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**Micrometers**



**Micrometer Heads**

**New Products**

**Coolant Proof Micrometer**

**Digimatic Micrometer**

**Ratchet Thimble Micrometer**

**Digimatic Spline Micrometer**

**Fine Pitch Micrometer Head**

# 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.



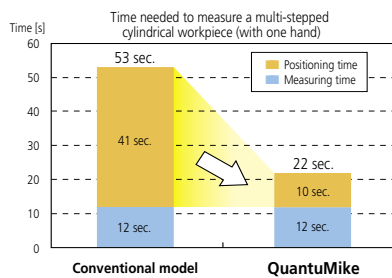
## FEATURES

### • 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

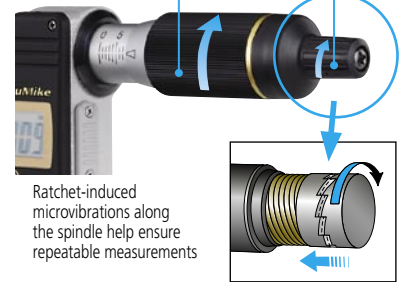
### • Repeatable measurement

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)



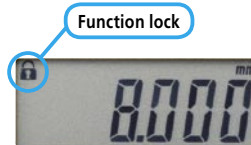
Ratchet on thimble Ratchet on speeder



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.

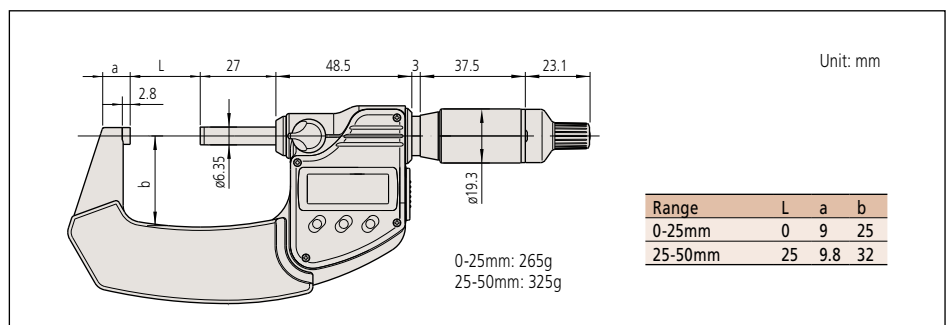


### • Dust/water resistance with IP65 protection level

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)



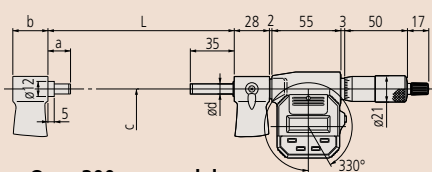
SPC cable with data switch



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

## DIMENSION AND MASS

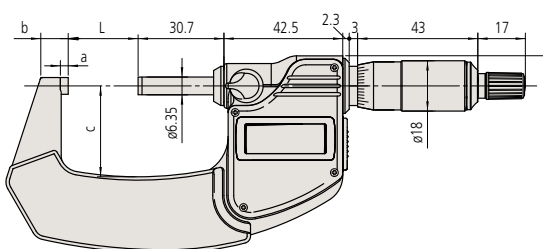
### DIMENSION



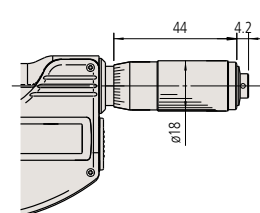
Over 300mm model

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

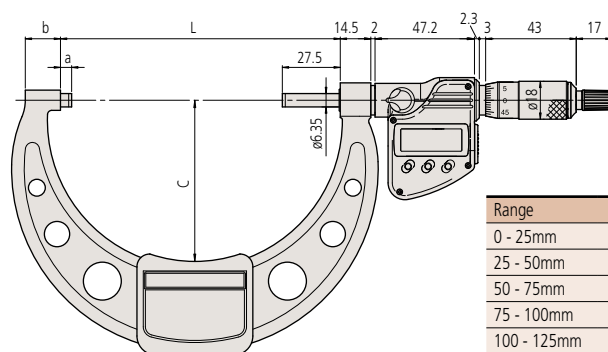
Ratchet stop type up to 100mm



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

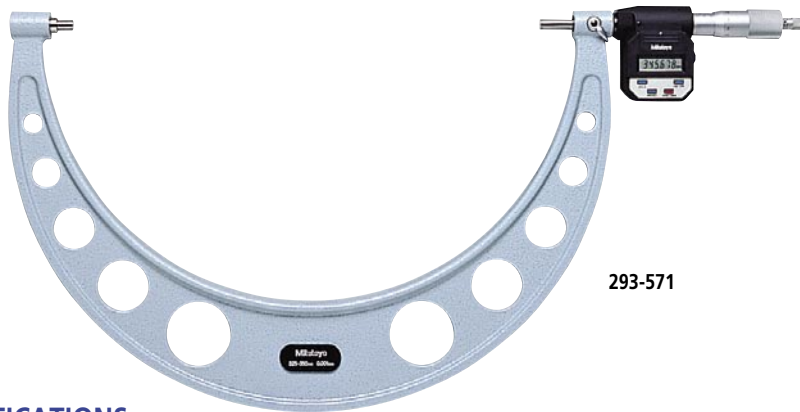
Range	Order No.	Accuracy
0 - 1"	293-335 / 293-348*	±0.00005"
1" - 2"	293-336	±0.00005"

\*without SPC data output

# Digimatic Micrometer


## SERIES 293


### FEATURES



293-571

### SPECIFICATIONS

Metric  With ratchet stop		
Range	Order No.	Accuracy
300 - 325mm	293-571	±6µm
325 - 350mm	293-572	±6µm
350 - 375mm	293-573	±6µm
375 - 400mm	293-574	±7µm
400 - 425mm	293-575	±7µm
425 - 450mm	293-576	±7µm
450 - 475mm	293-577	±8µm
475 - 500mm	293-578	±8µm

Inch/Metric  With ratchet stop		
Range	Order No.	Accuracy
12" - 13"	293-771	±.0003"
13" - 14"	293-772	±.0003"
14" - 15"	293-773	±.0003"
15" - 16"	293-774	±.00035"
16" - 17"	293-775	±.00035"
17" - 18"	293-776	±.00035"
18" - 19"	293-777	±.0004"
19" - 20"	293-778	±.0004"



### Technical Data

Accuracy: Refer to the list of specifications. (excluding quantizing error)  
 Resolution: 0.001mm or .0001"/0.001mm  
 Flatness: 0.6µm  
 Parallelism: 5µm for models up to 375mm  
 6µm for models up to 475mm  
 7µm for models over 500mm  
 Measuring faces: Carbide tipped  
 Display: LCD  
 Battery: SR44 (2 pcs.), **938882**  
 Battery life: Approx. 1.8 years under normal use  
 Dimensions: Refer to the page 27 for details.

### Function

Preset, 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)




# Digimatic Micrometer

## SERIES 293

### FEATURES

- Simply measures 0 through 25mm with resolution to 0.001mm.
- Provided only with a origin-set key 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	±2µm



293-821

Inch/Metric  With ratchet stop		
Range	Order No.	Accuracy
0 - 1"	293-831	±.0001"

Inch/Metric  With friction thimble		
Range	Order No.	Accuracy
0 - 1"	293-832	±.0001"

### 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. 1.2 years under normal use

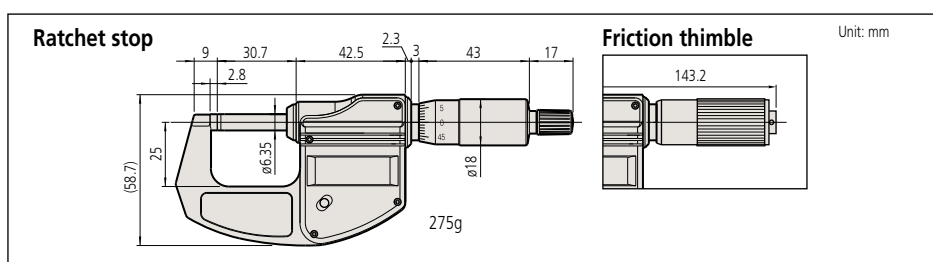
### Function

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



(Refer to the page 9 for details.)

### DIMENSION AND MASS





(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).



227-201

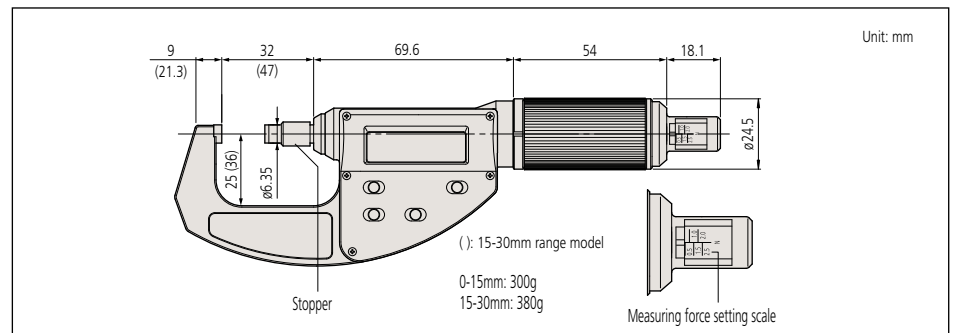
### SPECIFICATION

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).

SPC

IP54

(Refer to the page 9 for details.)

ABSOLUTE®  
Absolute System Patented by MITUTOYO

(Refer to the page 9 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  
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

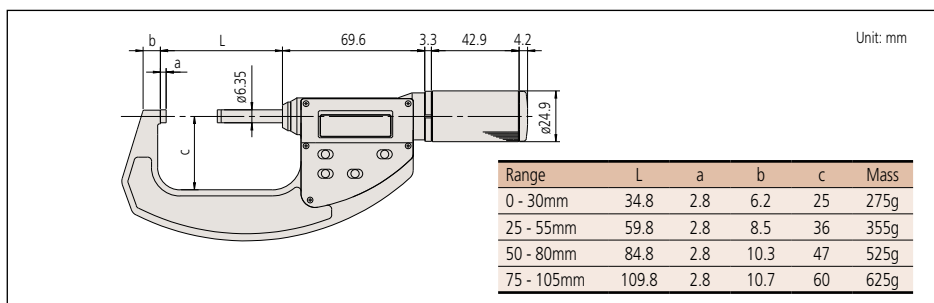
### SPECIFICATION

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

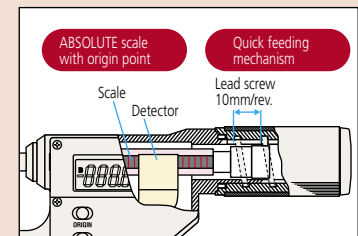
Inch/Metric		
Range	Order No.	Accuracy
0 - 1.2"	293-676	±.0001"
1" - 2.2"	293-677	±.0001"
2" - 3.2"	293-678	±.00015"
3" - 4.2"	293-679	±.00015"

### DIMENSION AND MASS



### 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

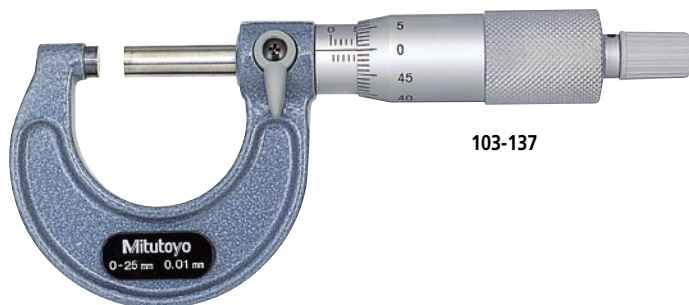
Note: The shape of the thimble changes on the model with friction thimble.

# 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

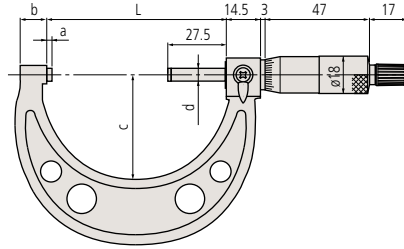
#### Inch Micrometer set

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

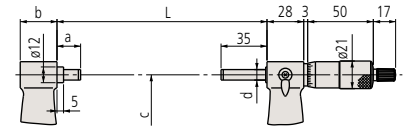
### Models up to 300mm



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



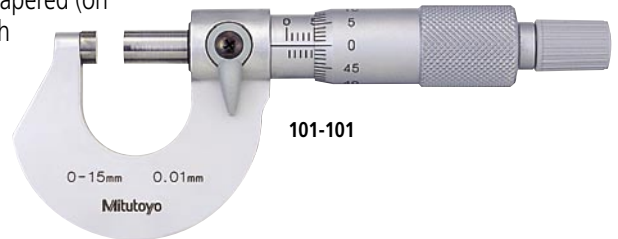
Range	L	a	b	c	d
225 - 250mm	258	5.5	18	143	ø6.35
250 - 275mm	284	6.5	18	156	ø6.35
275 - 300mm	309	6.5	18	169	ø6.35
300 - 325mm	353	18	28	187	ø8
325 - 350mm	378	18	28	199	ø8
350 - 375mm	403	18	28	212	ø8
375 - 400mm	428	18	28	224	ø8
400 - 425mm	453	18	28	236	ø8
425 - 450mm	478	18	28	248	ø8
450 - 475mm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



101-101

### 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.

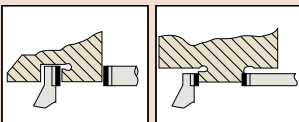
**Inch** With friction thimble

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

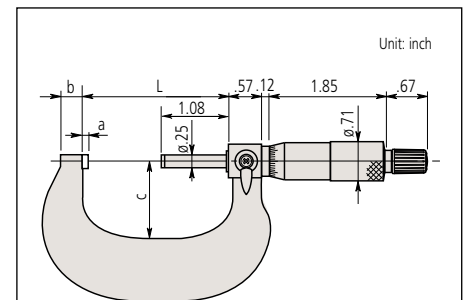
\*.0001" reading is obtained with vernier.

### 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



Unit: inch

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

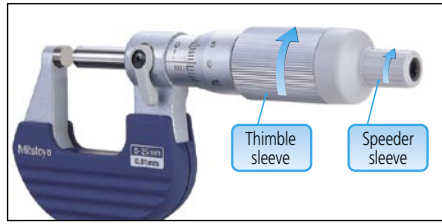
Note: The shape of the thimble changes on the model with friction thimble.

# Ratchet Thimble Micrometer

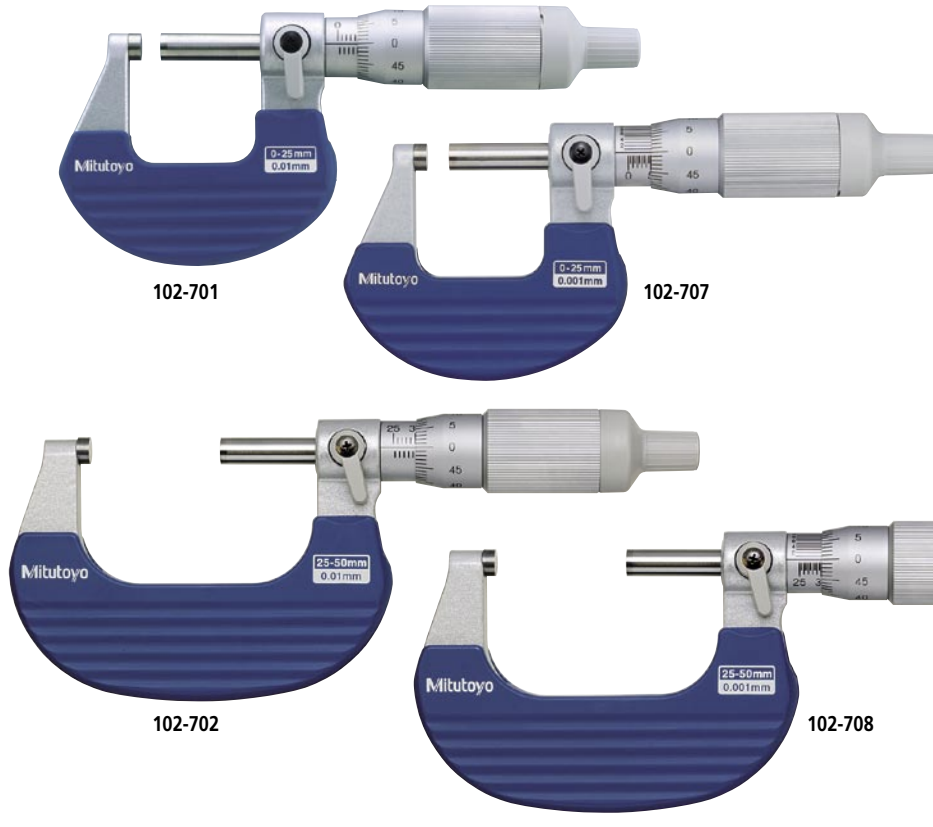
**SERIES 101, 102 — New smoother action Ratchet Thimble**

## 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.

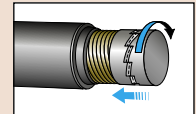


(Refer to the page 9 for details.)

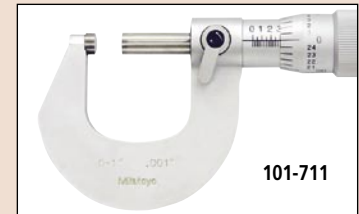
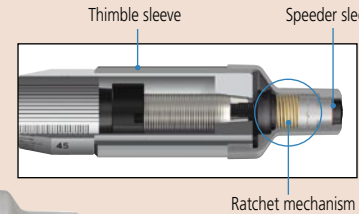


## Technical Data

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

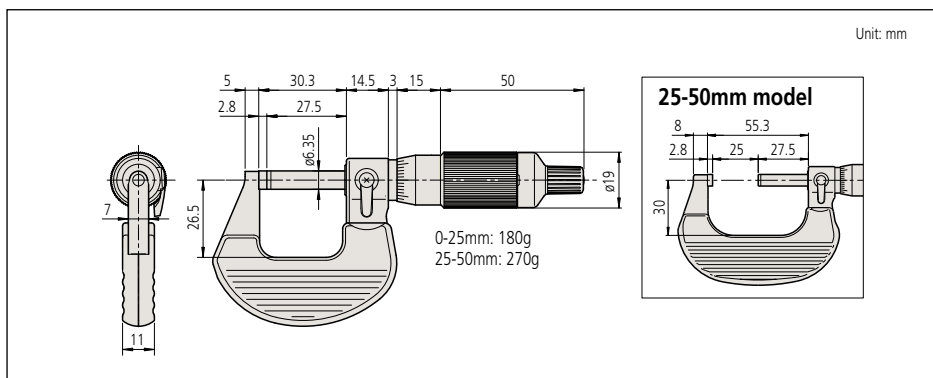
Metric		
Range	Order No.	Accuracy
0 - 25mm	102-701	±2µm
	102-707*	±2µm
25 - 50mm	102-702	±2µm
	102-708*	±2µm

\*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

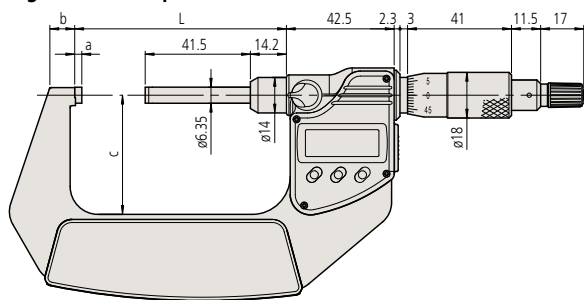
Metric	With ratchet thimble	
Range	Order No.	Accuracy
0 - 25mm	<b>106-101</b>	±2μm
25 - 50mm	<b>106-103</b>	±2μm
50 - 75mm	<b>106-105</b>	±3μm
75 - 100mm	<b>106-106</b>	±3μm

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"

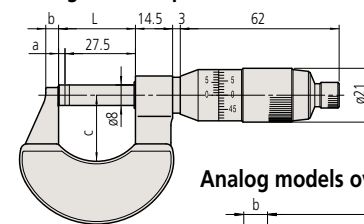
Inch	With friction thimble	
Range	Order No.	Accuracy
0 - 1"	<b>106-102</b>	±.0001"
1" - 2"	<b>106-104</b>	±.0001"

## DIMENSION

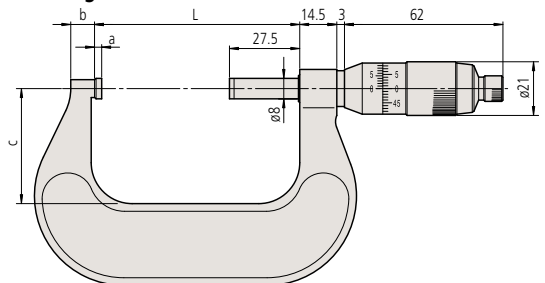
Digital models up to 75mm



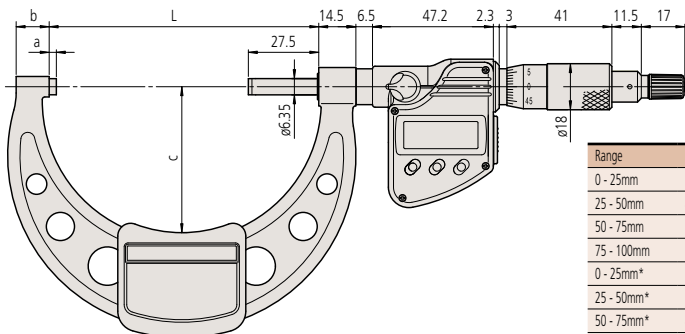
Analog models up to 50mm



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

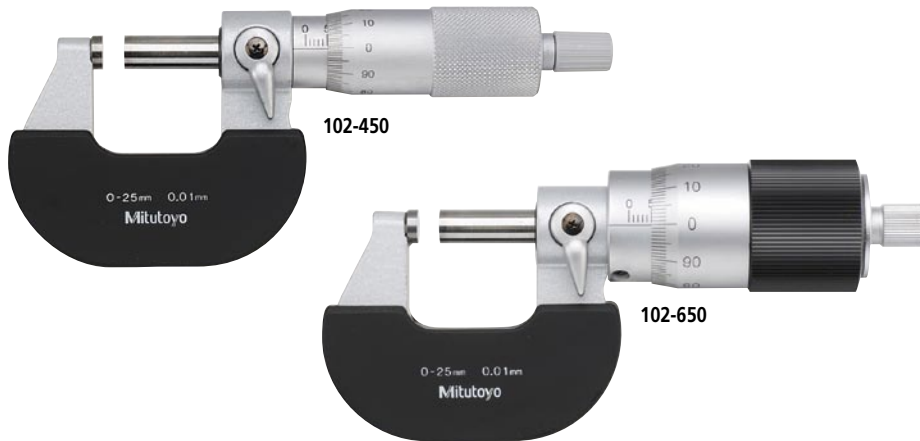
Unit: mm

# 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).



### 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

### SPECIFICATIONS

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

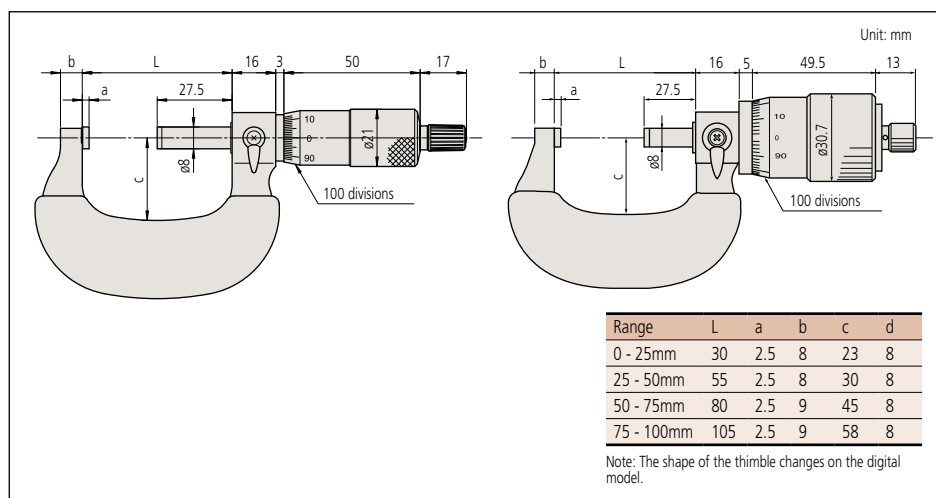
Metric With ratchet thimble		
Range	Order No.	Accuracy
0 - 25mm	<b>102-650</b>	±2μm
25 - 50mm	<b>102-651</b>	±2μm
50 - 75mm	<b>102-652</b>	±2μm
75 - 100mm	<b>102-653</b>	±3μm

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

### Optional Accessory for Digital Model

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

### DIMENSION





(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  
\*Digital models \*\*Analog models

### 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)



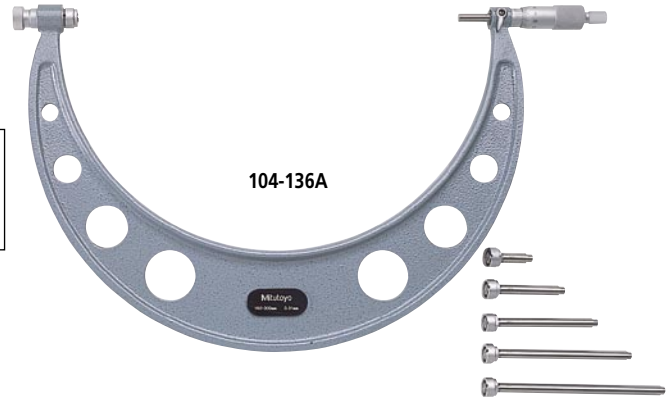
# Outside Micrometers

## 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"

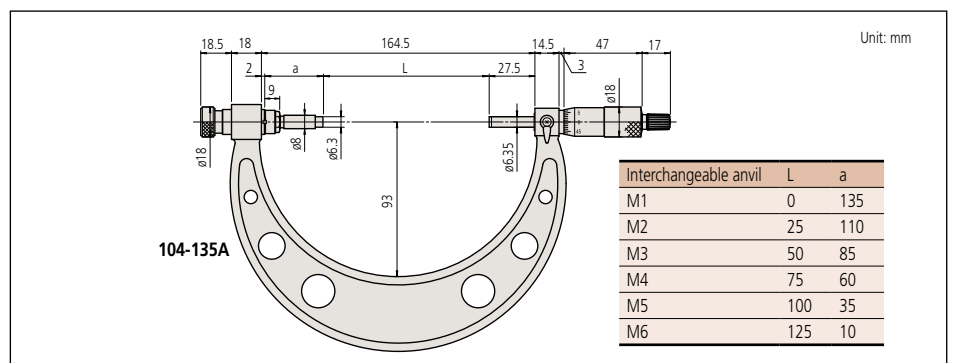
Metric		
Range	Order No.	Interchangeable anvils
0 - 50mm	<b>104-171*</b>	0, 25mm
0 - 100mm	<b>104-139A</b>	0, 25, 50, 75mm
0 - 150mm	<b>104-135A</b>	0, 25, 50, 75, 100, 125mm
50 - 150mm	<b>104-161A</b>	0, 25, 50, 75mm
100 - 200mm	<b>104-140A</b>	0, 25, 50, 75mm
150 - 300mm	<b>104-136A</b>	0, 25, 50, 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

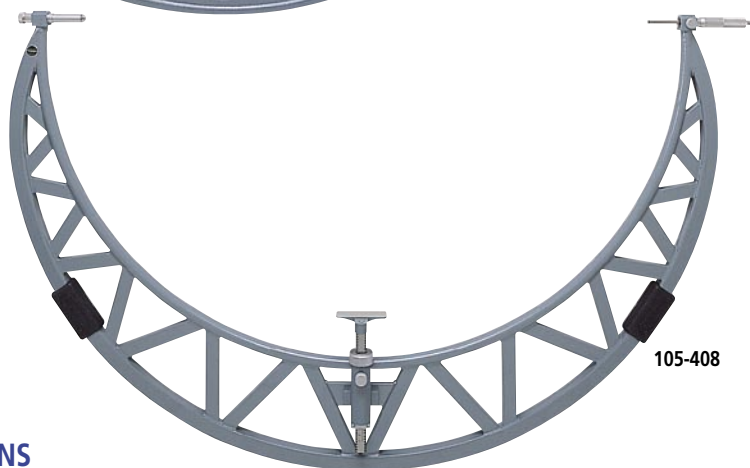
## SERIES 105 — with Extension Anvil Collars

### 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).



105-105



105-408

### 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)

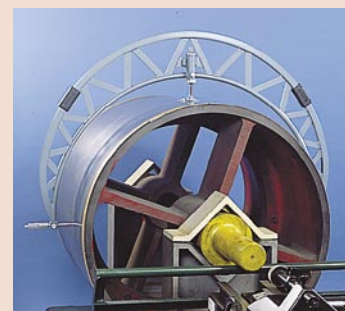
\*fraction rounded down

Measuring faces: Carbide tipped

### Extension anvil collar



Anvil collar





# Caliper Type Micrometers

**SERIES 343, 143**

## Technical Data

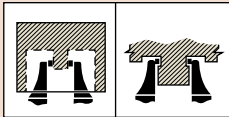
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*\*: 0.01mm  
Flatness: 0.3μm  
Parallelism: (3+R/75)μm, R = max. range (mm)  
\*Fraction rounded down  
Measuring faces: Carbide tipped  
Display\*: 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

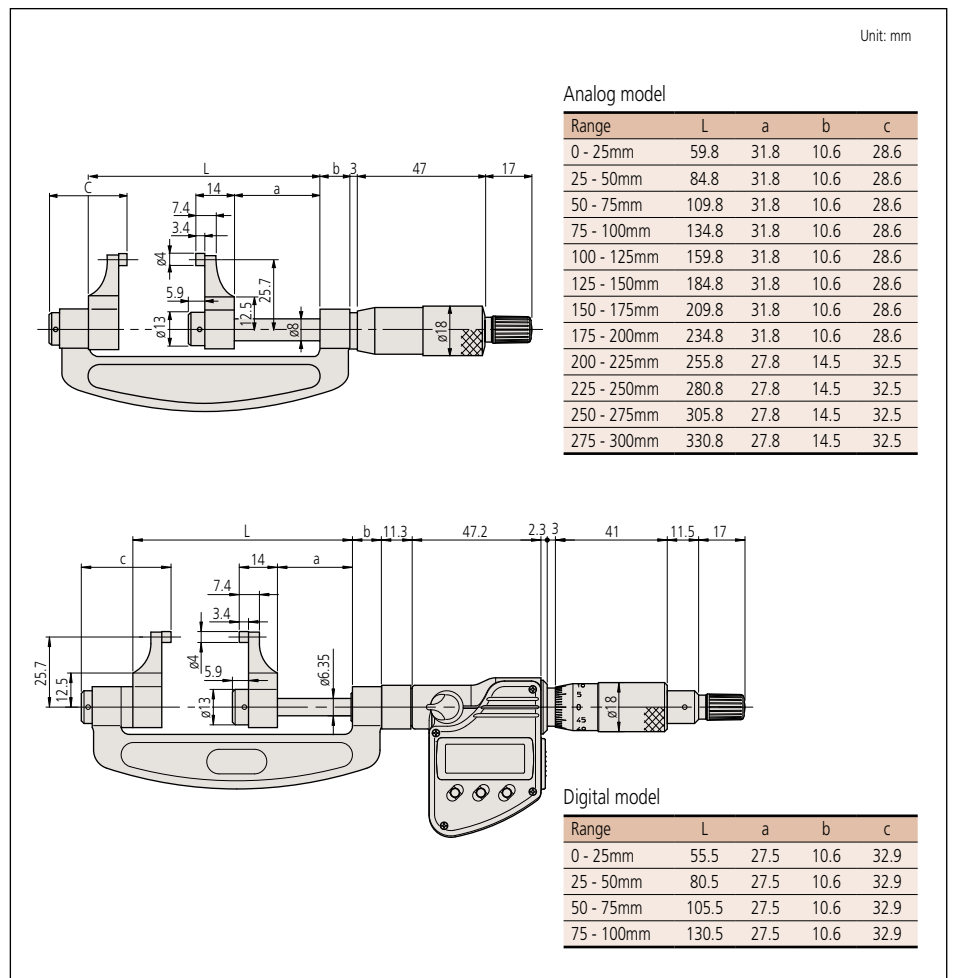
Models with a range up to 300mm are available.

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

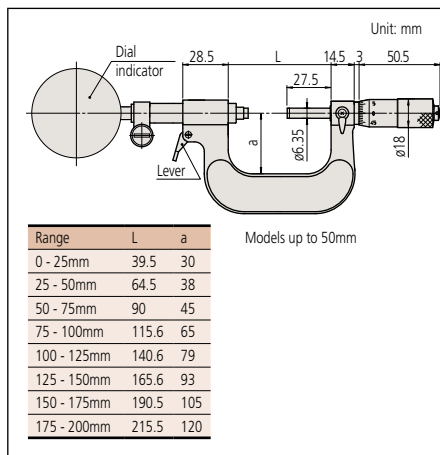
- With dial indicator for direct GO/NG-GO judgment for mass-produced parts.
- Anvil retracting trigger for quick measurement.
- With a standard except for 25mm model.



### 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

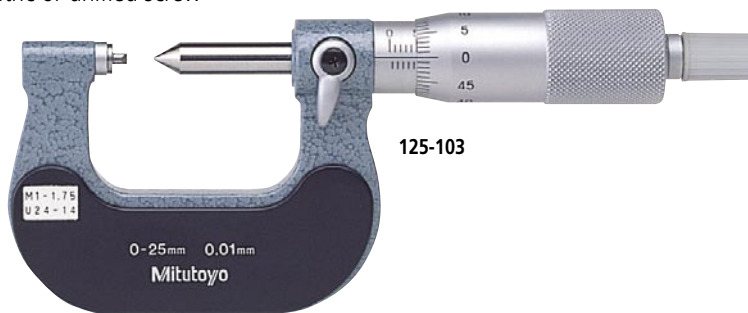


# Screw Thread Micrometers

## 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	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

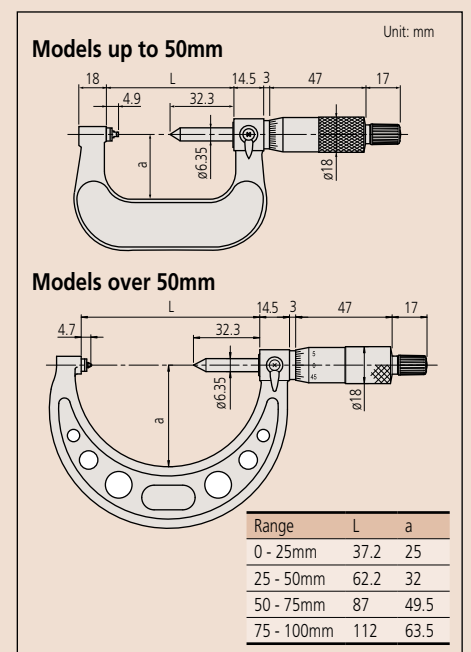
Range	Order No.	Screw to be measured (Metric/Unified)
50 - 75mm	125-111	0.6 - 0.9mm/44 - 28TPI
	125-112	1 - 1.75mm/24 - 14TPI
	125-113	2 - 3mm/13 - 9TPI
	125-114	3.5 - 5mm/8 - 5TPI
	125-115	5.5 - 7mm/4.5 - 3.5TPI
75 - 100mm	125-116	0.6 - 0.9mm/44 - 28TPI
	125-117	1 - 1.75mm/24 - 14TPI
	125-118	2 - 3mm/13 - 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)  
 \*fraction rounded up  
 Graduation: 0.01mm  
 Spindle feed error: 3μm



### 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"  
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:

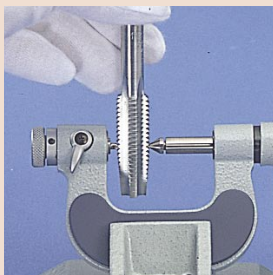


For Metric/Unified screws (60° threads)

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> )



# 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

### 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

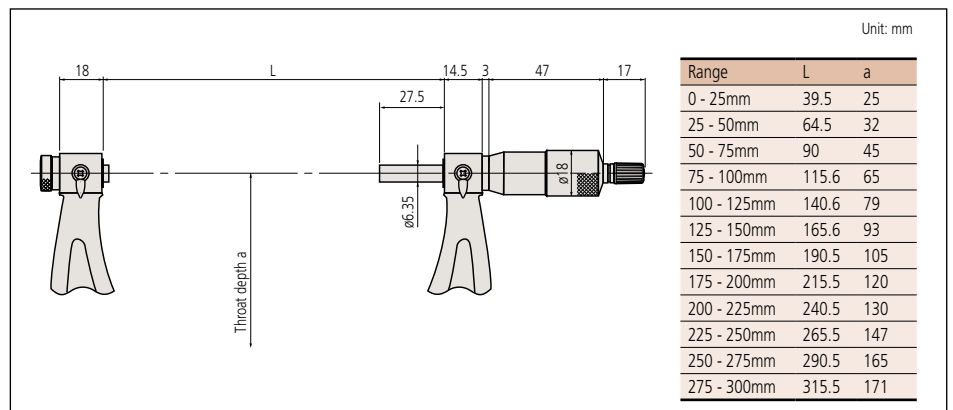
Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	<b>326-351</b>	±.0002"
1" - 2"	<b>326-352</b>	±.0002"
2" - 3"	<b>326-353</b>	±.0002"
3" - 4"	<b>326-354</b>	±.00025"

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		
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

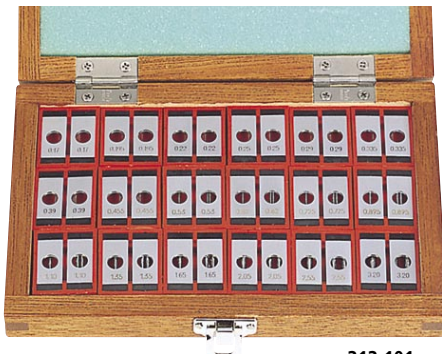
Inch		
Range	Order No.	Accuracy
0 - 1"	116-105	±.0002"
1" - 2"	116-106	±.0002"

# 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

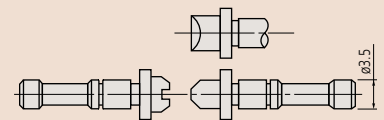
### Optional Accessory

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

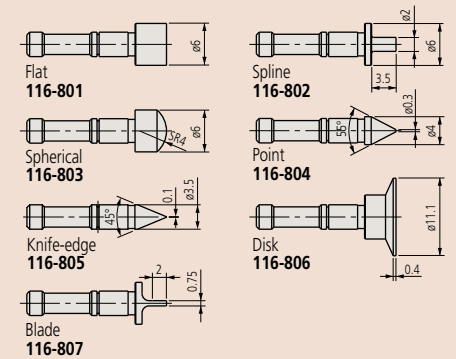
Order No.	Assortment of anvils and tip
116-840	60 - 48TPI (116-841) 48 - 40TPI (116-842) 40 - 32TPI (116-843) 32 - 24TPI (116-844) 24 - 18TPI (116-845) 18 - 14TPI (116-846) 14 - 10TPI (116-847) 10 - 7TPI (116-848) 7 - 4.5TPI (116-849) 4.5 - 3.5TPI (116-850)



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

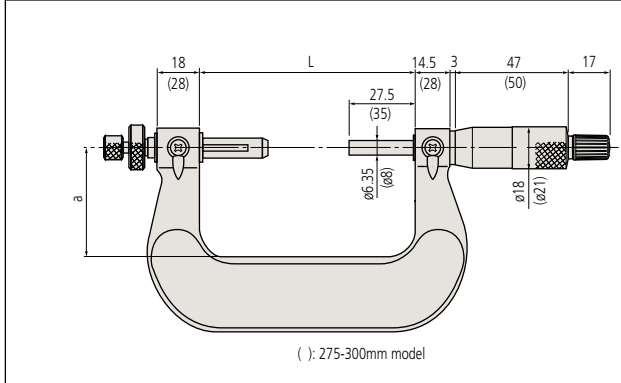
## SPECIFICATIONS

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

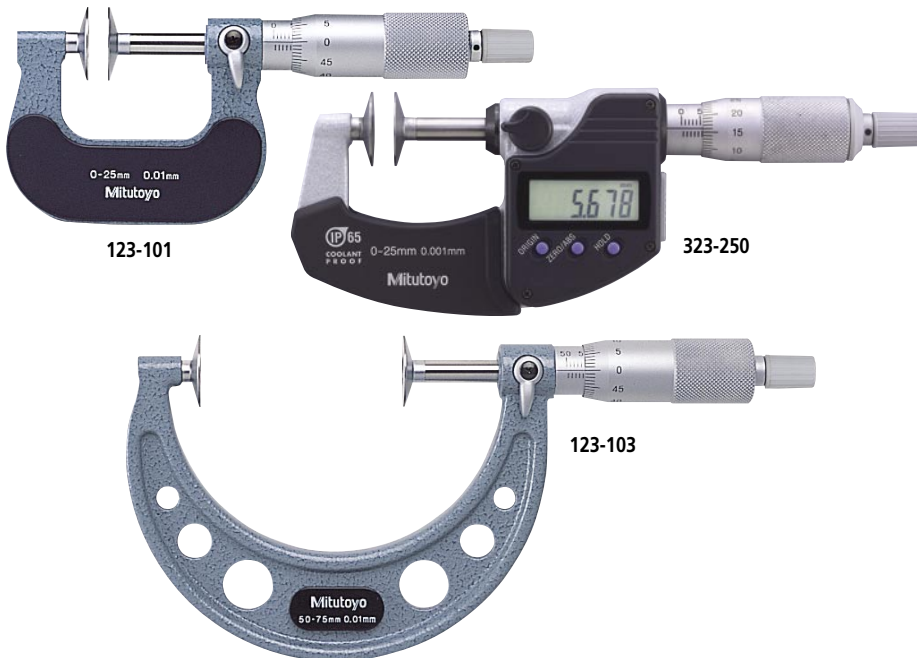
( ): 275-300mm model

# 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.
0 - 25mm	<b>323-250</b>
25 - 50mm	<b>323-251</b>
50 - 75mm	<b>323-252</b>
75 - 100mm	<b>323-253</b>

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

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

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

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

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

\*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

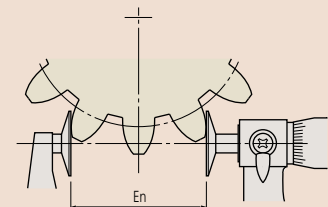
### Function of Digital Model

- 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

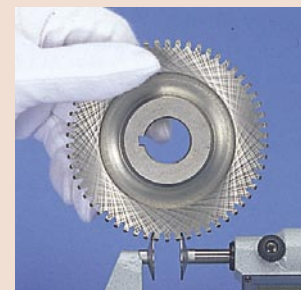
### Optional Accessory for Digital Model

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

### Root tangent length of gear (En)



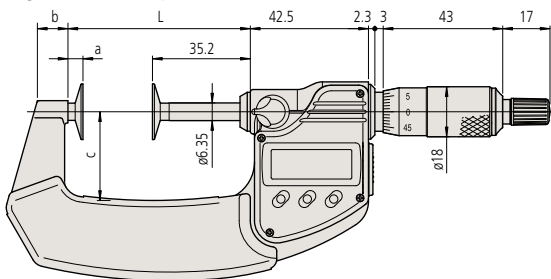
Note: Root tangent length measurement is not available for some types gears.



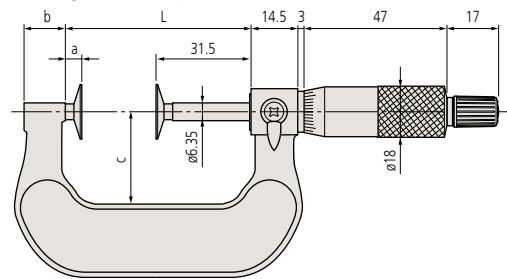
## DIMENSION

Unit: mm

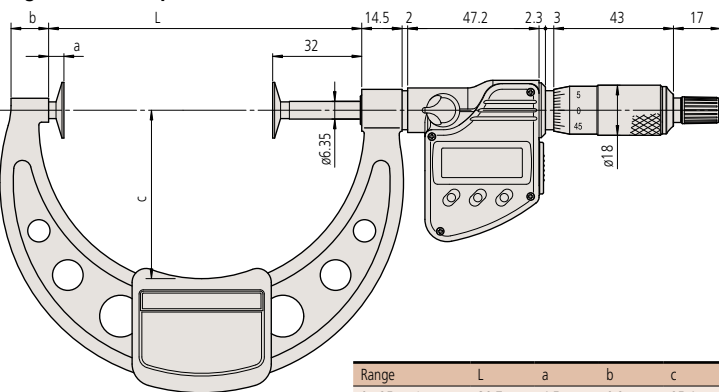
### Digital models up to 75mm



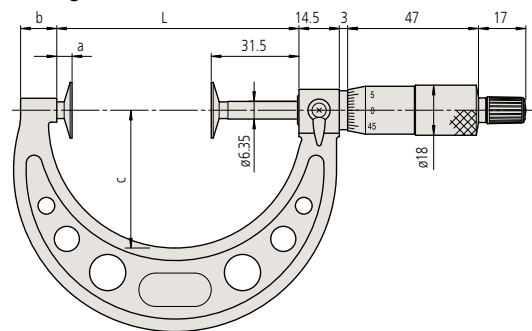
### Analog models up to 50mm



### Digital models over 75mm

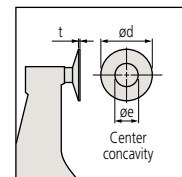


### Analog over 50mm



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

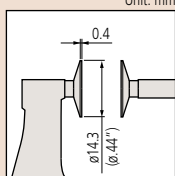


### Technical Data

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.

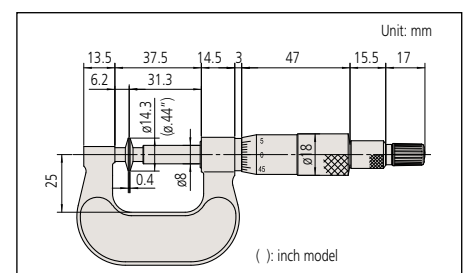


169-101

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

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

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

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

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

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

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

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

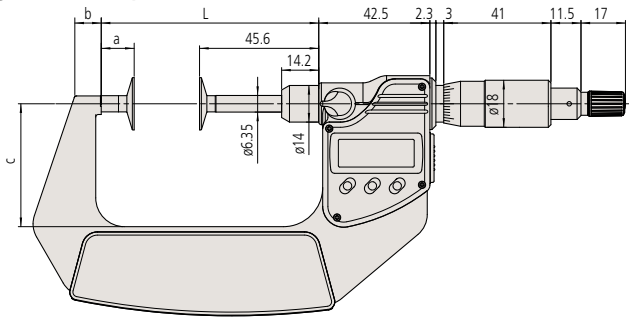




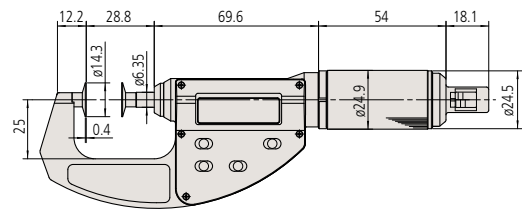
# DIMENSION

Unit: mm

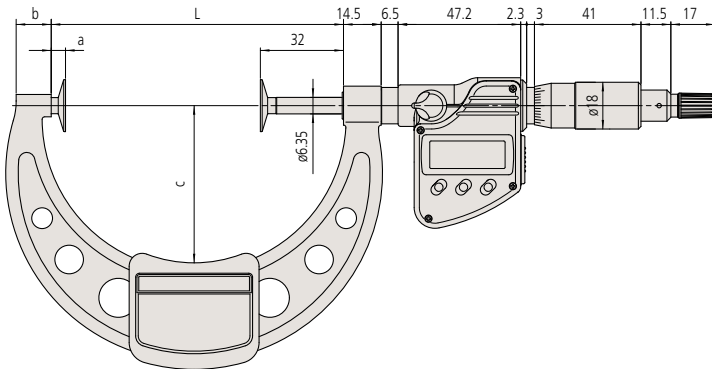
## Digital models up to 75mm



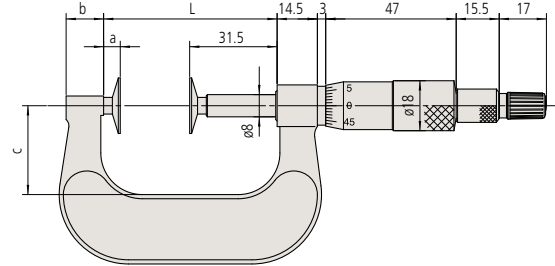
## Fine-loading type



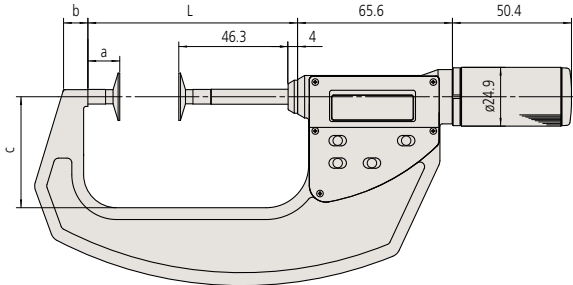
## Digital models over 75mm



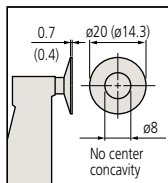
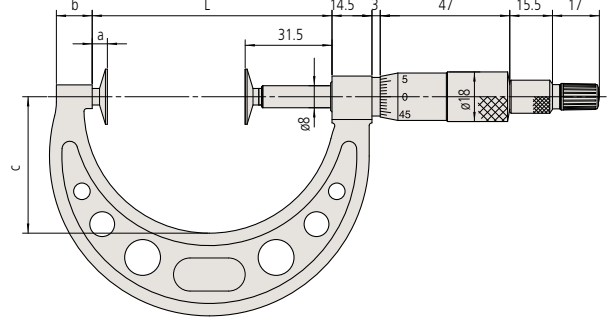
## Analog models up to 50mm



## 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

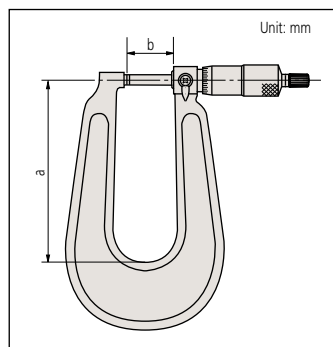
**SERIES 389, 189, 119, 118**

## 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				
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				
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	

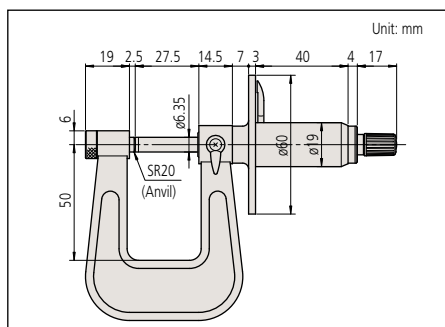
S-F: Spherical anvil and flat spindle  
S-S: Spherical anvil and spherical spindle  
\*.0001" reading is obtained with vernier.

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



## DIMENSION



(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

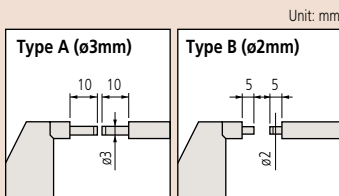
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm, .001" or .0001"  
Flatness: 0.3μm  
Parallelism: (2+R/100)μm, R = max. range (mm)  
\*fraction rounded up  
Measuring faces: Carbide tipped  
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	Accuracy	Remarks
0 - 25mm	331-251	±2μm	Type A
	331-261	±2μm	Type B
25 - 50mm	331-252	±2μm	Type A
	331-262	±2μm	Type B
50 - 75mm	331-253	±2μm	Type A
	331-263	±2μm	Type B
75 - 100mm	331-254	±3μm	Type A
	331-264	±3μm	Type B

Inch/Metric	Digital model	Accuracy	Remarks
0 - 1"	331-351	±.0001"	Type A
	331-361	±.0001"	Type B
1" - 2"	331-352	±.0001"	Type A
	331-362	±.0001"	Type B
2" - 3"	331-353	±.0001"	Type A
	331-363	±.0001"	Type B
3" - 4"	331-354	±.00015"	Type A
	331-364	±.00015"	Type B

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

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

\*.0001" reading is obtained with vernier.

### DIMENSION

**Models up to 75mm**

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

**Models over 75mm**

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

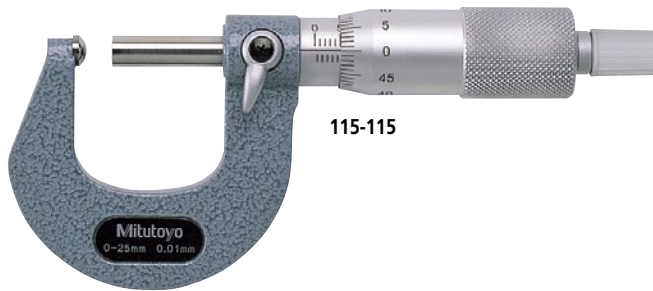
### FEATURES

- 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

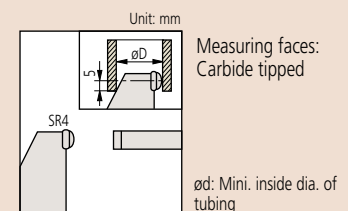
### Function of Digital Model

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

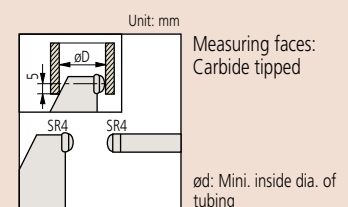
### Optional Accessory for Digital Model

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

### Spherical anvil type



### Spherical anvil-spindle type

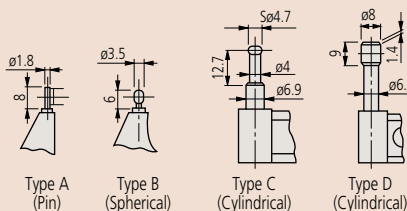


## Cylindrical Anvil Type



395-261

### Cylindrical anvil type

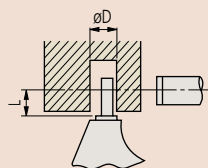


Type A (Pin)

Type B (Spherical)

Type C (Cylindrical)

Type D (Cylindrical)



øD: Mini. inside dia. of tubing  
Spindle face: Carbide tipped

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

## 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°

\*The points have not carbide tips.

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

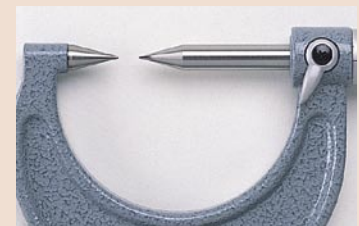
- 05CZA662: SPC cable with data switch (1m)
- 05CZA663: SPC cable with data switch (2m)



Tip angle: 15° (SR0.3)



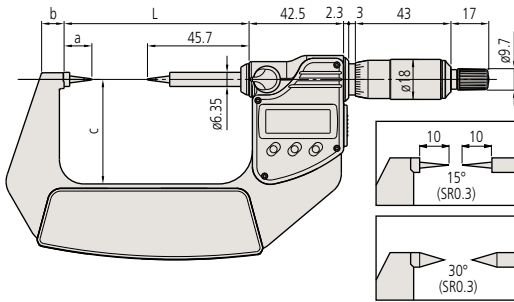
Tip angle: 30° (SR0.3)



## DIMENSION

Unit: mm

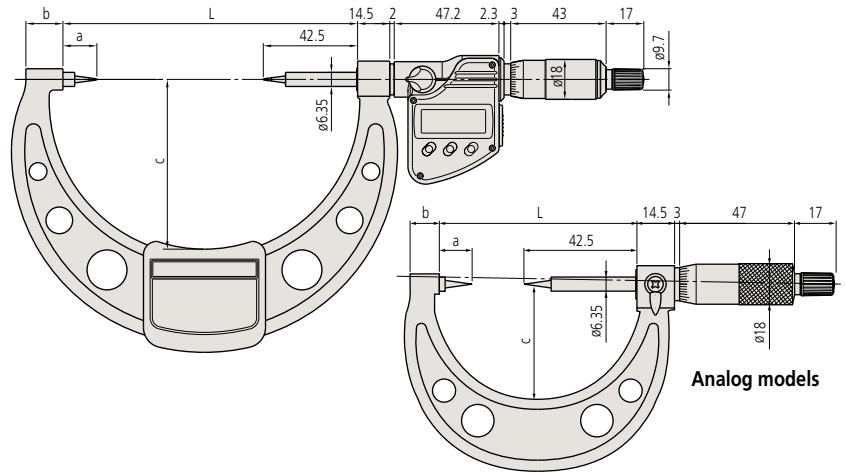
### Digital models up to 75mm



Range	L	a	b	c
0 - 25mm	58.2 (55.3)	12.5 (12.8)	7.3 (10)	32 (38)
25 - 50mm	83.2 (80.3)	12.5 (12.8)	10.1 (12)	47 (49)
50 - 75mm	108.2 (105.3)	12.5 (12.8)	11.5 (14)	60 (60)
75 - 100mm	132.8 (132.8)	15.3 (15.3)	16.7 (17)	76.5 (79)

( ) : Analog model

### Digital models over 75mm



Analog models



(Refer to the page 9 for details.)

### Technical Data

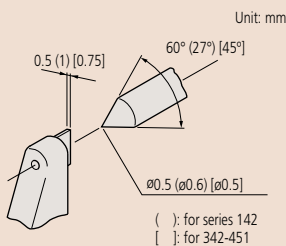
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm or .001"  
Display\*: LCD  
Battery\*: SR44 (1 pc.), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
(3 years: Quickmike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

# V-Anvil Micrometers

## SERIES 314, 114 — 3 Flutes and 5 Flutes

### FEATURES

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



314-251



114-121



114-102



114-204

### SPECIFICATIONS

Metric <span style="float: right;">Digital model for 3 flutes cutting head</span>			
Range	Order No.	Accuracy	Remarks
1 - 15mm	314-251	±4μm	w/ groove
	314-261	±4μm	—
10 - 25mm	314-252	±4μm	w/ groove
	314-262	±4μm	—
25 - 40mm	314-253	±5μm	—

Inch/Metric <span style="float: right;">Digital model for 3 flutes cutting head</span>			
Range	Order No.	Accuracy	Remarks
.05 - .6"	314-351	±.0002"	w/ groove
	314-361	±.0002"	—
.4" - 1"	314-352	±.0002"	w/ groove
	314-362	±.0002"	—
1" - 1.6"	314-353	±.00025"	—



### Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm, .001" or .0001"  
Flatness (spindle/anvil): 0.6μm / 1.3μm\*\* (0.3μm / 1.0μm)\*  
Spindle face: Carbide tipped  
Display\*: LCD  
Battery\*: SR44 (1 pc.), 938882  
Battery life\*: Approx. 8 months under normal use  
\*Digital models \*\*Analog models

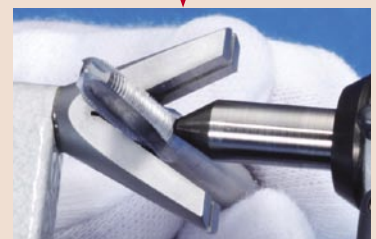
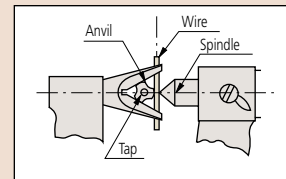
### Function of Digital Model

Zero-setting, Data hold, Preset, 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)

### Pitch Diameter Measurement of Tap by Single-wire Method





**Metric** For 3 flutes cutting head

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

\*Carbide-tipped anvil

**Inch** For 3 flutes cutting head

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

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

**Metric** For 5 flutes cutting head

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

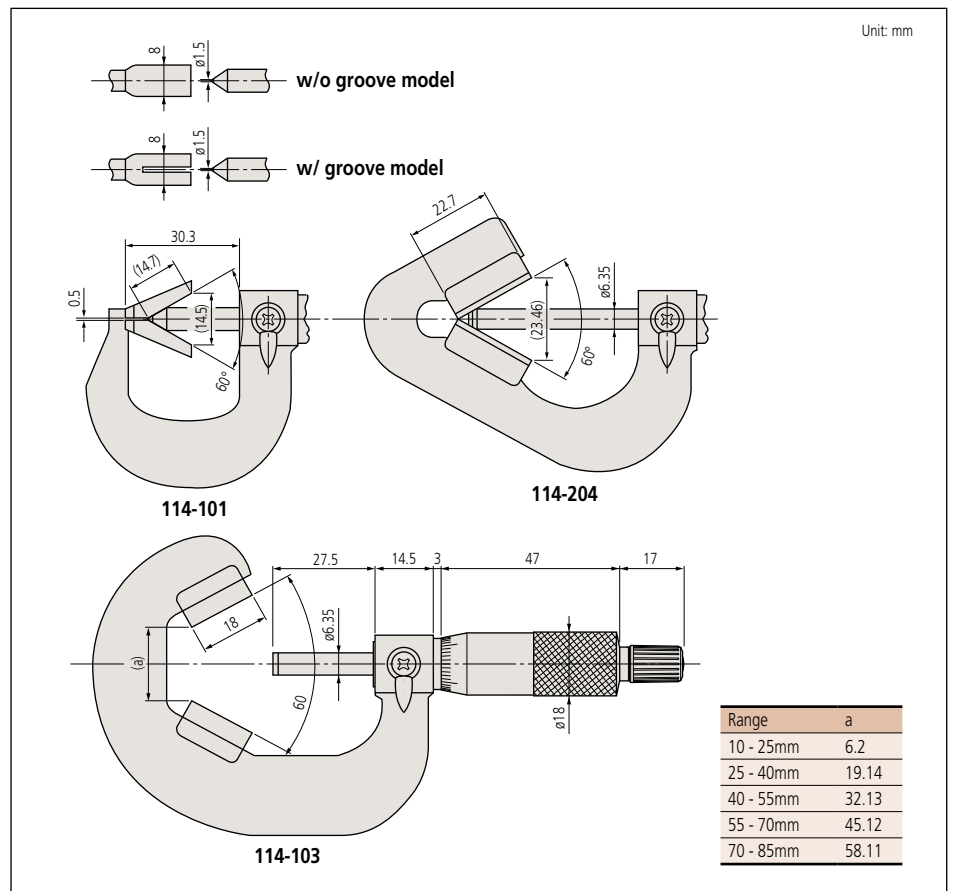
\*Carbide-tipped anvil

**Inch** For 5 flutes cutting head

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

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

## DIMENSION



# Blade Micrometers

## SERIES 422,122 — Non-Rotating Spindle Type

### FEATURES

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



422-230



Quickmike type

422-411



122-101

### SPECIFICATIONS

Metric		Digital model	
Range	Order No.	Accuracy	Remarks
0 - 25mm	422-230	±3µm	Type A
	422-260	±3µm	Type B
	422-270	±3µm	Type C
	422-271	±3µm	Type D
	422-231	±3µm	Type A
25 - 50mm	422-261	±3µm	Type B
50 - 75mm	422-232	±3µm	Type A
75 - 100mm	422-233	±4µm	Type A

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

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

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

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

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



### Technical Data

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

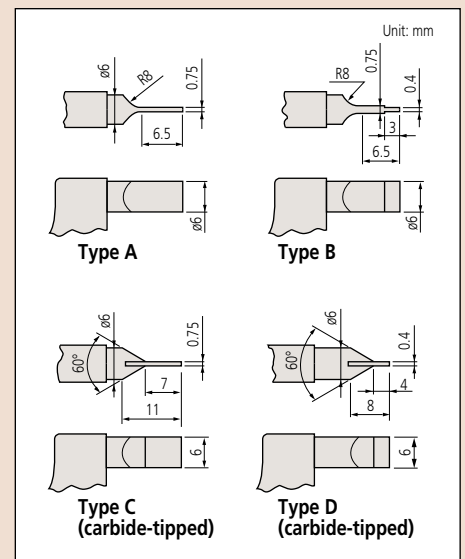
### Function of Digital Model

Origin-set, Zero-setting, Data hold, 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)

### TYPE AND DIMENSION



# Can Seam Micrometers

## SERIES 147

### FEATURES

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

### Technical Data

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

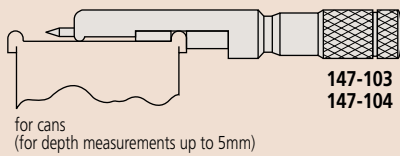


147-103

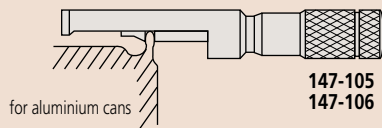
### SPECIFICATIONS

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

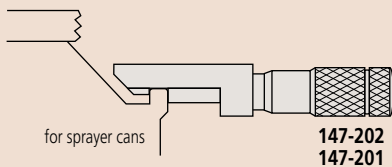
Inch		
Range	Order No.	Remarks
0 - .5"	147-104	for steel cans
	147-106	for aluminum cans
	147-201	for sprayer cans



147-103  
147-104



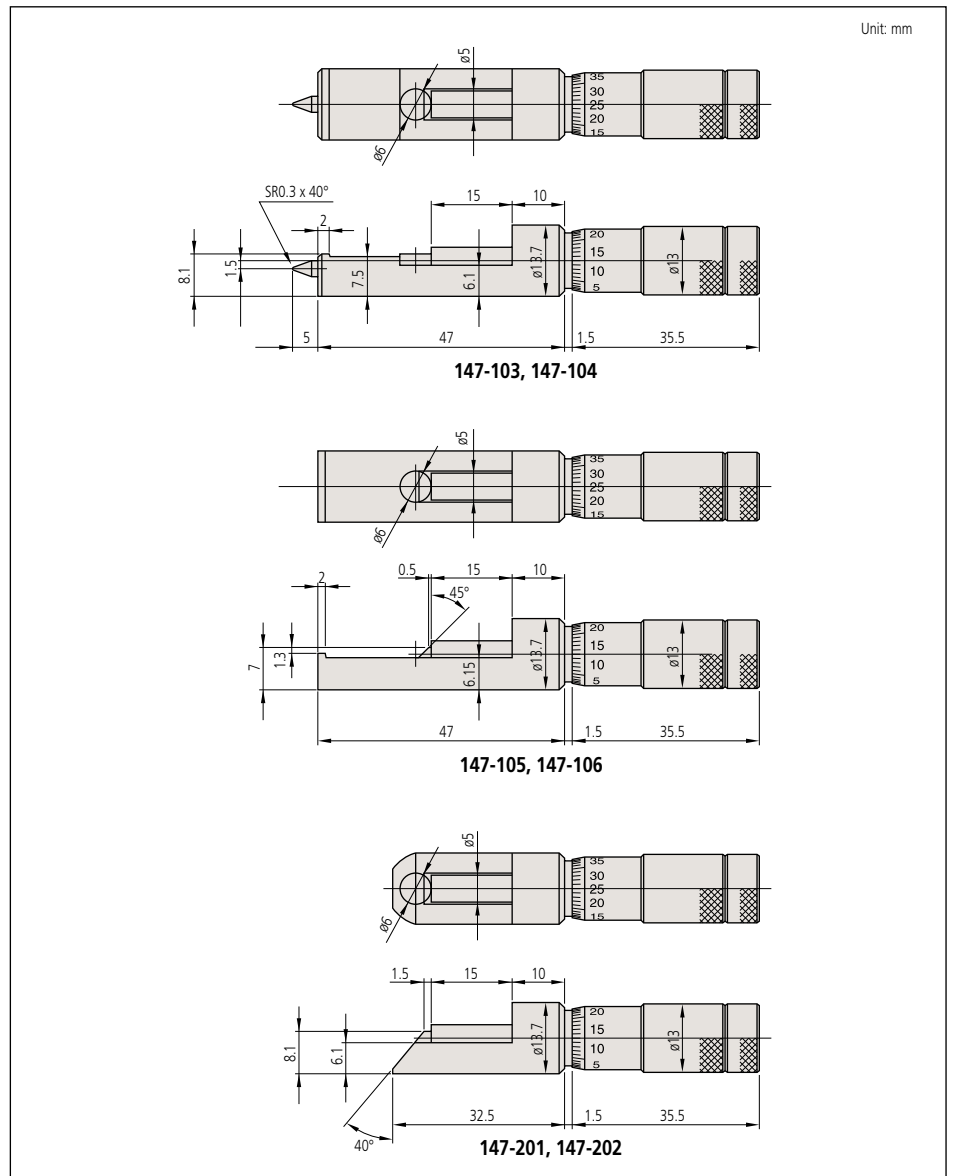
147-105  
147-106



147-202  
147-201



### DIMENSION



# Hub Micrometers

## SERIES 147

### FEATURES

- Measures hub thickness and shoulders inside a bore.
- With Ratchet Stop for constant force.
- With a standard except for 25mm model.



147-301

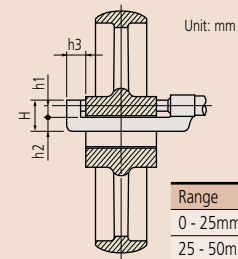
### SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 25mm	147-301	$\pm 2\mu\text{m}$
25 - 50mm	147-302	$\pm 2\mu\text{m}$
50 - 75mm	147-303	$\pm 2\mu\text{m}$
75 - 100mm	147-304	$\pm 3\mu\text{m}$

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

### Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm or .001"  
 Flatness: 0.6 $\mu\text{m}$   
 Parallelism:  $(2+R/100)\mu\text{m}$ , R = max. range (mm)  
\*fraction rounded up  
 Measuring faces: Carbide tipped



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

# Wire Micrometers

## SERIES 147

### FEATURES

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



147-401

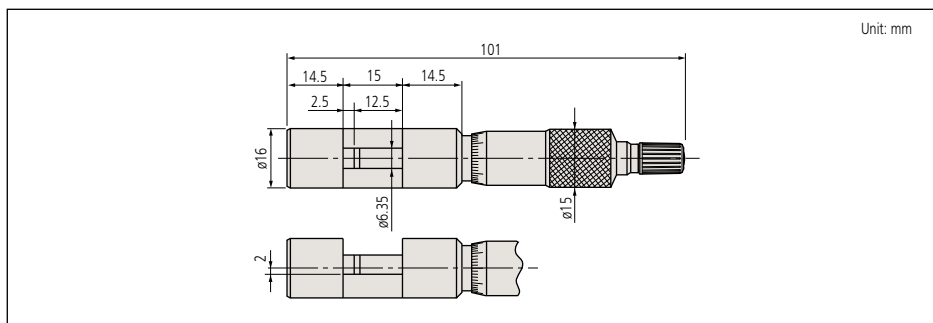
### SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 10mm	147-401	$\pm 3\mu\text{m}$

Inch		
Range	Order No.	Accuracy
0 - .4"	147-402	$\pm .00015$ "

\*.0001" reading is obtained with vernier.

### DIMENSION



### Technical Data

Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm or .0001"  
 Flatness: 0.6 $\mu\text{m}$   
 Parallelism: 1.3 $\mu\text{m}$   
 Measuring faces: Carbide tipped



# Digit Outside Micrometers

## SERIES 193

### FEATURES

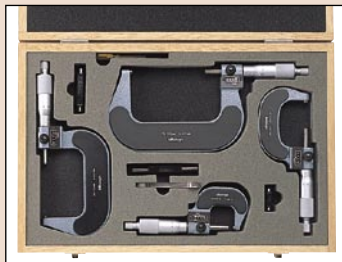
- Mechanical digit counter with 0.01 mm or .001" reading for quick and error-free reading.
- With a standard except for 25mm model.



193-101

### Technical Data

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



193-916

### SPECIFICATIONS

Metric  With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	<b>193-101</b>	±2μm
	<b>193-111*</b>	±2μm
25 - 50mm	<b>193-102</b>	±2μm
	<b>193-112*</b>	±2μm
50 - 75mm	<b>193-103</b>	±2μm
	<b>193-113*</b>	±2μm
75 - 100mm	<b>193-104</b>	±3μm
	<b>193-114*</b>	±3μm
100 - 125mm	<b>193-305</b>	±3μm
125 - 150mm	<b>193-306</b>	±3μm
150 - 175mm	<b>193-307</b>	±4μm
175 - 200mm	<b>193-308</b>	±4μm
200 - 225mm	<b>193-309</b>	±4μm
225 - 250mm	<b>193-310</b>	±5μm

\*0.001mm reading is obtained with vernier.

Inch  With ratchet stop		
Range	Order No.	Accuracy
2" - 3"	<b>193-213*</b>	±.0001"
3" - 4"	<b>193-214*</b>	±.00015"
4" - 5"	<b>193-415*</b>	±.00015"
5" - 6"	<b>193-416*</b>	±.00015"
6" - 7"	<b>193-417*</b>	±.0002"
7" - 8"	<b>193-418*</b>	±.0002"
8" - 9"	<b>193-419*</b>	±.0002"
9" - 10"	<b>193-420*</b>	±.00025"
10" - 11"	<b>193-421*</b>	±.00025"

\*.0001" reading is obtained with vernier.

Inch  With friction thimble		
Range	Order No.	Accuracy
0 - 1"	<b>193-201</b>	±.0001"
	<b>193-211*</b>	±.0001"
1" - 2"	<b>193-212*</b>	±.0001"

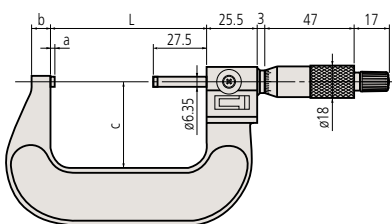
\*.0001" reading is obtained with vernier.

Metric  Micrometer set		
Range	Order No.	Assortment of micrometers
0 - 75mm (3 pcs./set)	<b>193-901</b>	• <b>193-101, 193-102, 193-103</b> • 2 micrometer standards
0 - 100mm (4 pcs./set)	<b>193-902</b>	• <b>193-101, 193-102, 193-103, 193-104</b> • 3 micrometer standards
0 - 150mm (6 pcs./set)	<b>193-908</b>	• <b>193-101, 193-102, 193-103, 193-104, 193-305, 193-306</b> • 5 micrometer standards

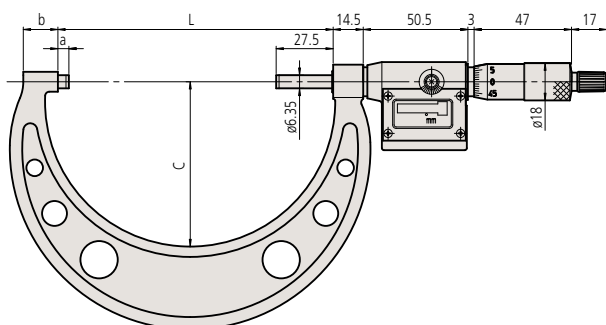
Inch  Micrometer set		
Range	Order No.	Assortment of micrometers
0 - 3" (3 pcs./set)	<b>193-923</b>	• <b>193-211, 193-212, 193-213</b> • 2 micrometer standards
0 - 6" (6 pcs./set)	<b>193-930</b>	• <b>193-211, 193-212, 193-213, 193-214, 193-415, 193-416</b> • 5 micrometer standards

### DIMENSION

#### Models up to 100mm



#### Models over 100mm



Unit: mm

Range	L	a	b	c
0 - 25mm	30	2.5	5	26
25 - 50mm	55	2	8	32
50 - 75mm	80	2	9	45
75 - 100mm	105	2	9	57
100 - 125mm	132.8	5.3	17	79
125 - 150mm	158.2	5.7	19	94
150 - 175mm	183.6	6.1	19	106
175 - 200mm	208.8	6.3	18	118
200 - 225mm	234.2	6.7	17	130
225 - 250mm	258.0	5.5	18	143

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

# "Uni-Mike"

## SERIES 317, 117 — Interchangeable Anvil Type

### FEATURES

- IP65 water/dust protection (317 series).
- Measures tubing thickness, shoulder-edge distance, rivet head height, etc. with interchangeable anvils (flat anvil, rod anvil, V-anvil).
- Supplied with Flat Anvil (**201216**) and Rod Anvil:  $\varnothing 3\text{mm}$  rod anvil (**201217**) for 0-25mm models,  $\varnothing 5\text{mm}$  (**201379**) for 25-50mm model.
- With special Disk Anvils. The Uni-Mike is used as a height micrometer. The disks have a lapped, mirror surface.



### SPECIFICATIONS

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

Excluding quantizing error

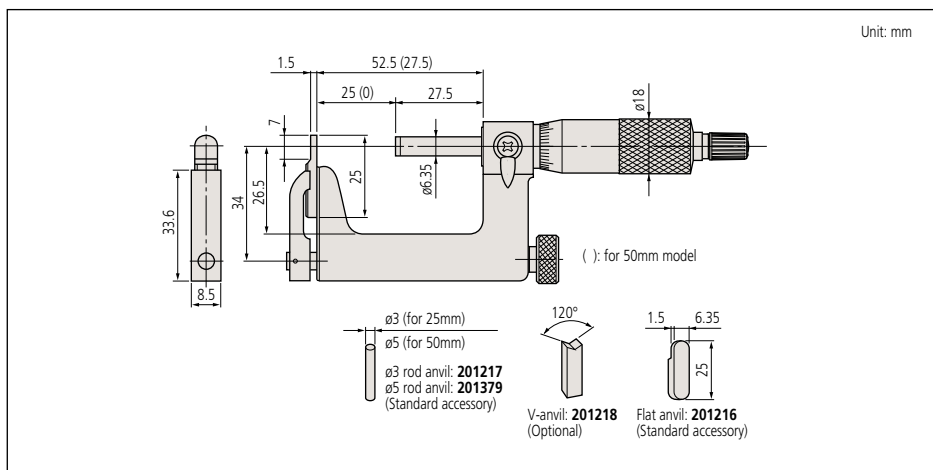
Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	<b>117-101</b>	$\pm 4\mu\text{m}$
25 - 50mm	<b>117-102</b>	$\pm 4\mu\text{m}$

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

Excluding quantizing error

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

### 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 .0001"  
Spindle face: 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

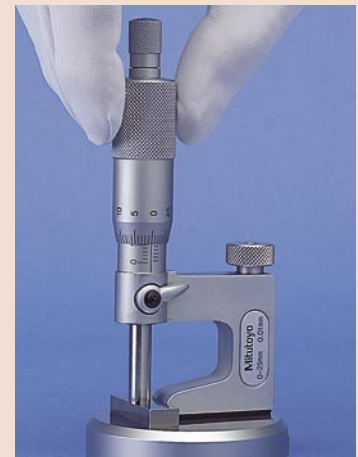
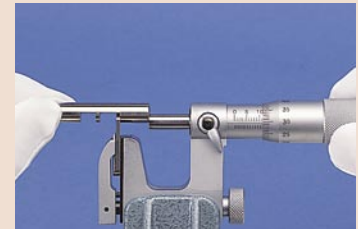
### Function of Digital Model

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

- 05CZA662**: SPC cable with data switch (1m)\*
- 05CZA663**: SPC cable with data switch (2m)\*
- 201218**: V-anvil
- 950758**: Disk anvil for 25mm (1") models
- 950759**: Disk anvil for 50mm (2") models

\*Only for digital models

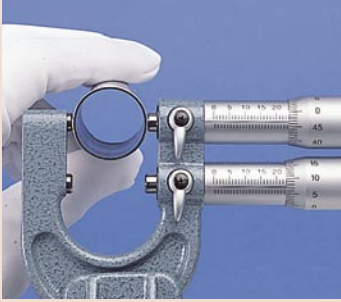


# Limit Micrometers

## SERIES 113

### FEATURES

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



113-102

### Technical Data

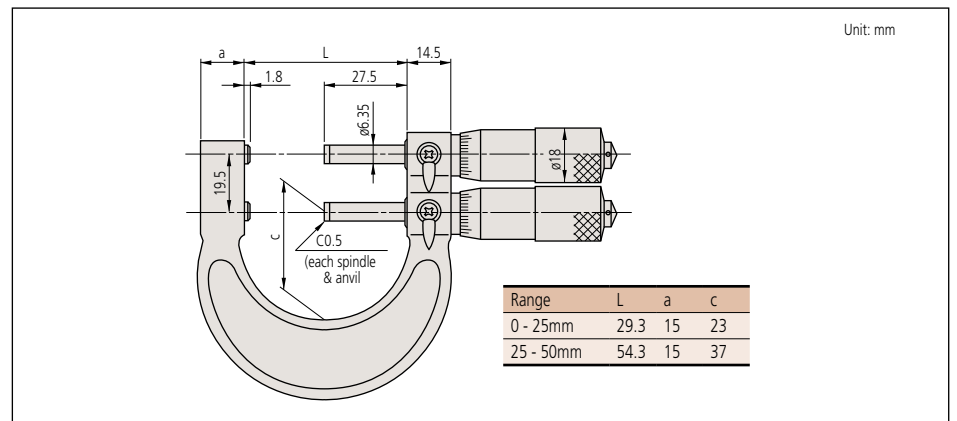
Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm  
 Flatness: 0.6μm  
 Parallelism:  $(3+R/100)\mu\text{m}$ , R = max. range (mm)  
\*fraction rounded down  
 Measuring faces: Carbide tipped

### SPECIFICATIONS

Metric

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

### DIMENSION



# Indicating Micrometers

## SERIES 510

### FEATURES

- Retractable anvil with indicator for three-wire measurements of pitch diameter of precision screws, roundness and parallelism measurements.
- With a standard except for 25mm model.
- IP protection level: 54



510-121



Retractable anvil button

### SPECIFICATIONS

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

\*Retractable anvil button on the right side.

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

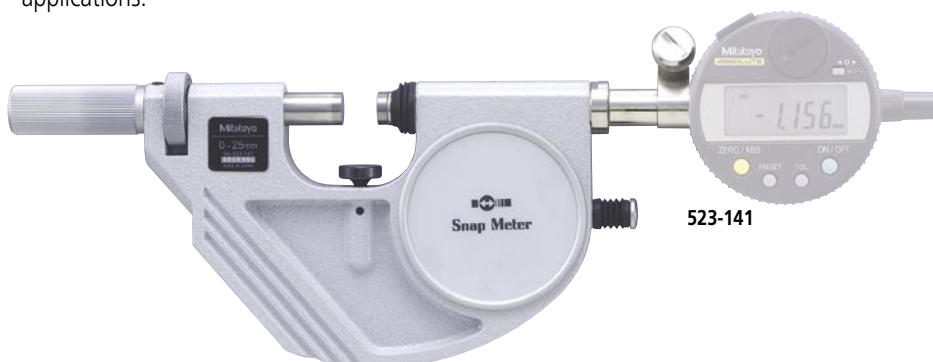
\*Retractable anvil button on the right side.

# Snap Meters

## SERIES 523

### FEATURES

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



523-141

### SPECIFICATIONS

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

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

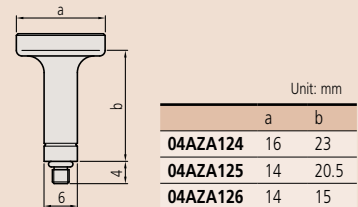


### Technical Data

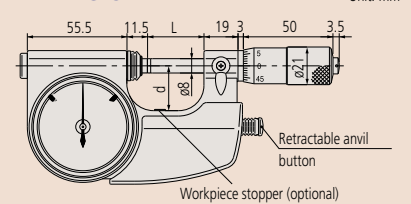
Spindle feed error: 3µm  
 Dial indication accuracy: 1µm  
 Dispersion of indication: 0.4µm  
 Graduation: 0.001mm or .0001"  
 Dial reading: 0.001mm or .00005"  
 Flatness: 0.3µm  
 Parallelism: 0.6µm for models up to 50mm  
 1µm for models over 50mm  
 Measuring force: 5 - 10N (500 - 1000gf)  
 Measuring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

### Optional Accessory

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



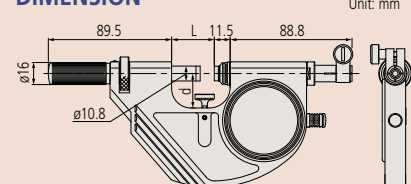
### DIMENSION



### Technical Data

Flatness: 0.3µm  
 Parallelism: 0.6µm for models up to 50mm  
 1µm for models over 50mm  
 Measuring force\*: 5 - 10N (500 - 1000gf)  
 Measuring faces: Carbide tipped  
 \*Measured at the position where the anvil is retracted by 1mm from the free position without installing the indicator.

### DIMENSION





# Dial Snap Meters

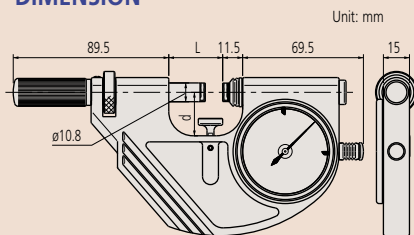
## SERIES 523



### Technical Data

Dial indication accuracy: 1µm  
 Dispersion of indication: 0.4µm  
 Dial reading: 0.001mm or .00005"  
 Flatness: 0.3µm  
 Parallelism: 0.6µm for models up to 50mm  
 1µm for models over 50mm  
 Measuring force: 5 - 10N (500 - 1000gf)  
 Measuring faces: Carbide tipped

### DIMENSION



Range	d	L
0 - 25mm	25	31
25 - 50mm	35	56
50 - 75mm	47.5	81
75 - 100mm	60	106

### FEATURES

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



523-121

### SPECIFICATIONS

Metric		
Range	Order No.	Indicating range
0 - 25mm	<b>523-121</b>	±0.060mm
25 - 50mm	<b>523-122</b>	±0.060mm
50 - 75mm	<b>523-123</b>	±0.060mm
75 - 100mm	<b>523-124</b>	±0.060mm

Inch		
Range	Order No.	Indicating range
0 - 1"	<b>523-131</b>	±.0023"
1" - 2"	<b>523-132</b>	±.0023"
2" - 3"	<b>523-133</b>	±.0023"
3" - 4"	<b>523-134</b>	±.0023"

# Digimatic Bench Micrometer

## SERIES 121 — Interchangeable Anvil Type

### FEATURES

- The LCD panel rotates within 330 degrees for use in horizontal or vertical position.
- Interchangeable anvils allow a wide measuring range of 50mm.
- With a ratchet stop for constant force.
- Provided with a standard to set the origin for 25-50mm measurement.



### SPECIFICATION

Metric		
Range	Order No.	Accuracy
0 - 50mm	121-145	±2µm

Excluding quantizing error

Inch/Metric		
Range	Order No.	Accuracy
0 - 2"	121-155	±.0001"

Excluding quantizing error



### Technical Data

Accuracy: Refer to the list of specifications.  
 Resolution: 0.001mm or .00005"/0.001mm  
 Measuring force: 6 – 10N (600 – 1000gf)  
 Display rotation: 330°  
 Display: LCD  
 Battery: SR44 (2 pcs.), **938882**  
 Battery life: Approx. 1.8 years under normal use

### Function

Zero-setting, Preset, Data hold, Power ON/OFF, 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)

# Groove Micrometers

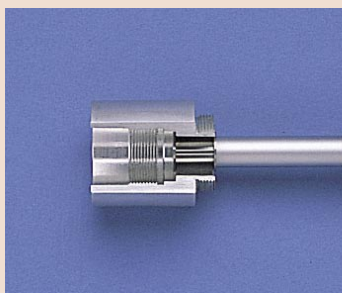
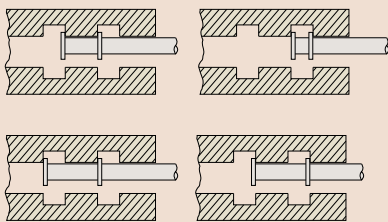
## SERIES 146

### FEATURES

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

### Technical Data

Accuracy:  $\pm 10\mu\text{m}$   
Parallelism:  $10\mu\text{m}$



### SPECIFICATIONS

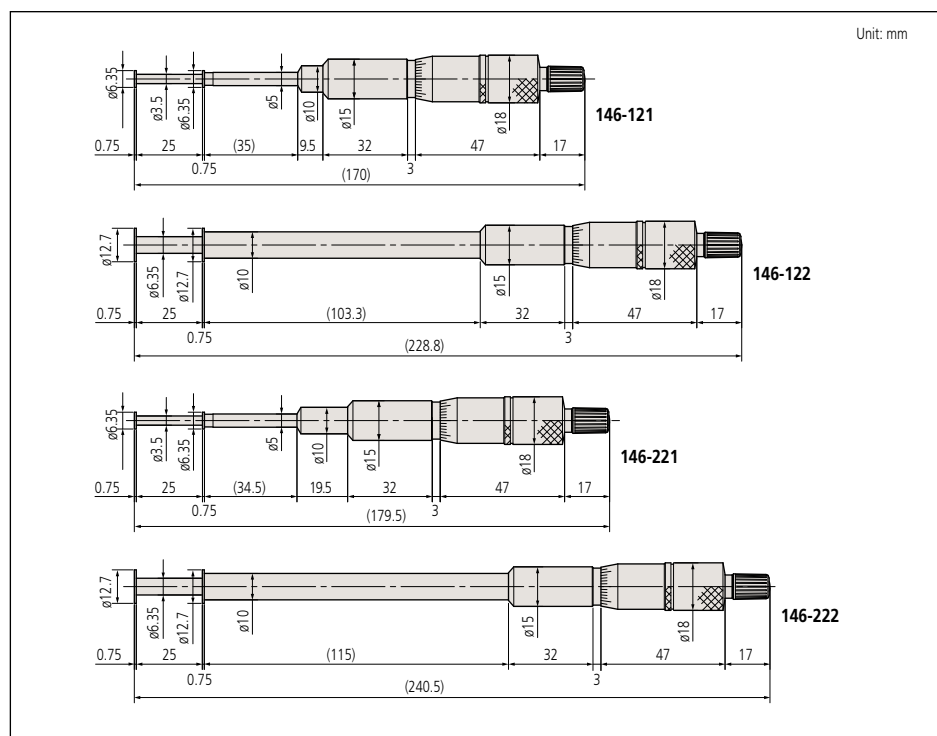
Metric Rotating spindle type			
Range Outside	Range Inside	Order No.	Flange
0 - 25mm	1.6 - 26.5mm	146-121	$\phi 6.35\text{mm}$
		146-122	$\phi 12.7\text{mm}$
25 - 50mm	26.5 - 51.5mm	146-123	$\phi 12.7\text{mm}$
50 - 75mm	51.5 - 76.5mm	146-124	$\phi 12.7\text{mm}$
75 - 100mm	76.5 - 101.5mm	146-125	$\phi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

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

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

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

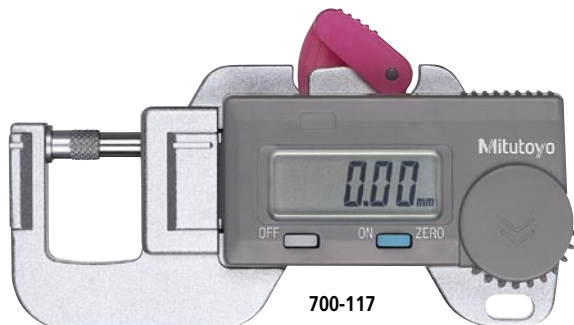
### DIMENSION



# Quick-Mini

## SERIES 700

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



700-117



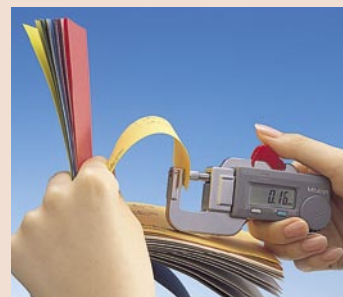
700-121

### Technical Data

Accuracy: Refer to the list of specifications.  
 Resolution: 0.01mm or .0005"/0.01mm  
 Display: LCD  
 Battery: SR44 (1 pc.), **938882**  
 Battery life: Approx. 2 years under normal use

### Function

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

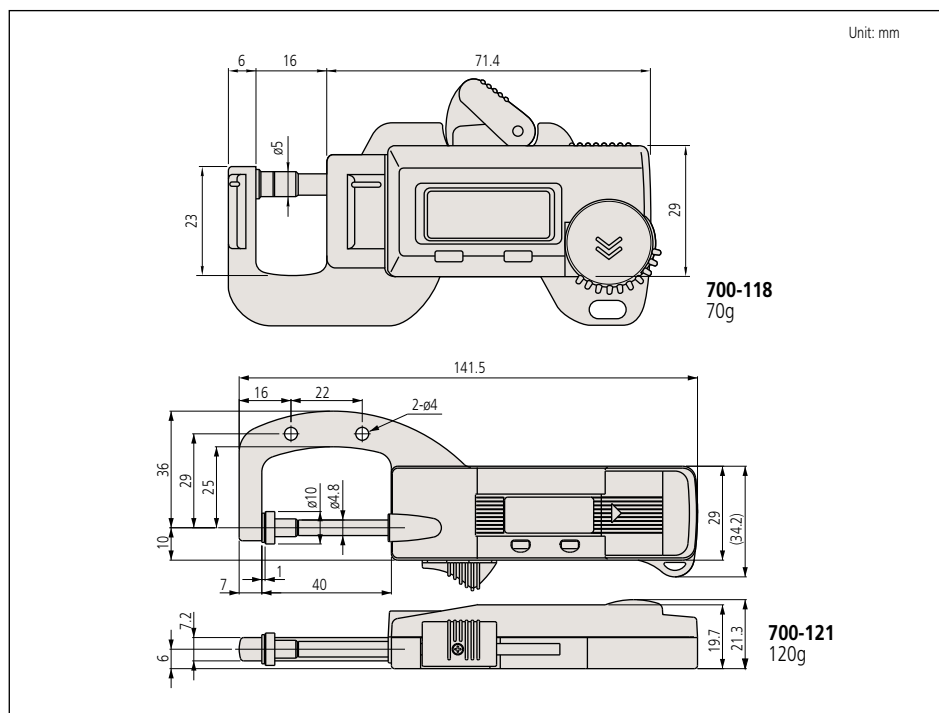


## SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 12mm	<b>700-119</b>	±0.02mm
0 - 25mm	<b>700-121</b>	±0.02mm

Inch/Metric		
Range	Order No.	Accuracy
0 - .5"/0 - 12mm	<b>700-118</b>	±.001"
0 - 1"/0 - 25mm	<b>700-122</b>	±.001"

## DIMENSION AND MASS



# Small Hole Gage Set

## SERIES 154

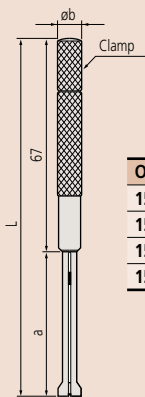
### FEATURES

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



154-902

### DIMENSION



Unit: mm

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

### SPECIFICATIONS

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

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

# Telescoping Gage Set

## SERIES 154

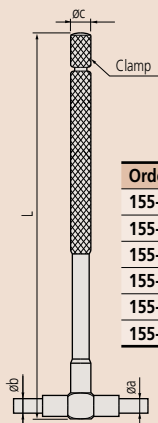
### FEATURES

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



155-905

### DIMENSION



Unit: mm

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

### SPECIFICATIONS

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

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

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

# Color Ratchet & Color Speeder

## Color ratchet

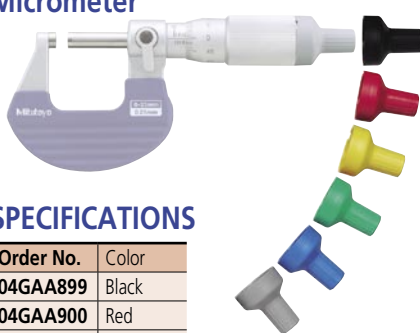


### SPECIFICATIONS

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

\*for 293 series digital model

## Color speeder for Ratchet Thimble Micrometer



### SPECIFICATIONS

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

# Spindle Attachment Tip



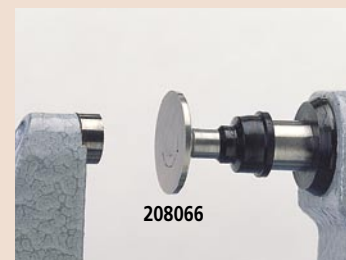
### DIMENSION

Order No.	Dimension
208062	
208063	
208064	

Order No.	Dimension
208065	
208066	

### Technical Data

Tip length: 10mm ±5µm



# Micrometer Oil

207000 (30ml)



# Optical Parallels

## SERIES 157

### FEATURES

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



157-903

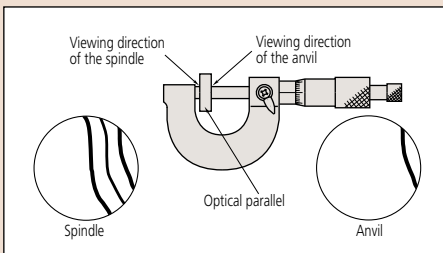
### Technical Data

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

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

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

The parallelism is about 1μm ( $0.32\mu\text{m} \times 3 = 0.96\mu\text{m}$ ).  
 Fringe on the anvil side must not be more than one.



### SPECIFICATIONS

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

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

# Optical Flats

## SERIES 158

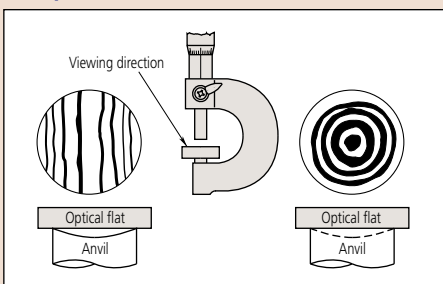
### FEATURES

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



158-118

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



### SPECIFICATIONS

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

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

# Micrometer Standards

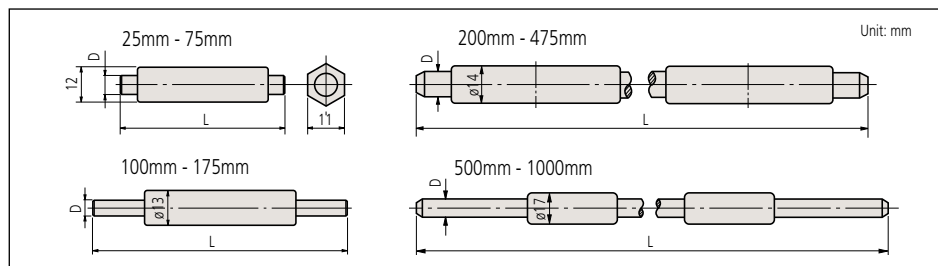
## SERIES 167

### FEATURES

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



### DIMENSION



### SPECIFICATIONS

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

Available up to 2000mm.

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

Available up to 79".

### Technical Data

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





# Standards for Screw Thread Micrometers

## SERIES 167 — 60 degree and 55 degree

### FEATURES

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



167-264 (60°)



167-262 (60°)

### SPECIFICATIONS

Metric			
Length	Order No.	Thread angle	Accuracy
25mm	167-261	60°	±4μm
	167-272	55°	±4μm
50mm	167-262	60°	±5μm
	167-273	55°	±5μm
75mm	167-263	60°	±6μm
	167-274	55°	±6μm
100mm	167-264	60°	±7μm
	167-275	55°	±7μm

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

### Technical Data

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

# Standards for V-Anvil Micrometers

## SERIES 167

### FEATURES

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



167-329

### SPECIFICATIONS

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

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

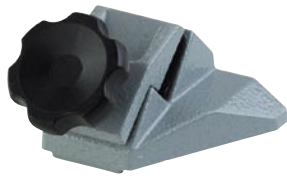
### Technical Data

Accuracy: Refer to the list of specifications.

# Micrometer Stands

## SERIES 156

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



156-105



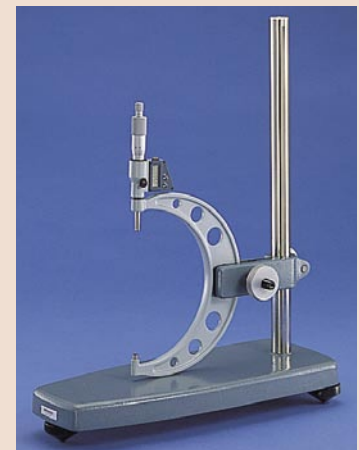
156-101



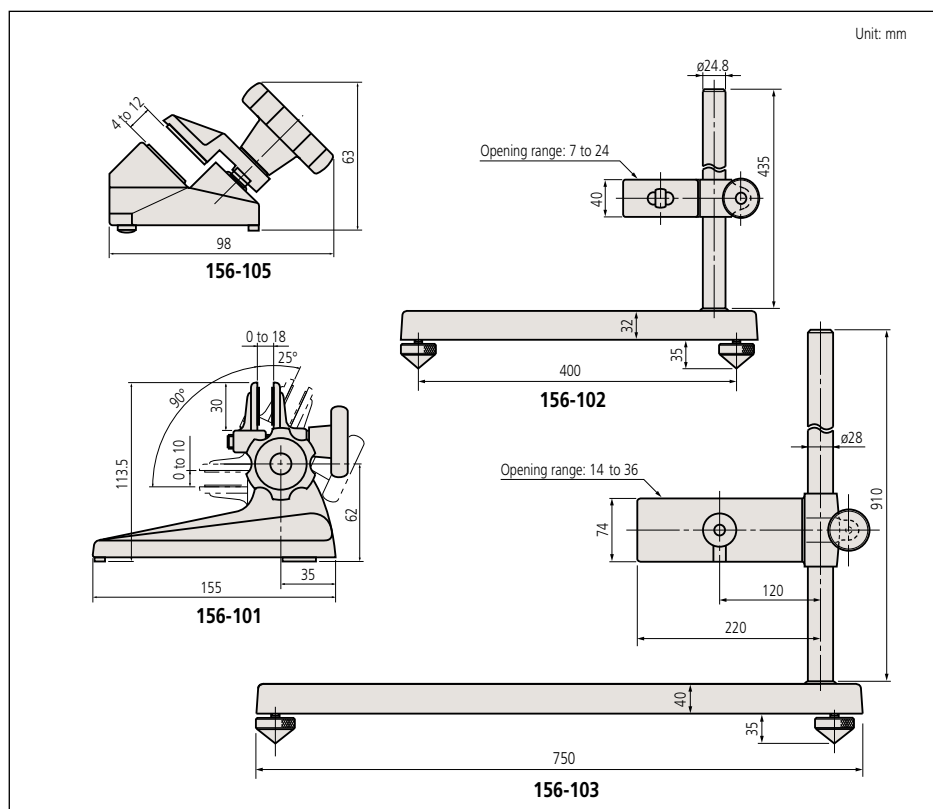
156-102

### SPECIFICATIONS

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

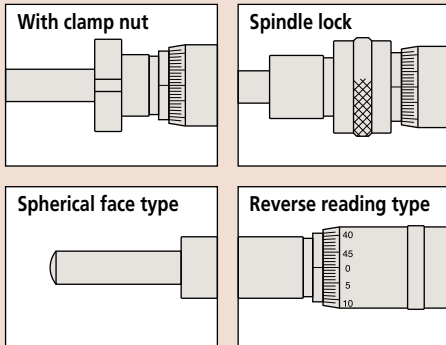


### DIMENSION



# Micrometer Head Selection Guide

## Variety of Specifications

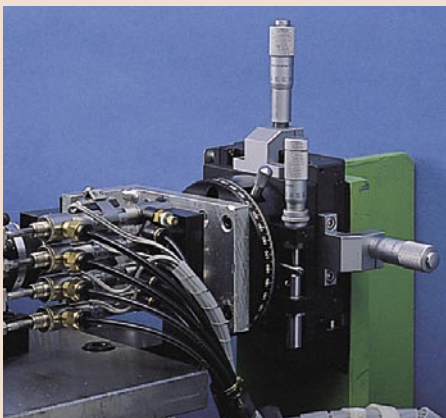
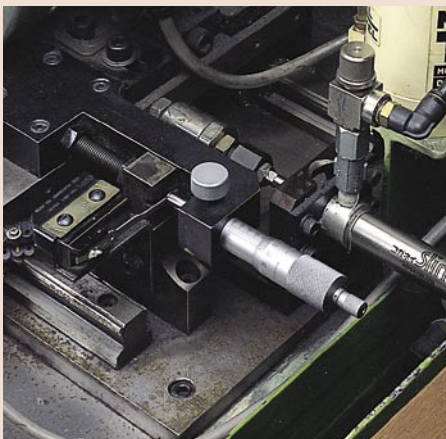


The table below provides an outline of Mitutoyo micrometer heads for each series so you can locate the pages to refer to select the micrometer head most appropriate to your specific application. When selecting consider the following points:

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

## SELECTION TABLE

Range	Series	Remarks	Page
0 - 1mm	110	Differential screw translator (extra-fine feeding) type	86
0 - 2.5mm	110	Differential screw translator (extra-fine feeding) type	86
0 - 5mm	148	Ultra small type	77
0 - 6.5mm	148	Fine spindle feeding of 0.1mm/rev.	75
	148	Fine spindle feeding of 0.25mm/rev.	76
	148	Small type	77
	148	Large thimble diameter for easy reading	78
0 - 10mm	152	Fine feeding type	85
0 - 13mm	148	Common type in small size	79
	148	Spindle feeding of 0.25mm/rev.	76
	148	Zero-adjustable thimble type	80
	148	Large thimble diameter for easy reading	78
	110	Differential screw translator (extra-fine feeding) type	86
0 - 15mm	149	with carbide-tipped spindle type	81
	153	Non-rotating spindle type	84
	152	Quick spindle feeding of 1mm/rev.	85
	227	with constant and adjustable fine-loading device	74
0 - 25mm	164	Digital type	72
	350	Compact digital type	72
	150	Common type in middle size	82
	153	Non-rotating spindle type	84
	153	Fine graduation type	88
	151	Heavy duty type (ø8mm spindle)	83
	152	Quick spindle feeding of 1mm/rev.	85
	152	Fine feeding type	85
	152	for XY-stage	87
	164	High resolution and high accuracy type	89
	250	with digit counter type	90
0 - 50mm	164	Digital type	72
	151	Heavy duty type (ø8mm spindle)	83
	152	Quick spindle feeding of 1mm/rev.	85
	152	Fine feeding type	85
	197	Non rotating spindle and large thimble	88



# Digimatic Micrometer Heads

**SERIES 164, 350**

## FEATURES

- The Digimatic Micrometer Heads...



## SPECIFICATIONS: Series 350

Metric		Inch/Metric		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	<b>350-251</b>	1"	<b>350-351</b>	Plain	Flat (carbide tip)	—
25mm	<b>350-252</b>	1"	<b>350-352</b>	w/ clamp nut	Flat (carbide tip)	—
25mm	<b>350-253</b>	1"	<b>350-353</b>	Plain	Spherical (SR4)	—
25mm	<b>350-254</b>	1"	<b>350-354</b>	w/ clamp nut	Spherical (SR4)	—
25mm	<b>350-271*</b>	—	—	Plain	Flat (carbide tip)	w/ 18mm stem bush
25mm	<b>350-272-10</b>	—	—	w/ clamp nut	Flat (carbide tip)	—
25mm	<b>350-273*</b>	—	—	Plain	Spherical (SR4)	w/ 18mm stem bush
25mm	<b>350-274-10</b>	—	—	w/ clamp nut	Spherical (SR4)	—
25mm	<b>350-281*</b>	1"	<b>350-381*</b>	Plain	Flat (carbide tip)	—
25mm	<b>350-282*</b>	1"	<b>350-382*</b>	w/ clamp nut	Flat (carbide tip)	—
25mm	<b>350-283*</b>	1"	<b>350-383*</b>	Plain	Spherical (SR4)	—
25mm	<b>350-284*</b>	1"	<b>350-384*</b>	w/ clamp nut	Spherical (SR4)	—
25mm	<b>350-261*</b>	1"	<b>350-361*</b>	Plain	Flat	w/ non-rotating device

\*IP65 dust/water protection type

## SPECIFICATIONS: Series 164

Metric		Inch/Metric		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	<b>164-171</b>	1"	<b>164-172</b>	Plain	Flat (carbide tip)	Non-rotating spindle
50mm	<b>164-161</b>	2"	<b>164-162</b>	Plain	Flat (carbide tip)	Non-rotating spindle

SPC

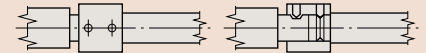


**IP65**

(Refer to the page 9 for details.)

## Non-rotating device

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



## Technical Data

Accuracy and stem diameter:

Order No.	Accuracy*	Stem dia.	
<b>350-251</b>	<b>350-351</b>	±2µm	10mm / .375"
<b>350-252</b>	<b>350-352</b>	±2µm	10mm / .375"
<b>350-253</b>	<b>350-353</b>	±2µm	10mm / .375"
<b>350-254</b>	<b>350-354</b>	±2µm	10mm / .375"
<b>350-271</b>	—	±2µm	12mm**
<b>350-272</b>	—	±2µm	12mm
<b>350-273</b>	—	±2µm	12mm**
<b>350-274</b>	—	±2µm	12mm
<b>350-281</b>	<b>350-381</b>	±2µm	12mm / .5"
<b>350-282</b>	<b>350-382</b>	±2µm	12mm / .5"
<b>350-283</b>	<b>350-383</b>	±2µm	12mm / .5"
<b>350-284</b>	<b>350-384</b>	±2µm	12mm / .5"
<b>350-261</b>	<b>350-361</b>	±2µm	12mm / .5"
<b>164-171</b>	<b>164-172</b>	±2µm	18mm / .71"
<b>164-161</b>	<b>164-162</b>	±3µm	18mm / .71"

\*Excluding quantizing error

\*\*with 18mm stem bush

Resolution: 0.001mm or .00005"/0.001mm

Display: LCD

Battery: SR44 (1 pc. / 2 pcs.\*), **938882**

Battery life: Approx. 8 months under normal use

(1.8 years: **164-161** and **164-162**)

(1.2 years: **164-171** and **164-172**)

Dust/Water protection level: IP65 (series 350)\*\*)

\* **164-161** and **164-162**

\*\* **350-271, 350-273, 350-261, 350-381, 350-382, 350-383, 350-384, 350-361, 350-281, 350-282, 350-283, 350-284**

## Function

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

\*Only for 350 series \*\*Only for 164 series

## Optional Accessory

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

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

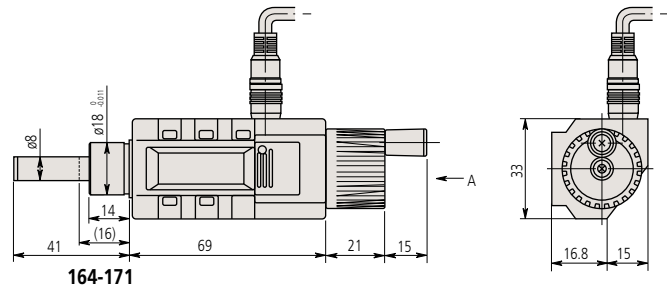
**937387:** SPC cable for series 164 (1m)

**965013:** SPC cable for series 164 (2m)

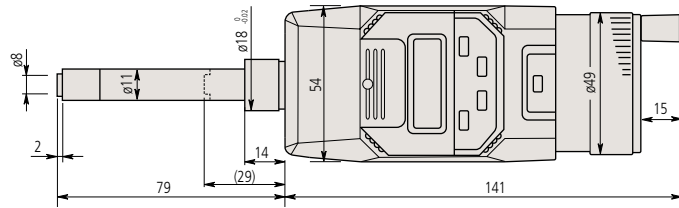
\*for series 350

## DIMENSION

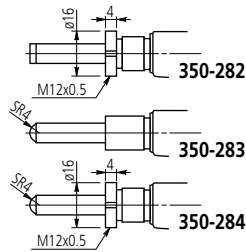
Unit: mm



164-171



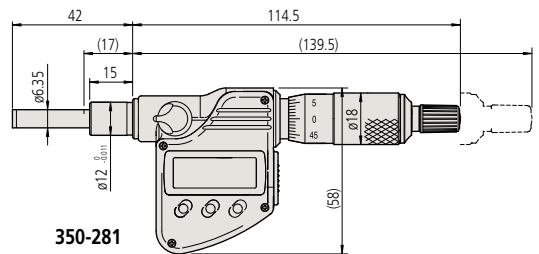
164-161



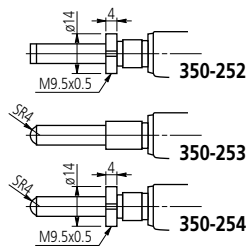
350-282

350-283

350-284



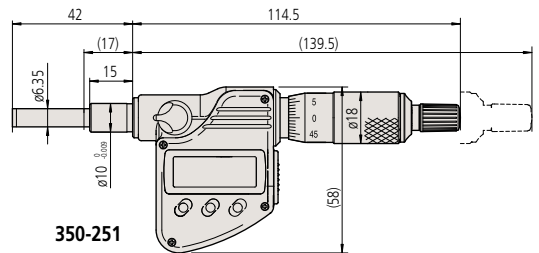
350-281



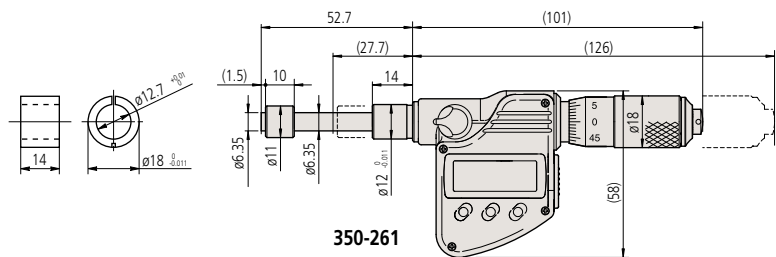
350-252

350-253

350-254



350-251



350-261

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

# ABSOLUTE Digimatic Micrometer Heads

**SERIES 227 — with constant & adjustable fine-loading device**

## FEATURES

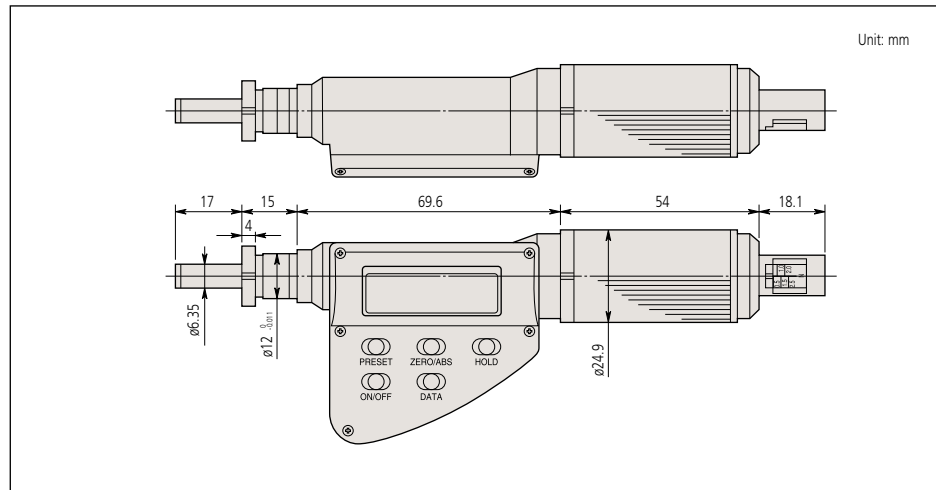
- Constant and low measuring force mechanism (adjustable: 0.5N - 2.5N or 2N - 10N) in the thimble.
- Non-rotating spindle.
- Speedy spindle feed of 10mm/rev.
- With ABSOLUTE linear encoder.



## SPECIFICATIONS

Metric		Inch/Metric		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
15mm	<b>227-241</b>	.6"	<b>227-251</b>	w/ clamp nut	Flat (carbide tip)	0.5 - 2.5N measuring force
15mm	<b>227-242</b>	.6"	<b>227-252</b>	w/ clamp nut	Flat (carbide tip)	2 - 10N measuring force

## DIMENSION



(Refer to the page 9 for details.)

## Technical Data

Accuracy and stem diameter:

Order No.	Accuracy*	Stem dia.	
<b>227-241</b>	<b>227-251</b>	±2μm	12mm
<b>227-242</b>	<b>227-252</b>	±2μm	12mm

\*Excluding quantizing error

Resolution: 0.001mm or .00005"/0.001mm  
 Display: LCD  
 Battery: SR44 (1 pc.), **938882**  
 Battery life: Approx. 1 year under normal use

## Function

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

## Optional Accessory

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

# Micrometer Heads

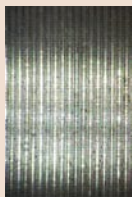
## SERIES 148 — Fine Spindle Feeding of 0.1mm/rev

### Technical Data

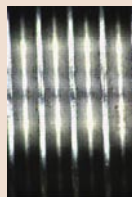
Graduations: 0.002mm  
 Spindle pitch: 0.1mm  
 Spindle face: Spherical of SKS3 (more than HRC60), lapped surface  
 Scale surface: Hard-chrome plating  
 Fixture thickness for clamp nut: 6mm (4mm: **148-243**)  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
<b>148-142</b>	±2μm	9.5mm
<b>148-143</b>	±2μm	9.5mm
<b>148-342</b>	±2μm	9.5mm
<b>148-343</b>	±2μm	9.5mm
<b>148-242</b>	±5μm	6mm
<b>148-243</b>	±5μm	6mm

### Spindle pitch



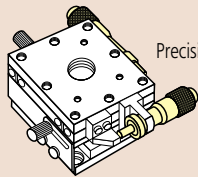
Screw Thread pitch= 0.1mm



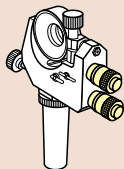
Screw Thread pitch= 0.5mm

### Applications

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

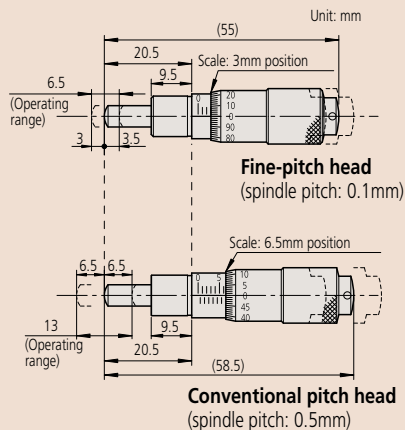


Precision X-Y table positioning



Precision adjustment of mirror holder

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



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

### FEATURES

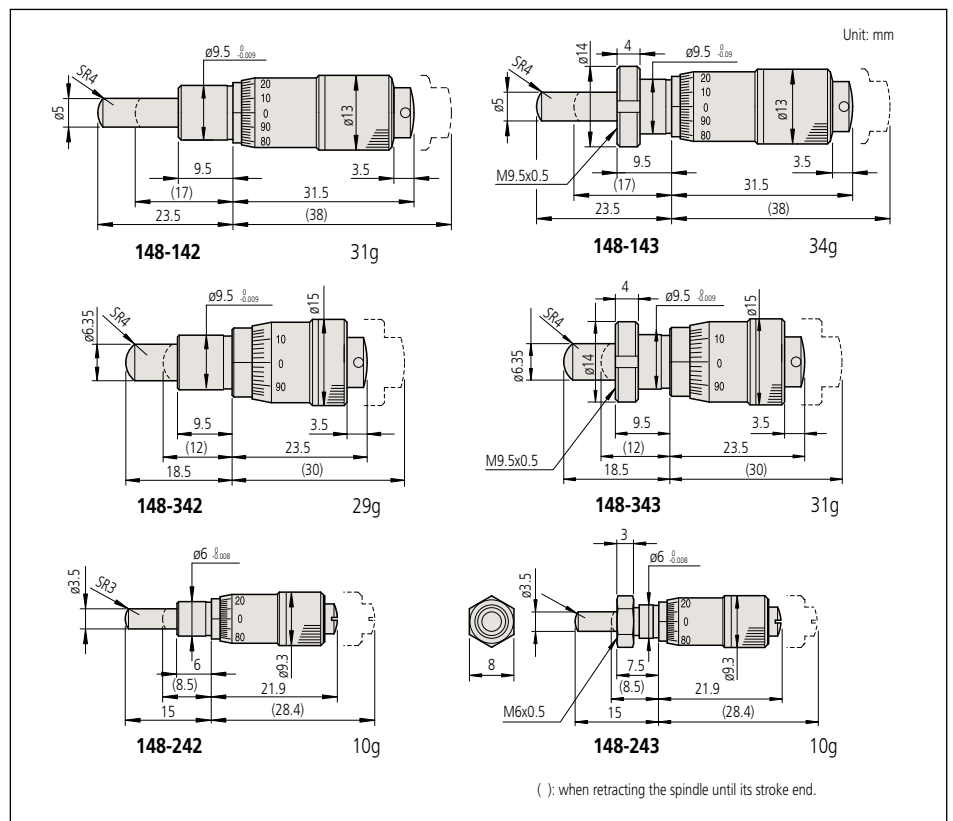
- Fine spindle feeding of just 0.1 mm/rev for extra-fine adjustment and positioning.
- External dimensions are compatible with conventional 0.5mm pitch heads.



### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
6.5mm	<b>148-142</b>	—	—	Plain	Spherical (SR4)	—
6.5mm	<b>148-143</b>	—	—	w/ clamp nut	Spherical (SR4)	—
6.5mm	<b>148-342</b>	—	—	Plain	Spherical (SR4)	Thicker & shorter thimble
6.5mm	<b>148-343</b>	—	—	w/ clamp nut	Spherical (SR4)	Thicker & shorter thimble
6.5mm	<b>148-242</b>	—	—	Plain	Spherical (SR3)	Small thimble diameter
6.5mm	<b>148-243</b>	—	—	w/ clamp nut	Spherical (SR3)	Small thimble diameter

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 148 — Fine Spindle Feeding of 0.25mm/rev

### FEATURES

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



148-132

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
13mm	148-132	—	—	Plain	Spherical (SR4)	—
13mm	148-133	—	—	w/ clamp nut	Spherical (SR4)	—
6.5mm	148-322	—	—	Plain	Spherical (SR4)	—
6.5mm	148-323	—	—	w/ clamp nut	Spherical (SR4)	—

### Technical Data

Graduations: 0.01mm

Spindle pitch: 0.25mm

Spindle face: Spherical of SKS3 (more than HRC60), lapped surface

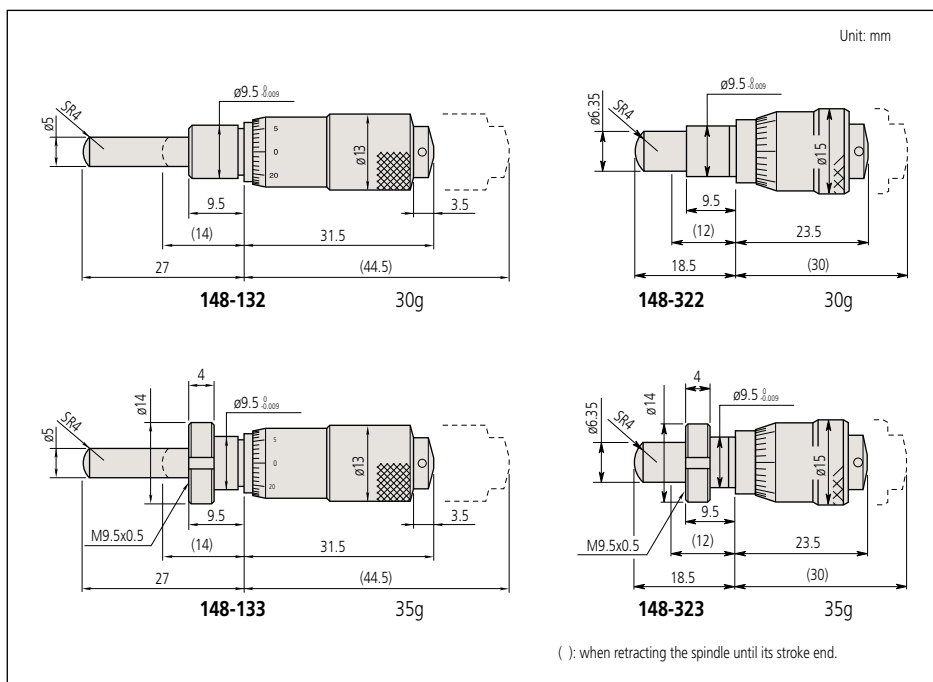
Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 6mm

Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
148-132	±2μm	9.5mm
148-133	±2μm	9.5mm
148-322	±2μm	9.5mm
148-323	±2μm	9.5mm

### DIMENSION AND MASS





# Micrometer Heads

## SERIES 148 — Ultra-small / Small Type

### Technical Data

Graduations: 0.02mm (**148-215**, **148-216**),  
0.01mm or .001"

Spindle pitch: 0.5mm or .025"

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

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 3mm (4mm: **148-216**,  
**148-218**)

Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
<b>148-215</b>	±5μm	3.5mm / .156"
<b>148-216</b>	±5μm	3.5mm / .156"
<b>148-201</b>	±5μm	6mm / .25"
<b>148-203</b>	±5μm	6mm / .25"
<b>148-205</b>	±5μm	6mm / .25"
<b>148-207</b>	±5μm	6mm / .25"
<b>148-209</b>	±5μm	6mm / .25"
<b>148-211</b>	±5μm	6mm / .25"

### FEATURES

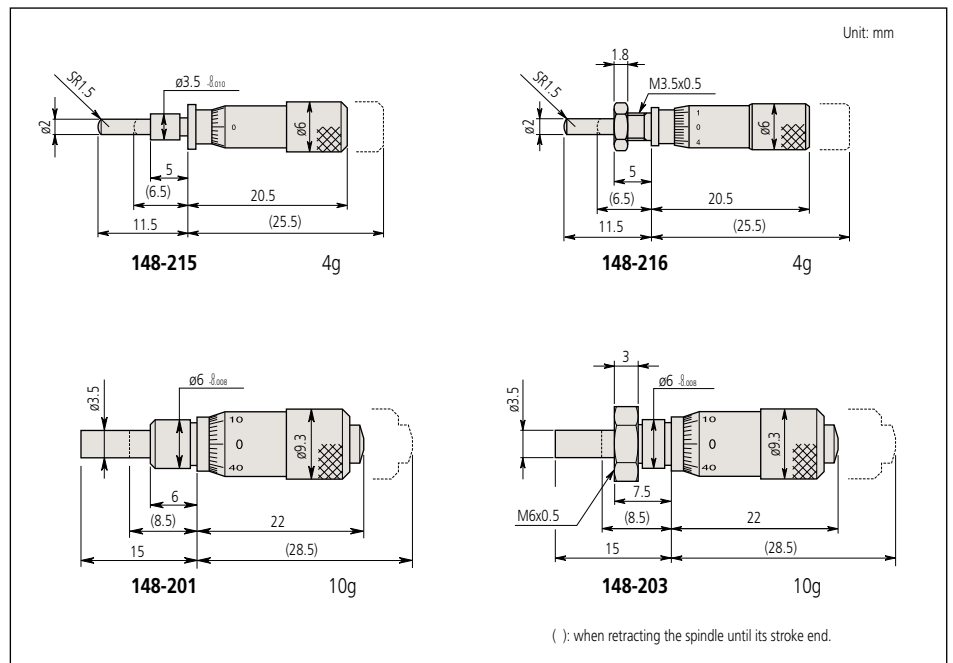
- Miniature micrometer heads for ease of incorporating into machines.



### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
5mm	<b>148-215</b>	.2"	<b>148-217</b>	Plain	Spherical (SR1.5)	—
5mm	<b>148-216</b>	.2"	<b>148-218</b>	w/ clamp nut	Spherical (SR1.5)	—
6.5mm	<b>148-201</b>	.25"	<b>148-202</b>	Plain	Flat	—
6.5mm	<b>148-203</b>	.25"	<b>148-204</b>	w/ clamp nut	Flat	—
6.5mm	<b>148-205</b>	.25"	<b>148-206</b>	Plain	Spherical (SR3)	—
6.5mm	<b>148-207</b>	.25"	<b>148-208</b>	w/ clamp nut	Spherical (SR3)	—
6.5mm	<b>148-209</b>	.25"	<b>148-210</b>	Plain	Flat	Reverse reading
6.5mm	<b>148-211</b>	.25"	<b>148-212</b>	w/ clamp nut	Flat	Reverse reading

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 148 — Large Thimble Diameter for Easy Reading

### FEATURES

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



### SPECIFICATIONS

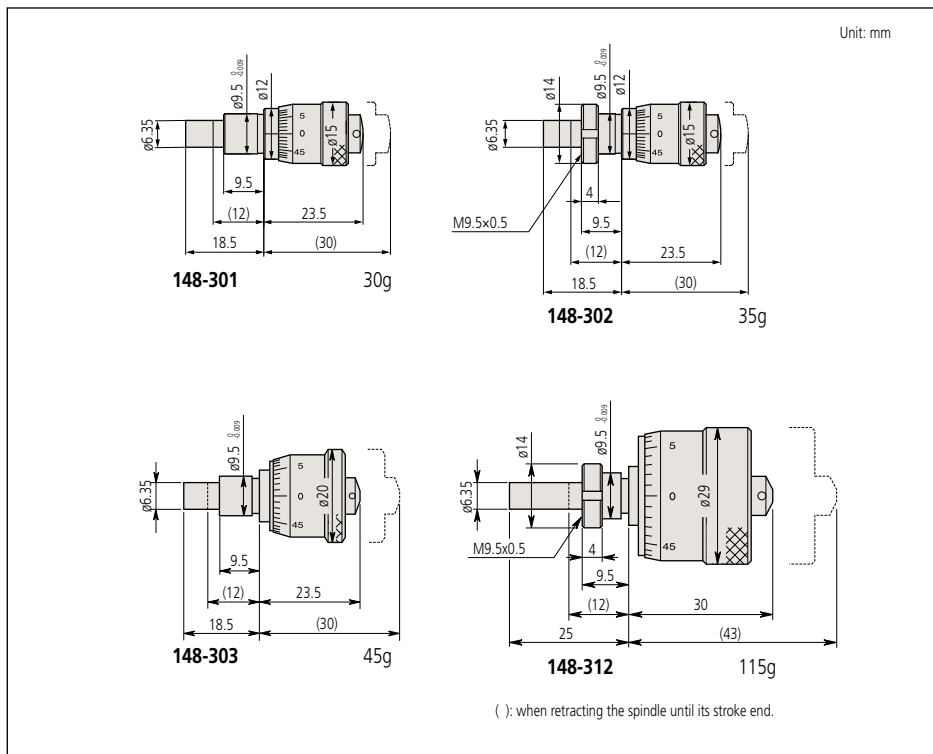
Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
6.5mm	<b>148-301</b>	.25"	<b>148-351</b>	Plain	Flat	15mm / .59" thimble dia.
6.5mm	<b>148-302</b>	.25"	<b>148-352</b>	w/ clamp nut	Flat	15mm / .59" thimble dia.
6.5mm	<b>148-303</b>	.25"	<b>148-353</b>	Plain	Flat	20mm / .79" thimble dia.
6.5mm	<b>148-304</b>	.25"	<b>148-354</b>	w/ clamp nut	Flat	20mm / .79" thimble dia.
6.5mm	<b>148-305</b>	.25"	<b>148-355</b>	Plain	Flat	29mm / 1.14" thimble dia.
6.5mm	<b>148-306</b>	.25"	<b>148-356</b>	w/ clamp nut	Flat	29mm / 1.14" thimble dia.
13mm	<b>148-307</b>	.5"	<b>148-357</b>	Plain	Flat	15mm / .59" thimble dia.
13mm	<b>148-308</b>	.5"	<b>148-358</b>	w/ clamp nut	Flat	15mm / .59" thimble dia.
13mm	<b>148-309</b>	.5"	<b>148-359</b>	Plain	Flat	20mm / .79" thimble dia.
13mm	<b>148-310</b>	.5"	<b>148-360</b>	w/ clamp nut	Flat	20mm / .79" thimble dia.
13mm	<b>148-311</b>	.5"	<b>148-361</b>	Plain	Flat	29mm / 1.14" thimble dia.
13mm	<b>148-312</b>	.5"	<b>148-362</b>	w/ clamp nut	Flat	29mm / 1.14" thimble dia.

### Technical Data

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

Order No.	Accuracy	Stem dia.
<b>148-301</b> <b>148-351</b>	±2μm	9.5mm / .375"
<b>148-302</b> <b>148-352</b>	±2μm	9.5mm / .375"
<b>148-303</b> <b>148-353</b>	±2μm	9.5mm / .375"
<b>148-304</b> <b>148-354</b>	±2μm	9.5mm / .375"
<b>148-305</b> <b>148-355</b>	±2μm	9.5mm / .375"
<b>148-306</b> <b>148-356</b>	±2μm	9.5mm / .375"
<b>148-307</b> <b>148-357</b>	±2μm	9.5mm / .375"
<b>148-308</b> <b>148-358</b>	±2μm	9.5mm / .375"
<b>148-309</b> <b>148-359</b>	±2μm	9.5mm / .375"
<b>148-310</b> <b>148-360</b>	±2μm	9.5mm / .375"
<b>148-311</b> <b>148-361</b>	±2μm	9.5mm / .375"
<b>148-312</b> <b>148-362</b>	±2μm	9.5mm / .375"

### DIMENSION AND MASS



# Micrometer Heads

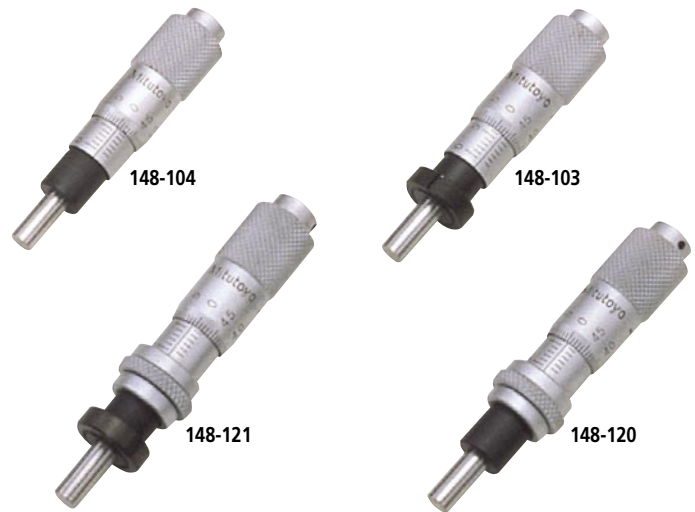
## SERIES 148 — Common Type in Small Size

### Technical Data

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

Order No.	Accuracy	Stem dia.
148-104	±2μm	9.5mm / .375"
148-103	±2μm	9.5mm / .375"
148-121	±2μm	9.5mm / .375"
148-120	±2μm	9.5mm / .375"
148-801	±2μm	9.5mm / .375"
148-802	±2μm	9.5mm / .375"
148-803	±2μm	9.5mm / .375"
148-804	±2μm	9.5mm / .375"
148-821	±2μm	9.5mm / .375"
148-822	±2μm	9.5mm / .375"
148-823	±2μm	9.5mm / .375"
148-824	±2μm	9.5mm / .375"

### FEATURES

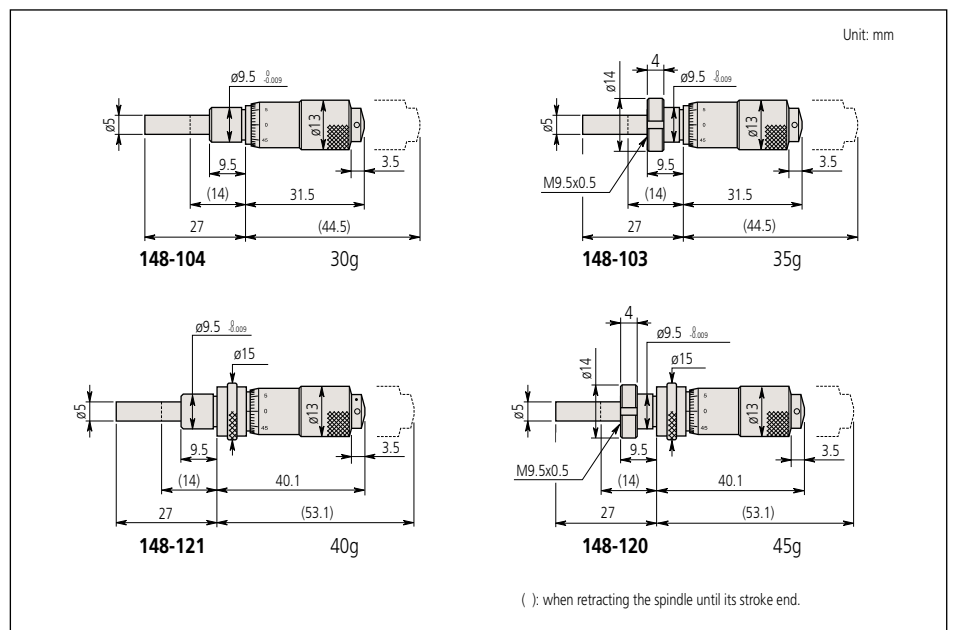


### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
13mm	148-104	.5"	148-112	Plain	Flat	—
13mm	148-103	.5"	148-111	w/ clamp nut	Flat	—
13mm	148-121	.5"	148-123	Plain*	Flat	—
13mm	148-120	.5"	148-122	w/ clamp nut*	Flat	—
13mm	148-801	.5"	148-811	Plain	Spherical (SR4)	—
13mm	148-802	.5"	148-812	w/ clamp nut	Spherical (SR4)	—
13mm	148-803	.5"	148-813	Plain*	Spherical (SR4)	—
13mm	148-804	.5"	148-814	w/ clamp nut*	Spherical (SR4)	—
13mm	148-821	.5"	148-831	Plain	Flat	Reverse reading
13mm	148-822	.5"	148-832	w/ clamp nut	Flat	Reverse reading
13mm	148-823	.5"	148-833	Plain*	Flat	Reverse reading
13mm	148-824	.5"	148-834	w/ clamp nut*	Flat	Reverse reading

\*with spindle lock

### DIMENSION AND MASS

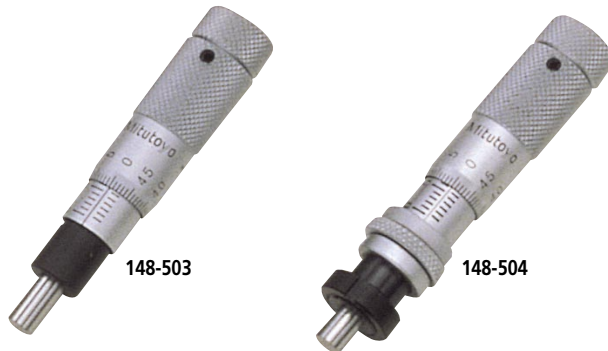


# Micrometer Heads

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

### FEATURES

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



### Technical Data

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

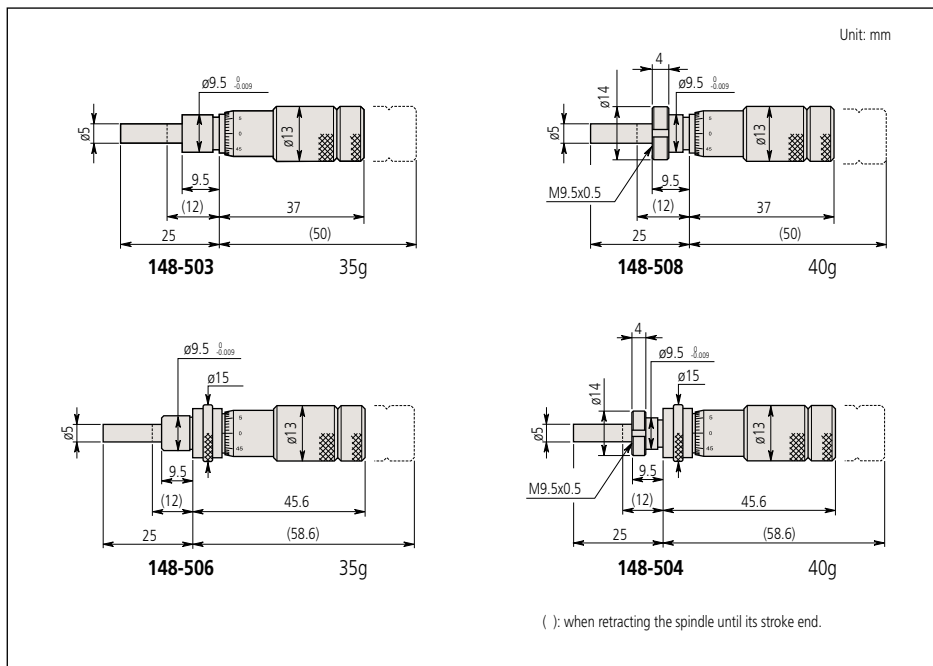
Order No.	Accuracy	Stem dia.
148-503	±2μm	9.5mm / .375"
148-513	±2μm	9.5mm / .375"
148-508	±2μm	9.5mm / .375"
148-506	±2μm	9.5mm / .375"
148-504	±2μm	9.5mm / .375"
148-853	±2μm	9.5mm / .375"
148-854	±2μm	9.5mm / .375"
148-863	±2μm	9.5mm / .375"
148-864	±2μm	9.5mm / .375"

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
13mm	148-503	.5"	148-501	Plain	Flat	—
13mm	148-513	.5"	148-511	Plain	Flat	Stainless steel throughout
13mm	148-508	.5"	148-507	w/ clamp nut	Flat	—
13mm	148-506	.5"	148-505	Plain*	Flat	—
13mm	148-504	.5"	148-502	w/ clamp nut*	Flat	—
13mm	148-853	.5"	148-851	Plain	Spherical (SR4)	—
13mm	148-854	.5"	148-852	w/ clamp nut*	Spherical (SR4)	—
13mm	148-863	.5"	148-861	Plain	Flat	Reverse reading
13mm	148-864	.5"	148-862	w/ clamp nut*	Flat	Reverse reading

\*with spindle lock

### DIMENSION AND MASS



# Micrometer Heads

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

## Technical Data

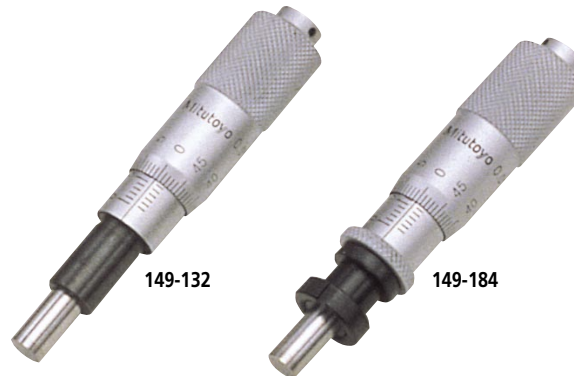
Graduations: 0.01mm or .001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90) or spherical, lapped surface  
 Scale surface: Hard-chrome plating  
 Fixture thickness for clamp nut: 6mm  
 (11.5mm: **149-131, 149-147, 149-802, 149-812, 149-822, 149-832**)

Accuracy and stem diameter

Order No.	Order No.	Accuracy	Stem dia.
<b>149-132</b>	<b>149-148</b>	±2μm	9.5mm / .375"
<b>149-131</b>	<b>149-147</b>	±2μm	9.5mm / .375"
<b>149-183</b>	<b>149-185</b>	±2μm	9.5mm / .375"
<b>149-184</b>	<b>149-182</b>	±2μm	9.5mm / .375"
<b>149-801</b>	<b>149-811</b>	±2μm	9.5mm / .375"
<b>149-802</b>	<b>149-812</b>	±2μm	9.5mm / .375"
<b>149-821</b>	<b>149-831</b>	±2μm	9.5mm / .375"
<b>149-822</b>	<b>149-832</b>	±2μm	9.5mm / .375"

## FEATURES

- Carbide tipped measuring face.

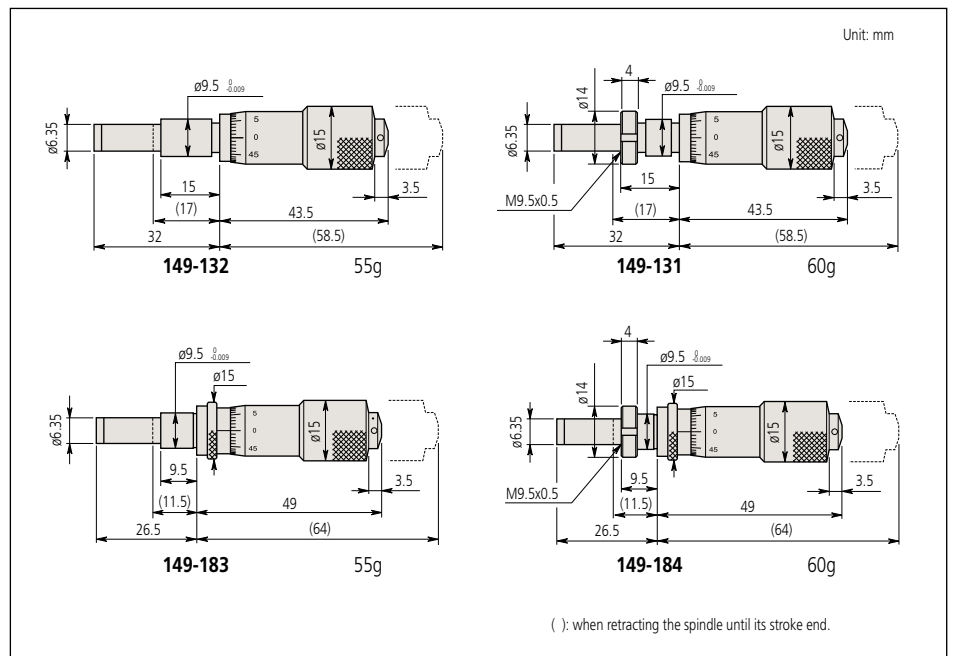


## SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
15mm	<b>149-132</b>	.6"	<b>149-148</b>	Plain	Flat (carbide tip)	—
15mm	<b>149-131</b>	.6"	<b>149-147</b>	w/ clamp nut	Flat (carbide tip)	—
15mm	<b>149-183</b>	.6"	<b>149-185**</b>	Plain*	Flat (carbide tip)	—
15mm	<b>149-184</b>	.6"	<b>149-182</b>	w/ clamp nut*	Flat (carbide tip)	—
15mm	<b>149-801</b>	.6"	<b>149-811</b>	Plain	Spherical (SR4)	—
15mm	<b>149-802</b>	.6"	<b>149-812</b>	w/ clamp nut	Spherical (SR4)	—
15mm	<b>149-821</b>	.6"	<b>149-831</b>	Plain	Flat (carbide tip)	Reverse reading
15mm	<b>149-822</b>	.6"	<b>149-832</b>	w/ clamp nut	Flat (carbide tip)	Reverse reading

\*with spindle lock \*\*w/ratchet model (**149-181**) is available.

## DIMENSION AND MASS



# Micrometer Heads

## SERIES 150 — Common Type in Middle Size

### FEATURES

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



### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	<b>150-192</b>	1"	<b>150-208</b>	Plain	Flat (carbide tip)	—
25mm	<b>150-191</b>	1"	<b>150-207</b>	w/ clamp nut	Flat (carbide tip)	—
25mm	<b>150-209</b>	1"	<b>150-213</b>	Plain*	Flat (carbide tip)	—
25mm	<b>150-210</b>	1"	<b>150-214</b>	w/ clamp nut*	Flat (carbide tip)	—
25mm	<b>150-801</b>	1"	<b>150-811</b>	Plain	Spherical (SR4)	—
25mm	<b>150-802</b>	1"	<b>150-812</b>	w/ clamp nut	Spherical (SR4)	—
25mm	<b>150-821</b>	1"	<b>150-831</b>	Plain	Flat (carbide tip)	Reverse reading
25mm	<b>150-822</b>	1"	<b>150-832</b>	w/ clamp nut	Flat (carbide tip)	Reverse reading
25mm	<b>150-190</b>	1"	<b>150-206</b>	Plain	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	<b>150-189</b>	1"	<b>150-205</b>	w/ clamp nut	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
—	—	1"	<b>150-215</b>	Plain*	Flat (carbide tip)	w/ vernier (.0001")
—	—	1"	<b>150-216</b>	w/ clamp nut*	Flat (carbide tip)	w/ vernier (.0001")
25mm	<b>150-196</b>	—	—	Plain	Flat (carbide tip)	w/o ratchet stop
25mm	<b>150-195</b>	—	—	w/ clamp nut	Flat (carbide tip)	w/o ratchet stop
25mm	<b>150-211</b>	1"	<b>150-217</b>	Plain*	Flat (carbide tip)	w/o ratchet stop
25mm	<b>150-212</b>	1"	<b>150-218</b>	w/ clamp nut*	Flat (carbide tip)	w/o ratchet stop
25mm	<b>150-219</b>	1"	<b>150-221</b>	Plain	Flat	Long spindle
25mm	<b>150-220</b>	1"	<b>150-222</b>	w/ clamp nut	Flat	Long spindle

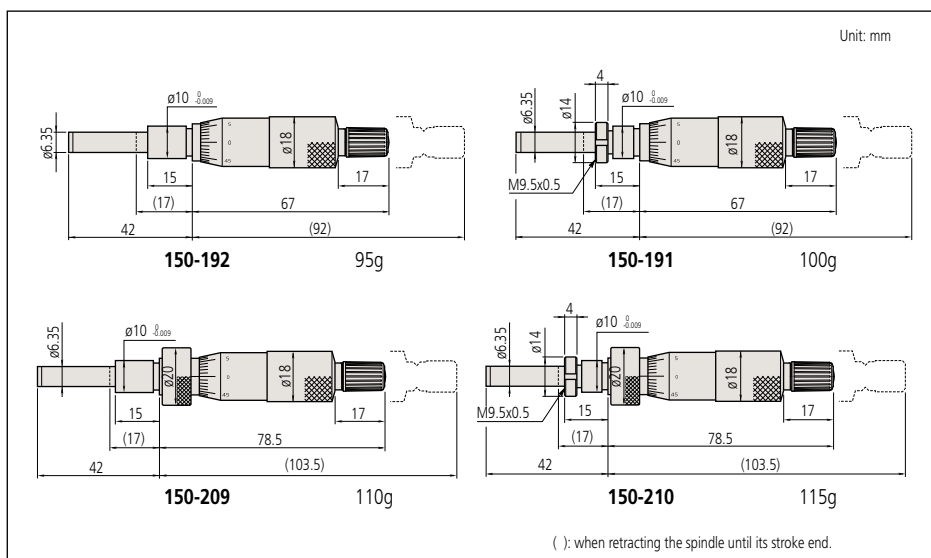
\*with spindle lock

### Technical Data

Graduations: 0.01mm, 0.001mm, .001" or .0001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90)\* or spherical, lapped surface  
 \* [SKS3 (more than HRC60): Long spindle type]  
 Scale surface: Hard-chrome plating  
 Fixture thickness for clamp nut: 11.5mm  
 Accuracy and stem diameter

Order No.	Order No.	Accuracy	Stem dia.
<b>150-192</b>	<b>150-208</b>	±2μm	10mm / .375"
<b>150-191</b>	<b>150-207</b>	±2μm	10mm / .375"
<b>150-209</b>	<b>150-213</b>	±2μm	10mm / .375"
<b>150-210</b>	<b>150-214</b>	±2μm	10mm / .375"
<b>150-801</b>	<b>150-811</b>	±2μm	10mm / .375"
<b>150-802</b>	<b>150-812</b>	±2μm	10mm / .375"
<b>150-821</b>	<b>150-831</b>	±2μm	10mm / .375"
<b>150-822</b>	<b>150-832</b>	±2μm	10mm / .375"
<b>150-190</b>	<b>150-206</b>	±2μm	10mm / .375"
<b>150-189</b>	<b>150-205</b>	±2μm	10mm / .375"
—	<b>150-215</b>	±2μm	10mm / .375"
—	<b>150-216</b>	±2μm	10mm / .375"
<b>150-196</b>	—	±2μm	10mm / .375"
<b>150-195</b>	—	±2μm	10mm / .375"
<b>150-211</b>	<b>150-217</b>	±2μm	10mm / .375"
<b>150-212</b>	<b>150-218</b>	±2μm	10mm / .375"
<b>150-219</b>	<b>150-221</b>	±2μm	10mm / .375"
<b>150-220</b>	<b>150-222</b>	±2μm	10mm / .375"

### DIMENSION AND MASS



# Micrometer Heads

**SERIES 151 — Common Type in Middle Size with 8mm diameter spindle**

## Technical Data

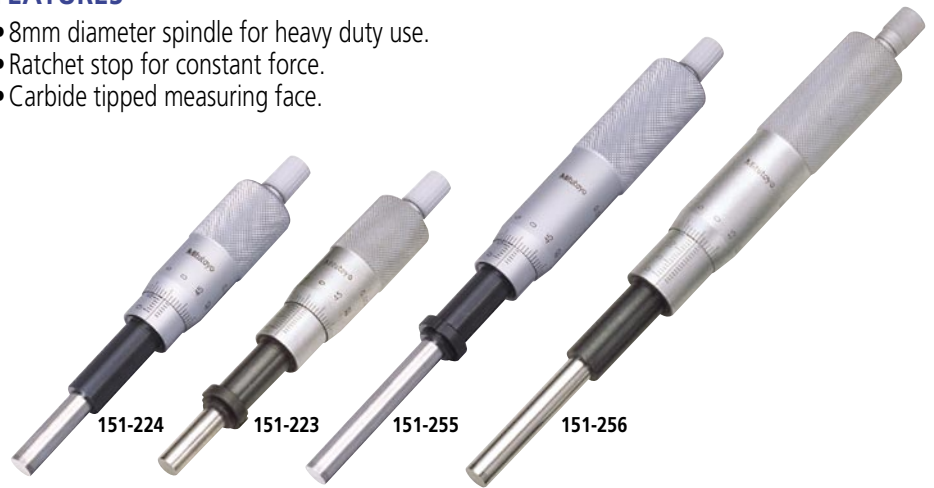
Graduations: 0.01mm, 0.001mm, .001" or .0001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface  
 Scale surface: Hard-chrome plating  
 Fixture thickness for clamp nut: 25.5mm  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
151-224	±2μm	12mm / .5"
151-223	±2μm	12mm / .5"
151-214*	±2μm	12mm / .5"
151-213*	±2μm	12mm / .5"
151-222	±2μm	12mm / .5"
151-221	±2μm	12mm / .5"
151-212*	±2μm	12mm / .5"
151-211*	±2μm	12mm / .5"
151-227*	±2μm	12mm / .5"
151-228*	±2μm	12mm / .5"
151-225	±2μm	12mm / .5"
151-226	±2μm	12mm / .5"
151-256	±4μm	12mm / .5"
151-255	±4μm	12mm / .5"
151-260	±4μm	12mm / .5"
151-259	±4μm	12mm / .5"

\*Order-to-made models

## FEATURES

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

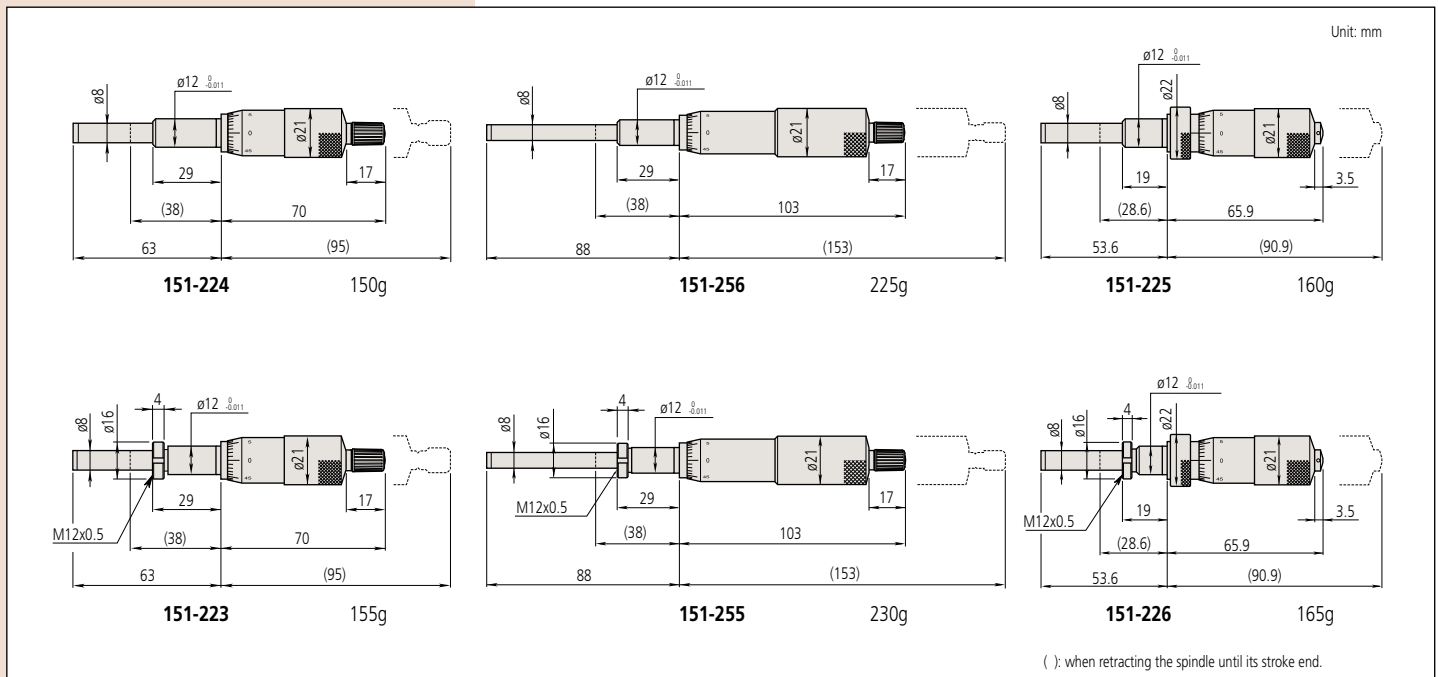


## SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	151-224	1"	151-240	Plain	Flat (carbide tip)	—
25mm	151-223	1"	151-239	w/ clamp nut	Flat (carbide tip)	—
25mm	151-214***	1"	—	Plain*	Flat (carbide tip)	—
25mm	151-213***	1"	—	w/ clamp nut*	Flat (carbide tip)	—
25mm	151-222	1"	151-238	Plain	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	151-221	1"	151-237	w/ clamp nut	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	151-212***	1"	151-243**	Plain*	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	151-211***	1"	151-244**	w/ clamp nut*	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	151-227***	1"	—	Plain	Flat (carbide tip)	w/o ratchet stop
25mm	151-228***	1"	—	w/ clamp nut	Flat (carbide tip)	w/o ratchet stop
25mm	151-225	1"	151-241	Plain*	Flat (carbide tip)	w/o ratchet stop
25mm	151-226	1"	151-242	w/ clamp nut*	Flat (carbide tip)	w/o ratchet stop
50mm	151-256	2"	151-272	Plain	Flat (carbide tip)	—
50mm	151-255	2"	151-271	w/ clamp nut	Flat (carbide tip)	—
50mm	151-260	2"	—	Plain	Flat (carbide tip)	w/o ratchet stop
50mm	151-259	2"	—	w/ clamp nut	Flat (carbide tip)	w/o ratchet stop

\*with spindle lock \*\*with ratchet stop \*\*\*Order-to-made models

## DIMENSION AND MASS



# Micrometer Heads

## SERIES 153 — Non-Rotating Spindle Type

### FEATURES

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



### Technical Data

Graduations: 0.01mm, 0.001mm, .001" or .0001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface  
 Scale surface: Hard-chrome plating  
 Accuracy and stem diameter

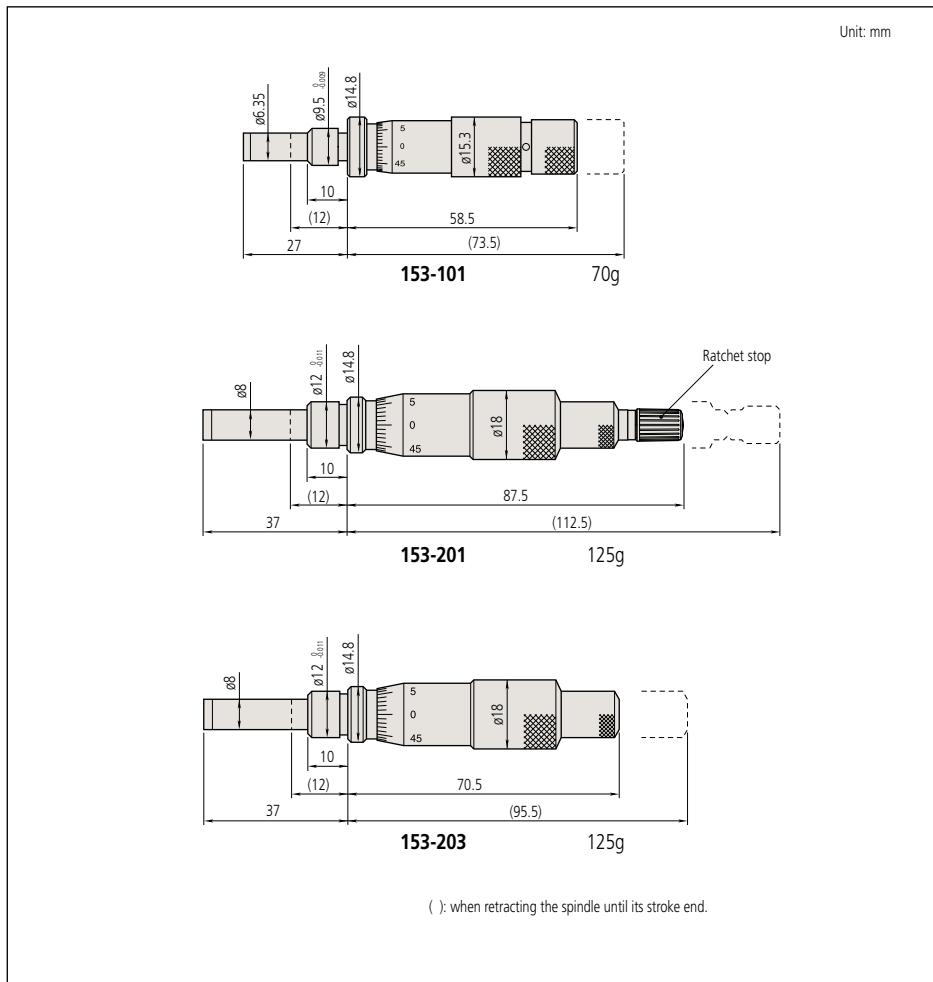
Order No.	Order No.	Accuracy	Stem dia.
153-101	153-108	±3µm	9.5mm / .375"
153-201	153-205	±3µm	12mm / .5"
153-202	153-206	±3µm	12mm / .5"
153-203	153-207	±3µm	12mm / .5"
153-204	153-208	±3µm	12mm/.5"

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
15mm	153-101	.5"	153-108	Plain	Flat (carbide tip)	w/ vernier (.0001")
25mm	153-201*	1"	153-205*	Plain	Flat (carbide tip)	—
25mm	153-202*	1"	153-206*	Plain	Flat (carbide tip)	w/ vernier (0.001mm / .0001")
25mm	153-203	1"	153-207	Plain	Flat (carbide tip)	—
25mm	153-204	1"	153-208	Plain	Flat (carbide tip)	w/ vernier (0.001mm / .0001")

\*with ratchet stop

### DIMENSION AND MASS





# Micrometer Heads

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

### Technical Data

Graduations: 0.01mm or .001"  
 Spindle pitch: 1mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90),  
 lapped surface  
 Scale surface: Hard-chrome plating  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
<b>152-101</b> <b>152-110</b>	±2μm	12mm / .5"
<b>152-102</b> <b>152-111</b>	±2μm	12mm / .5"
<b>152-103</b> <b>152-112</b>	±4μm	12mm / .5"

### FEATURES

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

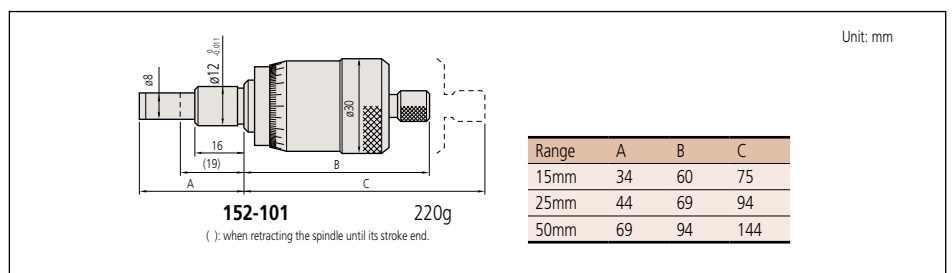


152-102

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
15mm	<b>152-101</b>	.5"	<b>152-110</b>	Plain	Flat (carbide tip)	—
25mm	<b>152-102</b>	1"	<b>152-111</b>	Plain	Flat (carbide tip)	—
50mm	<b>152-103</b>	2"	<b>152-112</b>	Plain	Flat (carbide tip)	—

### DIMENSION AND MASS



### Technical Data

Graduations: 0.002mm or .0001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90),  
 lapped surface  
 Scale surface: White anodized aluminum  
 Fixture thickness for clamp nut: 22.5mm  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
<b>152-283</b> —	±2μm	12mm
<b>152-332</b> —	±2μm	12mm
<b>152-348</b> <b>152-372</b>	±2μm	12mm / .5"
<b>152-380</b> <b>152-388</b>	±4μm	12mm / .5"

# Micrometer Heads

## SERIES 152 — Large Thimble Type for Fine Feeding

### FEATURES

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

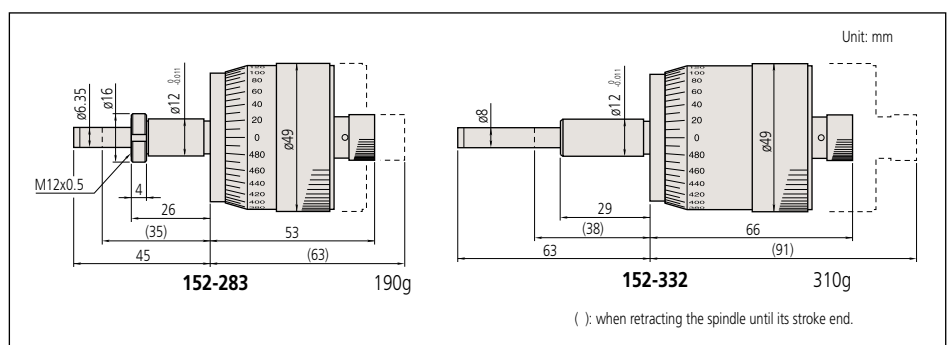


152-283

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
10mm	<b>152-283</b>	—	—	w/ clamp nut	Flat (carbide tip)	—
25mm	<b>152-332</b>	—	—	Plain	Flat (carbide tip)	—
25mm	<b>152-348</b>	1"	<b>152-372</b>	Plain	Flat (carbide tip)	Bidirectional graduation
50mm	<b>152-380</b>	2"	<b>152-388</b>	Plain	Flat (carbide tip)	Bidirectional graduation

### DIMENSION AND MASS



# Micrometer Heads

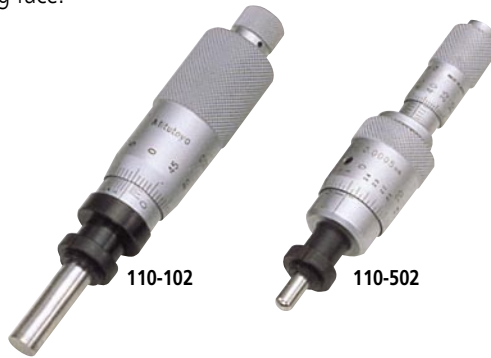
## SERIES 110 — Differential Screw Translator (Extra-Fine Feeding) Type

### FEATURES

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

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

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



### Technical Data

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

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

Scale surface: Hard-chrome plating

Fixture thickness for clamp nut: 9.5mm

(11.5mm: **110-502, 110-504**)

Accuracy and stem diameter

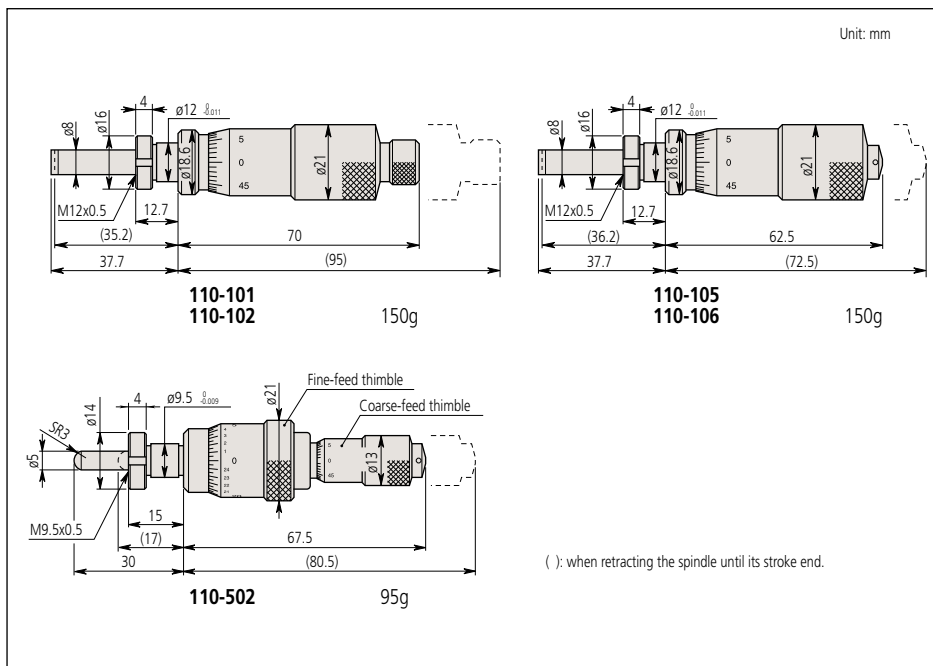
Order No.	Accuracy*	Stem dia.	
<b>110-105</b>	<b>110-115</b>	±3 / ±1.5µm	12mm / .5"
<b>110-106</b>	<b>110-116</b>	±3 / ±1.5µm	12mm / .5"
<b>110-107</b>	<b>110-117</b>	±3 / ±1.5µm	12mm / .5"
<b>110-108</b>	<b>110-118</b>	±3 / ±1.5µm	12mm / .5"
<b>110-101</b>	<b>110-111</b>	±5 / ±1.5µm	12mm / .5"
<b>110-102</b>	<b>110-112</b>	±5 / ±1.5µm	12mm / .5"
<b>110-502</b>	<b>110-504</b>	±3 / ±1.5µm	9.5mm / .375"

\*Wide range / narrow range

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
1mm	<b>110-105</b>	.02"	<b>110-115</b>	w/ clamp nut	Flat (carbide tip)	—
1mm	<b>110-106</b>	.02"	<b>110-116</b>	w/ clamp nut	Flat (carbide tip)	0.0001mm / .000005" graduations
1mm	<b>110-107</b>	.02"	<b>110-117</b>	w/ clamp nut	Spherical (SR10)	—
1mm	<b>110-108</b>	.02"	<b>110-118</b>	w/ clamp nut	Spherical (SR10)	0.0001mm / .000005" graduations
2.5mm	<b>110-101</b>	.05"	<b>110-111</b>	w/ clamp nut	Flat (carbide tip)	—
2.5mm	<b>110-102</b>	.05"	<b>110-112</b>	w/ clamp nut	Flat (carbide tip)	0.0001mm / .000005" graduations
13mm	<b>110-502</b>	.5"	<b>110-504</b>	w/ clamp nut	Spherical (SR3)	0.0005mm / .00002" graduations 0.2mm / .006" fine feeding range

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 152 — for XY-Stage

### Technical Data

Graduations: 0.005mm, 0.001mm\* or .0001"

\*vernier reading

Spindle pitch: 1mm or .025"

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

Scale surface: White anodized aluminum

Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
<b>152-390</b> <b>152-392</b>	±2μm	18mm / .709"
<b>152-389</b> <b>152-391</b>	±2μm	18mm / .709"
<b>152-402</b> —	±2μm	18mm / .709"
<b>152-401</b> —	±2μm	18mm / .709"

### FEATURES

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

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

#### 152-402, 152-401

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

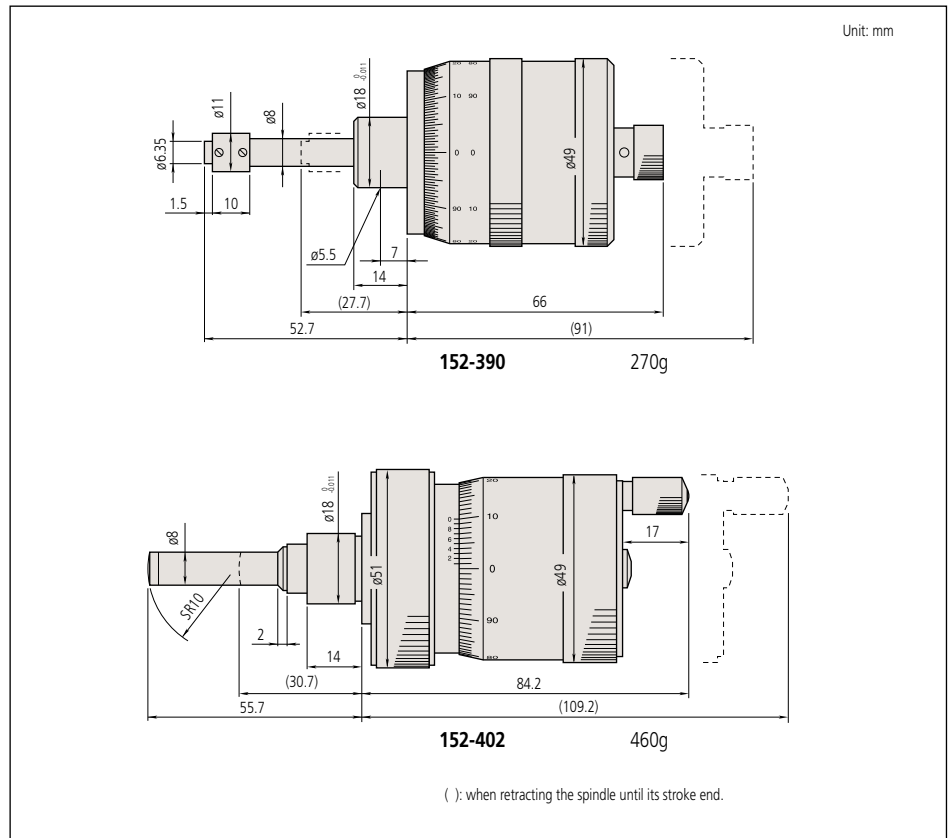


152-390

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	<b>152-390</b>	1"	<b>152-392</b>	Plain	Flat (hardened) with non-rotating device	for X-axis, Bidirectional grad.
25mm	<b>152-389</b>	1"	<b>152-391</b>	Plain	Flat (hardened) with non-rotating device	for Y-axis, Bidirectional grad.
25mm	<b>152-402*</b>	—	—	Plain	Spherical with carbide tip (SR10)	for X-axis, with vernier
25mm	<b>152-401*</b>	—	—	Plain	Spherical with carbide tip (SR10)	for Y-axis, with vernier

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 197 — Non-rotating Spindle and Large Thimble

### FEATURES

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

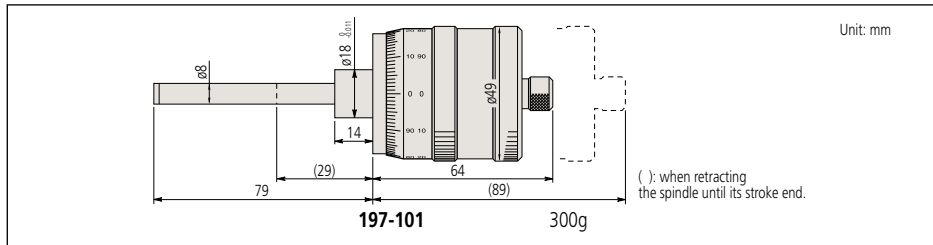


197-101

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
50mm	197-101	2"	197-201	Plain	Flat (carbide tip)	Bidirectional graduation

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 153 — Fine Graduation and High Accuracy

### FEATURES

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

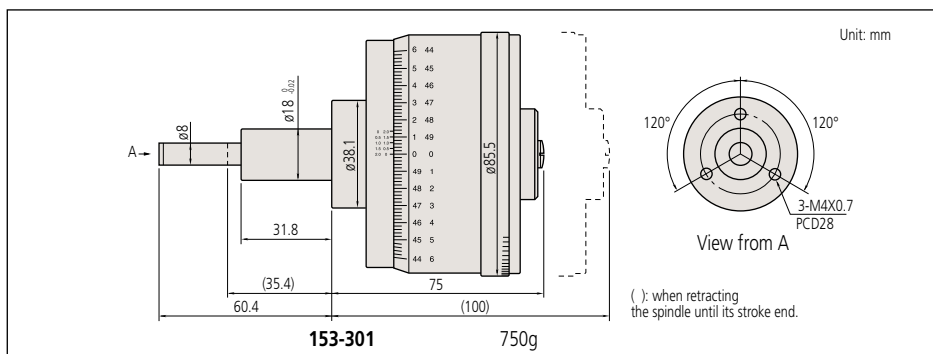


153-301

### SPECIFICATIONS

Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	153-301	1"	153-302	Plain	Flat (carbide tip)	Bidirectional graduation

### DIMENSION AND MASS



### Technical Data

Graduations: 0.005mm or .0002"  
 Spindle pitch: 1mm or .05"  
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface  
 Scale surface: White anodized aluminum  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
197-101	±5μm	18mm / .709"

### Technical Data

Graduations: 0.0005mm or .00001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface  
 Scale surface: White anodized aluminum  
 Accuracy and stem diameter

Order No.	Accuracy*	Stem dia.
153-301	±1 / ±0.5μm	18mm / .709"

\*Wide range / narrow range

# Digital Micrometer Heads

## SERIES 164 — High Resolution and High Accuracy



(Refer to the page 9 for details.)

### Technical Data

Accuracy:  $\pm 1\mu\text{m}$  (wide range),  $\pm 0.5\mu\text{m}$  (narrow range)  
(excluding quantizing error)

Stem diameter: 18mm

Resolution: 0.0001mm

When using the external KA counter

### FEATURES

- Connecting with an external display unit, the Electronic Micrometer Head provides the most efficient means of obtaining precision measurement on XY-stages and similar applications.
- External display units (KA Counter) are optional.



164-141



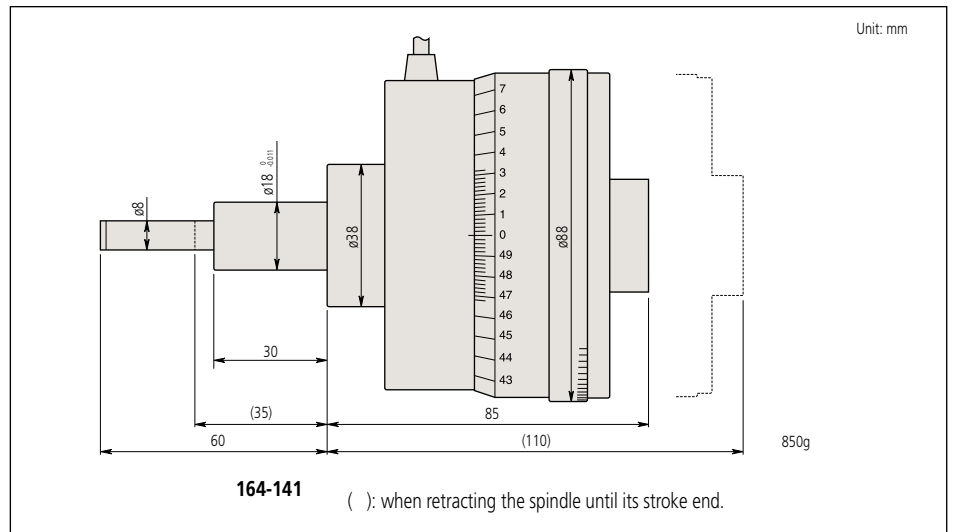
174-173

### SPECIFICATIONS

#### Metric

Range	Order No.	Stem	Spindle face	Remarks
25mm	164-141	Plain	Flat (carbide tip)	High accuracy model

### DIMENSION AND MASS



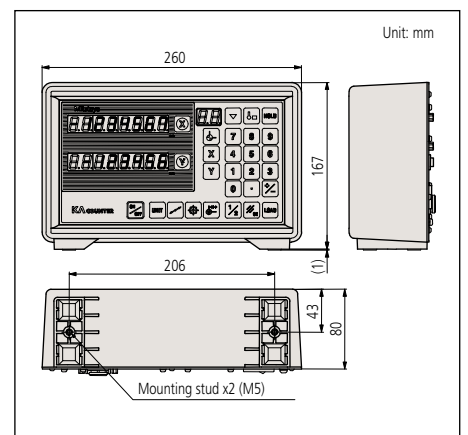
### SPECIFICATIONS: KA counter

Order No.	174-173*
Resolution	0.001mm, 0.005mm, .0001", .0005" (selectable)
Mass	1.1kg

\* To denote your AC line voltage add the following suffixes to the order No.

- A: for UL/CSA
- D: for CEE
- E: for BS
- F: for SAA
- DC: for China
- K: for Korea

### DIMENSION



# Micrometer Heads

## SERIES 250 — with Digit Counter

### FEATURES

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



250-301

### SPECIFICATIONS

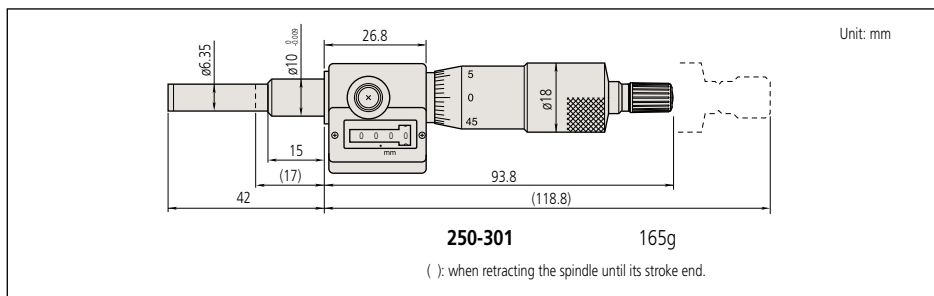
Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	250-301	1"	250-312*	Plain	Flat (carbide tip)	Vernier reading

### Technical Data

Graduations: 0.01mm or .0001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90), lapped surface  
 Scale surface: Hard-chrome plating  
 Accuracy and stem diameter

Order No.	Accuracy	Stem dia.
250-301	±2μm	10mm / .375"

### DIMENSION AND MASS



# Micro Jack

## SERIES 7

### FEATURES

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



7850

### SPECIFICATIONS

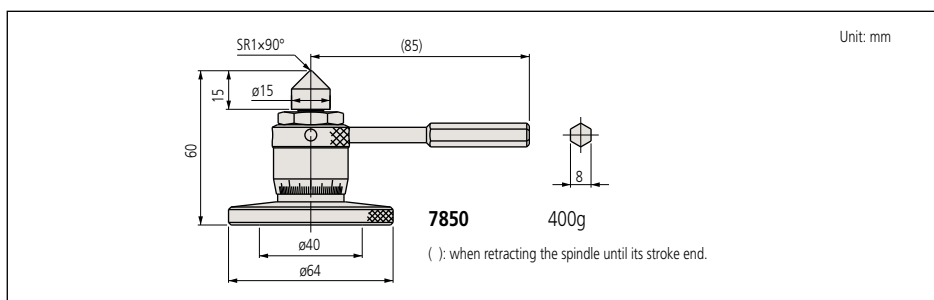
Metric			Inch		
Range	Order No.	Remarks	Range	Order No.	Remarks
60 - 75mm	7850	Max. load: 400kg	2.5" - 3"	7851	Max. load: 400kg

### Technical Data

Graduations: 0.01mm or .001"



### DIMENSION AND MASS

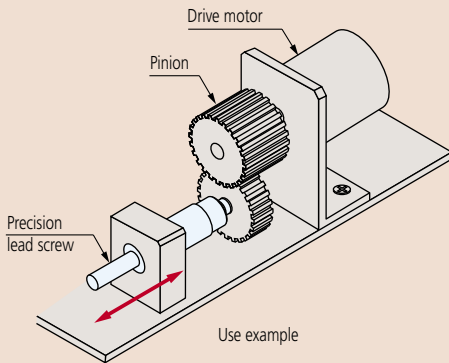


# Precision Lead Screw

## FEATURES

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

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



## SPECIFICATIONS

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

## DIMENSION

Unit: mm

### Type A: Straight type

### Type B: Stem with nut

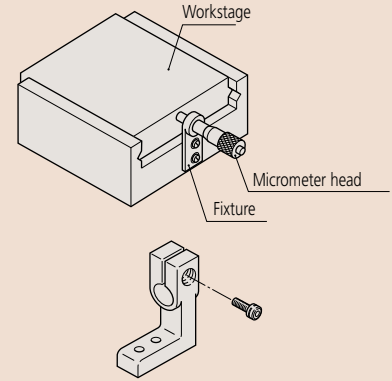
Order No.	L	L1	L2	L3	L4	L5
04AZA160	39	15	14.5	9	6	—
04AZA161	39	15	14.5	7.5	6	3
04AZA162	57.5	25	21.5	15.5	8	—
04AZA163	57.5	25	21.5	15.5	8	4
04AZA164	98.5	42	39.5	27	10	—
04AZA165	98.5	42	39.5	27	10	4

# Fixtures for Micrometer Heads

## FEATURES

• The act of fabricating brackets to mount micrometer heads for each particular application can be laborious and costly. Mitutoyo offers various types of fixtures for micrometer heads to meet a wide range of applications. These fixtures are made of nickel-plated cast iron.

• There are two types of fixtures for micrometer heads with or without clamping nut on the stem.

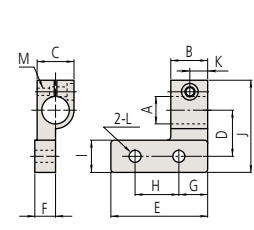
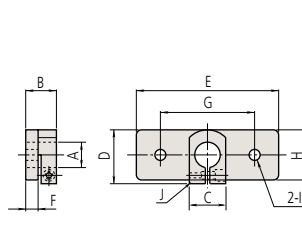
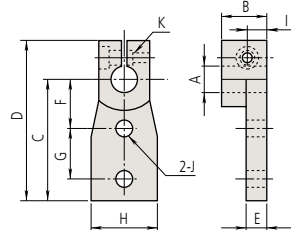
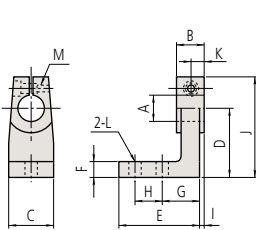


**Note:** Supplied with a socket head screw (M3x0.5x12mm) for the fixtures to be used with a micrometer head without clamp nut (plain stem type micrometer head).

## DIMENSION

### Fixtures for plain stem type micrometer heads

Unit: mm



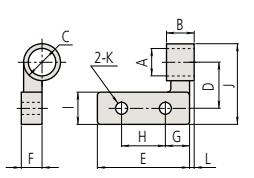
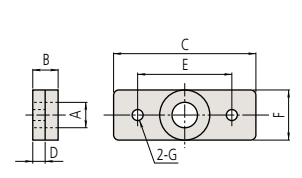
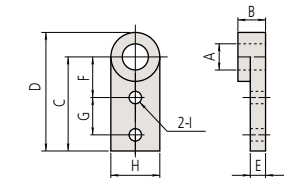
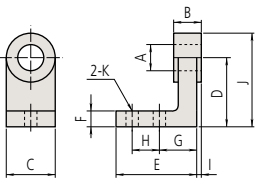
Order No.	303560	303569	303579
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	15	20	20
D	20	30	30
E	23	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	1.5	3.25	3.25
J	32.5	42.5	42.5
K	4.5	7.25	7.25
L	ø3.4	ø4.5	ø4.5
M	M3x0.5	M3x0.5	M3x0.5

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

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

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

### Fixtures for micrometer heads with clamp nut



Order No.	303559	303568	303578
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	15	20	20
D	20	30	30
E	24	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	0.5	1.75	1.75
J	27.5	40	40
K	ø3.4	ø4.5	ø4.5

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

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

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