3µm / .000012"
Parallelism: 2µm / .00008"



Inch

Length (L)	Order No.	Diameter (D)	Accuracy
41"	167-405	.47"	.0004"
42"	167-406	.47"	.0004"
43"	167-407	.47"	.0004"
44"	167-408	.47"	.0004"
45"	167-409	.47"	.0004"
46"	167-410	.47"	.0004"
47"	167-411	.47"	.0004"
48"	167-412	.47"	.0004"
49"	167-413	.47"	.0004"
50"	167-414	.47"	.0004"
51"	167-415	.47"	.0004"
52"	167-416	.47"	.0004"
53"	167-417	.47"	.0004"
54"	167-418	.47"	.0004"
55"	167-419	.47"	.0004"
56"	167-420	.47"	.0004"
57"	167-421	.47"	.0004"
58"	167-422	.47"	.0004"
59"	167-423	.47"	.0004"
60"	167-424	.47"	.0004"
61"	167-425	.47"	.0004"
62"	167-426	.47"	.0004"
63"	167-427	.47"	.0004"
64"	167-428	.47"	.0004"
65"	167-429	.47"	.0004"
66"	167-430	.47"	.0004"
67"	167-431	.47"	.0004"
68"	167-432	.47"	.0004"
69"	167-433	.47"	.0004"
70"	167-434	.47"	.0004"
71"	167-435	.47"	.0004"
72"	167-436	.47"	.0004"
73"	167-437	.47"	.0004"
74"	167-438	.47"	.0004"
75"	167-439	.47"	.0004"
76"	167-440	.47"	.0004"
77"	167-441	.47"	.0004"
78"	167-442	.47"	.0004"
79"	167-443	.47"	.0004"

Micrometer Standards Set

Inch

Order No.	Size	Remarks
167-912*	1"-5"	5 pcs. Set (167-141, 142, 143, 144, 145)
167-913*	1"-11"	11 pcs. Set (167-141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151)

Metric

Order No.	Size	Remarks
167-902*	25-125mm	5 pcs. Set (167-101, 102, 103, 104, 105)
167-903*	25-275mm	11 pcs. Set (167-101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111)

*Supplied with fitted carrying case

Micrometer Standards

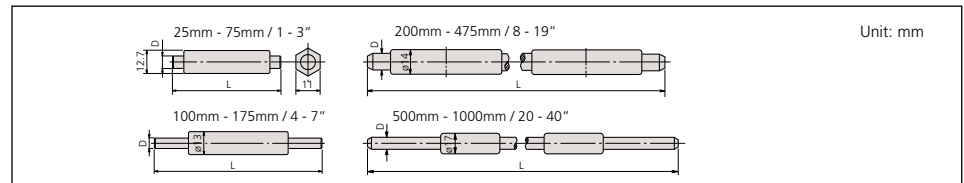
SERIES 167

FEATURES

- Used for the zero point setting of outside micrometers.
- Flat and lapped measuring faces.
- Heat insulating handle to prevent expansion due to body temperature.
- Supplied in fitted carton up to 500mm / 20" and wooden case for over 525mm / 21" length.



DIMENSION



SPECIFICATIONS

Metric

Length (L)	Order No.	Diameter (D)	Accuracy
25mm	167-101	6.35mm	±1.5µm
50mm	167-102	6.35mm	±2.0µm
75mm	167-103	6.35mm	±2.5µm
100mm	167-104	7.9mm	±3µm
125mm	167-105	7.9mm	±3.5µm
150mm	167-106	7.9mm	±4µm
175mm	167-107	7.9mm	±4.5µm
200mm	167-108	9.4mm	±5.0µm
225mm	167-109	9.4mm	±5.5µm
250mm	167-110	9.4mm	±6.0µm
275mm	167-111	9.4mm	±6.5µm
300mm	167-112	9.4mm	±7µm
325mm	167-113	9.4mm	±7.5µm
350mm	167-114	9.4mm	±8µm
375mm	167-115	9.4mm	±8.5µm
400mm	167-116	9.4mm	±9µm
425mm	167-117	9.4mm	±9.5µm
450mm	167-118	9.4mm	±1.0µm
475mm	167-119	9.4mm	±10.5µm
500mm	167-120	11.9mm	±11µm
525mm	167-121	11.9mm	±11.5µm
550mm	167-122	11.9mm	±12µm
575mm	167-123	11.9mm	±12.5µm
600mm	167-124	11.9mm	±13µm
625mm	167-125	11.9mm	±13.5µm
650mm	167-126	11.9mm	±14µm
675mm	167-127	11.9mm	±14.5µm
700mm	167-128	11.9mm	±15µm
725mm	167-129	11.9mm	±15.5µm
750mm	167-130	11.9mm	±16µm
775mm	167-131	11.9mm	±16.5µm
800mm	167-132	11.9mm	±17µm
825mm	167-133	11.9mm	±17.5µm
850mm	167-134	11.9mm	±18µm
875mm	167-135	11.9mm	±18.5µm
900mm	167-136	11.9mm	±19µm
925mm	167-137	11.9mm	±19.5µm
950mm	167-138	11.9mm	±20µm
975mm	167-139	11.9mm	±20.5µm
1000mm	167-140	11.9mm	±21µm

Inch

Length (L)	Order No.	Diameter (D)	Accuracy
1"	167-141	.25"	±.00005"
2"	167-142	.25"	±.0001"
3"	167-143	.25"	±.0001"
4"	167-144	.31"	±.0001"
5"	167-145	.31"	±.00015"
6"	167-146	.31"	±.00015"
7"	167-147	.31"	±.00015"
8"	167-148	.37"	±.00015"
9"	167-149	.37"	±.0002"
10"	167-150	.37"	±.0002"
11"	167-151	.37"	±.0002"
12"	167-152	.37"	±.00025"
13"	167-153	.37"	±.00025"
14"	167-154	.37"	±.00025"
15"	167-155	.37"	±.00025"
16"	167-156	.37"	±.00025"
17"	167-157	.37"	±.00025"
18"	167-158	.37"	±.00025"
19"	167-159	.37"	±.0003"
20"	167-160	.47"	±.0003"
21"	167-161	.47"	±.0003"
22"	167-162	.47"	±.0003"
23"	167-163	.47"	±.0003"
24"	167-164	.47"	±.0003"
25"	167-165	.47"	±.00035"
26"	167-166	.47"	±.00035"
27"	167-167	.47"	±.00035"
28"	167-168	.47"	±.00035"
29"	167-169	.47"	±.00035"
30"	167-170	.47"	±.00035"
31"	167-171	.47"	±.00035"
32"	167-172	.47"	±.00035"
33"	167-173	.47"	±.00035"
34"	167-174	.47"	±.00035"
35"	167-175	.47"	±.00035"
36"	167-176	.47"	±.00035"
37"	167-177	.47"	±.0004"
38"	167-178	.47"	±.0004"
39"	167-179	.47"	±.0004"
40"	167-180	.47"	±.0004"

Standards for Screw Thread Micrometers

SERIES 167 — 60 degree and 55 degree

FEATURES

- Specially designed for the zero point setting of screw thread micrometers.
- Supplied in fitted carton.



167-264 (60°)



167-262 (60°)

SPECIFICATIONS

Metric			
Length	Order No.	Thread angle	Accuracy
25mm	167-261	60°	±4μm
	167-272	55°	±4μm
50mm	167-262	60°	±5μm
	167-273	55°	±5μm
75mm	167-263	60°	±6μm
	167-274	55°	±6μm
100mm	167-264	60°	±7μm
	167-275	55°	±7μm
125mm	167-265	60°	±8μm
	167-276		±8μm
150mm	167-266	60°	±9μm
	167-277		±9μm
175mm	167-267	60°	±10μm
	167-278		±10μm
200mm	167-268	60°	±11μm
	167-279		±11μm
225mm	167-269	60°	±12μm
	167-280		±12μm
250mm	167-270	60°	±13μm
	167-281		±13μm
275mm	167-271	60°	±14μm
	167-282		±14μm

Inch			
Length	Order No.	Thread angle	Accuracy
1"	167-294	60°	±.00015"
	167-283	55°	±.00015"
2"	167-295	60°	±.0002"
	167-284	55°	±.0002"
3"	167-296	60°	±.00025"
	167-285	55°	±.00025"
4"	167-297	60°	±.0003"
	167-286	55°	±.0003"
5"	167-298	60°	±.00035"
	167-287	55°	±.00035"
6"	167-299	60°	±.0004"
	167-288	55°	±.0004"

Technical Data

Thread angle: 55° or 60°
Angle Accuracy: ±2°

Standards for V-Anvil Micrometers

SERIES 167

FEATURES

- Specially designed for the zero point setting of V-anvil micrometers.
- Supplied in fitted carton.



167-329

SPECIFICATIONS

Metric			
Diameter	Order No.	Type	Accuracy
5mm	167-327	Plug	±2μm
10mm	167-328	Plug	±2μm
25mm	167-329	Plug	±2μm
40mm	167-330	Ring	±3μm
55mm	167-331	Ring	±3μm
70mm	167-332	Ring	±3μm
85mm	167-333	Ring	±3μm

Inch			
Diameter	Order No.	Type	Accuracy
.2"	167-337	Plug	±.0001"
.4"	167-338	Plug	±.0001"
1"	167-339	Plug	±.0001"
1.6"	167-340	Ring	±.00015"
2.2"	167-341	Ring	±.00015"
2.8"	167-342	Ring	±.00015"
3.4"	167-343	Ring	±.00015"

Tool Kits

The Digimatic Tool Kits include Mitutoyo's highly popular 0–1" / 0–25mm Digimatic Micrometer (choose ratchet or friction type) and 0–6" / 0–150mm Digimatic Caliper with Absolute Encoder. The case is made of handsome, solid mahogany and has space for gage batteries. The micrometer spanner is a supplied accessory.

Order No. 64PKA068A (Inch Tool Kit)	
Item No.	Description
103-135	Outside Micrometer (Friction Thimble Type) (Range: 0–1", Graduation: .0001")
505-742	Dial Caliper (Range: 0–6", Dial Graduation: .001")
182-204	6" Full-Flexible Rule (3R)
64PPP932	Mahogany Case



64PKA068A

Order No. 64PKA069A (Inch Tool Kit)	
Item No.	Description
103-135	Outside Micrometer (Friction Thimble Type) (Range: 0–1", Graduation: .0001")
182-202	6" Full-Flexible Rule (16R)
513-518T	Test Indicator Set (Range: .04", Graduation: .001")
505-742	675 Dial Caliper (Range: 0–6", Dial Graduation: .001")
050501	Mahogany Case



64PKA069A

The basic measuring instruments recommended for vocational students and machinist apprentices are supplied in this kit.

Order No. 64PKA070A (Inch Tool Kit)	
Item No.	Description
101-117	Outside Micrometer (Friction Thimble Type) (Range: 0–1", Graduation: .0001")
129-132	Depth Micrometer (with 6 pcs rods) (Range: 0–6", Graduation: .001")
182-202	Full-Flexible Rule (16R)
505-742	Dial Caliper (Range: 0–6", Graduation: .001")
050503	Mahogany Case



64PKA070A

For operations where depth measurements are a primary concern, this kit is ideal for measuring depths to 6", in addition to providing the tools for regular precision measurements.

Order No. 64PKA071B (Inch Tool Kit)	
Item No.	Description
103-922	Outside Micrometer Set (3 pcs) (Range: 0–3", Graduation: .0001")
141-208	Inside Micrometer (with 6 pcs rods)
182-202	Full-Flexible Rule (16R)
513-518T	Test Indicator Set (Range: .04", Graduation: .001")
505-742	Dial Caliper (Range: 0–6", Dial Graduation: .001")
24165	Dial Indicator (Range: 1.0", Graduation: .001")
70105	Magnetic Stand
050504	Mahogany Case



64PKA071B

Most every routine inspection assignment can be completed with the eight high-quality Mitutoyo precision measuring instruments provided in this deluxe kit.

Note: 050504 Mahogany Case is being reconfigured (not as pictured).

Mitutoyo

Tool Kits



64PKA080B

Order No. 64PKA080B (Inch Tool Kit)	
Item No.	Description
182-102	6" Steel Rule (16R)
103-177	Micrometer (Ratchet Thimble) (Range 0-1", Graduation .001")
505-740	Dial Caliper (Range: 0-6", Dial Graduation: .001")
64PPP932	Mahogany Case



64PKA073B

Order No. 64PKA073B (Tool Kit Lite)	
Item No.	Description
182-102	6" Steel Rule (16R)
700-113-10	0 - 6" / 0 - 150mm MyCal Lite (Resolution: .001" / 0.1mm)
293-831-30	0 - 1" / 0 - 25.4mm MDC Lite (Ratchet Stop) (Resolution: .00005" / 0.001mm)
64PPP932	Mahogany Case



64PKA076B

Order No. 64PKA076B (Digimatic Tool Kit)	
Item No.	Description
293-340-30	Digimatic Micrometer (Ratchet Stop Type) (Range: 0 - 1" / 0 - 25.4mm, LCD Resolution: .00005" / 0.001mm)
500-196-30	Digimatic Caliper with Absolute Encoder (Range: 0 - 6" / 0 - 150mm, LCD Resolution: .0005" / 0.001mm)
64PPP932	Mahogany Case



64PKA077B

Order No.64PKA077B (Digimatic Tool Kit)	
Item No.	Description
293-348-30	Digimatic Micrometer (Friction Thimble Type) (Range: 0 - 1" / 0 - 25.4mm, LCD Resolution: .00005" / 0.001mm)
500-196-30	Digimatic Caliper with Absolute Encoder (Range: 0 - 6" / 0 - 150mm, LCD Resolution: .0005" / 0.001mm)
64PPP932	Mahogany Case

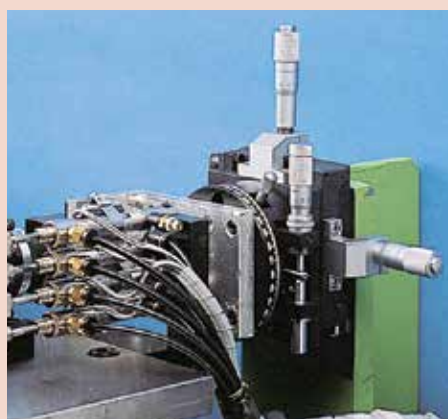
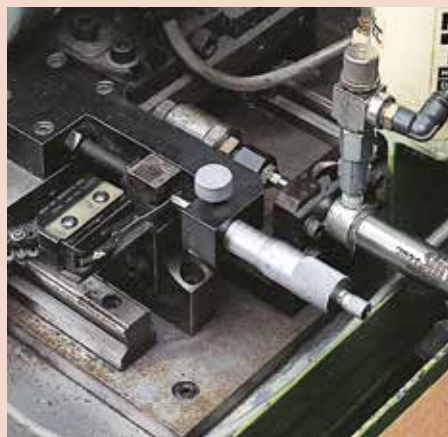
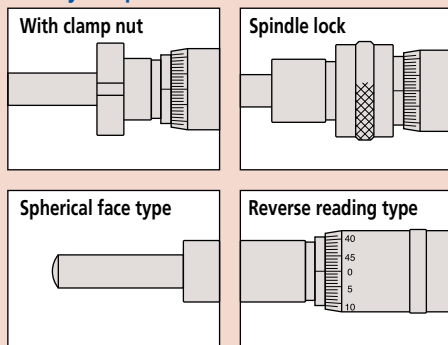


64PKA152

Order No.64PKA152 (Digimatic Tool Kit)	
Item No.	Description
293-185-30	Digimatic Micrometer (Friction Thimble Type) (Range: 0 - 1" / 0 - 25.4mm, LCD Resolution: .00005" / 0.001mm)
500-196-30	Digimatic Caliper with Absolute Encoder (Range: 0 - 6" / 0 - 150mm, LCD Resolution: .0005" / 0.001mm)
64PPP932	Mahogany Case

Micrometer Head Selection Guide

Variety of Specifications



The table below provides an outline of Mitutoyo micrometer heads for each series so you can locate the pages to refer to select the micrometer head most appropriate to your specific application. When selecting consider the following points:

- Dimensions
- Graduation/resolution and accuracy
- With or without spindle lock
- With or without clamping nut
- Normal or reverse reading
- With or without ratchet stop

SELECTION TABLE

Range	Series	Remarks	Page
0 - 1mm	110	Differential screw translator (extra-fine feeding) type	B-69
0 - 2.5mm	110	Differential screw translator (extra-fine feeding) type	B-69
0 - 5mm	148	Ultra-small type	B-60
0 - 6.5mm	148	Fine spindle feeding of 0.1mm/rev.	B-58
	148	Fine spindle feeding of 0.25mm/rev.	B-59
	148	Small type	B-60
	148	Large thimble diameter for easy reading	B-61
0 - 10mm	152	Fine-feeding type	B-68
0 - 13mm	148	Common type in small size	B-62
	148	Spindle feeding of 0.25mm/rev.	B-59
	148	Zero-adjustable thimble type	B-63
	148	Large thimble diameter for easy reading	B-61
	110	Differential screw translator (extra-fine feeding) type	B-69
0 - 15mm	149	with carbide-tipped spindle type	B-64
	153	Non-rotating spindle type	B-67
	152	Quick spindle feeding of 1mm/rev.	B-68
0 - 25mm	350	Compact digital type	B-57
	150	Common type in middle size	B-65
	153	Non-rotating spindle type	B-67
	153	Fine graduation type	B-71
	151	Heavy-duty type (ø8mm spindle)	B-66
	152	Quick spindle feeding of 1mm/rev.	B-68
	152	Fine feeding type	B-68
	152	for XY-stage	B-70
	250	with digit counter type	B-73
0 - 50mm	164	Digital type	B-56
	151	Heavy-duty type (ø8mm spindle)	B-66
	152	Quick spindle feeding of 1mm/rev.	B-68
	152	Fine-feeding type	B-68
	197	Non-rotating spindle and large thimble	B-71

Digimatic Micrometer Heads

SERIES 164

FEATURES

- The display can be rotated up to 330° for easy reading in any position.
- Non-rotating spindle imparts no torque on the workpiece.



164-164

SPECIFICATIONS

Metric				Inch/Metric			
Range	Order No.	Accuracy	Mass (g)	Range	Order No.	Accuracy	Mass (g)
0 - 50mm	164-163	±3µm	490	0 - 2" / 0 - 50.8mm	164-164	±.00015"	490

Technical Data

Accuracy: Refer to the list of specifications.

Resolution: 0.001mm or .00005"/0.001mm
Display: LCD
Battery: SR44 (2 pcs.), **938882**
Battery life: 1.8 years

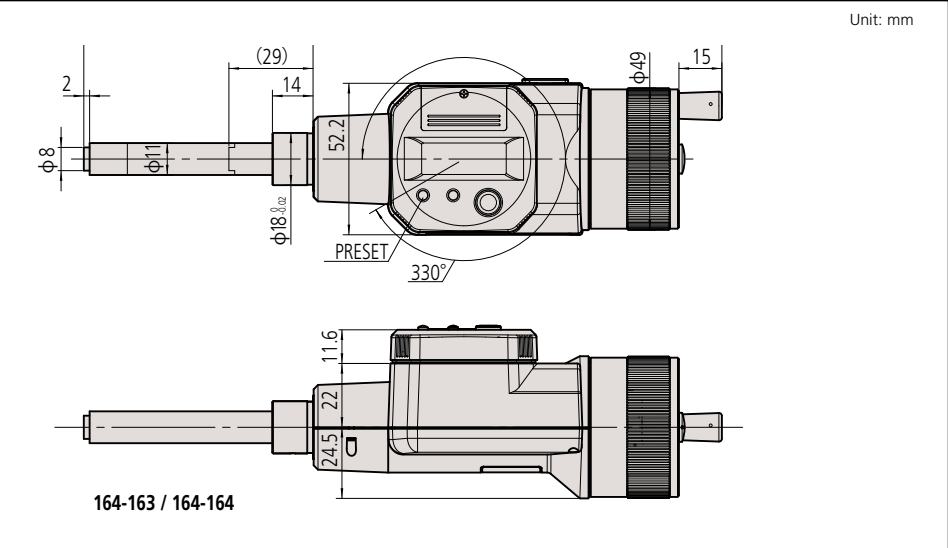
Function

Zero-setting, Data hold, Data output, Preset, inch/mm conversion (on inch/metric models only)
Alarm: Low voltage, Counting value composition error

Optional Accessories

959149: SPC cable (1m / 40")
959150: SPC cable (2m / 80")

DIMENSIONS



Digimatic Micrometer Heads

SERIES 350

FEATURES

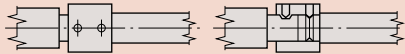
- Equipped with digital display and output.
- 350 series IP65 models: the Digimatic output port enables inclusion in a statistical process control or networked measurement system.

Measuring force: 5 - 10N

Non-rotating device

350-261-30, 350-361-30

The non-rotating device provides no radial torsion on the workpiece surface so that workpiece wear and deformation are minimized.



Technical Data

Accuracy* $\pm 2\mu\text{m}$ Metric model
 $\pm .0001"$ Inch / Metric model

Resolution: 0.001mm or .00005"/0.001mm

Display: LCD

Battery: SR44 (1 pc) 938882

Battery life: Approx. 2.4 years under normal use

Dust/Water protection level: IP65

350-281-30, 350-282-30, 350-283-30, 350-284-30, 350-261-30
350-381-30, 350-382-30, 350-383-30, 350-384-30, 350-361-30

Function

Preset, inch/mm conversion (on inch/metric models only)

Function Lock, 2 Presets

Alarm: Low voltage, Counting value composition error

Optional Accessories

05CZA662: SPC cable with data switch (1m / 40")

05CZA663: SPC cable with data switch (2m / 80")



350-251-30



350-381-30

SPECIFICATIONS

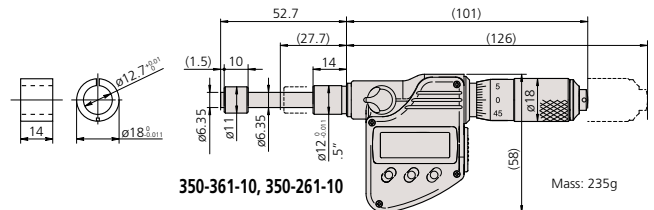
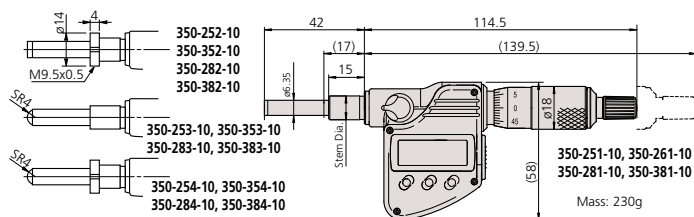
Metric					
Range	Order No.	Stem	Spindle face	Stem dia.	Remarks
0 - 25mm	350-251-30	Plain	Flat (carbide tip)	10mm	
0 - 25mm	350-252-30	w/ clamp nut	Flat (carbide tip)	10mm	
0 - 25mm	350-253-30	Plain	Spherical (SR4)	10mm	
0 - 25mm	350-254-30	w/ clamp nut	Spherical (SR4)	10mm	
0 - 25mm	350-281-30	Plain	Flat (carbide tip)	12mm	IP65
0 - 25mm	350-282-30	w/ clamp nut	Flat (carbide tip)	12mm	IP65
0 - 25mm	350-283-30	Plain	Spherical (SR4)	12mm	IP65
0 - 25mm	350-284-30	w/ clamp nut	Spherical (SR4)	12mm	IP65
0 - 25mm	350-261-30*	Plain	Flat	12mm	IP65

*with non-rotating device and 18mm stem bushing.

Inch/Metric					
Range	Order No.	Stem	Spindle face	Stem dia.	Remarks
0 - 1" / 0-25.4mm	350-351-30	Plain	Flat (carbide tip)	.375"	
0 - 1" / 0-25.4mm	350-352-30	w/ clamp nut	Flat (carbide tip)	.375"	
0 - 1" / 0-25.4mm	350-353-30	Plain	Spherical (SR4)	.375"	
0 - 1" / 0-25.4mm	350-354-30	w/ clamp nut	Spherical (SR4)	.375"	
0 - 1" / 0-25.4mm	350-381-30	Plain	Flat (carbide tip)	.5"	IP65
0 - 1" / 0-25.4mm	350-382-30	w/ clamp nut	Flat (carbide tip)	.5"	IP65
0 - 1" / 0-25.4mm	350-383-30	Plain	Spherical (SR4)	.5"	IP65
0 - 1" / 0-25.4mm	350-384-30	w/ clamp nut	Spherical (SR4)	.5"	IP65
0 - 1" / 0-25.4mm	350-361-30*	Plain	Flat	.5"	IP65

*with non-rotating device and 18mm stem bushing.

DIMENSIONS AND MASS

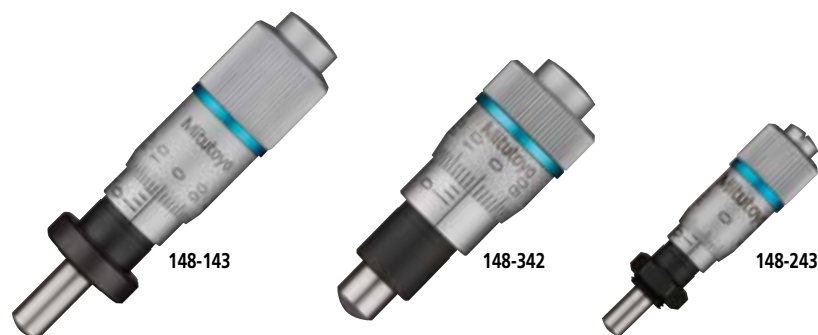


Micrometer Heads

SERIES 148 — Fine Spindle Feeding of 0.1mm/rev

FEATURES

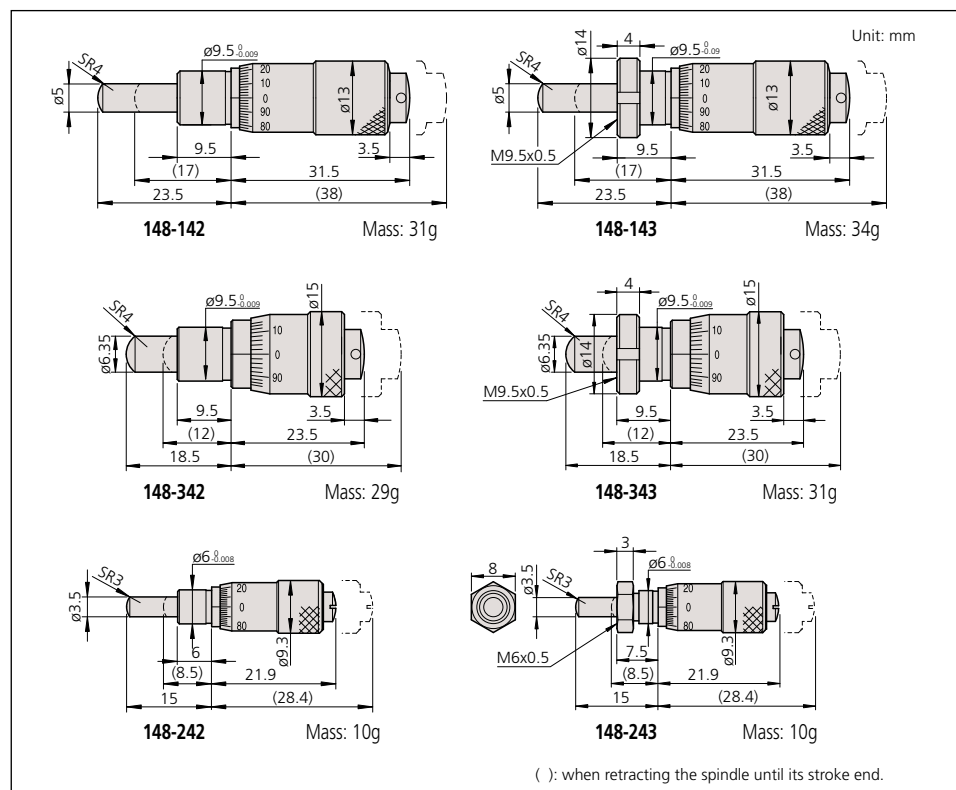
- Fine spindle feeding of just 0.1mm/rev for extra-fine adjustment and positioning.
- External dimensions are compatible with conventional 0.5mm pitch heads.



SPECIFICATIONS

Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 6.5mm	148-142	±2μm	9.5mm	Plain	Spherical (SR4)	—
0 - 6.5mm	148-143	±2μm	9.5mm	w/clamp nut	Spherical (SR4)	—
0 - 6.5mm	148-342	±2μm	9.5mm	Plain	Spherical (SR4)	Thicker & shorter thimble
0 - 6.5mm	148-343	±2μm	9.5mm	w/clamp nut	Spherical (SR4)	Thicker & shorter thimble
0 - 6.5mm	148-242	±5μm	6mm	Plain	Spherical (SR3)	Small thimble diameter
0 - 6.5mm	148-243	±5μm	6mm	w/clamp nut	Spherical (SR3)	Small thimble diameter

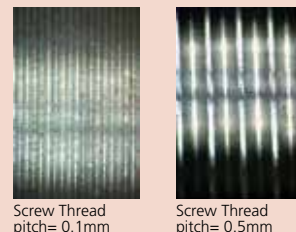
DIMENSIONS AND MASS



Technical Data

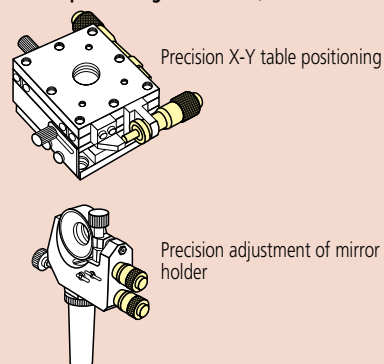
Graduations: 0.002mm
 Spindle pitch: 0.1mm
 Spindle face: Spherical of SKS3 (more than HRC60), lapped surface
 Scale surface: Hard-chrome plating
 Fixture thickness for clamp nut: 6mm (148-243: 4mm)

Spindle pitch

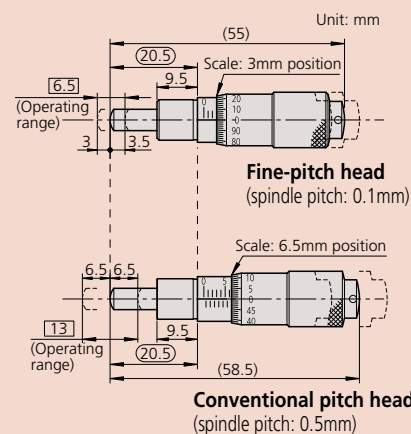


Applications

Semiconductor wafer positioning machinery and optical component alignment units, etc.



Comparison of mounting dimensions between a standard fine-pitch head and a standard conventional pitch head at the mid-range travel position.



While the fine-pitch micrometer head has a measuring range of 6.5mm, the conventional head has a larger range of 13mm. When replacing a conventional head, the fine-pitch type can use the common range in the middle of the spindle travel. The standard and compact types of fine-pitch head are completely interchangeable.

Micrometer Heads

SERIES 148 — Fine Spindle Feeding of 0.25 mm / rev

Technical Data

Graduations: 0.01mm
 Spindle pitch: 0.25mm
 Spindle face: Spherical of SKS3 (more than HRC60), lapped surface
 Scale surface: Hard-chrome plating
 Fixture thickness for clamp nut: 6mm

FEATURES

- Fine spindle feeding of just 0.25mm/rev for fine adjustment and positioning.

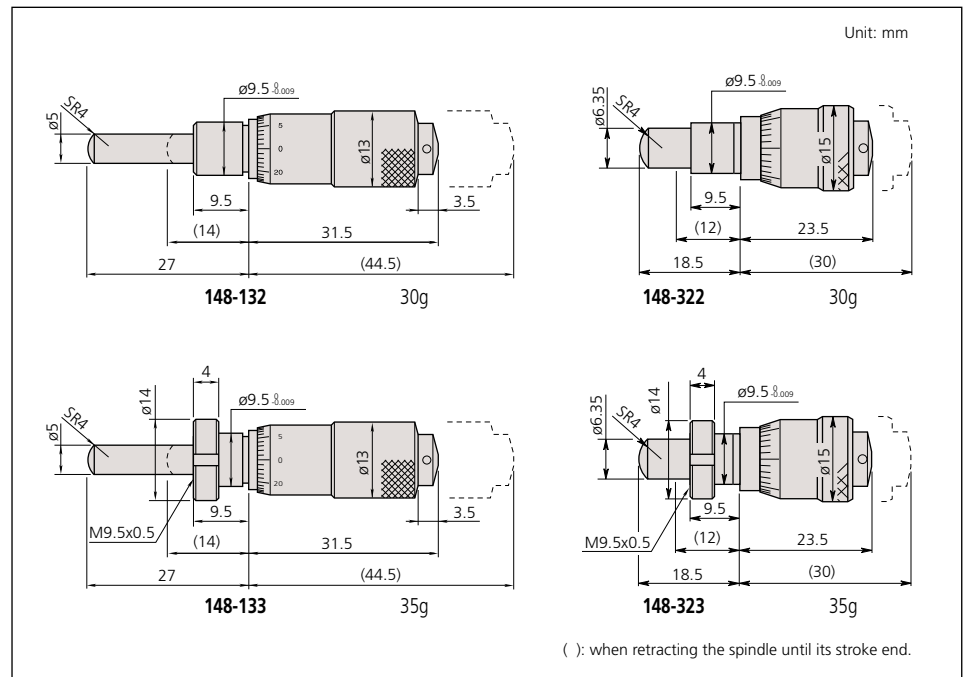


148-132

SPECIFICATIONS

Metric					
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face
0 - 13mm	148-132	2μm	9.5mm	Plain	Spherical (SR4)
0 - 13mm	148-133	2μm	9.5mm	w/clamp nut	Spherical (SR4)
0 - 6.5mm	148-322	2μm	9.5mm	Plain	Spherical (SR4)
0 - 6.5mm	148-323	2μm	9.5mm	w/ clamp nut	Spherical (SR4)

DIMENSIONS AND MASS



Micrometer Heads

SERIES 148 — Ultra-Small/Small Type

FEATURES

- Miniature micrometer heads for ease of incorporating into machines.

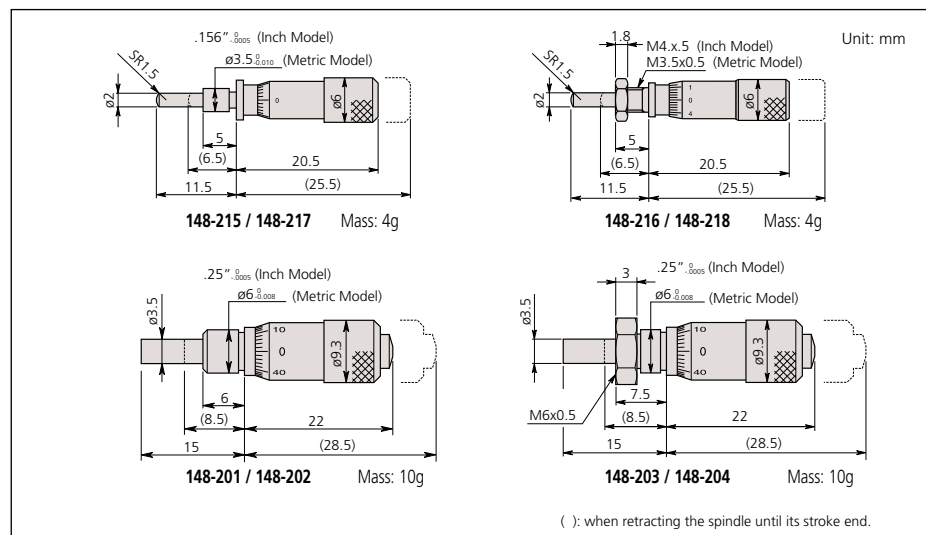


SPECIFICATIONS

Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 5mm	148-215	±5μm	3.5mm	Plain	Spherical (SR1.5)	—
0 - 5mm	148-216	±5μm	3.5mm	w/clamp nut	Spherical (SR1.5)	—
0 - 6.5mm	148-201	±5μm	6mm	Plain	Flat	—
0 - 6.5mm	148-203	±5μm	6mm	w/clamp nut	Flat	—
0 - 6.5mm	148-205	±5μm	6mm	Plain	Spherical (SR3)	—
0 - 6.5mm	148-207	±5μm	6mm	w/clamp nut	Spherical (SR3)	—
6.5 - 0 mm	148-209	±5μm	6mm	Plain	Flat	Reverse reading
6.5 - 0 mm	148-211	±5μm	6mm	w/ clamp nut	Flat	Reverse reading

Inch						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - .2"	148-217	±5μm	.156"	Plain	Spherical (SR1.5)	—
0 - .2"	148-218	±5μm	.156"	w/clamp nut	Spherical (SR1.5)	—
0 -.25"	148-202	±5μm	.25"	Plain	Flat	—
0 -.25"	148-204	±5μm	.25"	w/clamp nut	Flat	—
0 -.25"	148-206	±5μm	.25"	Plain	Spherical (SR3)	—
0 -.25"	148-208	±5μm	.25"	w/clamp nut	Spherical (SR3)	—
.25 - 0"	148-210	±5μm	.25"	Plain	Flat	Reverse reading
.25 - 0"	148-212	±5μm	.25"	w/ clamp nut	Flat	Reverse reading

DIMENSIONS AND MASS



Technical Data

Graduations: 0.02mm (**148-215, 148-216**), 0.01mm or .001"
 Spindle pitch: 0.5mm
 Spindle face: Flat or spherical of SKS3 (more than HRC60),
 lapped surface
 Scale surface: Hard-chrome plating
 Fixture thickness for clamp nut: 3mm (**148-216, 148-218**),
 4mm



Micrometer Heads

SERIES 148 — Large Thimble Diameter for Easy Reading

FEATURES

- Easy reading due to the large thimble diameter. (Three types of thimble diameters can be selected.)

SPECIFICATIONS

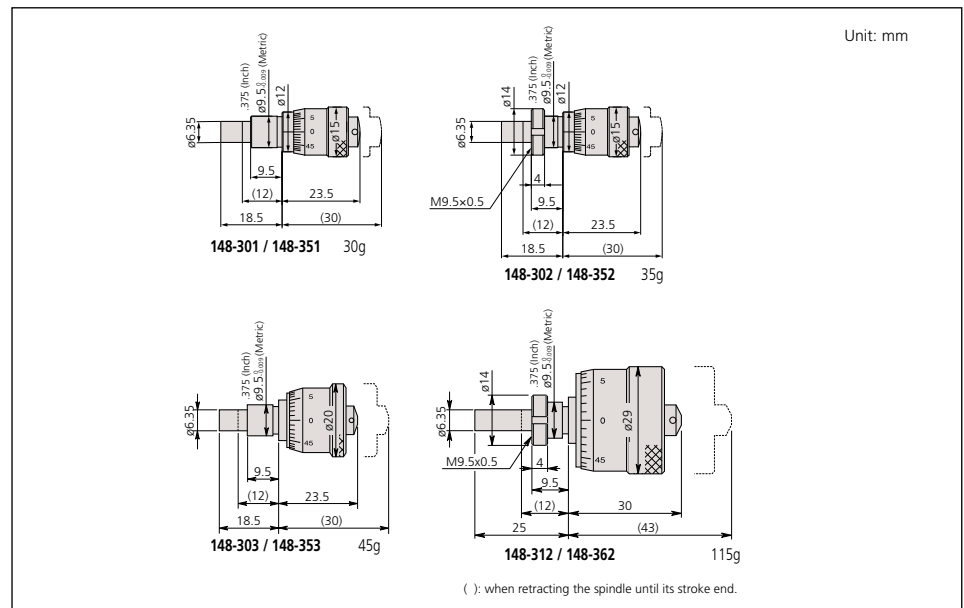
Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Thimble Dia.
0 - 6.5mm	148-301	±2μm	9.5mm	Plain	Flat	15mm
0 - 6.5mm	148-302	±2μm	9.5mm	w/clamp nut	Flat	15mm
0 - 6.5mm	148-303	±2μm	9.5mm	Plain	Flat	20mm
0 - 6.5mm	148-304	±2μm	9.5mm	w/clamp nut	Flat	20mm
0 - 6.5mm	148-305	±2μm	9.5mm	Plain	Flat	29mm
0 - 6.5mm	148-306	±2μm	9.5mm	w/clamp nut	Flat	29mm
0 - 13mm	148-307	±2μm	9.5mm	Plain	Flat	15mm
0 - 13mm	148-308	±2μm	9.5mm	w/clamp nut	Flat	15mm
0 - 13mm	148-309	±2μm	9.5mm	Plain	Flat	20mm
0 - 13mm	148-310	±2μm	9.5mm	w/clamp nut	Flat	20mm
0 - 13mm	148-311	±2μm	9.5mm	Plain	Flat	29mm
0 - 13mm	148-312	±2μm	9.5mm	w/ clamp nut	Flat	29mm

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Thimble Dia.
0 - .25"	148-351	±.0001"	.375"	Plain	Flat	.59"
0 - .25"	148-352	±.0001"	.375"	w/clamp nut	Flat	.59"
0 - .25"	148-353	±.0001"	.375"	Plain	Flat	.79"
0 - .25"	148-354	±.0001"	.375"	w/clamp nut	Flat	.79"
0 - .25"	148-355	±.0001"	.375"	Plain	Flat	1.14"
0 - .25"	148-356	±.0001"	.375"	w/clamp nut	Flat	1.14"
0 - .5"	148-357	±.0001"	.375"	Plain	Flat	.59"
0 - .5"	148-358	±.0001"	.375"	w/clamp nut	Flat	.59"
0 - .5"	148-359	±.0001"	.375"	Plain	Flat	.79"
0 - .5"	148-360	±.0001"	.375"	w/clamp nut	Flat	.79"
0 - .5"	148-361	±.0001"	.375"	Plain	Flat	1.14"
0 - .5"	148-362	±.0001"	.375"	w/ clamp nut	Flat	1.14"

DIMENSIONS AND MASS



Technical Data

Graduations: 0.01mm or .001"
 Spindle pitch: 0.5mm or .025"
 Spindle face: Flat of SKS3 (more than HRC60),
 lapped surface
 Scale surface: Hard-chrome plating
 Fixture thickness for clamp nut: 6mm

Micrometer Heads

SERIES 148 — Common Type in Small Size

SPECIFICATIONS

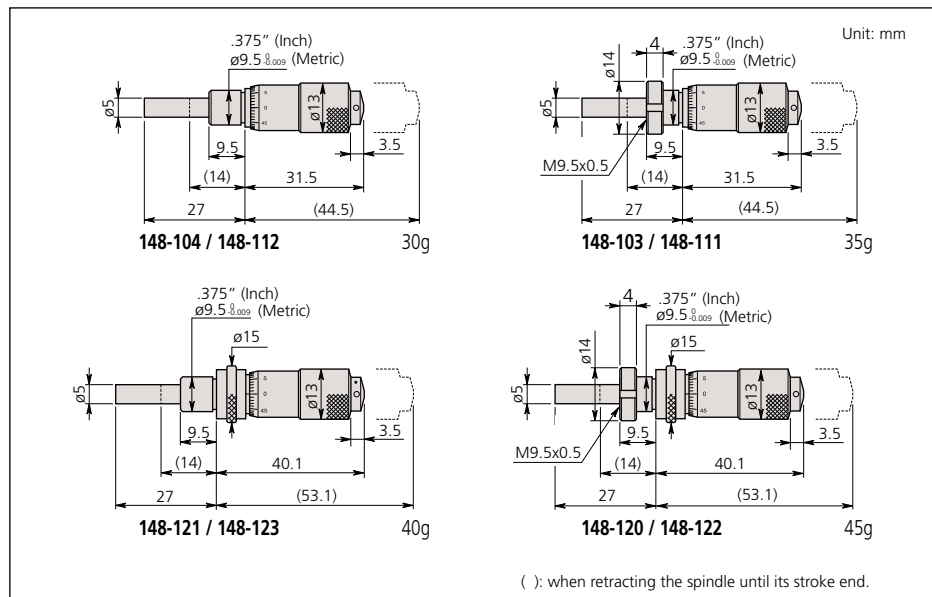
Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 13mm	148-104	±2μm	9.5mm	Plain	Flat	—
0 - 13mm	148-103	±2μm	9.5mm	w/clamp nut	Flat	—
0 - 13mm	148-121	±2μm	9.5mm	Plain*	Flat	—
0 - 13mm	148-120	±2μm	9.5mm	w/clamp nut*	Flat	—
0 - 13mm	148-801	±2μm	9.5mm	Plain	Spherical (SR4)	—
0 - 13mm	148-802	±2μm	9.5mm	w/clamp nut	Spherical (SR4)	—
0 - 13mm	148-803	±2μm	9.5mm	Plain*	Spherical (SR4)	—
0 - 13mm	148-804	±2μm	9.5mm	w/clamp nut*	Spherical (SR4)	—
13mm - 0	148-821	±2μm	9.5mm	Plain	Flat	Reverse reading
13mm - 0	148-822	±2μm	9.5mm	w/clamp nut	Flat	Reverse reading
13mm - 0	148-823	±2μm	9.5mm	Plain*	Flat	Reverse reading
13mm - 0	148-824	±2μm	9.5mm	w/ clamp nut*	Flat	Reverse reading

*with spindle lock

Inch						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - .5"	148-112	±.0001"	.375"	Plain	Flat	—
0 - .5"	148-111	±.0001"	.375"	w/clamp nut	Flat	—
0 - .5"	148-123	±.0001"	.375"	Plain*	Flat	—
0 - .5"	148-122	±.0001"	.375"	w/clamp nut*	Flat	—
0 - .5"	148-811	±.0001"	.375"	Plain	Spherical (SR4)	—
0 - .5"	148-812	±.0001"	.375"	w/clamp nut	Spherical (SR4)	—
0 - .5"	148-813	±.0001"	.375"	Plain*	Spherical (SR4)	—
0 - .5"	148-814	±.0001"	.375"	w/clamp nut*	Spherical (SR4)	—
.5" - 0	148-831	±.0001"	.375"	Plain	Flat	Reverse reading
.5" - 0	148-832	±.0001"	.375"	w/clamp nut	Flat	Reverse reading
.5" - 0	148-833	±.0001"	.375"	Plain*	Flat	Reverse reading
.5" - 0	148-834	±.0001"	.375"	w/ clamp nut*	Flat	Reverse reading

*with spindle lock

DIMENSIONS AND MASS



148-103



148-104



148-121



148-120

Technical Data

Graduations: 0.01mm or .001"

Spindle pitch: 0.5mm

Spindle face: Flat or spherical of SKS3 (more than HR60), lapped surface

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 6mm

Micrometer Heads

SERIES 148 — Common Type in Small Size with Zero-Adjustable Thimble

FEATURES

- The thimble can be set to zero at any position by loosening the set screw.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 13mm	148-503	±2μm	9.5mm	Plain	Flat	—
0 - 13mm	148-513	±2μm	9.5mm	Plain	Flat	Stainless steel throughout
0 - 13mm	148-508	±2μm	9.5mm	w/clamp nut	Flat	—
0 - 13mm	148-506	±2μm	9.5mm	Plain*	Flat	—
0 - 13mm	148-504	±2μm	9.5mm	w/clamp nut*	Flat	—
0 - 13mm	148-853	±2μm	9.5mm	Plain	Spherical (SR4)	—
0 - 13mm	148-854	±2μm	9.5mm	w/clamp nut*	Spherical (SR4)	—
13mm - 0	148-863	±2μm	9.5mm	Plain	Flat	Reverse reading
13mm - 0	148-864	±2μm	9.5mm	w/ clamp nut*	Flat	Reverse reading

*with spindle lock

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - .5"	148-501	±.0001"	.375"	Plain	Flat	—
0 - .5"	148-511	±.0001"	.375"	Plain	Flat	Stainless steel throughout
0 - .5"	148-507	±.0001"	.375"	w/clamp nut	Flat	—
0 - .5"	148-505	±.0001"	.375"	Plain*	Flat	—
0 - .5"	148-502	±.0001"	.375"	w/clamp nut*	Flat	—
0 - .5"	148-851	±.0001"	.375"	Plain	Spherical (SR4)	—
0 - .5"	148-852	±.0001"	.375"	w/clamp nut*	Spherical (SR4)	—
.5" - 0	148-861	±.0001"	.375"	Plain	Flat	Reverse reading
.5" - 0	148-862	±.0001"	.375"	w/ clamp nut*	Flat	Reverse reading

*with spindle lock

Technical Data

Graduations: 0.01mm or .001"

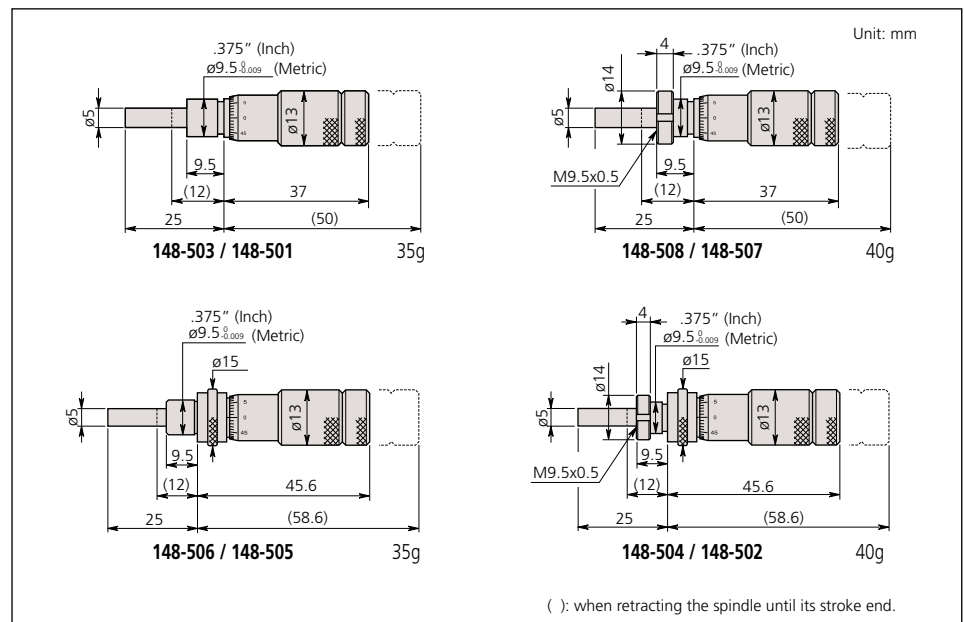
Spindle pitch: 0.5mm

Spindle face: Flat or spherical of SKS3 (more than HRC60), lapped surface

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 6mm

DIMENSIONS AND MASS



Micrometer Heads

SERIES 149 — Common Type in Small Size with Carbide-tipped Spindle

FEATURES

- Carbide-tipped measuring face.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 15mm	149-132	±2μm	9.5mm	Plain	Flat (carbide tip)	—
0 - 15mm	149-131	±2μm	9.5mm	w/clamp nut	Flat (carbide tip)	—
0 - 15mm	149-183	±2μm	9.5mm	Plain*	Flat (carbide tip)	With spindle lock
0 - 15mm	149-184	±2μm	9.5mm	w/clamp nut*	Flat (carbide tip)	With spindle lock
0 - 15mm	149-801	±2μm	9.5mm	Plain	Spherical (SR4)	—
0 - 15mm	149-802	±2μm	9.5mm	w/clamp nut	Spherical (SR4)	—
15mm - 0	149-821	±2μm	9.5mm	Plain	Flat (carbide tip)	Reverse reading
15mm - 0	149-822	±2μm	9.5mm	w/ clamp nut	Flat (carbide tip)	Reverse reading

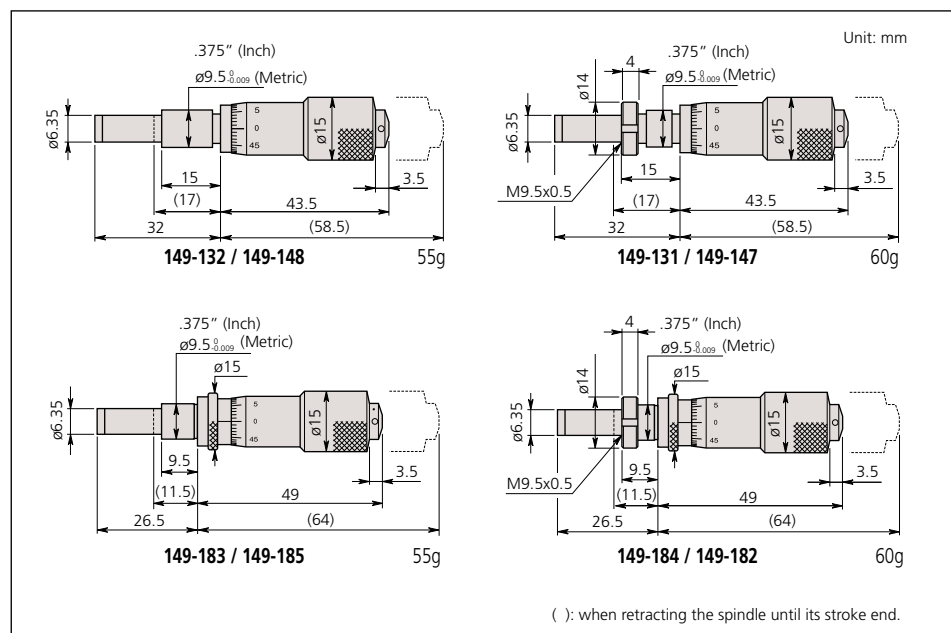
*with spindle lock.

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - .5"	149-148	±.0001"	.375"	Plain	Flat (carbide tip)	—
0 - .5"	149-147	±.0001"	.375"	w/clamp nut	Flat (carbide tip)	—
0 - .5"	149-185	±.0001"	.375"	Plain*	Flat (carbide tip)	With spindle lock
0 - .5"	149-182	±.0001"	.375"	w/clamp nut*	Flat (carbide tip)	With spindle lock
0 - .5"	149-811	±.0001"	.375"	Plain	Spherical (SR4)	—
0 - .5"	149-812	±.0001"	.375"	w/clamp nut	Spherical (SR4)	—
.5" - 0	149-831	±.0001"	.375"	Plain	Flat (carbide tip)	Reverse reading
.5" - 0	149-832	±.0001"	.375"	w/ clamp nut	Flat (carbide tip)	Reverse reading

*with spindle lock.

DIMENSIONS AND MASS



149-132



149-184

Technical Data

Graduations: 0.01mm or .001"

Spindle pitch: 0.5mm

Spindle face: Flat with carbide tip (more than HRA90) or spherical, lapped surface

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 6mm

(149-131, 149-147: 11.5mm)

Micrometer Heads

SERIES 150 — Common Type in Middle Size

FEATURES

- Ratchet stop for constant force.
- Long spindle type is available for a variety of applications.
- Carbide-tipped measuring face.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 25mm	150-192	±2μm	10mm	Plain	Flat (carbide tip)	—
0 - 25mm	150-191	±2μm	10mm	w/clamp nut	Flat (carbide tip)	—
0 - 25mm	150-209	±2μm	10mm	Plain*	Flat (carbide tip)	—
0 - 25mm	150-210	±2μm	10mm	w/clamp nut*	Flat (carbide tip)	—
0 - 25mm	150-801	±2μm	10mm	Plain	Spherical (SR4)	—
0 - 25mm	150-802	±2μm	10mm	w/clamp nut	Spherical (SR4)	—
0 - 25mm	150-821	±2μm	10mm	Plain	Flat (carbide tip)	Reverse reading
0 - 25mm	150-822	±2μm	10mm	w/clamp nut	Flat (carbide tip)	Reverse reading
0 - 25mm	150-190	±2μm	10mm	Plain	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	150-189	±2μm	10mm	w/clamp nut	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	150-196	±2μm	10mm	Plain*	Flat (carbide tip)	w/ vernier (.0001mm)
0 - 25mm	150-195	±2μm	10mm	w/clamp nut	Flat (carbide tip)	w/ vernier (.0001mm)
0 - 25mm	150-211	±2μm	10mm	Plain*	Flat (carbide tip)	w/o ratchet stop
0 - 25mm	150-212	±2μm	10mm	w/clamp nut*	Flat (carbide tip)	w/o ratchet stop
0 - 25mm	150-219	±2μm	10mm	Plain	Flat	Long spindle
0 - 25mm	150-220	±2μm	10mm	w/ clamp nut	Flat	Long spindle

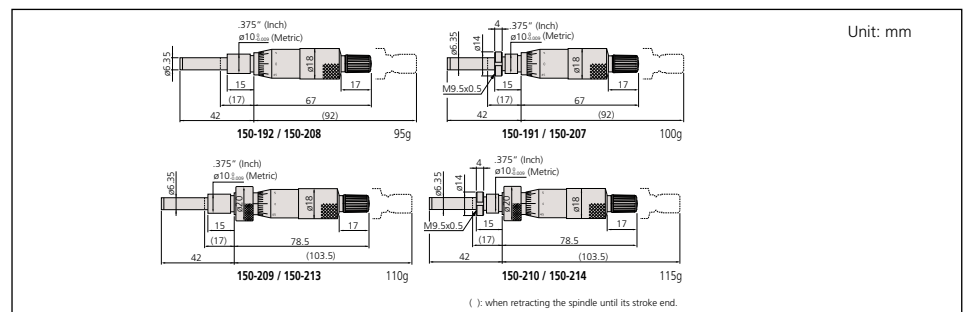
*with spindle lock

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	150-208	±.0001"	.375"	Plain	Flat (carbide tip)	—
0 - 1"	150-198	±.0001"	.375"	Plain	Flat (carbide tip)	w/o ratchet stop
0 - 1"	150-207	±.0001"	.375"	w/clamp nut	Flat (carbide tip)	—
0 - 1"	150-197	±.0001"	.375"	w/clamp nut	Flat (carbide tip)	w/o ratchet stop
0 - 1"	150-213	±.0001"	.375"	Plain*	Flat (carbide tip)	—
0 - 1"	150-214	±.0001"	.375"	w/clamp nut*	Flat (carbide tip)	—
0 - 1"	150-811	±.0001"	.375"	Plain	Spherical (SR4)	—
0 - 1"	150-812	±.0001"	.375"	w/clamp nut	Spherical (SR4)	—
0 - 1"	150-831	±.0001"	.375"	Plain	Flat (carbide tip)	Reverse reading
0 - 1"	150-832	±.0001"	.375"	w/clamp nut	Flat (carbide tip)	Reverse reading
0 - 1"	150-206	±.0001"	.375"	Plain	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	150-205	±.0001"	.375"	w/clamp nut	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	150-215	±.0001"	.375"	Plain*	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	150-216	±.0001"	.375"	w/clamp nut*	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	150-217	±.0001"	.375"	Plain*	Flat (carbide tip)	w/o ratchet stop
0 - 1"	150-218	±.0001"	.375"	w/clamp nut*	Flat (carbide tip)	w/o ratchet stop
0 - 1"	150-221	±.0001"	.375"	Plain	Flat	Long spindle
0 - 1"	150-222	±.0001"	.375"	w/ clamp nut	Flat	Long spindle

*with spindle lock

DIMENSIONS AND MASS



150-801



150-191

Technical Data

Graduations: 0.01mm, 0.001mm, .001" or .0001"
 Spindle pitch: 0.5mm
 Spindle face: Flat with carbide tip* (more than HRA90) or
 spherical, lapped surface
 *Long spindle type: SKS3 (more than HRC60)
 Scale surface: Hard-chrome plating
 Fixture thickness for clamp nut: 11.5mm

Micrometer Heads

SERIES 151 — Common Type in Middle Size with 8mm Diameter Spindle

FEATURES

- 8mm diameter spindle for heavy-duty use.
- Ratchet stop for constant force.
- Carbide-tipped measuring face.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 25mm	151-224	±2μm	12mm	Plain	Flat (carbide tip)	—
0 - 25mm	151-223	±2μm	12mm	w/clamp nut	Flat (carbide tip)	—
0 - 25mm	151-214	±2μm	12mm	Plain*	Flat (carbide tip)	—
0 - 25mm	151-213	±2μm	12mm	w/clamp nut*	Flat (carbide tip)	—
0 - 25mm	151-222	±2μm	12mm	Plain	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	151-221	±2μm	12mm	w/clamp nut	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	151-212	±2μm	12mm	Plain*	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	151-211	±2μm	12mm	w/clamp nut*	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	151-227	±2μm	12mm	Plain	Flat (carbide tip)	w/o ratchet stop
0 - 25mm	151-228	±2μm	12mm	w/clamp nut	Flat (carbide tip)	w/o ratchet stop
0 - 25mm	151-225	±2μm	12mm	Plain*	Flat (carbide tip)	w/o ratchet stop
0 - 25mm	151-226	±2μm	12mm	w/clamp nut*	Flat (carbide tip)	w/o ratchet stop
0 - 50mm	151-256	±4μm	12mm	Plain	Flat (carbide tip)	—
0 - 50mm	151-255	±4μm	12mm	w/clamp nut	Flat (carbide tip)	—
0 - 50mm	151-260	±4μm	12mm	Plain	Flat (carbide tip)	w/o ratchet stop
0 - 50mm	151-259	±4μm	12mm	w/ clamp nut	Flat (carbide tip)	w/o ratchet stop

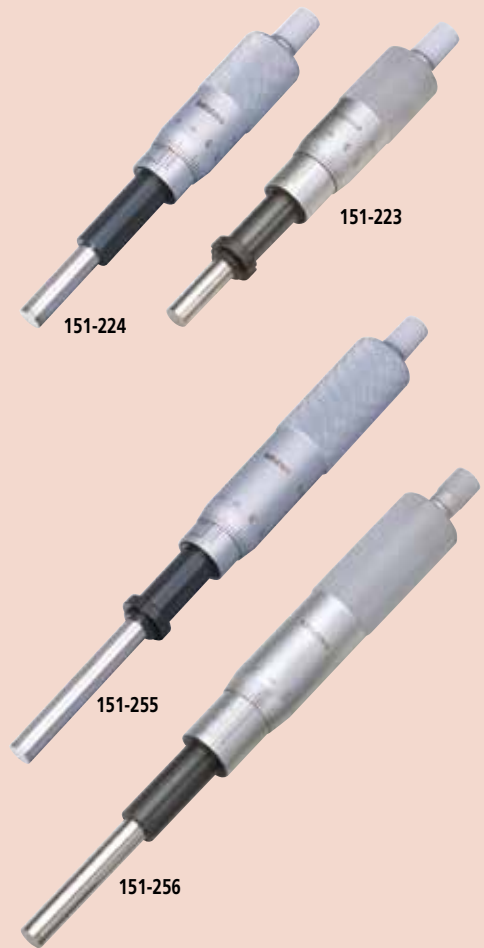
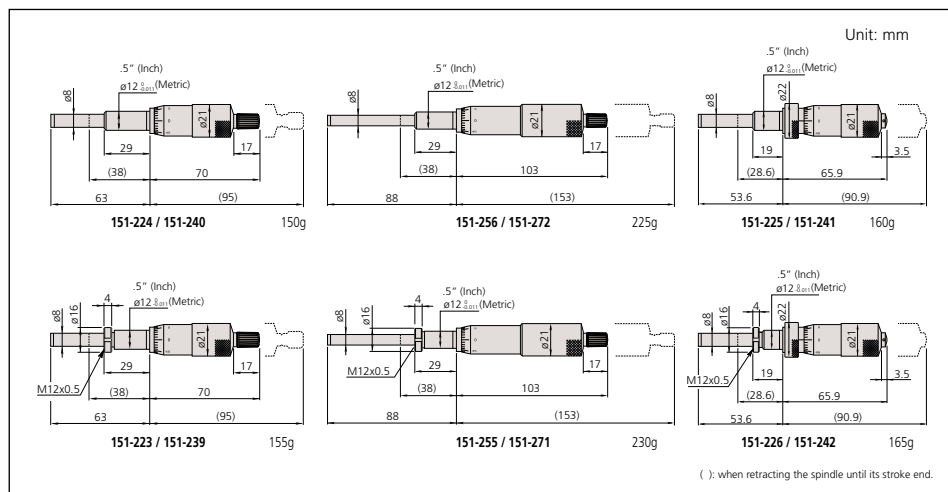
*with spindle lock

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	151-240	±.0001"	.5"	Plain	Flat (carbide tip)	—
0 - 1"	151-239	±.0001"	.5"	w/clamp nut	Flat (carbide tip)	—
0 - 1"	151-238	±.0001"	.5"	Plain	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	151-237	±.0001"	.5"	w/clamp nut	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	151-243**	±.0001"	.5"	Plain*	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	151-244**	±.0001"	.5"	w/clamp nut*	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	151-241	±.0001"	.5"	Plain*	Flat (carbide tip)	w/o ratchet stop
0 - 1"	151-242	±.0001"	.5"	w/clamp nut*	Flat (carbide tip)	w/o ratchet stop
0 - 2"	151-272	±.0002"	.5"	Plain	Flat (carbide tip)	—
0 - 2"	151-271	±.0002"	.5"	w/clamp nut	Flat (carbide tip)	—

*with spindle lock **with ratchet stop

DIMENSIONS AND MASS



Technical Data

Graduations: 0.01mm, 0.001mm, .001" or .0001"

Spindle pitch: 0.5mm

Spindle face: Flat with carbide tip (more than HRA90), lapped surface

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 25.5mm

Micrometer Heads

SERIES 153 — Non-rotating Spindle Type

FEATURES

- Carbide-tipped measuring face.
- Non-rotating spindle.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 15mm	153-101	±3μm	9.5mm	Plain	Flat (carbide tip)	—
0 - 25mm	153-201*	±3μm	12mm	Plain	Flat (carbide tip)	—
0 - 25mm	153-202*	±3μm	12mm	Plain	Flat (carbide tip)	w/ vernier (0.001mm)
0 - 25mm	153-203	±3μm	12mm	Plain	Flat (carbide tip)	—
0 - 25mm	153-204	±3μm	12mm	Plain	Flat (carbide tip)	w/ vernier (0.001mm)

*with ratchet stop

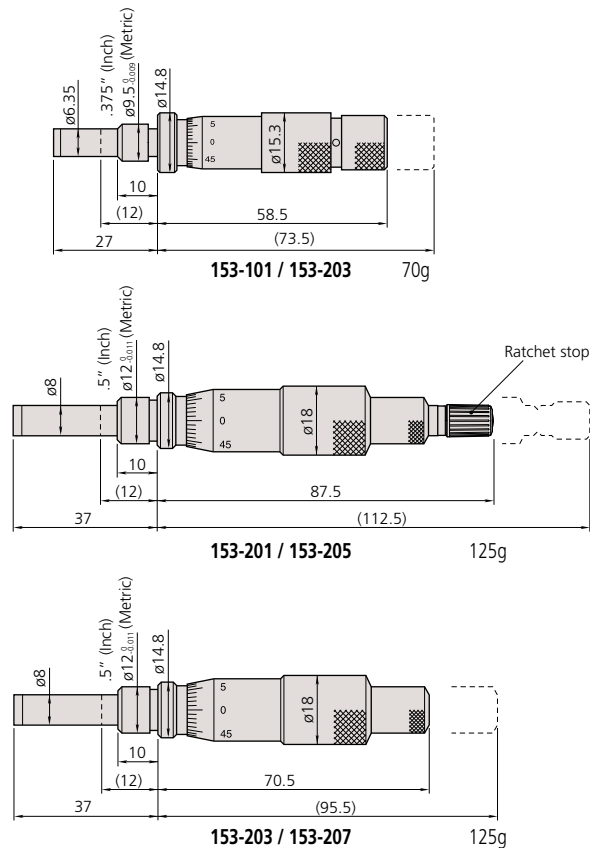
Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - .5"	153-108	±.00015"	.375"	Plain	Flat (carbide tip)	—
0 - 1"	153-205*	±.00015"	.5"	Plain	Flat (carbide tip)	—
0 - 1"	153-206*	±.00015"	.5"	Plain	Flat (carbide tip)	w/ vernier (.0001")
0 - 1"	153-207	±.00015"	.5"	Plain	Flat (carbide tip)	—
0 - 1"	153-208	±.00015"	.5"	Plain	Flat (carbide tip)	w/ vernier (.0001")

*with ratchet stop

DIMENSIONS AND MASS

Unit: mm



() : when retracting the spindle until its stroke end.



Technical Data

Graduations: 0.01mm, 0.001mm, .001" or .0001"

Spindle pitch: 0.5mm

Spindle face: Flat with carbide tip (more than HRA90), lapped surface

Scale surface: Hard-chrome plating

Micrometer Heads

SERIES 152 — Quick Spindle Feeding of 1mm/rev.

FEATURES

- Quick spindle feeding of 1mm/rev.
- Carbide-tipped measuring face.



152-102

SPECIFICATIONS

Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 15mm	152-101	±2μm	12mm	Plain	Flat (carbide tip)	—
0 - 25mm	152-102	±2μm	12mm	Plain	Flat (carbide tip)	—
0 - 50mm	152-103	±4μm	12mm	Plain	Flat (carbide tip)	—

Technical Data

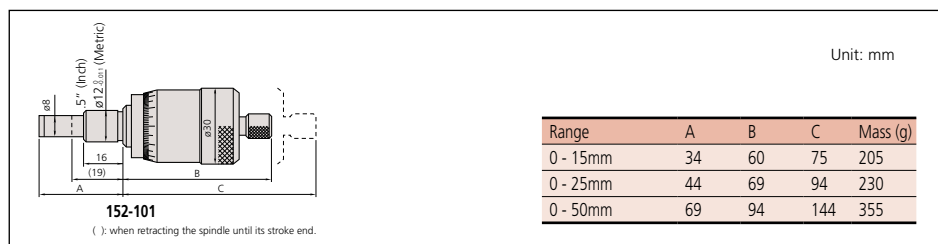
Graduations: 0.01mm

Spindle pitch: 1mm

Spindle face: Flat with carbide tip (more than HRA90), lapped surface

Scale surface: Hard-chrome plating

DIMENSIONS AND MASS



Micrometer Heads

SERIES 152 — Large Thimble Type for Fine Feeding

FEATURES

- The large diameter thimble for fine adjustment and positioning.
- Carbide-tipped measuring face.

SPECIFICATIONS

Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 10mm	152-283	±2μm	12mm	w/clamp nut	Flat (carbide tip)	—
0 - 25mm	152-332	±2μm	12mm	Plain	Flat (carbide tip)	—
0 - 25mm	152-348	±2μm	12mm	Plain	Flat (carbide tip)	Bidirectional graduation
0 - 50mm	152-380	±4μm	12mm	Plain	Flat (carbide tip)	Bidirectional graduation

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	152-372	±.0001"	.5"	Plain	Flat (carbide tip)	Bidirectional graduation
0 - 2"	152-388	±.0002"	.5"	Plain	Flat (carbide tip)	Bidirectional graduation



152-283

Technical Data

Graduations: 0.002mm or .0001"

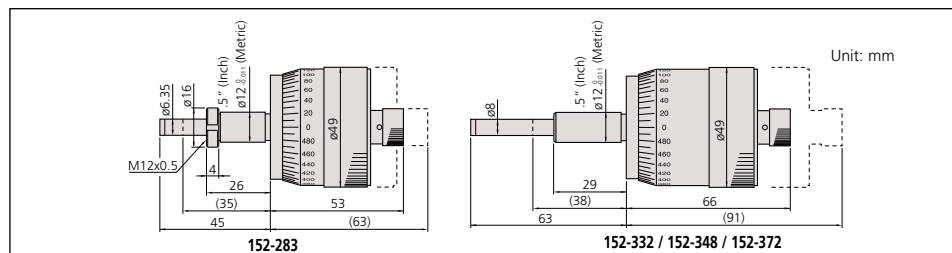
Spindle pitch: 1mm

Spindle face: Flat with carbide tip (more than HRA90), lapped surface

Scale surface: White anodized aluminum

Fixture thickness for clamp nut: 22.5mm

DIMENSIONS AND MASS



Micrometer Heads

SERIES 110 — Differential Screw Translator (Extra-Fine Feeding) Type

FEATURES

- Differential movements of spindle threads and units allow fine spindle feeding (0.05mm/rev*), resulting in high-resolution measurements.

*110-502, 110-504: 0.025mm/rev / .001"/rev (fine feeding)

- Carbide-tipped measuring face.
- Non-rotating spindle.

SPECIFICATIONS

Metric

Range	Order No.	Graduation	Accuracy*	Stem dia.	Stem	Spindle face
0 - 1mm	110-105	0.001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Flat (carbide tip)
0 - 1mm	110-106	0.0001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Flat (carbide tip)
0 - 1mm	110-107	0.001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Flat (carbide tip)
0 - 1mm	110-108	0.0001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Flat (carbide tip)
0 - 2.5mm	110-101	0.001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Spherical (SR8)
0 - 2.5mm	110-102	0.0001mm	$\pm 3 / \pm 1.5\mu\text{m}$	12mm	w/clamp nut	Spherical (SR8)
0 - 13mm	110-502*	0.0005mm 0.01mm	$\pm 3 / \pm 1.5\mu\text{m}$	9.5mm	w/clamp nut	Spherical (SR3)

* Narrow range (within 1 rev.): 0.2mm

Inch

Range	Order No.	Graduation	Accuracy*	Stem dia.	Stem	Spindle face
0 - .02"	110-115	.00005"	$\pm .00015" / \pm .00006"$	.5"	w/clamp nut	Flat (carbide tip)
0 - .02"	110-116	.000005"	$\pm .00015" / \pm .00006"$	.5"	w/clamp nut	Flat (carbide tip)
0 - .02"	110-117	.00005"	$\pm .00015" / \pm .00006"$	.5"	w/clamp nut	Flat (carbide tip)
0 - .02"	110-118	.000005"	$\pm .00015" / \pm .00006"$	.5"	w/clamp nut	Flat (carbide tip)
0 - .05"	110-111	.00005"	$\pm .0002" / \pm .00006"$	.5"	w/clamp nut	Spherical (SR8)
0 - .05"	110-112	.000005"	$\pm .0002" / \pm .00006"$	.5"	w/clamp nut	Spherical (SR8)
0 - .5"	110-504*	.00002" .001"	$\pm .00015" / \pm .00006"$	.375"	w/clamp nut	Spherical (SR3)

* Narrow range (within 1 rev.): .006"

Technical Data

Graduations: 0.001mm, 0.0005mm, 0.0001mm, .00005" or .00002", .000005"

Spindle pitch: 0.05mm or 0.025mm

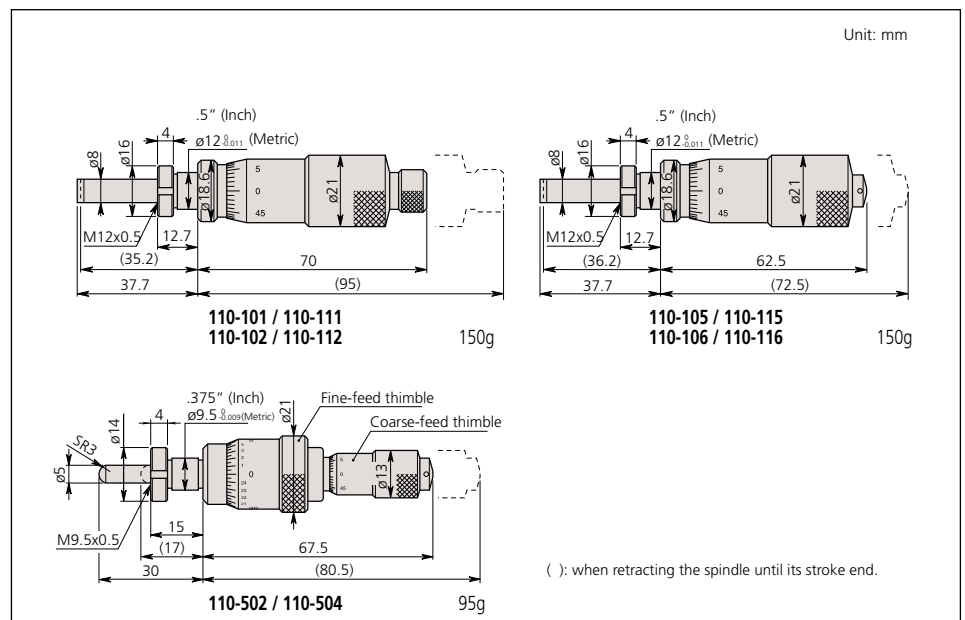
Spindle face: Flat with carbide tip (more than HRA90) or spherical, lapped surface

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 9.5mm (11.5mm*)

*110-502, 110-504

DIMENSIONS AND MASS



Micrometer Heads

SERIES 152 — for XY-Stage

FEATURES

152-390, 152-389, 152-391, 152-392

- Non-rotating device is attached to the spindle tip.
- Floating thimble allows easy zero setting at any spindle position.
- Bidirectional graduation for easy reading in both directions.

152-401, 152-402

- Adjustable spindle can be moved with the thimble and held at any position, allowing easy zero-setting.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 25mm	152-390	$\pm 2\mu\text{m}$	18mm	Plain	Flat (hardened) with non-rotating device	for X-axis, bidirectional grad.
0 - 25mm	152-389	$\pm 2\mu\text{m}$	18mm	Plain	Flat (hardened) with non-rotating device	for Y-axis, bidirectional grad.
0 - 25mm	152-402*	$\pm 2\mu\text{m}$	18mm	Plain	Spherical with carbide tip (SR10)	for X-axis, with vernier
0 - 25mm	152-401*	$\pm 2\mu\text{m}$	18mm	Plain	Spherical with carbide tip (SR10)	for Y-axis, with vernier

*0.001mm reading is obtained with vernier

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	152-392	$\pm .0001"$	.709"	Plain	Flat (hardened) with non-rotating device	for X-axis, Bidirectional grad.
0 - 1"	152-391	$\pm .0001"$	.709"	Plain	Flat (hardened) with non-rotating device	for Y-axis, Bidirectional grad.



152-390

Technical Data

Graduations: 0.005mm, 0.001mm*

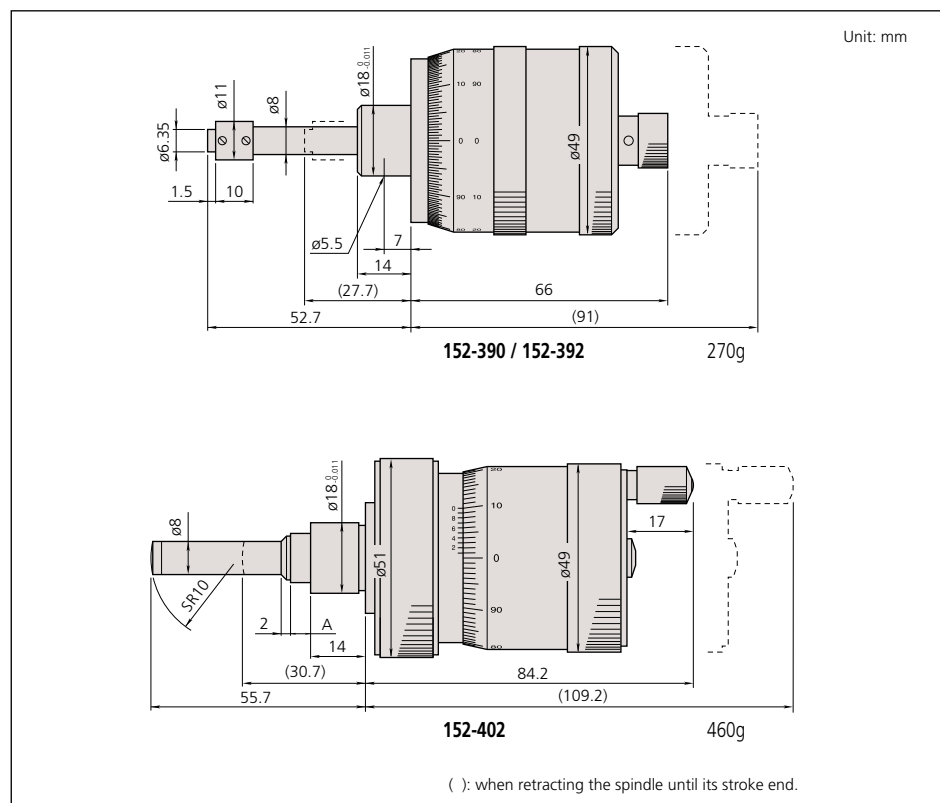
*vernier reading

Spindle pitch: 1mm

Spindle face: Flat (hardened) or spherical with carbide tip (more than HRA90), lapped surface

Scale surface: White anodized aluminum

DIMENSIONS AND MASS





197-101

Technical Data

Graduations: 0.005mm or .0002"
 Spindle pitch: 1mm
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface
 Scale surface: White anodized aluminum

Micrometer Heads

SERIES 197 — Non-rotating Spindle and Large Thimble

FEATURES

- Large thimble micrometer head with non-rotating spindle.
- Floating thimble allows easy zero setting at any spindle position.
- Bidirectional graduation for easy reading in both directions.
- Dual-spindle mechanism for quick feeding of 1mm/rev.
- Carbide-tipped measuring face.

SPECIFICATIONS

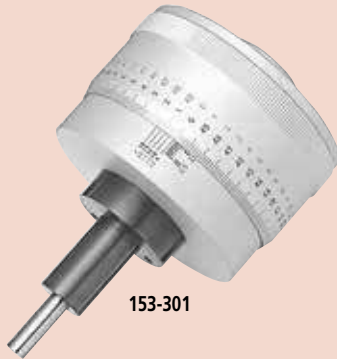
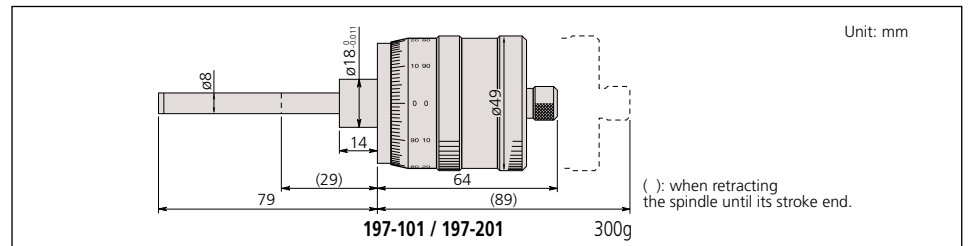
Metric

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 50mm	197-101	±5μm	18mm	Plain	Flat (carbide tip)	Bidirectional graduation

Inch

Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 2"	197-201	±.0002"	.709"	Plain	Flat (carbide tip)	Bidirectional graduation

DIMENSION AND MASS



153-301

Technical Data

Graduations: 0.0005mm or .00001"
 Spindle pitch: 0.5mm
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface
 Scale surface: White anodized aluminum

Micrometer Heads

SERIES 153 — Fine Graduation and High Accuracy

FEATURES

- Fine graduation and high-resolution model.
- Large thimble micrometer head with non-rotating spindle.
- Bidirectional graduation for easy reading in both directions.
- Carbide-tipped measuring face.

SPECIFICATIONS

Metric

Range	Order No.	Accuracy*	Stem dia.	Stem	Spindle face	Remarks
0 - 25mm	153-301	±1 / ±0.5μm	18mm	Plain	Flat (carbide tip)	Bidirectional graduation

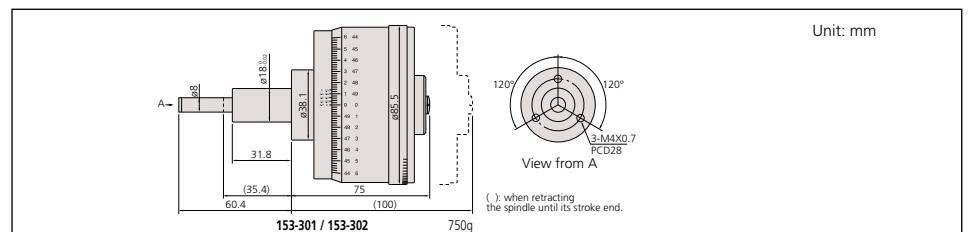
*Wide range / narrow range

Inch

Range	Order No.	Accuracy*	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	153-302	±.00004" / ±.00002"	.709"	Plain	Flat (carbide tip)	Bidirectional graduation

*Wide range / narrow range

DIMENSIONS AND MASS



Micrometer Heads

SERIES 250 — with Digit Counter

FEATURES

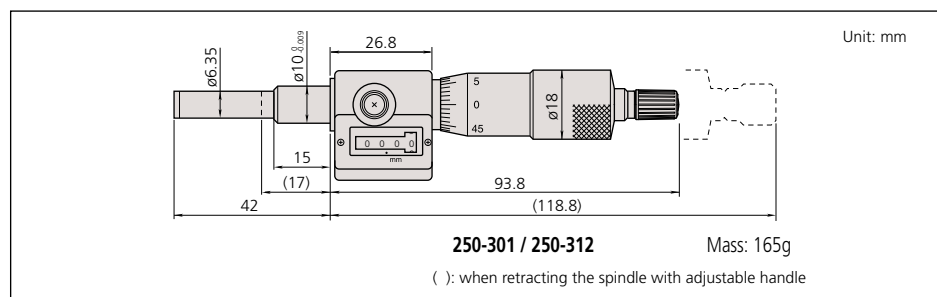
- Digit counter for easy reading of spindle movement.
- Carbide-tipped measuring face.
- Ratchet stop for constant force.

SPECIFICATIONS

Metric						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 25mm	250-301	$\pm 2\mu\text{m}$	10mm	Plain	Flat (carbide tip)	—

Inch						
Range	Order No.	Accuracy	Stem dia.	Stem	Spindle face	Remarks
0 - 1"	250-312	$\pm .0001"$	.375"	Plain	Flat (carbide tip)	w / vernier (.0001")

DIMENSIONS AND MASS



250-301

Technical Data

Graduations: 0.01mm or .0001"
 Spindle pitch: 0.5mm
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface
 Scale surface: Hard-chrome plating

Micro Jack

SERIES 7

FEATURES

- Used for accurate leveling of machines, surface plates and other precision instruments.
- Easy adjustment under heavy load.

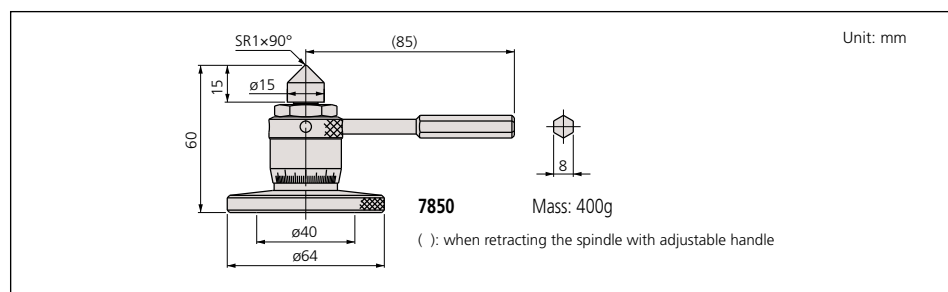


7850

SPECIFICATIONS

Metric				
Range	Order No.	Graduation	Max. Load	Remarks
60 - 75mm	7850	0.01mm	400kg	adjustable handle

DIMENSIONS AND MASS



Technical Data

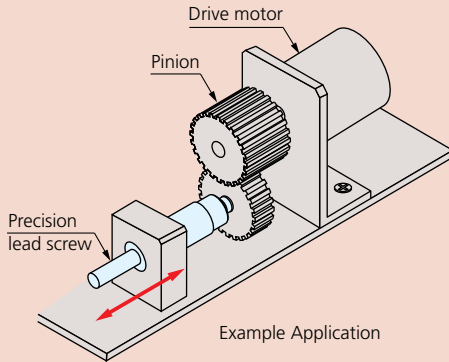
Graduations: 0.01mm



Precision Lead Screw

Technical Data

- Durability: 100,000 cycles are guaranteed (use condition: 4 kg load; 2 kg for AS-6.5 and BS-6.5)
- Main applications
 - Precision feed stages
 - Fine adjustment of optical elements (mirrors, prisms)
 - Fiber optic centering devices
 - Various assembly and adjustment jigs



FEATURES

- Mitutoyo manufactures simple and economical precision lead screws for precise positioning mechanisms and fine-feed mechanisms, in addition to the conventional micrometer heads.
- Mitutoyo also manufactures screws with special specifications, such as 0.25 mm pitch, as well as those with the standard 0.5 mm feed pitch and with dimensions and forms that meet customer's requirements.

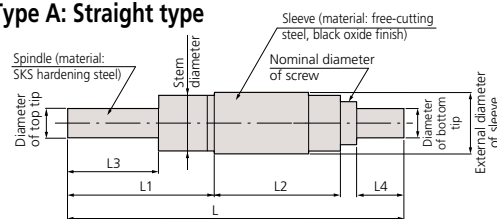


SPECIFICATIONS

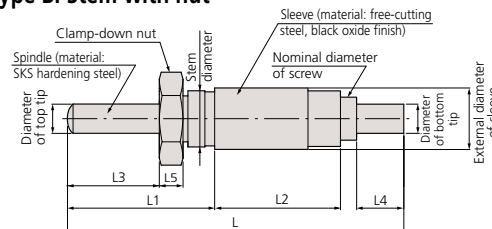
Order No.	Model	Stroke (mm)	Feed pitch (mm)	Feed accuracy (μm)	Stem diameter (mm)	Tip diameter (mm)	Tail diameter (mm)	Screw nominal diameter	Sleeve diameter (mm)	Measuring face	Mass	Others
04AZA160	AS-6.5	6.5	0.5	±5	ø6 ⁰ _{-0.008}	ø3.5	ø3 ⁰ _{-0.01}	M4.5 x 0.5	ø7	Hardened	10g	• AS type: Flat spindle tip without nut • BS type: Spherical spindle tip with nut
04AZA161	BS-6.5										11g	
04AZA162	AS-13	13		±2	ø9.5 ⁰ _{-0.009}	ø5	ø5 ⁰ _{-0.012}	M7.35 x 0.5	ø10.5	Carbide	27g	
04AZA163	BS-13										30g	
04AZA164	AS-25	25									61g	
04AZA165	BS-25				ø10 ⁰ _{-0.009}	ø6.35	ø6 ⁰ _{-0.015}		ø12		64g	

DIMENSIONS

Type A: Straight type



Type B: Stem with nut

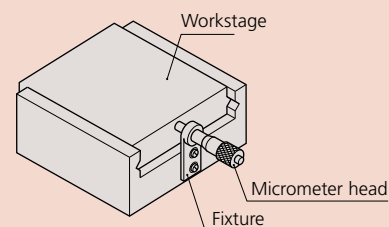


Order No.	L	L1	L2	L3	L4	L5
04AZA160	39	15	14.5	9	6	—
04AZA161	39	15	14.5	7.5	6	3
04AZA162	57.5	25	21.5	15.5	8	—
04AZA163	57.5	25	21.5	15.5	8	4
04AZA164	98.5	42	39.5	27	10	—
04AZA165	98.5	42	39.5	27	10	4

Fixtures for Micrometer Heads and Linear Gages

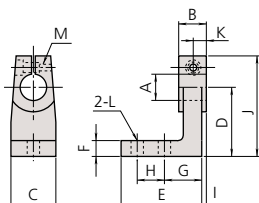
FEATURES

- The act of fabricating brackets to mount micrometer heads for each particular application can be laborious and costly. Mitutoyo offers various types of fixtures for micrometer heads to meet a range of applications. These fixtures are made of nickel-plated cast iron.
- There are two types of fixtures for micrometer heads--with or without clamping nut on the stem.

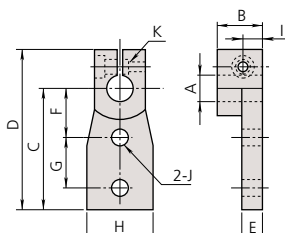


DIMENSIONS: Fixtures for plain-stem type micrometer heads

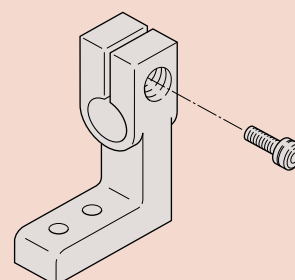
Unit: mm



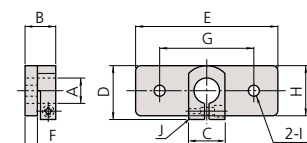
Order No.	303560	303569	303579
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	14.5	19.5	19.5
D	20	30	30
E	23	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	1.5	3.25	3.25
J	32.5	42.5	42.5
K	4.5	7.25	7.25
L	ø3.4	ø4.5	ø4.5
M	M3x0.5	M3x0.5	M3x0.5



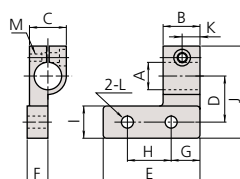
Order No.	303564	303573	303583
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	30	40	40
D	42.5	52.5	52.5
E	4	6	6
F	15	18	18
G	10	15	15
H	15	20	20
I	4.5	7.25	7.25
J	ø3.4	ø4.5	ø4.5
K	M3x0.5	M3x0.5	M3x0.5



Note: Supplied with a socket head screw (M3x0.5x12mm) for the fixtures to be used with a micrometer head without clamp nut (plain stem type micrometer head).



Order No.	303562	303571	303581
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	15	15	15
D	20	22.5	22.5
E	40	60	60
F	3	5	5
G	30	40	40
H	15	20	20
I	ø3.4	ø4.5	ø4.5
J	M3x0.5	M3x0.5	M3x0.5

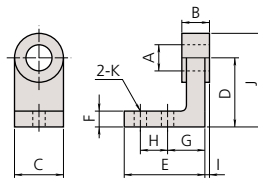


Order No.	303566	303575	303585
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	15	15	15
D	15	20	20
E	25	40	40
F	8.5	8.5	8.5
G	7.5	10	10
H	10	20	20
I	10	15	15
J	32.5	40	40
K	4.5	7.25	7.25
L	ø3.4	ø4.5	ø4.5
M	M3x0.5	M3x0.5	M3x0.5

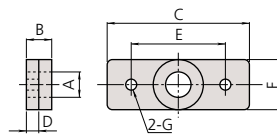
Fixtures for Micrometer Heads and Linear Gages



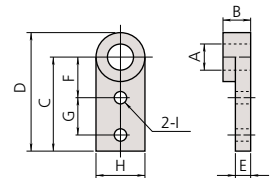
DIMENSIONS: Fixtures for micrometer heads with clamp nut



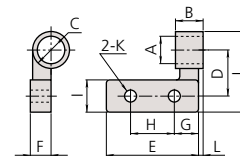
Order No.	303559	303568	303578
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	14.5	19.5	19.5
D	20	30	30
E	24	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	0.5	1.75	1.75
J	27.5	40	40
K	ø3.4	ø4.5	ø4.5



Order No.	303561	303570	303580
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	40	60	60
D	3.5	5.5	5.5
E	30	40	40
F	15	20	20
G	ø3.4	ø4.5	ø4.5

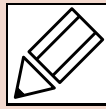


Order No.	303563	303572	303582
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	30	40	40
D	37.5	50	50
E	4.5	6.5	6.5
F	15	18	18
G	10	15	15
H	15	20	20
I	ø3.4	ø4.5	ø4.5



Order No.	303565	303574	303584
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	ø15	ø15	ø15
D	15	20	20
E	25	40	40
F	8.5	8.5	8.5
G	7.5	10	10
H	10	20	20
I	10	15	15
J	27.5	35	35
K	ø3.4	ø4.5	ø4.5
L	0.75	1.25	1.25

Quick Guide to Precision Measuring Instruments



Micrometer Heads

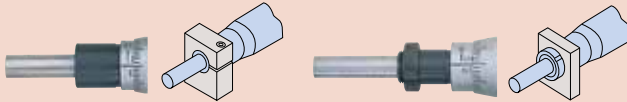
Key Factors in Selection

Key factors in selecting a micrometer head are the measuring range, spindle face, stem, graduations, thimble diameter, etc.

Stem

Plain stem

Stem locknut type

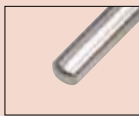


- The stem used to mount a micrometer head is classified as a "plain type" or "clamp nut type" as illustrated above. The stem diameter is manufactured to a nominal Metric or Imperial size with an h6 tolerance.
- The clamp nut stem allows fast and secure clamping of the micrometer head. The plain stem has the advantage of wider application and slight positional adjustment in the axial direction on final installation, although it does require a split-fixture clamping arrangement or adhesive fixing.
- General-purpose mounting fixtures are available as optional accessories.

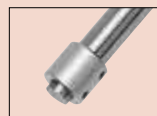
Measuring Face



Flat face

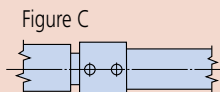
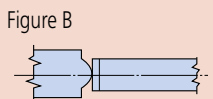
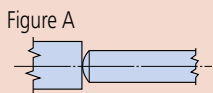


Spherical face



Anti-rotation device

- A flat measuring face is often specified where a micrometer head is used in measurement applications.
- When a micrometer head is used as a feed device, a spherical face can minimize errors due to misalignment (Figure A). Alternatively, a flat face on the spindle can bear against a sphere, such as a carbide ball (Figure B).
- A non-rotating spindle type micrometer head or one fitted with an anti-rotation device on the spindle (Figure C) can be used if a twisting action on the workpiece must be avoided.
- If a micrometer head is used as a stop then a flat face both on the spindle and the face it contacts provides durability.



Non-Rotating Spindle

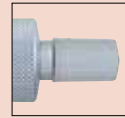
- A non-rotating spindle type head does not exert a twisting action on a workpiece, which may be an important factor in some applications.

Spindle Thread Pitch

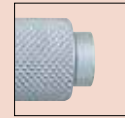
- The standard type head has 0.5mm pitch.
- 1mm-pitch type: quicker to set than standard type and avoids the possibility of a 0.5mm reading error. Excellent load-bearing characteristics due to larger screw thread.
- 0.25mm or 0.1mm-pitch type
This type is the best for fine-feed or fine-positioning applications.

Constant-force Device

- A micrometer head fitted with a constant-force device (ratchet or friction thimble) is recommended for measurement applications.
- If using a micrometer head as a stop, or where saving space is a priority, a head without a ratchet is probably the best choice.



Micrometer head with constant-force device



Micrometer head without constant-force device (no ratchet)

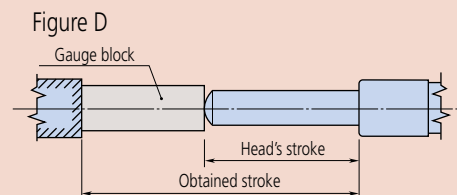
Spindle Lock

- If a micrometer head is used as a stop it is desirable to use a head fitted with a spindle lock so that the setting will not change even under repeated shock loading.



Measuring Range (Stroke)

- When choosing a measuring range for a micrometer head, allow an adequate margin in consideration of the expected measurement stroke. Six stroke ranges, 5 to 50mm, are available for standard micrometer heads.
- Even if an expected stroke is small, such as 2mm to 3mm, it will be cost effective to choose a 25mm-stroke model as long as there is enough space for installation.
- If a long stroke of over 50mm is required, the concurrent use of a gauge block can extend the effective measuring range. (Figure D)



- In this guide, the range (or stroke end) of the thimble is indicated by a dashed line. For stroke ends, consider the thimble as moving to the position indicated by the line when designing the jig.

Ultra-fine Feed Applications

- Dedicated micrometer heads are available for manipulator applications, etc., which require ultra-fine feed or adjustment of spindle.