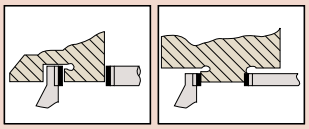
# Outside Micrometers

## SERIES 101

### Technical Data

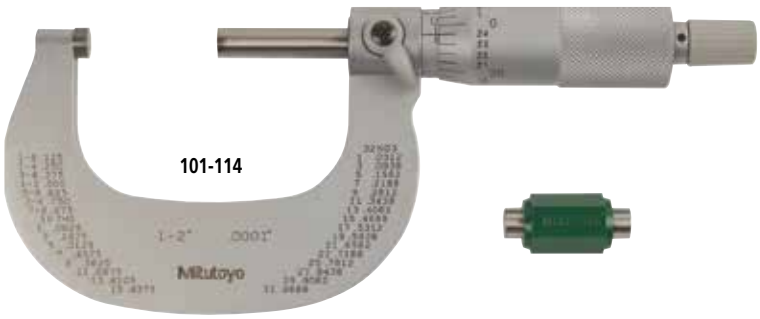
Graduation: .0001"
Flatness: .000024"
Parallelism: .00008" for models up to 3"
.00012" for models over 3"
Measuring faces: Carbide tipped



### FEATURES

- Satin chrome-finished frame, tapered (on the anvil side) for hard-to-reach places.
- With a standard bar except for 0 - 1" models.
- Supplied in fitted plastic case.

101-113



101-114

### SPECIFICATIONS

**Inch** With friction thimble

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0 - 1" | .0001" | **101-117*** | ±.0001" | 180 |
| 1 - 2" | .0001" | **101-118*** | ±.0001" | 245 |

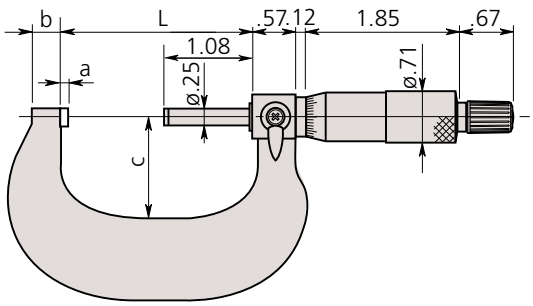
*.0001" reading is obtained with vernier.

**Inch** With ratchet stop

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0 - 1" | .0001" | **101-113*** | ±.0001" | 180 |
| 1 - 2" | .0001" | **101-114*** | ±.0001" | 245 |
| 2 - 3" | .0001" | **101-119*** | ±.0001" | 410 |
| 3 - 4" | .0001" | **101-120*** | ±.00015" | 550 |

*.0001" reading is obtained with vernier.

### DIMENSIONS




Unit: inch

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

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



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# 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.
- With a standard bar except for 0 - 25mm and 0 - 1" models.
- Supplied in fitted plastic case.

102-701

102-702

### SPECIFICATIONS

**Metric**

| Range | Graduation | Order No. | Accuracy |
|---|---|---|---|
| 0 - 25mm | 0.01mm | **102-701** | ±2µm |
| 0 - 25mm | 0.001mm | **102-707*** | ±2µm |
| 25 - 50mm | 0.01mm | **102-702** | ±2µm |
| 25 - 50mm | 0.001mm | **102-708*** | ±2µm |

*0.001mm reading is obtained with vernier.

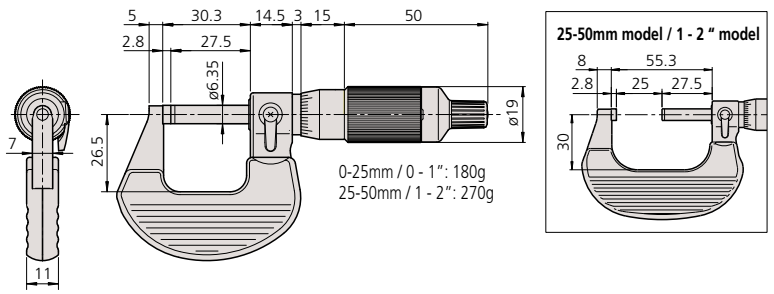
**Inch**

| Range | Graduation | Order No. | Accuracy |
|---|---|---|---|
| 0 - 1" | .001" | **101-711** | ±.0001" |
| | .0001" | **101-717*** | ±.0001" |
| | .0001" | **102-717*** | ±.0001" |
| 1 - 2" | .0001" | **102-718*** | ±.0001" |

*.0001" reading is obtained with vernier.

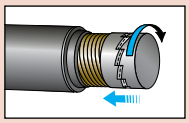
### DIMENSIONS AND MASS

Unit: mm

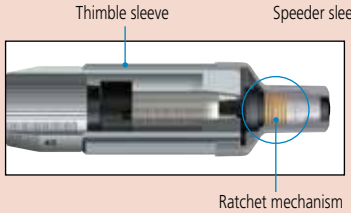



### Technical Data

Graduation: 0.01mm, 0.001mm, .001" or .0001"
Flatness: 0.6µm / .000024"
Parallelism: 2µm / .00008"
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.



# Outside Micrometers

## SERIES 102

PROPRIETARY INSPECTION CERTIFICATE

Mitutoyo guarantees the product quality.

### Technical Data

Graduation: 0.01mm
Flatness: 0.3µm
Parallelism: 1µm for 25mm model
3µm for models up to 100mm
Measuring faces: Carbide tipped

**Ratchet-stop type**

## FEATURES

- Heat-insulated frame, tapered (on the anvil side) for hard-to-reach places.
- With a standard bar except for 0 - 25mm model.
- A ratchet stop for a constant measuring force.
- Supplied in a fitted plastic case.

**102-301**

## SPECIFICATIONS

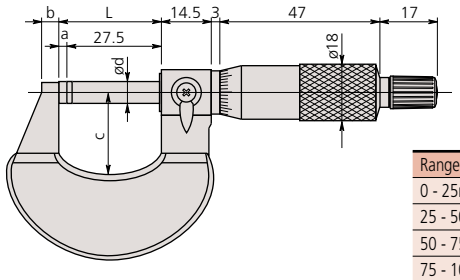
**Metric** With ratchet stop

| Range | Graduation | Order No. | Accuracy |
|---|---|---|---|
| 0 - 25mm | 0.01mm | **102-301** | ±2µm |
| 25 - 50mm | 0.01mm | **102-302** | ±2µm |
| 50 - 75mm | 0.01mm | **102-303** | ±2µm |
| 75 - 100mm | 0.01mm | **102-304** | ±3µm |

**Metric** Micrometer set 0.01mm Graduation model

| Range | Order No. | Included in set |
|---|---|---|
| 0 - 100mm (4 pcs/set) | **102-911-40** | • **102-301**<br>**102-302**<br>**102-303**<br>**102-304**<br>• 3 micrometer standards |

## DIMENSIONS AND MASS




Unit: mm

| Range | L | a | b | c | d | Mass (g) |
|---|---|---|---|---|---|---|
| 0 - 25mm | 30.3 | 2.8 | 5 | 26 | 6.35 | 180 |
| 25 - 50mm | 55.3 | 2.8 | 8 | 32 | 6.35 | 270 |
| 50 - 75mm | 80.3 | 2.8 | 9 | 45 | 6.35 | 375 |
| 75 - 100mm | 105.3 | 2.8 | 10 | 58 | 6.35 | 490 |



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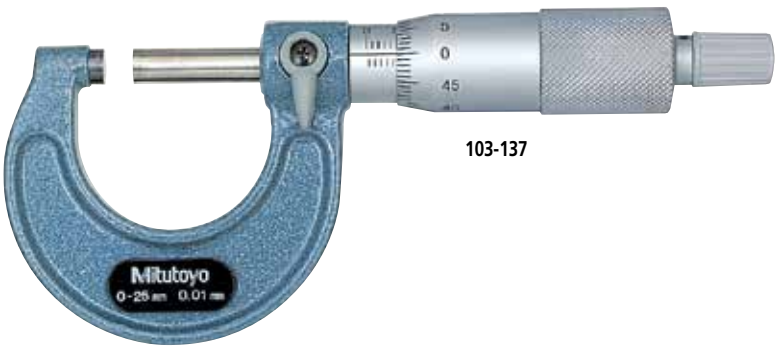
# Outside Micrometers

## SERIES 103

Mitutoyo guarantees the product quality. PROPRIETARY INSPECTION CERTIFICATE Mitutoyo guarantees the product quality.

## FEATURES

- Hammertone, baked-enamel-finished frame.
- Ratchet stop for exact repetitive readings.
- With a standard bar except for 0-25mm model.




103-137

### Technical Data

Graduation: 0.01mm, 0.001mm
Flatness: 0.6 µm for models up to 300mm/12"
1µm for models over 300mm/12"
Parallelism: (2+R/100)µm, R=max, range (mm)
Measuring faces: Carbide tipped

## SPECIFICATIONS

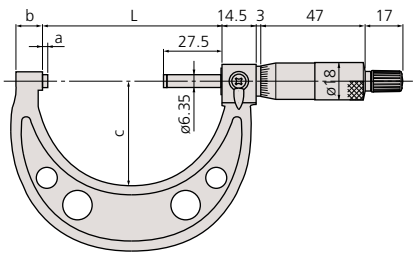
**Metric** With ratchet stop

| Range | Order No. | Accuracy | Mass (g) |
|---|---|---|---|
| 0 - 25mm | **103-137** | ±2µm | 175 |
| | **103-129*** | ±2µm | 175 |
| 25 - 50mm | **103-138** | ±2µm | 215 |
| | **103-130*** | ±2µm | 215 |
| 50 - 75mm | **103-139-10** | ±2µm | 315 |
| 75 - 100mm | **103-140-10** | ±3µm | 375 |
| 100 - 125mm | **103-141-10** | ±3µm | 515 |
| 125 - 150mm | **103-142-10** | ±3µm | 665 |
| 150 - 175mm | **103-143-10** | ±4µm | 720 |
| 175 - 200mm | **103-144-10** | ±4µm | 920 |
| 200 - 225mm | **103-145-10** | ±4µm | 1080 |
| 225 - 250mm | **103-146-10** | ±5µm | 1255 |
| 250 - 275mm | **103-147-10** | ±5µm | 1405 |
| 275 - 300mm | **103-148-10** | ±5µm | 1565 |
| 300 - 325mm | **103-149** | ±6µm | 1985 |
| 325 - 350mm | **103-150** | ±6µm | 2155 |
| 350 - 375mm | **103-151** | ±6µm | 2305 |
| 375 - 400mm | **103-152** | ±7µm | 2455 |
| 400 - 425mm | **103-153** | ±7µm | 2715 |
| 425 - 450mm | **103-154** | ±7µm | 2965 |
| 450 - 475mm | **103-155** | ±8µm | 3215 |
| 475 - 500mm | **103-156** | ±8µm | 3450 |
| (Models with a range up to 1000mm are available.) | | | |

*0.001mm reading is obtained with vernier.

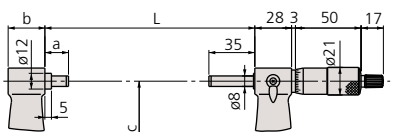
## DIMENSIONS AND MASS

Up to 300mm / 12"




| Range | L | a | b | c |
|---|---|---|---|---|
| 0 - 25mm / 0 - 1" | 30.3 | 2.8 | 9 | 28 |
| 25 - 50mm / 1 - 2" | 55.3 | 2.8 | 10 | 38 |
| 50 - 75mm / 2 - 3" | 80.3 | 2.8 | 12 | 49 |
| 75 - 100mm / 3 - 4" | 105.3 | 2.8 | 14 | 60 |
| 100 - 125mm / 4 - 5" | 132.8 | 5.3 | 17 | 79 |
| 125 - 150mm / 5 - 6" | 158.2 | 5.7 | 19 | 94 |
| 150 - 175mm / 6 - 7" | 183.6 | 6.1 | 20 | 106 |
| 175 - 200mm / 7 - 8" | 208.8 | 6.3 | 19 | 118 |
| 200 - 225mm / 8 - 9" | 234.2 | 6.7 | 18 | 130 |
| 225 - 250mm / 9 - 10" | 258 | 5.5 | 18 | 143 |
| 250 - 275mm / 10 - 11" | 284 | 6.5 | 18 | 156 |
| 275 - 300mm / 11 - 12" | 309 | 6.5 | 18 | 169 |

Over 300mm / 12"




| Range | L | a | b | c |
|---|---|---|---|---|
| 300 - 325mm / 12-13" | 353 | 18 | 28 | 187 |
| 325 - 350mm / 13-14" | 378 | 18 | 28 | 199 |
| 350 - 375mm / 14-15" | 403 | 18 | 28 | 212 |
| 375 - 400mm / 15-16" | 428 | 18 | 28 | 224 |
| 400 - 425mm / 16-17" | 453 | 18 | 28 | 236 |
| 425 - 450mm / 17-18" | 478 | 18 | 28 | 248 |
| 450 - 475mm / 18-19" | 503 | 18 | 28 | 261 |
| 475 - 500mm / 19-20" | 528 | 18 | 28 | 273 |

**Metric** Micrometer set

| Range | Order No. | Included in set | Mass (g) |
|---|---|---|---|
| 0 - 75mm (3 pc. set) | **103-927-10** | **103-137, 103-138, 103-139-10,** 2 micrometer standards | 750 |
| 0 - 150mm (6 pc. set) | **103-913-50** | **103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10,** 5 micrometer standards | 2260 |
| 150 - 300mm (6 pc. 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 | 7695 |
| 0 - 300mm (12 pc. set) | **103-914-50** | All micrometers of **103-913-50** and **103-915-10** in one set, 11 micrometer standards | 9300 |

# Outside Micrometers

## SERIES 103— Inch Models

### FEATURES

- Hammertone, baked-enamel-finished frame.
- Ratchet stop or friction thimble for exact repetitive readings.
- With a standard bar except for 0-1″ model.

103-177

103-260

### Technical Data (Inch Model)

Accuracy: Refer to the list of specifications
Graduation: .001" or .0001"
Flatness: .000024″ for models up to 12″
.00004″ for models over 12″
Parallelism: [.00008 + .00004 (L/4)]″ L= max range (inch)
Measuring faces: Carbide tipped

### SPECIFICATIONS

**Inch** With ratchet stop

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0 - 1" | .001" | **103-177** | ±.0001" | 175 |
| 1 - 2" | .001" | **103-178** | ±.0001" | 215 |
| 2 - 3" | .001" | **103-179** | ±.0001" | 315 |
| 3 - 4" | .001" | **103-180** | ±.00015" | 375 |
| 4 - 5" | .001" | **103-181** | ±.00015" | 515 |
| 5 - 6" | .001" | **103-182** | ±.00015" | 665 |
| 6 - 7" | .001" | **103-183** | ±.0002" | 720 |
| 7 - 8" | .001" | **103-184** | ±.0002" | 920 |
| 8 - 9" | .001" | **103-185** | ±.0002" | 1080 |
| 9 - 10" | .001" | **103-186** | ±.00025" | 1255 |
| 10 - 11" | .001" | **103-187** | ±.00025" | 1405 |
| 11 - 12" | .001" | **103-188** | ±.00025" | 1565 |
| 12 - 13" | .001" | **103-189** | ±.0003" | 1985 |
| 13 - 14" | .001" | **103-190** | ±.0003" | 2155 |
| 14 - 15" | .001" | **103-191** | ±.0003" | 2305 |
| 15 - 16" | .001" | **103-192** | ±.00035" | 2455 |
| 16 - 17" | .001" | **103-193** | ±.00035" | 2715 |
| 17 - 18" | .001" | **103-194** | ±.00035" | 2965 |
| 18 - 19" | .001" | **103-195** | ±.0004" | 3215 |
| 19 - 20" | .001" | **103-196** | ±.0004" | 3450 |
| 20 - 21" | .001" | **103-197** | ±.0004" | 4060 |
| 21 - 22" | .001" | **103-198** | ±.00045" | 4080 |
| 22 - 23" | .001" | **103-199** | ±.00045" | 4500 |
| 23 - 24" | .001" | **103-200** | ±.00045" | 4525 |
| 24 - 25" | .001" | **103-201** | ±.0005 | 4915 |
| 25 - 26" | .001" | **103-202** | ±.0005" | 4930 |
| 26 - 27" | .001" | **103-203** | ±.0005" | 5200 |
| 27 - 28" | .001" | **103-204** | ±.00055" | 5215 |
| 28 - 29" | .001" | **103-205** | ±.00055" | 5835 |
| 29 - 30" | .001" | **103-206** | ±.00055" | 5860 |
| 30 - 31" | .001" | **103-207** | ±.0006" | 6385 |
| 31 - 32" | .001" | **103-208** | ±.0006" | 6410 |
| 32 - 33" | .001" | **103-209** | ±.0006" | 6925 |
| 33 - 34" | .001" | **103-210** | ±.00065" | 6940 |
| 34 - 35" | .001" | **103-211** | ±.00065" | 7565 |
| 35 - 36" | .001" | **103-212** | ±.00065" | 7590 |
| 36 - 37" | .001" | **103-213** | ±.0007" | 8215 |
| 37 - 38" | .001" | **103-214** | ±.0007" | 8240 |
| 38 - 39" | .001" | **103-215** | ±.0007" | 8860 |
| 39 - 40" | .001" | **103-216** | ±.00075" | 8880 |

**Inch** With friction thimble

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0 - 1" | .0001" | **103-135*** | ±.0001" | 175 |
| 1 - 2" | .0001" | **103-136*** | ±.0001" | 215 |

* .0001" Reading is obtained with vernier

**Inch** With ratchet stop

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0 - 1" | .0001" | **103-131*** | ±.0001" | 175 |
| 1 - 2" | .0001" | **103-132*** | ±.0001" | 215 |
| 2 - 3" | .0001" | **103-217*** | ±.0001" | 315 |
| 3 - 4" | .0001" | **103-218*** | ±.00015" | 375 |
| 4 - 5" | .0001" | **103-219*** | ±.00015" | 515 |
| 5 - 6" | .0001" | **103-220*** | ±.00015" | 665 |
| 6 - 7" | .0001" | **103-221*** | ±.0002" | 720 |
| 7 - 8" | .0001" | **103-222*** | ±.0002" | 920 |
| 8 - 9" | .0001" | **103-223*** | ±.0002" | 1080 |
| 9 - 10" | .0001" | **103-224*** | ±.00025" | 1255 |
| 10 - 11" | .0001" | **103-225*** | ±.00025" | 1405 |
| 11 - 12" | .0001" | **103-226*** | ±.00025" | 1565 |

* .0001" Reading is obtained with vernier

**Inch** With Tapered Frame and Ratchet Stop

| Range | Graduation | Order No. | Accuracy | Mass (g) |
|---|---|---|---|---|
| 0-1" | .001" | **103-259** | ±.0001" | 175 |
| 0-1" | .0001" | **103-260*** | ±.0001" | 175 |
| 1-2" | .0001" | **103-262*** | ±.0001" | 215 |

* .0001" Reading is obtained with vernier



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# Outside Micrometers

## SERIES 103 — Inch model set

**Inch** Micrometer Set .001" Graduation Model

| Range | Order No. | Included in set | Mass (g) |
|---|---|---|---|
| 0 - 3" (3pcs./set) | **103-929** | 103-177, 103-178, 103-179, 2 Micrometer Standards | 750 |
| 0 - 4" (4pcs./set) | **103-930** | 103-177, 103-178, 103-179, 103-180, 3 Micrometer Standards | 1600 |
| 0 - 6" (6pcs./set) | **103-904-10** | 103-177, 103-178, 103-179, 103-180, 103-181, 103-182, 5 Micrometer Standards | 2200 |
| 0 - 12" (12pcs./set) | **103-905-10** | 103-177, 103-178, 103-179, 103-180, 103-181, 103-182, 103-183, 103-184, 103-185, 103-186, 103-187, 103-188, 11 Micrometer Standards | 9000 |
| 6 - 12" (6pcs./set) | **103-906** | 103-183, 103-184, 103-185, 103-186, 103-187, 103-188, 6 Micrometer Standards | 7695 |

**103-905-10**

**Inch** Micrometer Set .0001" Graduation Model

| Range | Order No. | Included in set | Mass (g) |
|---|---|---|---|
| 0 - 3" (3pcs./set) | **103-922** | 103-135, 103-136, 103-217, 2pcs. Micrometer Standards | 705 |
| 0 - 4" (4pcs./set) | **103-931** | 103-135, 103-136, 103-217, 103-218, 3pcs. Micrometer Standards | 1600 |
| 0 - 6" (6pcs./set) | **103-907-40** | 103-135, 103-136, 103-217, 103-218, 103-219, 103-220, 5 Micrometer Standards | 2200 |
| 0 - 12" (12pcs./set) | **103-908-40** | 103-135, 103-136, 103-217, 103-218, 103-219, 103-220, 103-221, 103-222, 103-223, 103-224, 103-225, 103-226, 11pcs. Micrometer Standards | 9000 |
| 6 - 12" (6pcs./set) | **103-909** | 103-221, 103-222, 103-223, 103-224, 103-225, 103-226, 6pcs. Micrometer Standards | 6945 |

**103-904-10**