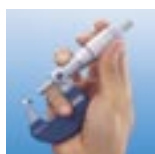


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## Micrometers



## Micrometer Heads



## New Products



Coolant Proof Micrometer



Digimatic Micrometer



Ratchet Thimble Micrometer



Digimatic Spline Micrometer



Fine Pitch Micrometer Head

# 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.

SPC



IP65

(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)

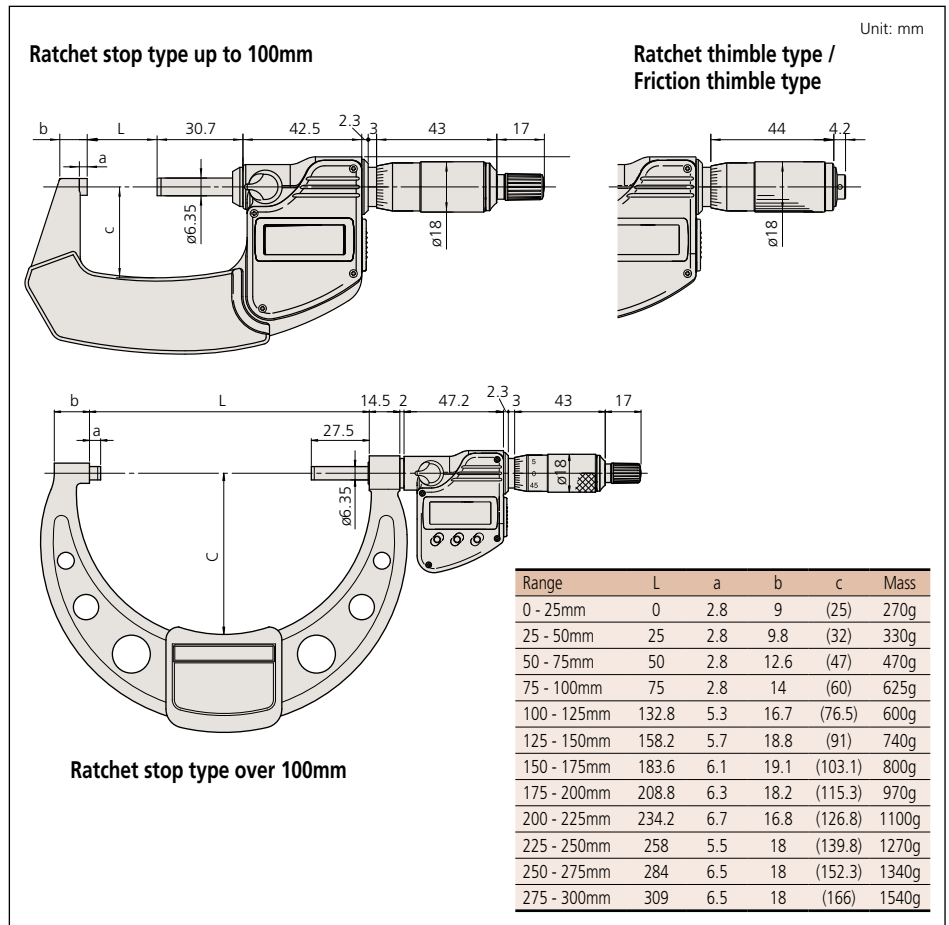


SPC cable with data switch



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

## DIMENSION AND MASS



## 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*	±.00005"
1" - 2"	293-331 / 293-341*	±.00005"
2" - 3"	293-332 / 293-342*	±.00005"
3" - 4"	293-333 / 293-343*	±.0001"
4" - 5"	293-350	±.0001"
5" - 6"	293-351	±.0001"
6" - 7"	293-352	±.00015"
7" - 8"	293-353	±.00015"
8" - 9"	293-354	±.00015"
9" - 10"	293-355	±.0002"
10" - 11"	293-356	±.0002"
11" - 12"	293-357	±.0002"

\*without SPC data output

### Inch/Metric With ratchet thimble

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

\*without SPC data output

### Inch/Metric With friction thimble

Range	Order No.	Accuracy
0 - 1"	293-335 / 293-348*	±.00005"
1" - 2"	293-336	±.00005"

\*without SPC data output

# 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"

# 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.

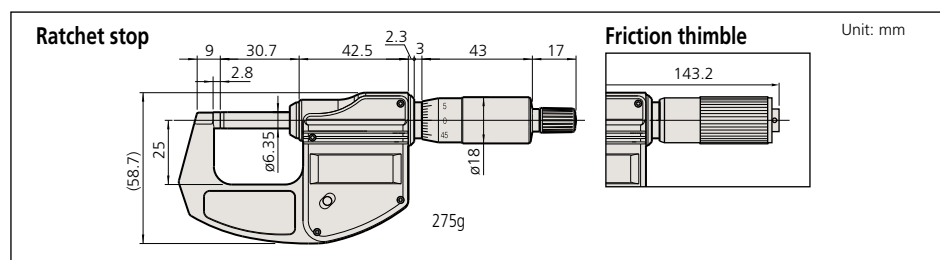
## SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	293-821	±2μm

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"

## DIMENSION AND MASS



## 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

## 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)



(Refer to the page 9 for details.)



293-821

## 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







Absolute System Patented by MITUTOYO

(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).



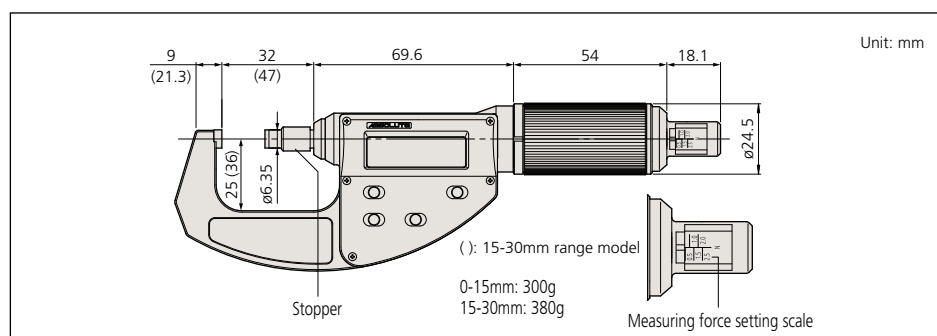
227-201

## 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.)

### 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



293-666



293-667



293-668



293-669

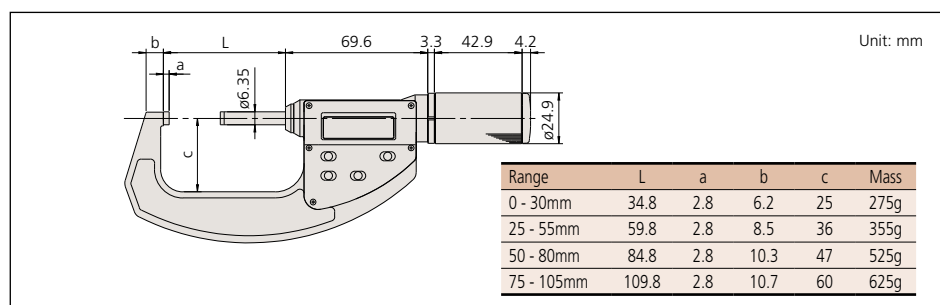
### SPECIFICATION

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

\*Without SPC data output

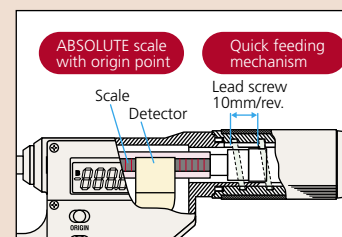
Inch/Metric		
Range	Order No.	Accuracy
0 - 1.2"	293-676	±.0001"
1" - 2.2"	293-677	±.0001"
2" - 3.2"	293-678	±.00015"
3" - 4.2"	293-679	±.00015"

### DIMENSION AND MASS



### 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.

#### 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.

#### 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.

#### 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"

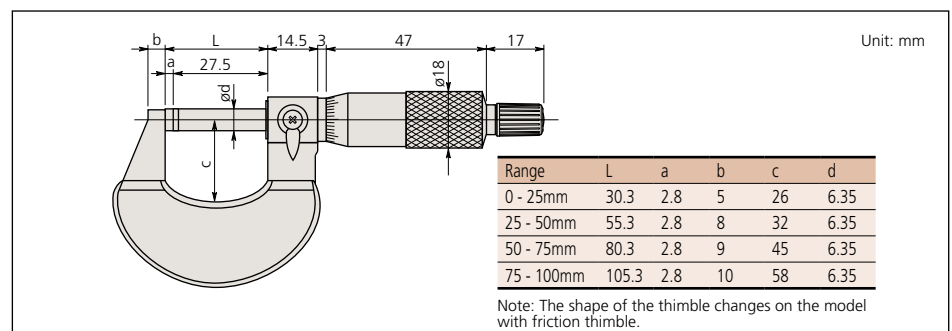
\*.0001" reading is obtained with vernier.

#### 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.

### DIMENSION



# 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.

#### 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.

#### 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 With ratchet stop

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

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

\*.0001" reading is obtained with vernier.

#### Inch With friction thimble

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

\*.0001" reading is obtained with vernier.

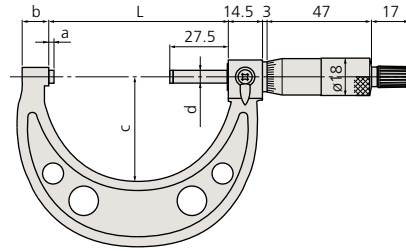
#### Inch Micrometer set

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

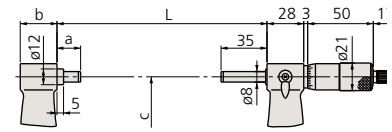
### Models up to 300mm



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



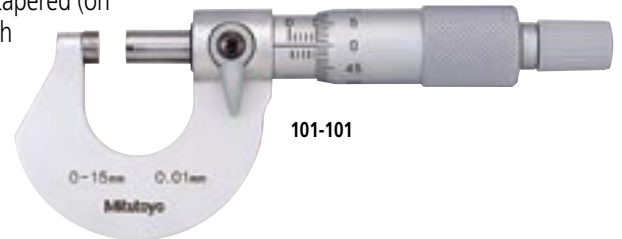
Range	L	a	b	c	d
225 - 250mm	258	5.5	18	143	ø6.35
250 - 275mm	284	6.5	18	156	ø6.35
275 - 300mm	309	6.5	18	169	ø6.35
300 - 325mm	353	18	28	187	ø8
325 - 350mm	378	18	28	199	ø8
350 - 375mm	403	18	28	212	ø8
375 - 400mm	428	18	28	224	ø8
400 - 425mm	453	18	28	236	ø8
425 - 450mm	478	18	28	248	ø8
450 - 475mm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

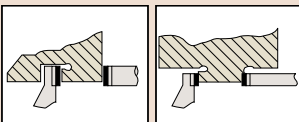
**Inch** With friction thimble

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

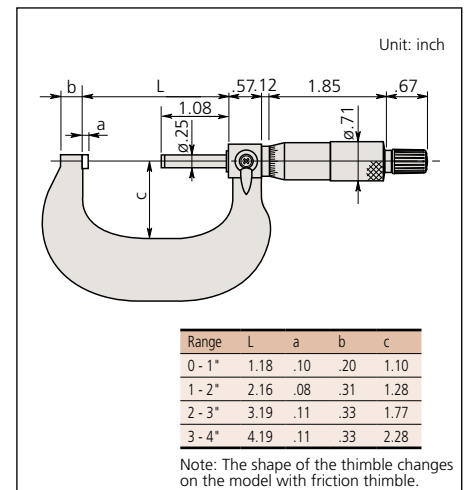
\*.0001" reading is obtained with vernier.

### 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



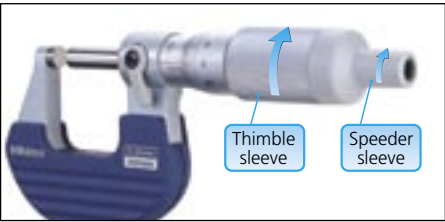


# Ratchet Thimble Micrometer

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

## FEATURES

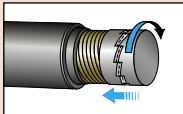
- Ratchet function works both from the thimble and the speeder, allowing easy one-handed operation.
- Clearly audible ratchet operation for reassurance that measurement is being performed at constant, preset force.
- Provided with a Certificate of Inspection.



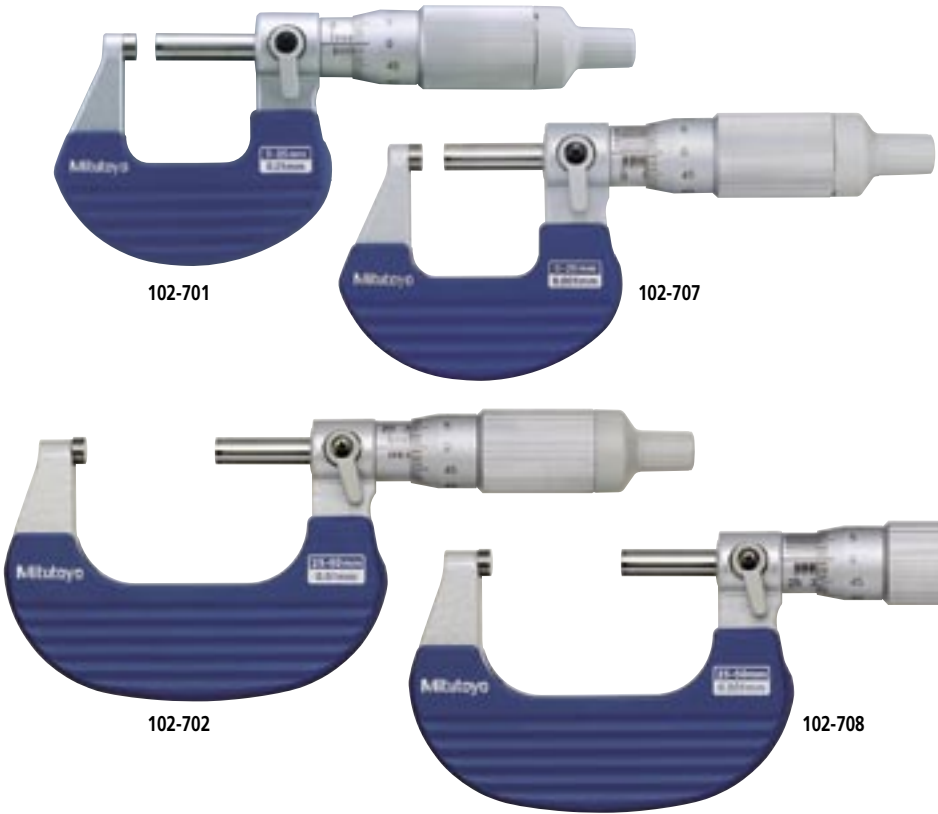
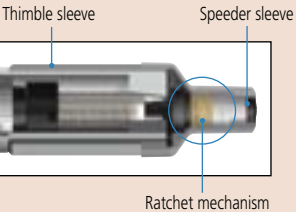
(Refer to the page 9 for details.)

## 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

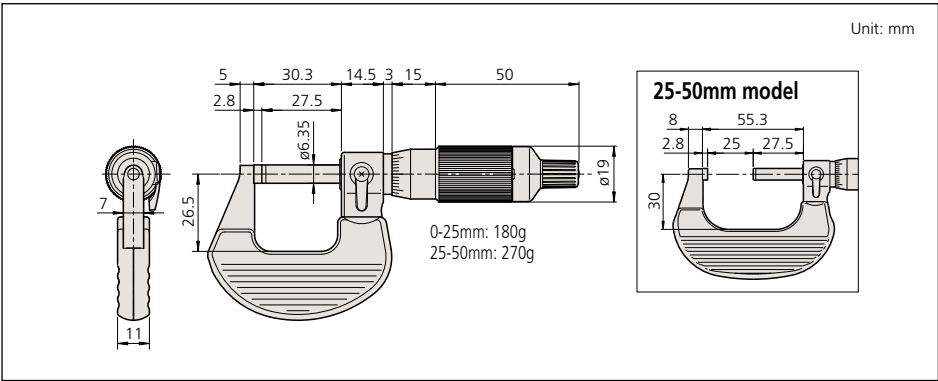
Metric		
Range	Order No.	Accuracy
0 - 25mm	102-701	±2μm
	102-707*	±2μm
25 - 50mm	102-702	±2μm
	102-708*	±2μm

\*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

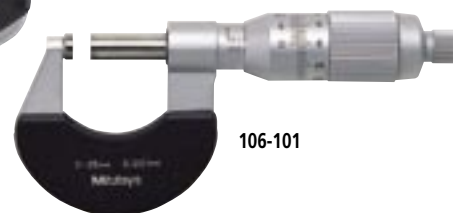
### Optional Accessory for Digital Model

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

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



406-250



106-101

### SPECIFICATIONS

**Metric** Digital model with ratchet stop

Range	Order No.	Accuracy
0 - 25mm	406-250	±3μm
25 - 50mm	406-251	±3μm
50 - 75mm	406-252	±3μm
75 - 100mm	406-253	±4μm

**Metric** With ratchet thimble

Range	Order No.	Accuracy
0 - 25mm	106-101	±2μm
25 - 50mm	106-103	±2μm
50 - 75mm	106-105	±3μm
75 - 100mm	106-106	±3μm

**Inch/Metric** Digital model with ratchet stop

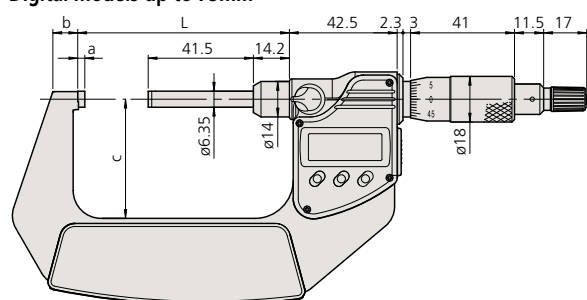
Range	Order No.	Accuracy
0 - 1"	406-350	±.00015"
1" - 2"	406-351	±.00015"
2" - 3"	406-352	±.00015"
3" - 4"	406-353	±.0002"

**Inch** With friction thimble

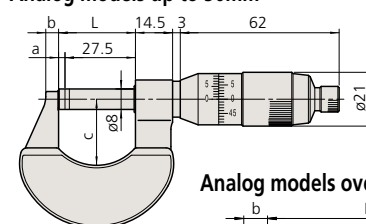
Range	Order No.	Accuracy
0 - 1"	106-102	±.0001"
1" - 2"	106-104	±.0001"

### DIMENSION

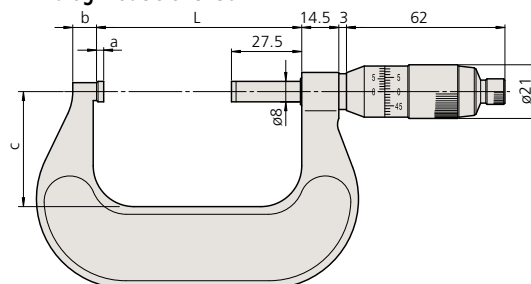
#### Digital models up to 75mm



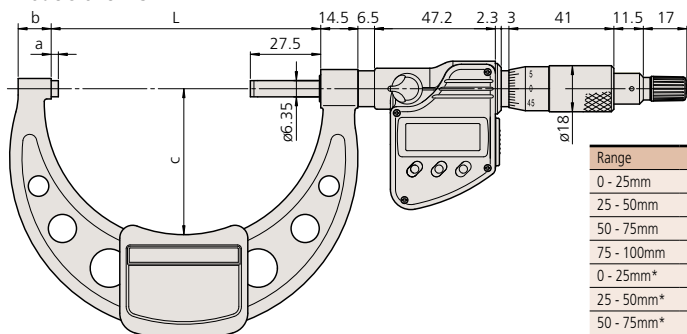
#### Analog models up to 50mm



#### Analog models over 50mm



#### Digital models over 75mm



Range	L	a	b	c
0 - 25mm	58.2	2.5	7.3	32
25 - 50mm	83.2	2.5	10.1	47
50 - 75mm	108.2	2.5	11.5	60
75 - 100mm	105.3	2.8	14.1	57
0 - 25mm*	30	2.5	5	25.8
25 - 50mm*	55	2.5	8	32.3
50 - 75mm*	80.3	2.8	10.3	45
75 - 100mm*	105.3	2.8	10.7	58

\*Analog model

Unit: mm

# Quick-Setting Outside Micrometers

**SERIES 293,102**

## FEATURES

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



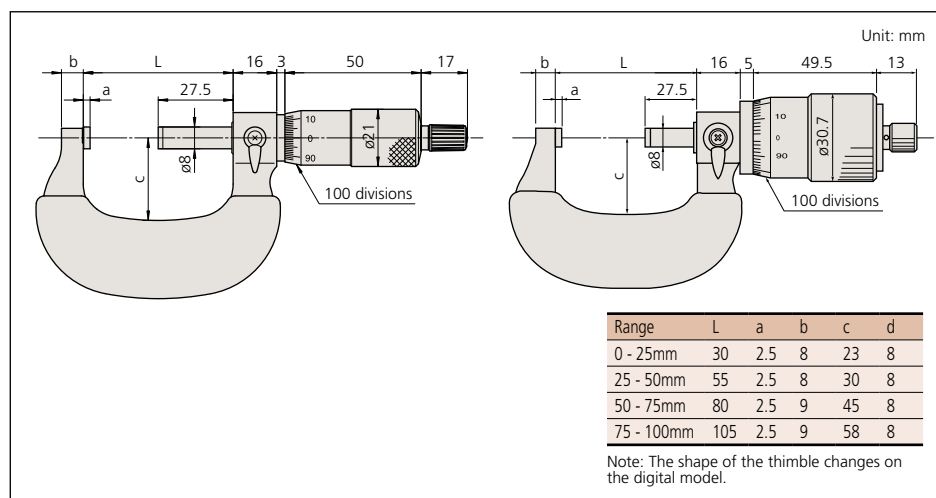
## SPECIFICATIONS

Metric <span style="float: right;">Digital model with ratchet stop</span>		
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 <span style="float: right;">With ratchet thimble</span>		
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 <span style="float: right;">With ratchet stop</span>		
Range	Order No.	Accuracy
0 - 25mm	<b>102-450</b>	±2μm
25 - 50mm	<b>102-451</b>	±2μm

## DIMENSION



## Technical Data

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

## Function of Digital Model

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

## Optional Accessory for Digital Model

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



(Refer to the page 9 for details.)

## Technical Data

Accuracy:  $\pm(4+R/75)\mu\text{m}$ , R = max. range (mm)  
(excluding quantizing error for digital models)  
\*fraction rounded up

Resolution\*: 0.001mm or .0001"/0.001mm  
(.00005"/0.001mm: **340-351**)

Graduation\*: 0.01mm

Flatness: 0.6 $\mu\text{m}$  for models up to 300mm  
1 $\mu\text{m}$  for models over 300mm

Parallelism: 2 $\mu\text{m}$  for models up to 75mm  
3 $\mu\text{m}$  for models up to 150mm  
(2+R/100) $\mu\text{m}$  for models over 150mm,  
R = max. range (mm) \*fraction rounded up

Measuring faces: Carbide tipped

Display\*: LCD

Battery\*: SR44 (2 pc.), **938882**  
(1 pc.: **340-251, 252, 340-351, 352**)

Battery life\*: Approx. 1.8 years under normal use  
(8 months for **340-251, 252, 340-351, 352**)

Dust/Water protection level\*: IP65

\*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"

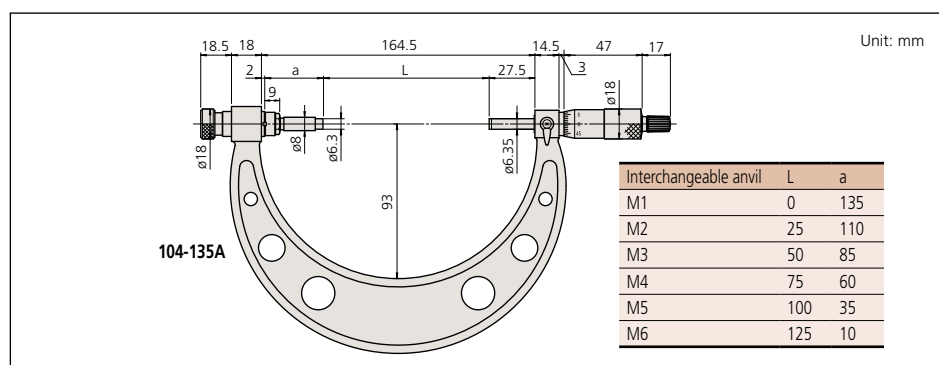
Metric		
Range	Order No.	Interchangeable anvils
0 - 50mm	<b>104-171*</b>	0, 25mm
0 - 100mm	<b>104-139A</b>	0, 25, 50, 75mm
0 - 150mm	<b>104-135A</b>	0, 25, 50, 75, 100, 125mm
50 - 150mm	<b>104-161A</b>	0, 25, 50, 75mm
100 - 200mm	<b>104-140A</b>	0, 25, 50, 75mm
150 - 300mm	<b>104-136A</b>	0, 25, 50,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

## DIMENSION

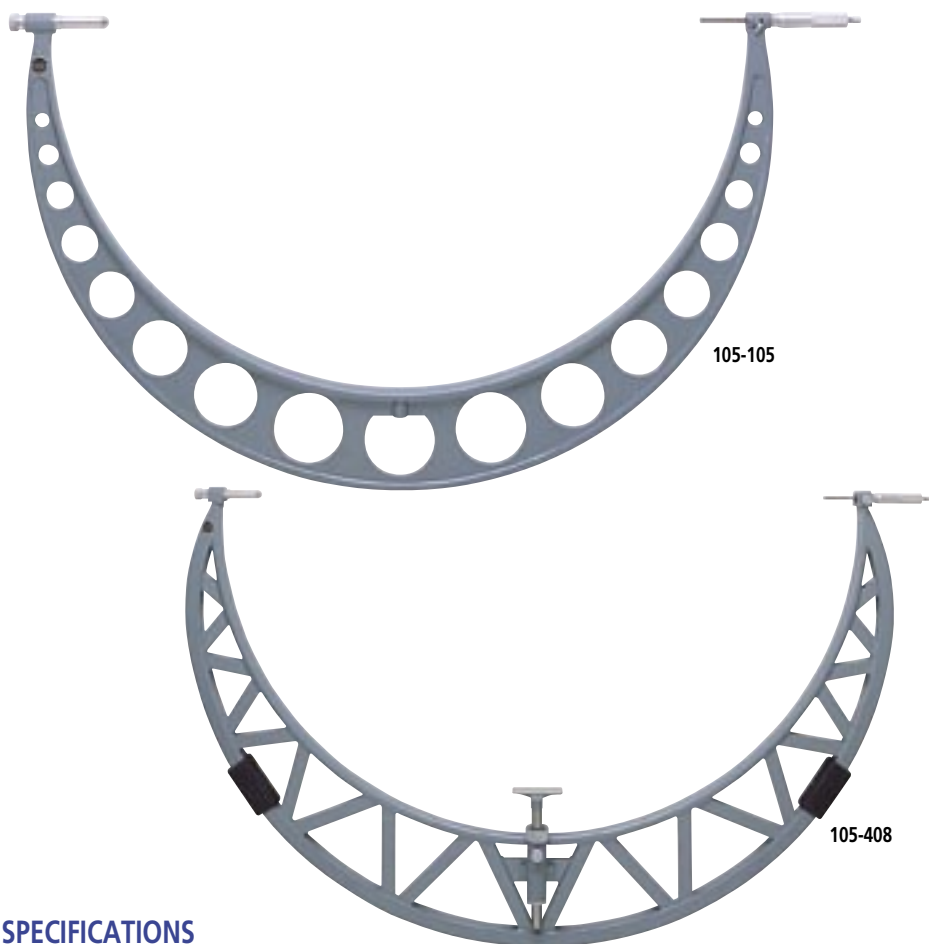


# Outside Micrometers

## SERIES 105 — with Extension Anvil Collars

### FEATURES

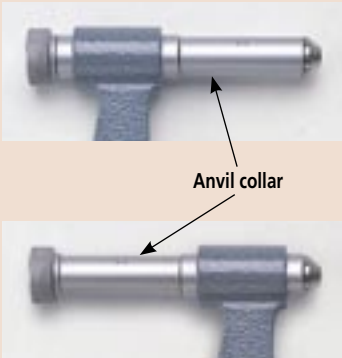
- Wide measuring range with extension anvil collars.
- 50mm spindle stroke.
- With Ratchet Stop for constant force.
- Supplied with zero-setting standards for each range.
- Square and round pipes are combined for light weight and rigid frame (for models over 1000mm range).
- Workpiece stopper (for models over 1000mm range).



### 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



### 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



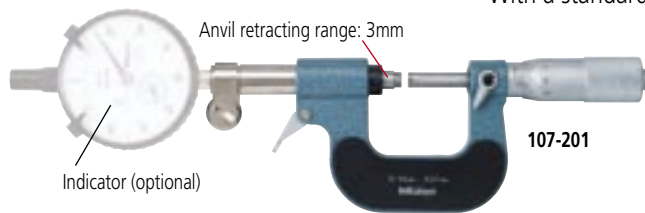


# Outside Micrometers

## 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.



### Technical Data

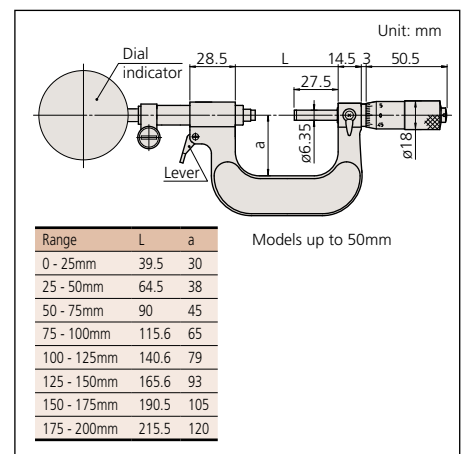
Accuracy: Refer to the list of specifications.  
 Graduation: 0.01mm (thimble)  
 Flatness: 0.6μm  
 Parallelism: (2+R/100)μm, R = max. range (mm)  
 Measuring faces: Carbide tipped



### 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

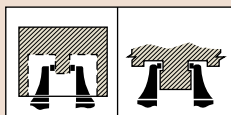
Accuracy: Refer to the list of specifications.  
 (excluding quantizing error for digital models)  
 Resolution\*: 0.001mm or .00005"/0.001mm  
 Graduation\*: 0.01mm  
 Flatness: 0.3μm  
 Parallelism: (3+R/75)μm, R = max. range (mm)  
 \*Fraction rounded down  
 Measuring faces: Carbide tipped  
 Display\*: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



# Caliper Type Micrometers

## SERIES 343, 143

### FEATURES

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



### SPECIFICATIONS

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

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

Models with a range up to 300mm are available.

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

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

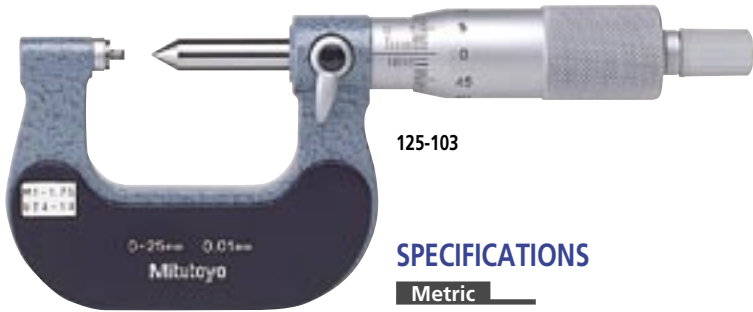
Models with a range up to 3" are available.

# 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.



125-103

### SPECIFICATIONS

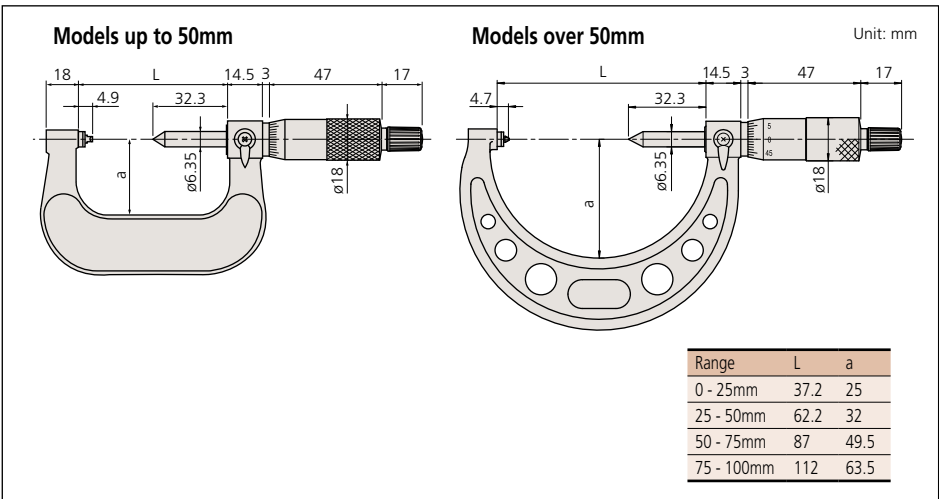
Metric		
Range	Order No.	Screw to be measured (Metric/Unified)
0 - 25mm	125-101	0.4 - 0.5mm/64 - 48TPI
	125-102	0.6 - 0.9mm/44 - 28TPI
	125-103	1 - 1.75mm/24 - 14TPI
	125-104	2 - 3mm/13 - 9TPI
	125-105	3.5 - 5mm/8 - 5TPI
25 - 50mm	125-106	0.4 - 0.5mm/64 - 48TPI
	125-107	0.6 - 0.9mm/44 - 28TPI
	125-108	1 - 1.75mm/24 - 14TPI
	125-109	2 - 3mm/13 - 9TPI
	125-110	3.5 - 5mm/8 - 5TPI
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:  $\pm(2+R/75)\mu\text{m}$ , R = max. range (mm)  
\*fraction rounded up  
Graduation: 0.01mm  
Spindle feed error: 3 $\mu\text{m}$



### 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	326-251	±4µm
25 - 50mm	326-252	±4µm
50 - 75mm	326-253	±4µm
75 - 100mm	326-254	±5µm

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

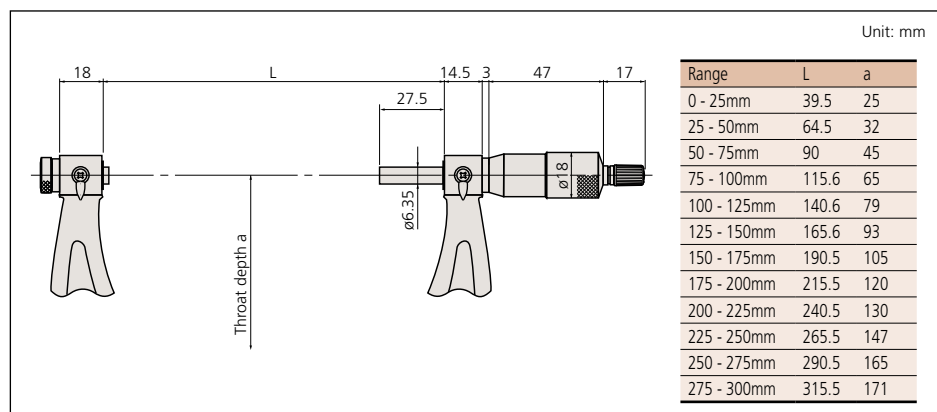
Inch/Metric		Digital model
Range	Order No.	Accuracy
0 - 1 "	<b>326-351</b>	±.0002 "
1 " - 2 "	<b>326-352</b>	±.0002 "
2" - 3 "	<b>326-353</b>	±.0002 "
3" - 4 "	<b>326-354</b>	±.00025"

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

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

(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

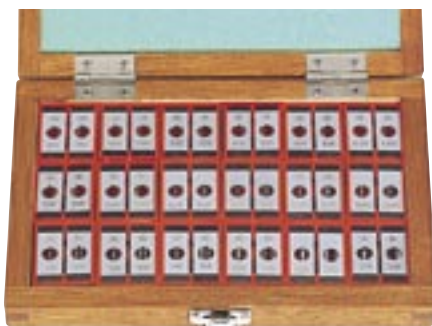
Inch		
Range	Order No.	Accuracy
0 - 1"	116-105	±.0002"
1" - 2"	116-106	±.0002"

# 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

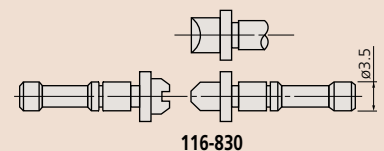
### Optional Accessory

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

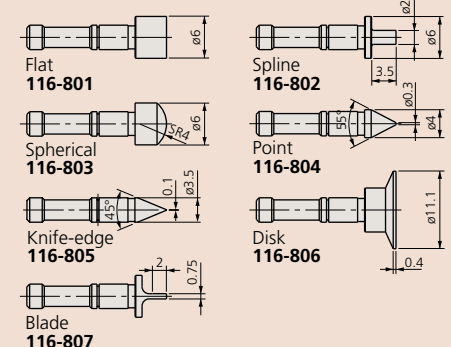
Order No.	Assortment of anvils and tip
116-840	60 - 48TPI (116-841) 48 - 40TPI (116-842) 40 - 32TPI (116-843) 32 - 24TPI (116-844) 24 - 18TPI (116-845) 18 - 14TPI (116-846) 14 - 10TPI (116-847) 10 - 7TPI (116-848) 7 - 4.5TPI (116-849) 4.5 - 3.5TPI (116-850)



116-830

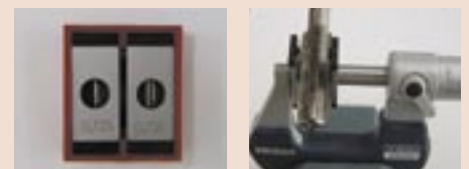
Interchangeable anvils set

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





(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	124-801*	0.5 - 0.55	50
1mm	124-802*	0.6 - 0.65	45
1.191mm (3/64")	124-803*	0.7 - 0.8	35 - 30
1.5mm	124-821*	0.9 - 1	28 - 26
1.588mm (1/16")	124-804*	0.9 - 1	28 - 26
2mm	124-805*	1.25	22
2.381mm (3/32")	124-806	1.5	17
2.5mm	124-822	1.5	17
3mm	124-807	1.75	15
3.175mm (1/8")	124-808	—	14
3.5mm	124-823	2	13
3.969mm (5/32")	124-809	2	13
4mm	124-810	2.25	11
4.5mm	124-824	2.5	10
4.763mm (3/16")	124-811	2.5	10
5mm	124-812	2.75	9
5.556mm (7/32")	124-813	3.0 - 3.25	8
6mm	124-814	3.5	7
6.35mm (1/4")	124-815	3.75	7
7mm	124-816	4.0	6.5
7.144mm (9/32")	124-817	4.25	6
7.938mm (5/16")	124-818	4.5	5.5
8mm	124-819	4.75	5.5
8.731mm (11/32")	124-820	5.0 - 5.25	5

\*Carbide-tipped type



# Gear Tooth Micrometers

## SERIES 324, 124 — Interchangeable Ball Anvil-Spindle Tip 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

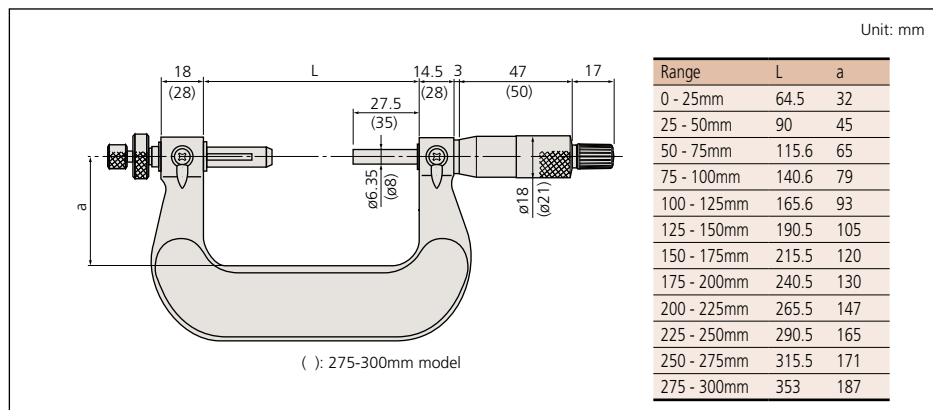
## SPECIFICATIONS

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

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

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

## DIMENSION





# Disk Micrometers

**SERIES 323, 223, 123**

## FEATURES

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



## SPECIFICATIONS

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

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

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

\*The measuring disks have carbide tips.

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

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

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

**SPC**



**IP65**

(Refer to the page 9 for details.)

## Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm or .001"  
Flatness: 1μm for models up to 100mm  
1.6μm for models over 100mm  
Parallelism: 4μm for models up to 50mm  
(4+R/50)μm for models up to 100mm  
(5+R/75)μm for models over 100mm,  
R = max. range (mm) \*Fraction rounded up  
Measurable module: 0.5 - 6 (0.7 - 11: models over 100mm)  
Display\*: LCD  
Battery\*: SR44 (1 pc.), 938882  
Battery life\*: Approx. 1.2 years under normal use  
\*Digital models \*\*Analog models

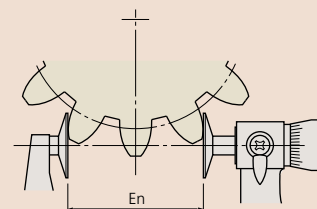
## Function of Digital Model

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

## Optional Accessory for Digital Model

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

## Root tangent length of gear (En)



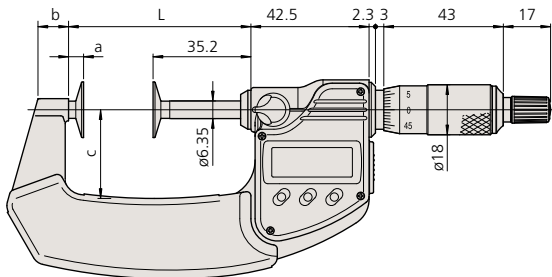
Note: Root tangent length measurement is not available for some types gears.



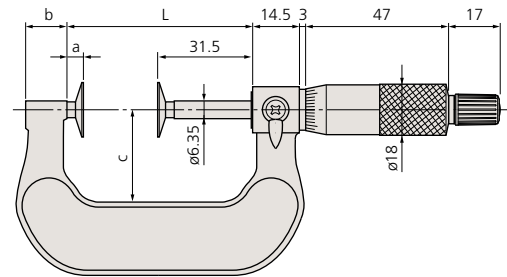
## DIMENSION

Unit: mm

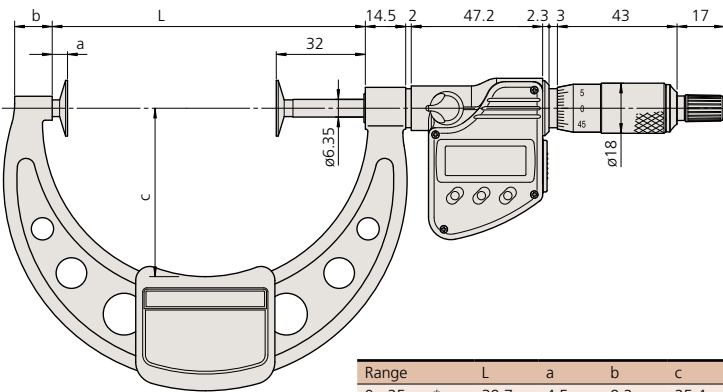
Digital models up to 75mm



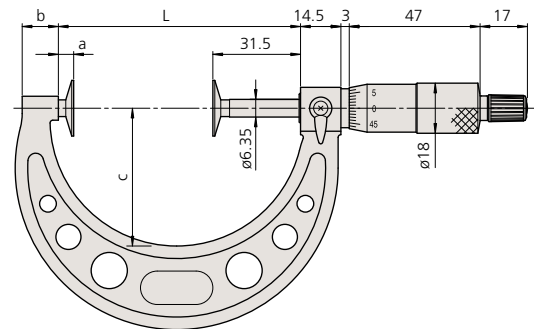
Analog models up to 50mm



Digital models over 75mm

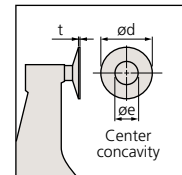


Analog over 50mm



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

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

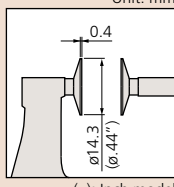


## Technical Data

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



Unit: mm



( ): Inch model

# Paper Thickness Micrometers

## SERIES 169 — Non-Rotating Spindle Type Designed for Paper Thickness Measurement

### FEATURES

- Non-rotating spindle.
- With Ratchet Stop for constant force.

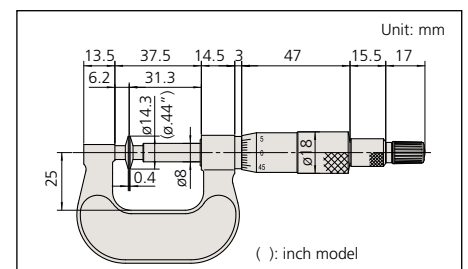


169-101

### SPECIFICATIONS

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

### DIMENSION



( ): inch model

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

# Disk Micrometers

## SERIES 369, 227, 169 — Non-Rotating Spindle Type

### FEATURES

- The Disk Micrometer is designed to easily measure root tangent length of spur gears and herical gears.
- Non-rotating spindle eliminates torque on workpiece.
- Speedy spindle feed of 10mm/rev. (Quickmike type).
- Diameter of measuring disk: 20mm
- With Ratchet Stop for constant force.
- With SPC output (series 369).

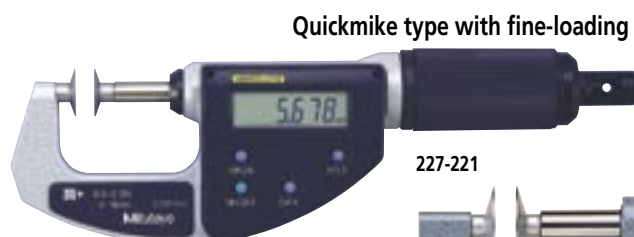


369-250



Quickmike type

369-411



Quickmike type with fine-loading

227-221



169-201

### SPECIFICATIONS

#### Metric Digital model

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

#### Inch/Metric Digital model

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

#### Metric Quickmike type

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

#### Inch/Metric Quickmike type

Range	Order No.	Accuracy
0 - 1.2"	369-421	±.0002"
1" - 2.2"	369-422	±.0002"

#### Metric Quickmike type with fine-loading

Range	Order No.	Accuracy	Measuring force
0 - 15mm	227-221	±4μm	0.5N - 2.5N
	227-222	±4μm	2N - 10N

#### Inch/Metric Quickmike type with fine-loading

Range	Order No.	Accuracy	Measuring force
0 - .6"	227-231	±.0002"	0.5N - 2.5N
	227-232	±.0002"	2N - 10N

#### Metric

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

#### Inch

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



### Technical Data

Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*\*: 0.01mm or .001"  
Flatness: 1μm  
Parallelism: 4μm for models up to 50mm  
6μm for models over 50mm  
(3μm: Quickmike type with fine-loading)  
Measurable module: 0.5-6,  
(0.4 - 3: Quickmike type with fine-loading)  
Display\*: LCD  
Battery\*: SR44 (1 pc.), 938882  
Battery life\*: Approx. 1.2 years under normal use  
(1 year: Quickmike type, 3 years: Quickmike type with fine-loading)  
Series 227: Refer to the page 27 for more information.  
\*Digital models \*\*Analog models

### Function of Digital Model

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

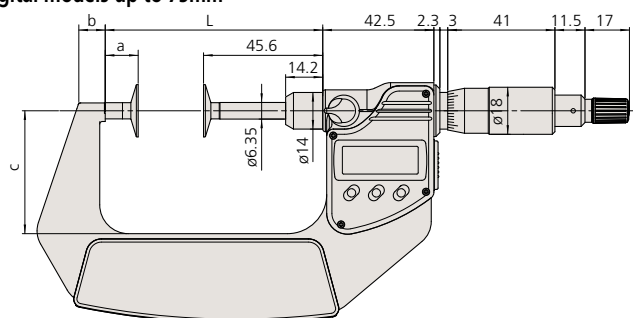
### Optional Accessory for Digital Model

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

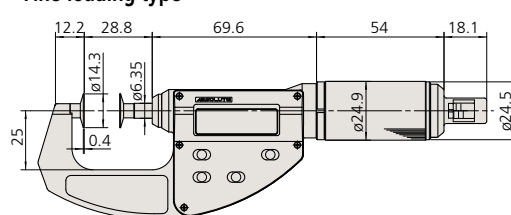
## DIMENSION

Unit: mm

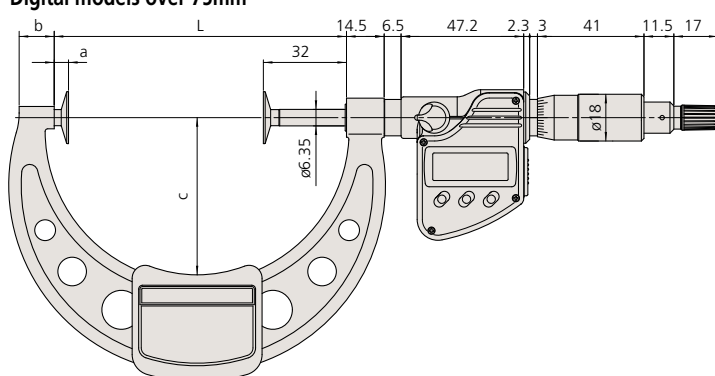
Digital models up to 75mm



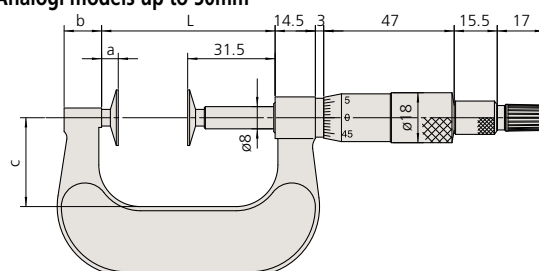
Fine-loading type



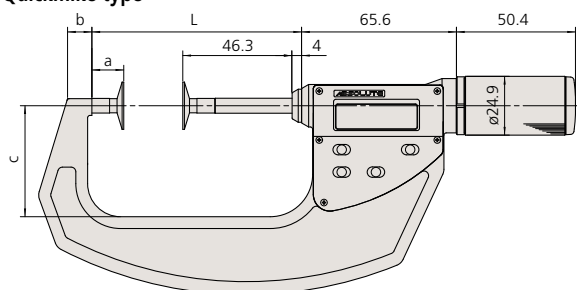
Digital models over 75mm



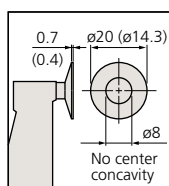
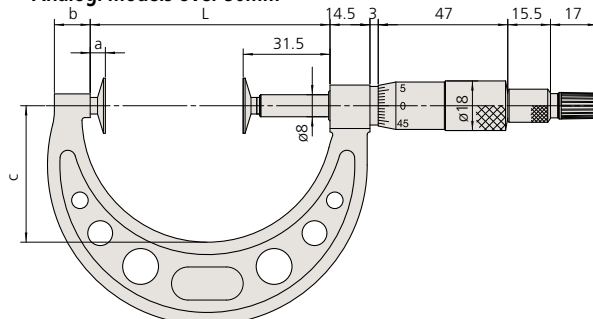
Analog models up to 50mm



Quickmike type



Analog models over 50mm



( ) : Fine-loading type

Digital model

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

\*Quickmike type

Analog model

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

# Sheet Metal Micrometers

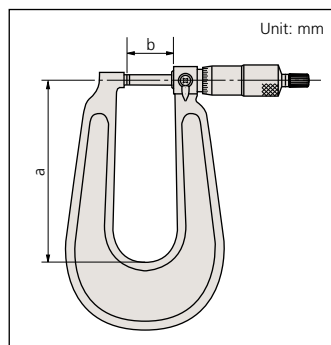
**SERIES 389, 189, 119, 118**

## FEATURES

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



## DIMENSION



## SPECIFICATIONS

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

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<sup>S-F</sup></b>	±4μm	160/27.5mm
	<b>118-118<sup>S-S</sup></b>	±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

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

S-F: Spherical anvil and flat spindle



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

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

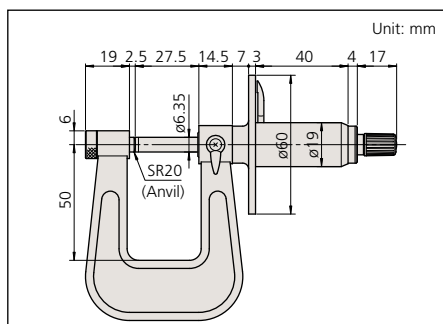
Inch Mechanical counter model			
Range	Order No.	Accuracy	a/b
0 - 1"	<b>189-129*</b>	±.0002"	160/27.5mm

\*.0001" reading is obtained with vernier.

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

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

## DIMENSION



**SPC**



**IP65**

(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.







(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: 0.3μm  
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

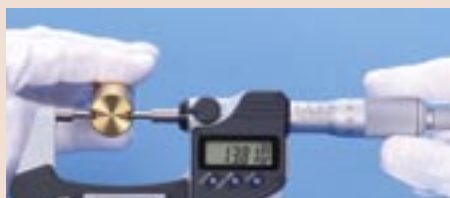
## Function of Digital Model

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

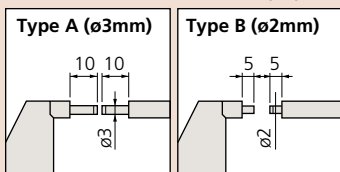
## Optional Accessory for Digital Model

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

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



Unit: mm



# Spline Micrometers

## SERIES 331, 111

## 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

## SPECIFICATIONS

### Metric Digital model

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

### Inch/Metric Digital model

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

### Metric

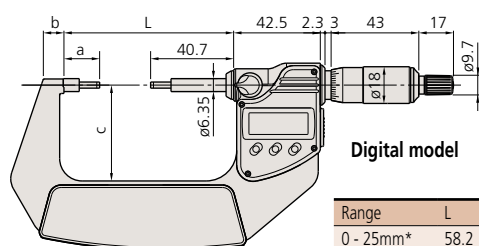
Range	Order No.	Accuracy	Remarks
0 - 25mm	<b>111-115</b>	±3μm	Type A
	<b>111-215</b>	±3μm	Type B
25 - 50mm	<b>111-116</b>	±3μm	Type A
50 - 75mm	<b>111-117</b>	±3μm	Type A
75 - 100mm	<b>111-118</b>	±4μm	Type A
100 - 125mm	<b>111-119</b>	±4μm	Type A
125 - 150mm	<b>111-120</b>	±4μm	Type A
150 - 175mm	<b>111-121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

### Inch

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

\*.0001" reading is obtained with vernier.

## DIMENSION

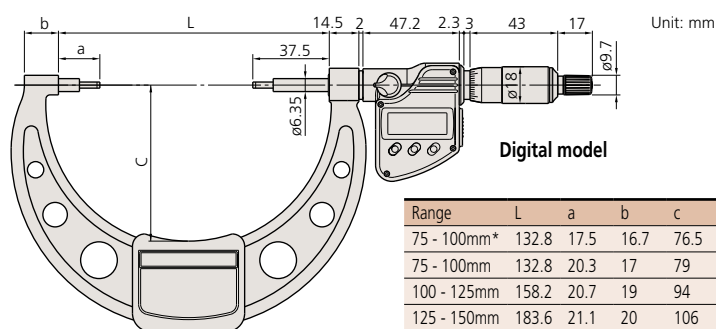


Models up to 75mm

Digital model

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

\*Digital models



Models over 75mm

Digital model

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

\*Digital models

# Tube Micrometers

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

### FEATURES

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



395-251

Spherical Anvil Type



115-115



395-271



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

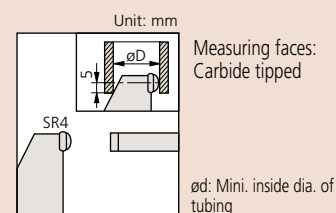
Origin-set, Zero-setting, Data hold, Automatic power ON/OFF, Data output, inch/mm conversion (inch/mm models)  
Alarm: Low voltage, Counting value composition error

### Optional Accessory for Digital Model

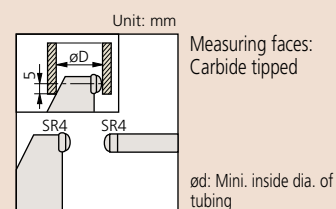
05CZA662: SPC cable with data switch (1m)

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

### Spherical anvil type



### Spherical anvil-spindle type

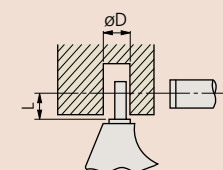
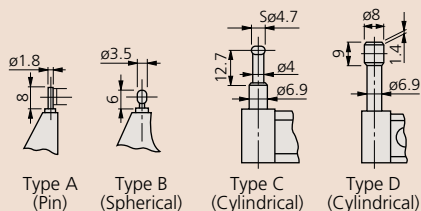


## Cylindrical Anvil Type



395-261

### Cylindrical anvil type



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"
	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).
- With digit counter (series 112).



## SPECIFICATIONS

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

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

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

\*The points have not carbide tips.

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

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

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

\*The points have not carbide tips.

**SPC**



**IP65**

(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)



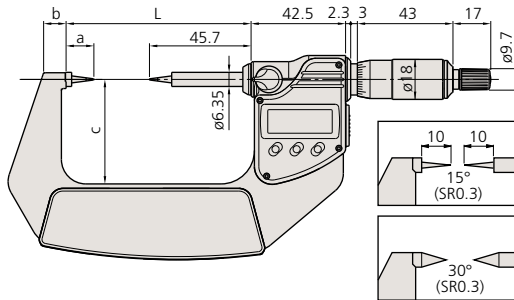
Tip angle: 30° (SR0.3)



## DIMENSION

Unit: mm

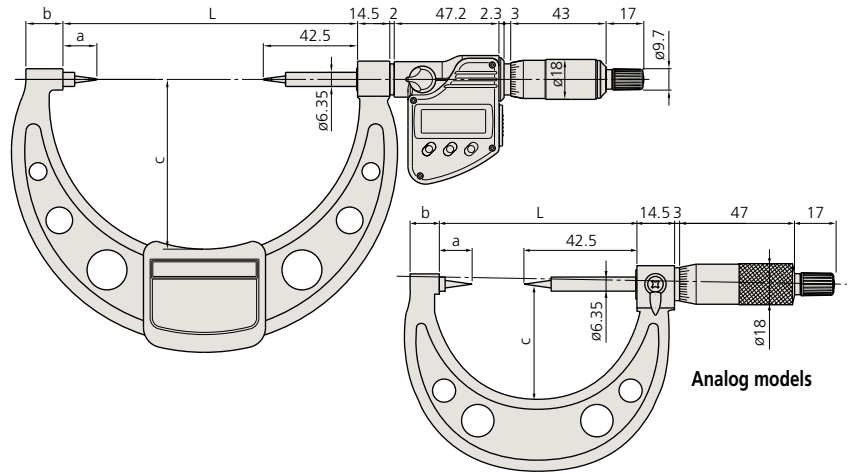
### Digital models up to 75mm



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 (15.3)	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

SPC



IP65

(Refer to the page 9 for details.)

### Technical Data

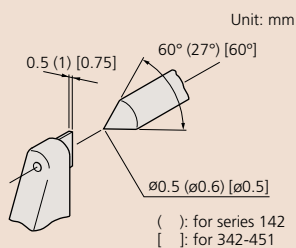
Accuracy: Refer to the list of specifications.  
(excluding quantizing error for digital models)  
Resolution\*: 0.001mm or .00005"/0.001mm  
Graduation\*: 0.01mm or .001"  
Display\*: LCD  
Battery\*: SR44 (1 pc.), **938882**  
Battery life\*: Approx. 1.2 years under normal use  
(3 years: Quickmike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



( ): for series 142  
[ ]: for 342-451

## Crimp Height Micrometers

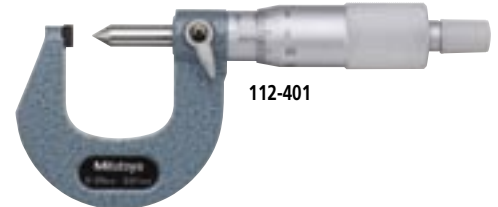
**SERIES 342, 142, 112 — Point Spindle and Blade Anvil**

### 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).



342-271



112-401

### Quickmike type



342-451

IP54

ABSOLUTE<sup>®</sup>  
Absolute System Protected by MITUTOYO



### SPECIFICATIONS

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

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

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

\* 0.001mm reading is obtained with vernier.

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

Metric	
Range	Order No.
0 - 25mm	<b>112-401</b>
	Accuracy
	±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 Digital model for 3 flutes cutting head			
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 Digital model for 3 flutes cutting head			
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

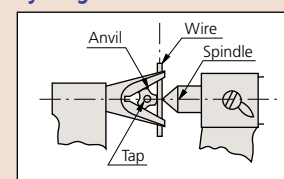
Zero-setting, Data hold, Preset, Automatic power ON/OFF,  
Data output, inch/mm conversion (inch/mm models)  
Alarm: Low voltage, Counting value composition error

### 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	—

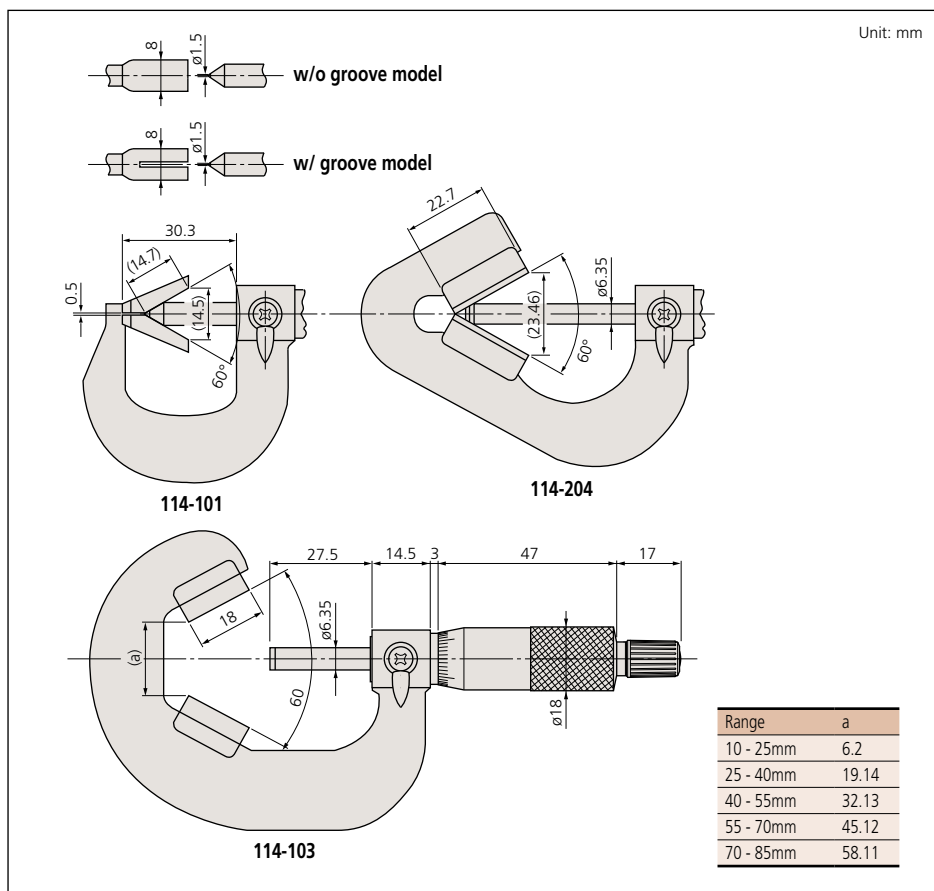
\*Carbide-tipped anvil

### 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



ABSOLUTE  
Absolute System Protected by METO



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
25 - 50mm	422-231	±3μm	Type A
	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
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
25 - 50mm	122-102	±3μm	Type A
	122-112	±3μm	Type B
	122-162	±3μm	Type C
	122-142	±3μm	Type D
50 - 75mm	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
1" - 2"	422-331	±.00015"	Type A
	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
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"	122-126	±.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

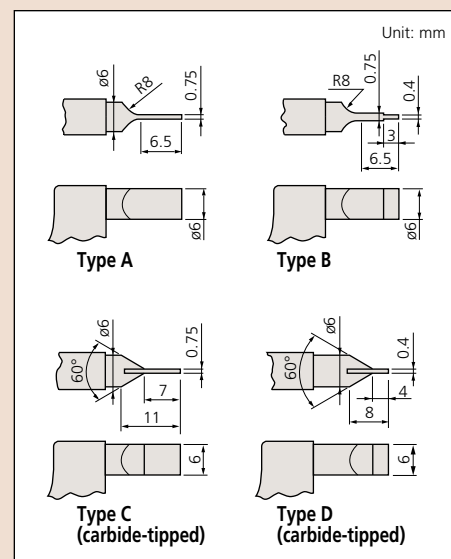
### Function of Digital Model

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.



147-103

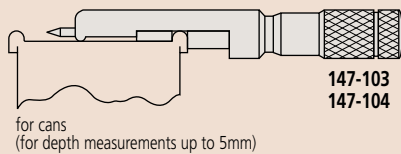
### Technical Data

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

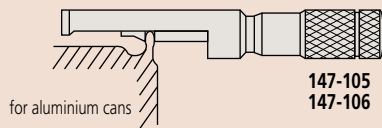
### SPECIFICATIONS

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

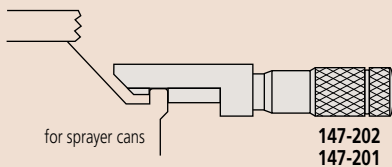
Inch		
Range	Order No.	Remarks
0 - .5"	<b>147-104</b>	for steel cans
	<b>147-106</b>	for aluminum cans
	<b>147-201</b>	for sprayer cans



147-103  
147-104



147-105  
147-106

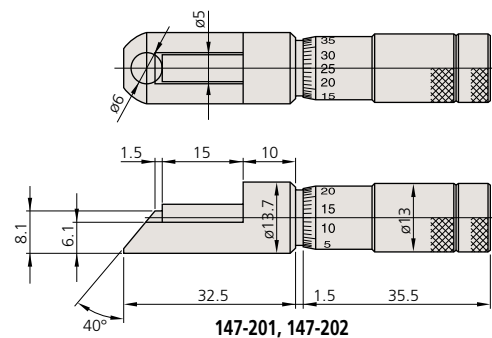
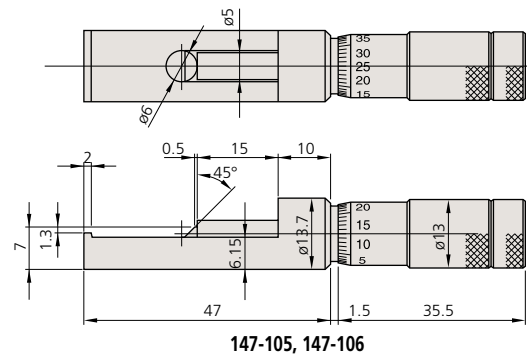
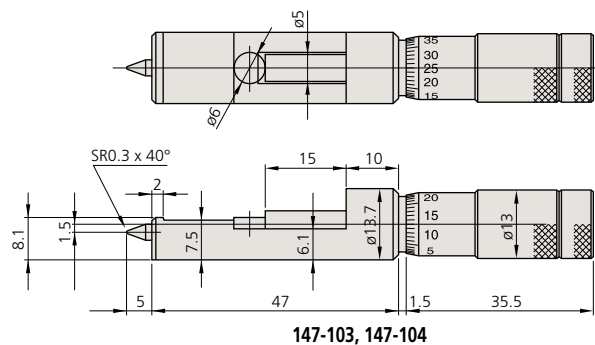


147-202  
147-201



### DIMENSION

Unit: mm







# Digit Outside Micrometers

## SERIES 193

### FEATURES

- Mechanical digit counter with 0.01mm 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:  $(2+R/100)\mu\text{m}$ , 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

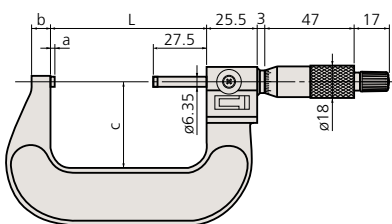
Range	Order No.	Assortment of micrometers
0 - 75mm (3 pcs./set)	<b>193-901</b>	• 193-101, 193-102, 193-103 • 2 micrometer standards
0 - 100mm (4 pcs./set)	<b>193-902</b>	• 193-101, 193-102, 193-103, 193-104 • 3 micrometer standards
0 - 150mm (6 pcs./set)	<b>193-908</b>	• 193-101, 193-102, 193-103, 193-104,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

#### Inch Micrometer set

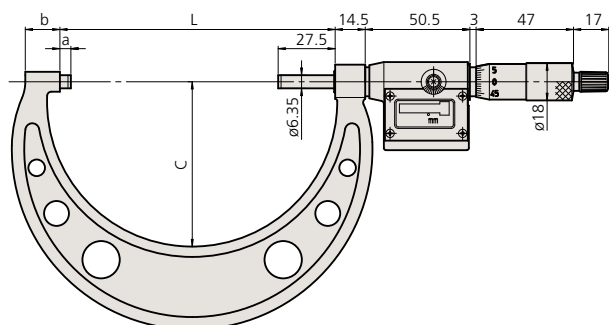
Range	Order No.	Assortment of micrometers
0 - 3" (3 pcs./set)	<b>193-923</b>	• 193-211, 193-212, 193-213 • 2 micrometer standards
0 - 6" (6 pcs./set)	<b>193-930</b>	• 193-211, 193-212, 193-213, 193-214, 193-415, 193-416 • 5 micrometer standards

### 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

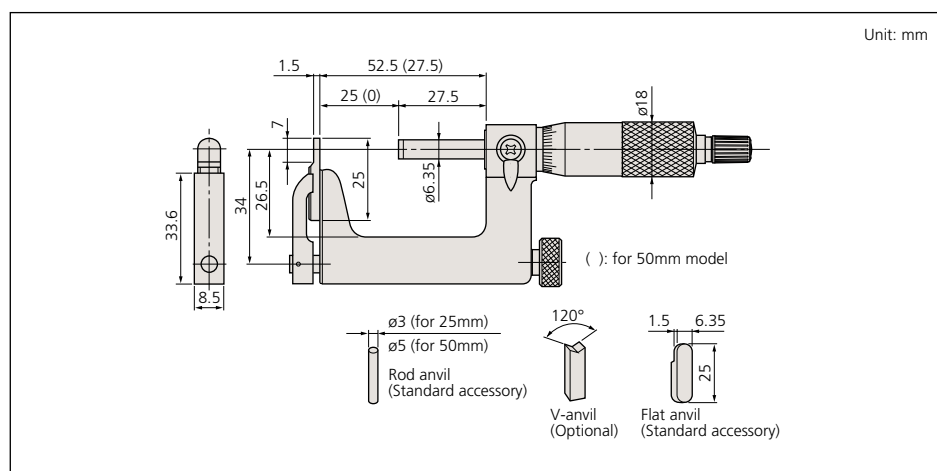
Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	<b>117-101</b>	$\pm 4\mu\text{m}$
25 - 50mm	<b>117-102</b>	$\pm 4\mu\text{m}$

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



SPC



IP65

(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.



### 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



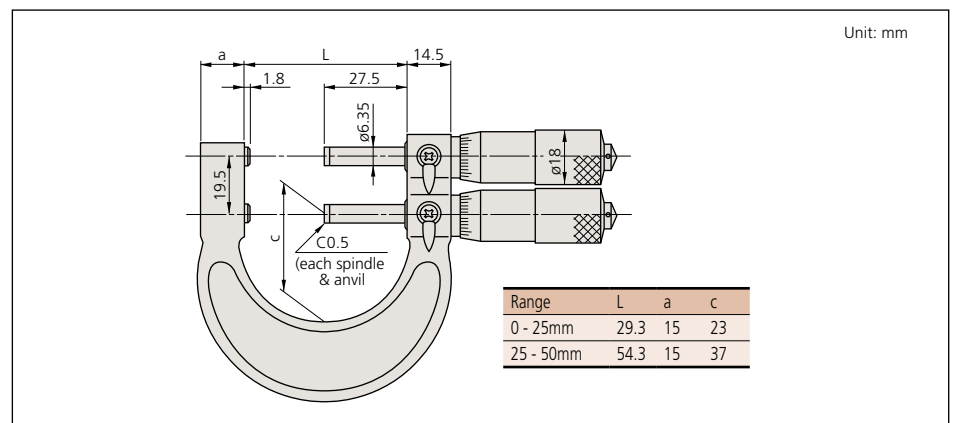
113-102

### 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"

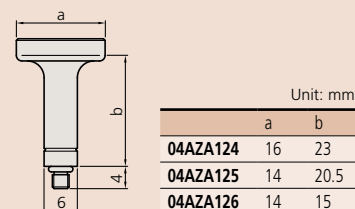


### Technical Data

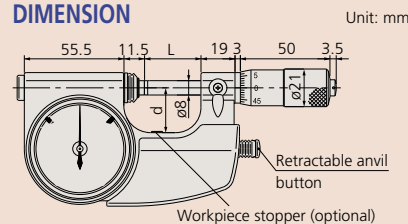
Spindle feed error: 3μm  
 Dial indication accuracy: 1μm  
 Dispersion of indication: 0.4μm  
 Graduation: 0.001mm or .0001"  
 Dial reading: 0.001mm or .00005"  
 Flatness: 0.3μm  
 Parallelism: 0.6μm for models up to 50mm  
 1μm for models over 50mm  
 Measuring force: 5 - 10N (500 - 1000gf)  
 Measuring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

### Optional Accessory

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



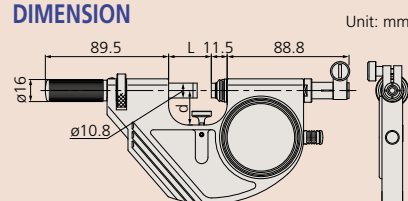
### DIMENSION



### 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

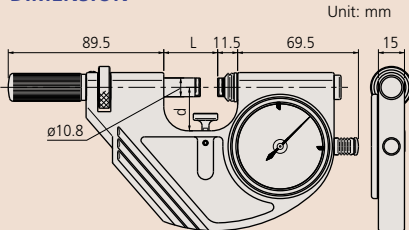




### Technical Data

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

# Dial Snap Meters

## SERIES 523

### 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	523-121	±0.060mm
25 - 50mm	523-122	±0.060mm
50 - 75mm	523-123	±0.060mm
75 - 100mm	523-124	±0.060mm

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

### Technical Data

Accuracy: ±2.5μm for up to ±50μm range  
 ±5μm for ±50μm to ±150μm range  
 (including dispersion of indication)  
 Dial reading: 0.005mm  
 Flatness: 0.3μm  
 Parallelism: 1.3μm for models up to 150mm  
 1.6μm for models over 150mm  
 Measuring force: 5 - 15N (500 - 1500gf)  
 Measuring faces: Carbide tipped

# Dial Snap Meters

## SERIES 523

### FEATURES

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



523-105

### SPECIFICATIONS

Metric		
Range	Order No.	Indicating range
100 - 125mm	523-105	±0.15mm
125 - 150mm	523-106	±0.15mm
150 - 175mm	523-113	±0.15mm
175 - 200mm	523-114	±0.15mm



# 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.



121-145



### 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)

### SPECIFICATION

Metric		
Range	Order No.	Accuracy
0 - 50mm	<b>121-145</b>	$\pm 2\mu\text{m}$

Excluding quantizing error

Inch/Metric		
Range	Order No.	Accuracy
0 - 2"	<b>121-155</b>	$\pm .0001"$

Excluding quantizing error

# Groove Micrometers

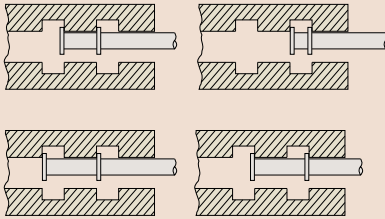
## SERIES 146

### 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	<b>146-121</b>	$\phi 6.35\text{mm}$
		<b>146-122</b>	$\phi 12.7\text{mm}$
25 - 50mm	26.5 - 51.5mm	<b>146-123</b>	$\phi 12.7\text{mm}$
50 - 75mm	51.5 - 76.5mm	<b>146-124</b>	$\phi 12.7\text{mm}$
75 - 100mm	76.5 - 101.5mm	<b>146-125</b>	$\phi 12.7\text{mm}$

#### Inch Rotating spindle type

Range Outside	Range Inside	Order No.	Flange
0 - 1"	.055" - 1.05"	<b>146-131</b>	$\phi .25"$
		<b>146-132</b>	$\phi .5"$
1" - 2"	1.05" - 2.05"	<b>146-133</b>	$\phi .5"$
2" - 3"	2.05" - 3.05"	<b>146-134</b>	$\phi .5"$
3" - 4"	3.05" - 4.05"	<b>146-135</b>	$\phi .5"$

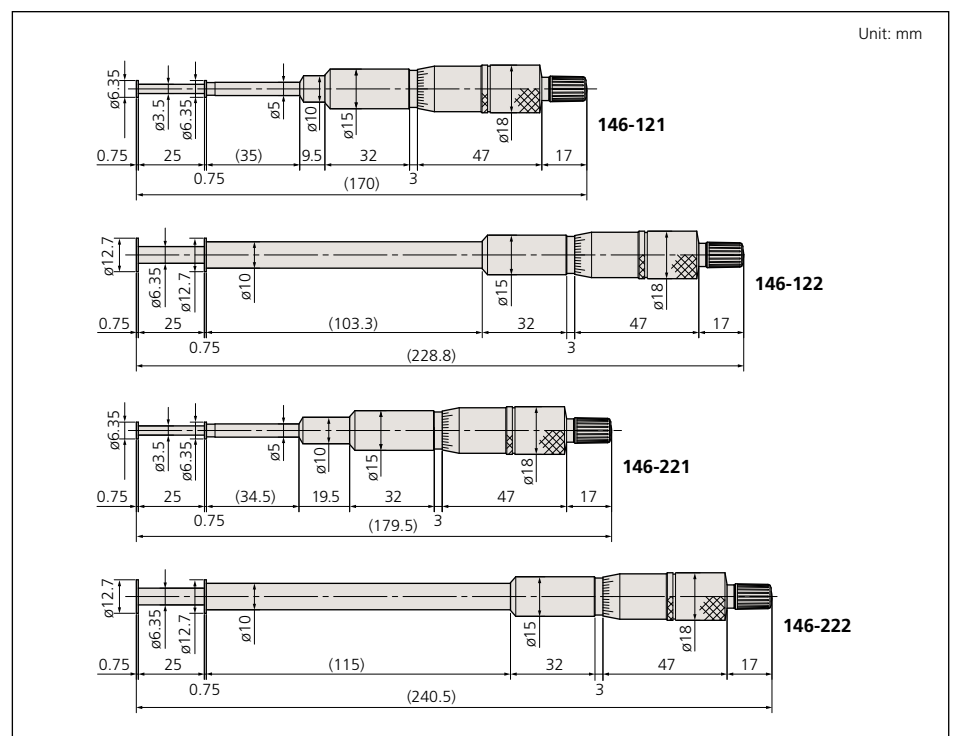
#### Metric Non-rotating spindle type

Range Outside	Range Inside	Order No.	Flange
0 - 25mm	1.6 - 26.5mm	<b>146-221</b>	$\phi 6.35\text{mm}$
		<b>146-222</b>	$\phi 12.7\text{mm}$
25 - 50mm	26.5 - 51.5mm	<b>146-223</b>	$\phi 12.7\text{mm}$
50 - 75mm	51.5 - 76.5mm	<b>146-224</b>	$\phi 12.7\text{mm}$
75 - 100mm	76.5 - 101.5mm	<b>146-225</b>	$\phi 12.7\text{mm}$

#### Inch Non-rotating spindle type

Range Outside	Range Inside	Order No.	Flange
0 - 1"	.055" - 1.05"	<b>146-231</b>	$\phi .25"$
		<b>146-232</b>	$\phi .5"$
1" - 2"	1.05" - 2.05"	<b>146-233</b>	$\phi .5"$
2" - 3"	2.05" - 3.05"	<b>146-234</b>	$\phi .5"$
3" - 4"	3.05" - 4.05"	<b>146-235</b>	$\phi .5"$

### 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

### SPECIFICATIONS

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

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

### Technical Data

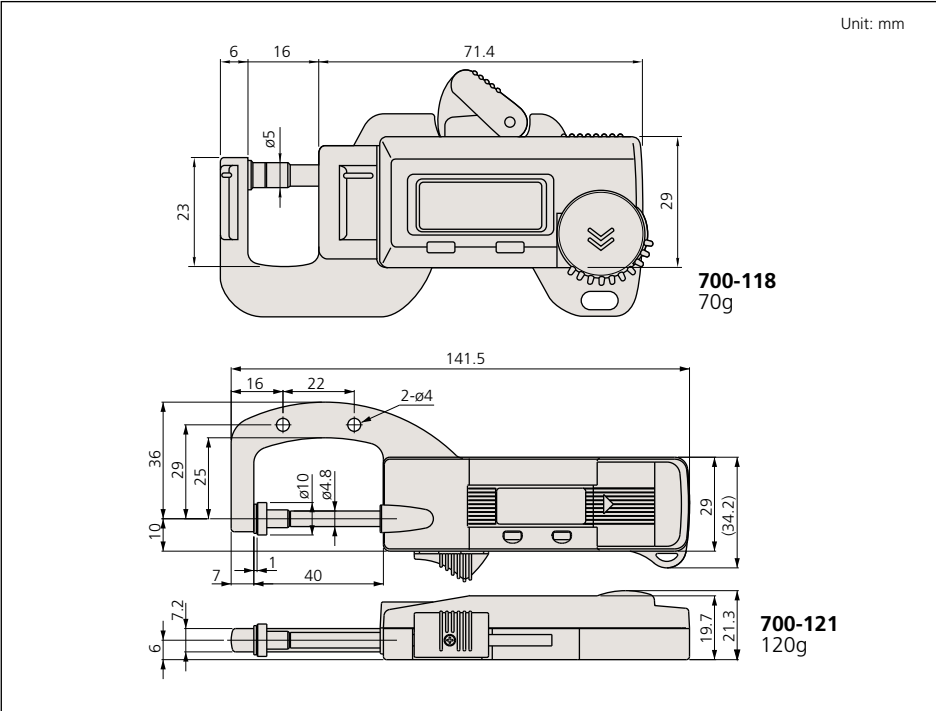
Accuracy: Refer to the list of specifications.  
 Resolution: 0.01mm or .0005"/0.01mm  
 Display: LCD  
 Battery: SR44 (1 pc.), **938882**  
 Battery life: Approx. 2 years under normal use

### Function

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



### DIMENSION AND MASS



# Small Hole Gage Set

## SERIES 154

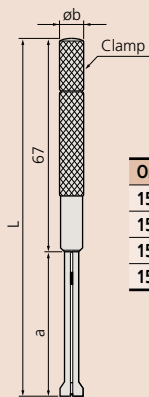
### FEATURES

- 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	102.8	35	8.5
154-104 / 108	108	40	8.5

### SPECIFICATIONS

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

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

# Telescoping Gage Set

## SERIES 154

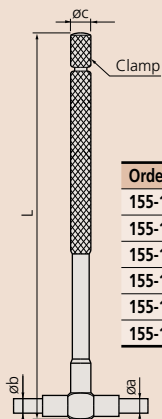
### FEATURES

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



155-905

### DIMENSION



Unit: mm

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

### SPECIFICATIONS

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

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

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

# Color Ratchet & Color Speeder

Color ratchet



### SPECIFICATIONS

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

\*for 293 series digital model

Color speeder for Ratchet Thimble Micrometer



### SPECIFICATIONS

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

# Spindle Attachment Tip



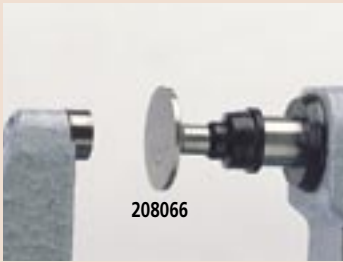
### DIMENSION

Order No.	Dimension
208062	
208063	
208064	

Order No.	Dimension
208065	
208066	

### Technical Data

Tip length: 10mm ±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.



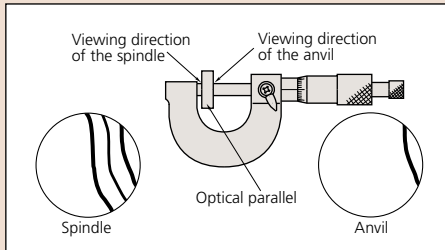
### Technical Data

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)
Range of micrometer to be checked		
0-25mm	<b>157-903</b>	12.00, 12.12, 12.25, 12.37mm
25-50mm	<b>157-904</b>	25.00, 25.12, 25.25, 25.37mm

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

# Optical Flats

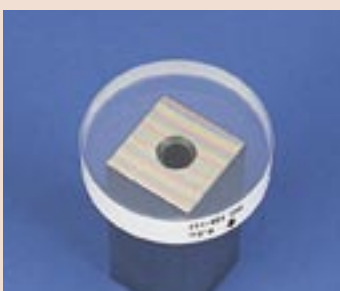
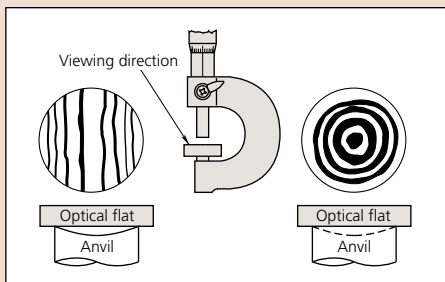
## SERIES 158

### FEATURES

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



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



### SPECIFICATIONS

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

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

# Micrometer Standards

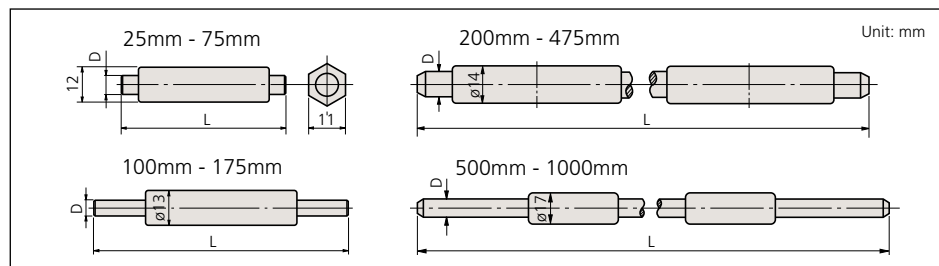
## SERIES 167

### 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	±10μm
475mm	167-119	9.4mm	±10.5μm
500mm	167-120	11.9mm	±11μm
525mm	167-121	11.9mm	±11.5μm
550mm	167-122	11.9mm	±12μm
575mm	167-123	11.9mm	±12.5μm
600mm	167-124	11.9mm	±13μm
625mm	167-125	11.9mm	±13.5μm
650mm	167-126	11.9mm	±14μm
675mm	167-127	11.9mm	±14.5μm
700mm	167-128	11.9mm	±15μm
725mm	167-129	11.9mm	±15.5μm
750mm	167-130	11.9mm	±16μm
775mm	167-131	11.9mm	±16.5μm
800mm	167-132	11.9mm	±17μm
825mm	167-133	11.9mm	±17.5μm
850mm	167-134	11.9mm	±18μm
875mm	167-135	11.9mm	±18.5μm
900mm	167-136	11.9mm	±19μm
925mm	167-137	11.9mm	±19.5μm
950mm	167-138	11.9mm	±20μm
975mm	167-139	11.9mm	±20.5μm
1000mm	167-140	11.9mm	±21μm

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"	±10μm
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

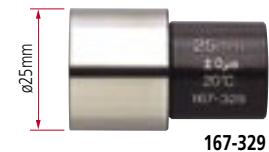
Accuracy: Refer to the list of specifications.  
Thread angle: 55° or 60°

# 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

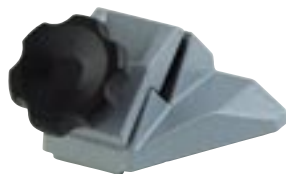
#### Technical Data

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

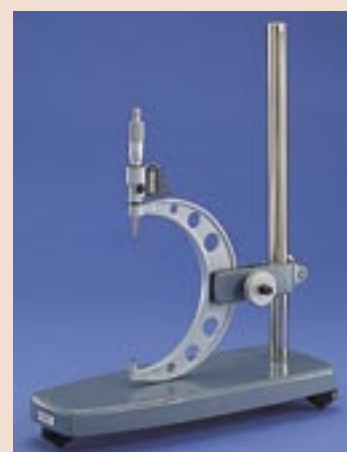
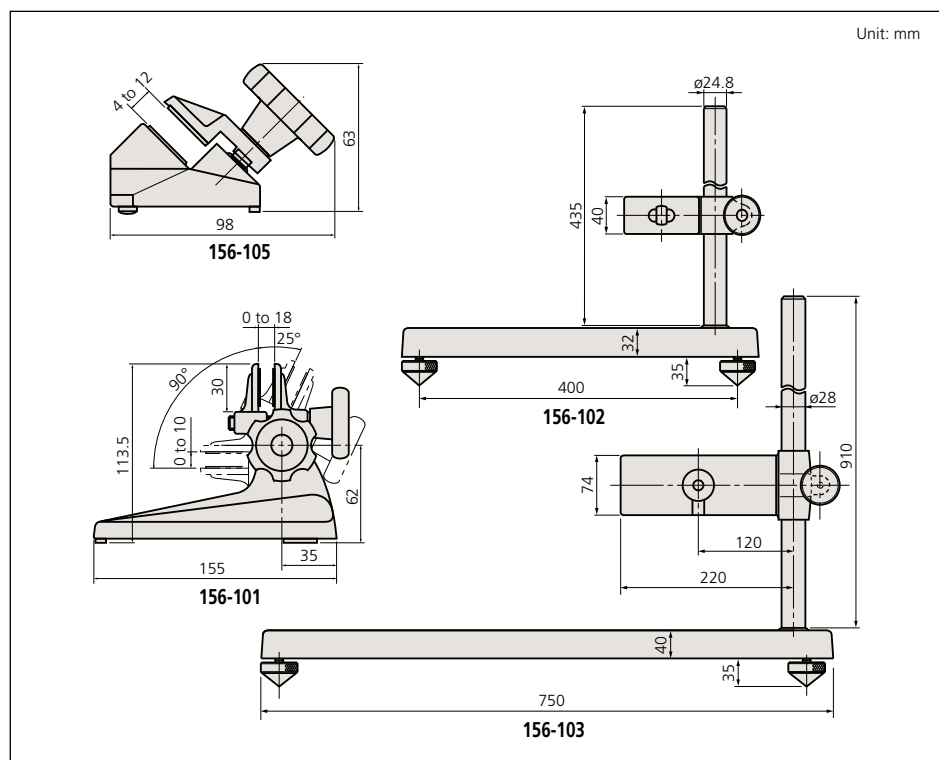


156-102

## SPECIFICATIONS

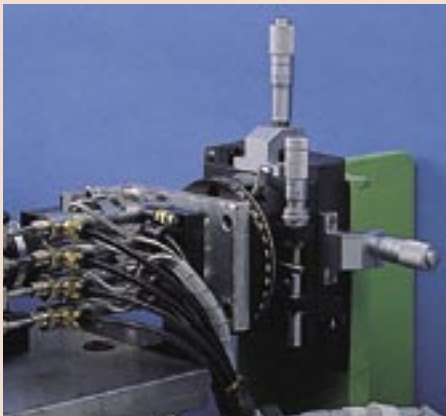
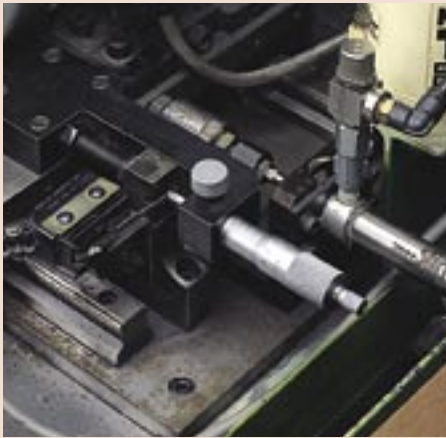
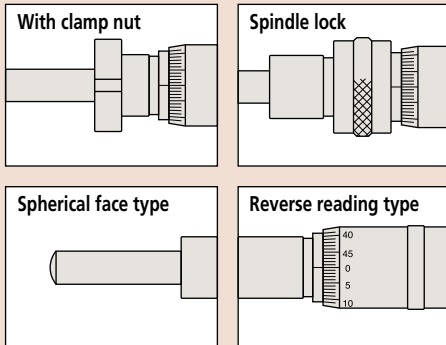
Micrometer ranges	Order No.	Remarks
0-25mm (0-1"), 25-50mm (1"-2")	<b>156-105</b>	Fixed angle type
Up to 100mm (4")	<b>156-101</b>	Adjustable angle type
125-300mm (5"-12")	<b>156-102</b>	Vertical type
300-1000mm (12"-40")	<b>156-103</b>	Vertical type

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

\*IP65 dust/water protection type

## SPECIFICATIONS: Series 164

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

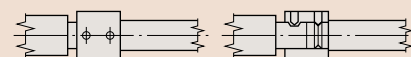
SPC

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.
350-251	±2μm	10mm / .375"
350-252	±2μm	10mm / .375"
350-253	±2μm	10mm / .375"
350-254	±2μm	10mm / .375"
350-271	—	12mm**
350-272	—	12mm
350-273	—	12mm**
350-274	—	12mm
350-281	±2μm	12mm / .5"
350-282	±2μm	12mm / .5"
350-283	±2μm	12mm / .5"
350-284	±2μm	12mm / .5"
350-261	±2μm	12mm / .5"
164-171	±2μm	18mm / .71"
164-161	±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)\*

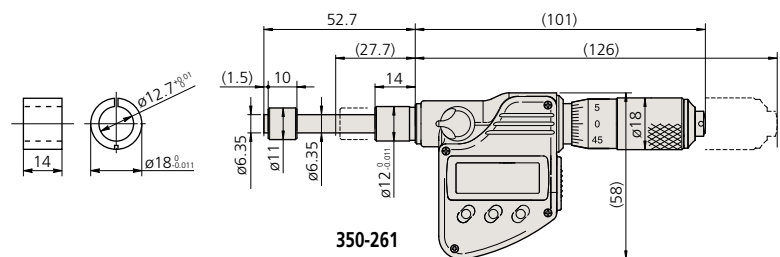
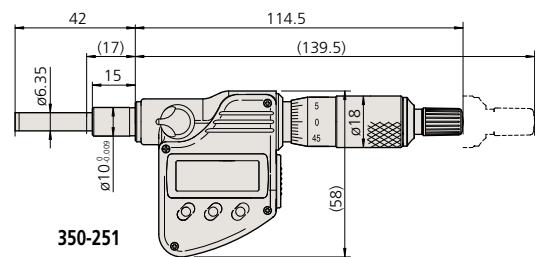
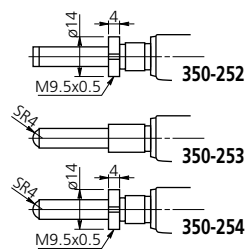
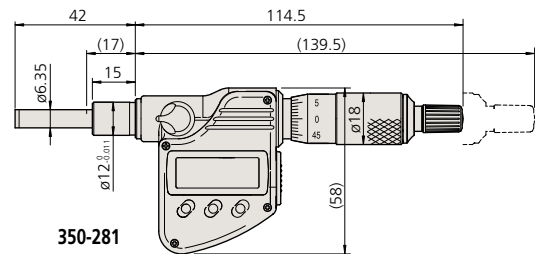
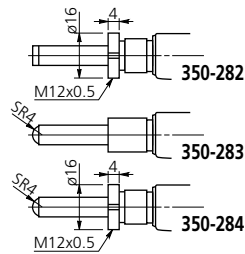
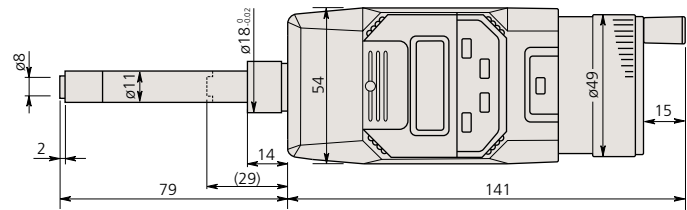
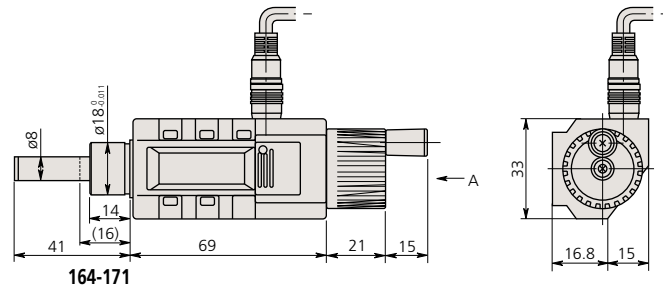
937387: SPC cable for series 164 (1m)

965013: SPC cable for series 164 (2m)

\*for series 350

## DIMENSION

Unit: mm



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

# ABSOLUTE Digimatic Micrometer Heads

SERIES 227 — with constant & adjustable fine-loading device

## FEATURES

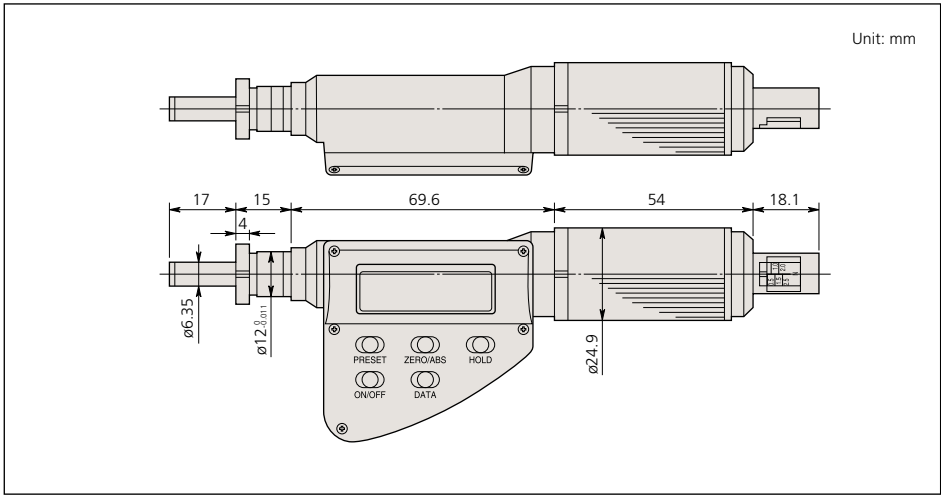
- Constant and low measuring force mechanism (adjustable: 0.5N - 2.5N or 2N - 10N) in the thimble.
- Non-rotating spindle.
- Speedy spindle feed of 10mm/rev.
- With ABSOLUTE linear encoder.



## SPECIFICATIONS

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

## DIMENSION



SPC

ABSOLUTE<sup>®</sup>  
Absolute System Patented by MITUTOYO

(Refer to the page 9 for details.)

## Technical Data

Accuracy and stem diameter:

Order No.	Accuracy*	Stem dia.
227-241	±2μm	12mm
227-242	±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)

## 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
<b>148-143</b>	—	±2μm
<b>148-342</b>	—	±2μm
<b>148-343</b>	—	±2μm
<b>148-242</b>	—	±5μm
<b>148-243</b>	—	±5μm

## Spindle pitch



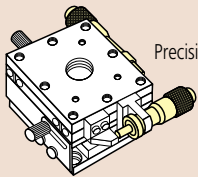
Screw Thread  
pitch= 0.1mm



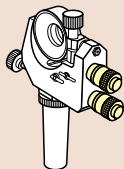
Screw Thread  
pitch= 0.5mm

## Applications

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

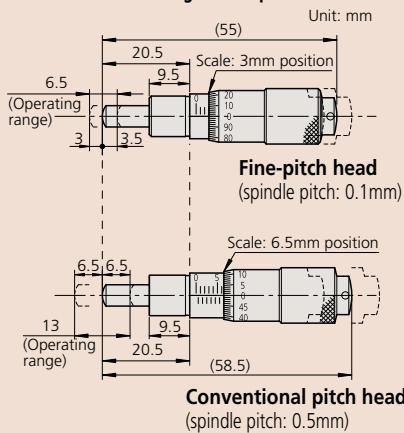


Precision X-Y table positioning



Precision adjustment of mirror in 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.

# Micrometer Heads

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

## FEATURES

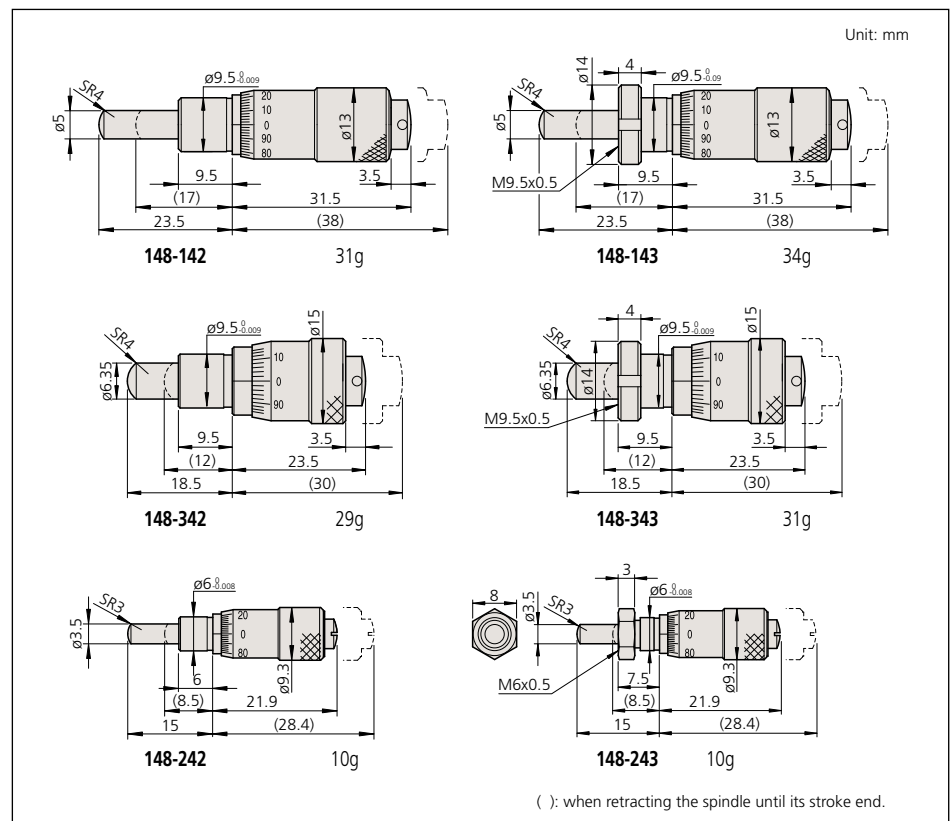
- Fine spindle feeding of just 0.1mm/rev for extra-fine adjustment and positioning.
- External dimensions are compatible with conventional 0.5mm pitch heads.



## 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

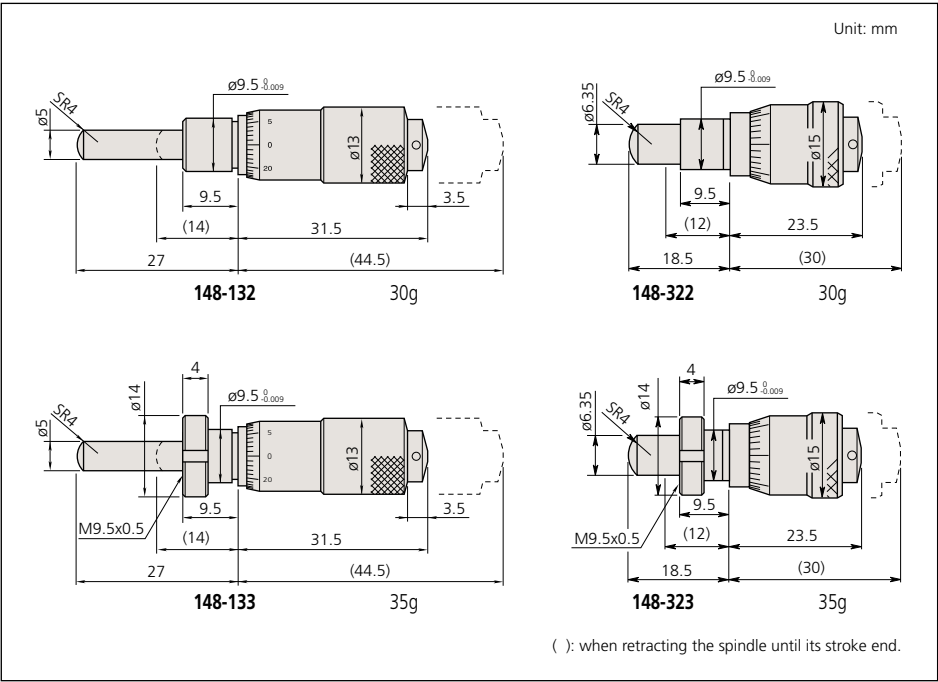
Metric		Inch				
Range	Order No.	Range	Order No.	Stem	Spindle face	Remarks
13mm	148-132	—	—	Plain	Spherical (SR4)	—
13mm	148-133	—	—	w/ clamp nut	Spherical (SR4)	—
6.5mm	148-322	—	—	Plain	Spherical (SR4)	—
6.5mm	148-323	—	—	w/ clamp nut	Spherical (SR4)	—

### 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.
148-215	±5μm	3.5mm / .156"
148-216	±5μm	3.5mm / .156"
148-201	±5μm	6mm / .25"
148-203	±5μm	6mm / .25"
148-205	±5μm	6mm / .25"
148-207	±5μm	6mm / .25"
148-209	±5μm	6mm / .25"
148-211	±5μm	6mm / .25"

### FEATURES

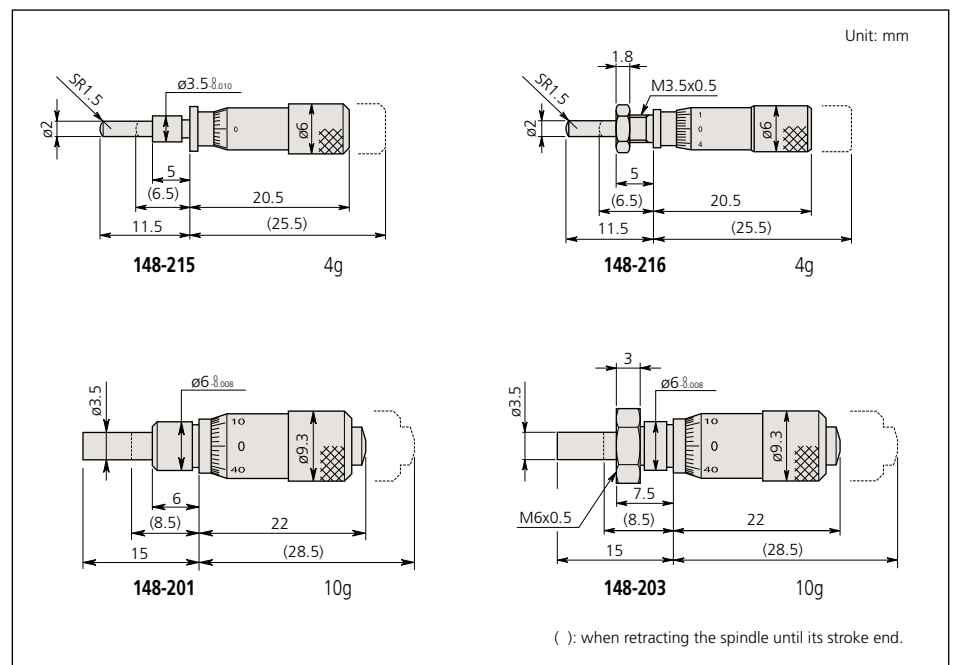
- Miniature micrometer heads for ease of incorporating into machines.



### SPECIFICATIONS

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

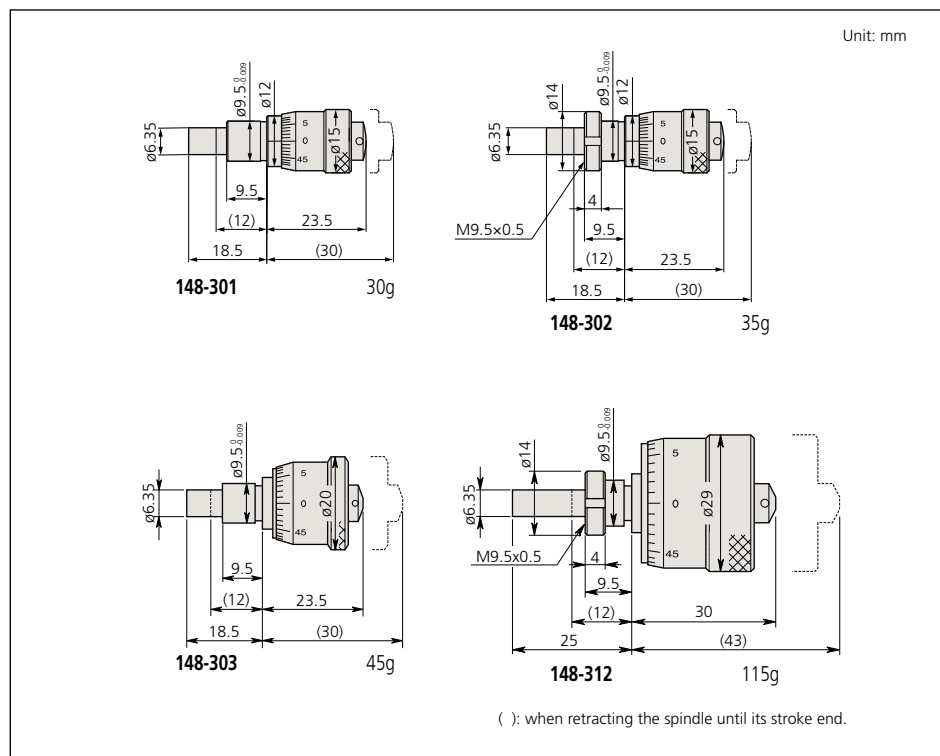
Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
6.5mm	148-301	.25"	148-351	Plain	Flat	15mm / .59" thimble dia.
6.5mm	148-302	.25"	148-352	w/ clamp nut	Flat	15mm / .59" thimble dia.
6.5mm	148-303	.25"	148-353	Plain	Flat	20mm / .79" thimble dia.
6.5mm	148-304	.25"	148-354	w/ clamp nut	Flat	20mm / .79" thimble dia.
6.5mm	148-305	.25"	148-355	Plain	Flat	29mm / 1.14" thimble dia.
6.5mm	148-306	.25"	148-356	w/ clamp nut	Flat	29mm / 1.14" thimble dia.
13mm	148-307	.5"	148-357	Plain	Flat	15mm / .59" thimble dia.
13mm	148-308	.5"	148-358	w/ clamp nut	Flat	15mm / .59" thimble dia.
13mm	148-309	.5"	148-359	Plain	Flat	20mm / .79" thimble dia.
13mm	148-310	.5"	148-360	w/ clamp nut	Flat	20mm / .79" thimble dia.
13mm	148-311	.5"	148-361	Plain	Flat	29mm / 1.14" thimble dia.
13mm	148-312	.5"	148-362	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.
148-301	±2μm	9.5mm / .375"
148-302	±2μm	9.5mm / .375"
148-303	±2μm	9.5mm / .375"
148-304	±2μm	9.5mm / .375"
148-305	±2μm	9.5mm / .375"
148-306	±2μm	9.5mm / .375"
148-307	±2μm	9.5mm / .375"
148-308	±2μm	9.5mm / .375"
148-309	±2μm	9.5mm / .375"
148-310	±2μm	9.5mm / .375"
148-311	±2μm	9.5mm / .375"
148-312	±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

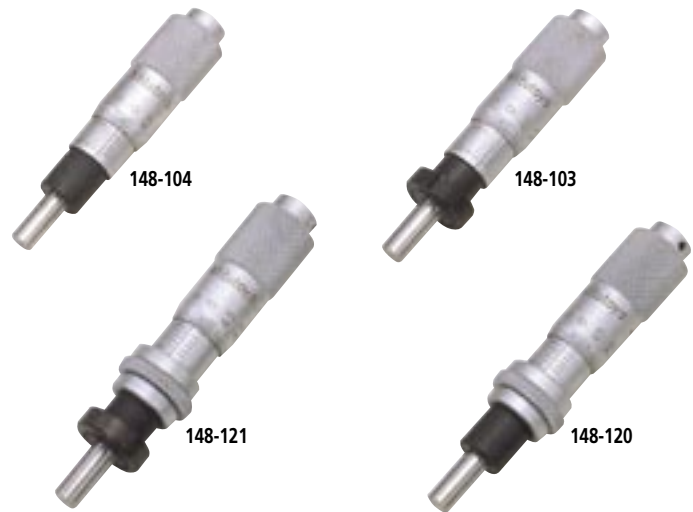
Scale surface: Hard-chrome plating

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

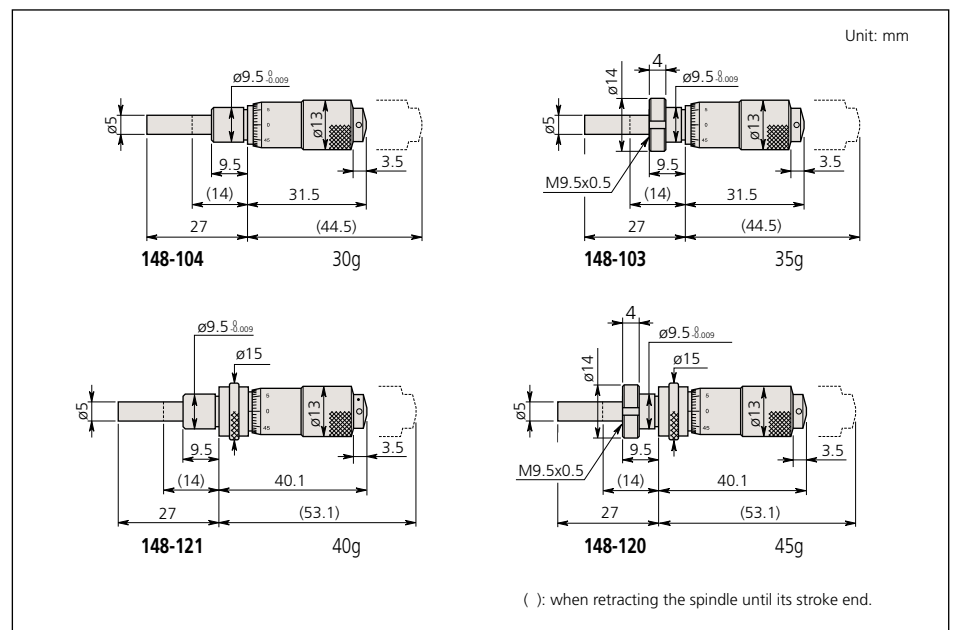


### SPECIFICATIONS

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

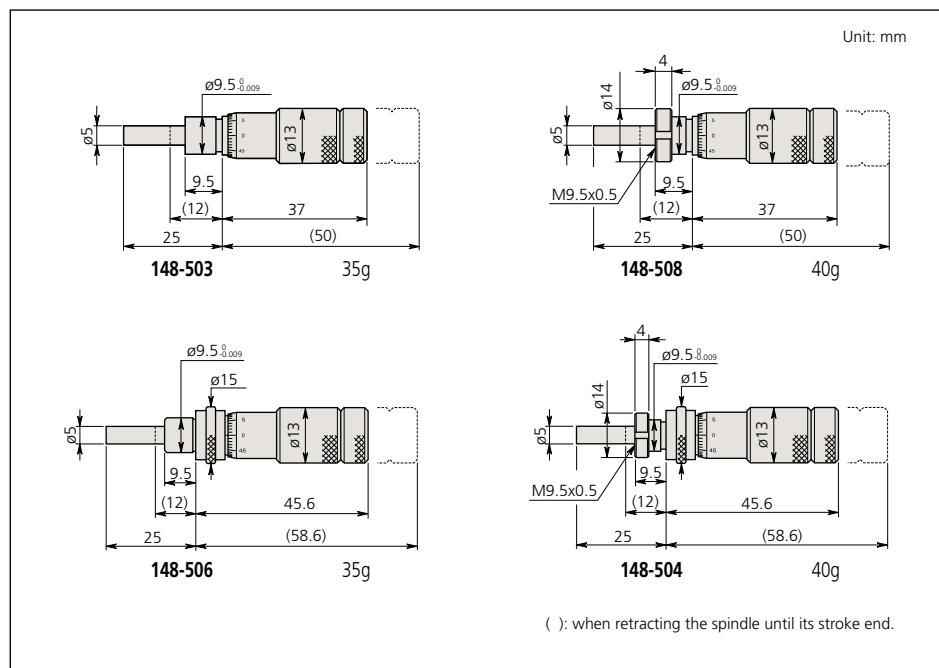
Order No.	Accuracy	Stem dia.
148-503	±2μm	9.5mm / .375"
148-513	±2μm	9.5mm / .375"
148-508	±2μm	9.5mm / .375"
148-506	±2μm	9.5mm / .375"
148-504	±2μm	9.5mm / .375"
148-853	±2μm	9.5mm / .375"
148-854	±2μm	9.5mm / .375"
148-863	±2μm	9.5mm / .375"
148-864	±2μm	9.5mm / .375"

### 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

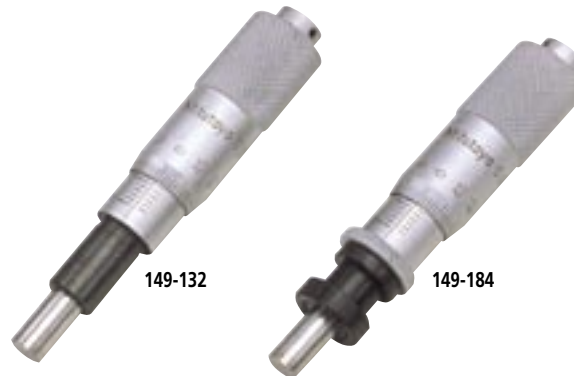
Graduations: 0.01mm or .001"  
 Spindle pitch: 0.5mm or .025"  
 Spindle face: Flat with carbide tip (more than HRA90) or spherical, lapped surface  
 Scale surface: Hard-chrome plating  
 Fixture thickness for clamp nut: 6mm  
 (11.5mm: **149-131, 149-147, 149-802, 149-812, 149-822, 149-832**)

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.

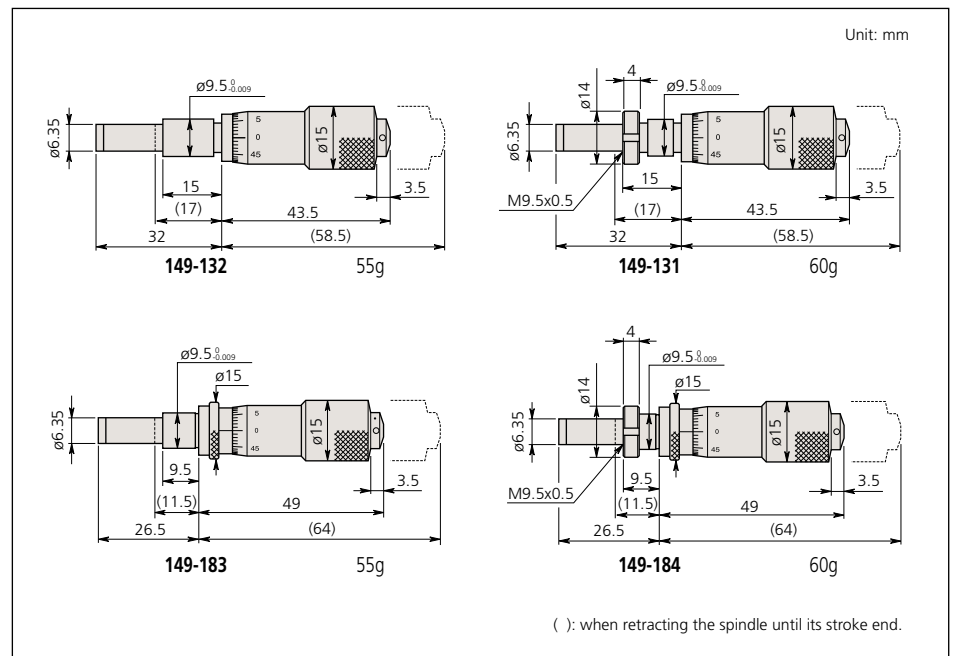


### SPECIFICATIONS

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).

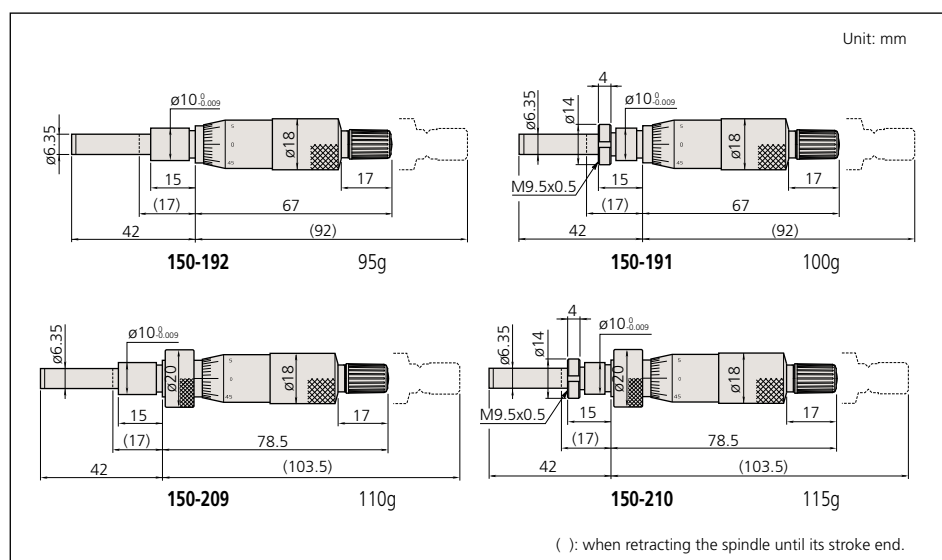


### SPECIFICATIONS

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

\*with spindle lock

### DIMENSION AND MASS



### 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.	Accuracy	Stem dia.
150-192	±2μm	10mm / .375"
150-191	±2μm	10mm / .375"
150-209	±2μm	10mm / .375"
150-210	±2μm	10mm / .375"
150-801	±2μm	10mm / .375"
150-802	±2μm	10mm / .375"
150-821	±2μm	10mm / .375"
150-822	±2μm	10mm / .375"
150-190	±2μm	10mm / .375"
150-189	±2μm	10mm / .375"
—	±2μm	10mm / .375"
—	±2μm	10mm / .375"
150-196	±2μm	10mm / .375"
150-195	±2μm	10mm / .375"
150-211	±2μm	10mm / .375"
150-212	±2μm	10mm / .375"
150-219	±2μm	10mm / .375"
150-220	±2μm	10mm / .375"



# 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

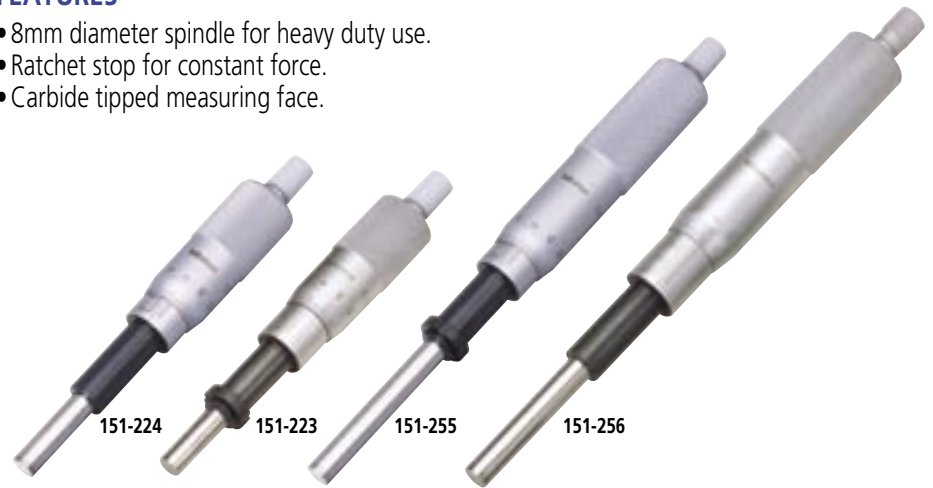
Accuracy and stem diameter

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.

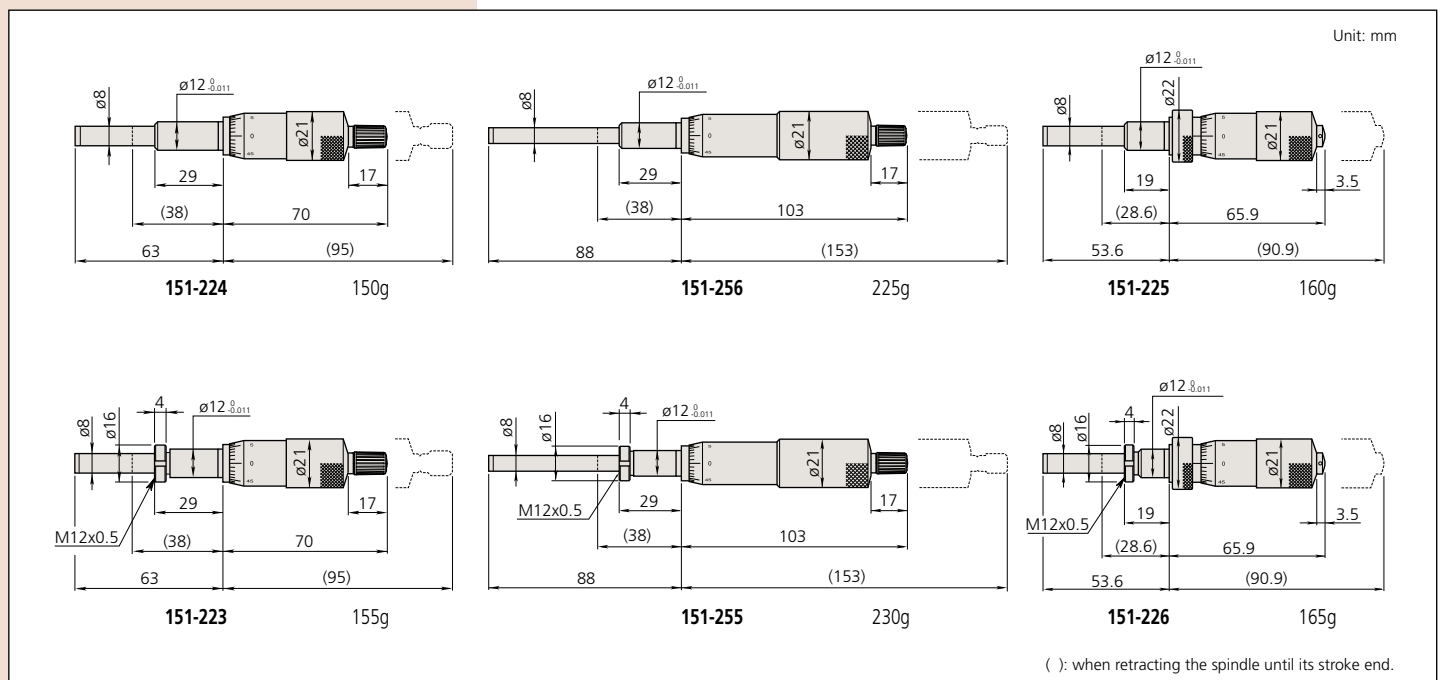


### SPECIFICATIONS

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

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 153 — Non-Rotating Spindle Type

### FEATURES

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



### SPECIFICATIONS

Metric		Inch				
Range	Order No.	Range	Order No.	Stem	Spindle face	Remarks
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")

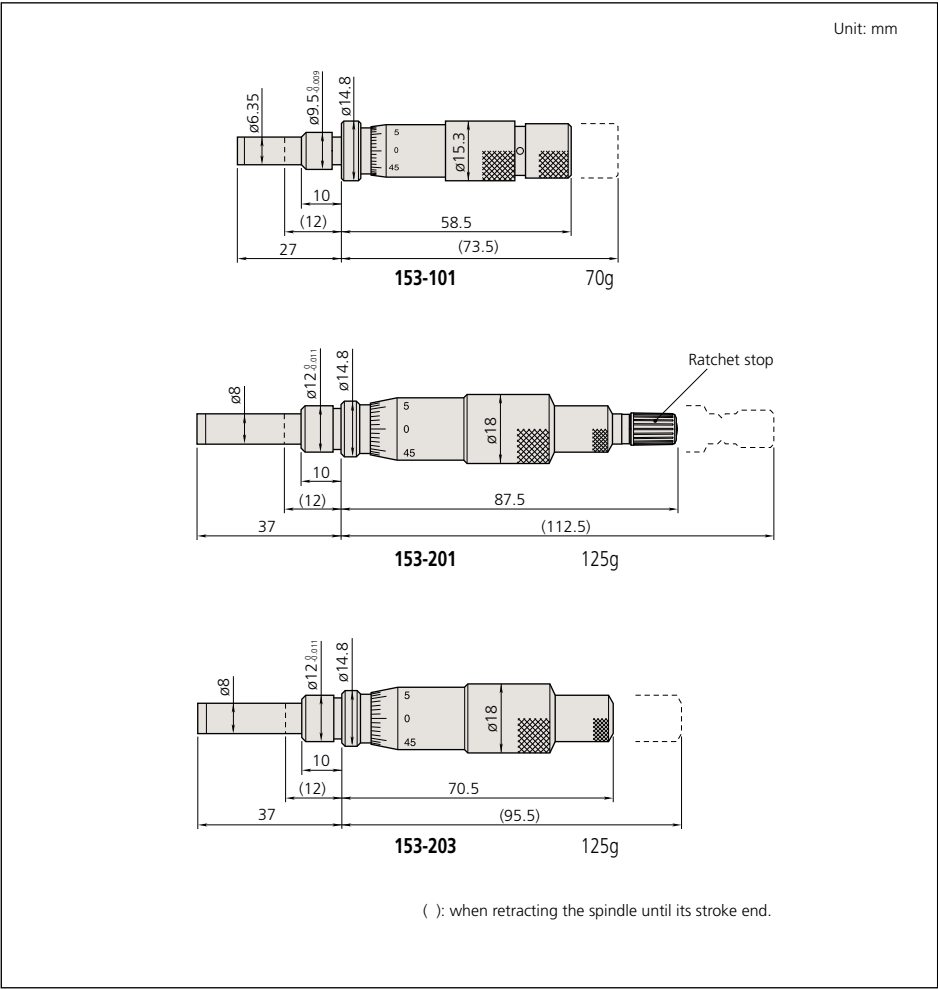
\*with ratchet stop

### 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.		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"

### 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.
152-101	±2μm	12mm / .5"
152-102	±2μm	12mm / .5"
152-103	±4μm	12mm / .5"

### FEATURES

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

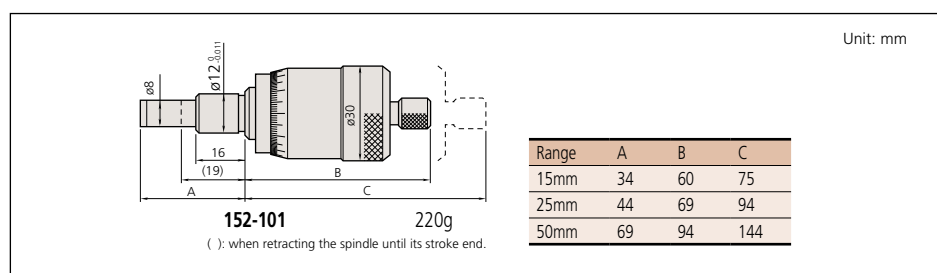


152-102

### SPECIFICATIONS

Metric	Inch	Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.	
15mm	152-101	.5"	152-110	Plain
25mm	152-102	1"	152-111	Plain
50mm	152-103	2"	152-112	Plain

### DIMENSION AND MASS



# Micrometer Heads

## SERIES 152 — Large Thimble Type for Fine Feeding

### FEATURES

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

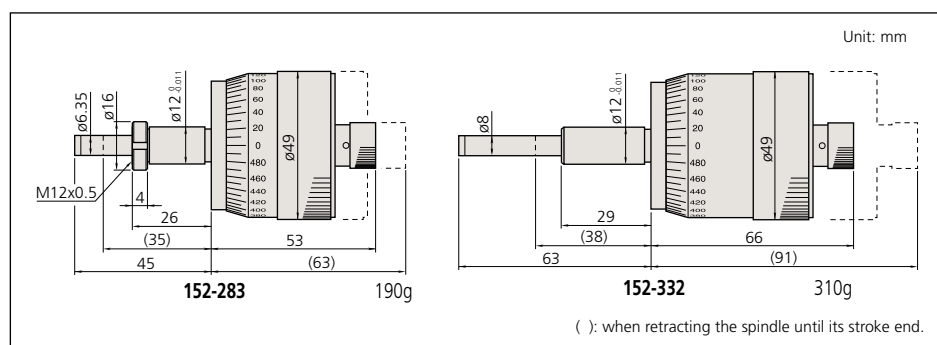


152-283

### SPECIFICATIONS

Metric	Inch	Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.	
10mm	152-283	—	—	w/ clamp nut
25mm	152-332	—	—	Plain
25mm	152-348	1"	152-372	Plain
50mm	152-380	2"	152-388	Plain

### 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.
152-283	±2μm	12mm
152-332	±2μm	12mm
152-348	±2μm	12mm / .5"
152-380	±4μm	12mm / .5"

# 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 / .001rev (fine feeding): **110-502, 110-504**
- Carbide tipped measuring face.
- Non-rotating spindle.



### 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

### 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

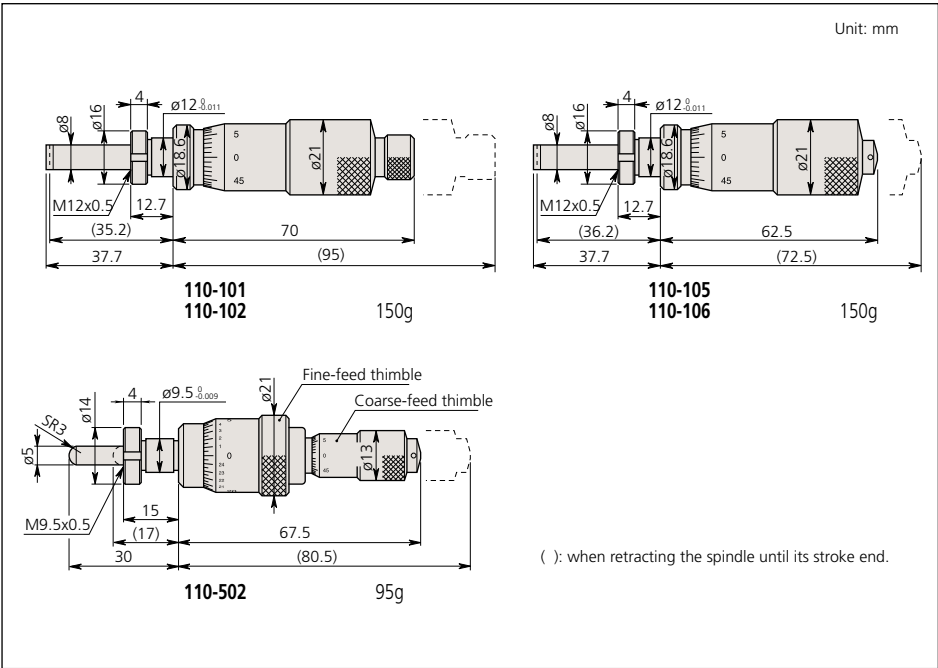
(11.5mm: **110-502, 110-504**)

Accuracy and stem diameter

Order No.		Accuracy*	Stem dia.
<b>110-105</b>	<b>110-115</b>	$\pm 3 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-106</b>	<b>110-116</b>	$\pm 3 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-107</b>	<b>110-117</b>	$\pm 3 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-108</b>	<b>110-118</b>	$\pm 3 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-101</b>	<b>110-111</b>	$\pm 5 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-102</b>	<b>110-112</b>	$\pm 5 / \pm 1.5 \mu\text{m}$	12mm / .5"
<b>110-502</b>	<b>110-504</b>	$\pm 3 / \pm 1.5 \mu\text{m}$	9.5mm / .375"

\*Wide range / narrow 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.
152-390	±2μm	18mm / .709"
152-389	±2μm	18mm / .709"
152-402	±2μm	18mm / .709"
152-401	±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.

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

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

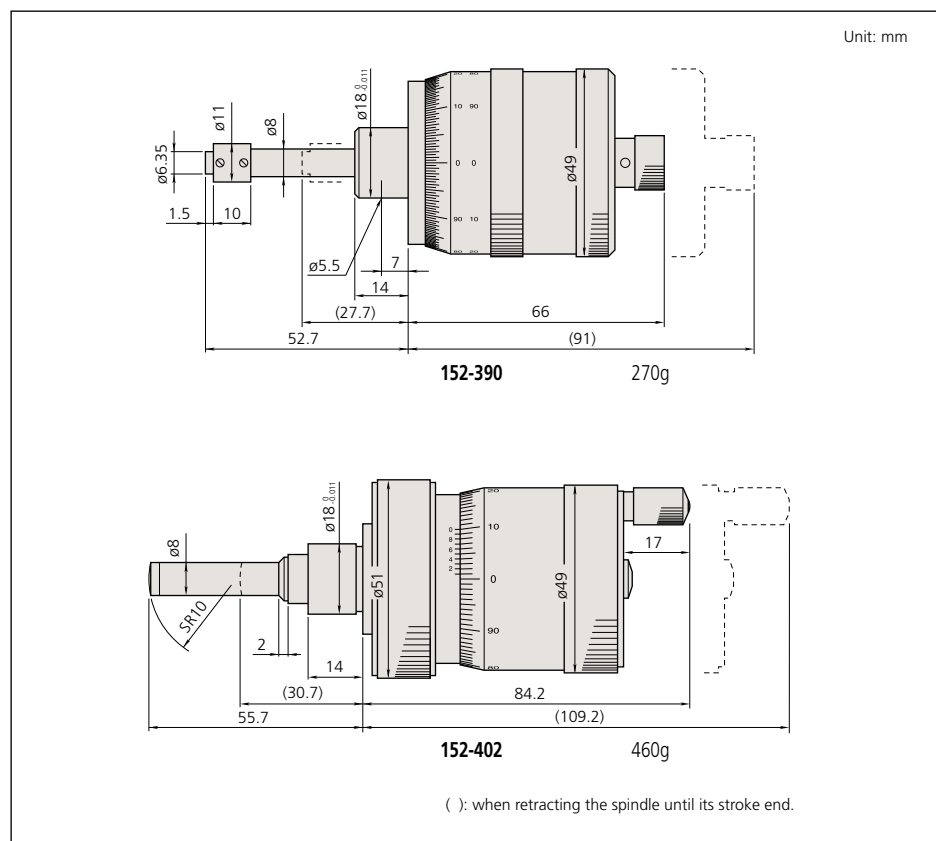


152-390

### SPECIFICATIONS

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

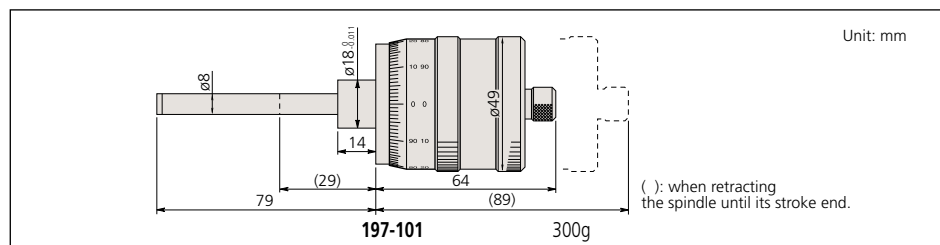


197-101

### 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.

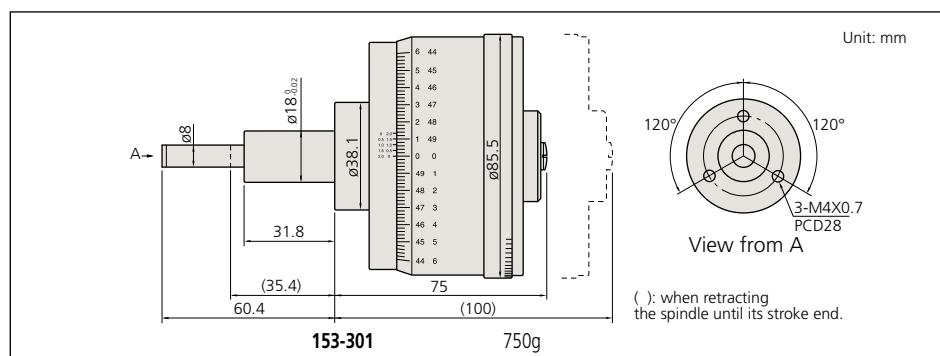


153-301

### 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





(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

# Digital Micrometer Heads

## SERIES 164 — High Resolution and High Accuracy

### 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

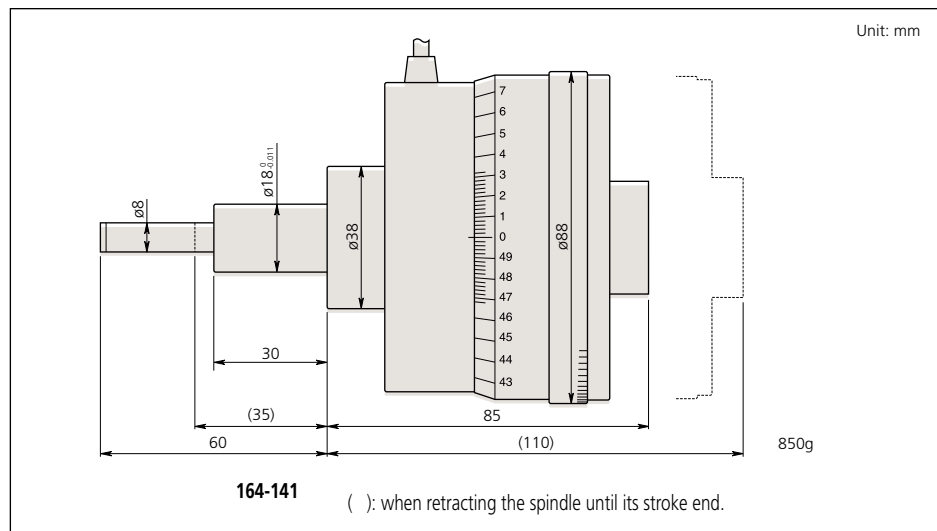


174-173

### SPECIFICATIONS

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

### DIMENSION AND MASS



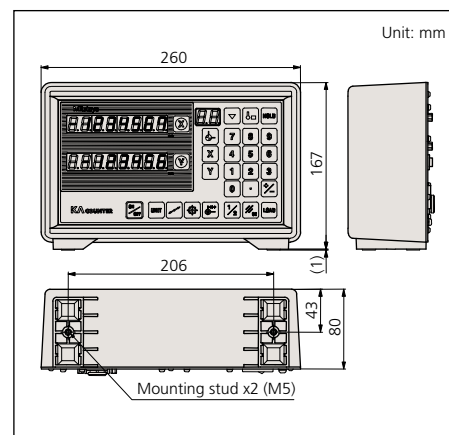
### SPECIFICATIONS: KA counter

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

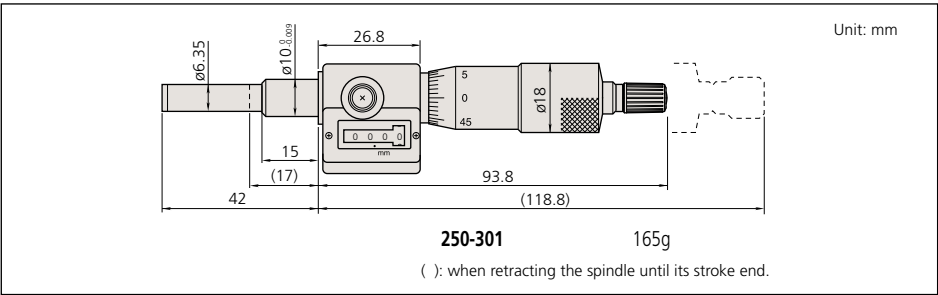
Metric		Inch		Stem	Spindle face	Remarks
Range	Order No.	Range	Order No.			
25mm	250-301	1"	250-312*	Plain	Flat (carbide tip)	Vernier reading

### 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

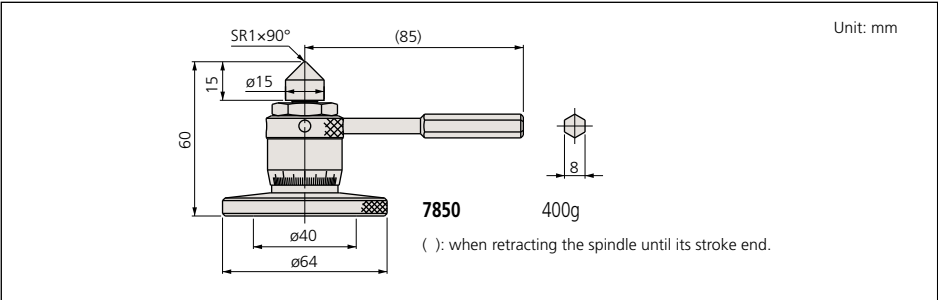
Metric			Inch		
Range	Order No.	Remarks	Range	Order No.	Remarks
60 - 75mm	7850	Max. load: 400kg	2.5" - 3"	7851	Max. load: 400kg

### Technical Data

Graduations: 0.01mm or .001"



### DIMENSION AND MASS

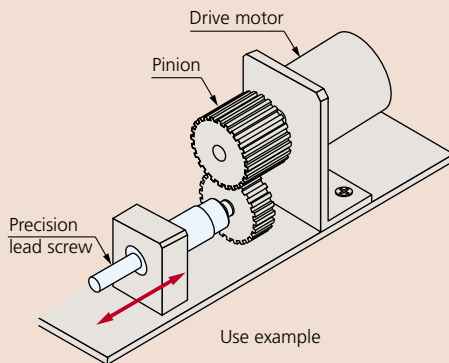


# Precision Lead Screw

## 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



04AZA164

04AZA162

04AZA160

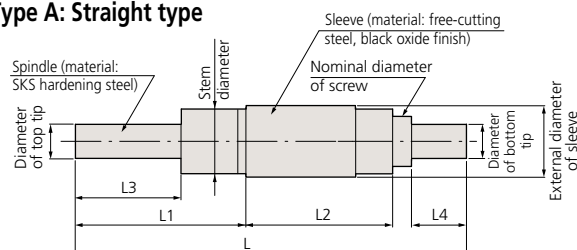
Micrometer Head

## SPECIFICATIONS

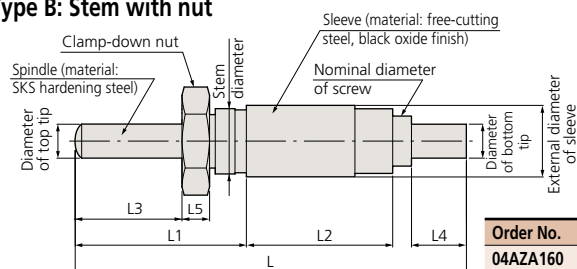
Order No.	04AZA160	04AZA161	04AZA162	04AZA163	04AZA164	04AZA165
Model	AS-6.5	BS-6.5	AS-13	BS-13	AS-25	BS-25
Stroke	6.5		13		25	
Feeding pitch	0.5					
Feeding accuracy	±5μm		±2μm			
Stem diameter	ø6 <sup>+0.008</sup> <sub>-0.008</sub>		ø9.5 <sup>+0.009</sup> <sub>-0.009</sub>		ø10 <sup>+0.009</sup> <sub>-0.009</sub>	
Tip diameter	ø3.5		ø5		ø6.35	
Tail diameter	ø3 <sup>+0.01</sup> <sub>-0.01</sub>		ø5 <sup>+0.012</sup> <sub>-0.012</sub>		ø6 <sup>+0.015</sup> <sub>-0.015</sub>	
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

### Type A: Straight type



### Type B: Stem with nut

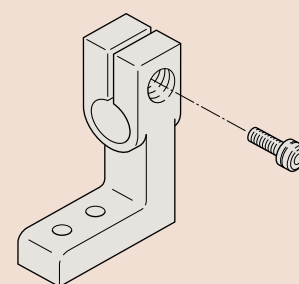
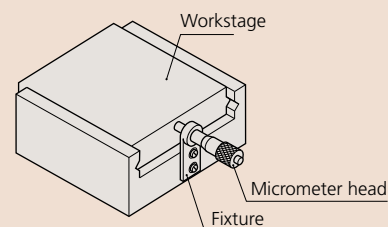


Order No.	L	L1	L2	L3	L4	L5
04AZA160	39	15	14.5	9	6	—
04AZA161	39	15	14.5	7.5	6	3
04AZA162	57.5	25	21.5	15.5	8	—
04AZA163	57.5	25	21.5	15.5	8	4
04AZA164	98.5	42	39.5	27	10	—
04AZA165	98.5	42	39.5	27	10	4

# Fixtures for Micrometer Heads

## FEATURES

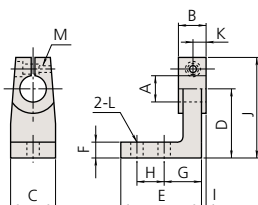
- The act of fabricating brackets to mount micrometer heads for each particular application can be laborious and costly. Mitutoyo offers various types of fixtures for micrometer heads to meet a wide range of applications. These fixtures are made of nickel-plated cast iron.
- There are two types of fixtures for micrometer heads with or without clamping nut on the stem.



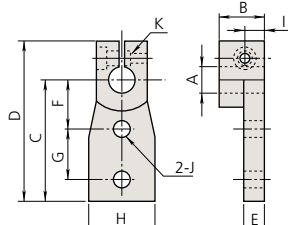
**Note:** Supplied with a socket head screw (M3x0.5x12mm) for the fixtures to be used with a micrometer head without clamp nut (plain stem type micrometer head).

## DIMENSION: Fixtures for plain stem type micrometer heads

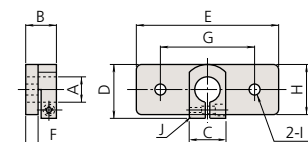
Unit: mm



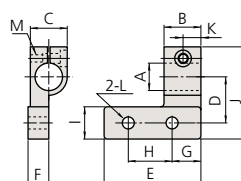
Order No.	303560	303569	303579
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	14.5	19.5	19.5
D	20	30	30
E	23	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	1.5	3.25	3.25
J	32.5	42.5	42.5
K	4.5	7.25	7.25
L	ø3.4	ø4.5	ø4.5
M	M3x0.5	M3x0.5	M3x0.5



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

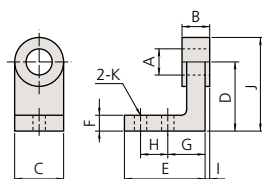


Order No.	303566	303575	303585
A	ø9.5	ø9.5	ø10
B	9	14.5	14.5
C	15	15	15
D	15	20	20
E	25	40	40
F	8.5	8.5	8.5
G	7.5	10	10
H	10	20	20
I	10	15	15
J	32.5	40	40
K	4.5	7.25	7.25
L	ø3.4	ø4.5	ø4.5
M	M3x0.5	M3x0.5	M3x0.5

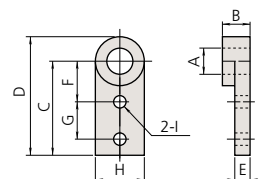


### DIMENSION: Fixtures for micrometer heads with clamp nut

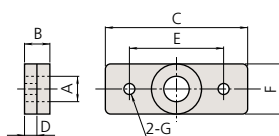
Unit: mm



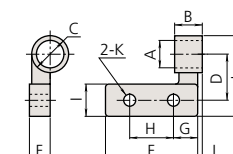
Order No.	303559	303568	303578
A	ø9.5	ø9.5	ø10
B	6	11.5	11.5
C	14.5	19.5	19.5
D	20	30	30
E	24	35	35
F	5	7	7
G	11	16	16
H	8	12	12
I	0.5	1.75	1.75
J	27.5	40	40
K	ø3.4	ø4.5	ø4.5



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

