

Small Hole Gage Set

SERIES 154

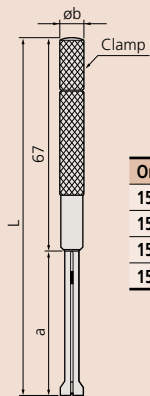
FEATURES

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



154-902

DIMENSION



Unit: mm

Order No.	L	a	b
154-101 / 105	90	22.5	5.5
154-102 / 106	97.6	30	5.5
154-103 / 107	102.8	35	8.5
154-104 / 108	108	40	8.5

SPECIFICATIONS

Metric		
Total range	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	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 154

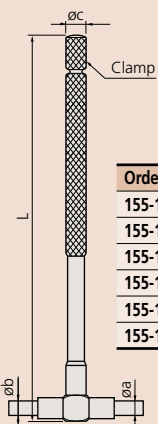
FEATURES

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



155-905

DIMENSION



Unit: mm

Order No.	L	a	b	c
155-127 / 121	110	4	3	5
155-128 / 122	110	5	3.5	5.5
155-129 / 123	110	5	3.5	5.5
155-130 / 124	150	7.5	6	8
155-131 / 125	150	7.5	6	8
155-132 / 126	150	7.5	6	8

SPECIFICATIONS

Metric		
Total range	Order No.	Assortment of gages
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	Order No.	Assortment of gages
.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)

*4-gage set (Total range: .313" - 2.125" (155-907)) and 5-gage set (Total range: .5" - 6" (155-904)) are also available.

Color Ratchet & Color Speeder

Color ratchet

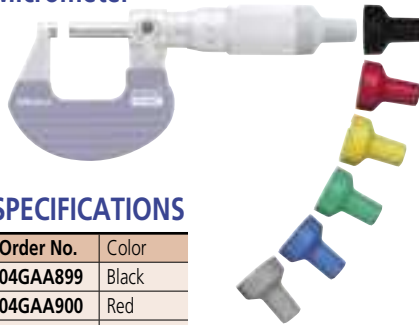


SPECIFICATIONS

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

*for 293 series digital model

Color speeder for Ratchet Thimble Micrometer



SPECIFICATIONS

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

Spindle Attachment Tip



DIMENSION

Order No.	Dimension
208062	
208063	
208064	

Order No.	Dimension
208065	
208066	

Technical Data

Tip length: 10mm \pm 5 μ m



Micrometer Oil

207000 (30ml)



Optical Parallels

SERIES 157

FEATURES

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



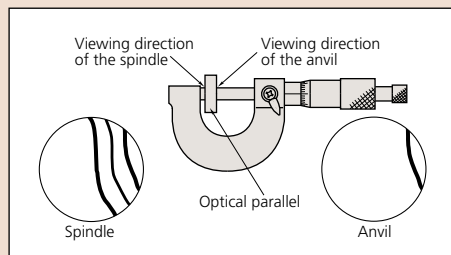
Technical Data

Flatness: 0.1µm
 Parallelism: 0.2µm
 Diameter: 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; bring 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.



SPECIFICATIONS

Metric		
Range of micrometer to be checked	Order No.	Assortment of parallels (Thickness of parallel)
0-25mm	157-903	12.00, 12.12, 12.25, 12.37mm
25-50mm	157-904	25.00, 25.12, 25.25, 25.37mm

Inch		
Range of micrometer to be checked	Order No.	Assortment of parallels (Thickness of parallel)
0-1"	157-901	.5000", .5062", .5125", .5187"
1-2"	157-902	1.0000", 1.0062", 1.0125", 1.0187"

Optical Flats

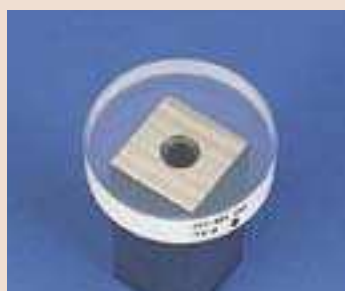
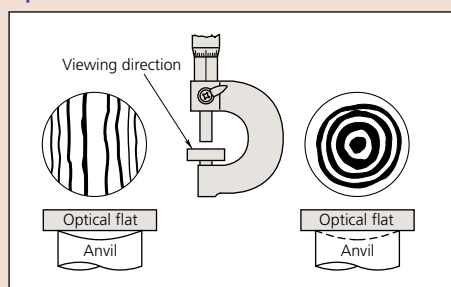
SERIES 158

FEATURES

- Used for inspecting the flatness of micrometer's or gauge block's measuring faces with high accuracy.



Flatness Check of Measuring Faces Using Interference Fringe Pattern Produced by an Optical Flat



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"

Micrometer Standards

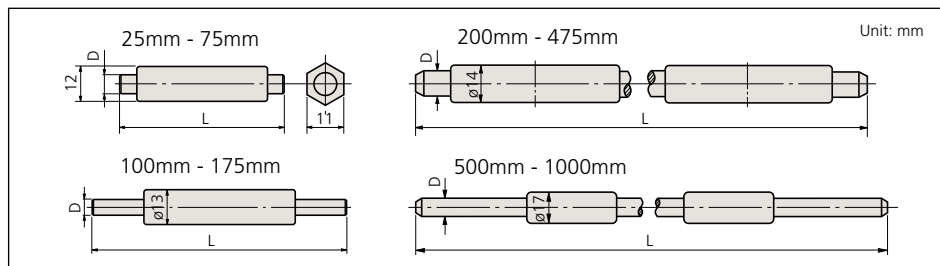
SERIES 167

FEATURES

- Used for the zero point setting of outside micrometers.
- Flat and lapped measuring faces.
- Heat insulating handle for preventing expansion due to body temperature.



DIMENSION



SPECIFICATIONS

Metric

Length (L)	Order No.	Diameter (D)	Tolerance
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)	Tolerance
1"	167-141	.25"	±1.5µm
2"	167-142	.25"	±2.0µm
3"	167-143	.25"	±2.5µm
4"	167-144	.31"	±3µm
5"	167-145	.31"	±3.5µm
6"	167-146	.31"	±4µm
7"	167-147	.31"	±4.5µm
8"	167-148	.37"	±5.0µm
9"	167-149	.37"	±5.5µm
10"	167-150	.37"	±6.0µm
11"	167-151	.37"	±6.5µm
12"	167-152	.37"	±7µm
13"	167-153	.37"	±7.5µm
14"	167-154	.37"	±8µm
15"	167-155	.37"	±8.5µm
16"	167-156	.37"	±9µm
17"	167-157	.37"	±9.5µm
18"	167-158	.37"	±1.0µm
19"	167-159	.37"	±10.5µm
20"	167-160	.47"	±11µm
21"	167-161	.47"	±11.5µm
22"	167-162	.47"	±12µm
23"	167-163	.47"	±12.5µm
24"	167-164	.47"	±13µm
25"	167-165	.47"	±13.5µm
26"	167-166	.47"	±14µm
27"	167-167	.47"	±14.5µm
28"	167-168	.47"	±15µm
29"	167-169	.47"	±15.5µm
30"	167-170	.47"	±16µm
31"	167-171	.47"	±16.5µm
32"	167-172	.47"	±17µm
33"	167-173	.47"	±17.5µm
34"	167-174	.47"	±18µm
35"	167-175	.47"	±18.5µm
36"	167-176	.47"	±19µm
37"	167-177	.47"	±19.5µm
38"	167-178	.47"	±20µm
39"	167-179	.47"	±20.5µm
40"	167-180	.47"	±21µm

Available up to 2000mm.

Available up to 79".

Technical Data

Tolerance*: Refer to the list of specifications.
 *Tolerance on deviation of measured central length from nominal at 20°C
 Flatness: 0.3µm
 Parallelism: 2µm



Standards for Screw Thread Micrometers

SERIES 167 — 60 degree and 55 degree

FEATURES

- Specially designed for the zero point setting of screw thread micrometers.

Technical Data

Accuracy: Refer to the list of specifications.
Thread angle: 55° or 60°



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

Inch			
Length	Order No.	Thread angle	Accuracy
1"	167-294	60°	±4μm
	167-283	55°	±4μm
2"	167-295	60°	±5μm
	167-284	55°	±5μm
	167-296	60°	±6μm
3"	167-285	55°	±6μm
	167-297	60°	±7μm
4"	167-286	55°	±7μm

Standards for V-Anvil Micrometers

SERIES 167

FEATURES

- Specially designed for the zero point setting of V-anvil micrometers.

Technical Data

Accuracy: Refer to the list of specifications.



167-329

SPECIFICATIONS

Metric			
Length	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			
Length	Order No.	Type	Accuracy
.2"	167-337	Plug	±2μm
.4"	167-338	Plug	±2μm
1"	167-339	Plug	±2μm
1.6"	167-340	Ring	±3μm
2.2"	167-341	Ring	±3μm
2.8"	167-342	Ring	±3μm
3.4"	167-343	Ring	±3μm

Micrometer Stands

SERIES 156

These stands are designed to allow bench-top use with hand micrometers or other gages which have frame area sufficient to grab onto.



156-105



156-101



156-102

SPECIFICATIONS

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

DIMENSION

