

QuantuMike

SERIES 293 — IP65 Coolant Proof Micrometer with 2mm/rev Spindle Feed

Speedy measurement is achieved thanks to 2mm of spindle feed for every thimble revolution!

Mitutoyo is proud to have reached its leading position in the micrometer market through a spirit of innovation, imagination and creating added value.

The QuantuMike brand of micrometer, inspired by this Mitutoyo Spirit, provides users with an excellent measuring experience with higher speed, quality and stability than ever before owing to the integration of sophisticated manufacturing and processing technologies.

SPC



IP65

(Refer to page VIII for details.)



(Refer to page VIII for details.)



Certificate of inspection

Technical Data

Accuracy: $\pm 1\mu\text{m}/\pm 0.0005''$ or $\pm 2\mu\text{m}/\pm 0.001''$ (over 75mm/3")

(excluding quantizing error)

Resolution: 0.001mm, .00005"/0.001mm

Flatness: 0.3 $\mu\text{m}/0.00012''$

Parallelism: 1 $\mu\text{m}/0.0004''$ for models up to 50mm/2"
2 $\mu\text{m}/0.0008''$ for models up to 100mm/4"

Measuring faces: Carbide

Display: LCD

Length standard: Electromagnetic rotary sensor

*Patent pending (in Japan, USA, Europe, and China)

Battery: SR44 (1 pc.), 938882

Battery life: Approx. 1.2 years under normal use

Dust/Water protection level: IP65

Functions

Origin-set, Zero-setting, Function lock, Automatic power ON/OFF, Data hold, Data output, inch/mm conversion (inch/mm models)

Alarm: Low voltage, Counting value composition error



Metric	
Range	Order No.
0 - 25mm	293-140 / 293-145*

Inch/Metric	
Range	Order No.
0 - 1"	293-180 / 293-185*

*without SPC data output



Metric	
Range	Order No.
25 - 50mm	293-141 / 293-146*

Inch/Metric	
Range	Order No.
1" - 2"	293-181 / 293-186*

*without SPC data output



Metric	
Range	Order No.
50 - 75mm	293-142 / 293-147*

Inch/Metric	
Range	Order No.
2" - 3"	293-182 / 293-187*

*without SPC data output



Metric	
Range	Order No.
75 - 100mm	293-143 / 293-148*

Inch/Metric	
Range	Order No.
3" - 4"	293-183 / 293-188*

*without SPC data output



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)



SPC cable with data switch



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

Useful application of measurement data

A statistical process control system and a measurement network system can be established to share information regarding quality with a model equipped with the data output function.



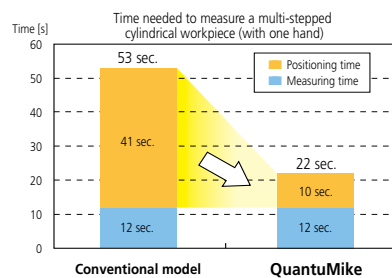
FEATURES

•Speedy measurement

Faster measurement is achieved by using a coarser thread which feeds the spindle by 2mm per revolution of the thimble instead of the standard 0.5mm. This increase in thread lead has been made possible thanks to new high precision thread-cutting and test techniques.

Trials show that a reduction in positioning times of 60% and measuring times of 35%* can be obtained, compared with a conventional micrometer.

* According to Mitutoyo's comparison test data for measuring time on typical workpieces.

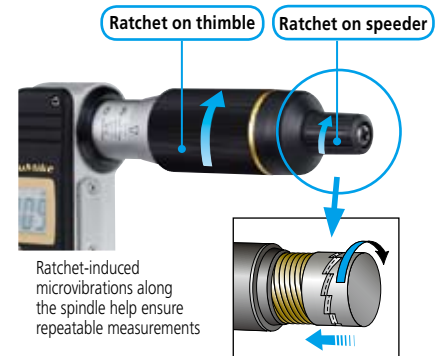


The time needed to measure 6 diameters on a workpiece, from the smallest to the largest with the micrometer held in one hand, was recorded for a conventional digital micrometer and for the QuantuMike

•Repeatable measurement

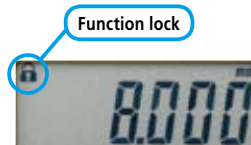
The patented ratchet thimble mechanism* helps ensure repeatable results by transmitting microvibrations along the spindle to the contact face to provide a constant measuring force and encourage good contact with the workpiece. The ratchet works from the thimble as well as the speeder so it is always easy to use – even when making measurements one-handed. The sound of the ratchet provides the user with a sense of confidence and the speeder enables the rapid spindle feed needed when measuring widely different dimensions.

*Patent registered (in Japan, USA, China, Germany, UK, and France)



•Function lock

QuantuMike is equipped with a function lock feature to prevent the origin point being moved by mistake during measurement.

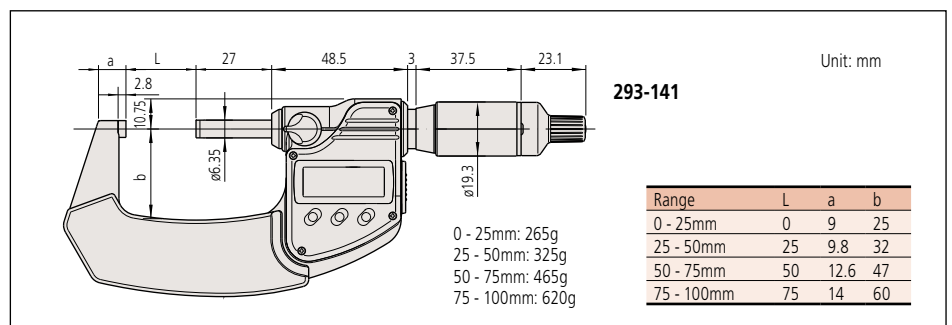


•Dust/water resistance with IP65 protection level

Excellent resistance against oil, water and dust enables this product to be used in machining situations that include splashing coolant fluid.



DIMENSIONS AND MASS



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.
- Oil-resistant materials are used in all plastic components.
- $\pm 1\mu\text{m}$ instrumental error (75mm/3" or less range models)
- Auto power ON/OFF function.
- Certificate of Inspection* is included.
(50mm/2" or less range models)
* This certificate is undated and therefore cannot be used as a calibration certificate.



293-230



293-252-10



Oil-resistant materials are used in all plastic components.

SPC



IP65

(Refer to page VIII for details.)



(Refer to page VIII for details.)



Certificate of Inspection

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm, .00005"/0.001mm (up to 4") or .0001"/0.001mm (over 4")
Flatness: 0.3 μm /0.00012"
Parallelism: 1 μm /0.0004" for models up to 50mm/2"
2 μm /0.0008" for models up to 100mm/4"
3 μm /0.0012" for models up to 175mm/7"
4 μm /0.0016" for models up to 275mm/11"
5 μm /0.002" for models over 300mm/12"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.), **938882**
Battery life: Approx. 1.2 years under normal use
Dust/Water protection level: IP65

Functions

Origin-set, 2-point preset (over 100mm), Zero-setting, Function lock (over 100mm) Automatic power ON/OFF, Data hold, 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)



SPC cable with data switch



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

SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	293-230 / 293-240*	±1μm
25 - 50mm	293-231 / 293-241*	±1μm
50 - 75mm	293-232 / 293-242*	±1μm
75 - 100mm	293-233 / 293-243*	±2μm
100 - 125mm	293-250-10	±2μm
125 - 150mm	293-251-10	±2μm
150 - 175mm	293-252-10	±3μm
175 - 200mm	293-253-10	±3μm
200 - 225mm	293-254-10	±3μm
225 - 250mm	293-255-10	±4μm
250 - 275mm	293-256-10	±4μm
275 - 300mm	293-257-10	±4μm

*without SPC data output

Metric With ratchet thimble		
Range	Order No.	Accuracy
0 - 25mm	293-234 / 293-244*	±1μm
25 - 50mm	293-235 / 293-245*	±1μm
50 - 75mm	293-236 / 293-246*	±1μm
75 - 100mm	293-237 / 293-247*	±2μm

*without SPC data output

Metric With friction thimble		
Range	Order No.	Accuracy
0 - 25mm	293-238 / 293-248*	±1μm

*without SPC data output

Inch/Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 1"	293-330 / 293-340*	±.00005"
1" - 2"	293-331 / 293-341*	±.00005"
2" - 3"	293-332 / 293-342*	±.00005"
3" - 4"	293-333 / 293-343*	±.0001"
4" - 5"	293-350-10	±.0001"
5" - 6"	293-351-10	±.0001"
6" - 7"	293-352-10	±.00015"
7" - 8"	293-353-10	±.00015"
8" - 9"	293-354-10	±.00015"
9" - 10"	293-355-10	±.0002"
10" - 11"	293-356-10	±.0002"
11" - 12"	293-357-10	±.0002"

*without SPC data output

Inch/Metric With ratchet thimble		
Range	Order No.	Accuracy
0 - 1"	293-334 / 293-344*	±.00005"
1" - 2"	293-345*	±.00005"
2" - 3"	293-346*	±.00005"
3" - 4"	293-347*	±.0001"

*without SPC data output

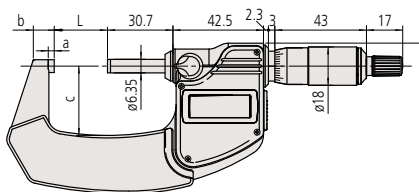
Inch/Metric With friction thimble		
Range	Order No.	Accuracy
0 - 1"	293-335 / 293-348*	±.00005"
1" - 2"	293-336	±.00005"

*without SPC data output

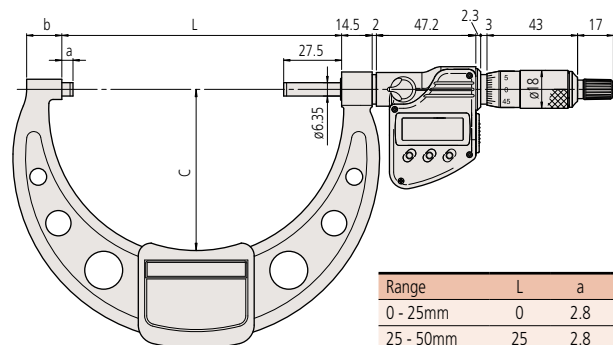
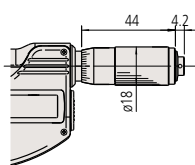
DIMENSIONS AND MASS

Unit: mm

Ratchet stop type up to 100mm

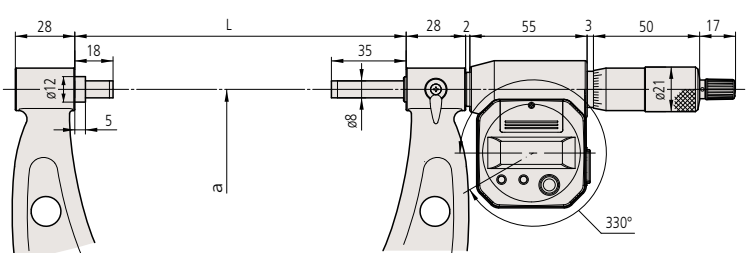


Ratchet thimble type / Friction thimble type



Ratchet stop type over 100mm

Range	L	a	b	c	Mass
0 - 25mm	0	2.8	9	25	270g
25 - 50mm	25	2.8	9.8	32	330g
50 - 75mm	50	2.8	12.6	47	470g
75 - 100mm	75	2.8	14	60	625g
100 - 125mm	132.8	5.3	16.7	76	600g
125 - 150mm	158.2	5.7	18.8	90	740g
150 - 175mm	183.6	6.1	19.1	102	800g
175 - 200mm	208.8	6.3	18.2	115	970g
200 - 225mm	234.2	6.7	16.8	127	1100g
225 - 250mm	258	5.5	18	139	1270g
250 - 275mm	284	6.5	18	152	1340g
275 - 300mm	309	6.5	18	166	1540g



Range	L	a
300 - 325mm	353	187
325 - 350mm	378	199
350 - 375mm	403	212
375 - 400mm	428	224
400 - 425mm	453	236
425 - 450mm	478	248
450 - 475mm	503	261
475 - 500mm	528	273

Digimatic Micrometer

SERIES 293

FEATURES



293-582

SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
300 - 325mm	293-582	$\pm 6\mu\text{m}$
325 - 350mm	293-583	$\pm 6\mu\text{m}$
350 - 375mm	293-584	$\pm 6\mu\text{m}$
375 - 400mm	293-585	$\pm 7\mu\text{m}$
400 - 425mm	293-586	$\pm 7\mu\text{m}$
425 - 450mm	293-587	$\pm 7\mu\text{m}$
450 - 475mm	293-588	$\pm 8\mu\text{m}$
475 - 500mm	293-589	$\pm 8\mu\text{m}$

Inch/Metric With ratchet stop		
Range	Order No.	Accuracy
12" - 13"	293-782	$\pm 0.003"$
13" - 14"	293-783	$\pm 0.003"$
14" - 15"	293-784	$\pm 0.003"$
15" - 16"	293-785	$\pm 0.0035"$
16" - 17"	293-786	$\pm 0.0035"$
17" - 18"	293-787	$\pm 0.0035"$
18" - 19"	293-788	$\pm 0.004"$
19" - 20"	293-789	$\pm 0.004"$

Digimatic Micrometer

SERIES 293

FEATURES

- Simply measures 0 through 25mm with resolution to 0.001mm.
- Provided only with an origin-set button for easy origin setting.
- A ratchet stop or friction thimble for a constant measuring force.
- Measurement readout with large characters on the LCD screen.

SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	293-821	$\pm 2\mu\text{m}$

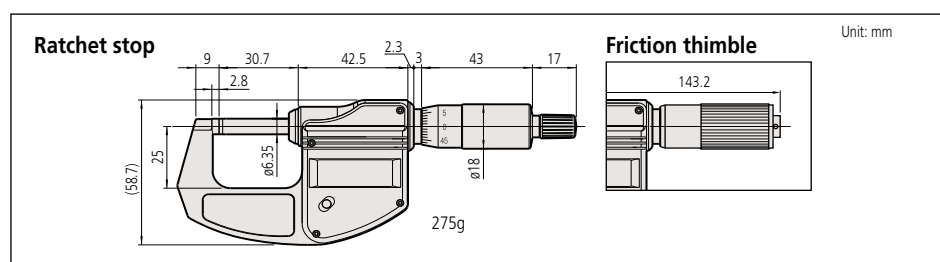


293-821

Inch/Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 1"	293-831	$\pm 0.001"$

Inch/Metric With friction thimble		
Range	Order No.	Accuracy
0 - 1"	293-832	$\pm 0.001"$

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .0001"/0.001mm
Flatness: 0.6 μm /0.00024"
Parallelism: 5 μm /0.002" for models up to 375mm/15"
6 μm /0.0024" for models up to 475mm/19"
7 μm /0.0028" for models over 500mm/20"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (2 pcs.), **938882**
Battery life: Approx. 1.8 years under normal use
Dimensions: Refer to page B-5 for details.

Functions

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

Optional Accessories

04AZB512: SPC cable (1m)
04AZB513: SPC cable (2m)
02AZD790E: SPC cable for U-WAVE (160mm)



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3 μm /0.00012"
Parallelism: 2 μm /0.0008"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.), **938882**
Battery life: Approx. 1.2 years under normal use

Functions

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





(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3µm/.000012"
Parallelism: 2µm/.00008"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.) **938882**
Battery life: Approx. 3 years under normal use
(1 year for 15-30mm, 10-20mm, 20-30mm,
.6"-1.2", .4"-.8", .8"-1.2" range model)

Functions

Origin-set, Power ON/OFF, Data hold, Data output, Preset
(15-30mm range model), inch/mm conversion (inch/mm
models)
Alarm: Low voltage, Counting value composition error

Optional Accessories

937387: SPC cable (1m)
965013: SPC cable (2m)
06ADV380E: USB Input Tool Direct with data switch (2m)
02AZD790E: SPC cable for U-WAVE (160mm)



ABSOLUTE Digimatic Micrometers

SERIES 227 — with Adjustable Measuring Force Device

FEATURES

- Constant and low measuring force mechanism in the thimble.
- Adjustable measuring force* to suit various kinds of workpiece.
- 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 of 10mm/rev.
- Absolute linear scale.
- SPC data output.

*0.5-2.5N or 2-10N



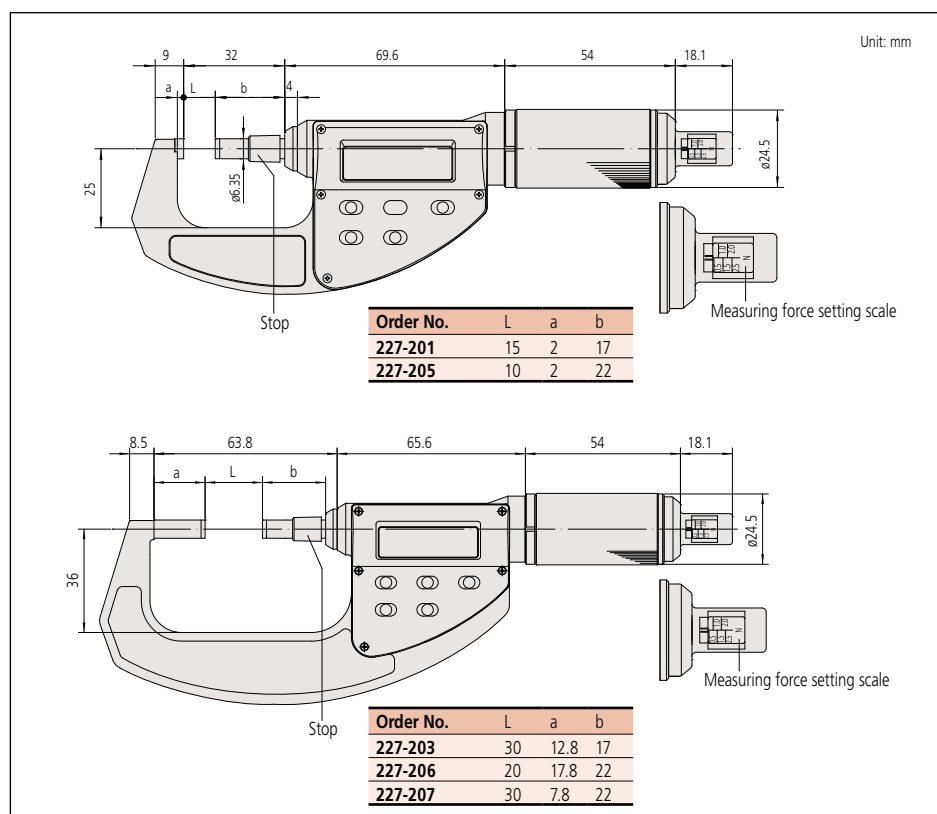
227-201

SPECIFICATIONS

Metric			
Range	Order No.	Accuracy	Measuring force
0 - 15mm	227-201	±2µm	0.5N - 2.5N
0 - 10mm	227-205	±2µm	2N - 10N
15 - 30mm	227-203	±2µm	0.5N - 2.5N
10 - 20mm	227-206	±2µm	2N - 10N
20 - 30mm	227-207	±2µm	2N - 10N

Inch/Metric			
Range	Order No.	Accuracy	Measuring force
0 - .6"	227-211	±.0001"	0.5N - 2.5N
	227-215	±.0001"	2N - 10N
.6" - 1.2"	227-213	±.0001"	0.5N - 2.5N
	227-216	±.0001"	2N - 10N
.8" - 1.2"	227-217	±.0001"	2N - 10N

DIMENSIONS AND MASS



Quickmike

SERIES 293 — IP-54 ABSOLUTE Digimatic Micrometers

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

FEATURES

- Non-rotating spindle and the new ratchet friction thimble.
- Speedy spindle feed of 10mm/rev.
- ABSOLUTE System linear scale.
- IP54 dust/water protection (when not connected with data output cable).
- SPC data output.
- Supplied with a setting standard (for models with a range over 30mm/1.2").

SPC

IP54

(Refer to page VIII for details.)

ABSOLUTE®
Absolute System Patented by MITUTOYO

(Refer to page VIII for details.)



293-666



293-667



293-668



293-669

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3μm/0.00012"
Parallelism: 2μm/0.0008" for models up to 80mm/3.2"
3μm/0.0012" for models up to 105mm/4.2"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.), 938882
Battery life: Approx. 3 years under normal use
(1 year for models over 30mm)
Dust/Water protection level: IP54

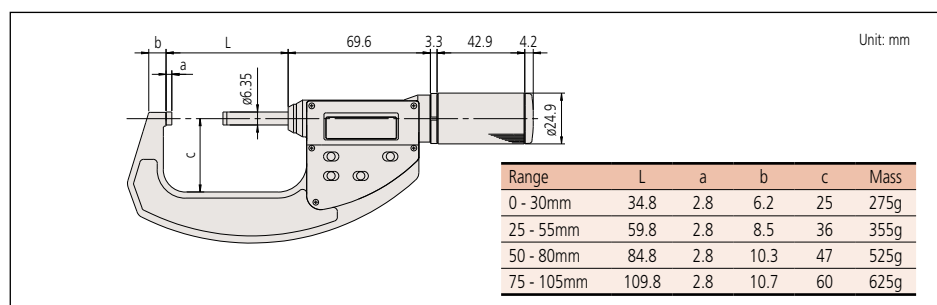
SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 30mm	293-666	±2μm
	293-661-10*	±2μm
25 - 55mm	293-667	±2μm
50 - 80mm	293-668	±3μm
75 - 105mm	293-669	±3μm

*Without SPC data output

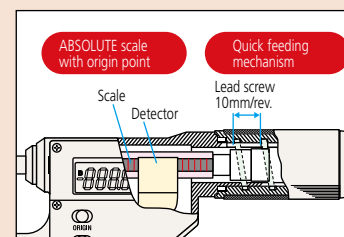
Inch/Metric		
Range	Order No.	Accuracy
0 - 1.2"	293-676	±.0001"
1" - 2.2"	293-677	±.0001"
2" - 3.2"	293-678	±.00015"
3" - 4.2"	293-679	±.00015"

DIMENSIONS AND MASS



Functions

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



Optional Accessories

937387: SPC cable (1m)
965013: SPC cable (2m)
06ADV380E: USB Input Tool Direct with data switch (2m)
02AZD790E: SPC cable for U-WAVE (160mm)

Outside Micrometers

SERIES 102



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm
 Flatness: 0.6μm
 Parallelism: 2μm for 25, 50, 75mm model
 3μm for models up to 100mm
 Measuring faces: Carbide

Ratchet stop type



FEATURES

- Heat-insulated frame, tapered (behind the anvil) for hard-to-reach places.
- Supplied with a setting standard (except for 0-25mm/0-1" models).
- A ratchet stop for a constant measuring force.



102-301



SPECIFICATIONS

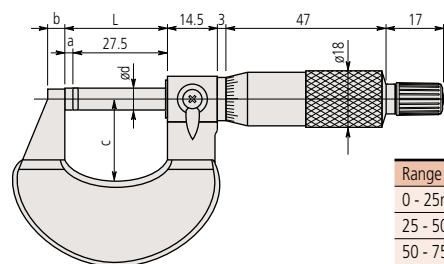
Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	102-301	±2μm
25 - 50mm	102-302	±2μm
50 - 75mm	102-303	±2μm
75 - 100mm	102-304	±3μm

*0.001mm reading is obtained with vernier.

Metric Micrometer set		
Range	Order No.	Models included
0 - 100mm (Four micrometers per set)	102-911-01	• 102-701* • 102-302 • 102-303 • 102-304 • 3 micrometer standards

*Ratchet thimble micrometer.

DIMENSIONS



Unit: mm

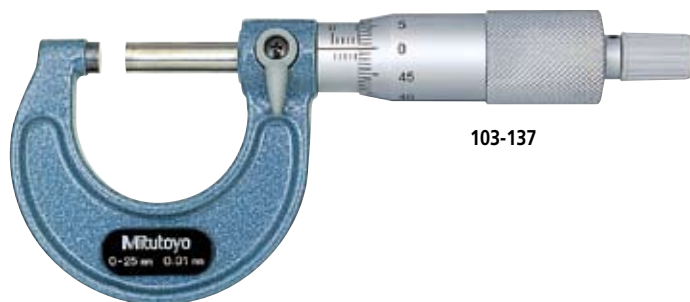
Range	L	a	b	c	d
0 - 25mm	30.3	2.8	5	26	6.35
25 - 50mm	55.3	2.8	8	32	6.35
50 - 75mm	80.3	2.8	9	45	6.35
75 - 100mm	105.3	2.8	10	58	6.35

Outside Micrometers

SERIES 103

FEATURES

- Hammertone-green, baked-enamel-finished frame.
- Ratchet Stop or Friction Thimble for excellent repeatability.
- Supplied with a setting standard (except for 0-25mm/0-1" models).



103-137

SPECIFICATIONS

Metric With ratchet stop

Range	Order No.	Accuracy
0 - 25mm	103-137	±2μm
	103-129*	±2μm
25 - 50mm	103-138	±2μm
	103-130*	±2μm
50 - 75mm	103-139-10	±2μm
75 - 100mm	103-140-10	±3μm
100 - 125mm	103-141-10	±3μm
125 - 150mm	103-142-10	±3μm
150 - 175mm	103-143-10	±4μm
175 - 200mm	103-144-10	±4μm
200 - 225mm	103-145-10	±4μm
225 - 250mm	103-146-10	±5μm
250 - 275mm	103-147-10	±5μm
275 - 300mm	103-148-10	±5μm
300 - 325mm	103-149	±6μm
325 - 350mm	103-150	±6μm
350 - 375mm	103-151	±6μm
375 - 400mm	103-152	±7μm
400 - 425mm	103-153	±7μm
425 - 450mm	103-154	±7μm
450 - 475mm	103-155	±8μm
475 - 500mm	103-156	±8μm

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

*0.001mm reading is obtained with vernier.

Inch With ratchet stop

Range	Order No.	Accuracy
0 - 1"	103-177	±.0001"
	103-131*	±.0001"
1" - 2"	103-178	±.0001"
	103-132*	±.0001"
2" - 3"	103-179	±.0001"
3" - 4"	103-180	±.00015"
4" - 5"	103-181	±.00015"
5" - 6"	103-182	±.00015"
6" - 7"	103-183	±.0002"
7" - 8"	103-184	±.0002"
8" - 9"	103-185	±.0002"
9" - 10"	103-186	±.00025"
10" - 11"	103-187	±.00025"
11" - 12"	103-188	±.00025"
12" - 13"	103-189	±.0003"
13" - 14"	103-190	±.0003"
14" - 15"	103-191	±.0003"
15" - 16"	103-192	±.00035"
16" - 17"	103-193	±.00035"
17" - 18"	103-194	±.00035"
18" - 19"	103-195	±.0004"
19" - 20"	103-196	±.0004"

(Models with a range up to 40" are available.)

*.0001" reading is obtained with vernier.

Inch With friction thimble

Range	Order No.	Accuracy
0 - 1"	103-135*	±.0001"
1" - 2"	103-136*	±.0001"

*.0001" reading is obtained with vernier.

Metric Micrometer set

Range	Order No.	Models included
0 - 75mm (3 pcs./set)	103-927-10	103-137, 103-138, 103-139-10 , 2 micrometer standards
0 - 150mm (6 pcs./set)	103-913-31	102-701*, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10 , 5 micrometer standards
150 - 300mm (6 pcs./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
0 - 300mm (12 pcs./set)	103-914-31	All micrometers of 103-913-31 and 103-915-10 in one set, 11 micrometer standards

*Ratchet thimble micrometer

Inch Micrometer set

Range	Order No.	Models included
0 - 3" (3 pcs./set)	103-929	103-177, 103-178, 103-179 , 2 micrometer standards
0 - 4" (4 pcs./set)	103-930	103-177, 103-178, 103-179, 103-180 , 3 micrometer standards
0 - 6" (6 pcs./set)	103-904-10	103-177, 103-178, 103-179, 103-180, 103-181, 103-182 , 5 micrometer standards
6" - 12" (6 pcs./set)	103-906	103-183, 103-184, 103-185, 103-186, 103-187, 103-188 , 6 micrometer standards
0 - 12" (12 pcs./set)	103-905-10	All micrometers of 103-904-10 and 103-906 in one set, 11 micrometer standards

*Ratchet thimble micrometer



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.

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

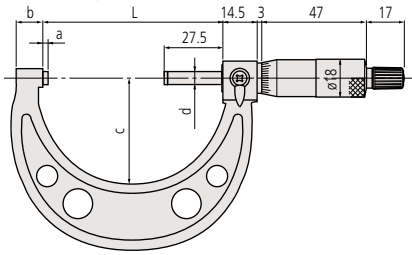
Flatness: 0.6μm/0.00024" for models up to 300mm/12"
1μm/0.0004" for models over 300mm/12"

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

Measuring faces: Carbide

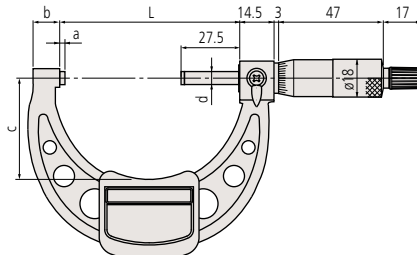
DIMENSIONS AND MASS

Models up to 75mm

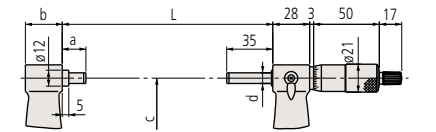


Range	L	a	b	c	d
0 - 25mm	30	2.5	9	28	ø6.35
25 - 50mm	55	2.5	10	38	ø6.35
50 - 75mm	80	2.5	12	46	ø6.35
75 - 100mm	105	2.5	14	57	ø6.35
100 - 125mm	132.8	5.3	16.7	76	ø6.35
125 - 150mm	158.2	5.7	18.8	90	ø6.35
150 - 175mm	183.6	6.1	19.1	102	ø6.35
175 - 200mm	208.8	6.3	18.2	115	ø6.35
200 - 225mm	234.2	6.7	16.8	127	ø6.35

Models 75mm to 300mm



Models over 300mm



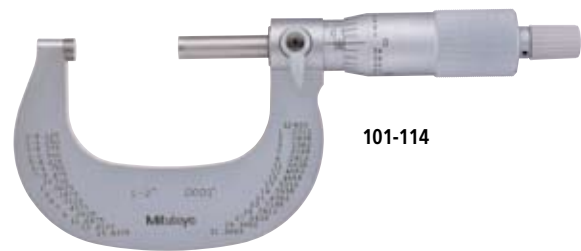
Range	L	a	b	c	d
225 - 250mm	258	5.5	18	139	ø6.35
250 - 275mm	284	6.5	18	152	ø6.35
275 - 300mm	309	6.5	18	166	ø6.35
300 - 325mm	353	18	28	187	ø8
325 - 350mm	378	18	28	199	ø8
350 - 375mm	403	18	28	212	ø8
375 - 400mm	428	18	28	224	ø8
400 - 425mm	453	18	28	236	ø8
425 - 450mm	478	18	28	248	ø8
450 - 475mm	503	18	28	261	ø8
475 - 500mm	528	18	28	273	ø8

Outside Micrometers

SERIES 101

FEATURES

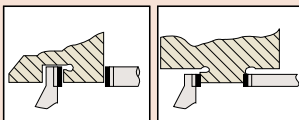
- Satin-chrome-finished frame, tapered (on the anvil side) for hard-to-reach places.
- Supplied with a setting standard (except for 0-1" models).



101-114

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: .001" or .0001"
 Flatness: .000024"
 Parallelism: .00008" for models up to 3"
 .00012" for models over 3"
 Measuring faces: Carbide



SPECIFICATIONS

Inch With ratchet stop

Range	Order No.	Accuracy
0 - 1"	101-113*	±.0001"
1" - 2"	101-114*	±.0001"
2" - 3"	101-119*	±.0001"
3" - 4"	101-120*	±.00015"

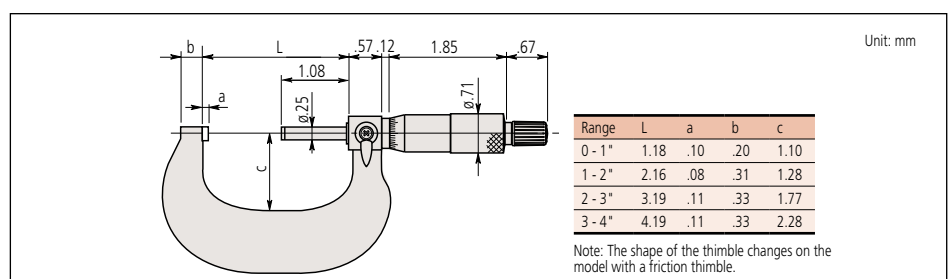
*.0001" reading is obtained with vernier.

Inch With friction thimble

Range	Order No.	Accuracy
0 - 1"	101-117*	±.0001"
1" - 2"	101-118*	±.0001"

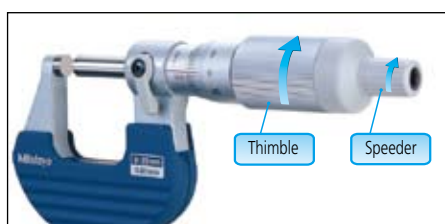
*.0001" reading is obtained with vernier.

DIMENSIONS

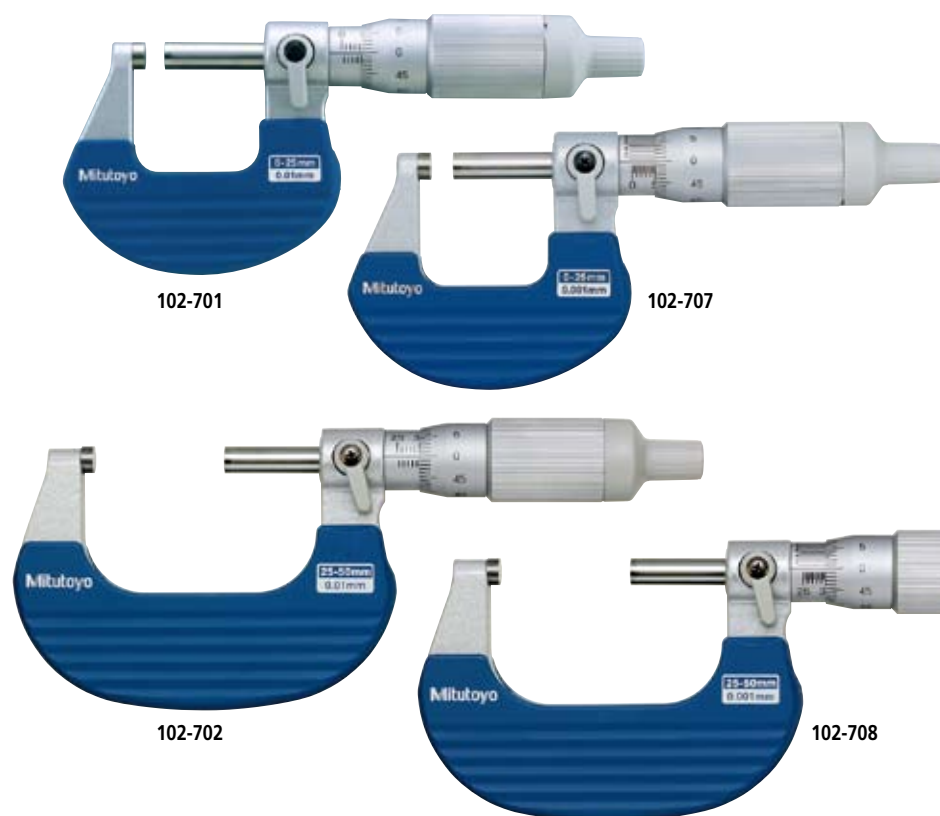


SERIES 102 — New smoother action Ratchet Thimble

- 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.
- Provided with a Certificate of Inspection.



(Refer to page VIII for details.)



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

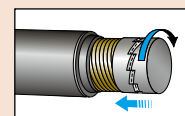
*0.001mm reading is obtained with vernier.

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

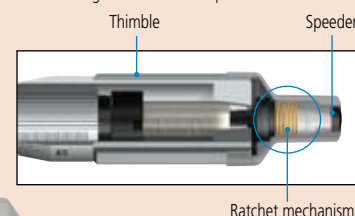
*.0001" reading is obtained with vernier.

[illegible]

Technical Data
Accuracy: Refer to the list of specifications.
Graduation: 0.01mm, 0.001mm, or .0001"
Flatness: 0.6µm/.000024"
Parallelism: 2µm/.00008"
Measuring faces: Carbide
Measuring force: 5 - 10N



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





Outside Micrometers

SERIES 406 — Non-Rotating Spindle Type

FEATURES

- Supplied with a setting standard (except for 0-25mm/0-1" models).
- With SPC output.

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3μm
Parallelism: 3μm/.00012" for models up to 75mm/3"
4μm/.00016" for models over 75mm/3"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.), **938882**
Battery life: Approx. 1.2 years under normal use

Functions of Digital Model

Origin-set, Zero-setting, Data hold, Data output, inch/mm conversion (inch/mm models), Automatic power ON/OFF
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)



406-250

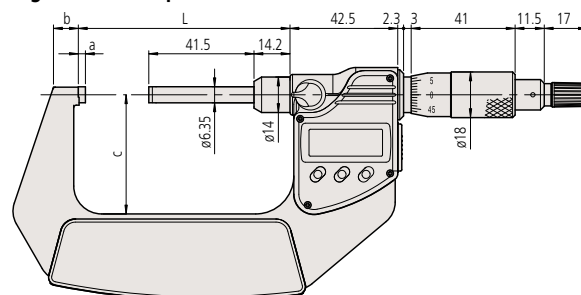
SPECIFICATIONS

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

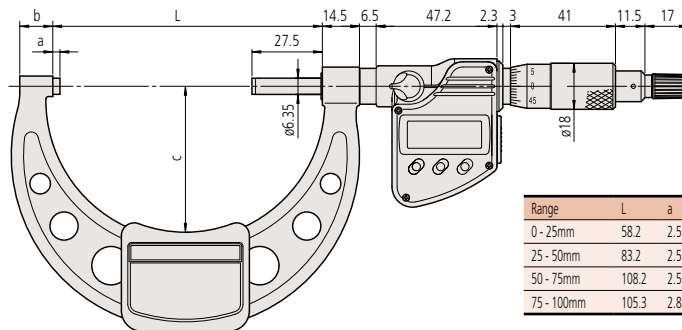
Inch/Metric Digital model with ratchet stop		
Range	Order No.	Accuracy
0 - 1"	406-350	±.00015"
1" - 2"	406-351	±.00015"
2" - 3"	406-352	±.00015"
3" - 4"	406-353	±.0002"

DIMENSIONS

Digital models up to 75mm



Digital models over 75mm



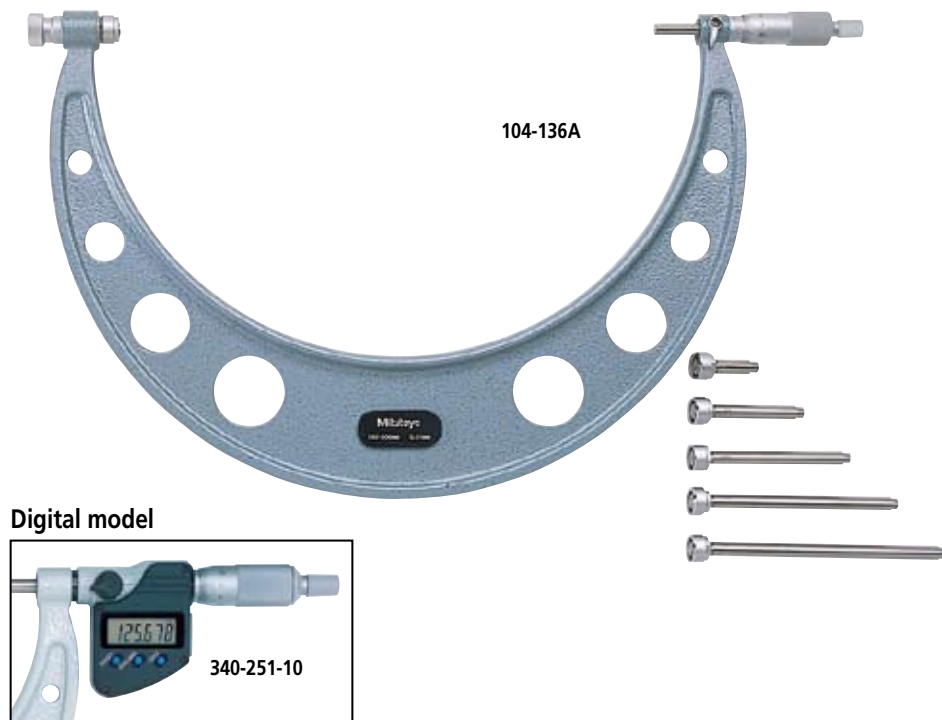
Range	L	a	b	c
0 - 25mm	58.2	2.5	7.3	32
25 - 50mm	83.2	2.5	10.1	47
50 - 75mm	108.2	2.5	11.5	60
75 - 100mm	105.3	2.8	14.1	57

Outside Micrometers

SERIES 340, 104 — with Interchangeable Anvils

FEATURES

- IP65 water/dust protection (340 series*).
*Models with a range up to 300mm.
- Wide measuring range with interchangeable anvils.
- With Ratchet Stop for constant force.
- Supplied with setting standards for each range.
- With SPC output (series 340).



SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Interchangeable anvils
0 - 150mm	340-251-10	6pcs.
150 - 300mm	340-252-10	6pcs.
300 - 400mm	340-520	4pcs.
400 - 500mm	340-521	4pcs.
500 - 600mm	340-522	4pcs.
600 - 700mm	340-523	4pcs.
700 - 800mm	340-524	4pcs.
800 - 900mm	340-525	4pcs.
900 - 1000mm	340-526	4pcs.

Metric		
Range	Order No.	Interchangeable anvils
0 - 50mm	104-171*	1pcs.
0 - 100mm	104-139A	4pcs.
0 - 150mm	104-135A	6pcs.
50 - 150mm	104-161A	4pcs.
100 - 200mm	104-140A	4pcs.
150 - 300mm	104-136A	6pcs.
200 - 300mm	104-141A	4pcs.
300 - 400mm	104-142A	4pcs.
400 - 500mm	104-143A	4pcs.
500 - 600mm	104-144A	4pcs.
600 - 700mm	104-145A	4pcs.
700 - 800mm	104-146A	4pcs.
800 - 900mm	104-147A	4pcs.
900 - 1000mm	104-148A	4pcs.

*The frame is fitted with a heat shield.

Inch/Metric	Digital model	
Range	Order No.	Interchangeable anvils
0 - 6"	340-351-10	6pcs.
6" - 12"	340-352-10	6pcs.
12" - 18"	340-720	6pcs.
18" - 24"	340-721	6pcs.
24" - 30"	340-722	6pcs.
30" - 36"	340-723	6pcs.

Inch		
Range	Order No.	Interchangeable anvils
0 - 2"	104-165*	1pcs.
0 - 4"	104-149	4pcs.
0 - 6"	104-137	6pcs.
2" - 6"	104-162	4pcs.
4" - 8"	104-150	4pcs.
6" - 12"	104-138	6pcs.
8" - 12"	104-151	4pcs.
12" - 16"	104-152	4pcs.
12" - 18"	104-201	6pcs.
16" - 20"	104-153	4pcs.
18" - 24"	104-202	6pcs.
20" - 24"	104-154	4pcs.
24" - 28"	104-155	4pcs.
24" - 30"	104-203	6pcs.
28" - 32"	104-156	4pcs.
30" - 36"	104-204	6pcs.
32" - 36"	104-157	4pcs.
36" - 40"	104-158	4pcs.
36" - 42"	104-205	6pcs.

*.0001" reading is obtained with vernier.

SPC

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ID: 4011207400

IP65

(Refer to page VIII for details.)

Technical Data

Accuracy: $\pm(4+R/75)\mu\text{m}$, R = max. range (mm)
 $\pm[.00016" + .00004(R/3)]"$ R = max. range (inch)
(excluding quantizing error for digital models)
Resolution*: 0.001mm or .0001"/0.001mm
(.00005"/0.001mm: **340-351-10**)
Graduation**: 0.01mm/.001"
Flatness: 0.6 μm /.000024" for models up to 300mm/12"
1 μm /.00004" for models over 300mm/12"
Parallelism: 2 μm /.00008" for models up to 75mm/3"
3 μm /.00012" for models up to 150mm/6"
(2+R/100) μm for models over 150mm,
R = max. range (mm)
fraction rounded up
 $\pm[.00008" + .00004(R/4)]"$ For models over 6"
R = max. range (inch)
fraction rounded up
Measuring faces: Carbide
Display*: LCD
Battery*: SR44 (2 pc.), **938882**
(1 pc.: **340-251-10, 252-10, 351-10, 352-10**)
Battery life*: Approx. 1.8 years under normal use
(1.2 years for **340-251-10, 252-10, 351-10, 352-10**)
Dust/Water protection level*: IP65 (**340-251-10, 252-10, 351-10, 352-10**)

*Digital models **Analog models

Functions of Digital Model

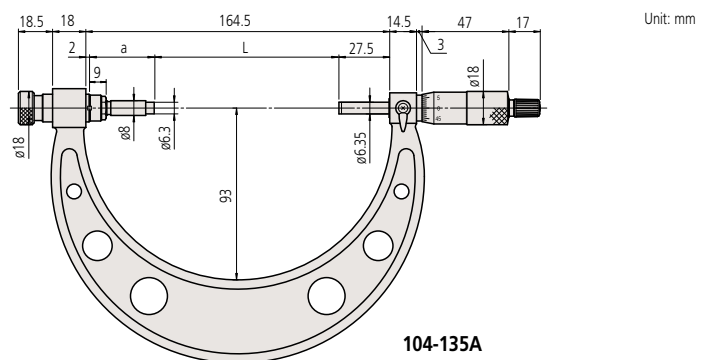
Zero-setting, Data hold, 2-point preset*, Function lock*, Power ON/OFF**, Data output, inch/mm conversion (inch/mm models)
*Only for **340-251-10, 252-10, 351-10, 352-10**
Not available for **340-251-10, 252-10, 351-10, 352-10
Alarm: Low voltage, Counting value composition error

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 w/ data switch (160mm)*
04AZB512: SPC cable (1m)**
04AZB513: SPC cable (2m)**
02AZD790B: SPC cable for U-WAVE (160mm)**
*Up to 300mm models **Over 300mm models



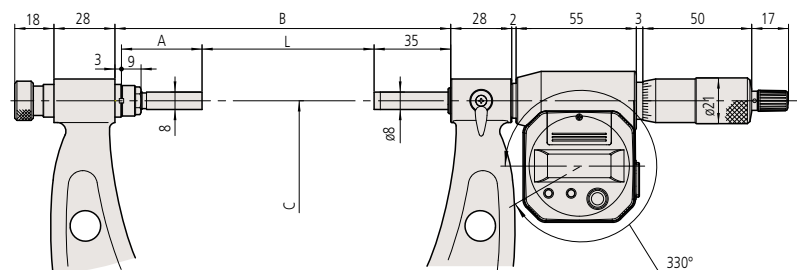
DIMENSIONS



Interchangeable anvil

	L: Range (mm)					
Range	0 to 150mm models	0-25	25-50	50-75	75-100	100-125
Range	150 to 300mm models	150-175	175-200	200-225	225-250	250-275
Order No.		303950	303951	303952	303953	303954
A: Overall length		135	110	85	60	35
Interchangeable anvil sign		M1	M2	M3	M4	M5

	L: Range (mm)			
Range	300 to 400mm models	300-325	325-350	350-375
Range	400 to 500mm models	400-425	425-450	450-475
Range	500 to 600mm models	500-525	525-550	550-575
Range	600 to 700mm models	600-625	625-650	650-675
Range	700 to 800mm models	700-725	725-750	750-775
Range	800 to 900mm models	800-825	825-850	850-875
Range	900 to 1000mm models	900-925	925-950	950-975
Order No.		304001	304002	304003
A: Overall length		87	62	37
Interchangeable anvil sign		M3	M4	M5



	L: Range (mm)				B	C
Range	300 to 400mm models	300-325	325-350	350-375	425	224
Range	400 to 500mm models	400-425	425-450	450-475	525	273
Range	500 to 600mm models	500-525	525-550	550-575	625	332
Range	600 to 700mm models	600-625	625-650	650-675	725	382
Range	700 to 800mm models	700-725	725-750	750-775	825	430
Range	800 to 900mm models	800-825	825-850	850-875	925	480
Range	900 to 1000mm models	900-925	925-950	950-975	1025	530
Order No.		304001	304002	304003	304004	
A: Overall length		87	62	37	12	
Interchangeable anvil sign		M3	M4	M5	M6	

Outside Micrometers

SERIES 105 — with Extension Anvil Collars

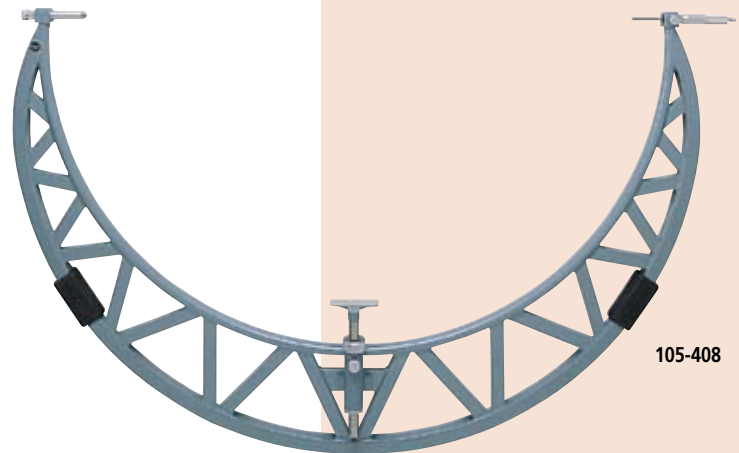
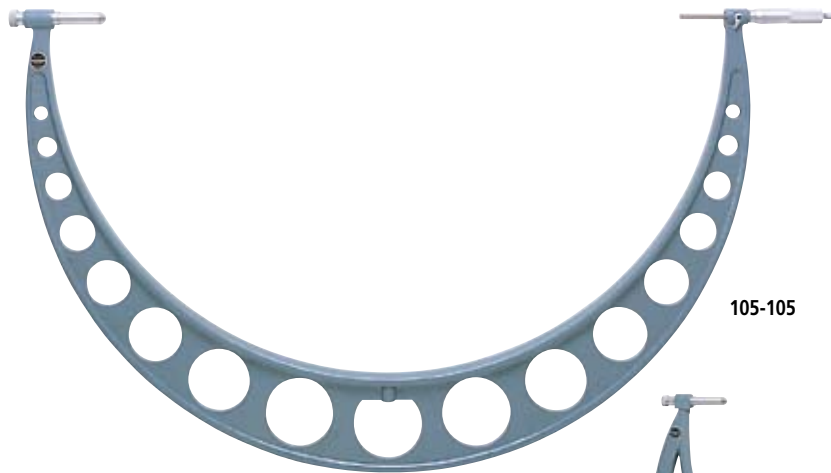
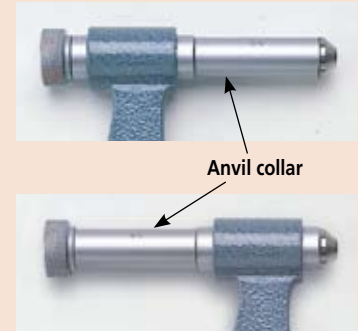
FEATURES

- Wide measuring range with extension anvil collars.
- 50mm/2" spindle stroke.
- With Ratchet Stop for constant force.
- Supplied with setting standards for each range.
- Square and round frame-tubes are combined for light weight and rigidity (for models over 1000mm/40" range).
- Workpiece stop (for models over 1000mm/40" range).

Technical Data

Accuracy: $\pm(6+R/75)\mu\text{m}$, $R = \text{max. range (mm)}$
 $\pm[.0003" + .00005"(R/3)]"$ $R = \text{max. range (inch)}$
 fraction rounded up
 Graduation: 0.01mm/.001"
 Flatness: $1.3\mu\text{m}/.00005"$
 Parallelism: $(2+R/100)\mu\text{m}$, $R = \text{max. range (mm)}$
 $[.00008" + .00004(R/4)]"$ $R = \text{max. range (inch)}$
 fraction rounded down
 Measuring faces: Carbide

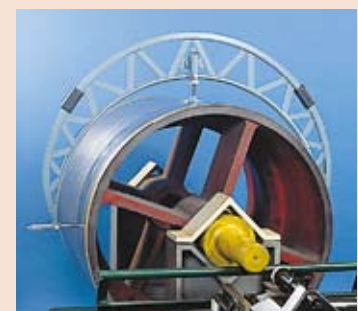
Anvil extension collar



SPECIFICATIONS

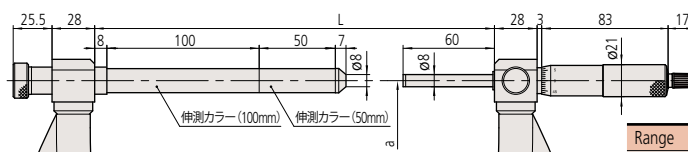
Metric		
Range	Order No.	Extension collars
500 - 600mm	105-103	50mm
600 - 700mm	105-104	50mm
700 - 800mm	105-105	50mm
800 - 900mm	105-106	50mm
900 - 1000mm	105-107	50mm
1000 - 1100mm	105-408	50mm
1100 - 1200mm	105-409	50mm
1000 - 1200mm	105-418	50mm, 100mm
1200 - 1300mm	105-410	50mm
1300 - 1400mm	105-411	50mm
1200 - 1400mm	105-419	50mm, 100mm
1400 - 1500mm	105-412	50mm
1500 - 1600mm	105-413	50mm
1400 - 1600mm	105-420	50mm, 100mm
1600 - 1700mm	105-414	50mm
1700 - 1800mm	105-415	50mm
1600 - 1800mm	105-421	50mm, 100mm
1800 - 1900mm	105-416	50mm
1900 - 2000mm	105-417	50mm
1800 - 2000mm	105-422	50mm, 100mm

Inch		
Range	Order No.	Interchangeable anvils
40" - 44"	105-428	2"
44" - 48"	105-429	2"
48" - 52"	105-430	2"
52" - 56"	105-431	2"
56" - 60"	105-432	2"
60" - 64"	105-433	2"
64" - 68"	105-434	2"
68" - 72"	105-435	2"
72" - 76"	105-436	2"
76" - 80"	105-437	2"



DIMENSIONS

105-418/419/420/421/422



Unit: mm

Range	L	a
1000 - 1200mm	1225	500 - 600
1200 - 1400mm	1425	600 - 700
1400 - 1600mm	1625	700 - 800
1600 - 1800mm	1825	800 - 900
1800 - 2000mm	2025	900 - 1000

Size a: Distance to the workpiece stopper

Outside Micrometers

SERIES 107

FEATURES

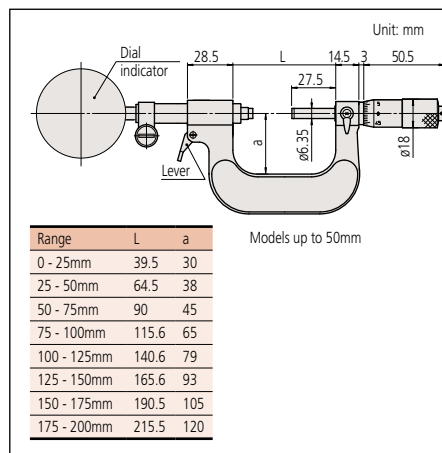
- With dial indicator for direct GO/NG-GO judgment for mass-produced parts.
- Anvil retracting trigger for quick measurement.
- Supplied with a setting standard (except for 0-25mm models).



SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 25mm	107-201	±2μm
25 - 50mm	107-202	±2μm
50 - 75mm	107-203	±2μm
75 - 100mm	107-204	±3μm
100 - 125mm	107-205	±3μm
125 - 150mm	107-206	±3μm
150 - 175mm	107-207	±4μm
175 - 200mm	107-208	±4μm

DIMENSIONS



Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm (thimble)
 Flatness: 0.6μm
 Parallelism: (2+R/100)μm, R = max. range (mm)
 fraction rounded down
 Measuring faces: Carbide

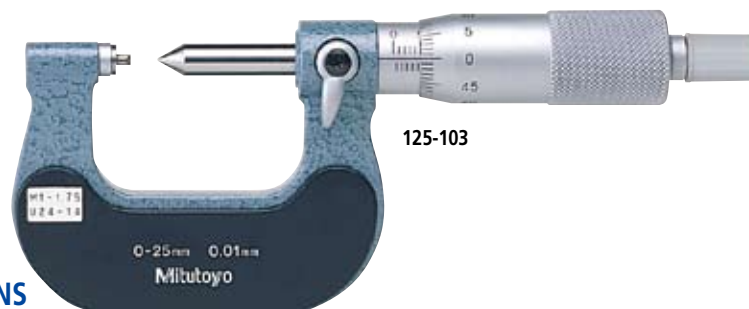


Screw Thread Micrometers

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.
- Supplied with a setting standard (except for 0-25mm models).



SPECIFICATIONS

Metric		
Range	Order No.	Thread to be measured (Metric/Unified)
0 - 25mm	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	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

Range	Order No.	Thread to be measured (Metric/Unified)
50 - 75mm	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	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

Technical Data

Accuracy: ±(2+R/75)μm, R = max. range (mm)
 Graduation: 0.01mm
 Spindle feed error: 3μm



DIMENSIONS

