

V-Anvil Micrometers

SERIES 314, 114 — 3 Flutes and 5 Flutes

FEATURES

- Measures the outside diameter of cutting tools (such as taps, reamers, end mills) which have three or five flutes.
- With Ratchet Stop for constant force.
- V-anvils with a centerline groove are available. These are useful for measuring pitch diameters of taps which have three or five flutes by using the single-wire method.
- SPC output (series 314).



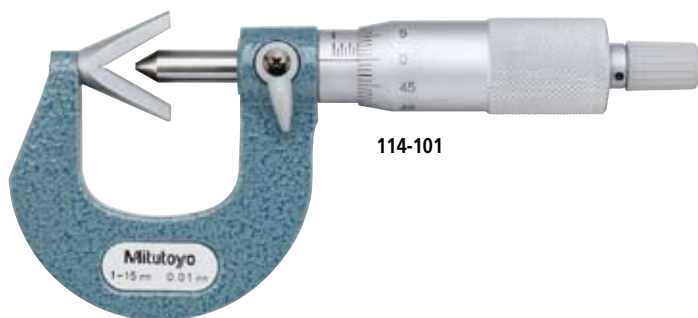
314-251-10



114-121



114-102



114-101

SPECIFICATIONS

Metric		Digital model for 3-flute cutting tools	
Range	Order No.	Accuracy	Remarks
1 - 15mm	314-251-10	±4μm	w/ groove
	314-261-10	±4μm	—
10 - 25mm	314-252-10	±4μm	w/ groove
	314-262-10	±4μm	—
25 - 40mm	314-253-10	±5μm	—

Inch/Metric		Digital model for 3-flute cutting tools	
Range	Order No.	Accuracy	Remarks
.05 - .6"	314-351-10	±.0002"	w/ groove
	314-361-10	±.0002"	—
.4" - 1"	314-352-10	±.0002"	w/ groove
	314-362-10	±.0002"	—
1" - 1.6"	314-353-10	±.00025"	—



Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error for digital models)
Resolution*: 0.001mm or .00005"/0.001mm
Graduation**: 0.01mm, .001" or .0001"
Flatness (spindle/anvil): 0.6μm[.000024"]/1.3μm[.00005"]**
(0.3μm[.000012"]/1μm[.00004"])*
Spindle face: Carbide
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 1, 2 years under normal use
*Digital models **Analog models

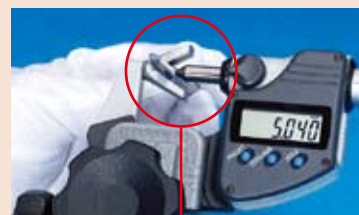
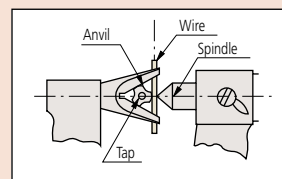
Functions of Digital Model

Zero-setting, Data hold, 2-point preset, Function lock, Automatic power ON/OFF, Data output, inch/mm conversion (inch/mm models)
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)

Pitch Diameter Measurement of Tap by Single-wire Method



Metric For 3-flute cutting tools

Range	Order No.	Accuracy	Remarks
1 - 15mm	114-101	±4μm	w/ groove
	114-161	±4μm	—
10 - 25mm	114-102	±4μm	w/ groove
	114-162	±4μm	—
2.3 - 25mm	114-204*	±4μm	—
25 - 40mm	114-103	±5μm	—
40 - 55mm	114-104	±6μm	—
55 - 70mm	114-105	±6μm	—
70 - 85mm	114-106	±7μm	—

*Carbide-tipped anvil

Inch For 3-flute cutting tools

Range	Order No.	Accuracy	Remarks
.05 - .6"	114-163	±.0002"	—
.09" - 1"	114-202*	±.0002"	—
1" - 1.6"	114-113	±.00025"	—
1.6" - 2.2"	114-114	±.0003"	—

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

Metric For 5-flute cutting tools

Range	Order No.	Accuracy	Remarks
5 - 25mm	114-121	±4μm	w/ groove
	114-165	±4μm	—
2.3 - 25mm	114-137*	±4μm	—
25 - 45mm	114-122	±5μm	—
45 - 65mm	114-123	±6μm	—
65 - 85mm	114-124	±7μm	—

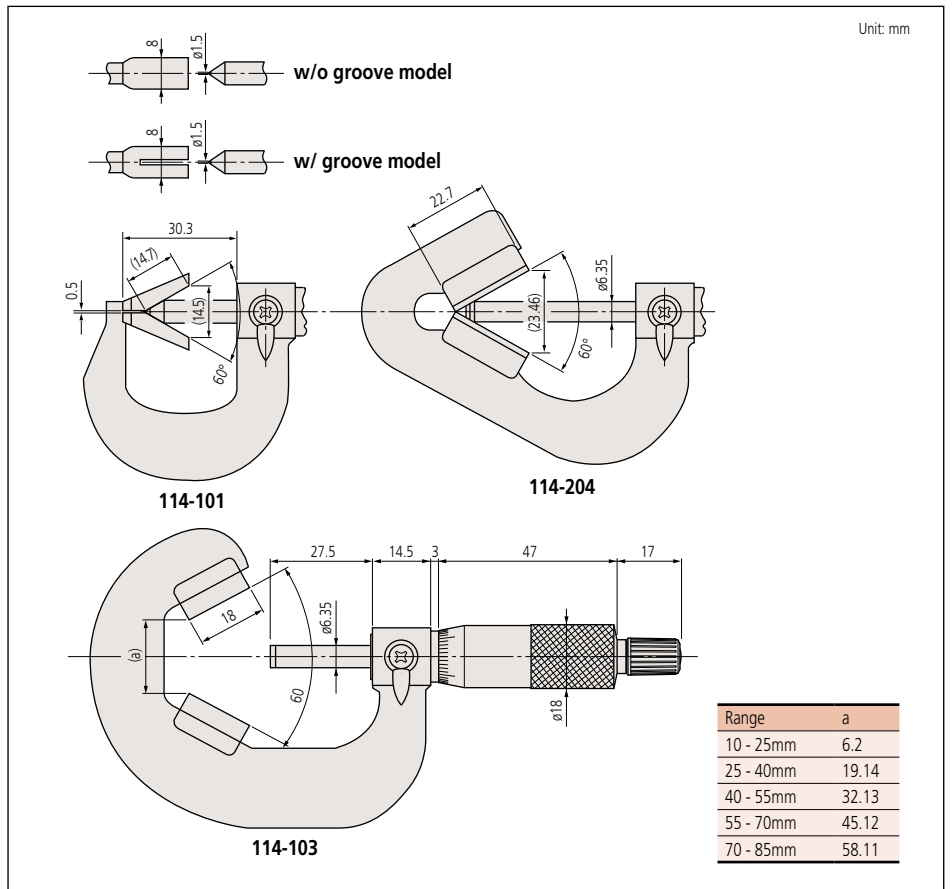
*Carbide-tipped anvil

Inch For 5-flute cutting tools

Range	Order No.	Accuracy	Remarks
.09" - 1"	114-135*	±.0002"	—

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

DIMENSIONS



Blade Micrometers

SERIES 422,122 — Non-Rotating Spindle Type

FEATURES

- The anvil and spindle are blade-shaped for measuring the groove diameter of shafts, keyways, and other hard-to-reach features.
- With Ratchet Stop for constant force.
- Speedy spindle feed of 10mm/rev. (Quickmike type).



422-230

Quickmike type



422-411



122-101

SPECIFICATIONS

Metric	Digital model		
Range	Order No.	Accuracy	Remarks
0 - 25mm	422-230	±3µm	Type A
	422-260	±3µm	Type B
	422-270	±3µm	Type C
	422-271	±3µm	Type D
	422-231	±3µm	Type A
25 - 50mm	422-261	±3µm	Type B
	422-232	±3µm	Type A
50 - 75mm	422-233	±4µm	Type A

Metric	Quickmike type		
Range	Order No.	Accuracy	
0 - 30mm	422-411	±3µm	
25 - 55mm	422-412	±3µm	

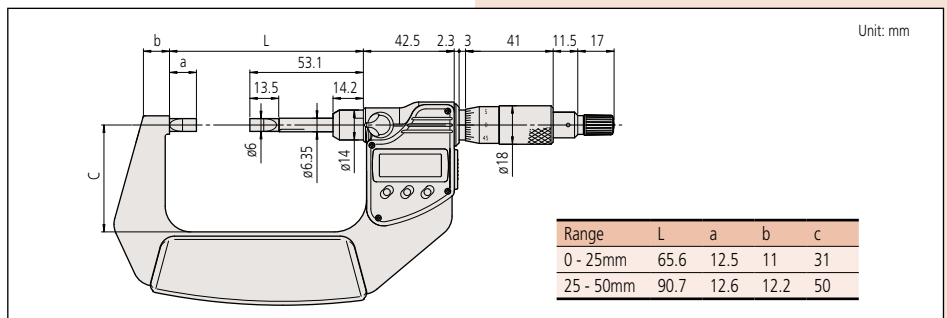
Metric			
Range	Order No.	Accuracy	Remarks
0 - 25mm	122-101	±3µm	Type A
	122-111	±3µm	Type B
	122-161	±3µm	Type C
	122-141	±3µm	Type D
	122-102	±3µm	Type A
25 - 50mm	122-112	±3µm	Type B
	122-162	±3µm	Type C
	122-142	±3µm	Type D
	122-103	±3µm	Type A
75 - 100mm	122-104	±4µm	Type A
100 - 125mm	122-105	±4µm	Type A
125 - 150mm	122-106	±4µm	Type A
150 - 175mm	122-107	±5µm	Type A
175 - 200mm	122-108	±5µm	Type A
200 - 225mm	122-109	±5µm	Type A
225 - 250mm	122-110	±6µm	Type A
250 - 275mm	122-115	±6µm	Type A
275 - 300mm	122-116	±6µm	Type A

Inch/Metric	Digital model		
Range	Order No.	Accuracy	Remarks
0 - 1"	422-330	±.00015"	Type A
	422-360	±.00015"	Type B
	422-370	±.00015"	Type C
	422-371	±.00015"	Type D
	422-331	±.00015"	Type A
1" - 2"	422-361	±.00015"	Type B
	422-332	±.00015"	Type A
2" - 3"	422-333	±.00015"	Type A
3" - 4"	422-333	±.0002"	Type A

Inch/Metric	Quickmike type		
Range	Order No.	Accuracy	
0 - 1.2"	422-421	±.00015"	
1" - 2.2"	422-422	±.00015"	

Inch			
Range	Order No.	Accuracy	Remarks
0 - 1"	122-125	±.00015"	Type A
	122-135	±.00015"	Type B
	122-151	±.00015"	Type D
	122-126	±.00015"	Type A
1" - 2"	122-127	±.00015"	Type A
2" - 3"	122-127	±.00015"	Type A
3" - 4"	122-128	±.0002"	Type A

DIMENSIONS



Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error for digital models)
Resolution*: 0.001mm or .00005"/0.001mm
Graduation**: 0.01mm or .0001"
Parallelism: 3µm/.00012" for models up to 75mm/3"
(3+R/100)µm for models over 75mm,
R = max. range (mm)
fraction rounded up
.00016" for 4" models
Display*: LCD
Battery*: SR44 (1 pc.), 938882
Battery life*: Approx. 1.2 years under normal use
*Digital models **Analog models

Functions of Digital Model

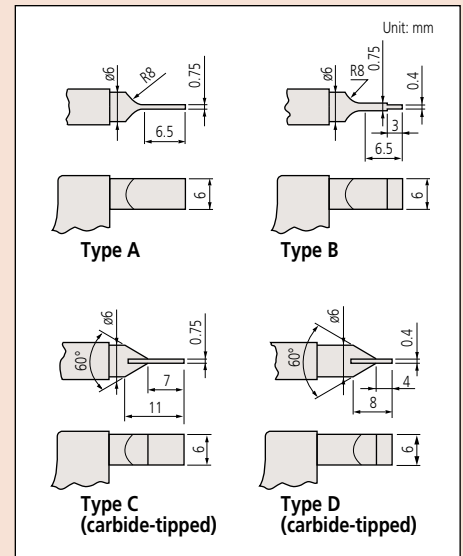
Origin-set, Zero-setting, Data hold, Automatic power ON/OFF, Data output, inch/mm conversion (inch/mm models)
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

- 05CZA662: SPC cable with data switch (1m)
- 05CZA663: SPC cable with data switch (2m)
- 06ADV380B: USB Input Tool Direct with data switch (2m)
- 02AZD790B: SPC cable for U-WAVE water-proof model (160mm)
- 937387: SPC cable (1m)*
- 965013: SPC cable (2m)*
- 06ADV380E: USB Input Tool Direct with data switch (2m)*
- 02AZD790E: SPC cable for U-WAVE (160mm)*

*Only for Quickmike type

TYPE AND DIMENSIONS



Can Seam Micrometers

SERIES 147

FEATURES

- Measures the width, height, and depth of can seams.
- Three types of micrometer are available (for steel, aluminum and spray cans).

Technical Data

Accuracy: $\pm 3\mu\text{m}/\pm 0.00015''$
 Graduation: 0.01mm or .001''



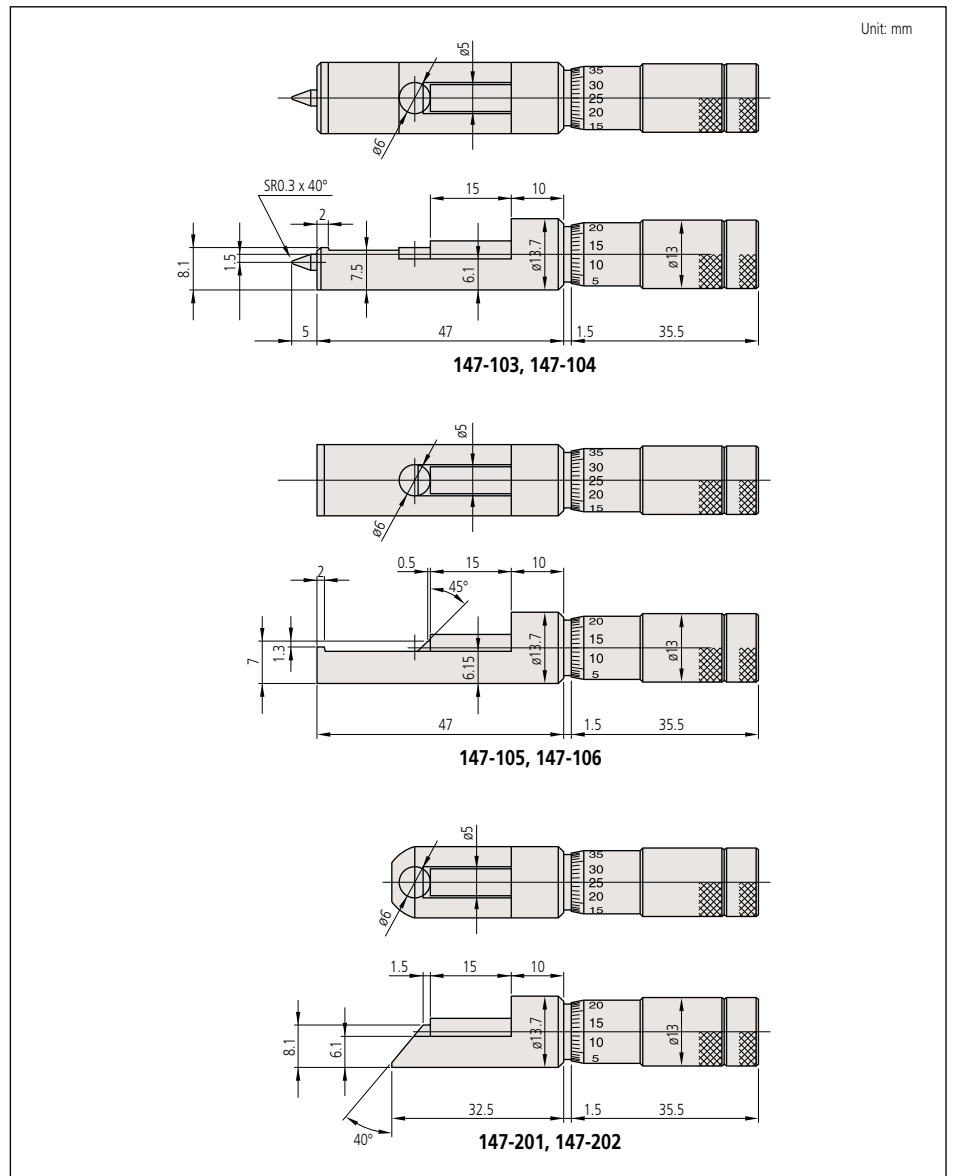
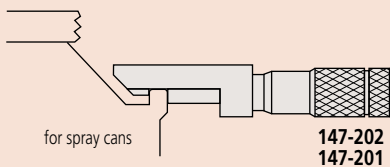
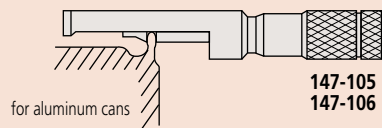
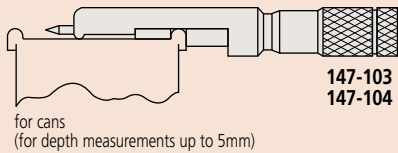
147-103

SPECIFICATIONS

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

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

DIMENSIONS



Hub Micrometers

SERIES 147

FEATURES

- Measures hub thickness and shoulders inside a bore.
- With Ratchet Stop for constant force.
- Supplied with a setting standard (except for 0-25mm/0-1" models).



SPECIFICATIONS

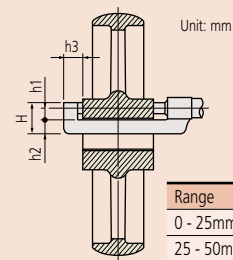
Metric		
Range	Order No.	Accuracy
0 - 25mm	147-301	±2µm
25 - 50mm	147-302	±2µm
50 - 75mm	147-303	±2µm
75 - 100mm	147-304	±3µm

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

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm or .001"
 Flatness: 0.6µm/0.00024"
 Parallelism: (2+R/100)µm, R = max. range (mm)
 [(.00008" + .00004(R/4))" R = max. range (inch)
 fraction rounded up

Measuring faces: Carbide



Range	h1	h2	h3	H
0 - 25mm	6	8.5	13.5	17.5
25 - 50mm	6.5	11	14	20.5
50 - 75mm	6.5	11	13	20.5
75 - 100mm	6.5	11	13	20.5

Wire Micrometers

SERIES 147

FEATURES

- Designed for measuring wire thickness.
- Also used to measure the diameter of small balls.



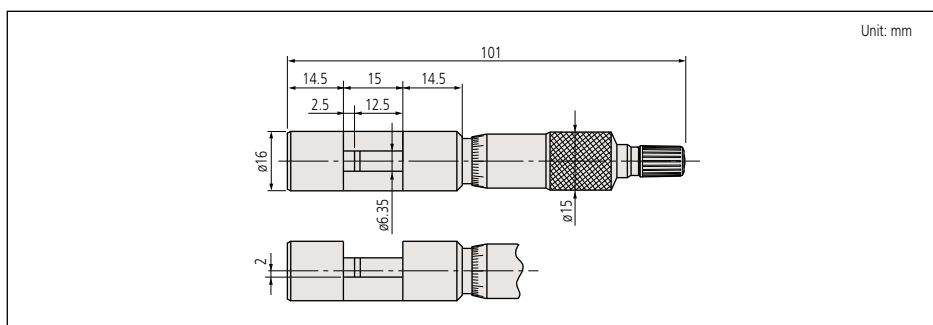
SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 10mm	147-401	±3µm

Inch		
Range	Order No.	Accuracy
0 - .4"	147-402	±.00015"

*.0001" reading is obtained with vernier.

DIMENSIONS



Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm or .0001"
 Flatness: 0.6µm/0.00024"
 Parallelism: 1.3µm/0.0005"
 Measuring faces: Carbide



Digit Outside Micrometers

SERIES 193

FEATURES

- Mechanical digit counter with 0.01mm or .001" reading for quick and error-free reading.
- Supplied with a setting standard (except for 0-25mm/0-1" models).



193-101

Technical Data

Accuracy: Refer to the list of specifications.

Counter reading: 0.01mm or .001"

Graduation: 0.01mm, 0.001mm, or .0001"

Flatness: 0.6µm/.000024"

Parallelism: (2+R/100)µm, R = max. range (mm)
[.00008+.00004(R/4)]" R = max. range (inch)
fraction rounded down

Measuring faces: Carbide

SPECIFICATIONS

Metric _____ With ratchet stop

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

*0.001mm reading is obtained with vernier.

Inch _____ With ratchet stop

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

*.0001" reading is obtained with vernier.

Inch _____ With friction thimble

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

*.0001" reading is obtained with vernier.

Metric _____ Micrometer set

Range	Order No.	Models included
0 - 75mm (3 pcs./set)	193-901	• 193-101, 193-102, 193-103 • 2 micrometer standards
0 - 100mm (4 pcs./set)	193-902	• 193-101, 193-102, 193-103, 193-104 • 3 micrometer standards

Inch _____ Micrometer set

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

DIMENSIONS

Unit: mm

Models up to 100mm

Range	L	a	b	c
0 - 25mm	30	2.5	5	26
25 - 50mm	55	2	8	32
50 - 75mm	80	2	9	45
75 - 100mm	105	2	9	57

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

"Uni-Mike"

SERIES 317, 117 — Interchangeable Anvil Type

FEATURES

- IP65 water/dust protection (317 series).
- 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: $\varnothing 3$ mm rod anvil (**201217**) for 0-25mm models, $\varnothing 5$ mm (**201379**) for 25-50mm model.
- With special Disk Anvils. The Uni-Mike is used as a height micrometer. The disks have a lapped, mirror-smooth surface.



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error for digital models)
Resolution*: 0.001mm or .00005"/0.001mm
Graduation**: 0.01mm or .0001"
Spindle face: Carbide
Display*: LCD
Battery*: SR44 (1 pc.), **938882**
Battery life*: Approx. 1.2 years under normal use
Dust/Water protection level*: IP65
*Digital models **Analog models

Functions of Digital Model

Origin-set, Zero-setting, Data hold, Automatic power ON/OFF, Data output, inch/mm conversion (inch/mm models)
Alarm: Low voltage, Counting value composition error

Optional Accessories

- 05CZA662**: SPC cable with data switch (1m)*
 - 05CZA663**: SPC cable with data switch (2m)*
 - 06ADV380B**: USB Input Tool Direct with data switch (2m)
 - 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)*
 - 201218**: V-anvil
 - 950758**: Disk anvil for 25m (1") models
- *Only for digital models



317-251



117-101

SPECIFICATIONS

Metric	Digital model with ratchet stop	
Range	Order No.	Accuracy
0 - 25mm	317-251	$\pm 4\mu\text{m}$
25 - 50mm	317-252	$\pm 4\mu\text{m}$

Excluding quantizing error

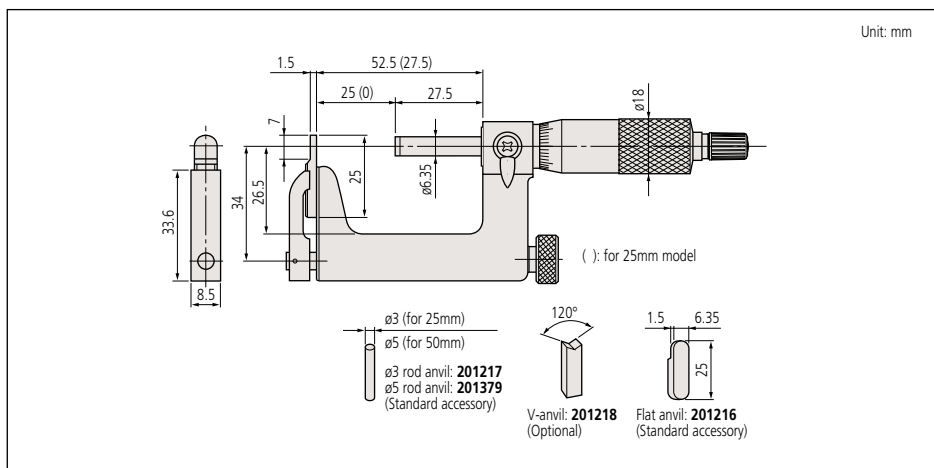
Inch/Metric	Digital model with friction thimble	
Range	Order No.	Accuracy
0 - 1"	317-351	$\pm .0002$ "
1" - 2"	317-352	$\pm .0002$ "

Excluding quantizing error

Metric	With ratchet stop	
Range	Order No.	Accuracy
0 - 25mm	117-101	$\pm 4\mu\text{m}$
25 - 50mm	117-102	$\pm 4\mu\text{m}$

Inch	With friction thimble	
Range	Order No.	Accuracy
0 - 1"	117-107	$\pm .0002$ "
1" - 2"	117-108	$\pm .0002$ "

DIMENSIONS



Limit Micrometers

SERIES 113

FEATURES

- Can be used as a GO/±NG gage by setting the upper and lower limits simultaneously.
- Provided with a setting standard for the 25mm - 50mm model.



113-102

Technical Data

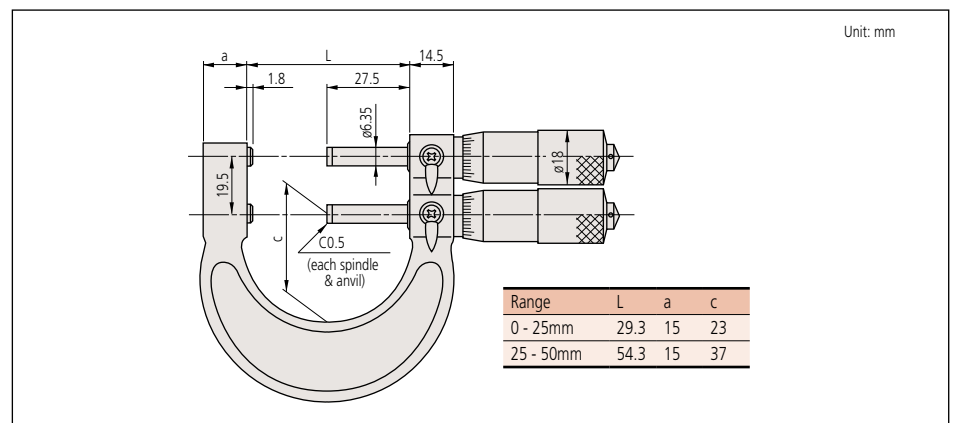
Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm
 Flatness: 0.6μm
 Parallelism: 3μm
 Measuring faces: Carbide

SPECIFICATIONS

Metric

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

DIMENSIONS



Indicating Micrometers

SERIES 510

FEATURES

- Retractable anvil with indicator for three-wire measurements of pitch diameter of precision screws, roundness and parallelism measurements.
- Supplied with a setting standard (except for 0-25mm/0-1" models).
- IP protection level: 54



510-121



Retractable anvil button



510-141



SPECIFICATIONS

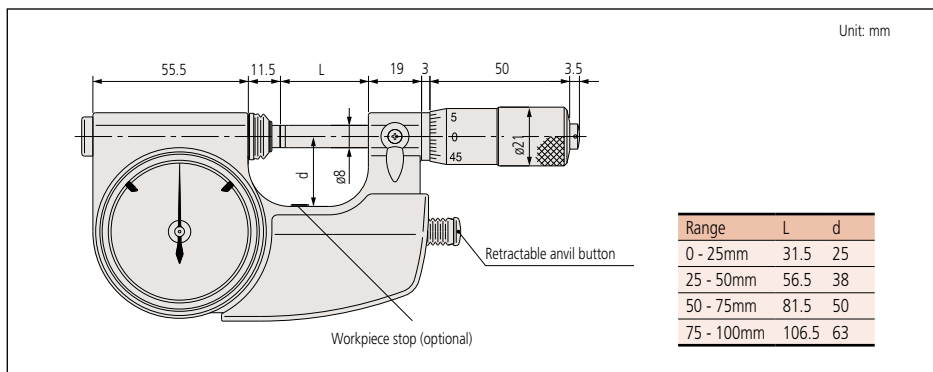
Metric		
Range	Order No.	Indicating range
0 - 25mm	510-141/510-121*	±0.060mm
25 - 50mm	510-122	±0.060mm
50 - 75mm	510-123	±0.060mm
75 - 100mm	510-124	±0.060mm

*Retractable anvil button on the right side.

Inch		
Range	Order No.	Indicating range
0 - 1"	510-151/510-131*	±.0023"
1" - 2"	510-132	±.0023"
2" - 3"	510-133	±.0023"
3" - 4"	510-134	±.0023"

*Retractable anvil button on the right side.

DIMENSIONS

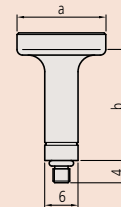


Technical Data

Spindle feed error: 3µm/0.0015"
 Dial indication accuracy: 1µm/0.00005"
 Dispersion of indication: 0.4µm/0.00002"
 Graduation: 0.001mm or .0001"
 Dial reading: 0.001mm or .00005"
 Flatness: 0.3µm/0.00012"
 Parallelism: 0.6µm/0.00024" for models up to 50mm/2"
 1µm/0.0004" for models over 50mm/2"
 Measuring force: 5 - 10N (500 - 1000gf)
 Measuring faces: Carbide

Optional Accessories

- 04AZA124: ø16mm workpiece stop (not available for 25mm model)
- 04AZA125: ø14mm workpiece stop
- 04AZA126: ø14mm workpiece stop



Unit: mm

	a	b
04AZA124	ø16	23
04AZA125	ø14	20.5
04AZA126	ø14	15

Snap Meters

SERIES 523

Technical Data

Flatness: 0.3µm/.000012"

Parallelism: 0.6µm/.000024" for models up to 50mm/2"
1µm/.00004" for models over 50mm/2"

Measuring force*: 5 - 10N (500 - 1000gf)

Measuring faces: Carbide

*Measured at the position where the anvil is retracted by 1mm from the free position without installing the indicator.

FEATURES

- Various types of indicator can be selected according to the measurement applications.



523-141

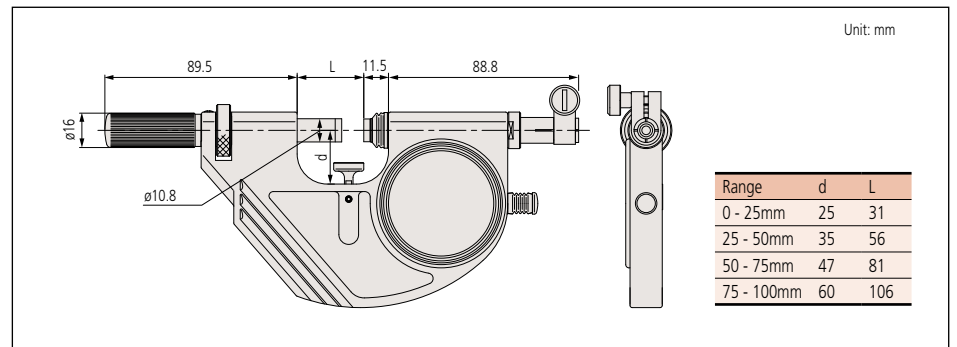


SPECIFICATIONS

Metric		
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		
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"

DIMENSIONS



Dial Snap Meters

SERIES 523

FEATURES

- Direct GO/NO-GO judgment for mass-produced parts.
- Spindle diameter: 10.8mm (.425")
- IP protection level: 54



Technical Data

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



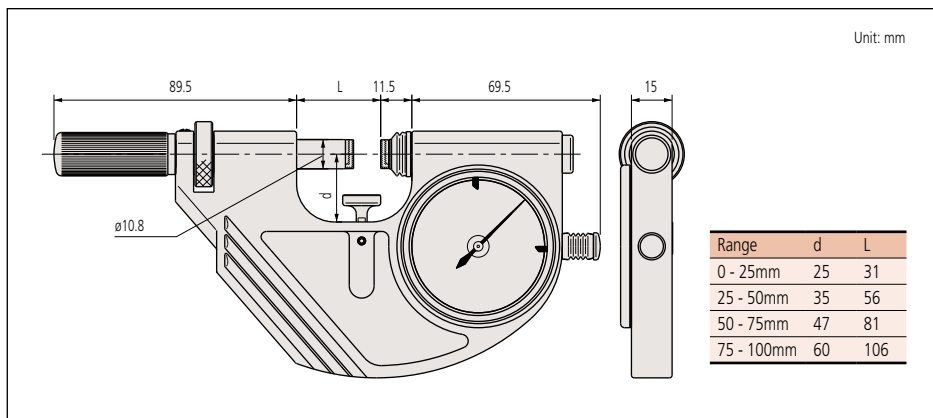
523-121

SPECIFICATIONS

Metric		
Range	Order No.	Indicating range
0 - 25mm	523-121	$\pm 0.060\text{mm}$
25 - 50mm	523-122	$\pm 0.060\text{mm}$
50 - 75mm	523-123	$\pm 0.060\text{mm}$
75 - 100mm	523-124	$\pm 0.060\text{mm}$

Inch		
Range	Order No.	Indicating range
0 - 1"	523-131	$\pm .0023''$
1" - 2"	523-132	$\pm .0023''$
2" - 3"	523-133	$\pm .0023''$
3" - 4"	523-134	$\pm .0023''$

DIMENSIONS



Groove Micrometers

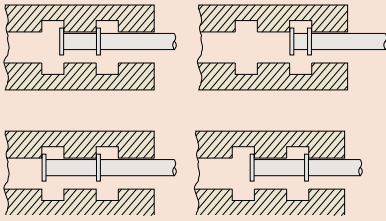
SERIES 146

FEATURES

- Flanged spindle for measuring width, depth, and location of grooves inside/outside bores, and tubes.
- Provided with offset graduations for inside and outside measurements.
- Non-rotating spindle type has two-directional ratchet stop.

Technical Data

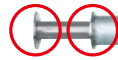
Accuracy: $\pm 10\mu\text{m}/\pm .0004''$
 Parallelism: $10\mu\text{m}/.0004''$



146-122

146-221

Flange (measuring face)



146-222

SPECIFICATIONS

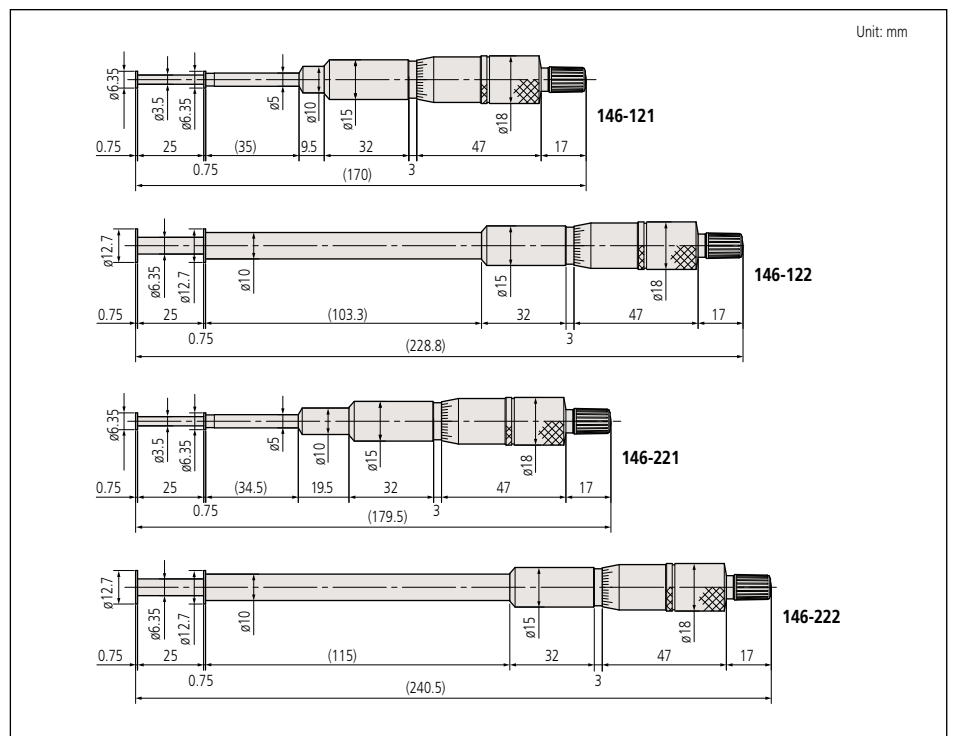
Metric		Rotating spindle type	
Range Outside	Range Inside	Order No.	Flange
0 - 25mm	1.6 - 26.5mm	146-121	$\phi 6.35\text{mm}$
		146-122	$\phi 12.7\text{mm}$
25 - 50mm	26.5 - 51.5mm	146-123	$\phi 12.7\text{mm}$
50 - 75mm	51.5 - 76.5mm	146-124	$\phi 12.7\text{mm}$
75 - 100mm	76.5 - 101.5mm	146-125	$\phi 12.7\text{mm}$

Inch		Rotating spindle type	
Range Outside	Range Inside	Order No.	Flange
0 - 1"	.055" - 1.05"	146-131	$\phi .25''$
		146-132	$\phi .5''$
1" - 2"	1.05" - 2.05"	146-133	$\phi .5''$
2" - 3"	2.05" - 3.05"	146-134	$\phi .5''$
3" - 4"	3.05" - 4.05"	146-135	$\phi .5''$

Metric		Non-rotating spindle type	
Range Outside	Range Inside	Order No.	Flange
0 - 25mm	1.6 - 26.5mm	146-221	$\phi 6.35\text{mm}$
		146-222	$\phi 12.7\text{mm}$
25 - 50mm	26.5 - 51.5mm	146-223	$\phi 12.7\text{mm}$
50 - 75mm	51.5 - 76.5mm	146-224	$\phi 12.7\text{mm}$
75 - 100mm	76.5 - 101.5mm	146-225	$\phi 12.7\text{mm}$

Inch		Non-rotating spindle type	
Range Outside	Range Inside	Order No.	Flange
0 - 1"	.055" - 1.05"	146-231	$\phi .25''$
		146-232	$\phi .5''$
1" - 2"	1.05" - 2.05"	146-233	$\phi .5''$
2" - 3"	2.05" - 3.05"	146-234	$\phi .5''$
3" - 4"	3.05" - 4.05"	146-235	$\phi .5''$

DIMENSIONS



Quick-Mini

SERIES 700

A compact comparator designed for carrying convenience, it is highly suitable for quick dimensional inspection of paper, leather, wires, plastic parts, etc. The digital display provides error-free reading with 0.01mm resolution.



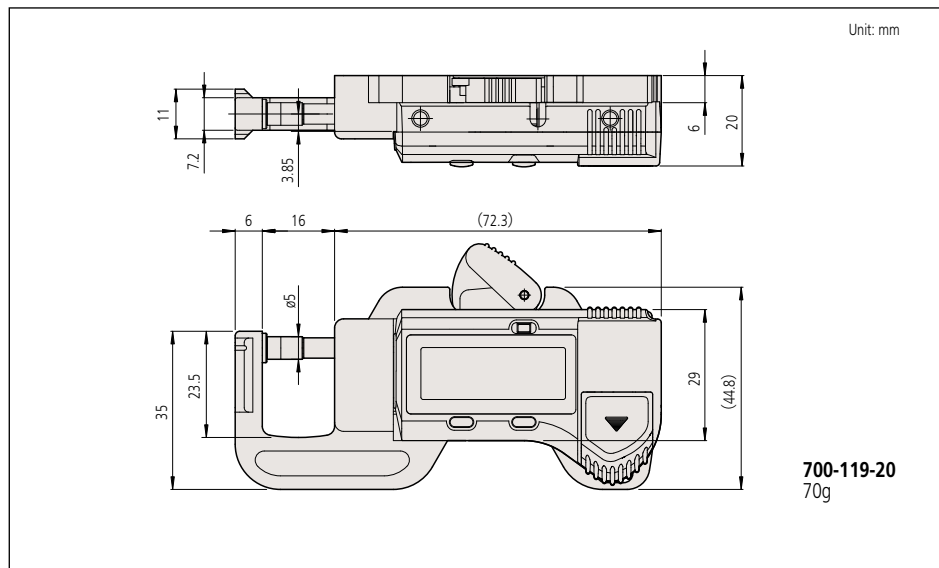
700-119-20

SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 12mm	700-119-20	±0.02mm

Inch/Metric		
Range	Order No.	Accuracy
0 - .5"/0 - 12mm	700-118-20	±.001"

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications.
 Resolution: 0.01mm or .0005"/0.01mm
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 3.5 years under normal use

Functions

Zero-setting, Data hold, Power ON/OFF, inch/mm conversion (inch/mm models)



Small Hole Gage Set

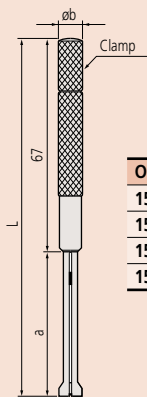
SERIES 154

FEATURES

- Two sprung leaves are fully expanded inside a small hole so that the hole diameter can be measured with an outside micrometer after extraction.
- Each set includes all 4 sizes of gage in a fitted case.
- Extra long for gaging deep and shallow holes, slots, and similar workpieces.
- Gaging surfaces are fully hardened to insure long tool life.



DIMENSIONS



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	108	40	8.5
154-104 / 108	108	40	8.5



154-902

SPECIFICATIONS

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

Inch		
Total range	Order No.	Gages included
.125" - .5" DIA. (4-gage set)	154-901	ø.125 - .2" (154-105)
		ø.2 - .3" (154-106)
		ø.3 - .4" (154-107)
		ø.4 - .5" (154-108)

Telescoping Gage Set

SERIES 155

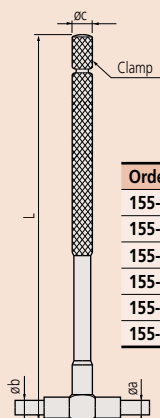
FEATURES

- A spring loaded plunger expands within a bore (or groove) and is locked in place, allowing measurement of diameter (or width) with an outside micrometer after extraction from the feature.
- Knurled finish provides a secure grip and easy locking.
- Each set includes all 6 sizes of gage in a fitted case.



155-905

DIMENSIONS



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.	Gages included
8 - 150mm (6-gage set)	155-905	8 - 12.7mm (155-127)
		12.7 - 19mm (155-128)
		19 - 32mm (155-129)
		32 - 54mm (155-130)
		54 - 90mm (155-131)
		90 - 150mm (155-132)

Inch		
Total range	Order No.	Gages included
.313" - 6" (6-gage set)*	155-903	.313" - .5" (155-121)
		.5" - .75" (155-122)
		.75" - 1.25" (155-123)
		1.25" - 2.125" (155-124)
		2.125" - 3.5" (155-125)
		3.5" - 6" (155-126)

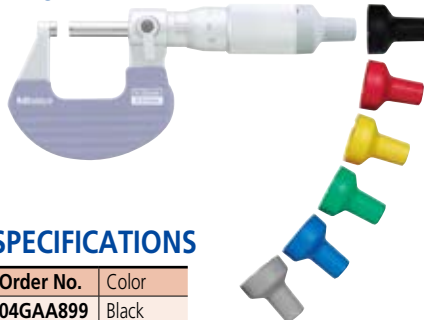
*4-gage set (Total range: .313" - 2.125" (155-907)) and 5-gage set (Total range: 5" - 6" (155-904)) are also available.

Color-Coded Ratchets & Speeders

Color-coded ratchets



Color-coded speeders for Ratchet Thimble Micrometer and Quantu-Mike



SPECIFICATIONS

Order No.	Color	Material	Description
985056*	Black	Plastic	for 0 - 300mm micrometers *for analog model **for digital model
985061*	Red		
985081*	Blue		
985071*	Yellow		
985076*	Green		
985066*	Brown		
04GZA239*	Gray		
04GZA241**	Gray	Steel	
950700*	Gray		
951588**	Gray	Plastic	for 300 - 1000mm micrometers
04GZA243	Gray		
950701	Gray		

SPECIFICATIONS

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

Spindle Attachment Tips



Technical Data

Tip length: 10mm ±5µm



DIMENSIONS

Order No.	Tip type
208062	
208063	
208064	

Order No.	Tip type
208065	
208066	

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 sizes.
- Supplied in fitted carrying case.



157-903

Technical Data

Flatness: 0.1μm
 Parallelism: 0.2μm
 Diameter: 30mm

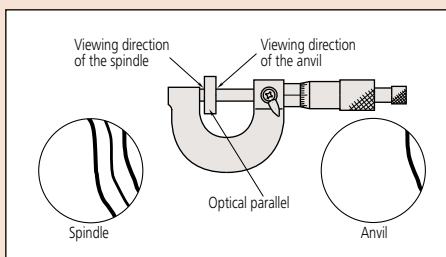
Parallelism Check of Measuring Faces by Means of Interference Fringe Produced by an Optical Parallel

The parallelism of 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 face under normal measuring force.

The diagram below shows parallelism of about 1μm ($0.32\mu\text{m} \times 3 = 0.96\mu\text{m}$).

There should not be more than one fringe visible on the anvil face.

The four parallels are sized such that testing can be performed at each quarter revolution of the spindle.



SPECIFICATIONS

Metric		
Range of micrometer to be checked	Order No.	Sizes of parallels included in set
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.	Sizes of parallels included in set
0-1"	157-901	.5000", .5062", .5125", .5187"
1-2"	157-902	1.0000", 1.0062", 1.0125", 1.0187"

Optical Flats

SERIES 158

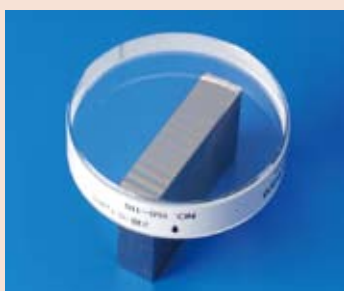
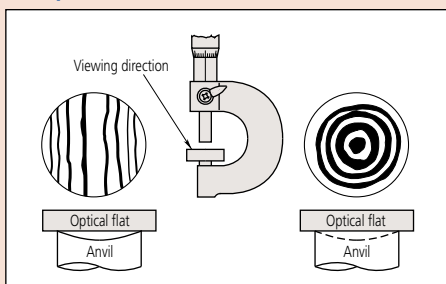
FEATURES

- Of circular form with one surface accurately polished, used for inspecting the flatness of gauge block or platen reference surfaces, micrometer measuring faces or any other very flat surface of high reflectivity.
- Available in two sizes and two grades of flatness tolerance for the specified surface.



158-118

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



SPECIFICATIONS

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

Micrometer Setting Standards

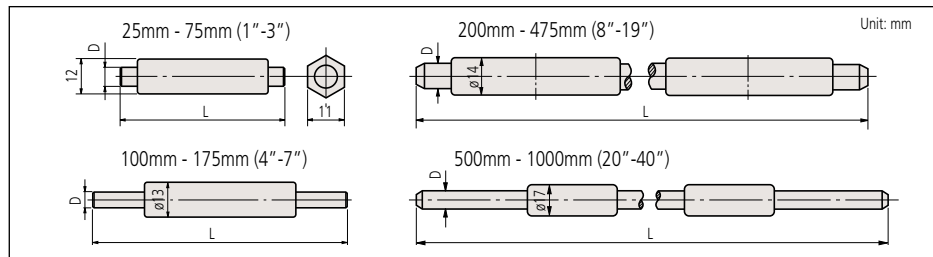
SERIES 167

FEATURES

- Used for accurately setting outside micrometers at the start or end of the measuring range.
- Flat and lapped measuring faces.
- Heat insulating handles are provided for preventing expansion due to body temperature.



DIMENSIONS



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	±10µm
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"	±.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"

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 accurate setting of screw thread micrometers.



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	55°	±8μm
150mm	167-266	60°	±9μm
	167-277	55°	±9μm
175mm	167-267	60°	±10μm
	167-278	55°	±10μm
200mm	167-268	60°	±11μm
	167-279	55°	±11μm
225mm	167-269	60°	±12μm
	167-280	55°	±12μm
250mm	167-270	60°	±13μm
	167-281	55°	±13μm
275mm	167-271	60°	±14μm
	167-282	55°	±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°	±.0004"
	167-287	55°	±.0004"

Technical Data

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

Standards for V-Anvil Micrometers

SERIES 167

FEATURES

- Specially designed for the accurate setting of V-anvil micrometers.



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	±.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"

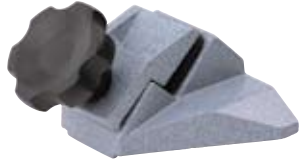
Technical Data

Accuracy: Refer to the list of specifications.

Micrometer Stands

SERIES 156

These stands are designed to allow bench-top use of hand micrometers or other gages which have frames suitable for gripping by the clamp.



156-105-10



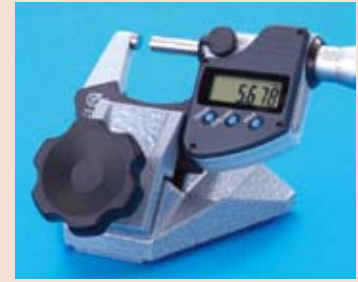
156-101-10



156-102

SPECIFICATIONS

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



DIMENSIONS

