

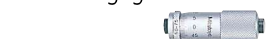
Inside Micrometers

For easy and accurate measurement of inside size and diameter

Tubular Inside Micrometers SERIES 133 — Single Rod Type

- Standard single rod type inside micrometer.
- Carbide measuring faces.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings (nominal size below 300 mm), CERA Inside Micro Checker and Gauge Block Accessory Sets are available as reference gages datum adjustment. (Refer

to pages C-47, C-26, and E-17 to E20 for details)



133-143



133-144



133-145



133-146



133-147



133-148



133-149



133-150



133-151



133-152

SPECIFICATIONS

Metric		Individual	
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
133-143	50 - 75	0.01	± 3
133-144	75 - 100		± 4
133-145	100 - 125		± 5
133-146	125 - 150		
133-147	150 - 175		
133-148	175 - 200		± 6
133-149	200 - 225		
133-150	225 - 250		
133-151	250 - 275		± 7
133-152	275 - 300		
133-153	300 - 325		
133-154	325 - 350		± 8
133-155	350 - 375		
133-156	375 - 400		
133-157	400 - 425		± 9
133-158	425 - 450		
133-159	450 - 475		
133-160	475 - 500	± 10	
133-161	500 - 525		
133-162	525 - 550		
133-163	550 - 575	± 11	
133-164	575 - 600		
133-165	600 - 625		
133-166	625 - 650	± 12	
133-167	650 - 675		
133-168	675 - 700		
133-169	700 - 725	± 13	
133-170	725 - 750		
133-171	750 - 775		
133-172	775 - 800	± 14	
133-173	800 - 825		
133-174	825 - 850		
133-175	850 - 875	± 15	
133-176	875 - 900		
133-177	900 - 925		
133-178	925 - 950	± 16	
133-179	950 - 975		
133-180	975 - 1000		

Inch		Individual	
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)
133-223	2 - 3	0.001	± 0.00015
133-224	3 - 4		± 0.0002
133-225	4 - 5		± 0.00025
133-226	5 - 6		
133-227	6 - 7		
133-228	7 - 8		± 0.0003
133-229	8 - 9		
133-230	9 - 10		
133-231	10 - 11		
133-232	11 - 12		

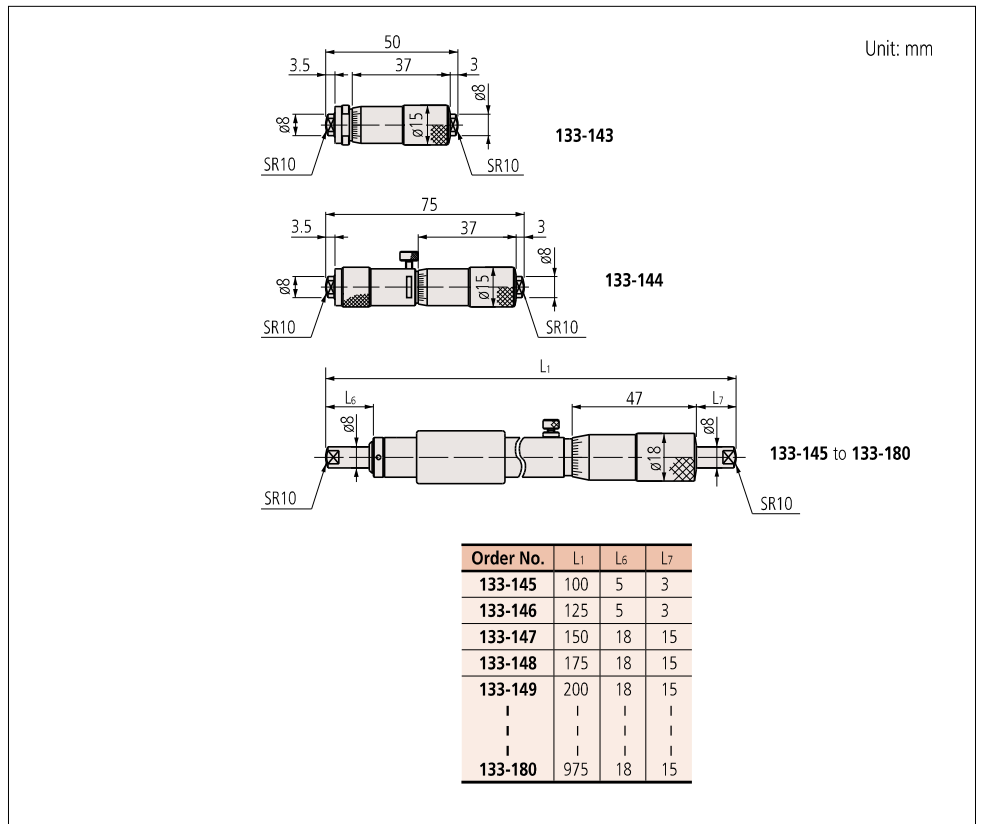
Single Rod Type Inside Micrometer Set



133-902

Metric			Inch		
Order No.	Range (mm)	Models included	Order No.	Range (in)	Models included
133-901	50 - 150 (4 heads/set)	133-143 133-144 133-145 133-146 with fitted case	133-903	2 - 6 (4 heads/set)	133-223 133-224 133-225 133-226 with fitted case
133-902	50 - 300 (10 heads/set)	133-143 133-144 133-145 133-146 133-147 133-148 133-149 133-150 133-151 133-152 with fitted case	133-904	2 - 12 (10 heads/set)	133-223 133-224 133-225 133-226 133-227 133-228 133-229 133-230 133-231 133-232 with fitted case

DIMENSIONS



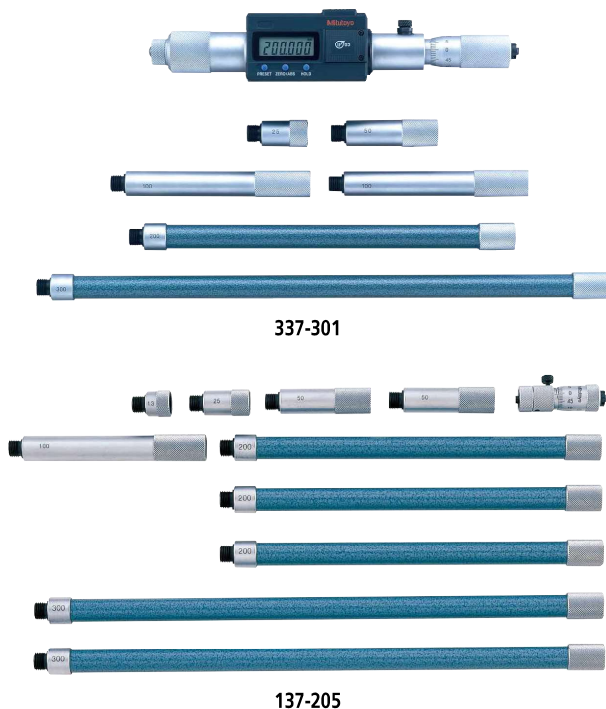
Inside Micrometers

For easy and accurate measurement of inside size and diameter

Tubular Inside Micrometers SERIES 137, 337 — Extension Rod Type

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

- Wide range of inside measurements possible by combining extension rods and anvils with the micrometer head.
- Two types of measuring faces are available; with or without carbide tip. (Order No. 337-101/301/302/102/303/304 only available with carbide tip)
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- An inside length standard is required for accurately setting the micrometer.
- Order No. 337-101/301/302/102/303/304 features:
 - IP65 (water-proof) protection level that enables use in the presence of cutting fluid.
 - A large-character LCD display.
 - Storage of 2 preset values for use when setting to an inside length standard.
 - A function lock that prevents accidental changing of the reference setting during measurement.



SPECIFICATIONS

Metric						
Order No.	Range (mm)	Resolution (mm)	Micrometer head stroke (mm)	Qty	Extension rods Size (mm)	Display unit (mm)
Digimatic (LCD)						
337-101	200 - 225	0.001	25	—	—	200 - 225
337-301	200 - 1000			6	25, 50, 100 (2 pcs.), 200, 300	
337-302	200 - 1500			7	25, 50, 100, 200, 300 (3 pcs.)	

Metric						
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)	Qty	Extension rods Size (mm)	Main unit (mm)
Analog						
137-201	50 - 150	0.01	13	3	13, 25, 50	50 - 63
137-202	50 - 300			5	13, 25, 50 (2 pcs.), 100	
137-203	50 - 500			6	13, 25, 50 (2 pcs.), 100, 200	
137-204	50 - 1000			8	13, 25, 50 (2 pcs.), 100, 200 (2 pcs.), 300	
137-205	50 - 1500			10	13, 25, 50 (2 pcs.), 100, 200 (3 pcs.), 300 (2 pcs.)	
Analog (With carbide measuring face)						
137-206	50 - 150	0.01	13	3	13, 25, 50	50 - 63
137-207	50 - 300			5	13, 25, 50 (2 pcs.), 100	
137-208	50 - 500			6	13, 25, 50 (2 pcs.), 100, 200	
137-209	50 - 1000			8	13, 25, 50 (2 pcs.), 100, 200 (2 pcs.), 300	
137-210	50 - 1500			10	13, 25, 50 (2 pcs.), 100, 200 (3 pcs.), 300 (2 pcs.)	

Inch / Metric						
Order No.	Range (in)	Resolution	Micrometer head stroke (in)	Qty	Extension rods Size (in)	Display unit (in)
Digimatic (LCD)						
337-102	8 - 9	0.0001 in/ 0.001 mm	1	—	—	8 - 9
337-303	8 - 40			6	1, 2, 4 (2 pcs.), 8, 12	
337-304	8 - 60			7	1, 2, 4, 8, 12 (3 pcs.)	

Inch						
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)	Qty	Extension rods Size (in)	Main unit (in)
Analog						
137-211	2 - 6	0.001	0.5	3	0.5, 1, 2	2 - 2.5
137-212	2 - 12			5	0.5, 1, 2 (2 pcs.), 4	
137-213	2 - 20			6	0.5, 1, 2 (2 pcs.), 4, 8	
137-214	2 - 40			8	0.5, 1, 2 (2 pcs.), 4, 8 (2 pcs.), 12	
137-215	2 - 60			10	0.5, 1, 2 (2 pcs.), 4, 8 (3 pcs.), 12 (2 pcs.)	
Analog (With carbide measuring face)						
137-216	2 - 6	0.001	0.5	3	0.5, 1, 2	2 - 2.5
137-217	2 - 12			5	0.5, 1, 2 (2 pcs.), 4	
137-218	2 - 20			6	0.5, 1, 2 (2 pcs.), 4, 8	
137-219	2 - 40			8	0.5, 1, 2 (2 pcs.), 4, 8 (2 pcs.), 12	
137-220	2 - 60			10	0.5, 1, 2 (2 pcs.), 4, 8 (3 pcs.), 12 (2 pcs.)	

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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

IP 65

These marks indicate that a product has successfully passed IP65-level testing, which is carried out by the independent German certification organization TÜV Rheinland.



IP Codes

Level 6: Dust-proof.

No ingress of dust allowed.

Level 5: Protected against water jets.

Water projected in jets against the enclosure from any direction shall have no harmful effects.

Technical Data

- Spindle feed error 3 μm/0.00015 in

Note: "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the measuring range of the micrometer head



Functions

(for 337-101 / 301 / 302 / 102 / 303 / 304)

- Zero-setting
- Origin restoration
- Data hold
- 2-point Preset
- Function lock
- Automatic power ON/OFF
- Error alarm
- Data output

Technical Data

- Battery and Scale Type (for 337-101/301/302/102/303/304) SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 1.2 years under normal use
- Scale type: Electromagnetic induction-type rotary encoder

Optional Accessories

Refer to page A-27 for details.

- Connecting cables with **IT / DP / MUX**, etc.
 - 1 m: **05CZA662**
 - 2 m: **05CZA663**
- **USB** Input Tool Direct (2 m): **06AFM380B**
- Connecting cables for **U-WAVE-T**
 - For standard (160 mm): **02AZD790B**
 - For foot switch: **02AZE140B**

Tubular Inside Micrometers SERIES 137 — Extension Rod Type (main unit)

Technical Data

- Spindle feed error 3 μm /0.00015 in
- Note: "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

- Micrometer head for Extension Rod Type inside micrometer.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-47 and E-17 to E-20 for details)

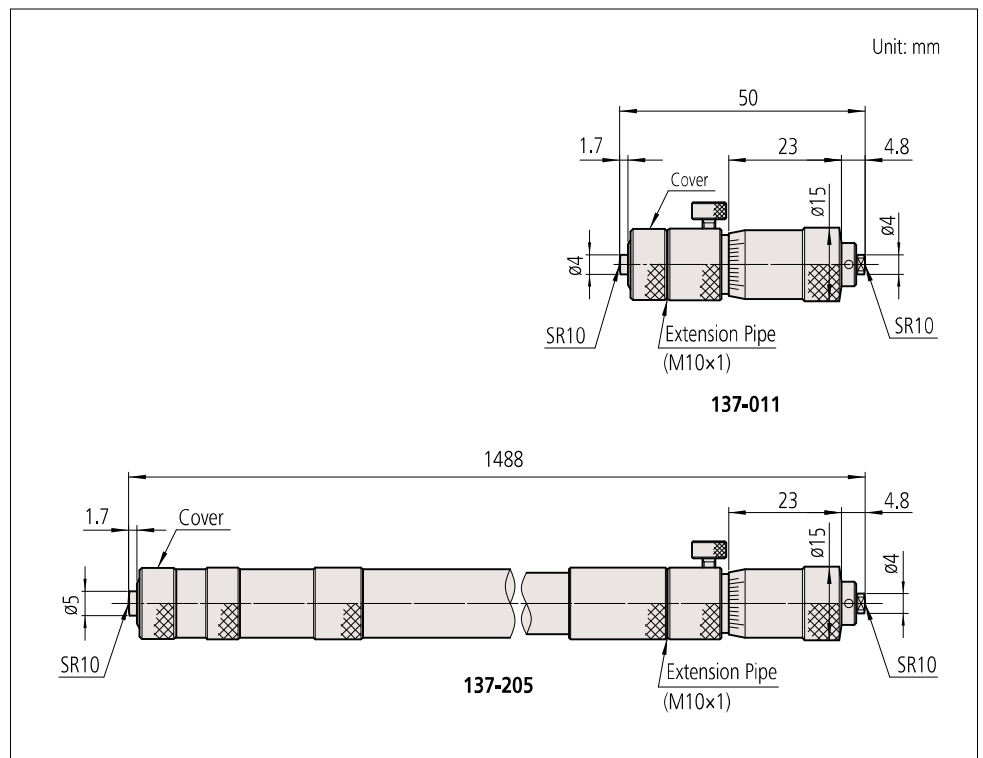


137-011

SPECIFICATIONS

Metric			
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)
137-011	50 - 63	0.01	13
Carbide-tipped 137-013			
Inch			
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)
137-012	2 - 2.5	0.001	0.5
Carbide-tipped 137-014			

DIMENSIONS



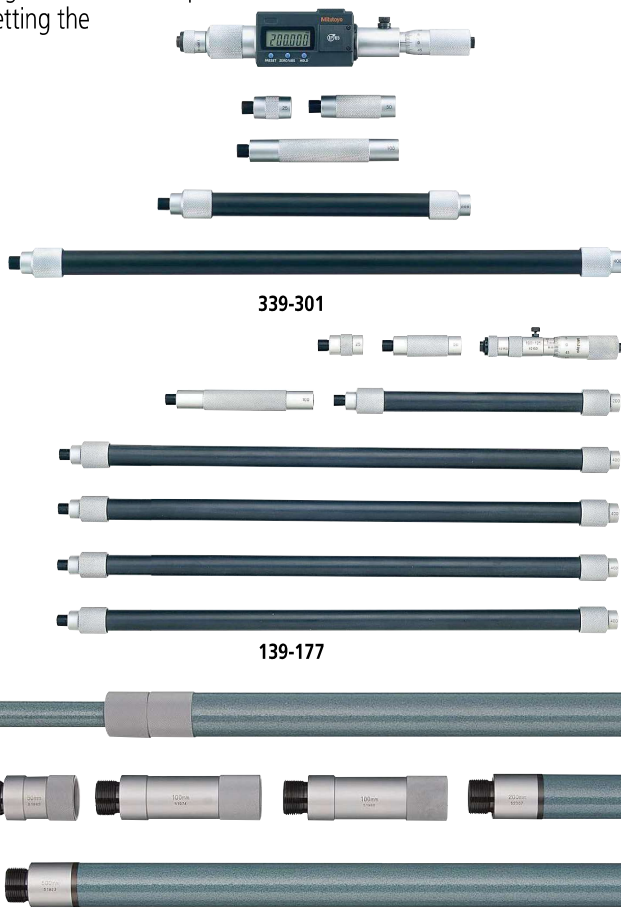
Inside Micrometers

For easy and accurate measurement of inside size and diameter

Tubular Inside Micrometers SERIES 139, 339, 140 — Extension Pipe Type

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

- Wide range of inside measurements possible by combining Extension Pipes and anvils with the micrometer head.
- Carbide measuring faces.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- An inside length standard is required for accurately setting the micrometer.
- Order No. 339-101/301/302/102/303/304 features:
 - IP65 (water-proof) protection level that enables use in the presence of cutting fluid.
 - A large-character LCD display.
 - Storage of 2 preset values for use when setting to an inside length standard.
 - A function lock that prevents accidental changing of the reference setting during measurement.



MeasurLink[®] ENABLED
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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).

IP 65

These marks indicate that a product has successfully passed IP65-level testing, which is carried out by the independent German certification organization TÜV Rheinland.



IP Codes

Level 6: Dust-proof.

No ingress of dust allowed.

Level 5: Protected against water jets.

Water projected in jets against the enclosure from any direction shall have no harmful effects.

Technical Data

- Spindle feed error 3 μm/0.00015 in (**139, 339** Series)
6 μm/0.0003 in (**140** Series)

Note: "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the measuring range of the micrometer head



Functions (for 339-101/301/302/102/303/304)

- Zero-setting
- Origin restoration
- Data hold
- Function lock
- Automatic power ON/OFF
- 2-point Preset
- Error alarm
- Data output

Technical Data

- Battery and Scale Type (for 339-101/301/302/102/303/304)
SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 1.2 years under normal use
- Scale type: Electromagnetic induction-type rotary encoder

Optional Accessories

Refer to page A-27 for details.

- Connecting cables with **IT/DP/MUX**, etc.
1 m: **05CZA662**
2 m: **05CZA663**
- **USB** Input Tool Direct (2 m): **06AFM380B**
- Connecting cables for **U-WAVE-T**
For standard (160 mm): **02AZD790B**
For foot switch: **02AZE140B**

SPECIFICATIONS

140-158

Metric						
Order No.	Range (mm)	Resolution (mm)	Micrometer head stroke (mm)	Qty	Extension pipes Size (mm)	Display unit (mm)
Digimatic (LCD)						
339-101	200 - 225	0.001	25	—	—	200 - 225
339-301	200 - 1000			5	25, 50, 100, 200, 400	
339-302	200 - 2000			8	25, 50, 100, 200 (2 pcs.), 400 (3 pcs.)	

Metric						
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)	Qty	Extension pipes Size (mm)	Main unit (mm)
Analog						
139-173	100 - 500	0.01	25	4	25, 50, 100, 200	100 - 125
139-174	100 - 900			5	25, 50, 100, 200, 400	
139-175	100 - 1300			6	25, 50, 100, 200, 400 (2 pcs.)	
139-176	100 - 1700			7	25, 50, 100, 200, 400 (3 pcs.)	
139-177	100 - 2100			8	25, 50, 100, 200, 400 (4 pcs.)	
140-157	1000 - 2000			5	50, 100 (2 pcs.), 200, 500	1000 - 1050
140-158	1000 - 3000			6	50, 100 (2 pcs.), 200, 500, 1000	
140-159	1000 - 4000			7	50, 100 (2 pcs.), 200, 500, 1000 (2 pcs.)	
140-160	1000 - 5000	8	50, 100 (2 pcs.), 200, 500, 1000 (3 pcs.)			

Inch/Metric						
Order No.	Range (in)	Resolution	Micrometer head stroke (in)	Qty	Extension pipes Size (in)	Display unit (in)
Digimatic (LCD)						
339-102	8 - 9	0.0001 in/ 0.001 mm	1	5	—	8 - 9
339-303	8 - 40			8	1, 2, 4, 8, 16	
339-304	8 - 80			8	1, 2, 4, 8 (2 pcs.), 16 (3 pcs.)	

Inch						
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)	Qty	Extension pipes Size (in)	Main unit (in)
Analog						
139-178	4 - 20	0.001	1	4	1, 2, 4, 8	4 - 5
139-179	4 - 36			5	1, 2, 4, 8, 16	
139-180	4 - 52			6	1, 2, 4, 8, 16 (2 pcs.)	
139-181	4 - 68			7	1, 2, 4, 8, 16 (3 pcs.)	
139-182	4 - 84			8	1, 2, 4, 8, 16 (4 pcs.)	
140-161	40 - 80			5	2, 4 (2 pcs.), 8, 20	40 - 42
140-162	40 - 120			6	2, 4 (2 pcs.), 8, 20, 40	
140-163	40 - 160			7	2, 4 (2 pcs.), 8, 20, 40 (2 pcs.)	
140-164	40 - 200	8	2, 4 (2 pcs.), 8, 20, 40 (3 pcs.)			

Tubular Inside Micrometers SERIES 139 — Extension Pipe Type (main unit)

Technical Data

- Spindle feed error 3 μm /0.00015 in
- Note: "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

- Micrometer head for Extension Pipe Type inside micrometer.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings, CERA Inside Micro Checker and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-47, C-26, and E-17 to E-20 for details)

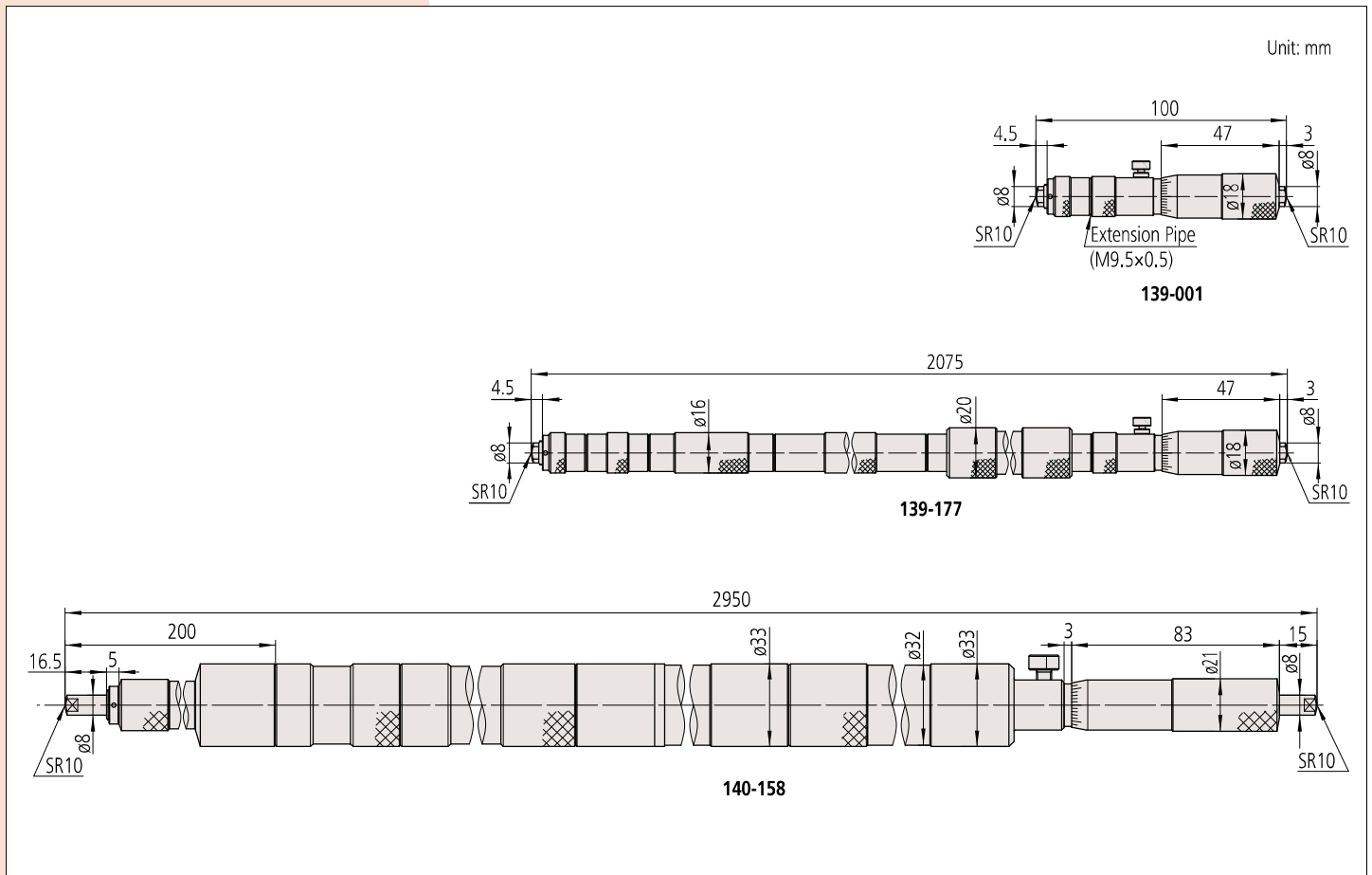


139-001

SPECIFICATIONS

Metric			
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)
139-001	100 - 125	0.01	25
Inch			
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)
139-002	4 - 5	0.001	1

DIMENSIONS



Inside Micrometers

For easy and accurate measurement of inside size and diameter

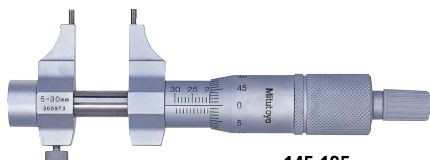
Inside Micrometers SERIES 345, 145 — Caliper Type

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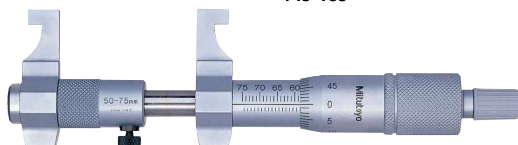
- Caliper type inside micrometer equipped with round pin or anvil type jaws, according to model.
- Carbide measuring faces.
- Equipped with a constant measuring-force device.
- Optional Setting Rings (nominal size below 300 mm), CERA Inside Micro Checker (more than 25 mm) and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-47, C-26, and E-17 to E-20 for details)



345-250-30



145-185



145-187

SPECIFICATIONS

Metric					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Jaw	Mass (g)
Digimatic (LCD)					
345-250-30	5 - 30	0.001	±5	Pin	320
345-251-30	25 - 50		±6	Anvil	325

Inch/Metric					
Order No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Jaw	Mass (g)
Digimatic (LCD)					
345-350-30	0.2 - 1.2	0.00005 in/ 0.001 mm	±0.00025	Pin	320
345-351-30	1 - 2		±0.0003	Anvil	325

Note: For the functions, refer to **293** Series with SPC data output on page B-8.

This model is NOT water-proof. Also, the origin setting is the free preset type.

Metric					
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Jaw	Mass (g)
Analog					
145-185	5 - 30	0.01	±5	Pin	130
145-186	25 - 50		±6	Anvil	140
145-187	50 - 75		±7	Anvil	160
145-188	75 - 100		±8	Anvil	180
145-189	100 - 125		±9	Anvil	210
145-190	125 - 150			Anvil	230
145-191	150 - 175		±10	Anvil	250
145-192	175 - 200			Anvil	270
145-217	200 - 225		±11	Anvil	310
145-218	225 - 250			Anvil	330
145-219	250 - 275		±12	Anvil	350
145-220	275 - 300			Anvil	370

Inch					
Order No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Jaw	Mass (g)
Analog					
145-193	0.2 - 1.2	0.001	±0.00025	Pin	130
145-194	1 - 2		±0.0003	Anvil	140
145-195	2 - 3		±0.00035	Anvil	160
145-196	3 - 4		±0.0004	Anvil	180

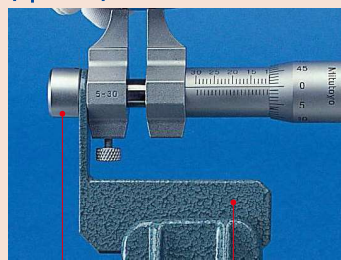
Note: The minimum pitch circle measurement is $\varnothing 5$ mm with pin types (145-185 and 345-250-30).

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Products equipped with the measurement data output function can be connected to the measurement data network system MeasurLink (refer to page A-5 for details).



Accessories for 145-185/186/193/194 (optional)



Cap (300401)

Holder (300400)

Note 1: This instrument requires the cap and the holder for mounting on a micrometer stand.

Note 2: It may not be applicable to a custom specification.

Technical Data

- Battery and Scale Type (for 345-250-30/251-30/350-30/351-30) SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Battery life: Approx. 2.4 years under normal use
- Scale type: Electromagnetic induction-type rotary encoder

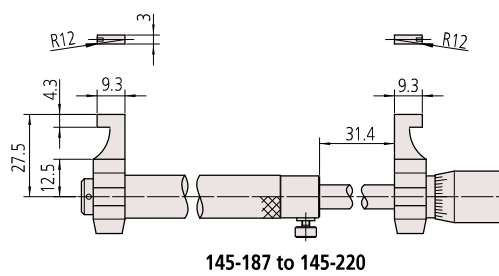
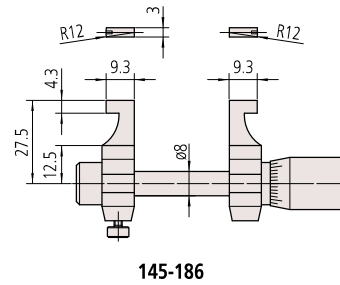
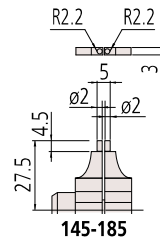
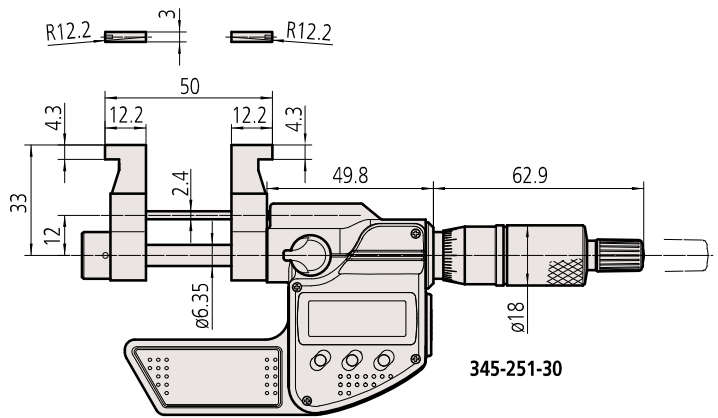
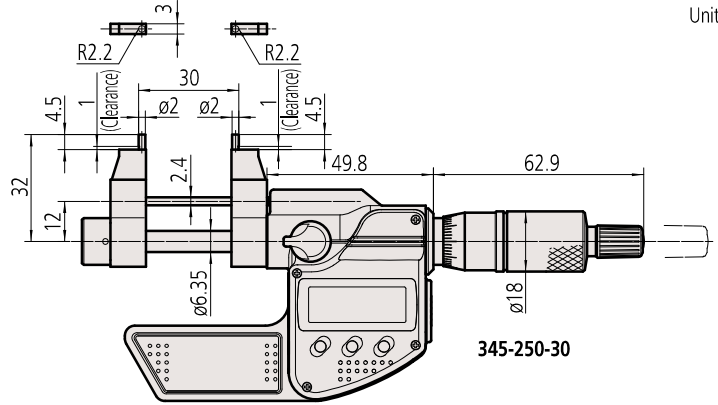
Optional Accessories

Refer to page A-27 for details.

- Connecting cables with **IT/DP/MUX**, etc.
 - 1 m: **05CZA662**
 - 2 m: **05CZA663**
- **USB** Input Tool Direct (2 m): **06AFM380B**
- Connecting cables for **U-WAVE-T** For standard (160 mm): **02AZD790B** For foot switch: **02AZE140B**

DIMENSIONS

Unit: mm

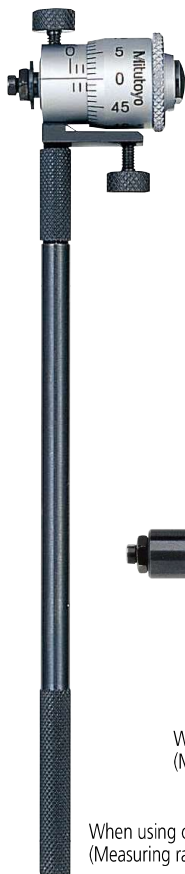


Inside Micrometers

For easy and accurate measurement of inside size and diameter

Inside Micrometers SERIES 141 — Interchangeable Rod Type

- Wide range of inside measurements possible by combining one or more interchangeable rods.
- For models supplied with more than one interchangeable rod, the full measuring range is achieved by combining spacing collars with the rods.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings (nominal size below 300 mm), CERA Inside Micro Checker and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-47, C-26, and E-17 to E-20 for details)



141-101



When using one of the extension rods supplied (Measuring range 43 to 50 mm)

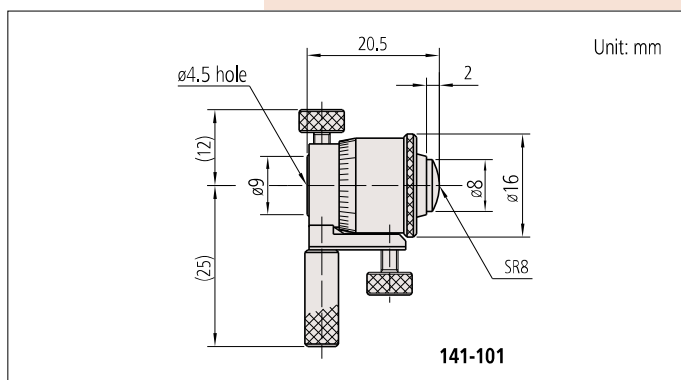
When using one of the extension rods supplied (Measuring range 25 to 32 mm)

Technical Data

- Spindle feed error 3 μm/0.00015 in
- Note: "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head



DIMENSIONS



SPECIFICATIONS

Metric				
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)	Remarks
141-101 / 141-103*	25 - 50	0.01	7	with 2 rods
141-205 / 141-211*	50 - 200		13	with 3 rods
141-206 / 141-212*	50 - 300		13	with 5 rods
141-117	200 - 500		25	with 3 rods
141-118	200 - 1000		25	with 8 rods

* With carbide measuring face

Inch				
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)	Remarks
141-102 / 141-104*	1 - 2	0.001	0.25	with 2 rods
141-208 / 141-214*	2 - 8		0.5	with 3 rods
141-233 / 141-215*	2 - 12		0.5	with 5 rods
141-121	8 - 20		1	with 3 rods
141-122	8 - 40		1	with 8 rods

* With carbide measuring face

Metric			
Micrometer head only model			
Order No.	Range (mm)	Graduation (mm)	Micrometer head stroke (mm)
141-001 / 141-003*	25 - 32	0.01	7
141-025 / 141-027*	50 - 63		13
141-009 / 141-011*	200 - 225		25

* With carbide measuring face

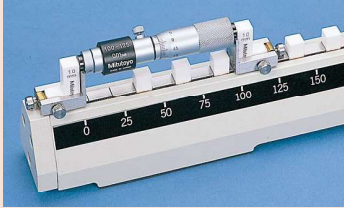
Inch			
Micrometer head only model			
Order No.	Range (in)	Graduation (in)	Micrometer head stroke (in)
141-002 / 141-004*	1 - 1.25	0.001	0.25
141-026 / 141-028*	2 - 2.5		0.5
141-010 / 141-012*	8 - 9		1

* With carbide measuring face



An inspection certificate is supplied as standard. Refer to page U-11 for details.

Typical application



Optional Accessory

- Wooden box
For 515-585: 602160
For 515-586: 602163

CERA Inside Micro Checker SERIES 515

- The Inside Micro Checker is designed to act as a setting standard for inside micrometers.
- Applicable for SERIES 133, 139 and 145 (over 50 mm). Not applicable for SERIES 137, 141, 337 and 339.



- Standard accessory set
- Support clamps **940286*** Pair
 - Auxiliary block 10 mm **602195** 2 pcs.
 - Collar **602195** 2 pcs.
 - Clamp screwdriver **600324** 1 pc.
- * Order No. is equivalent to a pair (2 pcs.)

SPECIFICATIONS

Order No.	Length to check (mm)	Block pitch accuracy
515-585	25 - 300	$\pm(1 + L/150) \mu\text{m}$ L: Length to check (mm)
515-586	25 - 600	

Note: Please note that the bottom surface and the contact faces are not precisely perpendicular to each other.

DIMENSIONS

