

# Micrometer

The origin of Mitutoyo's trustworthy brand of small tool instruments

## Outside Micrometers SERIES 103

- Baked-enamel-finished frame.
- Measuring faces: Carbide.
- Equipped with Ratchet Stop for constant measuring force.



An inspection certificate is supplied as standard. Refer to page U-9 for details.

### Technical Data

- Standard accessories: Reference bar, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
- Spanner (**301336**), 1 pc. (for maximum measuring range up to 300 mm (12 in))
- Spanner (**200154**), 1 pc. (for maximum measuring range 325 mm (13 in) or over)

Metric With ratchet stop						
Order No.	Range (mm)	Graduation (mm)	MPE*1 (μm)	Measuring force (N)	Flatness (μm)	Parallelism (μm)
103-129	0 - 25	0.001	±2	5 - 10	0.6	2
103-130	25 - 50	0.001				
103-139-10	50 - 75	0.01	±3			3
103-140-10	75 - 100					
103-141-10	100 - 125		±4			4
103-142-10	125 - 150					
103-143-10	150 - 175		±5			5
103-144-10	175 - 200					
103-145-10	200 - 225		±6			6
103-146-10	225 - 250					
103-147-10	250 - 275		±7			7
103-148-10	275 - 300					
103-149	300 - 325	0.01	±8	8		
103-150	325 - 350					
103-151	350 - 375		±9	9		
103-152	375 - 400					
103-153	400 - 425		±10	10		
103-154	425 - 450					
103-155	450 - 475		±11	11		
103-156	475 - 500					
103-157	500 - 525		±12	12		
103-158	525 - 550					
103-159	550 - 575	±13	13			
103-160	575 - 600					
103-161	600 - 625	±14	14			
103-162	625 - 650					
103-163	650 - 675	±15	15			
103-164	675 - 700					
103-165	700 - 725	±16	16			
103-166	725 - 750					
103-167	750 - 775	±17	17			
103-168	775 - 800					
103-169	800 - 825	±18	18			
103-170	825 - 850					
103-171	850 - 875	±19	19			
103-172	875 - 900					
103-173	900 - 925	±20	20			
103-174	925 - 950					
103-175	950 - 975	±21	21			
103-176	975 - 1000					

Inch With ratchet stop															
Order No.	Range (in)	Graduation (in)	MPE*1 (in)	Measuring force (N)	Flatness (in)	Parallelism (in)									
103-177	0 - 1	0.001	±0.00015	5 - 10	0.000024	0.00008									
103-131		0.0001													
103-178	1 - 2	0.001				±0.0002	5 - 10	0.000024	0.00012						
103-132		0.0001													
103-179	2 - 3	0.001							±0.00025	5 - 10	0.000024	0.00016			
103-180	3 - 4														
103-181	4 - 5											±0.0003	10 - 15	0.00004	0.0002
103-182	5 - 6														
103-183	6 - 7											±0.00035	10 - 15	0.00004	0.00024
103-184	7 - 8														
103-185	8 - 9											±0.0004	10 - 15	0.00004	0.00028
103-186	9 - 10														
103-187	10 - 11		±0.00045	10 - 15	0.00004							0.00032			
103-188	11 - 12														
103-189	12 - 13	±0.0005	10 - 15	0.00004	0.00036										
103-190	13 - 14														
103-191	14 - 15	±0.00055	10 - 15	0.00004	0.0004										
103-192	15 - 16														
103-193	16 - 17	±0.0006	10 - 15	0.00004	0.00044										
103-194	17 - 18														
103-195	18 - 19	±0.00065	10 - 15	0.00004	0.00048										
103-196	19 - 20														
103-197	20 - 21	±0.0007	10 - 15	0.00004	0.00048										
103-198	21 - 22														
103-199	22 - 23	±0.00075	10 - 15	0.00004	0.00048										
103-200	23 - 24														
103-201	24 - 25	±0.00075	10 - 15	0.00004	0.00048										
103-202	25 - 26														
103-203	26 - 27	±0.00075	10 - 15	0.00004	0.00048										
103-204	27 - 28														
103-205	28 - 29	±0.00075	10 - 15	0.00004	0.00048										
103-206	29 - 30														
103-207	30 - 31	±0.00075	10 - 15	0.00004	0.00048										
103-208	31 - 32														
103-209	32 - 33	±0.00075	10 - 15	0.00004	0.00048										
103-210	33 - 34														
103-211	34 - 35	±0.00075	10 - 15	0.00004	0.00048										
103-212	35 - 36														
103-213	36 - 37	±0.00075	10 - 15	0.00004	0.00048										
103-214	37 - 38														
103-215	38 - 39	±0.00075	10 - 15	0.00004	0.00048										
103-216	39 - 40														

Metric With ratchet stop						
Order No.	Range (mm)	Graduation (mm)	MPE*1 *2 (μm)	Measuring force (N)	Flatness (μm)	Parallelism (μm)
103-137	0 - 25	0.01	±2	5 - 10	0.6	2
103-138	25 - 50	0.01				

Inch With friction thimble						
Order No.	Range (in)	Graduation (in)	MPE*1 *2 (in)	Measuring force (N)	Flatness (in)	Parallelism (in)
103-135	0 - 1	0.0001	±0.0001	5 - 10	0.000024	0.00008
103-136	1 - 2					

\*1 MPE: Maximum permissible error  $J_{MPE}$

\*2 Maximum permissible error of the indication measured by contacting the full measuring face with the object to be measured.  $J_{MPE}$  is a term specified by JIS B 7502: 2016 which has been prepared based on ISO 3611: 2010 with some modifications of the technical contents.

The measurement method has not been changed from JIS B 7502: 1994. For details refer to page B-70.

## Technical Data

- Standard accessories: Reference rod 1 pc. (Excluding the measuring range 0 to 25 mm)
- Spanner (301336), 1 pc. (Maximum measuring length Less than 300 mm)
- Spanner (200154), 1 pc. (Maximum measuring length More than 325 mm)



103-904-10



103-905-10



103-906

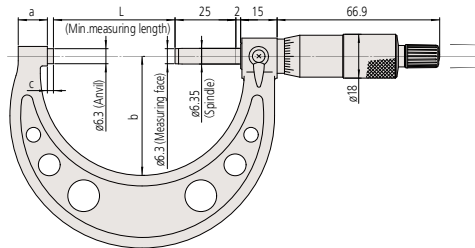
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Metric	Micrometer set/With ratchet thimble	
Order No.	Range (mm)	Models included
103-927-10	0 - 75 (3 pcs./set)	103-137, 103-138, 103-139-10, 2 micrometer standards
103-913-50	0 - 150 (6 pcs./set)	103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10, 5 micrometer standards
103-915-10	150 - 300 (6 pcs./set)	103-143-10, 103-144-10, 103-145-10, 103-146-10, 103-147-10, 103-148-10, 6 micrometer standards
103-914-50	0 - 300 (12 pcs./set)	All micrometers of 103-913-50 and 103-915-10 in one set, 11 micrometer standards

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

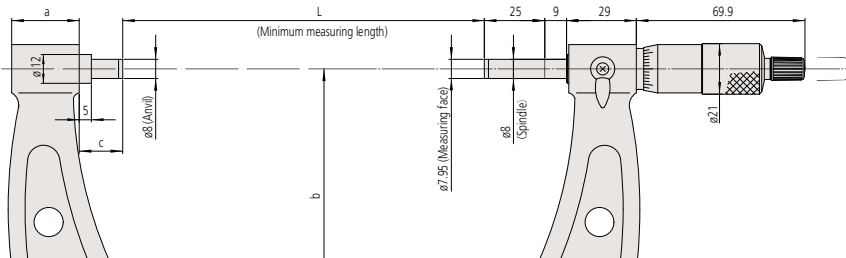
## DIMENSIONS

### 103-137 and 103-138, Models 75 mm to 300 mm



Unit: mm

### Models 325 mm to 1000 mm



Range (mm)	L	a	b	c
0 - 25	0	9	28	2.5
25 - 50	25	10	38	
50 - 75	50	12	49	
75 - 100	75	14	60	
100 - 125	100	16.7	79	
125 - 150	125	18.8	94	5.3
150 - 175	150	19.1	106	6.1
175 - 200	175	18.2	118	6.3
200 - 225	200	16.8	130	6.7
225 - 250	225	18	143	5.5

Range (mm)	L	a	b	c
250 - 275	250	18	156	6.5
275 - 300	275		169	
300 - 325	300		187	
325 - 350	325		199	
350 - 375	350		212	
375 - 400	375	28	224	18
400 - 425	400		236	
425 - 450	425		248	
450 - 475	450		261	
475 - 500	475		273	

Range (mm)	L	a	b	c
500 - 525	500	28	307	40
525 - 550	525		312	15
550 - 575	550		322	40
575 - 600	575		332	15
600 - 625	600		342	40
625 - 650	625		352	15
650 - 675	650		362	40
675 - 700	675		372	15
700 - 725	700		382	40
725 - 750	725		392	15
750 - 775	750	505	430	40
775 - 800	775		440	15
800 - 825	800		455	40
825 - 850	825		465	15
850 - 875	850		480	40
875 - 900	875		490	15
900 - 925	900		505	40
925 - 950	925		515	15
950 - 975	950		530	40
975 - 1000	975		540	15