



Micrometers



Micrometer Heads



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QuantuMike

SERIES 293 — IP65 Coolant Proof Micrometer with 2mm/rev Spindle Feed

Speedy measurement is achieved thanks to 2mm of spindle feed for every thimble revolution!

Mitutoyo is proud to have reached its leading position in the micrometer market through a spirit of innovation, imagination and creating added value.

The QuantuMike brand of micrometer, inspired by this Mitutoyo Spirit, provides users with an excellent measuring experience with higher speed, quality and stability than ever before owing to the integration of sophisticated manufacturing and processing technologies.



(Refer to page VIII for details.)



(Refer to page VIII for details.)



Certificate of inspection



Metric	
Range	Order No.
0 - 25mm	293-140 / 293-145*

Inch/Metric	
Range	Order No.
0 - 1"	293-180 / 293-185*

*without SPC data output



Metric	
Range	Order No.
25 - 50mm	293-141 / 293-146*

Inch/Metric	
Range	Order No.
1" - 2"	293-181 / 293-186*

*without SPC data output



Metric	
Range	Order No.
50 - 75mm	293-142 / 293-147*

Inch/Metric	
Range	Order No.
2" - 3"	293-182 / 293-187*

*without SPC data output



Metric	
Range	Order No.
75 - 100mm	293-143 / 293-148*

Inch/Metric	
Range	Order No.
3" - 4"	293-183 / 293-188*

*without SPC data output

Technical Data

Accuracy: $\pm 1\mu\text{m} \pm .00005''$ or $\pm 2\mu\text{m} \pm .0001''$ (over 75mm/3")

(excluding quantizing error)

Resolution: 0.001mm, .00005"/0.001mm

Flatness: 0.3 μm /0.00012"

Parallelism: 1 μm /0.0004" for models up to 50mm/2"
2 μm /0.0008" for models up to 100mm/4"

Measuring faces: Carbide

Display: LCD

Length standard: Electromagnetic rotary sensor

*Patent pending (in Japan, USA, Europe, and China)

Battery: SR44 (1 pc.), 938882

Battery life: Approx. 1.2 years under normal use

Dust/Water protection level: IP65

Functions

Origin-set, Zero-setting, Function lock, Automatic power ON/OFF, Data hold, Data output, inch/mm conversion (inch/mm models)

Alarm: Low voltage, Counting value composition error





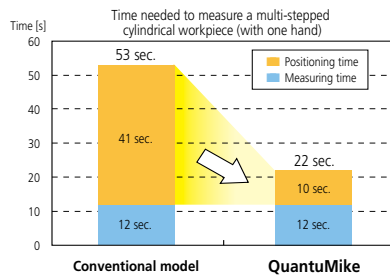
FEATURES

• Speedy measurement

Faster measurement is achieved by using a coarser thread which feeds the spindle by 2mm per revolution of the thimble instead of the standard 0.5mm. This increase in thread lead has been made possible thanks to new high precision thread-cutting and test techniques.

Trials show that a reduction in positioning times of 60% and measuring times of 35%* can be obtained, compared with a conventional micrometer.

* According to Mitutoyo's comparison test data for measuring time on typical workpieces.



The time needed to measure 6 diameters on a workpiece, from the smallest to the largest with the micrometer held in one hand, was recorded for a conventional digital micrometer and for the QuantuMike

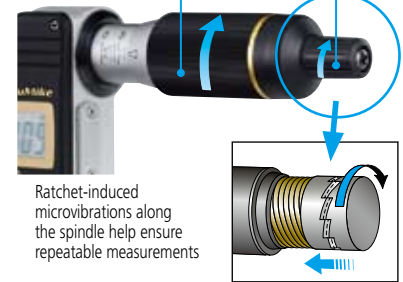
• Repeatable measurement

The patented ratchet thimble mechanism* helps ensure repeatable results by transmitting microvibrations along the spindle to the contact face to provide a constant measuring force and encourage good contact with the workpiece. The ratchet works from the thimble as well as the speeder so it is always easy to use – even when making measurements one-handed. The sound of the ratchet provides the user with a sense of confidence and the speeder enables the rapid spindle feed needed when measuring widely different dimensions.

* Patent registered (in Japan, USA, China, Germany, UK, and France)



Ratchet on thimble Ratchet on speeder



Ratchet-induced microvibrations along the spindle help ensure repeatable measurements

Optional Accessories

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

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

06ADV380B: USB Input Tool Direct with data switch (2m)

02AZD790B: SPC cable for U-WAVE water-proof model (160mm)



SPC cable with data switch



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

• Function lock

QuantuMike is equipped with a function lock feature to prevent the origin point being moved by mistake during measurement.



Function lock

• Dust/water resistance with IP65 protection level

Excellent resistance against oil, water and dust enables this product to be used in machining situations that include splashing coolant fluid.

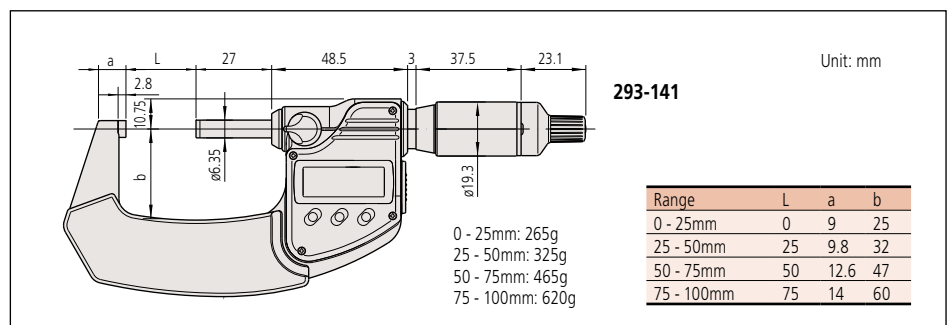


Useful application of measurement data

A statistical process control system and a measurement network system can be established to share information regarding quality with a model equipped with the data output function.



DIMENSIONS AND MASS



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-resistant materials are used in all plastic components.
- $\pm 1\mu\text{m}$ instrumental error (75mm/3" or less range models)
- Auto power ON/OFF function.
- Certificate of Inspection* is included. (50mm/2" or less range models)
* This certificate is outdated and therefore cannot be used as a calibration certificate.



Oil-resistant materials are used in all plastic components.



(Refer to page VIII for details.)



(Refer to page VIII 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 μm /0.00012"
- Parallelism: 1 μm /.00004" for models up to 50mm/2"
2 μm /.00008" for models up to 100mm/4"
3 μm /.00012" for models up to 175mm/7"
4 μm /.00016" for models up to 275mm/11"
5 μm /.0002" for models over 300mm/12"
- Measuring faces: Carbide
- Display: LCD
- Battery: SR44 (1 pc.), **938882**
- Battery life: Approx. 1.2 years under normal use
- Dust/Water protection level: IP65

Functions

- Origin-set, 2-point preset (over 100mm), Zero-setting, Function lock (over 100mm) Automatic power ON/OFF, Data hold, Data output, inch/mm conversion (inch/mm models)
- Alarm: Low voltage, Counting value composition error

Optional Accessories

- 05CZA662:** SPC cable with data switch (1m)
- 05CZA663:** SPC cable with data switch (2m)
- 06ADV380B:** USB Input Tool Direct with data switch (2m)
- 02AZD790B:** SPC cable for U-WAVE water-proof model (160mm)



SPC cable with data switch



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

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	293-250-10	±2μm
125 - 150mm	293-251-10	±2μm
150 - 175mm	293-252-10	±3μm
175 - 200mm	293-253-10	±3μm
200 - 225mm	293-254-10	±3μm
225 - 250mm	293-255-10	±4μm
250 - 275mm	293-256-10	±4μm
275 - 300mm	293-257-10	±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"	293-350-10	±.0001"
5" - 6"	293-351-10	±.0001"
6" - 7"	293-352-10	±.00015"
7" - 8"	293-353-10	±.00015"
8" - 9"	293-354-10	±.00015"
9" - 10"	293-355-10	±.0002"
10" - 11"	293-356-10	±.0002"
11" - 12"	293-357-10	±.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

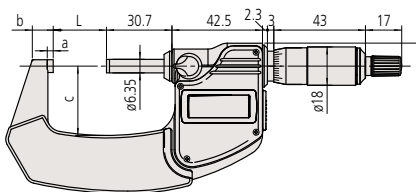
Inch/Metric With friction thimble		
Range	Order No.	Accuracy
0 - 1"	293-335 / 293-348*	±.00005"
1" - 2"	293-336	±.00005"

*without SPC data output

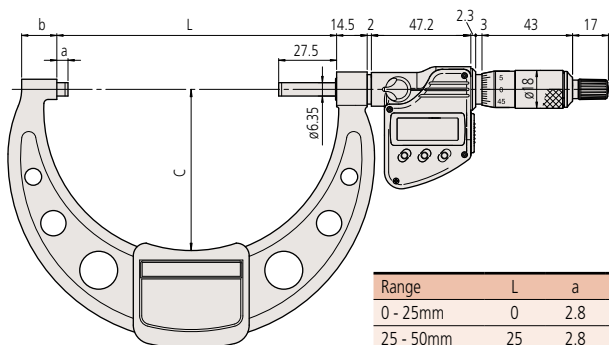
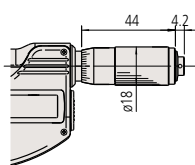
DIMENSIONS AND MASS

Unit: mm

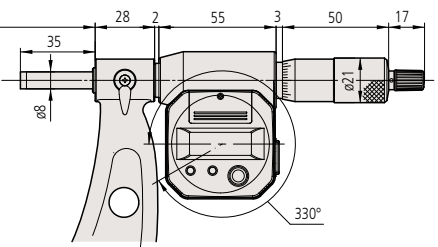
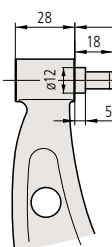
Ratchet stop type up to 100mm



Ratchet thimble type / Friction thimble type



Ratchet stop type over 100mm



Range	L	a	b	c	Mass
0 - 25mm	0	2.8	9	25	270g
25 - 50mm	25	2.8	9.8	32	330g
50 - 75mm	50	2.8	12.6	47	470g
75 - 100mm	75	2.8	14	60	625g
100 - 125mm	132.8	5.3	16.7	76	600g
125 - 150mm	158.2	5.7	18.8	90	740g
150 - 175mm	183.6	6.1	19.1	102	800g
175 - 200mm	208.8	6.3	18.2	115	970g
200 - 225mm	234.2	6.7	16.8	127	1100g
225 - 250mm	258	5.5	18	139	1270g
250 - 275mm	284	6.5	18	152	1340g
275 - 300mm	309	6.5	18	166	1540g

Range	L	a
300 - 325mm	353	187
325 - 350mm	378	199
350 - 375mm	403	212
375 - 400mm	428	224
400 - 425mm	453	236
425 - 450mm	478	248
450 - 475mm	503	261
475 - 500mm	528	273

Digimatic Micrometer

SERIES 293

FEATURES



293-582

SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
300 - 325mm	293-582	$\pm 6\mu\text{m}$
325 - 350mm	293-583	$\pm 6\mu\text{m}$
350 - 375mm	293-584	$\pm 6\mu\text{m}$
375 - 400mm	293-585	$\pm 7\mu\text{m}$
400 - 425mm	293-586	$\pm 7\mu\text{m}$
425 - 450mm	293-587	$\pm 7\mu\text{m}$
450 - 475mm	293-588	$\pm 8\mu\text{m}$
475 - 500mm	293-589	$\pm 8\mu\text{m}$

Inch/Metric With ratchet stop		
Range	Order No.	Accuracy
12" - 13"	293-782	± 0.003 "
13" - 14"	293-783	± 0.003 "
14" - 15"	293-784	± 0.003 "
15" - 16"	293-785	± 0.0035 "
16" - 17"	293-786	± 0.0035 "
17" - 18"	293-787	± 0.0035 "
18" - 19"	293-788	± 0.004 "
19" - 20"	293-789	± 0.004 "

Digimatic Micrometer

SERIES 293

FEATURES

- Simply measures 0 through 25mm with resolution to 0.001mm.
- Provided only with an origin-set button 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	$\pm 2\mu\text{m}$

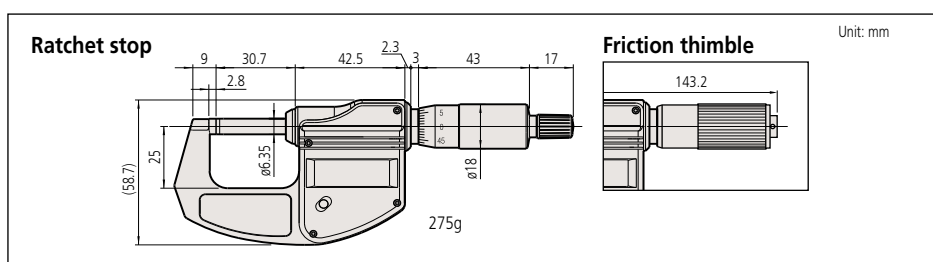


293-821

Inch/Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 1"	293-831	± 0.001 "

Inch/Metric With friction thimble		
Range	Order No.	Accuracy
0 - 1"	293-832	± 0.001 "

DIMENSIONS AND MASS



Technical Data

Accuracy: Refer to the list of specifications. (excluding quantizing error)
 Resolution: 0.001mm or .0001"/0.001mm
 Flatness: 0.6 μm /0.00024"
 Parallelism: 5 μm /.0002" for models up to 375mm/15"
 6 μm /.00024" for models up to 475mm/19"
 7 μm /.00028" for models over 500mm/20"
 Measuring faces: Carbide
 Display: LCD
 Battery: SR44 (2 pcs.), **938882**
 Battery life: Approx. 1.8 years under normal use
 Dimensions: Refer to page B-5 for details.

Functions

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

Optional Accessories

- 04AZB512: SPC cable (1m)
- 04AZB513: SPC cable (2m)
- 02AZD790E: SPC cable for U-WAVE (160mm)



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications. (excluding quantizing error)
 Resolution: 0.001mm or .00005"/0.001mm
 Flatness: 0.3 μm /0.00012"
 Parallelism: 2 μm /.00008"
 Measuring faces: Carbide
 Display: LCD
 Battery: SR44 (1 pc.), **938882**
 Battery life: Approx. 1.2 years under normal use

Functions

Origin-set, Automatic power on/off, inch/mm conversion (inch/mm models)
 Alarm: Low voltage, Counting value composition error



ABSOLUTE Digimatic Micrometers

SERIES 227 — with Adjustable Measuring Force Device



Absolute System Patented by MITUTOYO

(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3µm/.000012"
Parallelism: 2µm/.00008"
Measuring faces: Carbide
Display: LCD
Battery: SR44 (1 pc.) **938882**
Battery life: Approx. 3 years under normal use
(1 year for 15-30mm, 10-20mm, 20-30mm,
.6"-1.2", .4"-.8", .8"-1.2" range model)

Functions

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 Accessories

937387: SPC cable (1m)
965013: SPC cable (2m)
06ADV380E: USB Input Tool Direct with data switch (2m)
02AZD790E: SPC cable for U-WAVE (160mm)



FEATURES

- Constant and low measuring force mechanism in the thimble.
- Adjustable measuring force* to suit various kinds of workpiece.
- 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.
- Absolute linear scale.
- SPC data output.

*0.5-2.5N or 2-10N



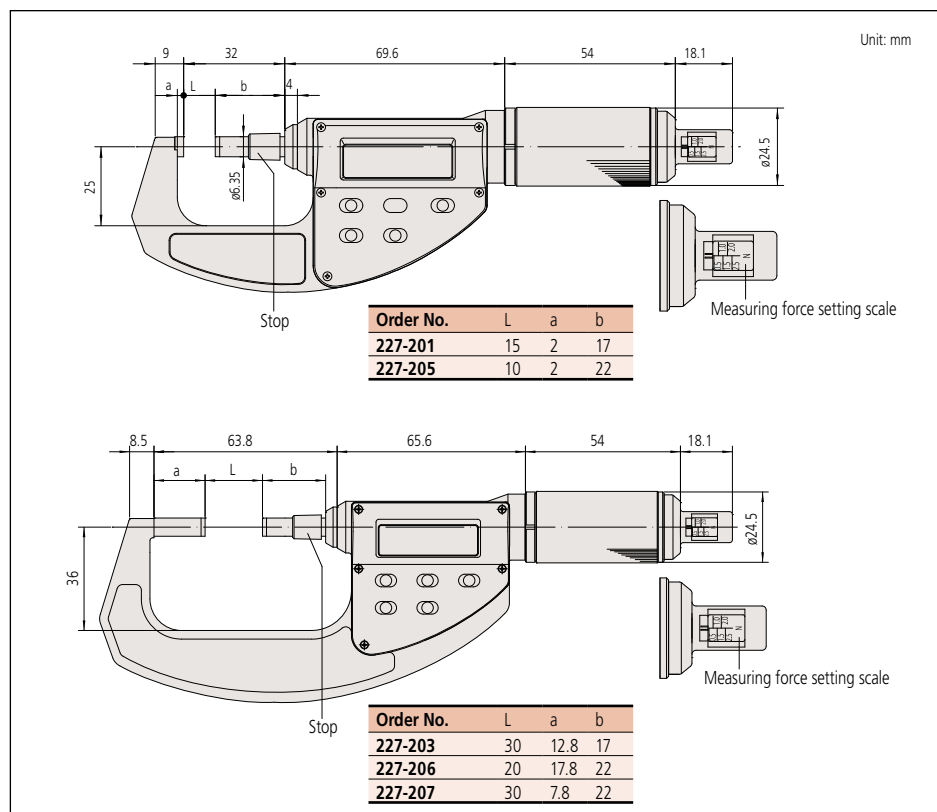
227-201

SPECIFICATIONS

Metric			
Range	Order No.	Accuracy	Measuring force
0 - 15mm	227-201	±2µm	0.5N - 2.5N
0 - 10mm	227-205	±2µm	2N - 10N
15 - 30mm	227-203	±2µm	0.5N - 2.5N
10 - 20mm	227-206	±2µm	2N - 10N
20 - 30mm	227-207	±2µm	2N - 10N

Inch/Metric			
Range	Order No.	Accuracy	Measuring force
0 - .6"	227-211	±.0001"	0.5N - 2.5N
	227-215	±.0001"	2N - 10N
.6" - 1.2"	227-213	±.0001"	0.5N - 2.5N
	227-216	±.0001"	2N - 10N
.8" - 1.2"	227-217	±.0001"	2N - 10N

DIMENSIONS 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/1.2" measuring range allows various workpieces of different shapes to be measured quickly.

FEATURES

- Non-rotating spindle and the new ratchet friction thimble.
- Speedy spindle feed of 10mm/rev.
- ABSOLUTE System linear scale.
- IP54 dust/water protection (when not connected with data output cable).
- SPC data output.
- Supplied with a setting standard (for models with a range over 30mm/1.2").

SPC

IP54

(Refer to page VIII for details.)

ABSOLUTE®
Absolute System Patented by MITUTOYO

(Refer to page VIII for details.)



293-666



293-667



293-668



293-669

Technical Data

Accuracy: Refer to the list of specifications.
(excluding quantizing error)
Resolution: 0.001mm or .00005"/0.001mm
Flatness: 0.3µm/.000012"
Parallelism: 2µm/.00008" for models up to 80mm/3.2"
3µm/.00012" for models up to 105mm/4.2"
Measuring faces: Carbide
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

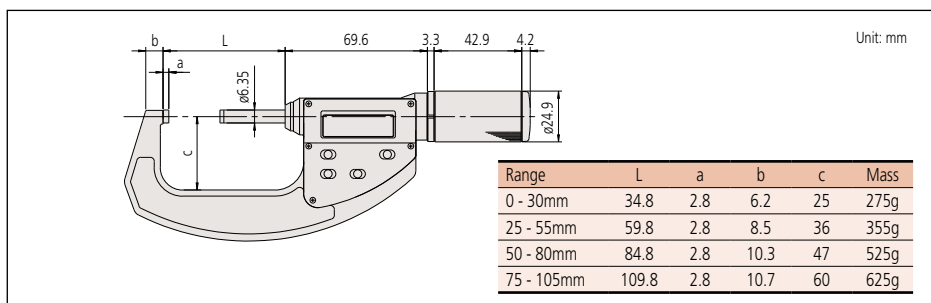
SPECIFICATIONS

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

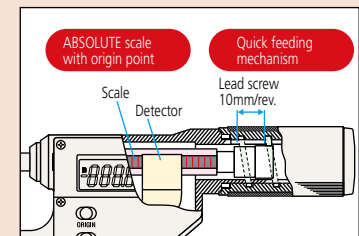
Inch/Metric		
Range	Order No.	Accuracy
0 - 1.2"	293-676	±.0001"
1" - 2.2"	293-677	±.0001"
2" - 3.2"	293-678	±.00015"
3" - 4.2"	293-679	±.00015"

DIMENSIONS AND MASS



Functions

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 Accessories

- 937387: SPC cable (1m)
- 965013: SPC cable (2m)
- 06ADV380E: USB Input Tool Direct with data switch (2m)
- 02AZD790E: SPC cable for U-WAVE (160mm)

Outside Micrometers

SERIES 102

FEATURES

- Heat-insulated frame, tapered (behind the anvil) for hard-to-reach places.
- Supplied with a setting standard (except for 0-25mm/0-1" models).
- A ratchet stop for a constant measuring force.



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm
 Flatness: 0.6μm
 Parallelism: 2μm for 25, 50, 75mm model
 3μm for models up to 100mm
 Measuring faces: Carbide

Ratchet stop type



102-301



SPECIFICATIONS

Metric With ratchet stop		
Range	Order No.	Accuracy
0 - 25mm	102-301	±2μm
25 - 50mm	102-302	±2μm
50 - 75mm	102-303	±2μm
75 - 100mm	102-304	±3μm

*0.001mm reading is obtained with vernier.

Metric Micrometer set		
Range	Order No.	Models included
0 - 100mm (Four micrometers per set)	102-911-01	<ul style="list-style-type: none"> • 102-701* • 102-302 • 102-303 • 102-304 • 3 micrometer standards

*Ratchet thimble micrometer.

DIMENSIONS

Unit: mm

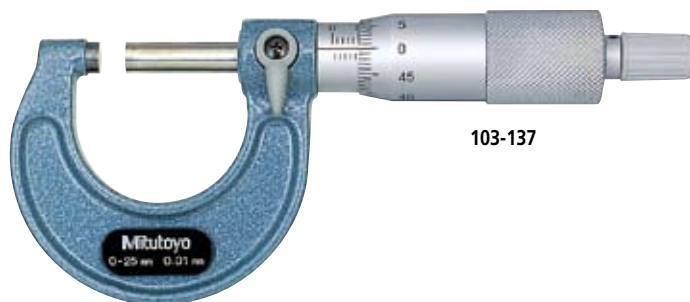
Range	L	a	b	c	d
0 - 25mm	30.3	2.8	5	26	6.35
25 - 50mm	55.3	2.8	8	32	6.35
50 - 75mm	80.3	2.8	9	45	6.35
75 - 100mm	105.3	2.8	10	58	6.35

Outside Micrometers

SERIES 103

FEATURES

- Hammertone-green, baked-enamel-finished frame.
- Ratchet Stop or Friction Thimble for excellent repeatability.
- Supplied with a setting standard (except for 0-25mm/0-1" models).



103-137



(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm, 0.001mm, .001" or .0001"
 Flatness: 0.6μm/.000024" for models up to 300mm/12"
 1μm/.00004" for models over 300mm/12"
 Parallelism: (2+R/100)μm, R = max. range (mm)
 [.00008+.00004(R/4)]", R=max, range (inch)
 *fraction rounded down
 Measuring faces: Carbide

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.

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"	103-135*	±.0001"
1" - 2"	103-136*	±.0001"

*.0001" reading is obtained with vernier.

Metric Micrometer set		
Range	Order No.	Models included
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

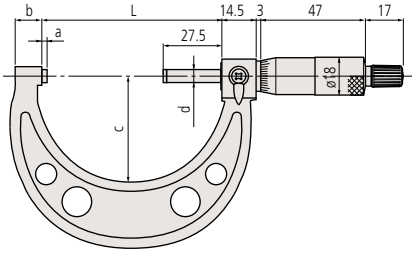
*Ratchet thimble micrometer

Inch Micrometer set		
Range	Order No.	Models included
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)	103-904-10	103-177, 103-178, 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)	103-905-10	All micrometers of 103-904-10 and 103-906 in one set, 11 micrometer standards

*Ratchet thimble micrometer

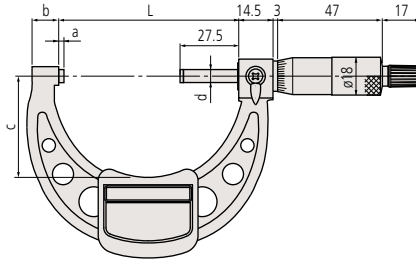
DIMENSIONS AND MASS

Models up to 75mm

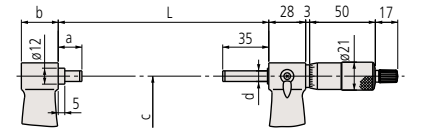


Range	L	a	b	c	d
0 - 25mm	30	2.5	9	28	ø6.35
25 - 50mm	55	2.5	10	38	ø6.35
50 - 75mm	80	2.5	12	46	ø6.35
75 - 100mm	105	2.5	14	57	ø6.35
100 - 125mm	132.8	5.3	16.7	76	ø6.35
125 - 150mm	158.2	5.7	18.8	90	ø6.35
150 - 175mm	183.6	6.1	19.1	102	ø6.35
175 - 200mm	208.8	6.3	18.2	115	ø6.35
200 - 225mm	234.2	6.7	16.8	127	ø6.35

Models 75mm to 300mm



Models over 300mm



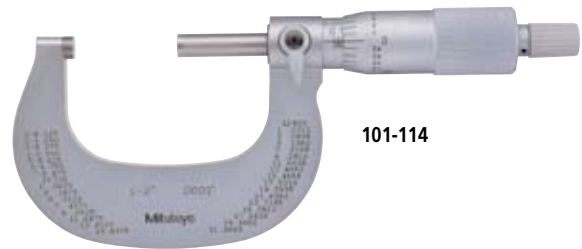
Range	L	a	b	c	d
225 - 250mm	258	5.5	18	139	ø6.35
250 - 275mm	284	6.5	18	152	ø6.35
275 - 300mm	309	6.5	18	166	ø6.35
300 - 325mm	353	18	28	187	ø8
325 - 350mm	378	18	28	199	ø8
350 - 375mm	403	18	28	212	ø8
375 - 400mm	428	18	28	224	ø8
400 - 425mm	453	18	28	236	ø8
425 - 450mm	478	18	28	248	ø8
450 - 475mm	503	18	28	261	ø8
475 - 500mm	528	18	28	273	ø8

Outside Micrometers

SERIES 101

FEATURES

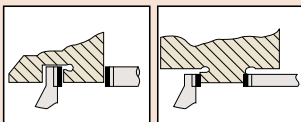
- Satin-chrome-finished frame, tapered (on the anvil side) for hard-to-reach places.
- Supplied with a setting standard (except for 0-1" models).



101-114

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: .001" or .0001"
 Flatness: .000024"
 Parallelism: .00008" for models up to 3"
 .00012" for models over 3"
 Measuring faces: Carbide



SPECIFICATIONS

Inch With ratchet stop

Range	Order No.	Accuracy
0 - 1"	101-113*	±.0001"
1" - 2"	101-114*	±.0001"
2" - 3"	101-119*	±.0001"
3" - 4"	101-120*	±.00015"

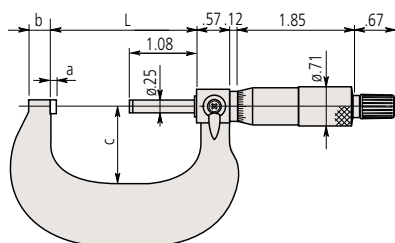
*.0001" reading is obtained with vernier.

Inch With friction thimble

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

*.0001" reading is obtained with vernier.

DIMENSIONS



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

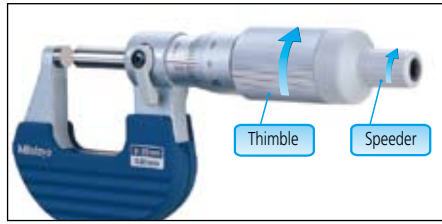
Note: The shape of the thimble changes on the model with a friction thimble.

Ratchet Thimble Micrometer

SERIES 102 — New smoother action Ratchet Thimble

FEATURES

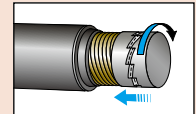
- Ratchet function works both from the thimble and the speeder, allowing easy one-handed operation.
- Clearly audible ratchet operation for reassurance that measurement is being performed at constant, preset force.
- Provided with a Certificate of Inspection.



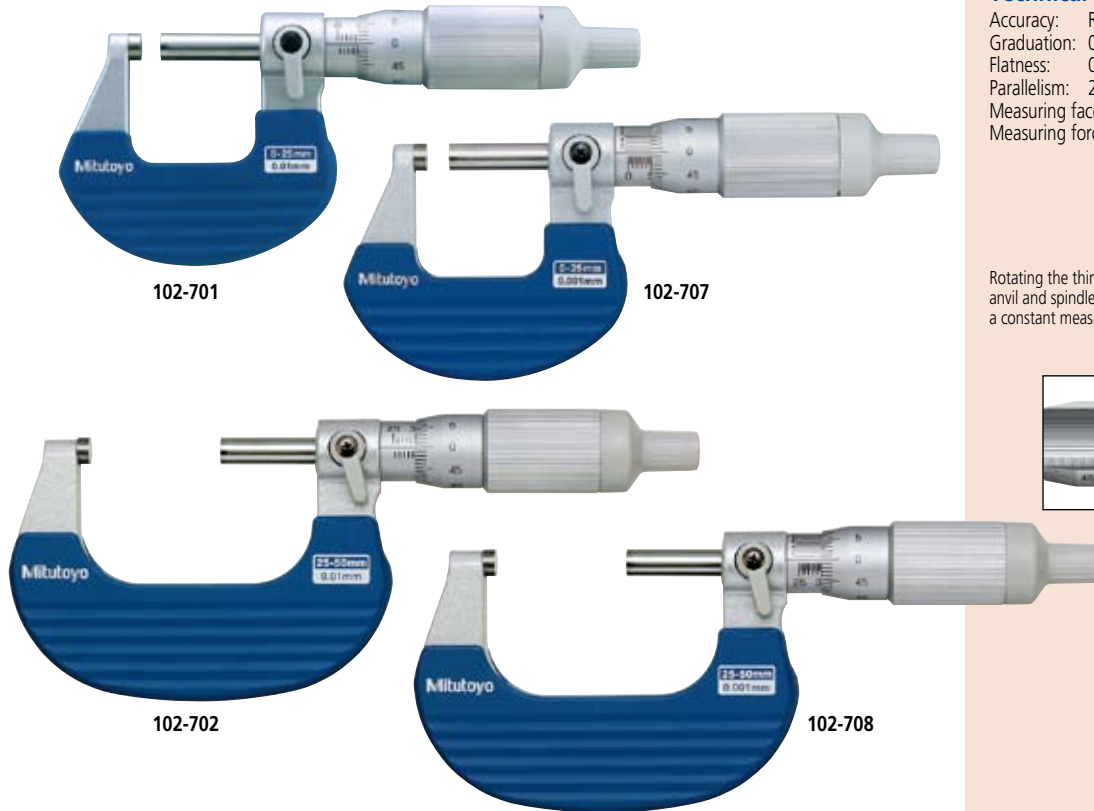
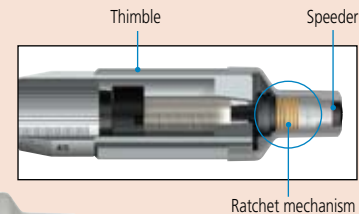
(Refer to page VIII for details.)

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm, 0.001mm, or .0001"
 Flatness: 0.6µm/.000024"
 Parallelism: 2µm/.00008"
 Measuring faces: Carbide
 Measuring force: 5 - 10N



Rotating the thimble/speeder when the workpiece is between the anvil and spindle causes the ratchet mechanism to operate and apply a constant measuring force to the workpiece.



SPECIFICATIONS

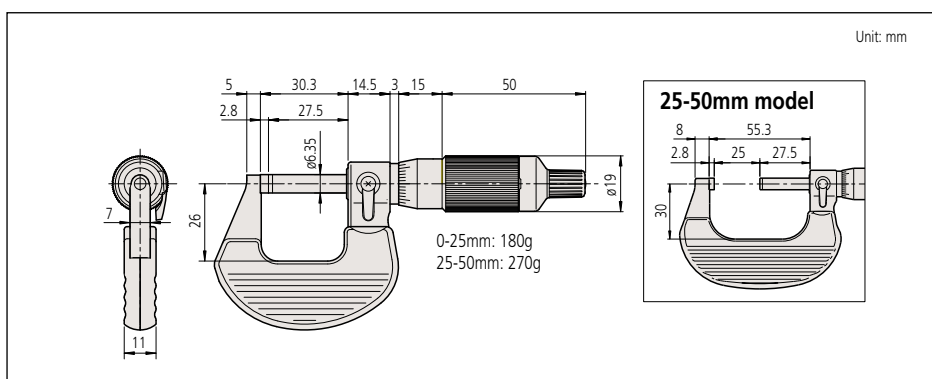
Metric		
Range	Order No.	Accuracy
0 - 25mm	102-701	±2µm
	102-707*	±2µm
25 - 50mm	102-702	±2µm
	102-708*	±2µm

Inch		
Range	Order No.	Accuracy
0 - 1"	102-717*	±.0001"
1 - 2"	102-718*	±.0001"

*.0001" reading is obtained with vernier.

*0.001mm reading is obtained with vernier.

DIMENSIONS AND MASS

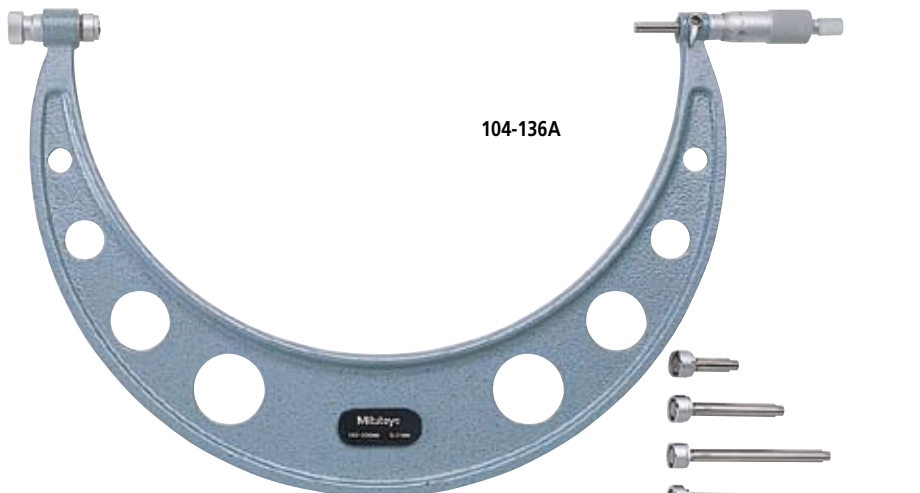


Outside Micrometers

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 Ratchet Stop for constant force.
- Supplied with setting standards for each range.
- With SPC output (series 340).



Digital model



SPECIFICATIONS

Metric	Digital model	Interchangeable anvils
Range	Order No.	
0 - 150mm	340-251-10	6pcs.
150 - 300mm	340-252-10	6pcs.
300 - 400mm	340-520	4pcs.
400 - 500mm	340-521	4pcs.
500 - 600mm	340-522	4pcs.
600 - 700mm	340-523	4pcs.
700 - 800mm	340-524	4pcs.
800 - 900mm	340-525	4pcs.
900 - 1000mm	340-526	4pcs.

Metric	Digital model	Interchangeable anvils
Range	Order No.	
0 - 50mm	104-171*	1pcs.
0 - 100mm	104-139A	4pcs.
0 - 150mm	104-135A	6pcs.
50 - 150mm	104-161A	4pcs.
100 - 200mm	104-140A	4pcs.
150 - 300mm	104-136A	6pcs.
200 - 300mm	104-141A	4pcs.
300 - 400mm	104-142A	4pcs.
400 - 500mm	104-143A	4pcs.
500 - 600mm	104-144A	4pcs.
600 - 700mm	104-145A	4pcs.
700 - 800mm	104-146A	4pcs.
800 - 900mm	104-147A	4pcs.
900 - 1000mm	104-148A	4pcs.

*The frame is fitted with a heat shield.

Inch/Metric	Digital model	Interchangeable anvils
Range	Order No.	
0 - 6"	340-351-10	6pcs.
6" - 12"	340-352-10	6pcs.
12" - 18"	340-720	6pcs.
18" - 24"	340-721	6pcs.
24" - 30"	340-722	6pcs.
30" - 36"	340-723	6pcs.

Inch	Digital model	Interchangeable anvils
Range	Order No.	
0 - 2"	104-165*	1pcs.
0 - 4"	104-149	4pcs.
0 - 6"	104-137	6pcs.
2" - 6"	104-162	4pcs.
4" - 8"	104-150	4pcs.
6" - 12"	104-138	6pcs.
8" - 12"	104-151	4pcs.
12" - 16"	104-152	4pcs.
12" - 18"	104-201	6pcs.
16" - 20"	104-153	4pcs.
18" - 24"	104-202	6pcs.
20" - 24"	104-154	4pcs.
24" - 28"	104-155	4pcs.
24" - 30"	104-203	6pcs.
28" - 32"	104-156	4pcs.
30" - 36"	104-204	6pcs.
32" - 36"	104-157	4pcs.
36" - 40"	104-158	4pcs.
36" - 42"	104-205	6pcs.

*.0001" reading is obtained with vernier.



(Refer to page VIII for details.)

Technical Data

Accuracy: $\pm(4+R/75)\mu\text{m}$, R = max. range (mm)
 $\pm[.00016"+.00004(R/3)]"$ R = max. range (inch)
 (excluding quantizing error for digital models)
 Resolution*: 0.001mm or .0001"/0.001mm
 (.00005"/0.001mm: **340-351-10**)
 Graduation**: 0.01mm/.001"
 Flatness: 0.6 μm /.000024" for models up to 300mm/12"
 1 μm /.00004" for models over 300mm/12"
 Parallelism: 2 μm /.00008" for models up to 75mm/3"
 3 μm /.00012" for models up to 150mm/6"
 (2+R/100) μm for models over 150mm,
 R = max. range (mm)
 fraction rounded up
 $\pm[.00008"+.00004(R/4)]"$ For models over 6"
 R = max. range (inch)
 fraction rounded up
 Measuring faces: Carbide
 Display*: LCD
 Battery*: SR44 (2 pc.), **938882**
 (1 pc.: **340-251-10, 252-10, 351-10, 352-10**)
 Battery life*: Approx. 1.8 years under normal use
 (1.2 years for **340-251-10, 252-10, 351-10, 352-10**)
 Dust/Water protection level*: IP65 (**340-251-10, 252-10, 351-10, 352-10**)
 *Digital models **Analog models

Functions of Digital Model

Zero-setting, Data hold, 2-point preset*, Function lock*, Power ON/OFF**, Data output, inch/mm conversion (inch/mm models)
 *Only for **340-251-10, 252-10, 351-10, 352-10**
 Not available for **340-251-10, 252-10, 351-10, 352-10
 Alarm: Low voltage, Counting value composition error

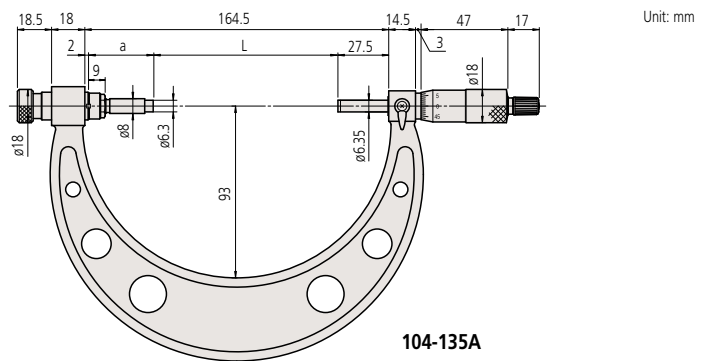
Optional Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)*
- 05CZA663**: SPC cable with data switch (2m)*
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE w/ data switch (160mm)*
- 04AZB512**: SPC cable (1m)**
- 04AZB513**: SPC cable (2m)**
- 02AZD790B**: SPC cable for U-WAVE (160mm)**

*Up to 300mm models **Over 300mm models



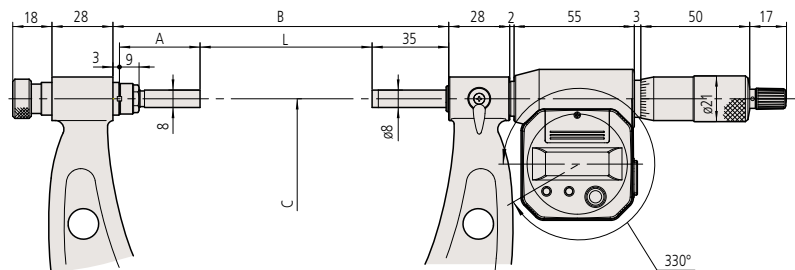
DIMENSIONS



Interchangeable anvil

	L: Range (mm)						
Range	0 to 150mm models	0-25	25-50	50-75	75-100	100-125	125-150
Range	150 to 300mm models	150-175	175-200	200-225	225-250	250-275	275-300
Order No.		303950	303951	303952	303953	303954	303955
A: Overall length		135	110	85	60	35	10
Interchangeable anvil sign		M1	M2	M3	M4	M5	M6

	L: Range (mm)				
Range	300 to 400mm models	300-325	325-350	350-375	375-400
Range	400 to 500mm models	400-425	425-450	450-475	475-500
Range	500 to 600mm models	500-525	525-550	550-575	575-600
Range	600 to 700mm models	600-625	625-650	650-675	675-700
Range	700 to 800mm models	700-725	725-750	750-775	775-800
Range	800 to 900mm models	800-825	825-850	850-875	875-900
Range	900 to 1000mm models	900-925	925-950	950-975	975-1000
Order No.		304001	304002	304003	304004
A: Overall length		87	62	37	12
Interchangeable anvil sign		M3	M4	M5	M6



	L: Range (mm)				B	C	
Range	300 to 400mm models	300-325	325-350	350-375	375-400	425	224
Range	400 to 500mm models	400-425	425-450	450-475	475-500	525	273
Range	500 to 600mm models	500-525	525-550	550-575	575-600	625	332
Range	600 to 700mm models	600-625	625-650	650-675	675-700	725	382
Range	700 to 800mm models	700-725	725-750	750-775	775-800	825	430
Range	800 to 900mm models	800-825	825-850	850-875	875-900	925	480
Range	900 to 1000mm models	900-925	925-950	950-975	975-1000	1025	530
Order No.		304001	304002	304003	304004		
A: Overall length		87	62	37	12		
Interchangeable anvil sign		M3	M4	M5	M6		

Outside Micrometers

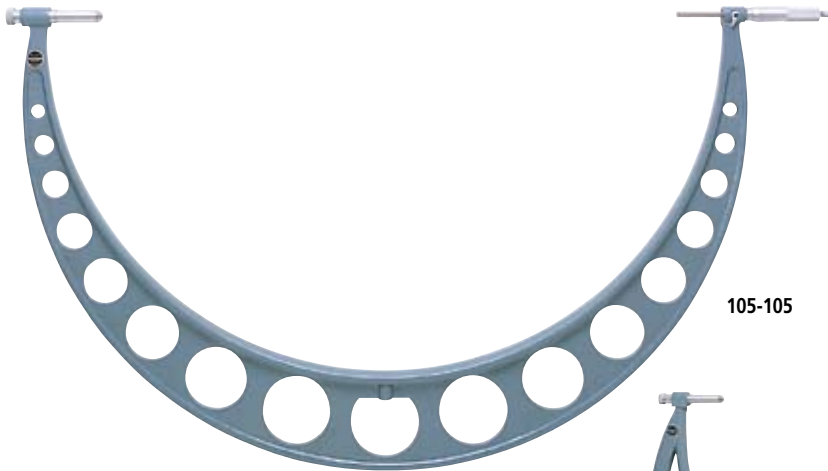
SERIES 105 — with Extension Anvil Collars

FEATURES

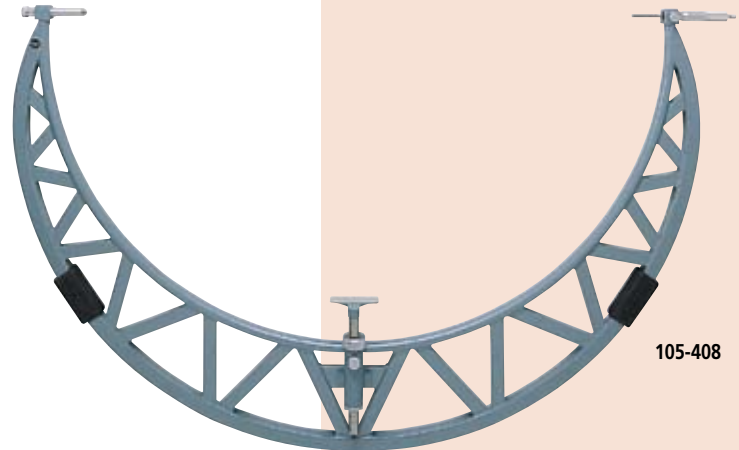
- Wide measuring range with extension anvil collars.
- 50mm/2" spindle stroke.
- With Ratchet Stop for constant force.
- Supplied with setting standards for each range.
- Square and round frame-tubes are combined for light weight and rigidity (for models over 1000mm/40" range).
- Workpiece stop (for models over 1000mm/40" range).

Technical Data

Accuracy: $\pm(6+R/75)\mu\text{m}$, R = max. range (mm)
 $\pm[.0003'' + .00005''(R/3)]''$ R = max. range (inch)
 fraction rounded up
 Graduation: 0.01mm/.001"
 Flatness: 1.3 μm /.00005"
 Parallelism: $(2+R/100)\mu\text{m}$, R = max. range (mm)
 $[.00008'' + .00004(R/4)]''$ R = max. range (inch)
 fraction rounded down
 Measuring faces: Carbide

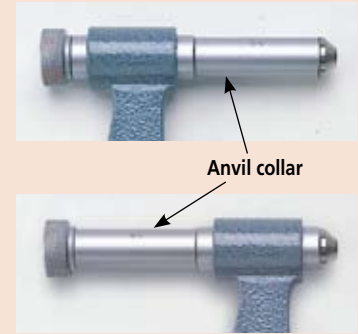


105-105



105-408

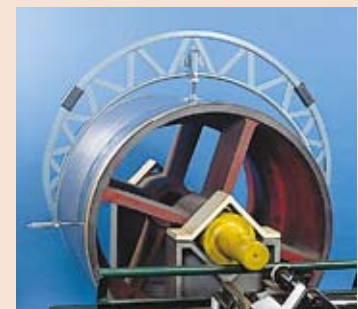
Anvil extension collar



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

Inch		
Range	Order No.	Interchangeable anvils
40" - 44"	105-428	2"
44" - 48"	105-429	2"
48" - 52"	105-430	2"
52" - 56"	105-431	2"
56" - 60"	105-432	2"
60" - 64"	105-433	2"
64" - 68"	105-434	2"
68" - 72"	105-435	2"
72" - 76"	105-436	2"
76" - 80"	105-437	2"



DIMENSIONS

105-418/419/420/421/422

Unit: mm

Range	L	a
1000 - 1200mm	1225	500 - 600
1200 - 1400mm	1425	600 - 700
1400 - 1600mm	1625	700 - 800
1600 - 1800mm	1825	800 - 900
1800 - 2000mm	2025	900 - 1000

Size a: Distance to the workpiece stopper

Caliper Type Micrometers

SERIES 343, 143

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/0.01"
Flatness: 0.3μm/0.00012"
Parallelism: (3+R/75)μm, R = max. range (mm)
[.00012"+.00004(R/3)]" R = max. range (inch)
fraction rounded down

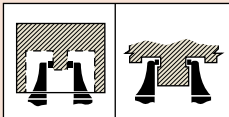
Measuring faces: Carbide
Display*: LCD
Battery*: SR44 (1 pc.) **938882**
Battery life*: Approx. 1.2 years under normal use
*Digital models **Analog models

Functions 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 Accessories for Digital Model

05CZA662: SPC cable with data switch (1m)
05CZA663: SPC cable with data switch (2m)
06ADV380B: USB Input Tool Direct with data switch (2m)
02AZD790B: SPC cable for U-WAVE water-proof model (160mm)



FEATURES

- With Ratchet Stop for constant force.
- 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
125 - 150mm	143-106	±9μm
150 - 175mm	143-107	±10μm
175 - 200mm	143-108	±10μm
200 - 225mm	143-109	±11μm
225 - 250mm	143-110	±11μm
250 - 275mm	143-111	±12μm
275 - 300mm	143-112	±12μm

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"
2" - 3"	143-123	±.00035"

DIMENSIONS

Unit: mm

Range	L	a	b	c
0 - 25mm	59.8	31.8	10.6	28.6
25 - 50mm	84.8	31.8	10.6	28.6
50 - 75mm	109.8	31.8	10.6	28.6
75 - 100mm	134.8	31.8	10.6	28.6
100 - 125mm	159.8	31.8	10.6	28.6
125 - 150mm	184.8	31.8	10.6	28.6
150 - 175mm	209.8	31.8	10.6	28.6
175 - 200mm	234.8	31.8	10.6	28.6
200 - 225mm	255.8	27.8	14.5	32.5
225 - 250mm	280.8	27.8	14.5	32.5
250 - 275mm	305.8	27.8	14.5	32.5
275 - 300mm	330.8	27.8	14.5	32.5

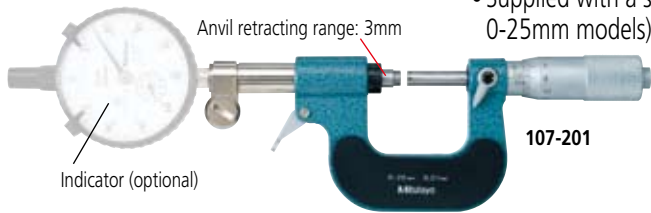
Range	L	a	b	c
0 - 25mm	55.5	27.5	10.6	32.9
25 - 50mm	80.5	27.5	10.6	32.9
50 - 75mm	105.5	27.5	10.6	32.9
75 - 100mm	130.5	27.5	10.6	32.9

Outside Micrometers

SERIES 107

FEATURES

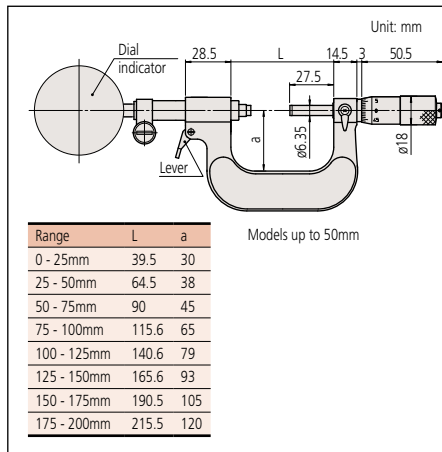
- With dial indicator for direct GO/NG-GO judgment for mass-produced parts.
- Anvil retracting trigger for quick measurement.
- Supplied with a setting standard (except for 0-25mm models).



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

DIMENSIONS



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) fraction rounded down
 Measuring faces: Carbide

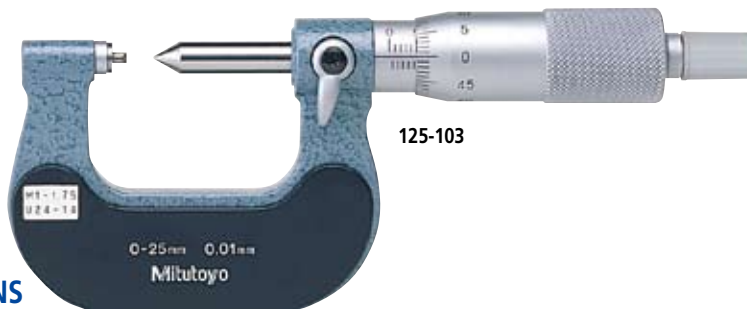


Screw Thread Micrometers

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.
- Supplied with a setting standard (except for 0-25mm models).



SPECIFICATIONS

Metric		
Range	Order No.	Thread 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
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

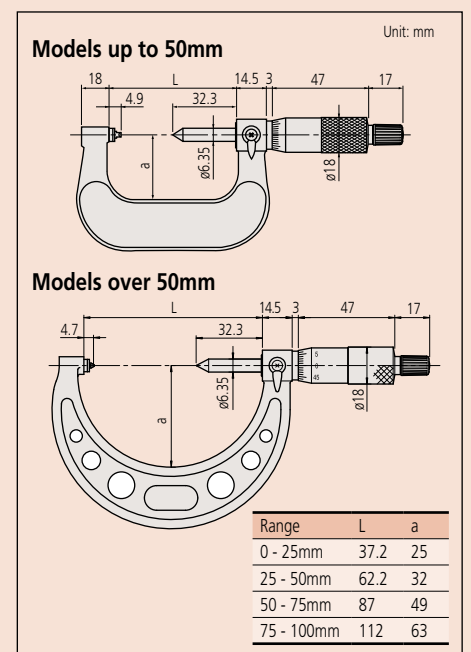
Range	Order No.	Thread to be measured (Metric/Unified)
50 - 75mm	125-111	0.6 - 0.9mm/44 - 28TPI
	125-112	1 - 1.75mm/24 - 14TPI
	125-113	2 - 3mm/13 - 9TPI
	125-114	3.5 - 5mm/8 - 5TPI
	125-115	5.5 - 7mm/4.5 - 3.5TPI
	75 - 100mm	125-116
125-117		1 - 1.75mm/24 - 14TPI
125-118		2 - 3mm/13 - 9TPI
125-119		3.5 - 5mm/8 - 5TPI
125-120		5.5 - 7mm/4.5 - 3.5TPI

Technical Data

Accuracy: ±(2+R/75)μm, R = max. range (mm)
 Graduation: 0.01mm
 Spindle feed error: 3μm



DIMENSIONS



Screw Thread Micrometers

SERIES 326, 126 — Interchangeable Anvil/Spindle Tip Type



(Refer to page VIII 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/0.00015"
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

Functions of Digital Model

Zero-setting, Data hold, 2-point preset, Function lock,
Automatic power ON/OFF, Data output, inch/mm conversion
(inch/mm models)
Alarm: Low voltage, Counting value composition error

Optional Accessories

05CZA662: SPC cable with data switch (1m)*
05CZA663: SPC cable with data switch (2m)*
06ADV380B: USB Input Tool Direct with data switch (2m)
02AZD790B: SPC cable for U-WAVE water-proof model
(160mm)*

*Only for digital models

(See page B-47.): Setting standard for screw thread micrometer

Anvil/spindle-tip matching pair:



For Metric/Unified threads (60° thread angle)

Order No.	Matching anvils/spindle-tips included
126-800	0.4 - 0.5mm/64 - 48TPI (126-801) 0.6 - 0.9mm/44 - 28TPI (126-802) 1 - 1.75mm/24 - 14TPI (126-803) 2 - 3mm/13 - 9TPI (126-804) 3.5 - 5mm/8 - 5TPI (126-805) 5.5 - 7mm/4.5 - 3.5TPI (126-806)

For Whitworth threads (55° thread angle)

Order No.	Matching anvils/spindle-tips included
126-810	60 - 48TPI (126-811) 48 - 40TPI (126-812) 40 - 32TPI (126-813) 32 - 24TPI (126-814) 24 - 18TPI (126-815) 18 - 14TPI (126-816) 14 - 10TPI (126-817) 10 - 7TPI (126-818) 7 - 4.5TPI (126-819) 4.5 - 3.5TPI (126-820)



FEATURES

- IP65 water/dust protection (326 series).
- Optional anvils/spindle-tips for measuring Metric/Unified or Whitworth screw threads (matching V and cone) are available. These are made of high-grade special steel, hardened and precision ground.
- With Ratchet Stop for constant force.
- SPC output (series 326).



326-251-10

Interchangeable anvils/spindle tips in matching pairs



126-125

SPECIFICATIONS

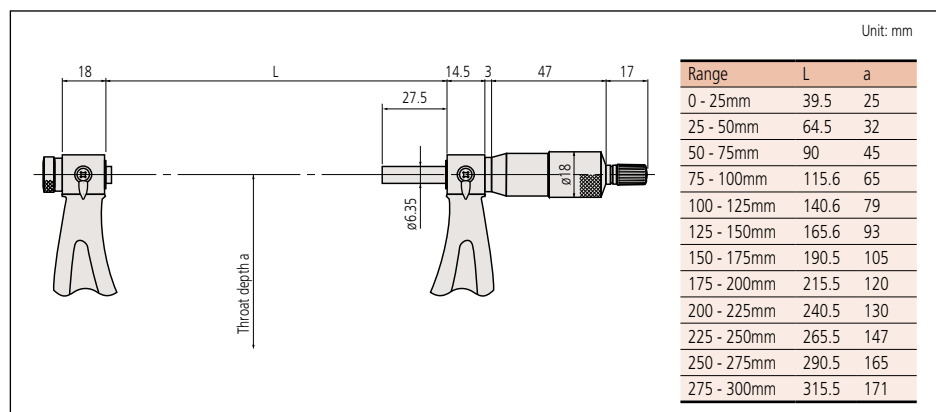
Metric	Digital model	
Range	Order No.	Accuracy
0 - 25mm	326-251-10	±4µm
25 - 50mm	326-252-10	±4µm
50 - 75mm	326-253-10	±4µm
75 - 100mm	326-254-10	±5µm

Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	326-351-10	±.0002"
1" - 2"	326-352-10	±.0002"
2" - 3"	326-353-10	±.0002"
3" - 4"	326-354-10	±.00025"

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

Inch		
Range	Order No.	Accuracy
0 - 1"	126-137	±.0002"
1" - 2"	126-138	±.0002"
2" - 3"	126-139	±.0002"
3" - 4"	126-140	±.00025"
4" - 5"	126-141	±.00025"
5" - 6"	126-142	±.00025"
6" - 7"	126-143	±.0003"

DIMENSIONS



Universal Micrometers

SERIES 116 — Interchangeable Anvil Type

FEATURES

- Non-rotating spindle type which accepts seven forms of optional interchangeable anvil/spindle-tip (flat, spline, spherical, point, knife-edge, disk, and blade) for a wide range of applications.
- Optional anvils/spindle-tips for screw thread measurement (matching V and cone) are also available.
- With Ratchet Stop for constant force.



116-101 with matching optional interchangeable anvil and spindle-tip fitted ready for measurement



SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 25mm	116-101	±4µm
25 - 50mm	116-102	±4µm

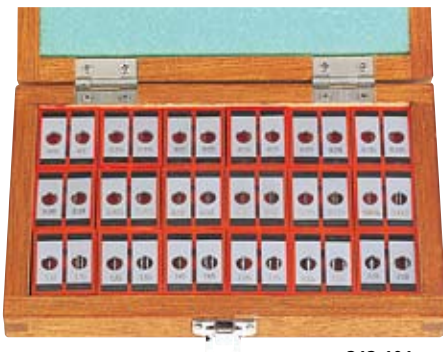
Inch		
Range	Order No.	Accuracy
0 - 1"	116-105	±.0002"
1" - 2"	116-106	±.0002"

3-Wire Units

SERIES 313

FEATURES

- Enables measurement of the pitch diameter of screw threads with a standard micrometer.
- 18 sizes of wire are provided in the set.



313-101

SPECIFICATIONS

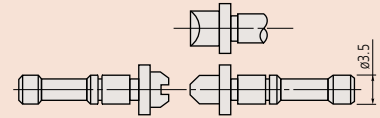
Application	Order No.	Wire units included
ø6.35mm (.25" DIA.)	313-101	0.17mm (952131)
		0.195mm (952132)
		0.22mm (952133)
		0.25mm (952134)
		0.29mm (952135)
		0.335mm (952136)
		0.39mm (952137)
		0.455mm (952138)
		0.53mm (952139)
		0.62mm (952140)
		0.725mm (952141)
		0.895mm (952142)
		1.1mm (952143)
		1.35mm (952144)
		1.65mm (952145)
		2.05mm (952146)
		2.55mm (952147)
		3.2mm (952148)

Technical Data

Accuracy: Refer to the list of specifications.
 Graduation: 0.01mm or .001"
 Spindle feed error: 3µm/.00015"

Optional Accessories

Interchangeable anvils/spindle-tips are available in sets:

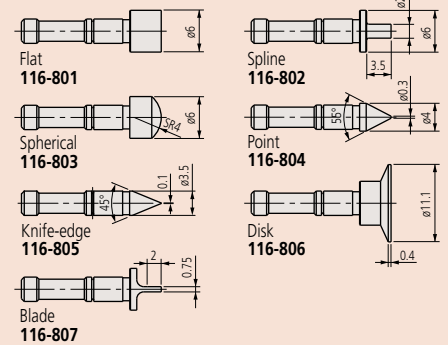


116-830 set style

For Metric/Unified threads

Order No.	Matching anvils/spindle-tips included
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)

Various shapes for general use:



For Metric/Unified threads

Order No.	Matching anvils/spindle-tips included
116-800	Flat (116-801) Spline (116-802) Spherical (116-803) Point (116-804) Knife-edge (116-805) Disk (116-806) Blade (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 page VIII 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. 1.2 years under normal use
Dust/Water protection level*: IP65
*Digital models **Analog models

Functions of Digital Model

Zero-setting, Data hold, 2-point preset, Function lock,
Automatic power ON/OFF, Data output, inch/mm conversion
(inch/mm models)
Alarm: Low voltage, Counting value composition error

Optional Accessories

- 05CZA662**: SPC cable with data switch (1m)*
- 05CZA663**: SPC cable with data switch (2m)*
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)*

*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 using precision steel (or carbide) ball anvils/spindle-tips.
- Interchangeable ball anvils/spindle-tips for various gear modules (0.5 - 5.25) are optional.
- With Ratchet Stop for constant force.
- SPC output (series 324).



SPECIFICATIONS

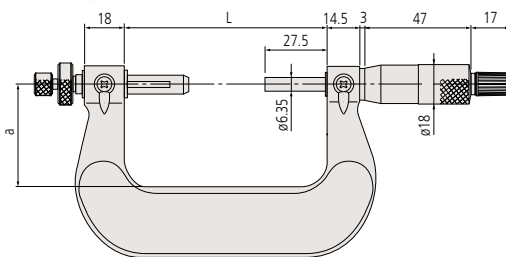
Metric	Digital model	
Range	Order No.	Accuracy
0 - 25mm	324-251-10	±4μm
25 - 50mm	324-252-10	±4μm
50 - 75mm	324-253-10	±4μm
75 - 100mm	324-254-10	±5μm

Metric	Digital model	
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

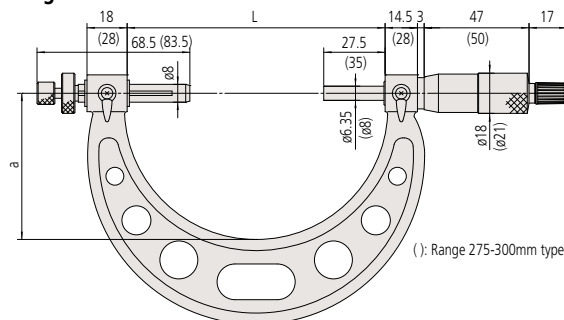
Inch/Metric	Digital model	
Range	Order No.	Accuracy
0 - 1"	324-351-10	±.0002"
1" - 2"	324-352-10	±.0002"
2" - 3"	324-353-10	±.0002"
3" - 4"	324-354-10	±.00025"

DIMENSIONS

Analog models up to 50mm



Analog over 50mm



(): Range 275-300mm type

Range	L	a
0 - 25mm	64.5	32
25 - 50mm	90	45
50 - 75mm	115.6	65
75 - 100mm	140.6	79
100 - 125mm	165.6	93
125 - 150mm	190.5	105
150 - 175mm	215.5	120
175 - 200mm	240.5	130
200 - 225mm	265.5	147
225 - 250mm	290.5	165
250 - 275mm	315.5	171
275 - 300mm	353	187

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.
- Supplied with a setting standard (except for 0-25mm/0-1" models).
- 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

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"

*The measuring disks have carbide tips.



(Refer to page VIII 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/.00004" for models up to 100mm/4"
1.6µm/.000063" for models over 100mm/4"
Parallelism: 4µm/.00016" for models up to 50mm/2"
6µm/.00024" for models up to 100mm
(5+R/75)µm for models over 100mm,
R = max. range (mm)
fraction rounded up
.00024" for models up to 4"
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

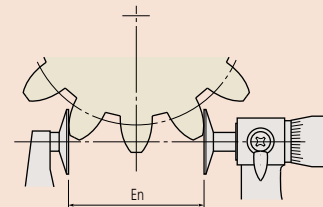
Functions of Digital Model

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 Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE water-proof mode (160mm)

Root tangent length of gear (En)



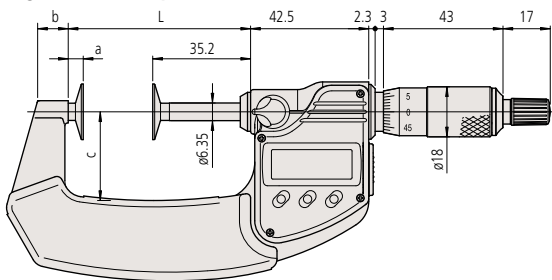
Note: Root tangent length measurement is not applicable to some types of gears.



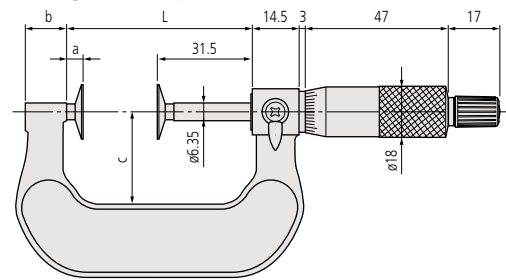
DIMENSIONS

Unit: mm

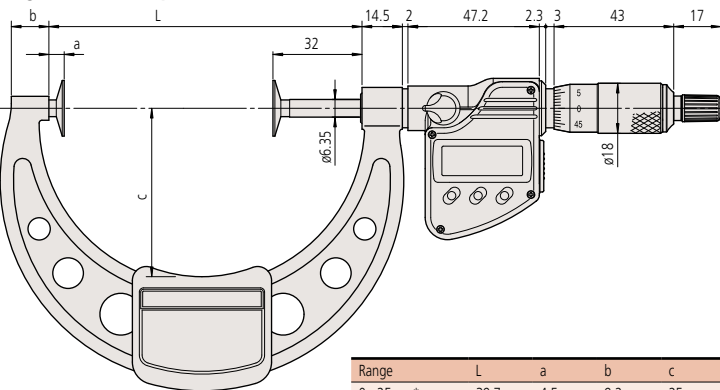
Digital models up to 75mm



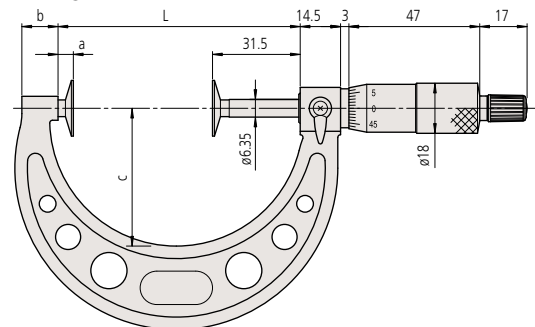
Analog models up to 50mm



Digital models over 75mm

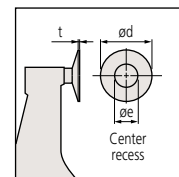


Analog over 50mm



Range	L	a	b	c	d	e	t
0 - 25mm*	39.7	4.5	9.2	25	20	8	0.7
25 - 50mm*	65.6	5.4	11	31	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	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-faced disks. *Digital models

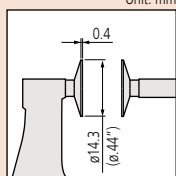


Technical Data

Accuracy: Refer to the list of specifications
 Graduation: 0.01mm or .001"
 Flatness: 1 μ m/.00004"
 Parallelism: 3 μ m/.00012"
 Measuring force: 8 \pm 0.8N



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.

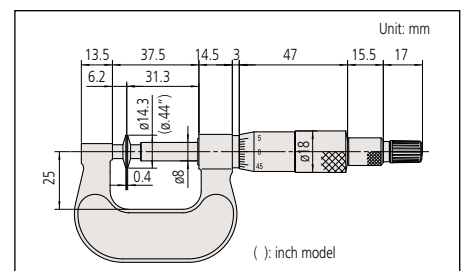


169-101

SPECIFICATIONS

Metric		
Range	Order No.	Accuracy
0 - 25mm	169-101	$\pm 4\mu$ m

DIMENSIONS



Inch		
Range	Order No.	Accuracy
0 - 1"	169-103	$\pm .0002''$

Disk Micrometers

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

FEATURES

- The Disk Micrometer is designed to easily measure the root tangent dimension of spur and helical 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.
- SPC output (series 369).



369-250

Quickmike type



369-411



Quickmike type with adjustable measuring force



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 adjustable measuring force		
Range	Order No.	Accuracy	Measuring force
0 - 15mm	227-221	±4µm	0.5N - 2.5N
	227-223	±4µm	2N - 10N

Metric	Quickmike type	
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	Quickmike type	
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/.00004"
 Parallelism: 4µm/.00016" for models up to 50mm/2"
 6µm/.00024" for models over 50mm/2"
 (3µm/.00012": Quickmike type with adjustable measuring force)
 Measurable module: 0.5-6,
 (0.4 - 3: Quickmike type with adjustable measuring force)
 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 adjustable measuring force)
 *Digital models **Analog models

Functions 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 Accessories for Digital Model

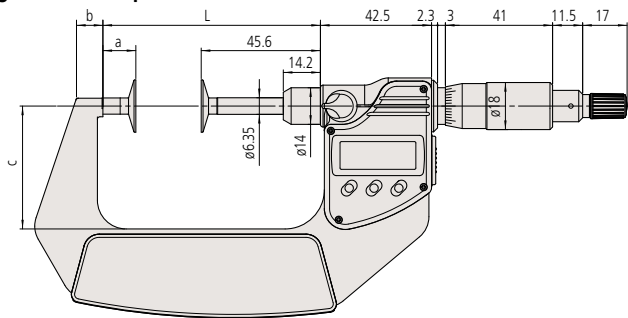
- 05CZA662: SPC cable with data switch (1m)
 - 05CZA663: SPC cable with data switch (2m)
 - 06ADV380B: USB Input Tool Direct with data switch (2m)
 - 02AZD790B: SPC cable for U-WAVE water-proof model (160mm)
 - 937387: SPC cable (1m)*
 - 965013: SPC cable (2m)*
 - 06ADV380E: USB Input Tool Direct with data switch (2m)*
 - 02AZD790E: SPC cable for U-WAVE (160mm)*
- *Only for Quickmike type



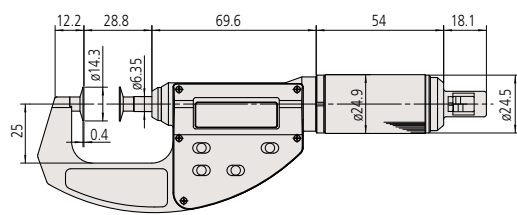
DIMENSIONS

Unit: mm

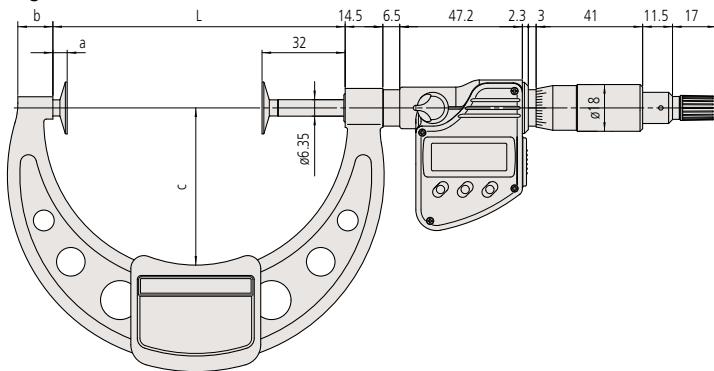
Digital models up to 75mm



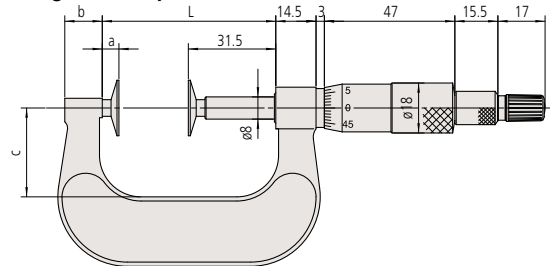
Adjustable measuring force type



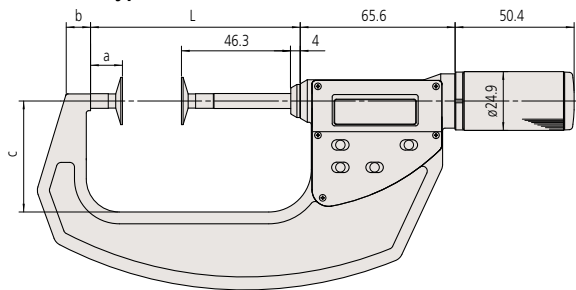
Digital models over 75mm



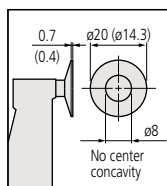
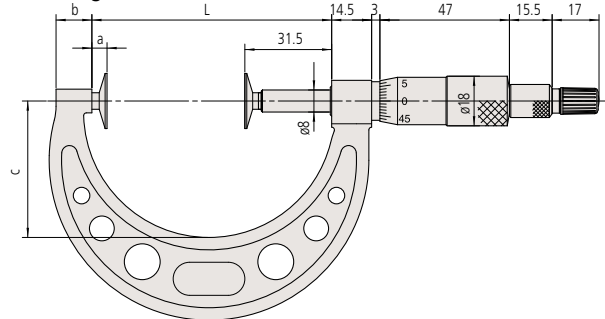
Analog models up to 50mm



Quickmike type



Analog models over 50mm



() : Adjustable measuring force 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
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
75 - 100mm	112	5.5	13	63

Sheet Metal Micrometers

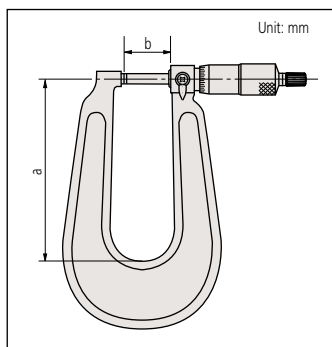
SERIES 389, 119, 118

FEATURES

- Measures thickness of sheet metal, and rubber parts.
- With Ratchet Stop for constant force.
- Supplied with a setting standard (except for 0-25mm/0-1" models).
- IP65 water/dust protection (389 series*).
- *Except for 389-514
- With digit counter (series 189).



DIMENSIONS



SPECIFICATIONS

Metric		Digital model	
Range	Order No.	Accuracy	a/b
0 - 25mm	389-251	±4µm	160/27.5mm
	389-261 ^{S-F}	±4µm	160/27.5mm
	389-271 ^{S-S}	±4µm	160/27.5mm
	389-514	±5µm	330/38.5mm
25 - 50mm	389-252	±4µm	165/27.5mm
	389-262 ^{S-F}	±4µm	165/27.5mm
	389-272 ^{S-S}	±4µm	165/27.5mm

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

Inch/Metric		Digital model	
Range	Order No.	Accuracy	a/b
0 - 1"	389-351	±.0002"	160/27.5mm 6.3"/1.08"
	389-361 ^{S-F}	±.0002"	160/27.5mm 6.3"/1.08"
	389-371 ^{S-S}	±.0002"	160/27.5mm 6.3"/1.08"
	389-714	±.00025"	330/38.5mm 13"/1.52"
	1" - 2"	389-352	±.0002"
389-362 ^{S-F}		±.0002"	165/27.5mm 6.5"/1.08"
389-372 ^{S-S}		±.0002"	165/27.5mm 6.5"/1.08"

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

Metric		Dial reading model	
Range	Order No.	Accuracy	a/b
0 - 25mm	118-101	±4µm	110/27.5mm
	118-102	±4µm	160/27.5mm
	118-114 ^{S-F}	±4µm	160/27.5mm
	118-118 ^{S-S}	±4µm	160/27.5mm
	118-103	±5µm	330/38.5mm
25 - 50mm	118-110	±4µm	165/27.5mm
	118-126 ^{S-S}	±4µm	165/27.5mm

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

Inch		Dial reading model	
Range	Order No.	Accuracy	a/b
0 - 1"	118-129*	±.0002"	160/27.5mm
	118-116 ^{S-F*}	±.0002"	160/27.5mm
	118-120 ^{S-S*}	±.0002"	160/27.5mm
	118-107	±.00025"	330/38.5mm
1" - 2"	118-112	±.0002"	165/27.5mm

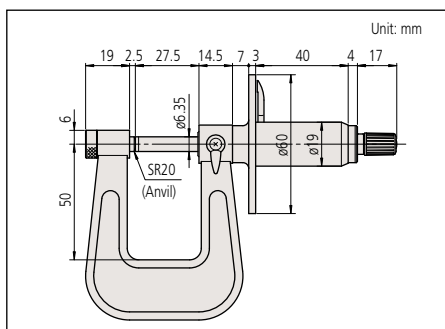
S-F: Spherical anvil and flat spindle
S-S: Spherical anvil and spherical spindle
*.0001" reading is obtained with vernier.

Metric		Dial reading model	
Range	Order No.	Accuracy	Throat
0 - 25mm	119-202 ^{S-F}	±4µm	50mm

S-F: Spherical anvil and flat spindle



DIMENSIONS



(Refer to page VIII 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/.000024" for models with 150mm/6" throat
1µm/.00004" for models with 300mm/12" throat
Parallelism: 3µm/.00012"
Measuring faces: Carbide
Display*: LCD
Battery*: SR44 [1 pc. (2 pcs.: **389-514** and **389-714**)], **938882**
Battery life*: Approx. 1.2 years under normal use
(1.8 years: **389-514** and **389-714**)
Dust/Water protection level*: IP65 (except for **389-714** and **389-514**)
*Digital models **Analog models

Functions 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 **389-514**, **389-714**
Alarm: Low voltage, Counting value composition error

Optional Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
 - 05CZA663**: SPC cable with data switch (2m)
 - 06ADV380B**: USB Input Tool Direct with data switch (2m)
 - 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)
 - 04AZB512**: SPC cable (1m)*
 - 04AZB513**: SPC cable (2m)*
 - 02AZD790E**: SPC cable for U-WAVE (160mm)*
- *Only for **389-514**, **389-714**

The 119 series is provided with a dial for easy and quick reading.



Spline Micrometers

SERIES 331, 111, 131



(Refer to page VIII for details.)

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.
- SPC output (series 331).



331-251



111-115

Technical Data

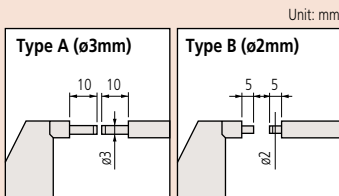
Accuracy: Refer to the list of specifications. (excluding quantizing error for digital models)
 Resolution*: 0.001mm or .00005"/0.001mm
 Graduation**: 0.01mm, .001" or .0001"
 Flatness: 0.3µm/.000012"
 Parallelism: (2+R/100)µm, R = max. range (mm) [0.00008"+.00004(R/4)]" R = max. range (inch) fraction rounded down
 Measuring faces: Carbide
 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

Functions 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 Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)



SPECIFICATIONS

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

Metric	Mechanical counter model		
Range	Order No.	Accuracy	Remarks
0 - 25mm	131-115	±3µm	Type A

Metric			
Range	Order No.	Accuracy	Remarks
0 - 25mm	111-115	±3µm	Type A
	111-215	±3µm	Type B
25 - 50mm	111-116	±3µm	Type A
50 - 75mm	111-117	±3µm	Type A
75 - 100mm	111-118	±4µm	Type A
100 - 125mm	111-119	±4µm	Type A
125 - 150mm	111-120	±4µm	Type A
150 - 175mm	111-121	±5µm	Type A
175 - 200mm	111-122	±5µm	Type A
200 - 225mm	111-123	±5µm	Type A
225 - 250mm	111-124	±6µm	Type A
250 - 275mm	111-125	±6µm	Type A
275 - 300mm	111-126	±6µm	Type A

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

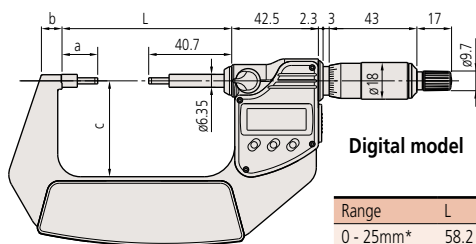
Inch	Mechanical counter model		
Range	Order No.	Accuracy	Remarks
0 - 1"	131-166*	±.00015"	Type A

*.0001" reading is obtained with vernier.

Inch			
Range	Order No.	Accuracy	Remarks
0 - 1"	111-166*	±.00015"	Type A

*.0001" reading is obtained with vernier.

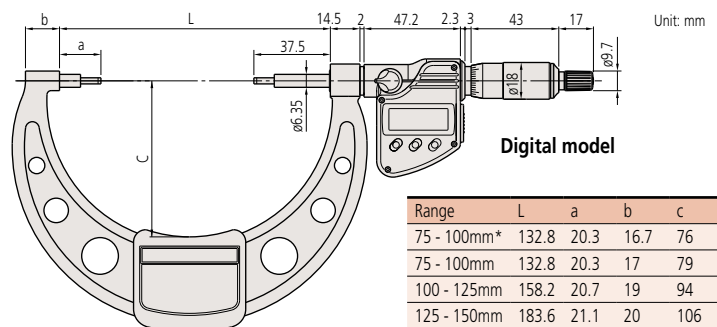
DIMENSIONS



Models up to 75mm

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	17.5	10	38
25 - 50mm	80	17.5	12	49
50 - 75mm	105	17.5	14	60

*Digital models



Models over 75mm

Range	L	a	b	c
75 - 100mm*	132.8	20.3	16.7	76
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

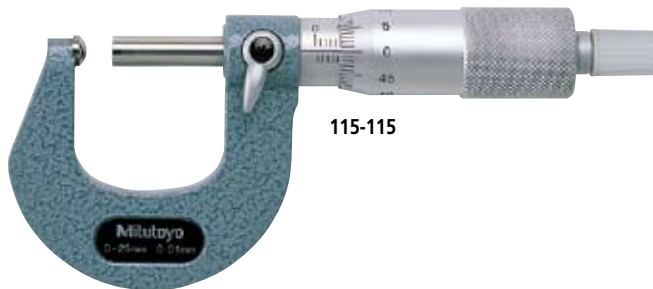
FEATURES

- 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.
- SPC output (series 395).
- Digit counter (series 295).



395-251

Spherical-flat Type



115-115



395-271

Spherical-spherical Type



115-215



(Refer to page VIII 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/0.00024"
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

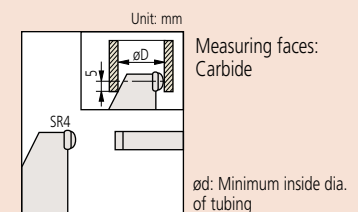
Functions of Digital Model

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

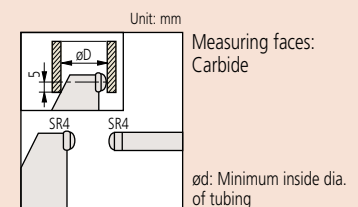
Optional Accessories for Digital Model

- 05CZA662**: SPC cable with data switch (1m)
- 05CZA663**: SPC cable with data switch (2m)
- 06ADV380B**: USB Input Tool Direct with data switch (2m)
- 02AZD790B**: SPC cable for U-WAVE water-proof model (160mm)

Spherical-flat type



Spherical-spherical type

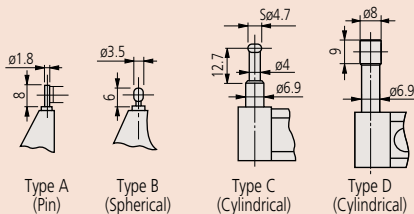


Cylindrical Anvil Type

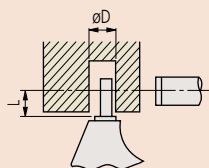


395-261

Cylindrical anvil types



Type A (Pin)
Type B (Spherical)
Type C (Cylindrical)
Type D (Cylindrical)



øD: Minimum inside dia. of tubing

Spindle face: Carbide

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 ^{S-F}	±2µm	D: 15mm
	395-271 ^{S-S}	±2µm	D: 15mm
25 - 50mm	395-252 ^{S-F}	±2µm	D: 15mm
	395-272 ^{S-S}	±2µm	D: 15mm
50 - 75mm	395-253 ^{S-F}	±2µm	D: 19mm
	395-273 ^{S-S}	±2µm	D: 19mm
75 - 100mm	395-254 ^{S-F}	±3µm	D: 20mm
	395-274 ^{S-S}	±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 ^{S-F}	±3µm	D: 10mm
	295-215 ^{S-S}	±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 ^{S-F}	±3µm	D: 10mm
	115-215 ^{S-S}	±3µm	D: 10mm
25 - 50mm	115-116 ^{S-F}	±3µm	D: 11mm
	115-216 ^{S-S}	±3µm	D: 11mm
50 - 75mm	115-117 ^{S-F}	±3µm	D: 17mm
	115-217 ^{S-S}	±3µm	D: 17mm
75 - 100mm	115-118 ^{S-F}	±4µm	D: 18mm
	115-218 ^{S-S}	±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 ^{S-F}	±.0001"	D: .59"
	395-371 ^{S-S}	±.0001"	D: .59"
1" - 2"	395-352 ^{S-F}	±.0001"	D: .59"
	395-372 ^{S-S}	±.0001"	D: .59"
2" - 3"	395-353 ^{S-F}	±.0001"	D: .75"
	395-373 ^{S-S}	±.0001"	D: .75"
3" - 4"	395-354 ^{S-F}	±.00015"	D: .79"
	395-374 ^{S-S}	±.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 ^{S-F*}	±.00015"	D: .40"
	295-253 ^{S-S*}	±.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 ^{S-F*}	±.00015"	D: .40"
	115-253 ^{S-S*}	±.00015"	D: .40"
1" - 2"	115-242 ^{S-S}	±.00015"	D: .44"
2" - 3"	115-243 ^{S-S}	±.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.
- SPC output (series 342).
- Digit counter (series 142).



SPECIFICATIONS

Metric Digital model (with carbide tip)

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

Metric Mechanical counter model

Range	Order No.	Accuracy	Point
0 - 25mm	142-153	±3µm	15°
	142-201	±3µm	30°

Metric

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

*The points do not have carbide tips.

Inch/Metric Digital model (with carbide tip)

Range	Order No.	Accuracy	Point
0 - 1"	342-351	±.0001"	15°
	342-361	±.0001"	30°
1" - 2"	342-352	±.0001"	15°
	342-362	±.0001"	30°
2" - 3"	342-353	±.0001"	15°
	342-363	±.0001"	30°
3" - 4"	342-354	±.00015"	15°
	342-364	±.00015"	30°

Inch Mechanical counter model

Range	Order No.	Accuracy	Point
0 - 1"	142-177	±.00015"	15°
	142-225	±.00015"	30°

Inch

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

*The points do not have carbide tips.

SPC

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IP65

(Refer to page VIII 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

Functions 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 Accessories for Digital Model

05CZA662: SPC cable with data switch (1m)
05CZA663: SPC cable with data switch (2m)
06ADV380B: USB Input Tool Direct with data switch (2m)
02AZD790B: SPC cable for U-WAVE water-proof model (160mm)



Tip angle: 15° (SR0.3mm)



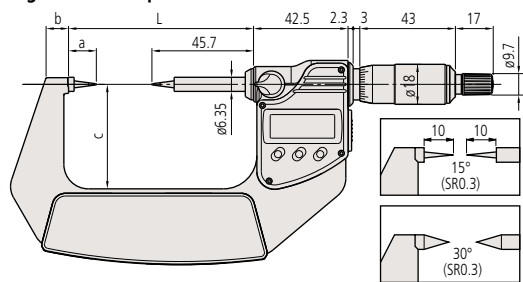
Tip angle: 30° (SR0.3mm)



DIMENSIONS

Unit: mm

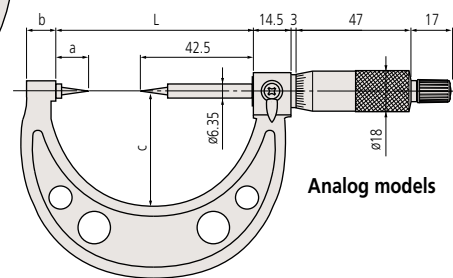
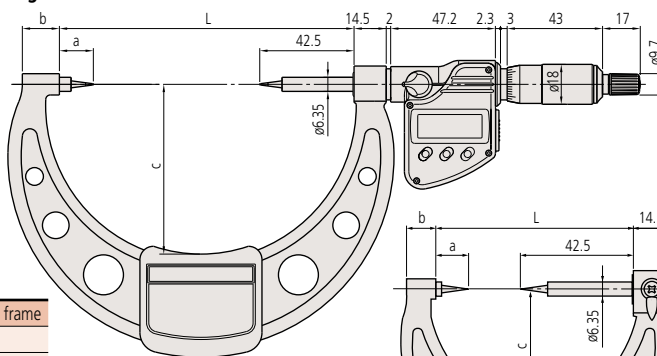
Digital models up to 75mm



Range	L	a	b	c	Thickness of frame
0 - 25mm	58.2 (55)	12.5 (12.5)	7.3 (10)	32 (38)	11.2 (9)
25 - 50mm	83.2 (80)	12.5 (12.5)	10.1 (12)	47 (49)	12.8 (10)
50 - 75mm	108.2 (105)	12.5 (12.5)	11.5 (14)	60 (60)	12.8 (11)
75 - 100mm	132.8 (132.8)	15.3 (15.3)	16.7 (17)	76 (79)	20.8 (13)

() : Analog model
Thickness of frame cover for Digimatic type

Digital models over 75mm



Analog models



(Refer to page VIII 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. 1.2 years under normal use
(3 years: Quickmike type)
Dust/Water protection level*: IP65 (342-271 and 371)
IP54 (342-451)
*Digital models **Analog models

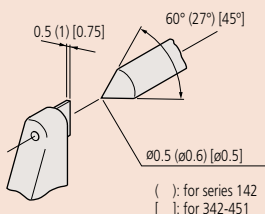
Functions of Digital Model

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 Accessories for Digital Model

05CZA662: SPC cable with data switch (1m)
05CZA663: SPC cable with data switch (2m)
06ADV380B: USB Input Tool Direct with data switch (2m)
02AZD790B: SPC cable for U-WAVE water-proof model (160mm)
937387: SPC cable (1m)*
965013: SPC cable (2m)*
06ADV380E: USB Input Tool Direct with data switch (2m)*
02AZD790E: SPC cable for U-WAVE (160mm)*
*Only for Quickmike type

Unit: mm

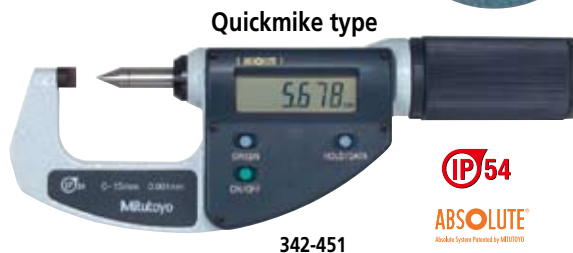


Crimp Height Micrometers

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.
- SPC output (series 342).
- Digit counter (series 142).



SPECIFICATIONS

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

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

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

* 0.001mm reading is obtained with vernier.

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

Metric	Mechanical counter model	
Range	Order No.	Accuracy
0 - 25mm	112-401	±3µm