# Inside Micrometers

For easy and accurate measurement of inside diameters

Tubular Inside Micrometers
SERIES 133 — Single Rod Type

- Standard single rod type inside micrometer.
- Carbide measuring faces.
- The sleeve is rotated to adjust the index line position when setting to a length standard.
- Setting ring (nominal size below 300mm), CERA Inside Micro Checker, and Gauge Block accessory set are provided as a reference gage for datum adjustment (refer to page C-47, C-26, and E-17 - E20 for details).

Optional Accessory

133-147

133-148

133-149

133-143

133-144
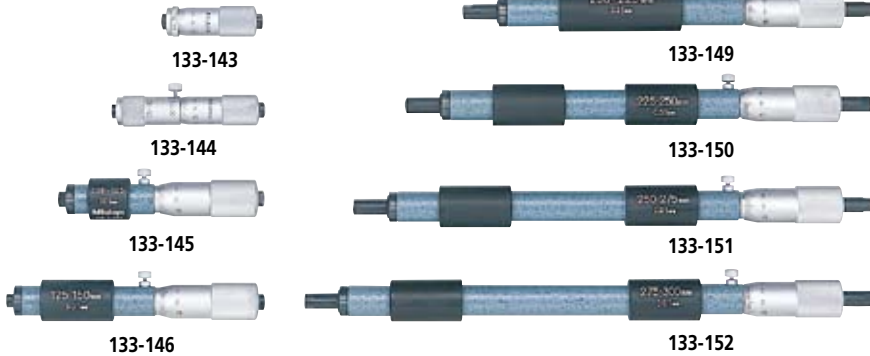
133-150

133-145

133-151

133-146

133-152

SPECIFICATIONS

Metric — Individual

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

Inch — Individual

Order No.	Range	Graduation	Accuracy
133-223	2" - 3"		±.00015"
133-224	3" - 4"		±.0002"
133-225	4" - 5"		
133-226	5" - 6"		
133-227	6" - 7	.001"	±.00025"
133-228	7" - 8"		
133-229	8" - 9"		
133-230	9" - 10"		
133-231	10" - 11"		±.0003"
133-232	11" - 12"		

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Single Rod Type Inside Micrometer Set

133-902

Metric — Micrometer set

Order No.	Range	Models included
133-901	50 - 150mm (4 heads/set)	**133-143 133-144 133-145 133-146** with fitted case
133-902	50 - 300mm (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

Inch — Micrometer set

Order No.	Range	Models included
133-903	2" - 6" (4 heads/set)	**133-223 133-224 133-225 133-226** 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
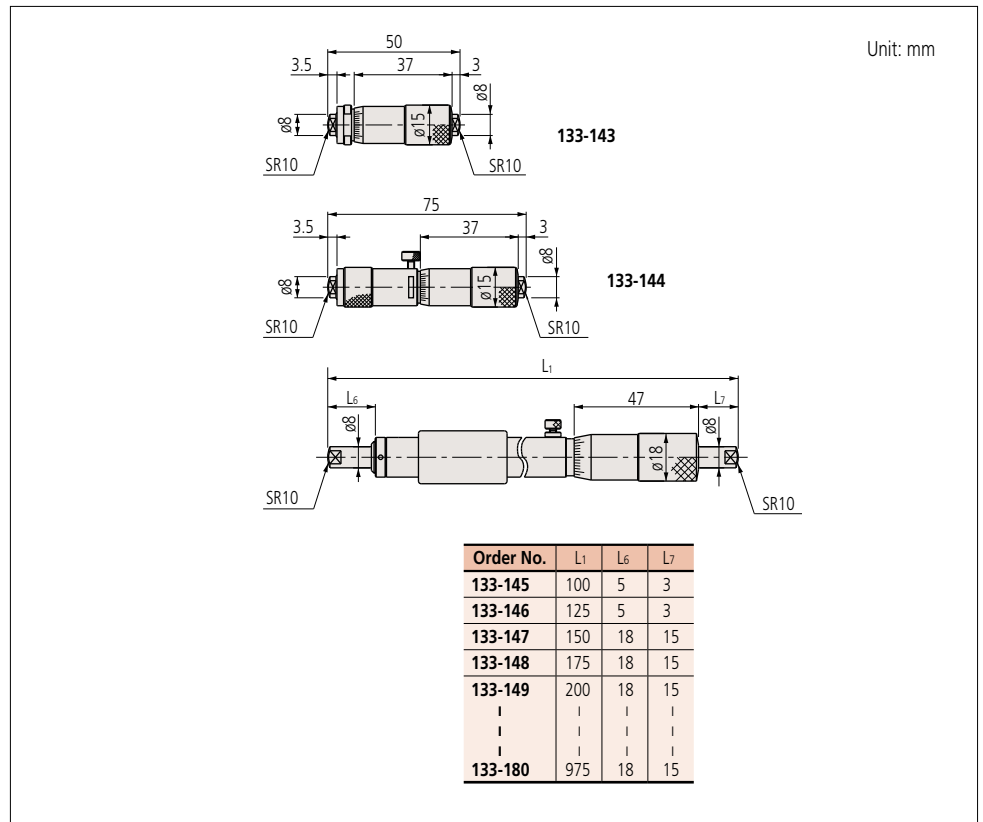
Unit: mm

133-143

133-144

Order No.	L_1	L_6	L_7
133-145	100	5	3
133-146	125	5	3
133-147	150	18	15
133-148	175	18	15
133-149	200	18	15
⋮	⋮	⋮	⋮
⋮	⋮	⋮	⋮
133-180	975	18	15

Mitutoyo

Inside Micrometers

For easy and accurate measurement of inside diameters

Tubular Inside Micrometers
SERIES 137, 337 — Extension Rod Type

- 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. (No. 337-101/301/302/102/303/304 only available with carbide tip.)
- The sleeve is rotated to adjust the index line position 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.
  - An output port for measurement data that enables inclusion in a statistical process control or networked measurement system. Refer to page A-3 for details.
  - Ability to use Interface Input Tools that enable conversion of measurement data to keyboard signals that are then directly input to cells in off-the-shelf spreadsheet software such as Excel. Refer to page A-5 for details.

337-301

137-205

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

Accuracy
±(3 + number of rods + maximum measurement length/50) µm (fraction rounded up)
Excluding quantizing error (only for Digimatic)

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

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-21 for details.
Connecting cables with **IT/DP/MUX**, etc.
　1m: **05CZA662**
　2m: **05CZA663**
USB Input Tool Direct (2m): **06ADV380B**
Connecting cables for **U-WAVE-T**
　For standard (160mm): **02AZD790B**
　For foot switch: **02AZE140B**

SPECIFICATIONS

Metric

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

Metric

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

Inch/Metric

Order No.	Range	Resolution	Micrometer head stroke	Extension rods Qty	Extension rods Size (inch)	Display unit
Digimatic (LCD)						
337-102	8" - 9"			—	—	
337-303	8" - 40"	.0001"/ 0.001mm	1"	6	1", 2", 4" (2 pcs.), 8", 12"	8 - 9"
337-304	8" - 60"			7	1", 2", 4", 8", 12" (3 pcs.)	

Inch

Order No.	Range	Graduation	Micrometer head stroke	Extension rods Qty	Extension rods Size (inch)	Main unit
Analog						
137-211	2" - 6"			3	.5", 1", 2"	
137-212	2" - 12"			5	.5", 1", 2" (2 pcs.), 4"	
137-213	2" - 20"			6	.5", 1", 2" (2 pcs.), 4", 8"	
137-214	2" - 40"			8	.5", 1", 2" (2 pcs.), 4", 8" (2 pcs.), 12"	
137-215	2" - 60"			10	.5", 1", 2" (2 pcs.), 4", 8" (3 pcs.), 12" (2 pcs.)	
Annalog (With carbide measuring face)		.001"	.5"			2 - 2.5"
137-216	2" - 6"			3	.5", 1", 2"	
137-217	2" - 12"			5	.5", 1", 2" (2 pcs.), 4"	
137-218	2" - 20"			6	.5", 1", 2" (2 pcs.), 4", 8"	
137-219	2" - 40"			8	.5", 1", 2" (2 pcs.), 4", 8" (2 pcs.), 12"	
137-220	2" - 60"			10	.5", 1", 2" (2 pcs.), 4", 8" (3 pcs.), 12" (2 pcs.)	

C

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

- Micrometer head for Extension Rod Type inside micrometer.
- The sleeve is rotated to adjust the index line position when setting to a length standard.

- Setting ring and Gauge Block accessory set are provided as a reference gage for datum adjustment (refer to page C-47 and E-17 - E20 for details).
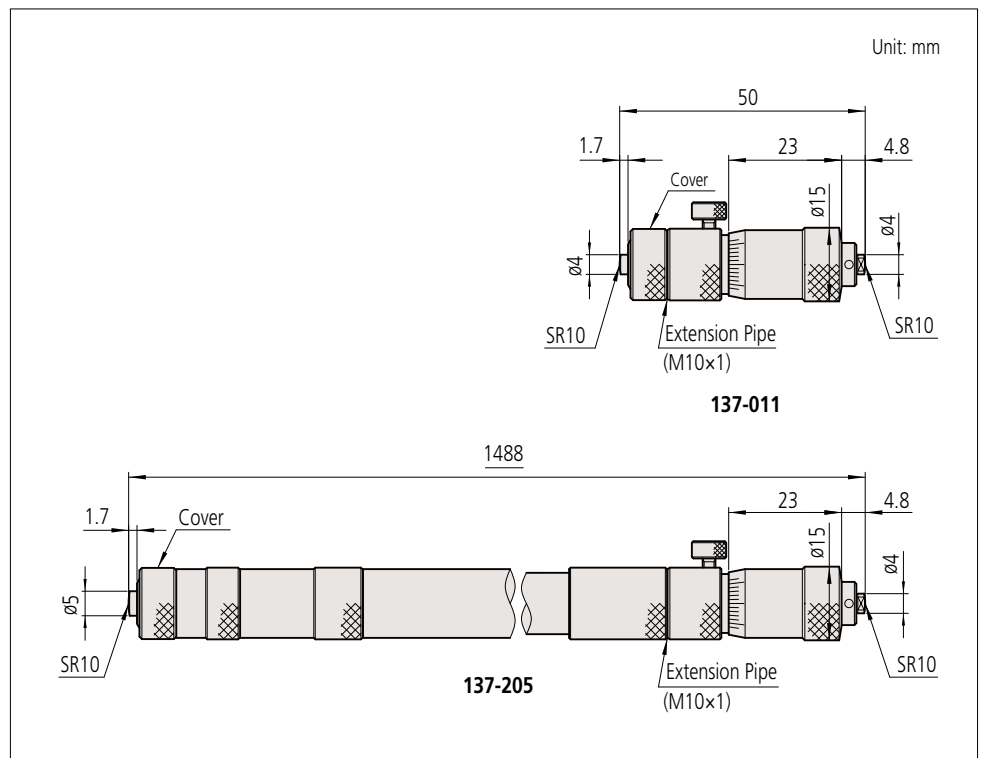

137-011

SPECIFICATIONS

Metric

Order No.	Range	Graduation	Accuracy	Micrometer head stroke
137-011 Carbide-tipped **137-013**	50 - 63mm	0.01mm	±3µm	13mm

Inch

Order No.	Range	Graduation	Accuracy	Micrometer head stroke
137-012 Carbide-tipped **137-014**	2" - 2.5"	.001"	±.00015"	.5"

DIMENSIONS

Unit: mm

137-011

137-205

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Inside Micrometers

For easy and accurate measurement of inside diameters

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

- Wide range of inside diameter measurements possible by combining extension pipes and anvils with the micrometer head.
- Carbide measuring faces are available.
- The sleeve is rotated to adjust the index line position 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.
  - An output port for measurement data that enables inclusion in a statistical process control or networked measurement system. Refer to page A-3 for details.
  - Ability to use Interface Input Tools that enable conversion of measurement data to keyboard signals that are then directly input to cells in off-the-shelf spreadsheet software such as Excel. Refer to page A-5 for details.

339-301

139-177

140-158

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
Accuracy
339 series
$\pm(3 + $ number of pipes $+$ maximum measurement length/50)μm (fraction rounded up)
139 series
$\pm(3 + $ number of pipes $+$ maximum measurement length/50)μm (fraction rounded up)
140 series
$\pm(7 + $ number of pipes $+$ maximum measurement length/50)μm (fraction rounded up)
Excluding quantizing error (only for Digimatic)

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

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-21 for details
Connecting cables with **IT/DP/MUX**, etc.
  1m: **05CZA662**
  2m: **05CZA663**
USB Input Tool Direct (2m): **06ADV380B**
Connecting cables for **U-WAVE-T**
  For standard (160mm): **02AZD790B**
  For foot switch: **02AZE140B**

SPECIFICATIONS

Metric

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

Inch/Metric

Order No.	Range	Resolution	Micrometer head stroke	Extension pipes Qty	Size	Display unit
Digimatic (LCD)						
339-102	8" - 9"	.0001"/ 0.001mm	1"	5	—	8" - 9"
339-303	8" - 40"			5	1", 2", 4", 8", 16"	
339-304	8" - 80"			8	1", 2", 4", 8" (2 pcs.), 16" (3 pcs.)	

Metric

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

Inch

Order No.	Range	Graduation	Micrometer head stroke	Extension pipes Qty	Size	Main unit
Analog						
139-178	4" - 20"		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"	.001"		7	1", 2", 4", 8", 16" (3 pcs.)	
139-182	4" - 84"			8	1", 2", 4", 8", 16" (4 pcs.)	
140-161	40" - 80"		2"	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.)	

C

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

- Micrometer head for Extension Pipe Type inside micrometer.
- The sleeve is rotated to adjust the index line position when setting to a length standard

- Setting ring, CERA Inside Micro Checker, and Gauge Block accessory set are provided as a reference gage for datum adjustment (refer to page C-47, C-26, and E-17 - E20 for details).
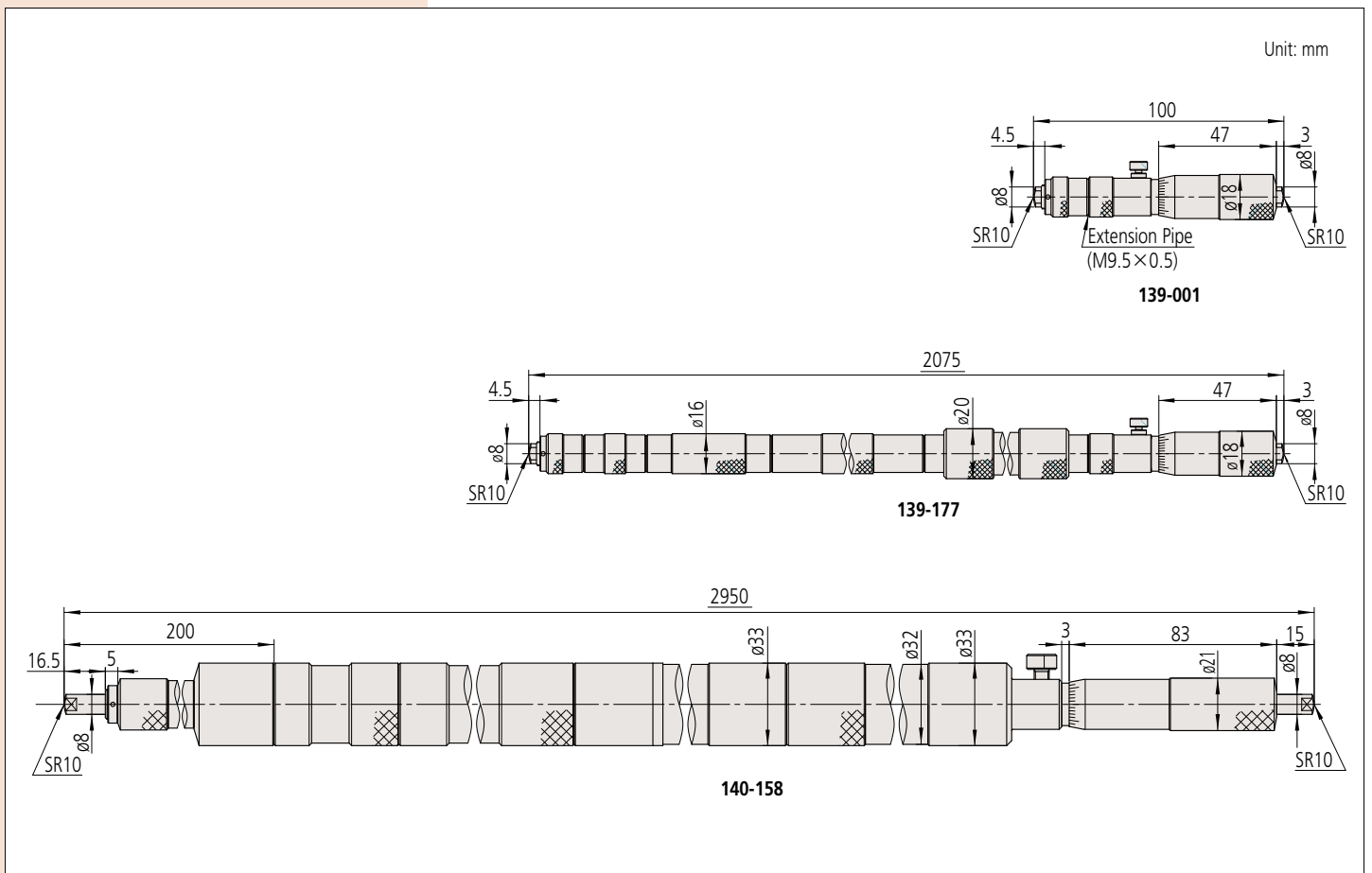
139-001

SPECIFICATIONS

Metric

Order No.	Range	Graduation	Accuracy	Micrometer head stroke
139-001	100 - 125mm	0.01mm	±3μm	25mm

Inch

Order No.	Range	Graduation	Accuracy	Micrometer head stroke
139-002	4" - 5"	.001"	±.00015"	1"

DIMENSIONS

Unit: mm

139-001

139-177

140-158

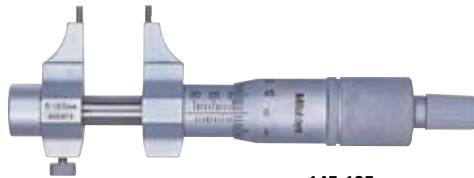**Mitutoyo**

Inside Micrometers

For easy and accurate measurement of inside diameters

Inside Micrometers
SERIES 345, 145 — Caliper Type

- Carbide measuring faces.
- Equipped with a constant measuring-force device.

- Setting ring (nominal size below 300mm), CERA Inside Micro Checker (more than 50mm), and Gauge Block accessory set are provided as a reference gage for datum adjustment (refer to page C-47, C-26, and E-17 - E20 for details).

345-250-30

145-185

145-187

Accessories for 145-185/186/193/194 (optional)
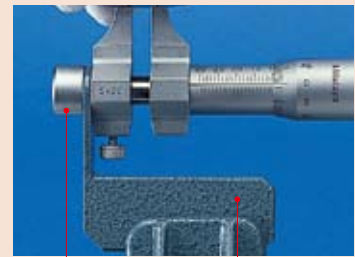
Cap (**No.300401**)   Holder (**No.300400**)

* This instrument requires the cap and the holder for mounting on a micrometer stand.

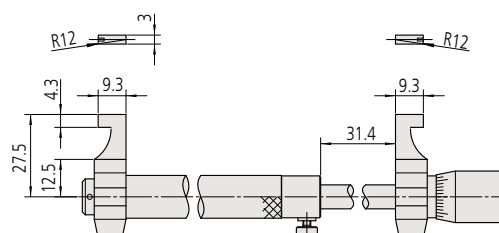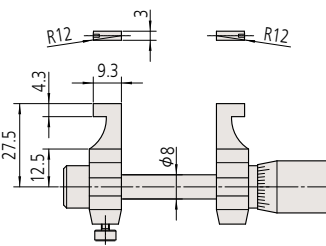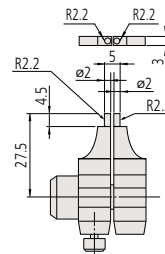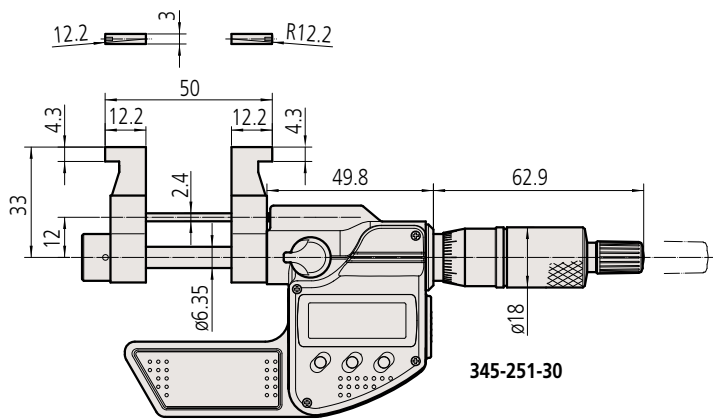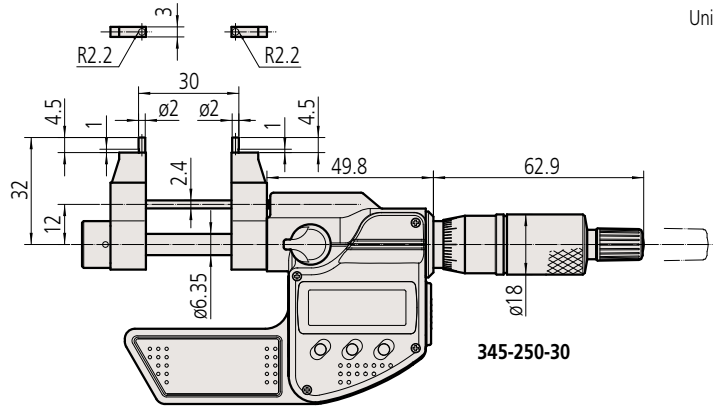### Battery and scale type
(for 345-250-30/251-30/350-30/351-30)

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-21 for details
Connecting cables for Input Tool/ Digimatic Mini-Processor, etc.
  1m: **05CZA662**
  2m: **05CZA663**
USB Input Tool Direct (2m): **06ADV380B**
Connecting cables for **U-WAVE-T**
  For standard (160mm): **02AZD790B**
  For foot switch: **02AZE140B**

SPECIFICATIONS

Metric

Order No.	Range	Resolution	Accuracy*	Mass
Digimatic (LCD)				
345-250-30	5 - 30mm	0.001mm	±5µm	320g
345-251-30	25 - 50mm		±6µm	325g

* Excluding quantizing error

Inch/Metric

Order No.	Range	Resolution	Accuracy*	Mass
Digimatic (LCD)				
345-350-30	.2" - 1.2"	.00005"/	±.00025"	320g
345-351-30	1" - 2"	0.001mm	±.0003"	325g

* Excluding quantizing error

Metric

Order No.	Range	Graduaton	Accuracy	Mass
Analog				
145-185	5 - 30mm		±5µm	130g
145-186	25 - 50mm		±6µm	140g
145-187	50 - 75mm		±7µm	160g
145-188	75 - 100mm		±8µm	180g
145-189	100 - 125mm		±9µm	210g
145-190	125 - 150mm	0.01mm		230g
145-191	150 - 175mm		±10µm	250g
145-192	175 - 200mm			270g
145-217	200 - 225mm		±11µm	310g
145-218	225 - 250mm			330g
145-219	250 - 275mm		±12µm	350g
145-220	275 - 300mm			370g

Inch

Order No.	Range	Graduaton	Accuracy	Mass
Analog				
145-193	.2" - 1.2"		±.00025"	130g
145-194	1" - 2"	.001"	±.0003"	140g
145-195	2" - 3"		±.00035"	160g
145-196	3" - 4"		±.0004"	180g

DIMENSIONS

345-250-30

345-251-30

145-185

145-186

50mm or more

Mitutoyo

Inside Micrometers

For easy and accurate measurement of inside diameters

Inside Micrometers
SERIES 141 — Interchangeable Rod Type

- Wide range of inside diameter measurements possible by combining one or more interchangeable rods.
- Each interchangeable rod is marked with its measuring range.
- For models supplied with more than one interchangeable rod, the full measuring range is achieved by combining spacing collars with the rods.

- Both micrometer head and rods are satin-chrome finished throughout.
- The sleeve is rotated to adjust the index line position when setting to a length standard.
- Setting ring (nominal size below 300mm), CERA Inside Micro Checker, and Gauge Block accessory set are provided as a reference gage for datum adjustment (refer to page C-47, C-26, and E-17 - E20 for details).
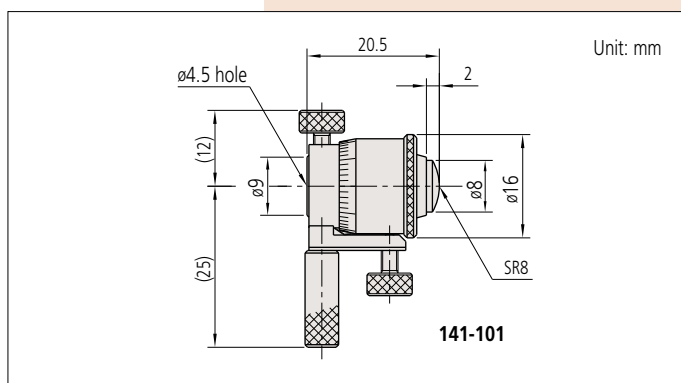
Technical Data
Accuracy
±(6+maximum measurement length/50)µm
 (fraction rounded up)

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

141-101
When using one of the extension rods supplied
(Measuring range 25 to 32mm)

DIMENSIONS

ø4.5 hole
20.5
2
Unit: mm
(12)
ø9
ø8
ø16
(25)
SR8
141-101

SPECIFICATIONS

Metric

Order No.	Range	Graduation	Micrometer head stroke	Remarks
141-001 / 141-003*	25 - 32mm		7mm	—
141-101 / 141-103*	25 - 50mm			with 2 rods
141-025 / 141-027*	50 - 63mm		13mm	—
141-205 / 141-211*	50 - 200mm	0.01mm		with 3 rods
141-206 / 141-212*	50 - 300mm			with 5 rods
141-009 / 141-011*	200 - 225mm		25mm	—
141-117	200 - 500mm			with 3 rods
141-118	200 - 1000mm			with 8 rods

* with carbide measuring face

Inch

Order No.	Range	Graduation	Micrometer head stroke	Remarks
141-002 / 141-004*	1" - 1.25"		.25"	—
141-102 / 141-104*	1" - 2"			with 2 rods
141-026 / 141-028*	2" - 2.5"		.5"	—
141-208 / 141-214*	2" - 8"	.001"		with 3 rods
141-233 / 141-215*	2" - 12"			with 5 rods
141-010 / 141-012*	8" - 9"		1"	—
141-121	8" - 20"			with 3 rods
141-122	8" - 40"			with 8 rods

* with carbide measuring face

Application
– The two auxiliary gauge blocks are held against the appropriate measuring blocks by the support clamps, which also provide accurate location for the inside micrometer by means of the V-grooved extensions.
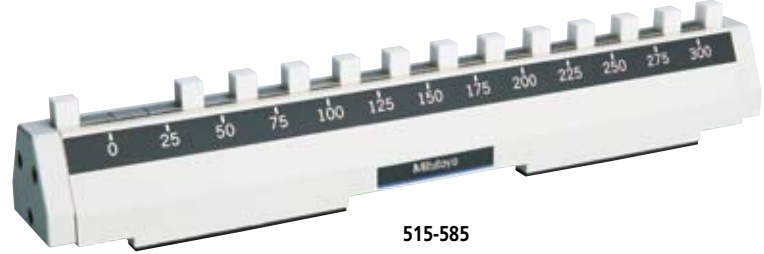
Optional accessories
• Wooden box
For 515-585: 602160
For 515-586: 602163

Inside Micro Checker
SERIES 515

• The Inside Micro Checker is designed to act as a setting standard for inside micrometers.

• Each measuring block is made of zirconia-based ceramic and it is free from deterioration and dimensional changes over time.

515-585

Standard accessory set

Support clamps	**940286***	Pair
Auxiliary block 10mm		2pcs.
Collar	**602195**	2pcs.
Clamp screwdriver	**600324**	1pc.

* Order No. is equivalent to a pair (2pcs.)

SPECIFICATIONS

Order No.	Length to check	Block pitch accuracy
515-585	25-300mm	±(1+L/150) µm L: Length to check (mm)
515-586	25-600mm	

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

DIMENSIONS

Unit: mm

515-585   CI-300C

63
52
50

364
340

0 25 50 75 100 125 150 175 200 225 250 275 300

515-586   CI-600C

63
52
50

664
640

0 25 50 75 100 125 150   475 500 525 550 575 600

Mitutoyo