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**Micrometers**



**Micrometer Heads**

**New Products**

**Coolant Proof Micrometer**

**Digimatic Micrometer**

**Ratchet Thimble Micrometer**

**Digimatic Spline Micrometer**

**Fine Pitch Micrometer Head**

**65**  
COOLANT PROOF  
0-25mm 0.001mm  
Mitutoyo

ORIGIN  
ZERO/ABS  
HOLD

# 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.



Metric	
Range	Order No.
0 - 25mm	293-140 / 293-145*
25 - 50mm	293-141 / 293-146*

\*without SPC data output



Inch/Metric	
Range	Order No.
0 - 1"	293-180 / 293-185*
1" - 2"	293-181 / 293-186*

\*without SPC data output



(Refer to the page 9 for details.)



(Refer to the page 9 for details.)



Certificate of inspection

### Technical Data

- Accuracy:  $\pm 1\mu\text{m}$  (excluding quantizing error)
- Resolution: 0.001mm, .00005"/0.001mm
- Flatness: 0.3 $\mu\text{m}$
- Parallelism: 1 $\mu\text{m}$
- Measuring faces: Carbide tipped
- Display: LCD
- Length standard: Electromagnetic rotary sensor
- \*Patent pending (in Japan, USA, Europe, and China)
- Battery: SR44 (1 pc.), 938882
- Battery life: Approx. 3 years under normal use
- Dust/Water protection level: IP65

### Function

- Origin-set, Preset (over 100mm models), Zero-setting, Automatic power ON/OFF, Data hold, Data output, inch/mm conversion (inch/mm models)
- Alarm: Low voltage, Counting value composition error





### Optional Accessory

05CZA662: SPC cable with data switch (1m)  
05CZA663: SPC cable with data switch (2m)



SPC cable with data switch



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

### Useful application of measured 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.



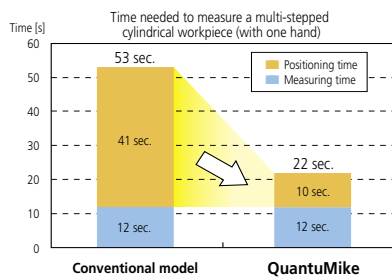
## FEATURES

### • 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

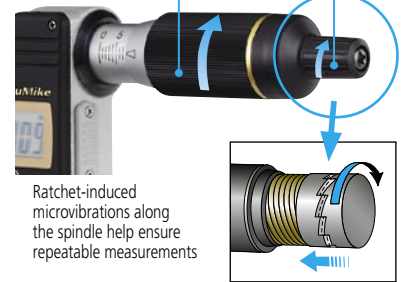
### • Repeatable measurement

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)



Ratchet on thimble Ratchet on speeder



Ratchet-induced microvibrations along the spindle help ensure repeatable measurements

### • Function lock

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

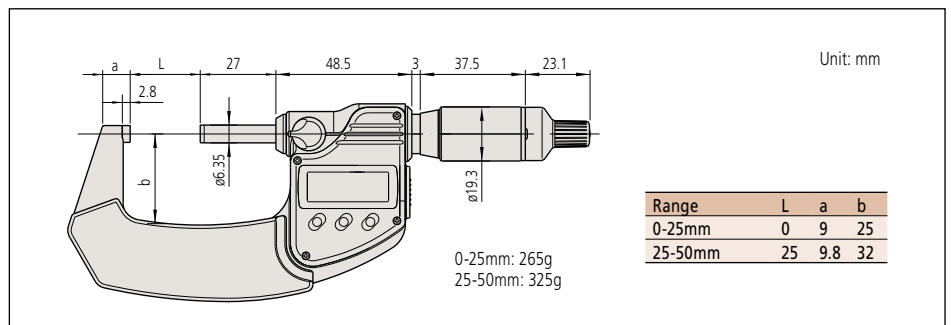


### • Dust/water resistance with IP65 protection level

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



## DIMENSION 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-resistance materials are used in all plastic components.
- $\pm 1\mu\text{m}$  instrumental error (75mm or less range models)
- Auto power ON/OFF function.
- Certificate of inspection\* is included. (50mm or less range models)  
\*It is not the type used to obtain calibration certificates.



293-230



293-252



Oil-resistance materials are used in all plastic components.



(Refer to the page 9 for details.)



(Refer to the page 9 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 $\mu\text{m}$
- Parallelism: 1 $\mu\text{m}$  for models up to 50mm  
2 $\mu\text{m}$  for models up to 100mm  
3 $\mu\text{m}$  for models up to 175mm  
4 $\mu\text{m}$  for models up to 275mm  
5 $\mu\text{m}$  for models over 275mm
- Measuring faces: Carbide tipped
- Display: LCD
- Battery: SR44 (1 pc.), **938882**
- Battery life: Approx. 1.2 years under normal use (8 months: over 100mm models)
- Dust/Water protection level: IP65

## Function

- Origin-set, Preset (over 100mm models), Zero-setting, Automatic power ON/OFF, Data hold, Data output, inch/mm conversion (inch/mm models)
- Alarm: Low voltage, Counting value composition error

## Optional Accessory

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



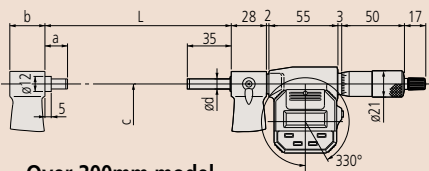
SPC cable with data switch



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

## DIMENSION AND MASS

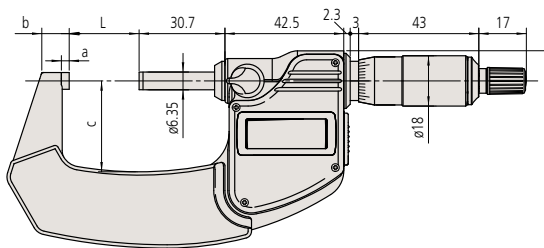
### DIMENSION



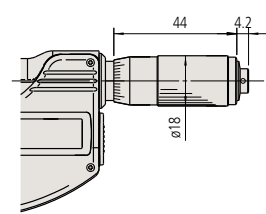
Over 300mm model

Range	L	a	b	c	d
300 - 235mm	353	18	28	187	8
325 - 350mm	378	18	28	199	8
350 - 375mm	403	18	28	212	8
375 - 400mm	428	18	28	224	8
400 - 425mm	453	18	28	236	8
425 - 450mm	478	18	28	248	8
450 - 475mm	503	18	28	261	8
475 - 500mm	528	18	28	273	8

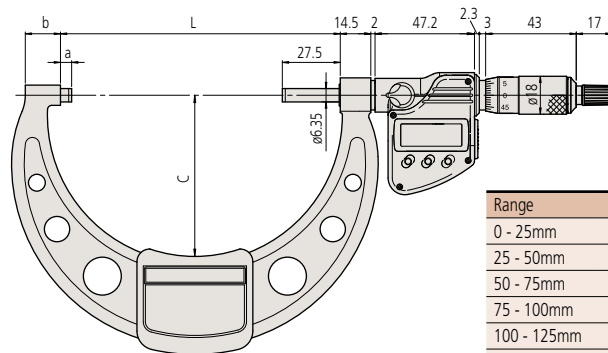
Ratchet stop type up to 100mm



Ratchet thimble type / Friction thimble type



Unit: mm



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	(76.5)	600g
125 - 150mm	158.2	5.7	18.8	(91)	740g
150 - 175mm	183.6	6.1	19.1	(103.1)	800g
175 - 200mm	208.8	6.3	18.2	(115.3)	970g
200 - 225mm	234.2	6.7	16.8	(126.8)	1100g
225 - 250mm	258	5.5	18	(139.8)	1270g
250 - 275mm	284	6.5	18	(152.3)	1340g
275 - 300mm	309	6.5	18	(166)	1540g

### 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	±2µm
125 - 150mm	293-251	±2µm
150 - 175mm	293-252	±3µm
175 - 200mm	293-253	±3µm
200 - 225mm	293-254	±3µm
225 - 250mm	293-255	±4µm
250 - 275mm	293-256	±4µm
275 - 300mm	293-257	±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*	±0.00005"
1" - 2"	293-331 / 293-341*	±0.00005"
2" - 3"	293-332 / 293-342*	±0.00005"
3" - 4"	293-333 / 293-343*	±0.0001"
4" - 5"	293-350	±0.0001"
5" - 6"	293-351	±0.0001"
6" - 7"	293-352	±0.00015"
7" - 8"	293-353	±0.00015"
8" - 9"	293-354	±0.00015"
9" - 10"	293-355	±0.0002"
10" - 11"	293-356	±0.0002"
11" - 12"	293-357	±0.0002"

\*without SPC data output

**Inch/Metric** With ratchet thimble

Range	Order No.	Accuracy
0 - 1"	293-334 / 293-344*	±0.00005"
1" - 2"	293-345*	±0.00005"
2" - 3"	293-346*	±0.00005"
3" - 4"	293-347*	±0.0001"

\*without SPC data output

**Inch/Metric** With friction thimble

Range	Order No.	Accuracy
0 - 1"	293-335 / 293-348*	±0.00005"
1" - 2"	293-336	±0.00005"

\*without SPC data output





(Refer to the page 9 for details.)

### Technical Data

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

### Function

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 Accessory

**937387**: SPC cable (1m)  
**965013**: SPC cable (2m)

# ABSOLUTE Digimatic Micrometers

## SERIES 227 — with Constant & Adjustable Fine-loading Device

### FEATURES

- Constant and low measuring force mechanism in the thimble.
- Adjustable measuring force\* accommodates various kind of work materials.  
\*0.5-2.5N or 2-10N
- 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.
- With absolute linear scale.
- With SPC data output.
- With a standard bar to set the origin point (for models with 15 - 30mm range).



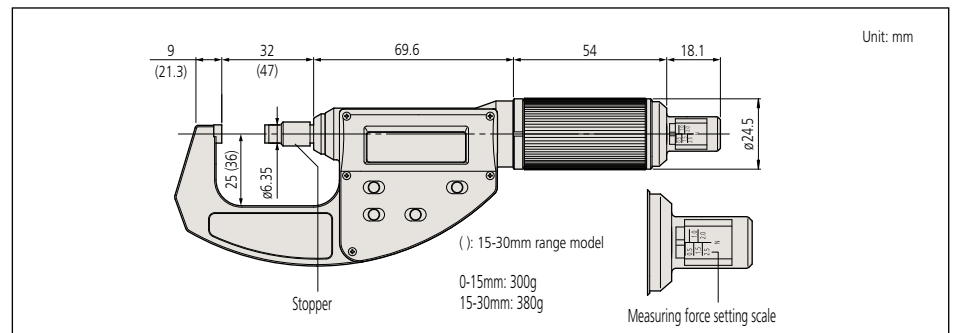
### SPECIFICATION

Metric			
Range	Order No.	Accuracy	Measuring force
0 - 15mm	<b>227-201</b>	±2µm	0.5N - 2.5N
	<b>227-202</b>	±2µm	2N - 10N
15 - 30mm	<b>227-203</b>	±2µm	0.5N - 2.5N
	<b>227-204</b>	±2µm	2N - 10N

Inch/Metric			
Range	Order No.	Accuracy	Measuring force
0 - .6"	<b>227-211</b>	±.0001"	0.5N - 2.5N
	<b>227-212</b>	±.0001"	2N - 10N
.6" - 1.2"	<b>227-213</b>	±.0001"	0.5N - 2.5N
	<b>227-214</b>	±.0001"	2N - 10N



### DIMENSION 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 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 of 10mm/rev.
- 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).



293-666



293-667



293-668



293-669

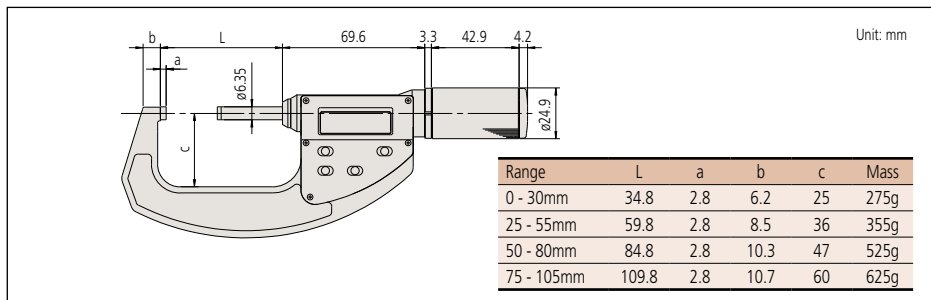
### SPECIFICATION

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"

### DIMENSION AND MASS



(Refer to the page 9 for details.)



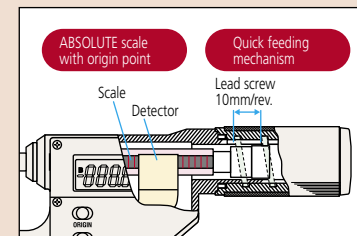
(Refer to the page 9 for details.)

### Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error)  
Resolution: 0.001mm or .00005"/0.001mm  
Flatness: 0.3μm  
Parallelism: 2μm for models up to 80mm  
3μm for models up to 105mm  
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)  
Dust/Water protection level: IP54

### Function

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 Accessory

- 937387: SPC cable (1m)
- 965013: SPC cable (2m)



# Outside Micrometers

## SERIES 102

### FEATURES

- Heat-insulated frame, tapered (on the anvil side) for hard-to-reach places.
- With a standard except for 25mm model.
- A ratchet stop or friction thimble for a constant measuring force.



(Refer to the page 9 for details.)

### Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm, 0.001mm, .001" or .0001"  
 Flatness: 0.6μm  
 Parallelism: 2μm for 25mm model  
 3μm for models up to 100mm  
 Measuring faces: Carbide tipped

#### Ratchet stop type



#### Friction thimble type



### SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	102-301	±2μm
	102-307*	±2μm
25 - 50mm	102-302	±2μm
	102-308*	±2μm
50 - 75mm	102-303	±2μm
75 - 100mm	102-304	±3μm

\*0.001mm reading is obtained with vernier.

Inch With ratchet stop		
Range	Order No.	Accuracy
0 - 1"	102-321	±.0001"
	102-327*	±.0001"
1" - 2"	102-322	±.0001"
	102-328*	±.0001"
2" - 3"	102-323	±.0001"
3" - 4"	102-324	±.00015"

\*.0001" reading is obtained with vernier.

Metric With friction thimble		
Range	Order No.	Accuracy
0 - 25mm	102-305	±2μm
	102-309*	±2μm
25 - 50mm	102-306	±2μm
	102-310*	±2μm

\*0.001mm reading is obtained with vernier

Inch With friction thimble		
Range	Order No.	Accuracy
0 - 1"	102-325	±.0001"
	102-329*	±.0001"
1" - 2"	102-326	±.0001"
	102-330*	±.0001"

\*.0001" reading is obtained with vernier.

Metric Micrometer set		
Range	Order No.	Assortment of micrometers
0 - 100mm (4 mikes/set)	102-911-01	<ul style="list-style-type: none"> <li>• 102-701*</li> <li>• 102-302</li> <li>• 102-303</li> <li>• 102-304</li> <li>• 3 micrometer standards</li> </ul>

\*Ratchet thimble micrometer.

### DIMENSION

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

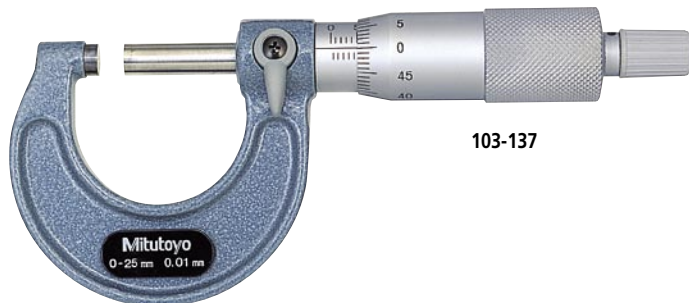
Note: The shape of the thimble changes on the model with friction thimble.

# Outside Micrometers

## SERIES 103

### FEATURES

- Hammertone-green, baked-enamel-finished frame.
- Ratchet Stop or Friction Thimble for exact repetitive readings.
- With a standard except for 25mm model.



103-137



(Refer to the page 9 for details.)

### Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm, 0.001mm, .001" or .0001"  
 Flatness: 0.6μm for models up to 300mm  
 1μm for models over 300mm  
 Parallelism: (2+R/100)μm, R = max. range (mm)  
 \*fraction rounded down  
 Measuring faces: Carbide tipped

### 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.

#### Metric With friction thimble

Range	Order No.	Accuracy
0 - 25mm	103-125	±2μm
	103-133*	±2μm
25 - 50mm	103-126	±2μm

\*0.001mm reading is obtained with vernier.

#### Inch With friction thimble

Range	Order No.	Accuracy
0 - 1"	103-127	±.0001"
	103-135*	±.0001"
1" - 2"	103-128	±.0001"
	103-136*	±.0001"

\*.0001" reading is obtained with vernier.

#### Metric Micrometer set

Range	Order No.	Assortment of micrometers
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

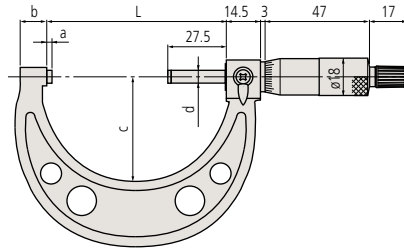
#### Inch Micrometer set

Range	Order No.	Assortment of micrometers
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)	103-904-01	101-711*, 101-106, 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)	103-905-01	All micrometers of 103-904-01 and 103-906 in one set, 11 micrometer standards

\*Ratchet thimble micrometer

## DIMENSION AND MASS

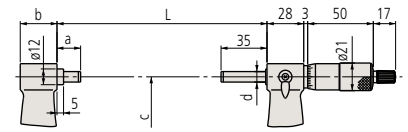
### Models up to 300mm



Range	L	a	b	c	d
0 - 25mm	30.3	2.8	9	28	ø6.35
25 - 50mm	55.3	2.8	10	38	ø6.35
50 - 75mm	80.3	2.8	12	49	ø6.35
75 - 100mm	105.3	2.8	14	60	ø6.35
100 - 125mm	132.8	5.3	17	79	ø6.35
125 - 150mm	158.2	5.7	19	94	ø6.35
150 - 175mm	183.6	6.1	20	106	ø6.35
175 - 200mm	208.8	6.3	19	118	ø6.35
200 - 225mm	234.2	6.7	18	130	ø6.35

### Models over 300mm

Unit: mm



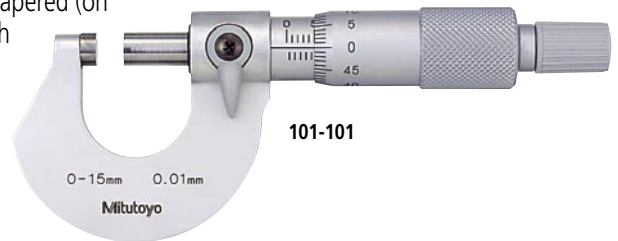
Range	L	a	b	c	d
225 - 250mm	258	5.5	18	143	ø6.35
250 - 275mm	284	6.5	18	156	ø6.35
275 - 300mm	309	6.5	18	169	ø6.35
300 - 325mm	353	18	28	187	ø8
325 - 350mm	378	18	28	199	ø8
350 - 375mm	403	18	28	212	ø8
375 - 400mm	428	18	28	224	ø8
400 - 425mm	453	18	28	236	ø8
425 - 450mm	478	18	28	248	ø8
450 - 475mm	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.
- With a standard except for .5"/1" models.



### SPECIFICATIONS

**Metric** With ratchet stop

Range	Order No.	Accuracy
0 - 15mm	101-101	±2µm
	101-227*	±2µm

\*0.001mm reading is obtained with vernier.

**Inch** With ratchet stop

Range	Order No.	Accuracy
0 - 1"	101-105	±.0001"
	101-113*	±.0001"
1" - 2"	101-106	±.0001"
	101-114*	±.0001"
2" - 3"	101-119*	±.0001"
3" - 4"	101-120*	±.00015"

\*.0001" reading is obtained with vernier.

**Inch** With friction thimble

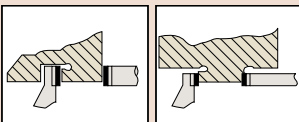
Range	Order No.	Accuracy
0 - 1"	101-109	±.0001"
	101-117*	±.0001"
1" - 2"	101-110	±.0001"
	101-118*	±.0001"

\*.0001" reading is obtained with vernier.

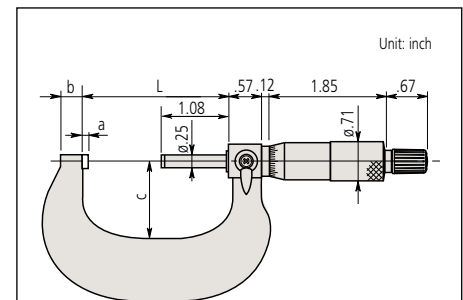
### Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm, 0.001mm, .001" or .0001"  
 Flatness: 0.6µm  
 Parallelism: 1.3µm (.00005") for models up to 15mm  
 .00008" for models up to 3"  
 .00012" for models over 3"

Measuring faces: Carbide tipped



### DIMENSION



Range	L	a	b	c
0 - 1"	1.18	.10	.20	1.10
1 - 2"	2.16	.08	.31	1.28
2 - 3"	3.19	.11	.33	1.77
3 - 4"	4.19	.11	.33	2.28

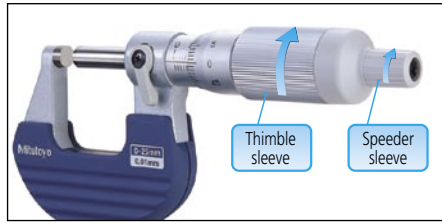
Note: The shape of the thimble changes on the model with friction thimble.

# Ratchet Thimble Micrometer

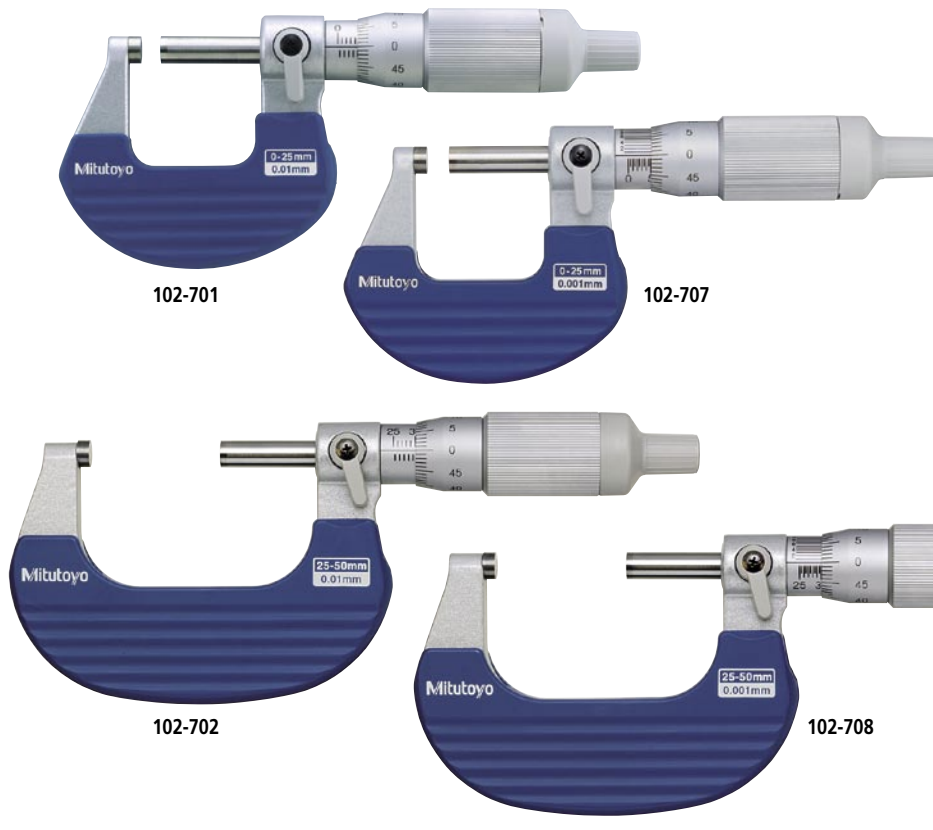
**SERIES 101, 102 — New smoother action Ratchet Thimble**

## 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.
- Provided with a Certificate of Inspection.

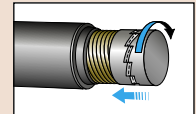


(Refer to the page 9 for details.)

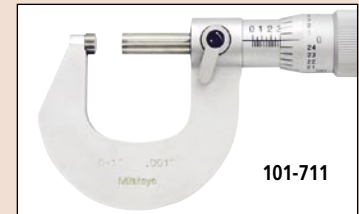
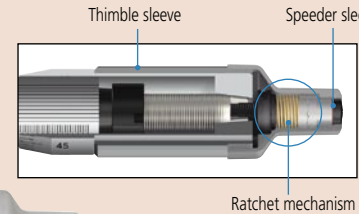


## Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm, 0.001mm, .001" or .0001"  
 Flatness: 0.6µm  
 Parallelism: 2µm  
 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

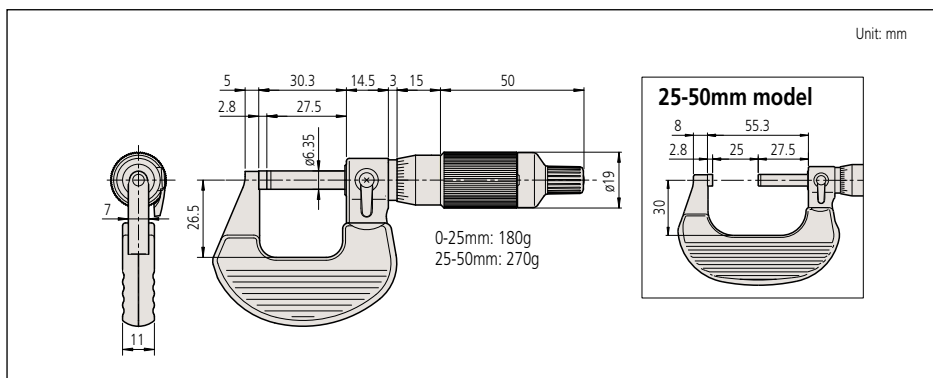
Metric		
Range	Order No.	Accuracy
0 - 25mm	102-701	±2µm
	102-707*	±2µm
25 - 50mm	102-702	±2µm
	102-708*	±2µm

\*0.001mm reading is obtained with vernier.

Inch		
Range	Order No.	Accuracy
0 - 1"	101-711	±.0001"
	101-717*	±.0001"
0 - 1"	102-711	±.0001"
	102-717	±.0001"
1 - 2"	102-712	±.0001"
	102-718*	±.0001"

\*.0001" reading is obtained with vernier.  
 101-711/101-717: Stain-chrome-finished frame model

## DIMENSION AND MASS





# Outside Micrometers

**SERIES 406, 106 — Non-Rotating Spindle Type**

## FEATURES

- Easy-to-read with large vernier on the thimble (series 106).
- With a standard except for 25mm model.
- With SPC output (series 406).

## Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.001mm or .0001"  
Flatness: 0.3μm  
Parallelism: 3μm for models up to 75mm\*  
4μm for models over 75mm\*  
1.6μm for models up to 50mm\*\*  
2μm for models over 50mm\*\*  
Measuring faces: Carbide tipped  
Display\*: LCD  
Battery\*: SR44 (1 pc.), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
\*Digital models \*\*Analog models

## Function 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 Accessory for Digital Model

**05CZA662**: SPC cable with data switch (1m)  
**05CZA663**: SPC cable with data switch (2m)



## SPECIFICATIONS

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

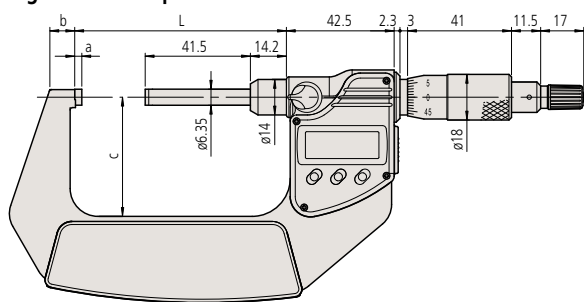
Metric	With ratchet thimble	
Range	Order No.	Accuracy
0 - 25mm	<b>106-101</b>	±2μm
25 - 50mm	<b>106-103</b>	±2μm
50 - 75mm	<b>106-105</b>	±3μm
75 - 100mm	<b>106-106</b>	±3μm

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

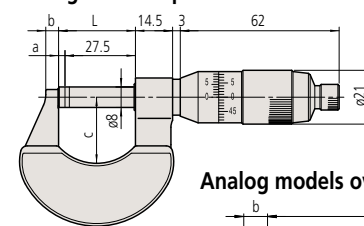
Inch	With friction thimble	
Range	Order No.	Accuracy
0 - 1"	<b>106-102</b>	±.0001"
1" - 2"	<b>106-104</b>	±.0001"

## DIMENSION

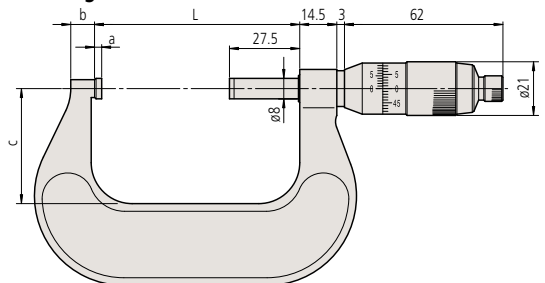
Digital models up to 75mm



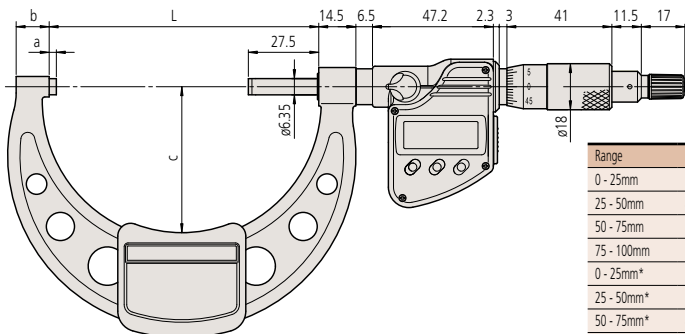
Analog models up to 50mm



Analog models over 50mm



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
0 - 25mm*	30	2.5	5	25.8
25 - 50mm*	55	2.5	8	32.3
50 - 75mm*	80.3	2.8	10.3	45
75 - 100mm*	105.3	2.8	10.7	58

\*Analog model

Unit: mm

# Quick-Setting Outside Micrometers

## SERIES 293,102

### FEATURES

- 1mm spindle thread pitch for quick setting.
- The measurement can be read directly from the thimble due to the 100 step graduation.
- With Ratchet Thimble or Ratchet Stop for constant force.
- With a standard except for 25mm model.
- With SPC output (series 293).



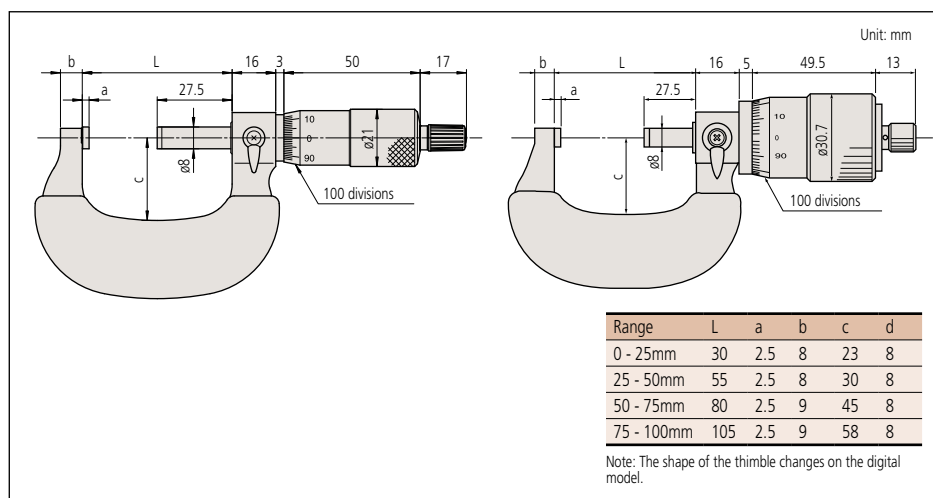
### SPECIFICATIONS

Metric Digital model with ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	293-151-30	±1μm
25 - 50mm	293-152-30	±1μm
50 - 75mm	293-153-30	±1μm
75 - 100mm	293-154-30	±2μm

Metric With ratchet thimble		
Range	Order No.	Accuracy
0 - 25mm	102-650	±2μm
25 - 50mm	102-651	±2μm
50 - 75mm	102-652	±2μm
75 - 100mm	102-653	±3μm

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	102-450	±2μm
25 - 50mm	102-451	±2μm

### DIMENSION



### Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm  
Graduation\*\*: 0.01mm  
Flatness: 0.6μm  
Parallelism: 1μm (digital), 2μm (analog)  
Measuring faces: Carbide tipped  
Display\*: LCD  
Battery\*: SR44 (1pc.), 938882  
Battery life\*: Approx. 1.2 years under normal use  
\*Digital models \*\*Analog models

### Function of Digital Model

Origin-set, Zero-setting, Data hold, Data output  
Alarm: Low voltage, Counting value composition error

### Optional Accessory for Digital Model

937387: SPC cable (1m)  
965013: SPC cable (2m)



(Refer to the page 9 for details.)

### Technical Data

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

### Function of Digital Model

- Zero-setting, Data hold, Preset, Power ON/OFF\*, Data output, inch/mm conversion (inch/mm models)
- \*Not available for **340-251, 252, 340-351, 352**
- Alarm: Low voltage, Counting value composition error

### Optional Accessory for Digital Model

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



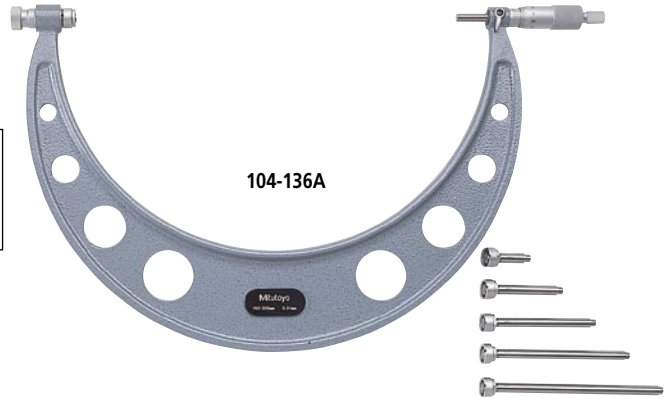
# Outside Micrometers

## 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 a Ratchet Stop for constant force.
- Supplied with zero-setting standards for each range.
- With SPC output (series 340).

### Digital model



### SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Interchangeable anvils
0 - 150mm	<b>340-251</b>	0, 25, 50, 75, 100, 125mm
150 - 300mm	<b>340-252</b>	0, 25, 50, 75, 100, 125mm
300 - 400mm	<b>340-513</b>	0, 25, 50, 75mm
400 - 500mm	<b>340-514</b>	0, 25, 50, 75mm
500 - 600mm	<b>340-515</b>	0, 25, 50, 75mm
600 - 700mm	<b>340-516</b>	0, 25, 50, 75mm
700 - 800mm	<b>340-517</b>	0, 25, 50, 75mm
800 - 900mm	<b>340-518</b>	0, 25, 50, 75mm
900 - 1000mm	<b>340-519</b>	0, 25, 50, 75mm

Inch/Metric	Digital model	
Range	Order No.	Interchangeable anvils
0 - 6"	<b>340-351</b>	0, 1", 2", 3", 4", 5"
6" - 12"	<b>340-352</b>	0, 1", 2", 3", 4", 5"
12" - 18"	<b>340-713</b>	0, 1", 2", 3", 4", 5"
18" - 24"	<b>340-714</b>	0, 1", 2", 3", 4", 5"
24" - 30"	<b>340-715</b>	0, 1", 2", 3", 4", 5"
30" - 36"	<b>340-716</b>	0, 1", 2", 3", 4", 5"

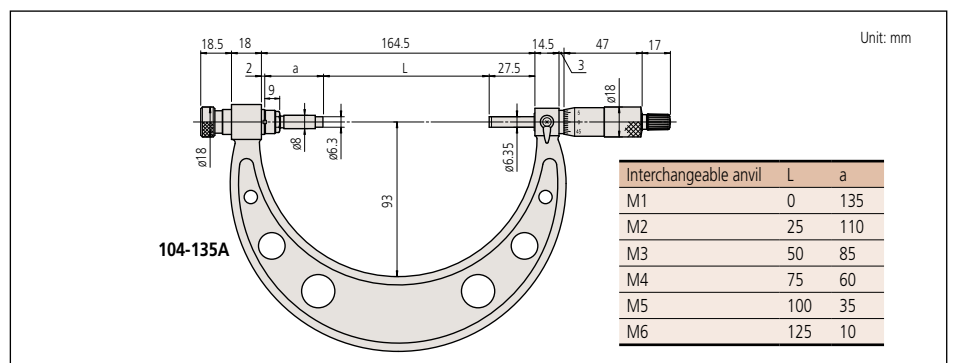
Metric		
Range	Order No.	Interchangeable anvils
0 - 50mm	<b>104-171*</b>	0, 25mm
0 - 100mm	<b>104-139A</b>	0, 25, 50, 75mm
0 - 150mm	<b>104-135A</b>	0, 25, 50, 75, 100, 125mm
50 - 150mm	<b>104-161A</b>	0, 25, 50, 75mm
100 - 200mm	<b>104-140A</b>	0, 25, 50, 75mm
150 - 300mm	<b>104-136A</b>	0, 25, 50, 75, 100, 125mm
200 - 300mm	<b>104-141A</b>	0, 25, 50, 75mm
300 - 400mm	<b>104-142A</b>	0, 25, 50, 75mm
400 - 500mm	<b>104-143A</b>	0, 25, 50, 75mm
500 - 600mm	<b>104-144A</b>	0, 25, 50, 75mm
600 - 700mm	<b>104-145A</b>	0, 25, 50, 75mm
700 - 800mm	<b>104-146A</b>	0, 25, 50, 75mm
800 - 900mm	<b>104-147A</b>	0, 25, 50, 75mm
900 - 1000mm	<b>104-148A</b>	0, 25, 50, 75mm

Inch		
Range	Order No.	Interchangeable anvils
0 - 2"	<b>104-165*</b>	0, 1"
0 - 4"	<b>104-149</b>	0, 1", 2", 3"
0 - 6"	<b>104-137</b>	0, 1", 2", 3", 4", 5"
2 - 6"	<b>104-162</b>	0, 1", 2", 3"
4 - 8"	<b>104-150</b>	0, 1", 2", 3"
8 - 12"	<b>104-151</b>	0, 1", 2", 3"
6" - 12"	<b>104-138</b>	0, 1", 2", 3", 4", 5"
12" - 18"	<b>104-201</b>	0, 1", 2", 3", 4", 5"
18" - 24"	<b>104-202</b>	0, 1", 2", 3", 4", 5"
24" - 30"	<b>104-203</b>	0, 1", 2", 3", 4", 5"
30" - 36"	<b>104-204</b>	0, 1", 2", 3", 4", 5"
36" - 42"	<b>104-205</b>	0, 1", 2", 3", 4", 5"

\*.0001" reading is obtained with vernier.

\*The frame is in a heat insulating cover

### DIMENSION

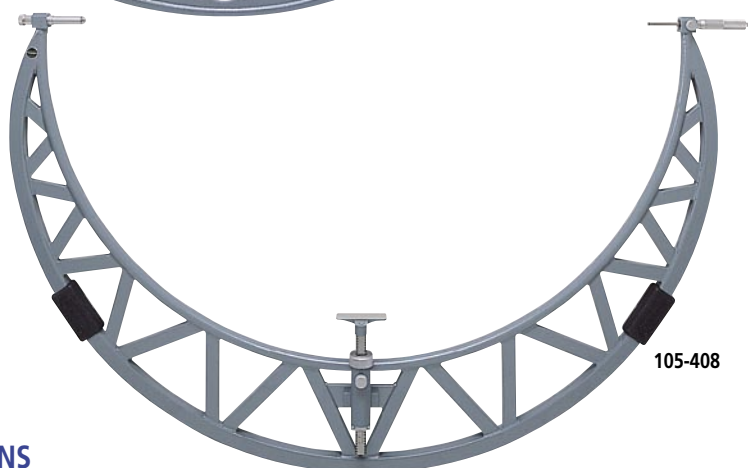


# Outside Micrometers

## SERIES 105 — with Extension Anvil Collars

### FEATURES

- Wide measuring range with extension anvil collars.
- 50mm spindle stroke.
- With Ratchet Stop for constant force.
- Supplied with zero-setting standards 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).



### 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

### Technical Data

Accuracy:  $\pm(6+R/75)\mu\text{m}$ , R = max. range (mm)  
\*fraction rounded up

Graduation: 0.01mm

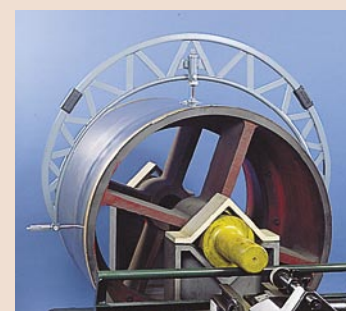
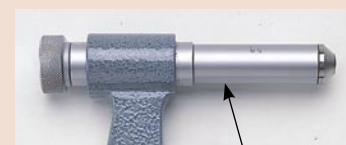
Flatness: 1.3 $\mu\text{m}$

Parallelism:  $(2+R/100)\mu\text{m}$ , R = max. range (mm)

\*fraction rounded down

Measuring faces: Carbide tipped

### Extension anvil collar





# Caliper Type Micrometers

**SERIES 343, 143**

## Technical Data

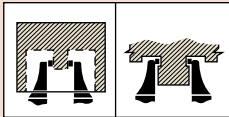
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*\*: 0.01mm  
Flatness: 0.3μm  
Parallelism: (3+R/75)μm, R = max. range (mm)  
\*Fraction rounded down  
Measuring faces: Carbide tipped  
Display\*: LCD  
Battery\*: SR44 (1 pc.), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
\*Digital models \*\*Analog models

## Function of Digital Model

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

## Optional Accessory for Digital Model

**05CZA662**: SPC cable with data switch (1m)  
**05CZA663**: SPC cable with data switch (2m)



## FEATURES

- With Ratchet Stop for constant force.
- With SPC output (series 343).



## SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Accuracy
0 - 25mm	<b>343-250</b>	±5μm
25 - 50mm	<b>343-251</b>	±6μm
50 - 75mm	<b>343-252</b>	±7μm
75 - 100mm	<b>343-253</b>	±8μm

Metric		
Range	Order No.	Accuracy
0 - 25mm	<b>143-101</b>	±5μm
25 - 50mm	<b>143-102</b>	±6μm
50 - 75mm	<b>143-103</b>	±7μm
75 - 100mm	<b>143-104</b>	±8μm
100 - 125mm	<b>143-105</b>	±9μm

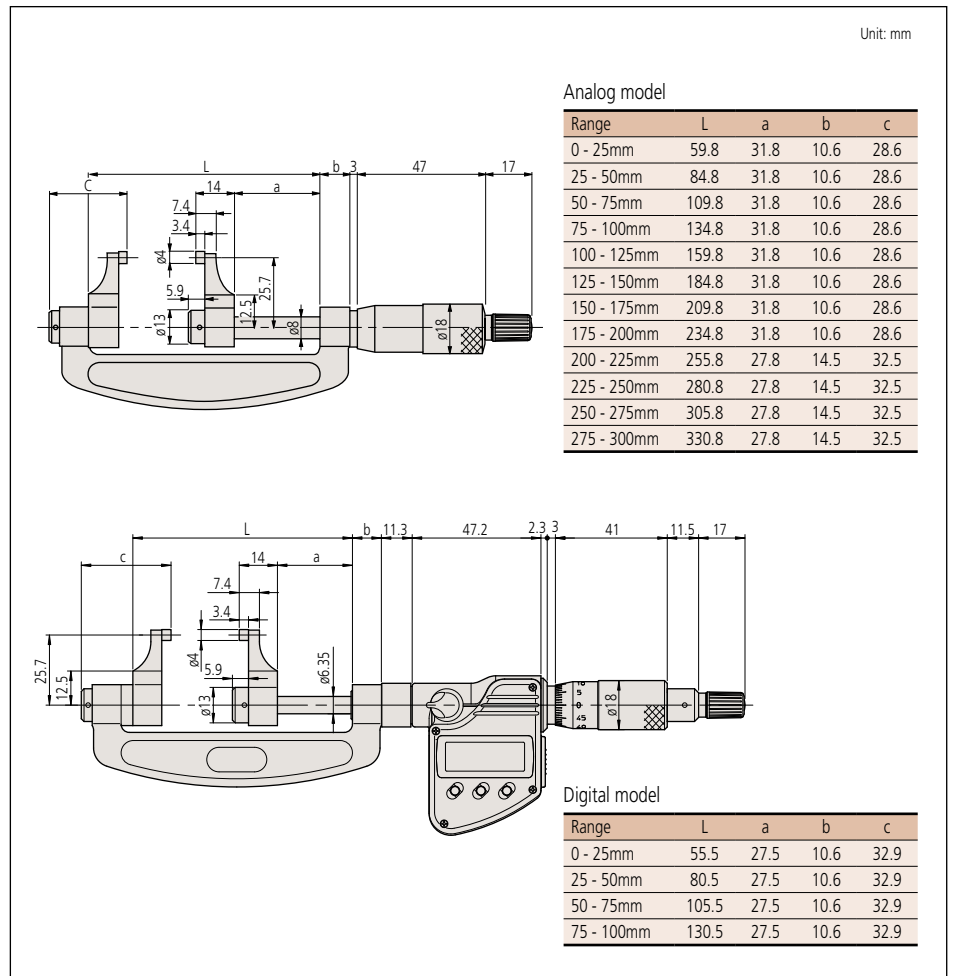
Models with a range up to 300mm are available.

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	<b>343-350</b>	±.00025"
1" - 2"	<b>343-351</b>	±.0003"
2" - 3"	<b>343-352</b>	±.00035"
3" - 4"	<b>343-353</b>	±.0004"

Inch		
Range	Order No.	Accuracy
0 - 1"	<b>143-121</b>	±.00025"
1" - 2"	<b>143-122</b>	±.0003"

Models with a range up to 3" are available.

## DIMENSION



# Outside Micrometers

## SERIES 107

### FEATURES

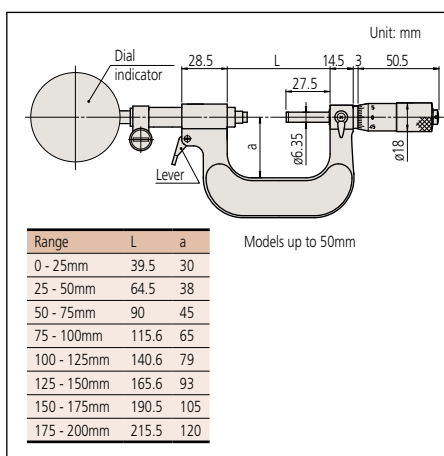
- With dial indicator for direct GO/NG-GO judgment for mass-produced parts.
- Anvil retracting range: 3mm
- Anvil retracting trigger for quick measurement.
- With a standard except for 25mm model.



### 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

### DIMENSION



### 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)  
 Measuring faces: Carbide tipped



# 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 for zero point adjustment.



### SPECIFICATIONS

Metric		
Range	Order No.	Screw 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
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

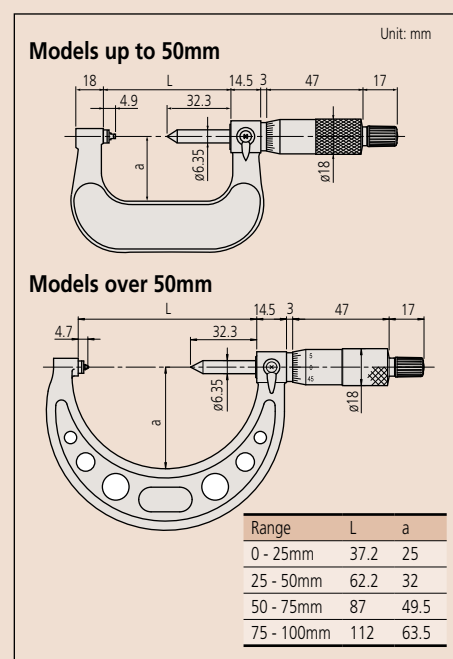
Range	Order No.	Screw to be measured (Metric/Unified)
50 - 75mm	125-111	0.6 - 0.9mm/44 - 28TPI
	125-112	1 - 1.75mm/24 - 14TPI
	125-113	2 - 3mm/13 - 9TPI
	125-114	3.5 - 5mm/8 - 5TPI
	125-115	5.5 - 7mm/4.5 - 3.5TPI
	75 - 100mm	125-116
125-117		1 - 1.75mm/24 - 14TPI
125-118		2 - 3mm/13 - 9TPI
125-119		3.5 - 5mm/8 - 5TPI
125-120		5.5 - 7mm/4.5 - 3.5TPI

### Technical Data

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



### DIMENSION



# Screw Thread Micrometers

**SERIES 326, 126 — Interchangeable Anvil-Spindle Tip Type**

## FEATURES

- IP65 water/dust protection (326 series).
- 60 degree or 55 degree V-anvil and conical spindle (interchangeable) are optional, which are made of high-grade special steel, hardened and precision ground.
- With Ratchet Stop for constant force.
- With SPC output (series 326).



326-251



126-125



(Refer to the page 9 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 .001"

Spindle feed error: 3µm

Display\*: LCD

Battery\*: SR44 (1 pc.), 938882

Battery life\*: Approx. 8 months under normal use

Dust/Water protection level\*: IP65

\*Digital models \*\*Analog models

## Function of Digital Model

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

Alarm: Low voltage, Counting value composition error

## Optional Accessory

**05CZA662:** SPC cable with data switch (1m)\*

**05CZA663:** SPC cable with data switch (2m)\*

\*Only for digital models

(See page 69.): Standard for screw thread micrometer

Anvil-spindle tip set:

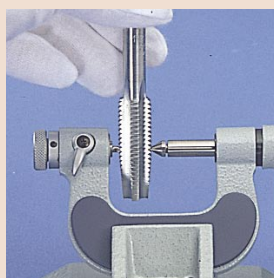


For Metric/Unified screws (60° threads)

Order No.	Assortment of anvil-spindle tips
<b>126-800</b>	0.4 - 0.5mm/64 - 48TPI ( <b>126-801</b> ) 0.6 - 0.9mm/44 - 28TPI ( <b>126-802</b> ) 1 - 1.75mm/24 - 14TPI ( <b>126-803</b> ) 2 - 3mm/13 - 9TPI ( <b>126-804</b> ) 3.5 - 5mm/8 - 5TPI ( <b>126-805</b> ) 5.5 - 7mm/4.5 - 3.5TPI ( <b>126-806</b> )

For Whitworth screws (55° threads)

Order No.	Assortment of anvil-spindle tips
<b>126-810</b>	60 - 48TPI ( <b>126-811</b> ) 48 - 40TPI ( <b>126-812</b> ) 40 - 32TPI ( <b>126-813</b> ) 32 - 24TPI ( <b>126-814</b> ) 24 - 18TPI ( <b>126-815</b> ) 18 - 14TPI ( <b>126-816</b> ) 14 - 10TPI ( <b>126-817</b> ) 10 - 7TPI ( <b>126-818</b> ) 7 - 4.5TPI ( <b>126-819</b> ) 4.5 - 3.5TPI ( <b>126-820</b> )



## SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Accuracy
0 - 25mm	<b>326-251</b>	±4µm
25 - 50mm	<b>326-252</b>	±4µm
50 - 75mm	<b>326-253</b>	±4µm
75 - 100mm	<b>326-254</b>	±5µm

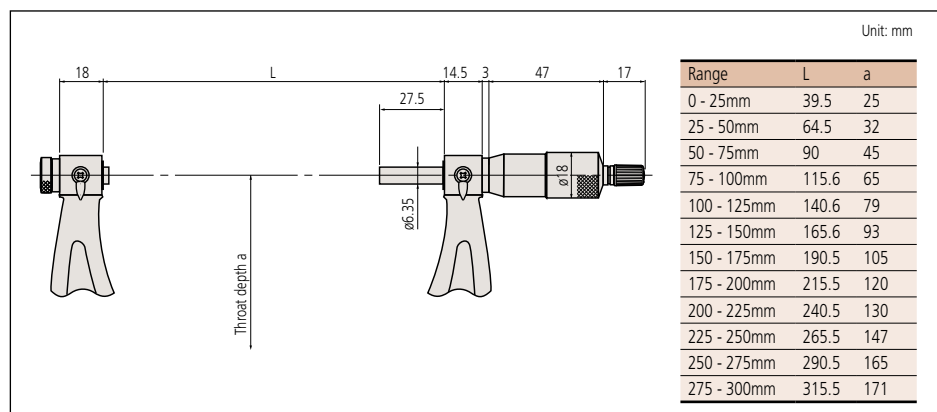
Metric		
Range	Order No.	Accuracy
0 - 25mm	<b>126-125</b>	±4µm
25 - 50mm	<b>126-126</b>	±4µm
50 - 75mm	<b>126-127</b>	±4µm
75 - 100mm	<b>126-128</b>	±5µm
100 - 125mm	<b>126-129</b>	±5µm
125 - 150mm	<b>126-130</b>	±5µm
150 - 175mm	<b>126-131</b>	±6µm
175 - 200mm	<b>126-132</b>	±6µm
200 - 225mm	<b>126-133</b>	±6µm
225 - 250mm	<b>126-134</b>	±7µm
250 - 275mm	<b>126-135</b>	±7µm
275 - 300mm	<b>126-136</b>	±7µm

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	<b>326-351</b>	±.0002"
1" - 2"	<b>326-352</b>	±.0002"
2" - 3"	<b>326-353</b>	±.0002"
3" - 4"	<b>326-354</b>	±.00025"

Inch		
Range	Order No.	Accuracy
0 - 1"	<b>126-137</b>	±.0002"
1" - 2"	<b>126-138</b>	±.0002"
2" - 3"	<b>126-139</b>	±.0002"
3" - 4"	<b>126-140</b>	±.00025"

(Models with a range up to 7" are available.)

## DIMENSION



# Universal Micrometers

## SERIES 116 — Interchangeable Anvil Type

### FEATURES

- Non-rotating spindle with seven interchangeable anvils (flat, spline, spherical, point, knife-edge, disk, and blade) for a wide range of applications.
- Interchangeable anvils (pair) are optional.
- V-anvils and conical spindle tips (matching pair) for screw thread measurement are also available.
- With Ratchet Stop for constant force.



116-101

### SPECIFICATIONS

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

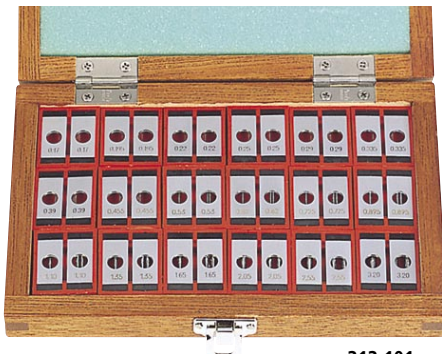
Inch		
Range	Order No.	Accuracy
0 - 1"	116-105	±.0002"
1" - 2"	116-106	±.0002"

# 3-Wire Units

## SERIES 313

### FEATURES

- Facilitates measurement of the pitch diameter of screw threads with a standard micrometer.
- 18 sizes of wires are assorted in a set.



313-101

### SPECIFICATIONS

Application	Order No.	Assortment of wire units
ø6.35mm (.25" DIA.)	313-101	0.17mm (952131), 0.195mm (952132), 0.22mm (952133), 0.25mm (952134), 0.29mm (952135), 0.335mm (952136), 0.39mm (952137), 0.455mm (952138), 0.53mm (952139), 0.62mm (952140), 0.725mm (952141), 0.895mm (952142), 1.1mm (952143), 1.35mm (952144), 1.65mm (952145), 2.05mm (952146), 2.55mm (952147), 3.2mm (952148)
ø8mm (.315" DIA.)	313-102	0.17mm (952149), 0.195mm (952150), 0.22mm (952151), 0.25mm (952152), 0.29mm (952153), 0.335mm (952154), 0.39mm (952155), 0.455mm (952156), 0.53mm (952157), 0.62mm (952158), 0.725mm (952159), 0.895mm (952160), 1.1mm (952161), 1.35mm (952162), 1.65mm (952163), 2.05mm (952164), 2.55mm (952165), 3.2mm (952166)

### Technical Data

Accuracy: Refer to the list of specifications.  
Graduation: 0.01mm or .001"  
Spindle feed error: 3μm

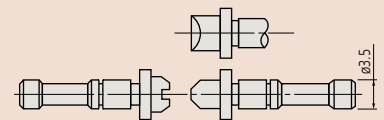
### Optional Accessory

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)

For Whitworth screw

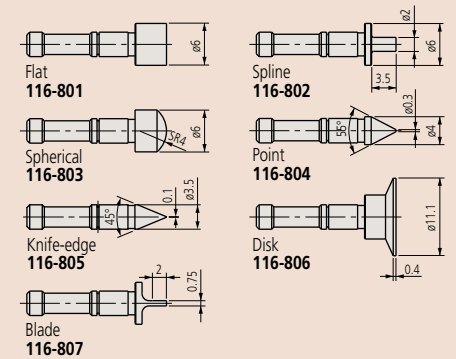
Order No.	Assortment of anvils and tip
116-840	60 - 48TPI (116-841) 48 - 40TPI (116-842) 40 - 32TPI (116-843) 32 - 24TPI (116-844) 24 - 18TPI (116-845) 18 - 14TPI (116-846) 14 - 10TPI (116-847) 10 - 7TPI (116-848) 7 - 4.5TPI (116-849) 4.5 - 3.5TPI (116-850)



116-830

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)



### Technical Data

Roundness of wire: within 0.5μm  
Cylindricity of wire: within 1μm  
Hardness of wire: 63-66 HRC  
Accuracy of wire diameter: ±2μm



# Gear Tooth Micrometers

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



(Refer to the page 9 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

Display\*: LCD

Battery\*: SR44 (1 pc.), **938882**

Battery life\*: Approx. 8 months under normal use

Dust/Water protection level\*: IP65

\*Digital models \*\*Analog models

## Function of Digital Model

Zero-setting, Data hold, Automatic power ON/OFF, Data

output, Preset, inch/mm conversion (inch/mm models)

Alarm: Low voltage, Counting value composition error

## Optional Accessory

**05CZA662**: SPC cable with data switch (1m)\*

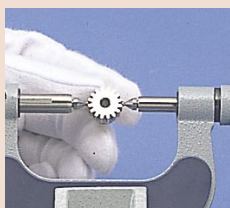
**05CZA663**: SPC cable with data switch (2m)\*

\*Only for digital models

Interchangeable ball anvil-spindle tip set:

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

\*Carbide-tipped type



## FEATURES

- IP65 water/dust protection (324 series).
- Measures over-pin diameter of gears with precision steel (carbide) ball-tipped measuring faces.
- 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).



324-251



124-173

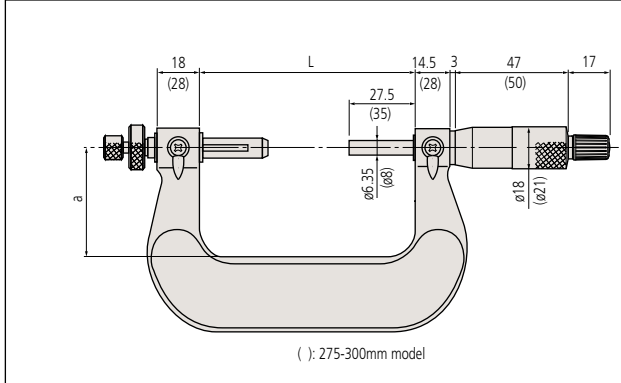
## SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Accuracy
0 - 25mm	<b>324-251</b>	±4μm
25 - 50mm	<b>324-252</b>	±4μm
50 - 75mm	<b>324-253</b>	±4μm
75 - 100mm	<b>324-254</b>	±5μm

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	<b>324-351</b>	±.0002"
1" - 2"	<b>324-352</b>	±.0002"
2" - 3"	<b>324-353</b>	±.0002"
3" - 4"	<b>324-354</b>	±.00025"

Metric		
Range	Order No.	Accuracy
0 - 25mm	<b>124-173</b>	±4μm
25 - 50mm	<b>124-174</b>	±4μm
50 - 75mm	<b>124-175</b>	±4μm
75 - 100mm	<b>124-176</b>	±5μm
100 - 125mm	<b>124-177</b>	±5μm
125 - 150mm	<b>124-178</b>	±5μm
150 - 175mm	<b>124-179</b>	±6μm
175 - 200mm	<b>124-180</b>	±6μm
200 - 225mm	<b>124-181</b>	±6μm
225 - 250mm	<b>124-182</b>	±7μm
250 - 275mm	<b>124-183</b>	±7μm
275 - 300mm	<b>124-195</b>	±7μm

## DIMENSION



Range	L	a
0 - 25mm	64.5	32
25 - 50mm	90	45
50 - 75mm	115.6	65
75 - 100mm	140.6	79
100 - 125mm	165.6	93
125 - 150mm	190.5	105
150 - 175mm	215.5	120
175 - 200mm	240.5	130
200 - 225mm	265.5	147
225 - 250mm	290.5	165
250 - 275mm	315.5	171
275 - 300mm	353	187

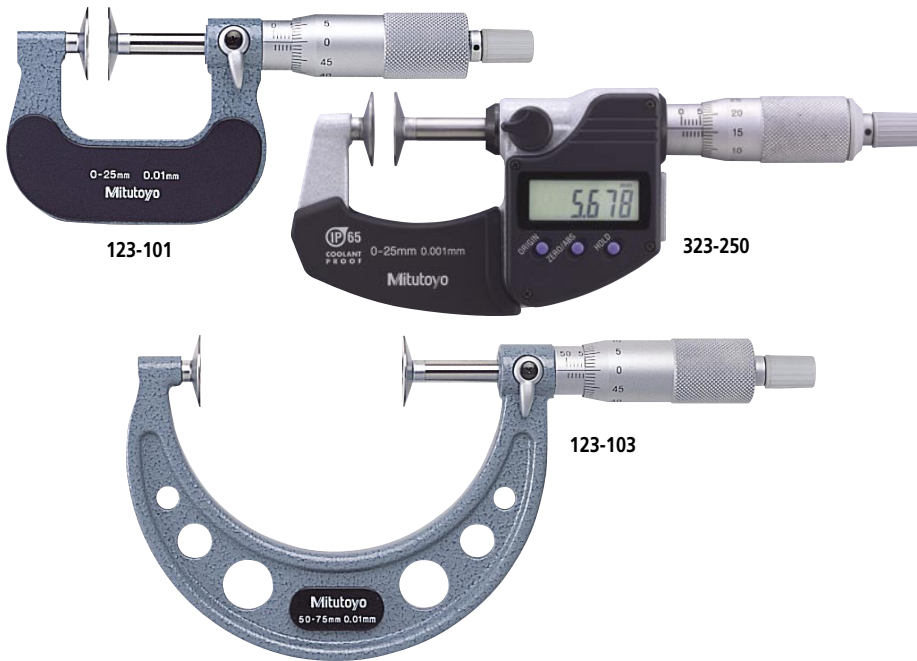
( ): 275-300mm model

# Disk Micrometers

**SERIES 323, 223, 123**

## FEATURES

- Diameter of measuring disk: 20mm (30mm: models over 100mm)
- 0.7mm (1mm: models over 100mm) edge thickness to enter narrow recesses.
- With Ratchet Stop for constant force.
- With a standard except for 25mm model.
- With SPC output (series 323).
- The 223 series is provided with a mechanical digit counter for quick reading of measurements.



## SPECIFICATIONS

Metric	Digital model
Range	Order No. Accuracy
0 - 25mm	<b>323-250</b> ±4µm
25 - 50mm	<b>323-251</b> ±4µm
50 - 75mm	<b>323-252</b> ±6µm
75 - 100mm	<b>323-253</b> ±6µm

Metric	Mechanical counter model
Range	Order No. Accuracy
0 - 25mm	<b>223-101</b> ±4µm
25 - 50mm	<b>223-102</b> ±4µm

Metric	
Range	Order No. Accuracy
0 - 25mm	<b>123-101</b> ±4µm
	<b>123-113*</b> ±4µm
25 - 50mm	<b>123-102</b> ±4µm
	<b>123-114*</b> ±4µm
50 - 75mm	<b>123-103</b> ±6µm
	<b>123-115*</b> ±6µm
75 - 100mm	<b>123-104</b> ±6µm
	<b>123-116*</b> ±6µm
100 - 125mm	<b>123-105</b> ±7µm
125 - 150mm	<b>123-106</b> ±7µm
150 - 175mm	<b>123-107</b> ±8µm
175 - 200mm	<b>123-108</b> ±8µm
200 - 225mm	<b>123-109</b> ±8µm
225 - 250mm	<b>123-110</b> ±9µm
250 - 275mm	<b>123-111</b> ±9µm
275 - 300mm	<b>123-112</b> ±9µm

Inch/Metric	Digital model
Range	Order No. Accuracy
0 - 1"	<b>323-350</b> ±.0002"
1" - 2"	<b>323-351</b> ±.0002"
2" - 3"	<b>323-352</b> ±.0003"
3" - 4"	<b>323-353</b> ±.0003"

Inch	Mechanical counter model
Range	Order No. Accuracy
0 - 1"	<b>223-125</b> ±.0002"

Inch	
Range	Order No. Accuracy
0 - 1"	<b>123-125</b> ±.0002"
1" - 2"	<b>123-126</b> ±.0002"
2" - 3"	<b>123-127</b> ±.0003"
3" - 4"	<b>123-128</b> ±.0003"

\*The measuring disks have carbide tips.



(Refer to the page 9 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 .001"
- Flatness: 1µm for models up to 100mm  
1.6µm for models over 100mm
- Parallelism: 4µm for models up to 50mm  
(4+R/50)µm for models up to 100mm  
(5+R/75)µm for models over 100mm,  
R = max. range (mm) \*Fraction rounded up
- Measurable module: 0.5 - 6 (0.7 - 11: models over 100mm)
- Display\*: LCD
- Battery\*: SR44 (1 pc.), **938882**
- Battery life\*: Approx. 1.2 years under normal use
- \*Digital models \*\*Analog models

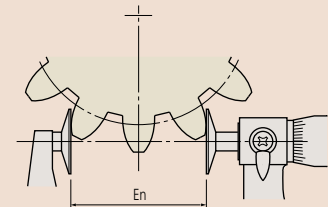
## Function of Digital Model

- 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

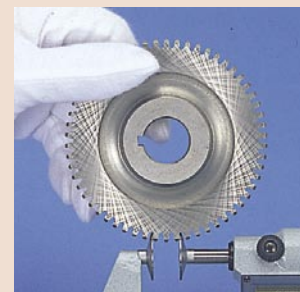
## Optional Accessory for Digital Model

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

## Root tangent length of gear (En)



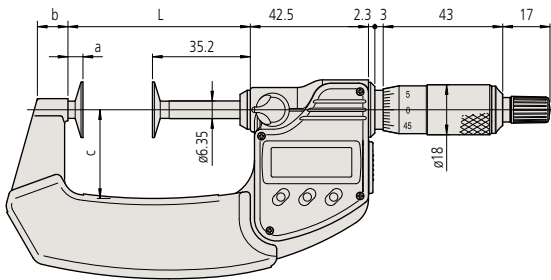
Note: Root tangent length measurement is not available for some types gears.



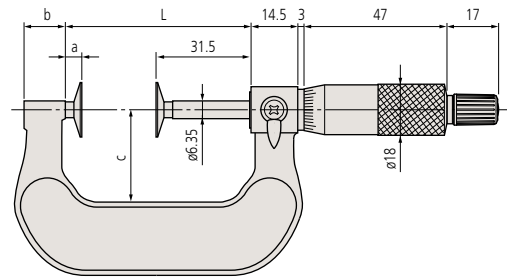
## DIMENSION

Unit: mm

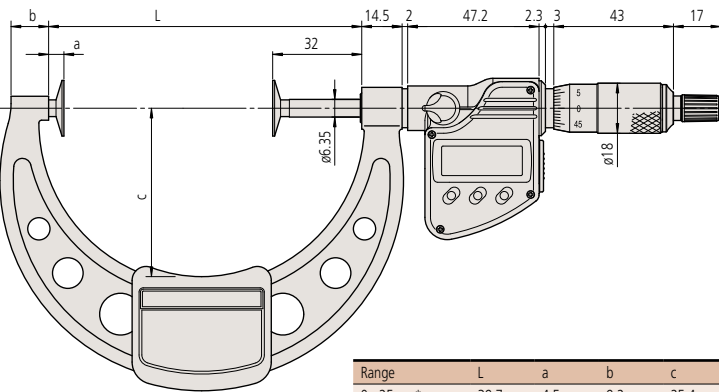
### Digital models up to 75mm



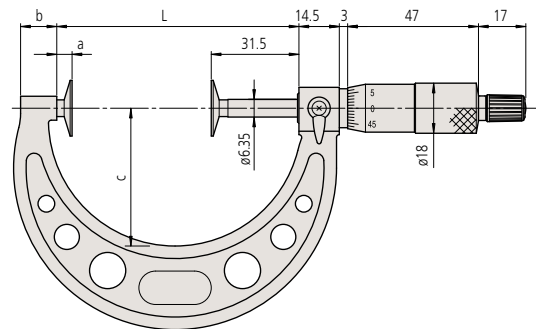
### Analog models up to 50mm



### Digital models over 75mm

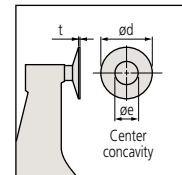


### Analog over 50mm



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

Data in ( ) applies to those with carbide tipped disks. \*Digital models

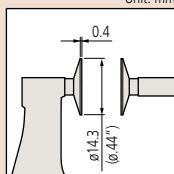


### Technical Data

Accuracy: Refer to the list of specifications  
 Graduation: 0.01mm or .001"  
 Flatness: 1µm  
 Parallelism: 3µm



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.

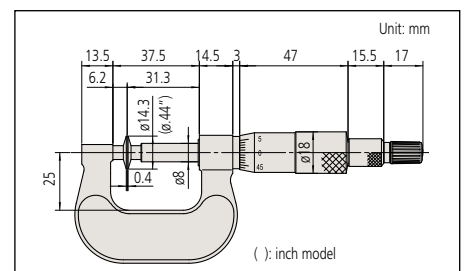


169-101

### SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 25mm	169-101	±4µm

### DIMENSION



( ) : inch model

Inch		
Range	Order No.	Accuracy
0 - 1"	169-103	±.0002"

# 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 herical gears.
- Non-rotating spindle eliminates torque on workpiece.
- Speedy spindle feed of 10mm/rev. (Quickmike type).
- Diameter of measuring disk: 20mm
- With Ratchet Stop for constant force.
- With SPC output (series 369).



369-250

### Quickmike type



369-411



### Quickmike type with fine-loading



227-221



169-201

### SPECIFICATIONS

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

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	369-350	±.0002"
1" - 2"	369-351	±.0002"
2" - 3"	369-352	±.0003"
3" - 4"	369-353	±.0003"

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

Inch/Metric	Quickmike type	
Range	Order No.	Accuracy
0 - 1.2"	369-421	±.0002"
1" - 2.2"	369-422	±.0002"

Metric	Quickmike type with fine-loading		
Range	Order No.	Accuracy	Measuring force
0 - 15mm	227-221	±4µm	0.5N - 2.5N
	227-222	±4µm	2N - 10N

Inch/Metric	Quickmike type with fine-loading		
Range	Order No.	Accuracy	Measuring force
0 - .6"	227-231	±.0002"	0.5N - 2.5N
	227-232	±.0002"	2N - 10N

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

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



### 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 .001"  
 Flatness: 1µm  
 Parallelism: 4µm for models up to 50mm  
 6µm for models over 50mm  
 (3µm: Quickmike type with fine-loading)  
 Measurable module: 0.5-6,  
 (0.4 - 3: Quickmike type with fine-loading)  
 Display\*: LCD  
 Battery\*: SR44 (1 pc.), **938882**  
 Battery life\*: Approx. 1.2 years under normal use  
 (1 year: Quickmike type, 3 years: Quickmike type with fine-loading)  
 Series 227: Refer to the page 27 for more information.  
 \*Digital models \*\*Analog models

### Function 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 Accessory for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 937387**: SPC cable for Quickmike type (1m)
- 965013**: SPC cable for Quickmike type (2m)

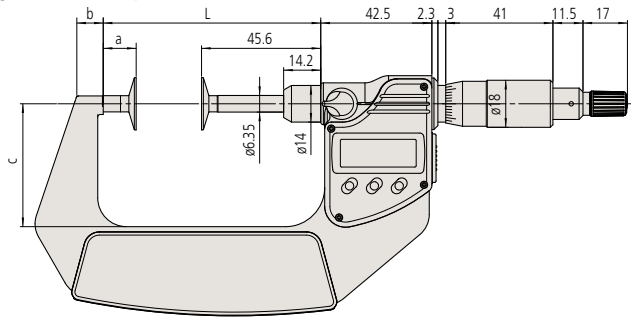




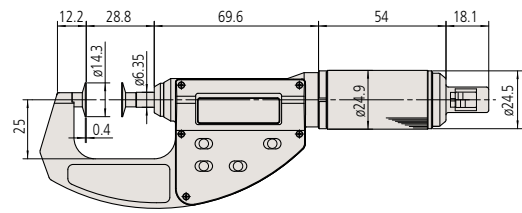
## DIMENSION

Unit: mm

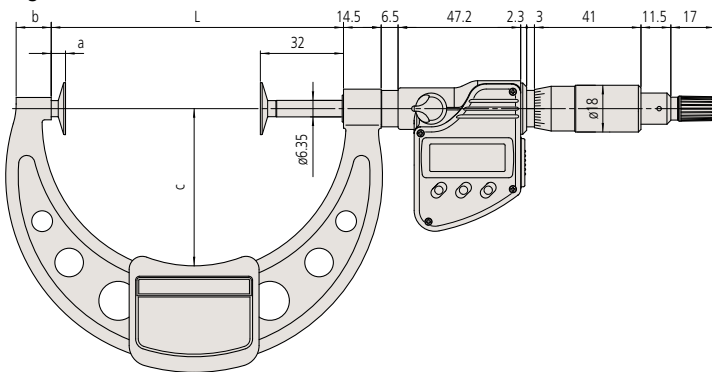
### Digital models up to 75mm



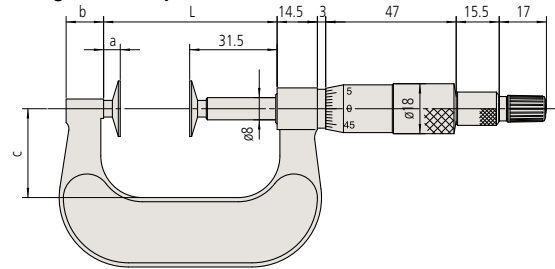
### Fine-loading type



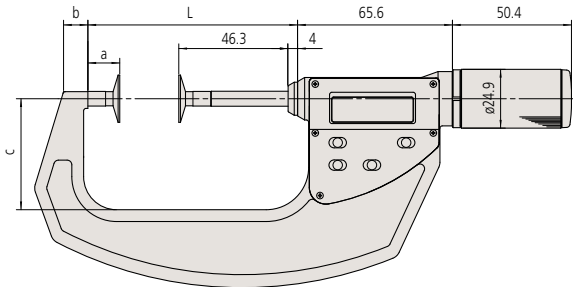
### Digital models over 75mm



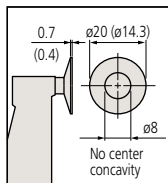
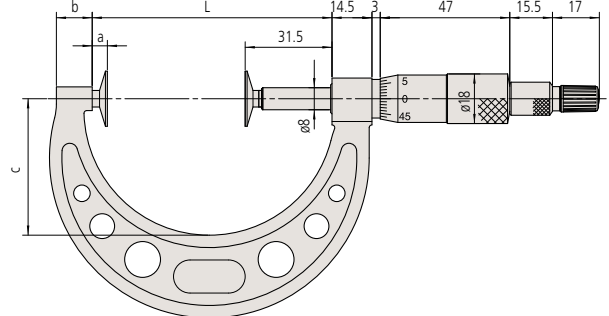
### Analog models up to 50mm



### Quickmike type



### Analog models over 50mm



( ) : Fine-loading type

#### Digital model

Range	L	a	b	c
0 - 25mm	58.5	12.9	7	32
25 - 50mm	83.5	12.9	9.8	47
50 - 75mm	108.5	12.9	11.2	60
75 - 100mm	112.5	5.5	13.5	60.5
0 - 30mm*	63.8	13.5	8.5	36
25 - 55mm*	88.8	13.5	10.3	47

\*Quickmike type

#### Analog model

Range	L	a	b	c
0 - 25mm	37.5	6	13.5	25
25 - 50mm	62.5	6	13.5	32
50 - 75mm	87	5.5	13	49.5
75 - 100mm	112	5.5	13	63.5

# Sheet Metal Micrometers

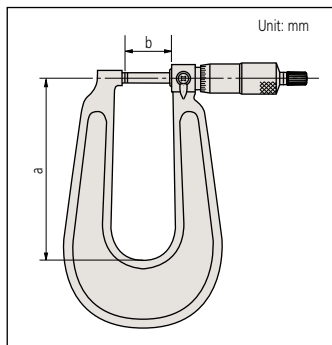
**SERIES 389, 189, 119, 118**

## FEATURES

- Measures thickness of sheet metal, and rubber parts.
- With Ratchet Stop for constant force.
- With a standard except for 25mm model.
- IP65 water/dust protection (389 series\*).
- \*Except for 389-513
- With digit counter (series 189).



## DIMENSION



## SPECIFICATIONS

Metric		Digital model	
Range	Order No.	Accuracy	a/b
0 - 25mm	<b>389-251</b>	±4μm	160/27.5mm
	<b>389-261</b> <sup>S-F</sup>	±4μm	160/27.5mm
	<b>389-271</b> <sup>S-S</sup>	±4μm	160/27.5mm
	<b>389-513</b>	±5μm	330/35mm
25 - 50mm	<b>389-252</b>	±4μm	165/27.5mm
	<b>389-262</b> <sup>S-F</sup>	±4μm	165/27.5mm
	<b>389-272</b> <sup>S-S</sup>	±4μm	165/27.5mm

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

Inch/Metric		Digital model	
Range	Order No.	Accuracy	a/b
0 - 1"	<b>389-351</b>	±.0002"	160/27.5mm
	<b>389-361</b> <sup>S-F</sup>	±.0002"	160/27.5mm
	<b>389-371</b> <sup>S-S</sup>	±.0002"	160/27.5mm
	<b>389-713</b>	±.00025"	330/35mm
1" - 2"	<b>389-352</b>	±.0002"	165/27.5mm
	<b>389-362</b> <sup>S-F</sup>	±.0002"	165/27.5mm
	<b>389-372</b> <sup>S-S</sup>	±.0002"	165/27.5mm

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

Metric		Mechanical counter model	
Range	Order No.	Accuracy	a/b
0 - 25mm	<b>189-102</b>	±4μm	160/27.5mm

Inch		Mechanical counter model	
Range	Order No.	Accuracy	a/b
0 - 1"	<b>189-129*</b>	±.0002"	160/27.5mm

\*.0001" reading is obtained with vernier.

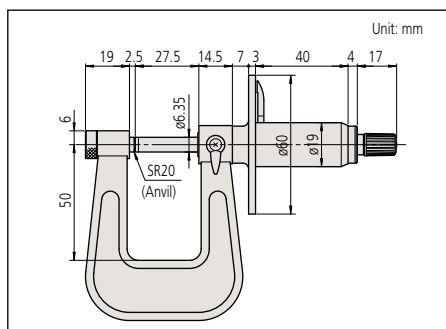
Metric		Dial reading model	
Range	Order No.	Accuracy	a/b
0 - 25mm	<b>118-101</b>	±4μm	110/27.5mm
	<b>118-102</b>	±4μm	160/27.5mm
	<b>118-114</b> <sup>S-F</sup>	±4μm	160/27.5mm
	<b>118-118</b> <sup>S-S</sup>	±4μm	160/27.5mm
	<b>118-103</b>	±5μm	330/35mm
25 - 50mm	<b>118-110</b>	±4μm	165/27.5mm

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

Inch		Dial reading model	
Range	Order No.	Accuracy	a/b
0 - 1"	<b>118-129*</b>	±.0002"	160/27.5mm
	<b>118-116</b> <sup>S-F*</sup>	±.0002"	160/27.5mm
	<b>118-120</b> <sup>S-S*</sup>	±.0002"	160/27.5mm
	<b>118-107</b>	±.00025"	330/35mm
1" - 2"	<b>118-112</b>	±.0002"	165/27.5mm

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

## DIMENSION



Metric		Dial reading model	
Range	Order No.	Accuracy	Throat
0 - 25mm	<b>119-202</b> <sup>S-F</sup>	±4μm	50mm

S-F: Spherical anvil and flat spindle



(Refer to the page 9 for details.)

## Anvil-Spindle Combinations



Standard, Flat-Flat



Spherical-Flat (S-F)



Spherical-Spherical (S-S)

## 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: 0.6μm for models with 150mm throat  
1μm for models with 300mm throat  
Parallelism: 3μm  
Measuring faces: Carbide tipped  
Display\*: LCD  
Battery\*: SR44 [1 pc. (2 pcs.: **389-513** and **389-713**), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
(1.8 years: **389-513** and **389-713**)  
Dust/Water protection level\*: IP65  
\*Digital models \*\*Analog models

## Function of Digital Model

Origin-set (Preset\*), Zero-setting, Data hold, Power ON/OFF\*,  
Data output, inch/mm conversion (inch/mm models)  
Preset zero-setting Power ON/OFF Data hold Data output  
inch/mm conversion (inch/mm models) \*Only for **389-513**,  
**389-713**  
Alarm: Low voltage, Counting value composition error

## Optional Accessory for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 937387**: SPC cable for **389-513/389-713** (1m)
- 965013**: SPC cable for **389-513/389-713** (2m)

The 119 series is provided with a dial for making easy and quick reading.



# Spline Micrometers

## SERIES 331, 111



(Refer to the page 9 for details.)

### FEATURES

- IP65 water/dust protection (series 331).
- The anvil and spindle have a small diameter for measuring splined shafts, slots, and keyways.
- With Ratchet Stop for constant force.
- With SPC output (series 331).



331-251



111-115

### Technical Data

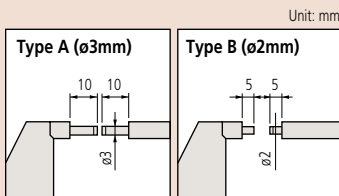
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm, .001" or .0001"  
Flatness: 0.3μm  
Parallelism: (2+R/100)μm, R = max. range (mm)  
\*fraction rounded up  
Measuring faces: Carbide tipped  
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

### Function 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 Accessory for Digital Model

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



### SPECIFICATIONS

Metric	Digital model		
Range	Order No.	Accuracy	Remarks
0 - 25mm	<b>331-251</b>	±2μm	Type A
	<b>331-261</b>	±2μm	Type B
25 - 50mm	<b>331-252</b>	±2μm	Type A
	<b>331-262</b>	±2μm	Type B
50 - 75mm	<b>331-253</b>	±2μm	Type A
	<b>331-263</b>	±2μm	Type B
75 - 100mm	<b>331-254</b>	±3μm	Type A
	<b>331-264</b>	±3μm	Type B

Inch/Metric	Digital model		
Range	Order No.	Accuracy	Remarks
0 - 1"	<b>331-351</b>	±.0001"	Type A
	<b>331-361</b>	±.0001"	Type B
1" - 2"	<b>331-352</b>	±.0001"	Type A
	<b>331-362</b>	±.0001"	Type B
2" - 3"	<b>331-353</b>	±.0001"	Type A
	<b>331-363</b>	±.0001"	Type B
3" - 4"	<b>331-354</b>	±.00015"	Type A
	<b>331-364</b>	±.00015"	Type B

Metric			
Range	Order No.	Accuracy	Remarks
0 - 25mm	<b>111-115</b>	±3μm	Type A
	<b>111-215</b>	±3μm	Type B
25 - 50mm	<b>111-116</b>	±3μm	Type A
	<b>111-117</b>	±3μm	Type A
50 - 75mm	<b>111-117</b>	±3μm	Type A
	<b>111-118</b>	±4μm	Type A
75 - 100mm	<b>111-118</b>	±4μm	Type A
	<b>111-119</b>	±4μm	Type A
100 - 125mm	<b>111-119</b>	±4μm	Type A
	<b>111-120</b>	±4μm	Type A
125 - 150mm	<b>111-120</b>	±4μm	Type A
	<b>111-121</b>	±5μm	Type A
150 - 175mm	<b>111-121</b>	±5μm	Type A
	<b>111-122</b>	±5μm	Type A
175 - 200mm	<b>111-122</b>	±5μm	Type A

Inch			
Range	Order No.	Accuracy	Remarks
0 - 1"	<b>111-166*</b>	±.00015"	Type A
1" - 2"	<b>111-142</b>	±.00015"	Type A
2" - 3"	<b>111-143</b>	±.00015"	Type A

\*.0001" reading is obtained with vernier.

### DIMENSION

**Digital model**

Range	L	a	b	c
0 - 25mm*	58.2	17.5	7.3	32
25 - 50mm*	83.2	17.5	10.1	47
50 - 75mm*	108.2	17.5	11.5	60
0 - 25mm	55.3	17.8	10	38
25 - 50mm	80.3	17.8	12	49
50 - 75mm	105.3	17.8	14	60

\*Digital models

**Digital model**

Range	L	a	b	c
75 - 100mm*	132.8	17.5	16.7	76.5
75 - 100mm	132.8	20.3	17	79
100 - 125mm	158.2	20.7	19	94
125 - 150mm	183.6	21.1	20	106
150 - 175mm	208.8	21.3	19	118
175 - 200mm	234.2	21.7	18	130

\*Digital models

# Tube Micrometers

## SERIES 395, 295, 115 — Spherical and Cylindrical Anvils

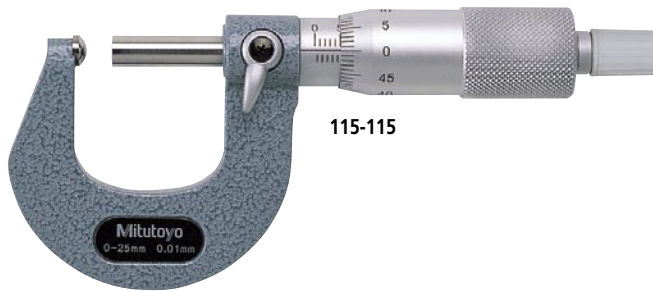
### FEATURES

- IP65 water/dust protection (395 series).
- Designed to measure the wall thickness of various tubing.
- The Tube Micrometers have two combinations of measuring faces (carbide-tipped): spherical-flat type, and spherical-spherical type.
- Cylindrical anvils (perpendicular) are also available.
- With Ratchet Stop for constant force.
- With SPC output (series 395).
- With digit counter (series 295).



395-251

Spherical-flat Type



115-115



395-271

Spherical-spherical Type



115-215



(Refer to the page 9 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, .001" or .0001"  
Flatness: 0.6µm  
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

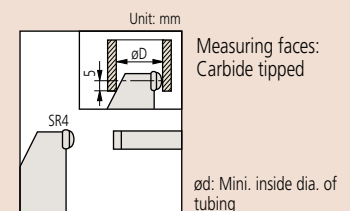
### Function of Digital Model

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

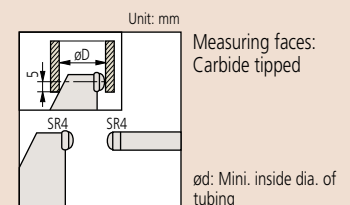
### Optional Accessory for Digital Model

**05CZA662**: SPC cable with data switch (1m)  
**05CZA663**: SPC cable with data switch (2m)

### Spherical anvil type



### Spherical anvil-spindle type

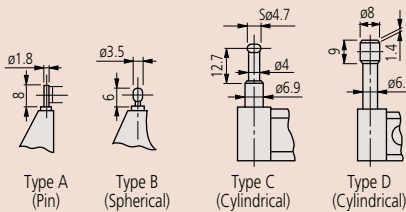


## Cylindrical Anvil Type



395-261

### Cylindrical anvil type

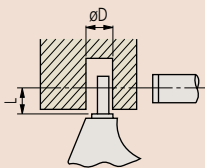


Type A (Pin)

Type B (Spherical)

Type C (Cylindrical)

Type D (Cylindrical)



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

∅D: Mini. inside dia. of tubing  
Spindle face: Carbide tipped

## SPECIFICATIONS

### Metric Digital model with spherical anvil

Range	Order No.	Accuracy	Remarks
0 - 25mm	395-251 <sup>S-F</sup>	±2μm	D: 15mm
	395-271 <sup>S-S</sup>	±2μm	D: 15mm
25 - 50mm	395-252 <sup>S-F</sup>	±2μm	D: 15mm
	395-272 <sup>S-S</sup>	±2μm	D: 15mm
50 - 75mm	395-253 <sup>S-F</sup>	±2μm	D: 19mm
	395-273 <sup>S-S</sup>	±2μm	D: 19mm
75 - 100mm	395-254 <sup>S-F</sup>	±3μm	D: 20mm
	395-274 <sup>S-S</sup>	±3μm	D: 20mm

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

### Metric Digital model with cylindrical anvil

Range	Order No.	Accuracy	Remarks
0 - 25mm	395-261	±3μm	Type A
	395-262	±3μm	Type B
	395-263	±3μm	Type C
	395-264	±3μm	Type D

### Metric Mechanical counter model with spherical anvil

Range	Order No.	Accuracy	Remarks
0 - 25mm	295-115 <sup>S-F</sup>	±3μm	D: 10mm
	295-215 <sup>S-S</sup>	±3μm	D: 10mm

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

### Metric With spherical anvil

Range	Order No.	Accuracy	Remarks
0 - 25mm	115-115 <sup>S-F</sup>	±3μm	D: 10mm
	115-215 <sup>S-S</sup>	±3μm	D: 10mm
25 - 50mm	115-116 <sup>S-F</sup>	±3μm	D: 11mm
	115-216 <sup>S-S</sup>	±3μm	D: 11mm
50 - 75mm	115-117 <sup>S-F</sup>	±3μm	D: 17mm
	115-217 <sup>S-S</sup>	±3μm	D: 17mm
75 - 100mm	115-118 <sup>S-F</sup>	±4μm	D: 18mm
	115-218 <sup>S-S</sup>	±4μm	D: 18mm

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

### Metric With cylindrical anvil

Range	Order No.	Accuracy	Remarks
0 - 25mm	115-302	±3μm	Type A
	115-308	±3μm	Type B
	115-315	±3μm	Type C
	115-316	±3μm	Type D
25 - 50mm	115-303	±3μm	Type A
	115-309	±3μm	Type B

### Inch/Metric Digital model with spherical anvil

Range	Order No.	Accuracy	Remarks
0 - 1"	395-351 <sup>S-F</sup>	±.0001"	D: .59"
	395-371 <sup>S-S</sup>	±.0001"	D: .59"
1" - 2"	395-352 <sup>S-F</sup>	±.0001"	D: .59"
	395-372 <sup>S-S</sup>	±.0001"	D: .59"
2" - 3"	395-353 <sup>S-F</sup>	±.0001"	D: .75"
	395-373 <sup>S-S</sup>	±.0001"	D: .75"
3" - 4"	395-354 <sup>S-F</sup>	±.00015"	D: .79"
	395-374 <sup>S-S</sup>	±.00015"	D: .79"

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

### Inch/Metric Digital model with cylindrical anvil

Range	Order No.	Accuracy	Remarks
0 - 1"	395-362	±.00015"	Type B
	395-363	±.00015"	Type C
	395-364	±.00015"	Type D

### Inch Mechanical counter model with spherical anvil

Range	Order No.	Accuracy	Remarks
0 - 1"	295-153 <sup>S-F*</sup>	±.00015"	D: .40"
	295-253 <sup>S-S*</sup>	±.00015"	D: .40"

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	Order No.	Accuracy	Remarks
0 - 1"	115-153 <sup>S-F*</sup>	±.00015"	D: .40"
	115-253 <sup>S-S*</sup>	±.00015"	D: .40"
1" - 2"	115-242 <sup>S-S</sup>	±.00015"	D: .44"
2" - 3"	115-243 <sup>S-S</sup>	±.00015"	D: .67"

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

### Inch With cylindrical anvil

Range	Order No.	Accuracy	Remarks
0 - 1"	115-305	±.00015"	Type A
	115-313*	±.00015"	Type C
	115-314*	±.00015"	Type D

\*.0001" reading is obtained with vernier.

# Point Micrometers

**SERIES 342, 142, 112**

## FEATURES

- IP65 water/dust protection (342 series).
- 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.
- The measuring points (carbide-tipped) have approximately 0.3mm radius.
- With Ratchet Stop for constant force.
- With SPC output (series 342).
- With digit counter (series 142).



## SPECIFICATIONS

Metric Digital model			
Range	Order No.	Accuracy	Point
0 - 25mm	342-251	±2µm	15°
	342-261	±2µm	30°
25 - 50mm	342-252	±2µm	15°
	342-262	±2µm	30°
50 - 75mm	342-253	±2µm	15°
	342-263	±2µm	30°
75 - 100mm	342-254	±3µm	15°
	342-264	±3µm	30°

Metric			
Range	Order No.	Accuracy	Point
0 - 25mm	142-153	±3µm	15°
	142-201	±3µm	30°

Metric			
Range	Order No.	Accuracy	Point
0 - 25mm	112-165	±3µm	15°
	112-153*	±3µm	15°
	112-213	±3µm	30°
	112-201*	±3µm	30°
25 - 50mm	112-166	±3µm	15°
	112-154*	±3µm	15°
	112-214	±3µm	30°
	112-202*	±3µm	30°
50 - 75mm	112-167	±3µm	15°
	112-155*	±3µm	15°
	112-215	±3µm	30°
	112-203*	±3µm	30°
75 - 100mm	112-168	±4µm	15°
	112-156*	±4µm	15°
	112-216	±4µm	30°
	112-204*	±4µm	30°

Inch/Metric Digital model			
Range	Order No.	Accuracy	Point
0 - 1"	342-351	±.0001"	15°
	342-361	±.0001"	30°
1" - 2"	342-352	±.0001"	15°
	342-362	±.0001"	30°
2" - 3"	342-353	±.0001"	15°
	342-363	±.0001"	30°
3" - 4"	342-354	±.00015"	15°
	342-364	±.00015"	30°

Inch			
Range	Order No.	Accuracy	Point
0 - 1"	142-177	±.00015"	15°
	142-225	±.00015"	30°

Inch			
Range	Order No.	Accuracy	Point
0 - 1"	112-189	±.00015"	15°
	112-177*	±.00015"	15°
	112-237	±.00015"	30°
	112-225*	±.00015"	30°
1" - 2"	112-190	±.00015"	15°
	112-178*	±.00015"	15°
	112-238	±.00015"	30°
	112-226*	±.00015"	30°
2" - 3"	112-191	±.00015"	15°

\*The points have not carbide tips.



(Refer to the page 9 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 .001"  
 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

## Function of Digital Model

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

## Optional Accessory for Digital Model

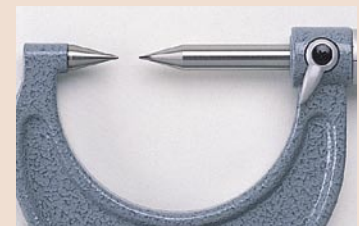
- 05CZA662: SPC cable with data switch (1m)
- 05CZA663: SPC cable with data switch (2m)



Tip angle: 15° (SR0.3)

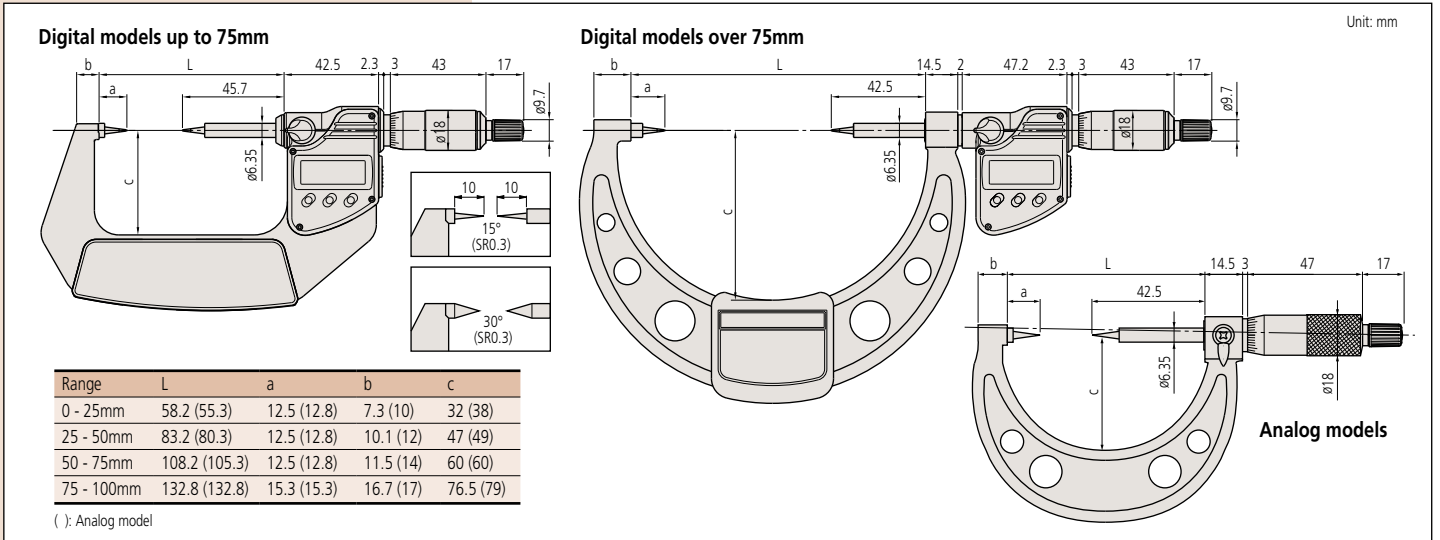


Tip angle: 30° (SR0.3)



\*The points have not carbide tips.

## DIMENSION



(Refer to the page 9 for details.)

### Technical Data

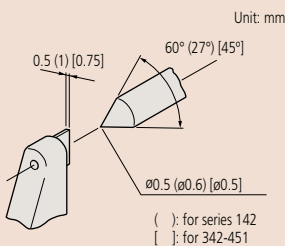
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm or .001"  
Display\*: LCD  
Battery\*: SR44 (1 pc.), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
(3 years: Quickmike type)  
Dust/Water protection level\*: IP65  
\*Digital models \*\*Analog models

### Function of Digital Model

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

### Optional Accessory for Digital Model

**05CZA662**: SPC cable with data switch (1m)  
**05CZA663**: SPC cable with data switch (2m)  
**937387**: SPC cable for Quickmike type (1m)  
**965013**: SPC cable for Quickmike type (2m)



# Crimp Height Micrometers

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

### FEATURES

- IP54/65 water/dust protection (342 series).
- Measures the height of crimp contacts.
- With Ratchet Stop for constant force.
- With SPC output (series 342).
- With digit counter (series 142).



### SPECIFICATIONS

Metric	Digital model	
Range	Order No.	Accuracy
0 - 20mm	<b>342-271</b>	±3μm

Metric	Quickmike type	
Range	Order No.	Accuracy
0 - 15mm	<b>342-451</b>	±3μm

Metric	Mechanical counter model	
Range	Order No.	Accuracy
0 - 25mm	<b>142-402/142-403*</b>	±3μm

\* 0.001mm reading is obtained with vernier.

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 0.8"	<b>342-371</b>	±.00015"

Metric	Mechanical counter model	
Range	Order No.	Accuracy
0 - 25mm	<b>112-401</b>	±3μm