

New Products



High-Accuracy Digimatic Micrometer

Refer to pages B-3 – B-4 for details.



QuantuMike

Refer to pages B-5 – B-6 for details.



Coolant Proof Micrometers

Refer to pages B-7 – B-8 for details.



Digimatic Micrometer Heads

Refer to page B-77 - B-79 for details.



Micrometer Heads (Fine Spindle Feed of 0.1mm/rev)

Refer to pages B-101 - B-102 for details.

B

Small Tool Instruments Micrometers Micrometer Heads

Micrometers



Micrometer Heads



INDEX

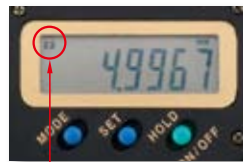
Micrometer	
High-Accuracy Digimatic Micrometer	B-3
QuantuMike	B-5
Coolant Proof Micrometers	B-7
Digimatic Outside Micrometers	B-9
Quickmike	B-10
Absolute Digimatic Micrometers	B-11
Outside Micrometers	B-13
Ratchet Thimble Micrometers	B-14
Outside Micrometers	B-15
Digit Outside Micrometers	B-18
Digimatic straight line micrometer outside micrometer	B-19
Indicator Type Micrometers	B-20
Outside Micrometers with Interchangeable Anvils	B-21
Outside Micrometers with Anvil Extension Collars	B-23
Caliper Type Micrometers	B-25
Screw Thread Micrometers	B-26
Universal Micrometers	B-28
3-Wire Units	B-29
Paper Thickness Micrometers	B-30
Disk Micrometers	B-31
Gear Tooth Micrometers	B-33
Disk Micrometers Non-Rotating Spindle Type	B-35
Sheet Metal Micrometers	B-37
Tube Micrometers	B-39
Spline Micrometers	B-42
Point Micrometers	B-44
V-Anvil Micrometers	B-46
Blade Micrometers	B-48
Can Seam Micrometers	B-50
Hub Micrometers / Wire Micrometers	B-51
Crimp Height Micrometers	B-52
"Uni-Mike"	B-53
Limit Micrometers	B-54
Indicating Micrometers	B-55
Dial Snap Meters	B-56
Snap Meters	B-57
Groove Micrometers	B-58
Quick-Mini	B-59
Small Hole Gage Set / Telescoping Gage Set	B-60
Setting Standards for Outside Micrometers	B-61
Setting Standards for Screw Thread Micrometers	B-63
Setting Standards for V-Anvil Micrometers	B-63
Optical Parallels / Optical Flats	B-64
Spindle Attachment Tips / Micrometer Oil	B-65
Color-Coded Ratchets & Speeder Covers	B-66
Micrometer Stands	B-67
Introduction for Measurement data recording toolfor Micrometers and Micrometer Heads (optional)	B-68
Quick Guide to Precision Measuring Instruments	B-69
Micrometer Heads	
Micrometer Head Selection Guide	B-75
Digimatic Micrometer Heads	B-77
Ultra-small / Small Type	B-80
Short Body with Choice of Thimble Diameter	B-82
Small-Standard Type	B-84
Standard Type in Small Size with Zero-adjustable Thimble	B-86
Small Standard Type with Carbide-tipped Spindle	B-88
Medium-sized Standard Type	B-90
Medium-sized Standard Type with 8mm diameter spindle	B-93
Locking-screw Type	B-96
Non-rotating Spindle Type	B-99
Quick Spindle Feed of 1mm/rev	B-100
Find Spindle Feed of 0.1mm/rev	B-101
Fine spindle Feed of 0.25mm/rev	B-103
Differential Screw Translator (Extra-Fine Feed) Type	B-104
Large Thimble Type for Fine Feed	B-105
XY-Stage Type	B-107
Non-rotating Spindle and Large Thimble / Fine Graduation and High Accuracy	B-108
Digit Counter type / Micro Jack	B-109
Fixtures for Micrometer Heads	B-110
Precision Leadscrews	B-112
Quick Guide to Precision Measuring Instruments	B-113

Micrometer

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

High-Accuracy Digimatic Micrometer SERIES 293

- Enabling 0.1 μ m resolution measurement, this micrometer is ideal for customers who need to make highly accurate measurements with a hand-held tool.
- The High-Accuracy Digimatic Micrometer utilizes Mitutoyo's innovative 0.1 μ m resolution ABS (absolute) rotary sensor*1 and high-accuracy screw machining technology to reduce the instrumental error to $\pm 0.5\mu$ m, delivering higher accuracy without sacrificing operability.
*1. Patent pending in Japan, the United States of America, the European Union, and China.
- A highly rigid frame and high-performance constant-force mechanism*2 enable more stable measurement, while the clicks emitted while the workpiece is being measured assure the operator that measurement is proceeding normally.
*2. Patent pending in Japan, the United States of America, the European Union, and China.
- Body heat transferred to the instrument is reduced by a (removable) heat shield, minimizing the error caused by thermal expansion of the frame when performing handheld measurements.
- The ABS (absolute) rotary sensor also eliminates the need to perform origin setting each time the power is turned on, letting you start measuring straight away. With no possibility of overspeed errors, the High-Accuracy Digimatic Micrometer also delivers a higher level of reliability.
- The High-Accuracy Digimatic Micrometer has a range of features to enable flexible measurement, including switchable resolution (0.0001mm/0.0005mm), function lock and preset.
- Carbide-tipped measuring faces



Function lock



293-100

- High-Accuracy Digimatic Micrometer received GOOD DESIGN AWARD 2011.



An inspection certificate is supplied as standard. Refer to page X for details.

ABSOLUTE™ Absolute Encoder

Technical Data

Measuring force: 7 to 9N
Power supply: Lithium battery (CR2032) x 1
Battery life: Approx. two years when used under normal conditions

Functions

Preset (ABS measurement system):
The measurement origin can be preset to any value within the display range for convenience in measuring.

Zero-setting (INC measurement system):
The display can be zeroed at any position of the spindle, making comparison measurement easier. Returning to the absolute-measurement mode is easily accomplished.

Hold:
The displayed value is held while the spindle is withdrawn and the micrometer moved so that the display can be read at the operator's convenience. After cancelling the hold, the instrument returns to the previous measuring mode (absolute or incremental).

Resolution switching:
The resolution of the display can be switched. If 0.1 μ m measurement is not required, the resolution can be switched to 0.5 μ m.

Function lock:
Functions such as preset or zero-set can be locked to avoid inadvertently changing the origin position.

On/off:
The power can be turned off after measurement is complete. Even after the power is turned off, the origin or last zero-set position remains in the memory.

Auto power off:
Even if the power is left on, the power turns off automatically if the micrometer is not used within a 20-minute period.

Measurement data output:
Measurement data can be output, allowing easy incorporation of this instrument into a statistical process control or measurement system.

Error alarm:
In the unlikely event of a display overflow or calculation error, an error message is displayed and measurement stops. Measurement cannot continue until the error is corrected.

Also, if the battery voltage drops below a certain point, the battery indicator will turn on before measurement becomes impossible, warning the user that the battery needs to be replaced.

Standard accessories

Heat shield (No.04AAB969A: 293-100
No.04AAB969B: 293-130) x 1
Lithium battery CR2032 (1 pc),
for initial operational checks (standard accessory)
Spanner (No.200877) x 1
Screwdriver (No.04AAB985) x 1
Cleaning paper for measuring faces
Inspection certificate



With heat shield*
attached

Heat shield



Optional accessories

Connecting cables with output switch

1m: No. 05CZA662

2m: No. 05CZA663

USB Input Tool Direct

USB-ITN-B (2m): No. 06ADV380B

Connecting cables for U-WAVE-T (160mm)

No. 02AZD790B

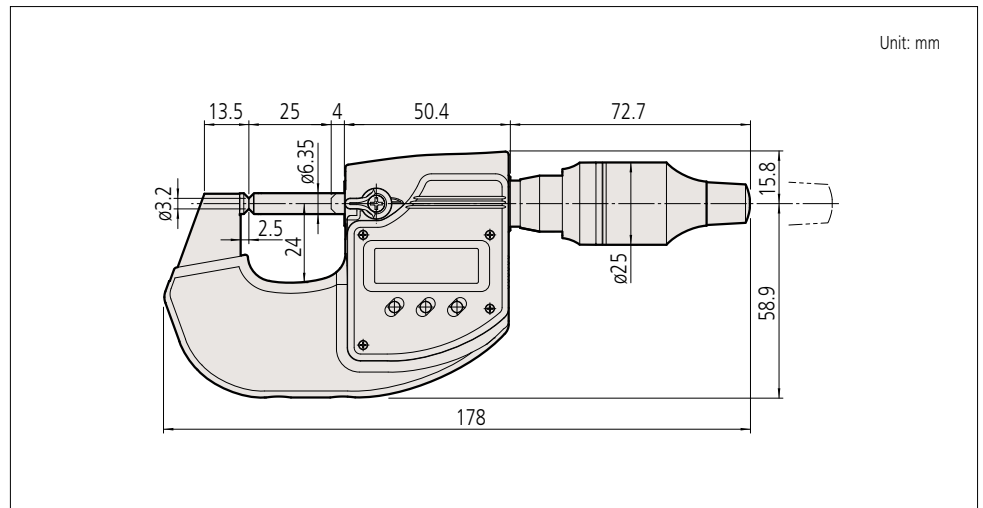
For foot switch: No. 02AZE140B

Refer to page B-68 for details.

Cleaning paper for measuring faces (1000sheet): No.04AZB581



DIMENSIONS



SPECIFICATIONS

Metric

Order No.	Range	Resolution	Accuracy*	Anvil/spindle faces	Mass
293-100	0 - 25mm	0.0001mm/0.0005mm (switchable)	±0.5μm	ø3.2mm	400g

* Excluding quantizing error

Inch/Metric

Order No.	Range	Resolution	Accuracy*	Anvil/spindle faces	Mass
293-130	0 - 1"	.000005"/.00002" 0.0001mm/0.0005mm (switchable)	±.00002"	ø3.2mm	400g

* Excluding quantizing error

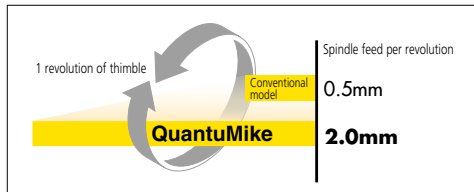


Micrometer

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

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

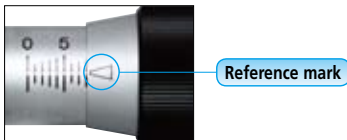
- Advanced pioneering technology has created the next generation of micrometer, the most revolutionary advance in micrometer technology since James Watt invented the instrument.
- Faster measurement is achieved by using a coarser thread which feeds the spindle by 2mm per revolution of the thimble. This increase in thread lead has been made possible thanks to new high precision thread-cutting and testing techniques.



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



- A graduated scale is provided on the sleeve for use with a reference mark on the thimble so that every millimeter displacement can be checked to provide extra confidence.



- 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-induced microvibrations along the spindle help ensure repeatable measurements.



293-140-30



293-143-30



293-142-30



293-143-30



293-143-30

The name QuantuMike is from Quantum and Micrometer, reflecting our belief this tool represents a quantum leap in micrometer ergonomics.

- 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. (Refer to page A-3 for details.)
- There is a lineup of convenient Interface Input Tools which enable the conversion of measurement data to keyboard signals and directly input them to cells in off-the-shelf spreadsheet software such as Excel. (Refer to page A-5 for details.)
- Excellent resistance against oil, water and dust (IP65 protection level) enables this product to be used in machining situations that include splashing coolant fluid.
- Measuring faces: Carbide.



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



An inspection certificate is supplied as standard. Refer to page X for details.

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

Dust/Water protection level: IP65 (IEC60529)*2

Measuring force: 7 to 12N*3

Battery: **SR44** (1 pc), **938882**, for initial operational checks (standard accessory)

Length standard: Electromagnetic rotary sensor

Battery life: Approx. 1.2 years under normal use

Standard accessories: Reference bar, 1 pc (except for 0-25mm (0-1") models) Spanner (**No. 301336**), 1 pc

*2 Rustproofing shall be applied after use.

*3 Measuring force when using the speeder ratchet (Apply a measuring force in the same condition as for measurement and then set the origin.)

Functions

Origin point setting (ABS length measurement system):

Pressing the ORIGIN button resets the ABS origin at the current spindle position. Origin values can be set depending on each size.

Zero setting (INC length measurement system):

A brief press on the ZERO/ABS button sets display to zero at the current spindle position and switches to the incremental (INC) measuring mode. A longer press resets to the ABS measuring mode.

Hold:

Pressing the HOLD button freezes the current value in the display. This function is useful for preserving a measurement in situations of poor visibility when the instrument must be moved away from the workpiece before the reading can be recorded.

Function lock:

This function allows the ORIGIN (origin point setting) function and the ZERO (zero setting) function to be locked to prevent these points being reset accidentally.

Auto power ON/OFF:

The reading on the LCD disappears after this instrument is idle for approx. 20 minutes, but the origin point is retained. Turning the spindle causes the reading on the LCD to reappear.

Data output*4:

Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.

Error alarm:

In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

*4: Only for the models with SPC data output

Optional accessories

(Only for models with data output function)

Connecting cables with output switch

1m: **No. 05CZA662**

2m: **No. 05CZA663**

USB Input Tool Direct

USB-ITN-B (2m): **No. 06ADV380B**

Connecting cables for **U-WAVE-T** (160mm)

No. 02AZD790B

For foot switch: **No. 02AZE140B**

Refer to page B-68 for details.



SPECIFICATIONS

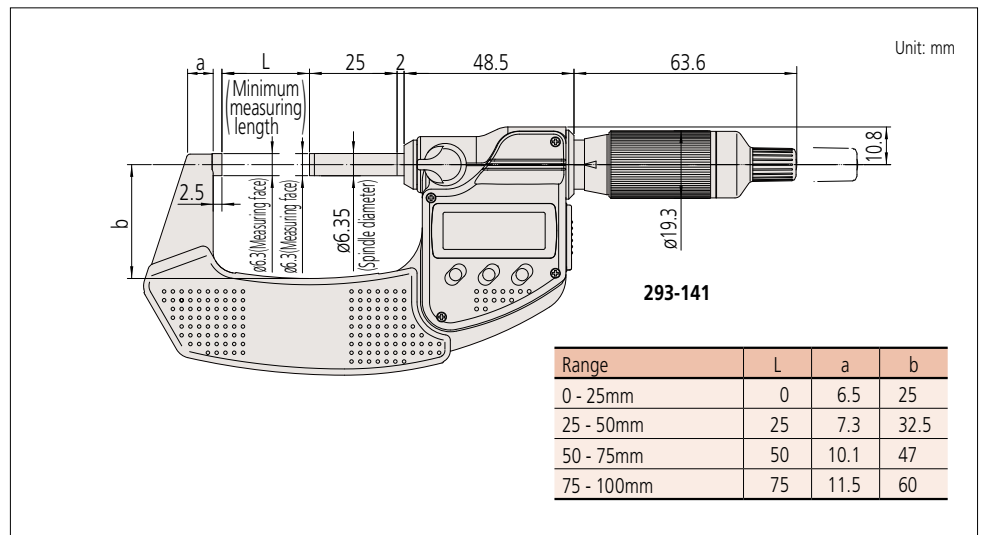
		Metric					
	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	293-140-30	0 - 25mm	0.001mm	±1µm	0.3µm	1µm	265g
	293-141-30	25 - 50mm					325g
	293-142-30	50 - 75mm					465g
without SPC data output	293-143-30	75 - 100mm		±2µm		620g	
	293-145-30	0 - 25mm		±1µm		1µm	265g
	293-146-30	25 - 50mm					325g
	293-147-30	50 - 75mm	465g				
	293-148-30	75 - 100mm	±2µm	2µm	620g		

*1 Excluding quantizing error

		Inch/Metric					
	Order No.	Range	Resolution	Accuracy*1	Flatness	Parallelism	Mass
with SPC data output	293-180-30	0 - 1"	.00005"/ 0.001mm	±.00005"	.000012"	.00004"	265g
	293-181-30	1" - 2"					325g
	293-182-30	2" - 3"					465g
without SPC data output	293-183-30	3" - 4"		±.0001"		620g	
	293-185-30	0 - 1"		±.00005"		.00004"	265g
	293-186-30	1" - 2"					325g
	293-187-30	2" - 3"	465g				
	293-188-30	3" - 4"	±.0001"	.00008"	620g		

*1 Excluding quantizing error

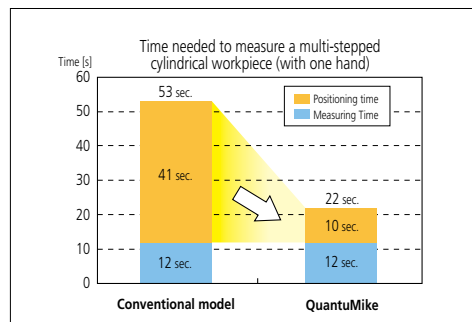
DIMENSIONS



Measuring time on a 6-stepped workpiece with one hand

Thanks to the quick movement, positioning times are reduced by 60%* and measuring times by 35%* compared with a conventional micrometer.

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



Micrometer

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

Coolant Proof Micrometers SERIES 293 — with Dust/Water Protection Conforming to IP65 Level

- World's highest performing micrometer overall.
- Extended battery life of approximately 2.4 years.
- Ergonomic anti-slip frame cover and front panel for more comfortable hand-held measurements.
- Ratchet thimble provides better operability for one-handed operation.
- Oil-resistant material used for all plastic parts.
- Models equipped with a Digimatic output port can form part of a statistical process control or networked measurement system. (Refer to page A-3 for details.)
- Interface Input Tools are available that enable the 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.)
- Two types of constant-force devices are available: Ratchet Stop and Ratchet Thimble.
- Measuring faces: Carbide



293-230-30



293-252-30



293-233-30

293-231-30

293-230-30

293-232-30



293-234-30
With ratchet thimble



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



www.tuv.com
ID 000040191



An inspection certificate is supplied as standard. Refer to page X for details.

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

Flatness: 0.3µm/.000012"
Dust/water protection level: IP65 (IEC60529) *2
Measuring force: 5 to 10N (ratchet thimble type is 7 to 12N)*3
Battery: **SR44** (1 pc), **938882**,
for initial operational checks
(standard accessory)

Battery life: Approx. 2.4 years under normal use

Length standard: Electromagnetic rotary sensor

Standard accessories: Reference bar, 1 pc
(except for 0-25mm (0-1") models)
Spanner (**301336**), 1 pc

*2 Rustproofing shall be applied after use.

*3 Refer to page B-6 for details.

Optional accessories

(Only for models with data output function)

Connecting cables with output switch

1m: **05CZA662**

2m: **05CZA663**

USB Input Tool Direct

USB-ITN-B (2m): **06ADV380B**

Connecting cables for **U-WAVE-T** (160mm)

02AZD790B

For foot switch: **02AZE140B**

Refer to page B-68 for details.



These are dedicated connecting cables for Coolant Proof micrometers.

SPECIFICATIONS

Metric

	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass			
with SPC data output	293-230-30	0 - 25mm	0.001mm	±1µm	1µm	With ratchet stop	270g			
	293-231-30	25 - 50mm					330g			
	293-232-30	50 - 75mm			470g					
	293-233-30	75 - 100mm			625g					
	293-250-30	100 - 125mm		600g	±2µm		2µm	970g		
	293-251-30	125 - 150mm		740g						
	293-252-30	150 - 175mm		800g	±3µm		3µm	800g		
	293-253-30	175 - 200mm		970g						
	293-254-30	200 - 225mm		1100g	±4µm		4µm	1100g		
	293-255-30	225 - 250mm		1270g						
	293-256-30	250 - 275mm		1370g	±1µm		1µm	1370g		
	293-257-30	275 - 300mm		1590g						
	without SPC data output	293-234-30		0 - 25mm	0.001mm		±1µm	1µm	With ratchet thimble	280g
		293-235-30		25 - 50mm						340g
293-236-30		50 - 75mm	480g							
293-237-30		75 - 100mm	635g							
293-240-30		0 - 25mm	270g	±2µm		2µm	270g			
293-241-30		25 - 50mm	330g							
293-242-30		50 - 75mm	470g	±1µm		1µm	470g			
293-243-30		75 - 100mm	625g							
293-244-30		0 - 25mm	280g	±1µm		1µm	280g			
293-245-30		25 - 50mm	340g							
293-246-30		50 - 75mm	480g	±2µm		2µm	480g			
293-247-30		75 - 100mm	635g							

* Excluding quantizing error

• All-Digit preset type: models over 125mm (5") measuring range

Inch/Metric

	Order No	Range	Resolution	Accuracy*	Parallelism	Constant-force device	Mass		
with SPC data output	293-330-30	0 - 1"	.00005" / 0.001mm	±.00005"	.00004"	With ratchet stop	270g		
	293-331-30	1" - 2"					330g		
	293-332-30	2" - 3"			470g				
	293-333-30	3" - 4"			625g				
	293-350-30	4" - 5"		.0001"	±.0001"		.00012"	600g	
	293-351-30	5" - 6"						740g	
	293-352-30	6" - 7"		.00015"	±.00015"		.00016"	800g	
	293-353-30	7" - 8"						970g	
	293-354-30	8" - 9"		±.0002"	±.0002"		.0002"	1100g	
	293-355-30	9" - 10"						1270g	
	293-356-30	10" - 11"		.0002"	±.0002"		.0002"	1370g	
	293-357-30	11" - 12"						1590g	
	293-334-30	0 - 1"		.00005" / 0.001mm	±.00005"		.00004"	With ratchet thimble	280g
	293-335-30	1" - 2"						With friction thimble	275g
293-336-30	1" - 2"	335g							
293-340-30	0 - 1"	±.00005"	.00004"		.00008"	With ratchet stop	270g		
293-341-30	1" - 2"						330g		
293-342-30	2" - 3"	±.0001"	.00008"		.00008"	With ratchet thimble	470g		
293-343-30	3" - 4"						625g		
293-344-30	0 - 1"	±.00005"	.00004"		.00008"	With friction thimble	280g		
293-345-30	1" - 2"						340g		
293-346-30	2" - 3"	±.0001"	.00008"		.00008"	With friction thimble	480g		
293-347-30	3" - 4"						635g		
293-348-30	0 - 1"	±.00005"	.00004"		275g				

* Excluding quantizing error

• All-Digit preset type: models over 125mm (5") measuring range

Functions

Origin point setting (ABS measurement system):

Resets the ABS origin at the current spindle position to the minimum value of the measuring range and switches to ABS mode.

Zero-setting (INC measurement system):

A brief press on the ZERO/ABS button sets display to zero at the current spindle position and switches to the incremental (INC) measuring mode. A longer press resets to the ABS measuring mode.

Hold:

Pressing the HOLD button freezes the current value in the display. This function is useful for preserving a measurement in situations of poor visibility where the instrument must be moved away from the workpiece before the reading can be recorded.

Data output*4:

Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.

*4: Only models with the data output function

Auto power ON/OFF:

The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading and measurement mode are retained. Turning the spindle causes the reading to reappear.

Error alarm:

In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

Function lock:

This function allows the ORIGIN (origin point setting) function and the ZERO (zero-setting) function to be locked to prevent these points being reset accidentally.

DIMENSIONS

Measuring range: 100mm or less

Friction thimble type

Ratchet stop type over 100mm

Unit: mm

Range	Order No.	L	a	b	c
0-25mm	293-230-30/293-240-30	0	6.5	25	2.5
25-50mm	293-231-30/293-241-30	25	7.3	32.5	
50-75mm	293-232-30/293-242-30	50	10.1	47	
75-100mm	293-233-30/293-243-30	75	11.5	60	
0-25mm	293-234-30/293-244-30	0	6.5	25	2.5
25-50mm	293-235-30/293-245-30	25	7.3	32.5	
100-125mm	293-250-30	100	16.7	76	
125-150mm	293-251-30	125	18.8	90	
150-175mm	293-252-30	150	19.1	103	6.1
175-200mm	293-253-30	175	18.2	115	
200-225mm	293-254-30	200	16.8	126	6.7
225-250mm	293-255-30	225	18	139	
250-275mm	293-256-30	250	18	152	6.5
275-300mm	293-257-30	275	18	166	

Micrometer

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

Digimatic outside micrometers SERIES 293

- Models equipped with a Digimatic output port can form part of a statistical process control or networked measurement system. (Refer to page A-3 for details.)
- Constant-force device: ratchet stop
- Interface Input Tools are available that enable the 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.)
- Measuring faces: Carbide



SPECIFICATIONS

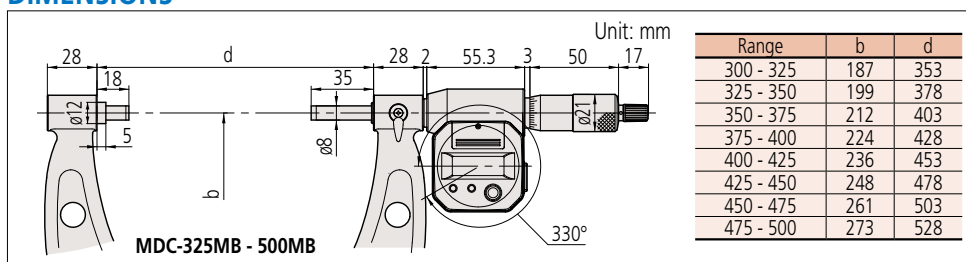
Metric				
Order No.	Range	Accuracy*	Flatness	Parallelism
293-582	300 - 325mm	±6µm	0.6µm	5µm
293-583	325 - 350mm			
293-584	350 - 375mm			
293-585	375 - 400mm	±7µm		6µm
293-586	400 - 425mm			
293-587	425 - 450mm			
293-588	450 - 475mm	±8µm	7µm	
293-589	475 - 500mm			

* Excluding quantizing error

Inch/Metric				
Order No.	Range	Accuracy*	Flatness	Parallelism
293-782	12"-13"	±.0003"	.000024"	.0002"
293-783	13"-14"			
293-784	14"-15"			
293-785	15"-16"	±.00035"		.00024"
293-786	16"-17"			
293-787	17"-18"			
293-788	18"-19"	±.0004"	.00028"	
293-789	19"-20"			

* Excluding quantizing error

DIMENSIONS



SERIES 293 — Digimatic outside micrometers

- Extended battery life of approximately 2.4 years.
- An economical price is achieved through simple design and excluding the data output function.
- One switch operation (Origin Set) for easy use.
- Equipped with Ratchet Stop for constant measuring force.
- Measuring faces: Carbide



293-821-30
GOOD DESIGN
AWARD 2014

SPECIFICATIONS

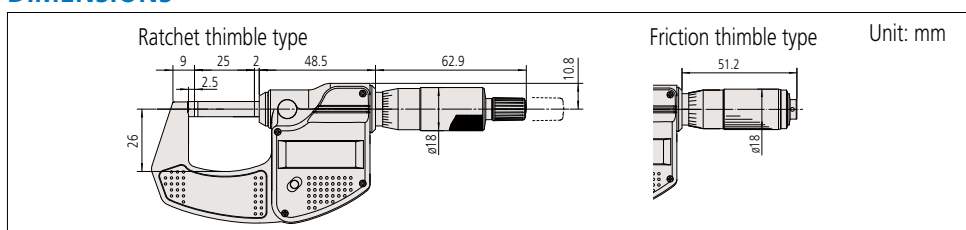
Metric			
Order No.	Range	Resolution	Accuracy*
293-821-30	0 - 25mm	0.001mm	±2µm

* Excluding quantizing error

Inch/Metric			
Order No.	Range	Resolution	Accuracy*
293-831-30	0 - 1"	.00005"/0.001mm	±.0001"

* Excluding quantizing error

DIMENSIONS



Technical Data

Resolution: 0.001mm or .0001"/0.001mm
Measuring force: 10 to 15N
SR44 (2 pc), 938882, for initial operational checks (standard accessory)
Battery life: Approx. 1.8 years under normal use
Length standard: Electromagnetic rotary sensor
Standard accessories: Reference bar, 1 pc
Spanner (200154), 1 pc

Functions

Origin point setting (ABS measurement system): Resets the ABS origin at the current spindle position to the minimum value of the measuring range and switches to ABS mode.

Zero-setting (INC measurement system): A brief press on the ZERO/ABS button sets display to zero at the current spindle position and switches to the incremental (INC) measuring mode. A longer press resets to the ABS measuring mode.

Hold: Pressing the HOLD button freezes the current value in the display. This function is useful for preserving a measurement in situations of poor visibility where the instrument must be moved away from the workpiece before the reading can be recorded.

Function lock: This function allows the PRESET (origin point setting) function and the ZERO (zero-setting) function to be locked to prevent these points being reset accidentally.

Auto power ON/OFF: The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading and measurement mode are retained. Turning the spindle causes the reading to reappear.

Data output: Models equipped with this function have an output port for transferring measurement data to a Statistical Process Control (SPC) system.

Error alarm: In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

Optional accessories

Connecting Cables
Recommended cables:
L-Type (does not interfere with operating the thimble.)
1m: 04AZB512
2m: 04AZB513
Straight type (may interfere with operating the thimble.)
1m: 959149
2m: 959150

Refer to page B-68 for detailed information about recommended cables.



An inspection certificate is supplied as standard. Refer to page X for details.

Technical Data

SR44 (1 pc), 938882, for initial operational checks (standard accessory)
Length standard: Electromagnetic rotary sensor
Standard accessories: Reference bar, 1 pc
Spanner (301336), 1 pc

Functions

Zero-setting: A brief press on the ORIGIN button sets display to zero at the current spindle position (zero-setting), which allows easy comparison measurement.

Auto power ON/OFF: The reading on the LCD disappears after this instrument is idle for about 20 minutes, but the reading is retained. Turning the spindle causes the reading on the LCD to reappear.

Inch/Metric			
Order No.	Range	Resolution	Accuracy*
293-832-30	0 - 1"	.00005"/0.001mm	±.0001"

* Excluding quantizing error

Error alarm:

In case of an overflow on the LCD or a computing error, an error message appears on the LCD, and the measuring function stops. This prevents an instrument from giving an erroneous reading. Also, when the battery voltage drops to a certain level, the low-battery-voltage alarm annunciator appears well before the micrometer becomes unusable.

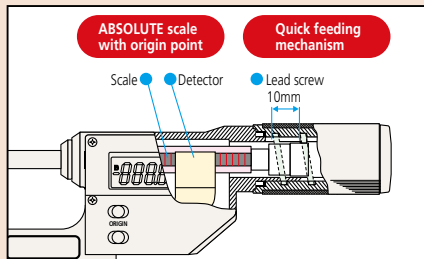
IP Codes

Level 5: Protected against dust.
 Ingress of dust is not totally prevented, but dust that does penetrate must not interfere with satisfactory operation of the apparatus or impair safety.

Level 4: Protected against splashing water.
 Water splashed against the enclosure from any direction shall have no harmful effects.

Technical Data

Resolution: 0.001mm, .00005"/0.001mm
 Accuracy: Refer to the list of specifications.
 Measuring force: 5 - 10N
SR44 (1 pc), **938882**, for initial operational checks (standard accessory)
 Battery life: Approx. 3 years under normal use (1 year for No. 293-667, 668, 669, 677, 678, 679)
 Length standard: Electrostatic capacity absolute sensor
 Standard accessories: Reference bar, 1 pc (except for measuring range 0-30mm (0-1.2") models)
 Maximum response speed: without limit
 The non-rotating spindle enables even inexperienced operators to perform measurements repeatably and accurately.



Optional accessories

Connecting cables
 1m: **937387**
 2m: **965013**
USB Input Tool Direct
USB-ITN-E (2m): **06ADV380E**
 Connecting cables for **U-WAVE-T**
02AZD790E 160mm
 For foot switch: **02AZE140E**
 Refer to page B-68 for details.

Quickmike
SERIES 293 — IP54 ABSOLUTE Digimatic Micrometers

- The Quickmike provides a speedy spindle feed of 10mm per thimble rotation, which enables widely differently sized features to be measured quickly.
- Set the origin only once. The absolute linear scale maintains the origin throughout the life of battery, meaning no more zero setting (presetting) or overspeed error.
- Measuring faces: Carbide
- Supplied with a Ratchet Stop for constant measuring force.
- The lineup includes Blade Micrometer types (refer to page B-48), Disk Micrometer types (refer to page B-35 for details) and Crimp Height Micrometer types (refer to page B-52).



SPECIFICATIONS

Metric						
Order No.	Range	Accuracy*	Flatness	Parallelism	Mass	Output function
293-661-10	0 - 30mm	±2µm	0.3µm	2µm	275g	Without
293-666					355g	With
293-667	25 - 55mm	±3µm	525g			
293-668	50 - 80mm		625g			
293-669	75 - 105mm					

* Excluding quantizing error

Inch/Metric						
Order No.	Range	Accuracy*	Flatness	Parallelism	Mass	Output function
293-676	0 - 1.2"	±.0001"	.000012"	.00008"	275g	With
293-677	1" - 2.2"				355g	
293-678	2" - 3.2"	±.00015"		525g		
293-679	3" - 4.2"			.00012"	625g	

* Excluding quantizing error

DIMENSIONS

Unit: mm						
Range	L	a	b	c	d	
0 - 30	0	7	25	2	34.8	
25 - 55	25	8.5	36		59.8	
50 - 80	50	10.3	47	2.8	84.8	
75 - 105	75	10.7	60		109.8	

Micrometer

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

ABSOLUTE Digimatic Micrometers SERIES 227 — with Adjustable Measuring Force

- Digimatic micrometer dedicated to applications requiring a constant/low measuring force such as measuring wire, paper, and plastic/rubber parts.
- Ratchet mechanism in the thimble applies constant force to workpiece.
- Compact and easy to handle.
- Measuring force is adjustable (in steps) to suit various kinds of workpiece.
- High-accuracy measurement can be performed even by unskilled operators due to the repeatability of the automatically applied measuring force.
- Non-rotating spindle.
- Measuring faces: Carbide



227-201

SPECIFICATIONS

Metric								
Order No.	Range	Measuring force	Resolution	Accuracy*	Measuring force	Accuracy of the selected measuring force* ¹	Repeatability of measuring force* ¹	Mass
227-201	0 - 15mm	0.5N - 2.5N	0.001mm	±2μm	0.5, 1.0, 1.5, 2.0, 2.5 N	± (0.1+ the selected measuring force/10) N	within 0.1 N	300g
227-203	15 - 30mm							380g
227-205	0 - 10mm	2N - 10N	0.001mm	±2μm	2, 4, 6, 8, 10 N	± (0.4+ the selected measuring force/10) N	within 0.4 N	340g
227-206	10 - 20mm							425g
227-207	20 - 30mm							415g

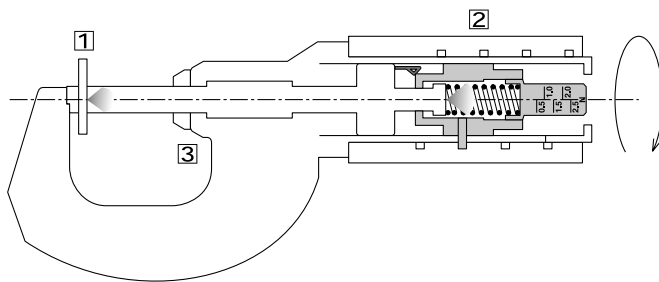
* Excluding quantizing error

Inch/Metric								
Order No.	Range	Measuring force	Resolution	Accuracy*	Measuring force	Accuracy of the selected measuring force* ¹	Repeatability of measuring force* ¹	Mass
227-211	0 - .6"	0.5N - 2.5N	.00005"/0.001mm	±.0001"	0.5, 1.0, 1.5, 2.0, 2.5 N	± (0.1+ the selected measuring force/10) N	within 0.1 N	300g
227-213	.6" - 1.2"							380g
227-215	0 - .4"	2N - 10N	.00005"/0.001mm	±.0001"	2, 4, 6, 8, 10 N	± (0.4+ the selected measuring force/10) N	within 0.4 N	340g
227-216	.4" - .8"							425g
227-217	.8" - 1.2"							415g

* Excluding quantizing error

* 1: These values are guaranteed used in a horizontal orientation (within ±3 degrees)

Constant-measuring-force mechanism



- 1 Measuring force is generated by the action of trapping a workpiece between the spindle face and the anvil.
- 2 The constant-force unit applies the specified measuring force.
- 3 When the preset measuring force is reached, the count on the LCD is automatically held and the hold symbol appears.
(To cancel the hold, reverse the thimble more than 1/10 revolution and press the hold button.)

ABSOLUTE™ Absolute Encoder

Technical Data

Flatness: 0.3μm/0.00012"
 Parallelism: 2μm/0.0008"
 Measurement posture: horizontal orientation only
 (Recommended spindle inclination: within ±3°)
SR44 (1 pc), **938882**, for initial operational checks (standard accessory)
 Battery life: Approx. 3 years under normal use
 (1 year for No.227-203, 206, 207, 213, 216, 217)
 Length standard: Electrostatic capacity absolute sensor
 Standard accessories: Reference bar, 1 pc
 (except for measuring range 0-15mm (0-6") / 0-10mm (0-.4") models)
 Screwdriver (210183), 1 pc

Functions

Adjustable measuring force mechanism
 Hold
 Origin point setting
 ABS measurement system
 Low voltage alarm
 Data output
 Presetting (No.227-203, 206, 207, 213, 216, 217)

Optional accessories

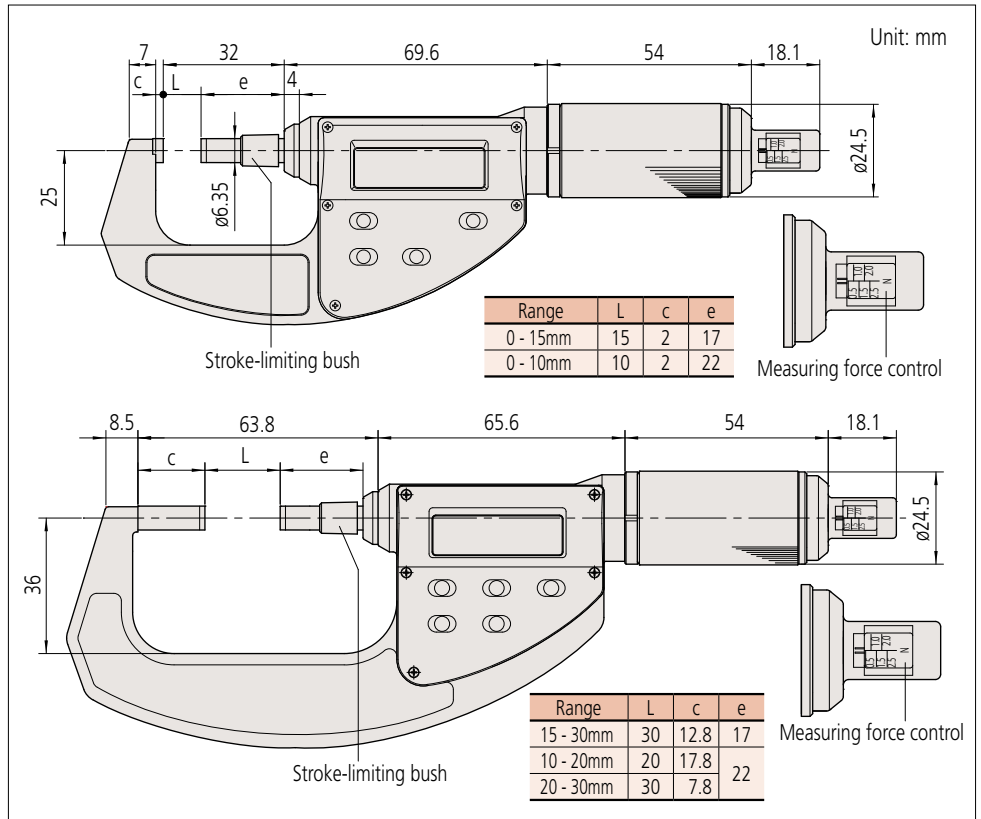
Connecting cables
 1m: **937387**
 2m: **965013**
USB Input Tool Direct
USB-ITN-E (2m): **06ADV380E**
 Connecting cables for **U-WAVE-T**
02AZD790E 160mm
 For foot switch: **02AZE140E**
 Refer to page B-68 for details.

Adjustable measuring force

To preset the measuring force, adjust the measuring force setting scale on the thimble with the screwdriver supplied.



DIMENSIONS



Micrometer

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

Outside Micrometers SERIES 102

- Heat-insulated frame.
- Cut-away frame (behind anvil) for measuring in hard-to-reach places.
- A ratchet stop or a friction thimble for a constant measuring force.
- Measuring faces: Carbide

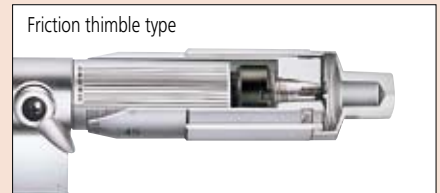


Ratchet stop
102-301



An inspection certificate is supplied as standard. Refer to page X for details.

Common specifications:
Standard accessories: Reference bar, 1 pc (except for measuring range 0-25mm models)
Spanner (301336), 1 pc (for measuring range 0-25mm/25-50mm models)
Spanner (200877), 1 pc (for measuring range 50-75mm/75-100mm models)

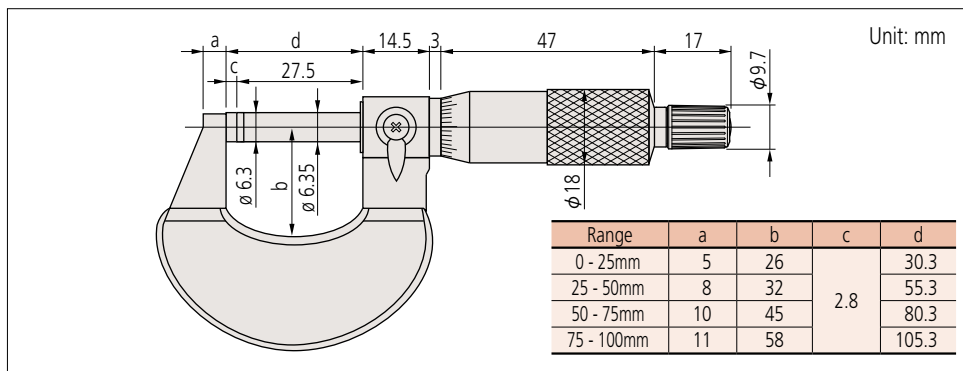


SPECIFICATIONS

Metric						
Order No.	Range	Graduation	Accuracy	Flatness	Parallelism	Constant-force device
102-301	0 - 25mm	0.01mm	±2μm	0.6μm	2μm	Ratchet stop
102-311		0.001mm	±1μm	0.3μm	1μm	friction thimble
102-313						
102-302	25 - 50mm	0.01mm	±2μm	0.6μm	2μm	Ratchet stop
102-312		0.001mm	±1μm	0.3μm	1μm	
102-303	50 - 75mm	0.01mm	±2μm	0.6μm	2μm	Ratchet stop
102-304	75 - 100mm		±3μm		3μm	

Metric		
Order No.	Range	Models included
102-911-40	0 - 100mm (Four micrometers per set)	<ul style="list-style-type: none"> • 102-301 • 102-302 • 102-303 • 102-304 • 3 micrometer standards

DIMENSIONS



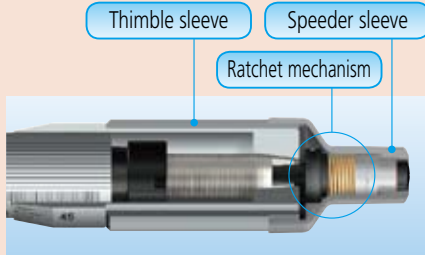


An inspection certificate is supplied as standard. Refer to page X for details.

Technical Data

Flatness: 0.6µm/0.00024"
 Parallelism: 2µm/0.0008"
 Measuring force: 5-10N
 Standard accessories: Reference bar, 1 pc
 (except for measuring range 0-25mm (0-1") models)
 Spanner (301336), 1 pc

Internal structure

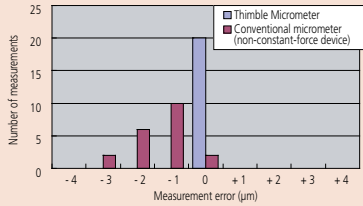


Greatly improved accuracy and repeatability

Measurement results of one-handed operation

A beginner performed a test by measuring a workpiece 20 times using a conventional micrometer and a Ratchet Thimble Micrometer.

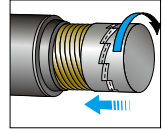
Table showing results of test



Ratchet Thimble Micrometer SERIES 102 — Outside Micrometers

- More accurate in one-handed operation: inexperienced operators measure significantly more accurately with the new micrometer.
- Ratchet function works both from the thimble and the speeder.

- 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.
- Clearly audible ratchet operation for reassurance that measurement is being performed at constant, preset force.
- The speeder is always available for quick rotation of spindle.
- A simple mechanism, which requires neither parts maintenance nor special technique, is employed in the constant-force device.
- Heat-insulated frame.
- Measuring faces: Carbide

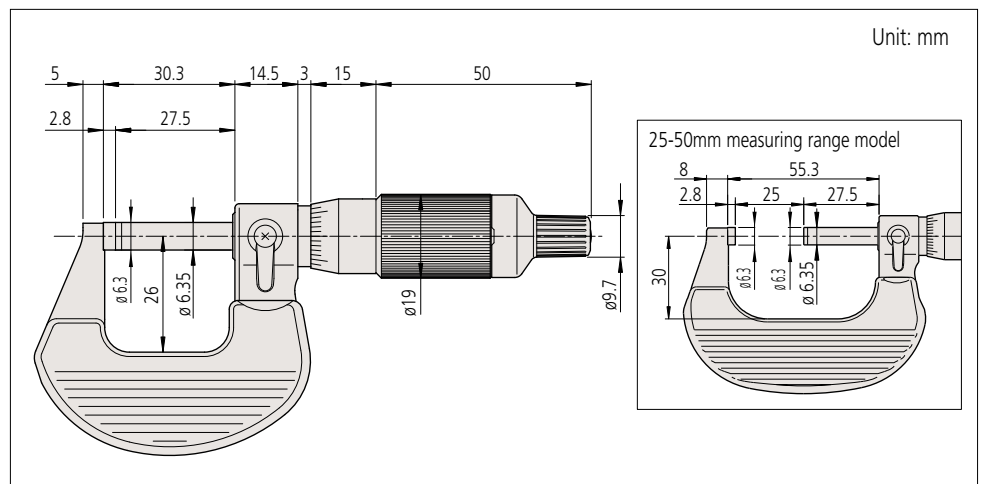


SPECIFICATIONS

Metric				
Order No.	Range	Graduation	Accuracy	Mass
102-701	0 - 25mm	0.01mm	±2µm	180g
102-707		0.001mm		
102-702	25 - 50mm	0.01mm	±2µm	270g
102-708		0.001mm		

Inch				
Order No.	Range	Graduation	Accuracy	Mass
102-717	0 - 1"	.0001"	±0.001"	180g
102-718	1" - 2"			270g

DIMENSIONS

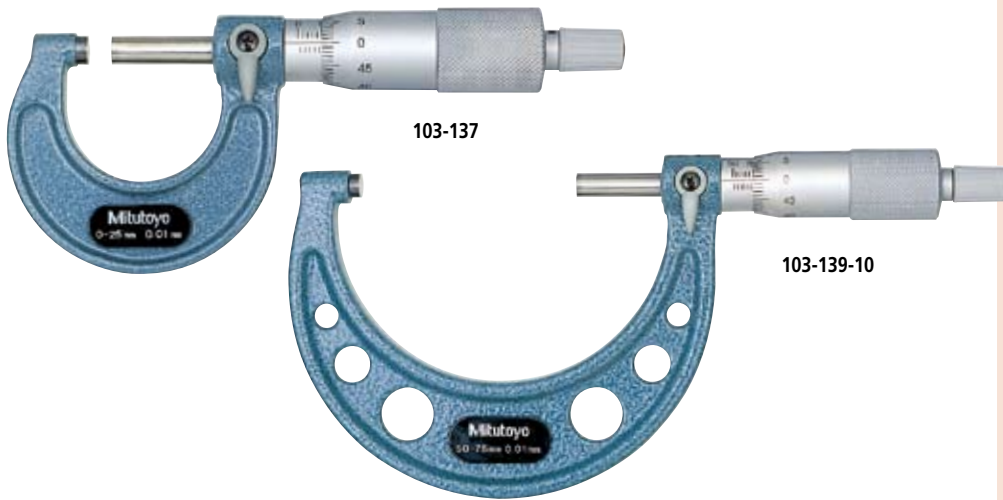


Micrometer

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

Outside Micrometers SERIES 103

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



Metric	With ratchet stop			
Order No.	Range	Graduation	Accuracy	
103-137	0 - 25mm	0.01mm	±2μm	
103-129		0.001mm		
103-138	25 - 50mm	0.01mm		
103-130		0.001mm		
103-139-10	50 - 75mm	0.01mm		±3μm
103-140-10	75 - 100mm			
103-141-10	100 - 125mm			
103-142-10	125 - 150mm			
103-143-10	150 - 175mm			
103-144-10	175 - 200mm			
103-145-10	200 - 225mm			
103-146-10	225 - 250mm			
103-147-10	250 - 275mm			
103-148-10	275 - 300mm		±4μm	
103-149	300 - 325mm			
103-150	325 - 350mm	±5μm		
103-151	350 - 375mm			
103-152	375 - 400mm	±6μm		
103-153	400 - 425mm			
103-154	425 - 450mm	±7μm		
103-155	450 - 475mm			
103-156	475 - 500mm	±8μm		
103-157	500 - 525mm			
103-158	525 - 550mm	±9μm		
103-159	550 - 575mm			
103-160	575 - 600mm	±10μm		
103-161	600 - 625mm			
103-162	625 - 650mm	±11μm		
103-163	650 - 675mm			
103-164	675 - 700mm	±12μm		
103-165	700 - 725mm			
103-166	725 - 750mm	±13μm		
103-167	750 - 775mm			
103-168	775 - 800mm	±14μm		
103-169	800 - 825mm			
103-170	825 - 850mm	±15μm		
103-171	850 - 875mm			
103-172	875 - 900mm			
103-173	900 - 925mm			
103-174	925 - 950mm			
103-175	950 - 975mm			
103-176	975 - 1000mm			

Inch	With ratchet stop			
Order No.	Range	Graduation	Accuracy	
103-177	0 - 1"	.001"	±.0001"	
103-131		.0001"		
103-178	1" - 2"	.001"		
103-132		.0001"		
103-179	2" - 3"	.001"		±.00015"
103-180	3" - 4"			
103-181	4" - 5"			
103-182	5" - 6"			
103-183	6" - 7"			
103-184	7" - 8"			
103-185	8" - 9"			
103-186	9" - 10"			
103-187	10" - 11"			
103-188	11" - 12"		±.00025"	
103-189	12" - 13"			
103-190	13" - 14"	±.0003"		
103-191	14" - 15"			
103-192	15" - 16"	±.00035"		
103-193	16" - 17"			
103-194	17" - 18"	±.0004"		
103-195	18" - 19"			
103-196	19" - 20"	±.00045"		
103-197	20" - 21"			
103-198	21" - 22"	±.0005"		
103-199	22" - 23"			
103-200	23" - 24"	±.00055"		
103-201	24" - 25"			
103-202	25" - 26"	±.0006"		
103-203	26" - 27"			
103-204	27" - 28"	±.00065"		
103-205	28" - 29"			
103-206	29" - 30"	±.0007"		
103-207	30" - 31"			
103-208	31" - 32"	±.00075"		
103-209	32" - 33"			
103-210	33" - 34"			
103-211	34" - 35"			
103-212	35" - 36"			
103-213	36" - 37"			
103-214	37" - 38"			
103-215	38" - 39"			
103-216	39" - 40"			

Inch	With friction thimble		
Order No.	Range	Graduation	Accuracy
103-135	0 - 1"	.0001"	±.0001"
103-136	1" - 2"		



An inspection certificate is supplied as standard. Refer to page X for details.

Technical Data

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

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



103-904-10



103-905-10



103-906

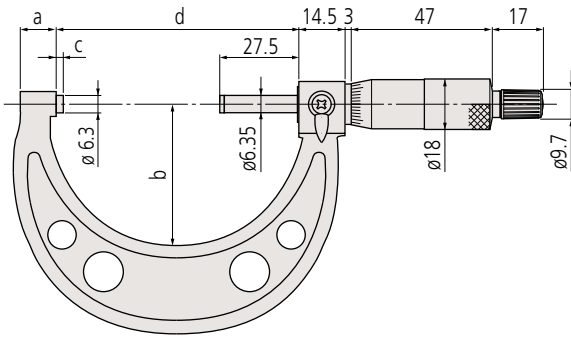
Metric Micrometer set / With ratchet thimble		
Order No.	Range	Models included
103-927-10	0 - 75mm (3 pcs./set)	103-137, 103-138, 103-139-10, 2 micrometer standards
103-913-50	0 - 150mm (6 pcs./set)	103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10, 5 micrometer standards
103-915-10	150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

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

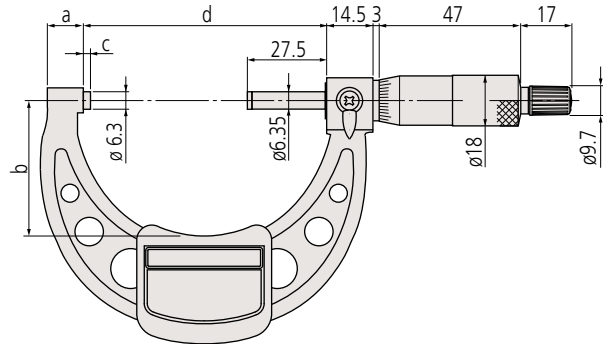
DIMENSIONS

Unit: mm

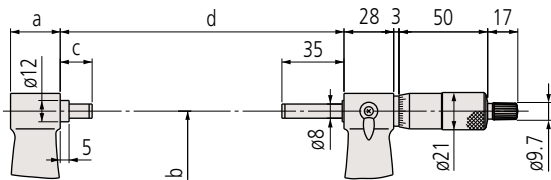
Models up to 75mm measuring range



Models 75mm to 300mm



Models over 300mm measuring range



Range	a	b	c	d
0 - 25mm	9	28	2.5	30
25 - 50mm	10	38		55
50 - 75mm	12	47		80
75 - 100mm	14	58		105
100 - 125mm	16.7	77	5.3	132.8
125 - 150mm	18.8	92	5.7	158.2
150 - 175mm	19.1	104	6.1	183.6
175 - 200mm	18.2	115	6.3	208.8
200 - 225mm	16.8	128	6.7	234.2
225 - 250mm	18	141	5.5	258

Range	a	b	c	d
250 - 275mm	18	153	6.5	284
275 - 300mm		166		309
300 - 325mm		187		353
325 - 350mm		199		378
350 - 375mm	28	212	18	403
375 - 400mm		224		428
400 - 425mm		236		453
425 - 450mm		248		478
450 - 475mm		261		503
475 - 500mm		273		528

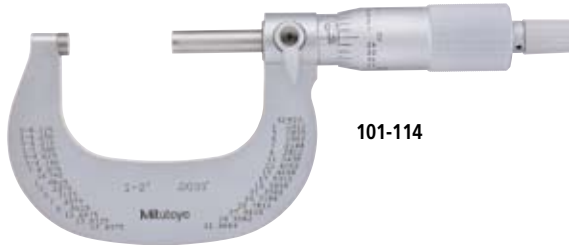
Range	a	b	c	d
500 - 525mm	28	307	40	575
525 - 550mm			15	
550 - 575mm		332	40	625
575 - 600mm			15	
600 - 625mm		355	40	675
625 - 650mm			15	
650 - 675mm		382	40	725
675 - 700mm			15	
700 - 725mm		405	40	775
725 - 750mm			15	
750 - 775mm		430	40	825
775 - 800mm			15	
800 - 825mm	455	40	875	
825 - 850mm		15		
850 - 875mm	480	40	925	
875 - 900mm		15		
900 - 925mm	505	40	975	
925 - 950mm		15		
950 - 975mm	530	40	1025	
975 - 1000mm		15		

Micrometer

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

Outside Micrometers SERIES 101

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



101-114

SPECIFICATIONS

Inch	With ratchet stop		
Order No.	Range	Graduation	Accuracy
101-113	0 - 1"	.0001"	±.0001"
101-114	1" - 2"		
101-119	2" - 3"		
101-120	3" - 4"		

Inch	With friction thimble		
Order No.	Range	Graduation	Accuracy
101-117	0 - 1"	.0001"	±.0001"
101-118	1" - 2"		

DIMENSIONS

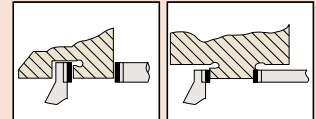
Unit: inch

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

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

Technical Data

Flatness: .000024"
 Parallelism: .00008" for models up to 3"
 .00012" for models over 3"
 Standard accessories: Reference bar, 1 pc
 (except for measuring range 0-1" models)
 Spanner (301336), 1 pc
 (for measuring range 0-1" / 1-2" models)
 Spanner (200877), 1 pc
 (for measuring range 2-3" / 3-4" models)



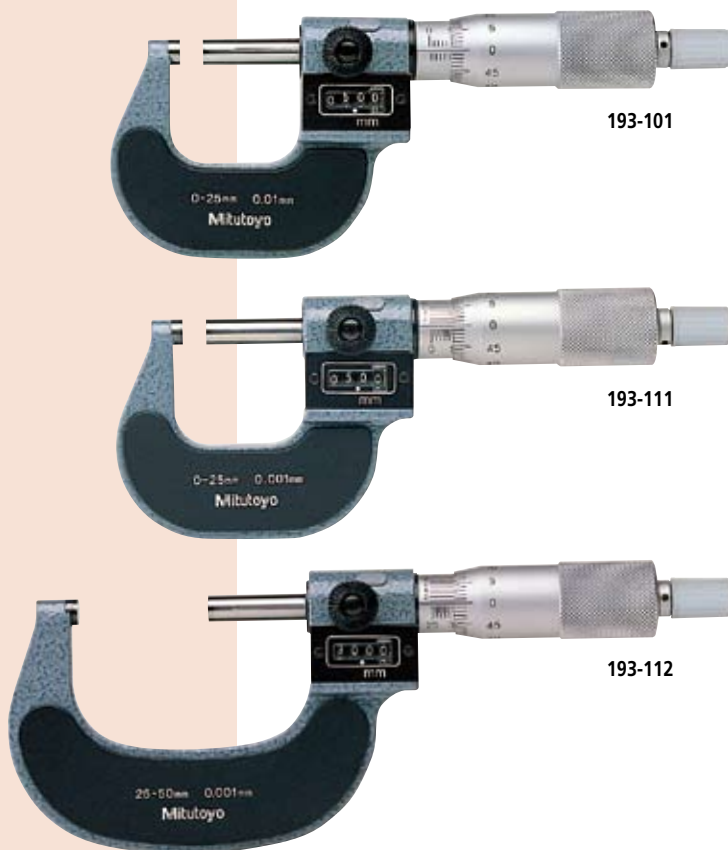
Technical Data

Counter Reading : 0.01mm or .001"
 Flatness: 0.6µm/0.00024"
 Parallelism:
 (2 + R/100)µm, R = max. range (mm)
 [.00008" + .00004(R/4)]" R = max. range (inch)
 fraction rounded down
 Standard accessories: Reference bar, 1 pc
 (except for measuring range 0-25mm (0-1") models)
 Spanner (301336), 1 pc

Digit Outside Micrometers SERIES 193

- Mechanical digit counter with 0.01mm or .001" resolution for quick and error-free reading.
- Measuring faces: Carbide

- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric	With ratchet stop		
Order No.	Range	Graduation	Accuracy
193-101	0 - 25mm	0.01mm	±2µm
193-111		0.001mm	
193-102		0.01mm	
193-112	25 - 50mm	0.001mm	
193-103	50 - 75mm	0.01mm	
193-113		0.001mm	
193-104	75 - 100mm	0.01mm	±3µm
193-114		0.001mm	

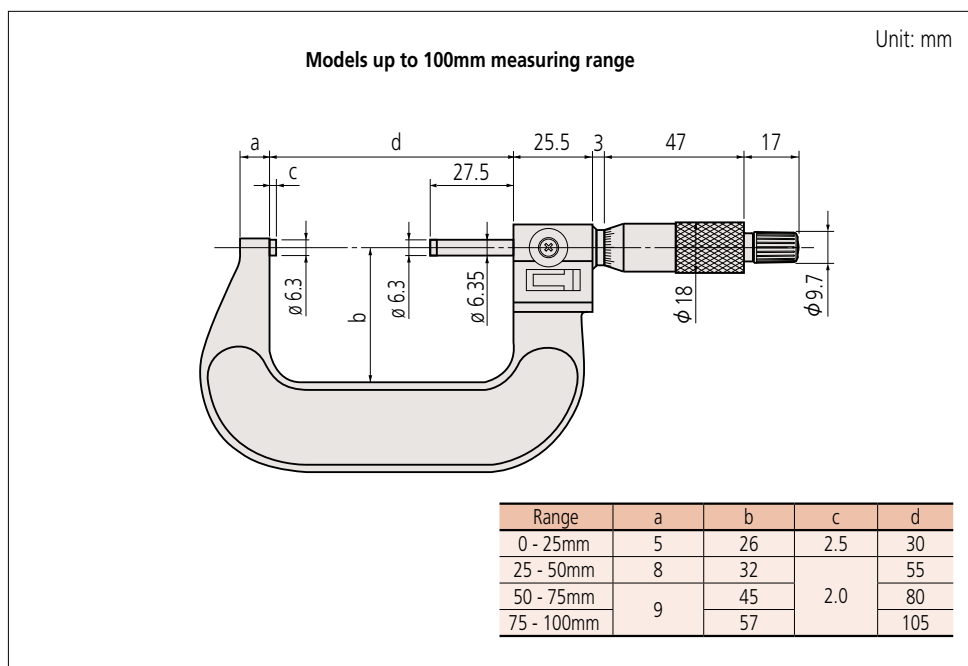
Inch	With ratchet stop		
Order No.	Range	Graduation	Accuracy
193-213	2" - 3"	.0001"	±.0001"
193-214	3" - 4"		±.00015"

Inch	With friction thimble		
Order No.	Range	Graduation	Accuracy
193-211	0 - 1"	.0001"	±.0001"
193-212	1" - 2"		

Metric	Micrometer set	
Order No.	Range	Models included
193-901	0 - 75mm (3 pcs./set)	• 193-101, 193-102, 193-103 • 2 micrometer standards
193-902	0 - 100mm (4 pcs./set)	• 193-101, 193-102, 193-103, 193-104 • 3 micrometer standards

Inch	Micrometer set	
Order No.	Range	Models included
193-923	0 - 3" (3 pcs./set)	• 193-211, 193-212, 193-213 • 2 micrometer standards

DIMENSIONS



Micrometer

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

Outside Micrometers

SERIES 406 — Digimatic straight line micrometer outside micrometer

- Non-rotating spindle.
- Equipped with Ratchet Stop for constant measuring force.



406-250-30

Metric

Order No.	Range	Resolution	Accuracy*	Flatness	Parallelism
406-250-30	0 - 25mm	0.001mm	±3μm	0.3μm	3μm
406-251-30	25 - 50mm				
406-252-30	50 - 75mm		±4μm		
406-253-30	75 - 100mm				4μm

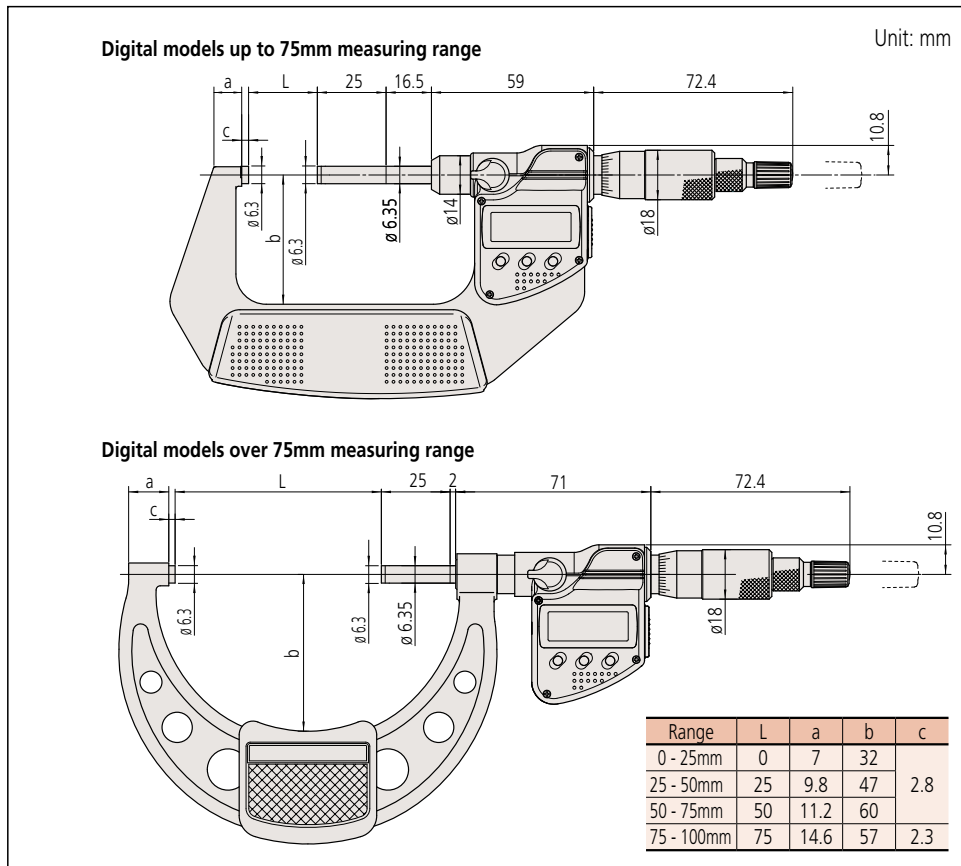
* Excluding quantizing error

Inch/Metric

Order No.	Range	Resolution	Accuracy*	Flatness	Parallelism
406-350-30	0 - 1"	.00005"/ 0.001mm	±.00015"	.000012"	.00012"
406-351-30	1" - 2"				
406-352-30	2" - 3"		±.0002"		
406-353-30	3" - 4"				.00016"

* Excluding quantizing error

DIMENSIONS



Technical Data

Battery: **SR44** (1 pc), **938882**, for initial operational checks (standard accessory)
 Battery life: Approx. 2.4 years under normal use
 Length standard: Electromagnetic rotary sensor
 Standard accessories: Reference bar, 1 pc (except for measuring range 0-25mm (0-1") models)
 Spanner (301336), 1 pc

Optional accessories

Connecting cables

1m: **05CZA662**

2m: **05CZA663**

USB Input Tool Direct

USB-ITN-B (2m): **06ADV380B**

SPC cables for **U-WAVE** w/ data switch (160mm):

02AZD790B

For foot switch: **02AZE140B**

(Refer to page B-68 for details.)

Technical Data

Flatness: $0.6\mu\text{m}/.000024''$
 Parallelism:
 $(2 + R/100)\mu\text{m}$, R = max. measuring range (mm)
 fraction rounded down
 Standard accessories: Reference bar, 1 pc
 (except for measuring range 0-25mm models)
 Spanner (301336), 1 pc



Typical indicator choice

Dial indicator (0.01mm) / **2046SB**
 Dial indicator (0.001mm) / **2109SB-10**
 ABS Digimatic Indicator (0.01mm) / **543-400B**
 ABS Digimatic Indicator (0.001mm) / **543-390B**
 *1 Indicators with stems cannot be installed on this micrometer.

Indicator Type Micrometers SERIES 107

- Designed to mount a dial indicator for direct GO/ \pm NG judgment on mass-produced parts.
- Anvil retracting trigger for quick measurement.
- Various kinds of indicators*1 are selectable depending on the measurement type (accuracy required, measuring range, etc.).
- Measuring faces: Carbide
- Anvil stroke: 3mm



107-201
(Indicator shown is optional)

SPECIFICATIONS

Metric		
Order No.	Range	Accuracy
107-201	0 - 25mm	$\pm 2\mu\text{m}$
107-202	25 - 50mm	
107-203	50 - 75mm	
107-204	75 - 100mm	$\pm 3\mu\text{m}$
107-205	100 - 125mm	
107-206	125 - 150mm	
107-207	150 - 175mm	$\pm 4\mu\text{m}$
107-208	175 - 200mm	

DIMENSIONS AND MASS

Measuring range up to 50mm

Measuring range up to 200mm

Unit: mm

Measuring range up to 75mm

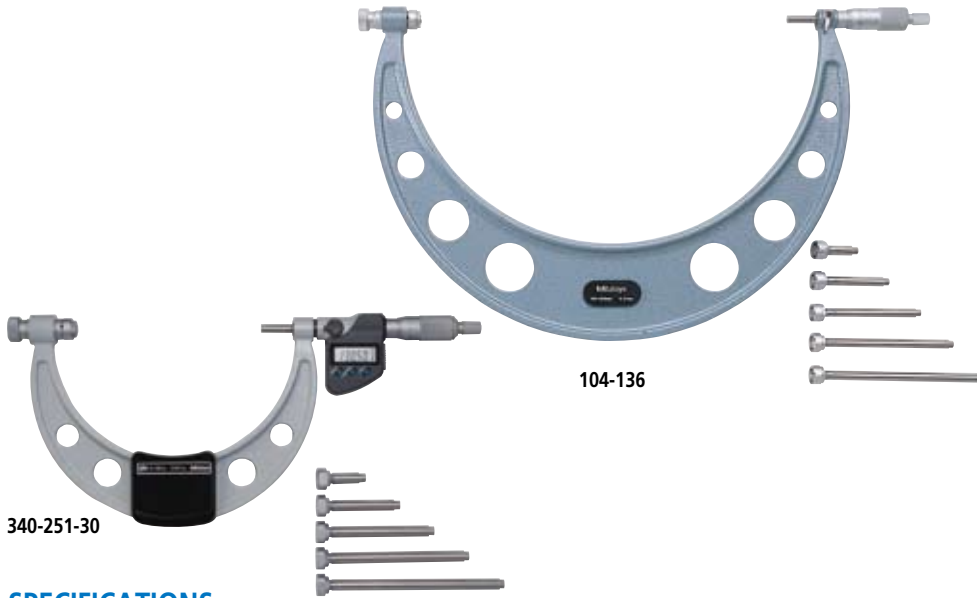
Range	b	d
0 - 25mm	30	39.5
25 - 50mm	38	64.5
50 - 75mm	45	90
75 - 100mm	65	115.6
100 - 125mm	79	140.6
125 - 150mm	93	165.6
150 - 175mm	105	190.5
175 - 200mm	118	214.5

Micrometer

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

Outside Micrometers SERIES 340, 104 — with Interchangeable Anvils

- Wide measuring range with interchangeable anvils.
- Measuring face of the spindle is carbide tipped (standard model).
- IP 65 water/dust protection (series 340).
* Models with a measuring range up to 300mm.
- Equipped with Ratchet Stop for constant measuring force.



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



IP Codes (series 340)

- 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

Flatness:
0.6µm/ .000024" for models up to 300mm/ 12"
1.0µm/ .00004" for models over 300mm/ 12"

Parallelism:
2µm/ .00008" for models up to 75mm/ 3"
3µm/ .00012" for models up to 150mm/ 6"
(2+R/100)µm for models over 150mm,
R=max. range (mm)
Fraction rounded up
±[.00008" + .00004 (R/4)]" For models over 6"
R= max. range (inch)
Fraction rounded up
Accuracy:
±(4+R/75)µm, R = max. range (mm)
±[.00016" + .00004(R/3)]" R = max. range (inch)
(excluding quantizing error for digital models)
Fraction rounded up
Excluding quantizing error

SPECIFICATIONS

Metric							
Order No.	Range	Resolution	Interchangeable anvils	Setting Standard		Micrometer head stroke	
				Qty	Size		
Digimatic (LCD)							
340-251-30	0 - 150mm	0.001mm	6pcs.	5	25-125mm	25mm	
340-252-30	150 - 300mm			6	150-275mm		
340-520	300 - 400mm			4pcs.	4		300-375mm
340-521	400 - 500mm						400-475mm
340-522	500 - 600mm						500-575mm
340-523	600 - 700mm						600-675mm
340-524	700 - 800mm		700-775mm				
340-525	800 - 900mm		800-875mm				
340-526	900 - 1000mm		900-975mm				

Metric							
Order No.	Range	Graduation	Interchangeable anvils	Setting Standard		Micrometer head stroke	
				Qty	Size		
Analog							
104-171*	0 - 50mm	0.01mm	1pcs.	1	25mm	25mm	
104-139A	0 - 100mm		4pcs.	3	25-75mm		
104-135A	0 - 150mm		6pcs.	5	25-125mm		
104-161A	50 - 150mm		4pcs.	4	50-125mm		
104-140A	100 - 200mm				100-175mm		
104-136A	150 - 300mm		4pcs.	4	6		150-275mm
104-141A	200 - 300mm				200-275mm		
104-142A	300 - 400mm				300-375mm		
104-143A	400 - 500mm				400-475mm		
104-144A	500 - 600mm				500-575mm		
104-145A	600 - 700mm				600-675mm		
104-146A	700 - 800mm		700-775mm				
104-147A	800 - 900mm		800-875mm				
104-148A	900 - 1000mm		900-975mm				

* The frame is fitted with a heat shield.

Inch/Metric							
Order No.	Range	Resolution	Interchangeable anvils	Setting Standard		Micrometer head stroke	
				Qty	Size		
Digimatic (LCD)							
340-251-30	0 - 6"	.00005"/ 0.001mm	6pcs.	5	1" - 5"	1"	
340-252-30	6" - 12"	.0001"/ 0.001mm			6		6" - 11"
340-720	12" - 18"						12" - 17"
340-721	18" - 24"			18" - 23"			
340-722	24" - 30"			24" - 29"			
340-723	30" - 36"			30" - 35"			

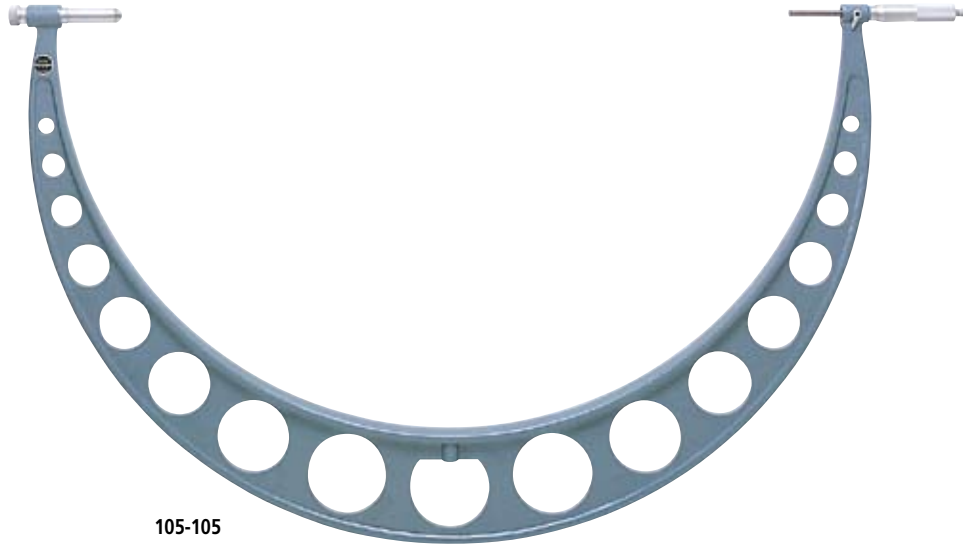
Inch							
Order No.	Range	Interchangeable anvils	Graduation	Setting Standard		Micrometer head stroke	
				Qty	Size		
Analog							
104-165	0 - 2"	1pcs.	.0001"	1	1"	25mm	
104-149	0 - 4"	4pcs.	.001"	3	1" - 3"		
104-137	0 - 6"	6pcs.		4	5		1" - 5"
104-162	2" - 6"	4pcs.			4		2" - 5"
104-150	4" - 8"						4" - 7"
104-138	6" - 12"	6pcs.			6		6" - 11"
104-151	8" - 12"	4pcs.			4		8" - 11"
104-152	12" - 16"						12" - 15"
104-201	12" - 18"	6pcs.		6	12" - 17"		
104-153	16" - 20"	4pcs.			16" - 19"		
104-202	18" - 24"	6pcs.			18" - 23"		
104-154	20" - 24"	4pcs.			4		20" - 23"
104-155	24" - 28"						24" - 27"
104-203	24" - 30"	6pcs.	4		24" - 29"		
104-156	28" - 32"	4pcs.			28" - 31"		
104-204	30" - 36"	6pcs.			30" - 35"		
104-157	32" - 36"	4pcs.			4		32" - 35"
104-158	36" - 40"						36" - 39"
104-205	36" - 42"	6pcs.			6		36" - 41"

Micrometer

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

Outside micrometers SERIES 105 — with Anvil Extension Collars

- Adjustable measuring range with extension collars.
- 50mm/2" spindle stroke
- Measuring faces: Carbide
- Equipped with Ratchet Stop for constant measuring force.



105-105

SPECIFICATIONS

Metric				
Order No.	Range	Graduation	Extension Collars	Setting Standard
105-103	500 - 600mm	0.01mm	1 pc (50mm)	2 pcs.
105-104	600 - 700mm			
105-105	700 - 800mm			
105-106	800 - 900mm			
105-107	900 - 1000mm			

Technical Data

Flatness: 1.3μm

Parallelism:

$(2 + R/100)\mu\text{m}$, R = max. range (mm)
fraction rounded down

Accuracy:

$\pm(6+R/75)\mu\text{m}$, R = max. range (mm)
fraction rounded up

Standard accessories: Spanner (200154), 1 pc

Anvil Extension Collar



Measuring range 700 to 750mm
with **105-105**



Measuring range 750 to 800mm
with **105-105**

Micrometer

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

Caliper Type Micrometers SERIES 343, 143

- Effective for measuring workpiece features where access is difficult.
- Measuring faces: Carbide
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric			
Order No.	Range	Resolution	Accuracy*
Digimatic (LCD)			
343-250-30	0 - 25mm	0.001mm	±5μm
343-251-30	25 - 50mm		±6μm
343-252-30	50 - 75mm		±7μm
343-253-30	75 - 100mm		±8μm

* Excluding quantizing error

Metric			
Order No.	Range	Graduation	Accuracy
Analog			
143-101	0 - 25mm	0.01mm	±5μm
143-102	25 - 50mm		±6μm
143-103	50 - 75mm		±7μm
143-104	75 - 100mm		±8μm
143-105	100 - 125mm		±9μm
143-106	125 - 150mm		
143-107	150 - 175mm		±10μm
143-108	175 - 200mm		
143-109	200 - 225mm		±11μm
143-110	225 - 250mm		
143-111	250 - 275mm		±12μm
143-112	275 - 300mm		

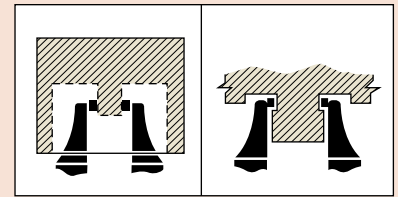
Inch/Metric			
Order No.	Range	Resolution	Accuracy*
Digimatic (LCD)			
343-350-30	0 - 1"	.00005" / 0.001mm	±0.0025"
343-351-30	1" - 2"		±0.003"
343-352-30	2" - 3"		±0.0035"
343-353-30	3" - 4"		±0.004"

* Excluding quantizing error

Inch			
Order No.	Range	Graduation	Accuracy
Analog			
143-121	0 - 1"	.001"	±0.0025"
143-122	1" - 2"		±0.003"
143-123	2" - 3"		±0.0035"

Technical Data

Flatness: 0.3μm/.000012"
 Parallelism: (3+R/75)μm, R = max. range (mm)
 [.00012"+.00004(R/3)]" R = max. range (inch)
 fraction rounded down



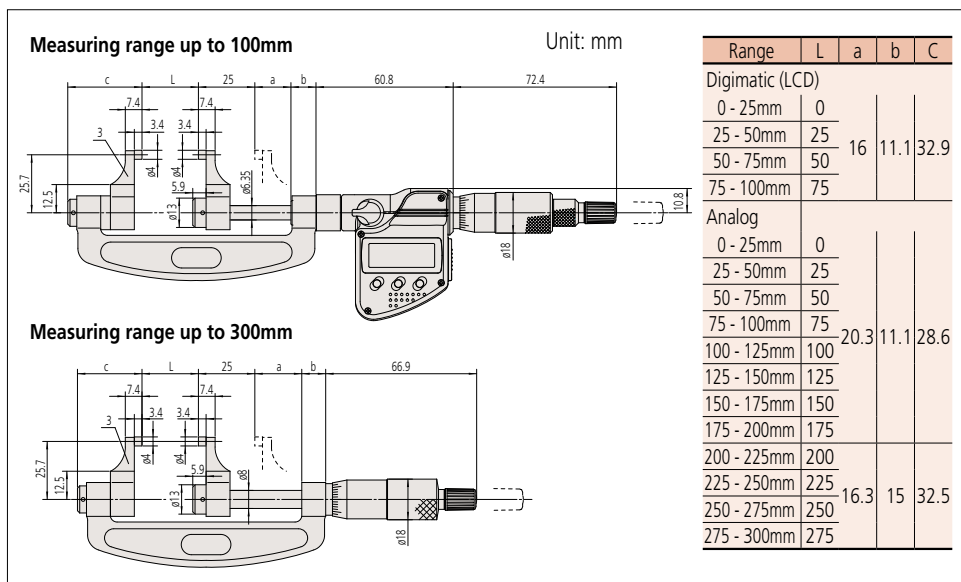
Battery for series 343

SR44 (1 pc), 938882, for initial operational checks (standard accessory)
 Battery life: Approx. 2.4 years under normal use (for series 343)
 Length standard: Electromagnetic rotary sensor (for series 343)
 Standard accessories: Reference bar, 1 pc (except for measuring range 0-25mm (0-1") models)
 Spanner (301336), 1 pc

Optional accessories for series 343

Connecting cables
 1m: 05CZA662
 2m: 05CZA663
USB Input Tool Direct
USB-ITN-B (2m): 06ADV380B
 Connecting cables for **U-WAVE-T**
02AZD790B 160mm
 For foot switch: **02AZE140B**
 Refer to page B-68 for details.

DIMENSIONS



Technical data

Accuracy: $\pm(2+R/75)\mu\text{m}$, R = max. range (mm)
fraction rounded up
Standard accessories: Spanner (301336), 1 pc



Screw Thread Micrometers SERIES 125

- Fixed anvil type to suit 60° threads
- Directly indicates screw pitch diameter (no need for calculation)
- Equipped with Ratchet Stop for constant measuring force.



125-103

SPECIFICATIONS

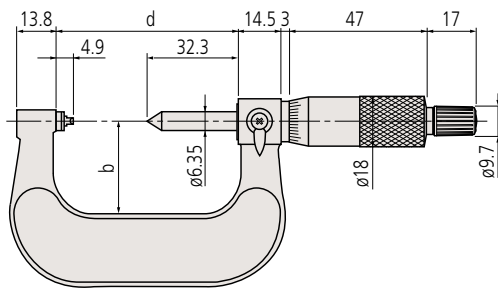
Metric			
Order No.	Thread to be measured (Metric/Unified)	Range	Graduation
125-101	0.4 - 0.5mm/64 - 48TPI	0 - 25mm	0.01mm
125-102	0.6 - 0.9mm/44 - 28TPI		
125-103	1 - 1.75mm/24 - 14TPI		
125-104	2 - 3mm/13 - 9TPI		
125-105	3.5 - 5mm/8 - 5TPI		
125-106	0.4 - 0.5mm/64 - 48TPI		
125-107	0.6 - 0.9mm/44 - 28TPI		
125-108	1 - 1.75mm/24 - 14TPI		
125-109	2 - 3mm/13 - 9TPI		
125-110	3.5 - 5mm/8 - 5TPI		

Metric			
Order No.	Thread to be measured (Metric/Unified)	Range	Graduation
125-111	0.6 - 0.9mm/44 - 28TPI	50 - 75mm	0.01mm
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		
125-116	0.6 - 0.9mm/44 - 28TPI	75 - 100mm	0.01mm
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		

* A setting standard is supplied with each model (except for 0-25mm measuring range).
The setting standard is for metric threads (unified) 60°.

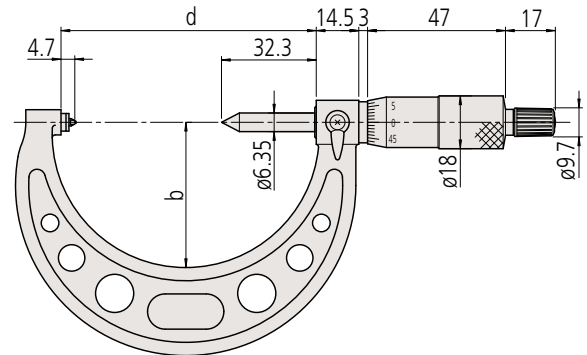
DIMENSIONS

No.125-101,125-106



Range	b	d
0 - 25mm	25	37.2
25 - 50mm	32	62.2

No.125-111,125-116



Range	b	d
50 - 75mm	49	87
75 - 100mm	63	112

Unit: mm

Micrometer

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

Screw Thread Micrometers

SERIES 326, 126 — Interchangeable Anvil / Spindle Tip Type

- Anvils and spindle tips are interchangeable in matching pairs to enable measurement of Metric/Unified or Whitworth threads.
- Direct reading of screw pitch diameter (no need for calculation)
- Equipped with Ratchet Stop for constant measuring force.
- Interchangeable anvils / spindle tips are optional.



SPECIFICATIONS

Metric			
Order No.	Range	Resolution	Accuracy*
Digimatic (LCD)			
326-251-30	0 - 25mm	0.001mm	±4μm
326-252-30	25 - 50mm		
326-253-30	50 - 75mm		
326-254-30	75 - 100mm		
			±5μm

* Excluding quantizing error

Metric			
Order No.	Range	Graduation	Accuracy
Analog			
126-125	0 - 25mm	0.01mm	±4μm
126-126	25 - 50mm		
126-127	50 - 75mm		
126-128	75 - 100mm		
126-129	100 - 125mm	±5μm	±6μm
126-130	125 - 150mm		
126-131	150 - 175mm		
126-132	175 - 200mm		
126-133	200 - 225mm	±7μm	±7μm
126-134	225 - 250mm		
126-135	250 - 275mm		
126-136	275 - 300mm		

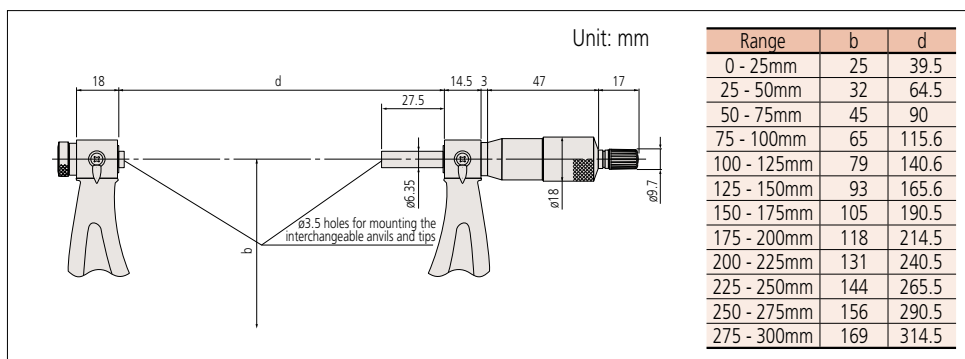
Notes: 1) A matching setting standard is supplied with each model (except for 0-25mm measuring range). (Refer to page B-63 for details.)

The setting standard is for metric threads (unified) 60°.

2) For functional details of series 326, refer to series 293.

Please note that origin setting of these models is free-digit preset type. Also, connecting cables (optional) have to be a waterproof type.

DIMENSIONS



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



IP Codes (series 326)

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



Battery for series 326

SR44 (1 pc), 938882, for initial operational checks (standard accessory)

Battery life: Approx. 2.4 years under normal use (for series 326)

Length standard: Electromagnetic rotary sensor (for series 326)

Standard accessories: Spanner (301336), 1 pc

Optional accessories

Connecting cables

1m: 05CZA662

2m: 05CZA663

USB Input Tool Direct

USB-ITN-B (2m): 06ADV380B

Connecting cables for U-WAVE-T

02AZD790B 160mm

For foot switch: 02AZE140B

Refer to page B-68 for details.

Optional accessories

Sets of interchangeable anvils / spindle tips

- For Metric/Unified threads (pair)

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 (pair)

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)

Technical description

- Anvils / spindle tips



Allowable error of the angle of anvils and spindle tips

Type	Metric (Unified)	Whitworth (Unified)	Half angle error
Pitch (mm), Nominal designation of threads per inch		W1	±30'
		W2	±30'
		W3	±20'
		W4	±20'
		W5	±15'
		W6	±15'
		W7	±10'
		W8	±10'
		W9	±10'
		W10	±10'

Note) This chart indicates the difference between the angle made by anvil's contact faces and spindle's axes and the half angle with error α.
Metric/Unified θ = 60°
Whitworth θ = 55°

Technical Data

Standard accessories: Spanner (301336), 1 pc

Universal Micrometer SERIES 116 — Interchangeable Anvil Type

- 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.
- Equipped with Ratchet Stop for constant measuring force.
- Optional anvils / spindle tips for screw thread measurement (matching V and cone) are also available.



116-101



SPECIFICATIONS

Metric			
Order No.	Range	Graduation	Accuracy
116-101	0 - 25mm	0.01mm	±4μm
116-102	25 - 50mm		

* 116-102 is provided with a plain setting standard (167-101) and a 60°-thread setting standard (167-261) for adjusting the minimum range point according to the application.

* 116-106 is provided with a plain setting standard (167-141) and a 60°-thread setting standard (167-294) for adjusting the minimum range point according to the application.

Inch			
Order No.	Range	Graduation	Accuracy
116-105	0 - 1"	.001"	±.0002"
116-106	1" - 2"		

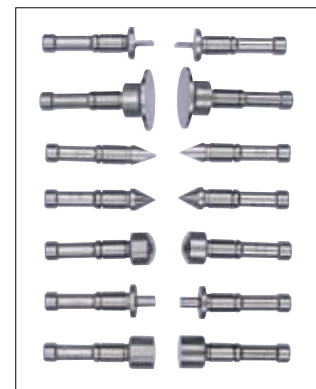
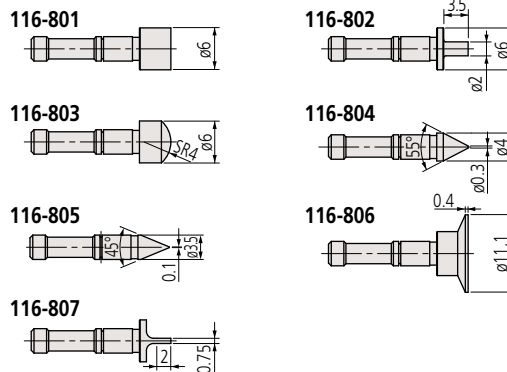
* 116-106 is provided with a plain setting standard (167-141) and a 60°-thread setting standard (167-294) for adjusting the minimum range point according to the application.

Order No.	Description
116-801	Flat
116-802	Spline
116-803	Spherical
116-804	Point
116-805	Knife-edge
116-806	Disk
116-807	Blade

116-800 116-801 - 116-807 Set
Anvils / spindle tips set (7 pairs)

Optional accessories

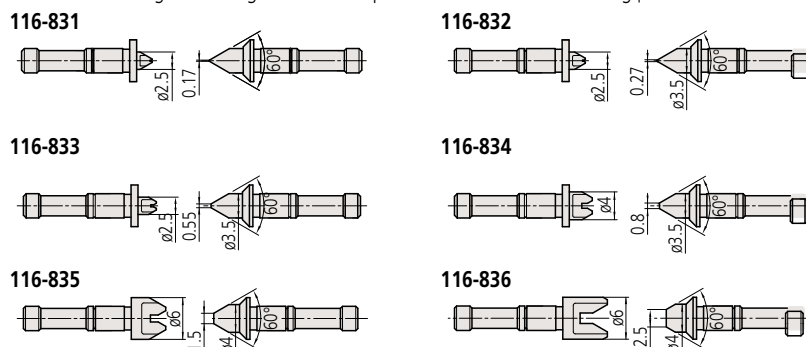
- Interchangeable anvils / spindle tips are available in matching pairs.



Interchangeable contact points (optional)

- Thread-measuring interchangeable contact points are available in matching pairs.

Order No.	Set Identifier	Range of measurement (mm)
116-831	0.4 - 0.5mm/64	48TPI
116-832	0.6 - 0.9mm/44	28TPI
116-833	1 - 1.75mm/24	14TPI
116-834	2 - 3mm/13	9TPI
116-835	3.5 - 5mm/8	5TPI
116-836	5.5 - 7mm/4.5	3.5TPI
116-830	116-831 - 116-836	M (U) Set



Micrometer

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

3-Wire Units SERIES 313

- Enables measurement of the pitch diameter of screw threads with a standard micrometer.
- Determination of the pitch diameter: refer to "Quick Guide to Precision Measuring Instruments".



Technical Data

Accuracy of wire diameter: $\pm 2\mu\text{m}$

SPECIFICATIONS

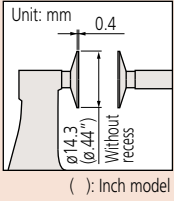
3-Wire Units set

Order No.	Set	Wire dia. (mm)	Support spindle dia. (mm)
313-101	18	0.170 - 3.200	$\phi 6.35$

Order No. (One pair) (Support spindle dia.) $\phi 6.35\text{mm}$ (.25" DIA.)	Wire dia. (mm)	Pitch		
		Metric thread (mm)	Unified thread (thread per inch)	Whitworth thread (thread per inch)
952131	0.170	0.2, 0.25, 0.3	80	—
952132	0.195	0.35	72	—
952133	0.220	0.4	64	—
952134	0.250	0.45	56	60
952135	0.290	0.5	48	48
952136	0.335	0.6	44, 40	40
952137	0.390	0.7	36	36
952138	0.455	0.75, 0.8	32	32
952139	0.530	0.9	28	28, 26
952140	0.620	1.0	24	24, 22
952141	0.725	1.25	20	20, 19, 18
952142	0.895	1.5	18, 16	16
952143	1.100	1.75, 2.0	14, 13, 12	14, 12
952144	1.350	2.5	11, 10	11, 10
952145	1.650	3.0	9, 8	9, 8
952146	2.050	3.5	7	7
952147	2.550	4, 4.5	6	6
952148	3.200	5, 5.5, 6	5, 4.5	5, 4.5



Anvil dimensions



Technical Data

Standard accessories: Spanner (301336), 1 pc

Paper Thickness Micrometers SERIES 169 — Non-Rotating Spindle Type

- For paper thickness measurement.
- Non-rotating spindle.
- Equipped with Ratchet Stop for constant measuring force. (8.02±0.8N)

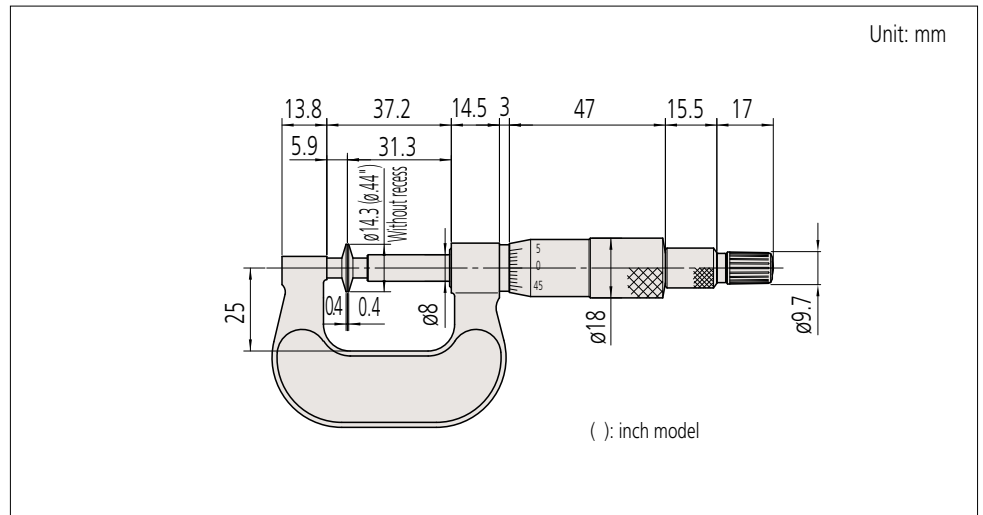


169-101

SPECIFICATIONS

Metric					
Order No.	Range	Graduation	Accuracy	Flatness	Parallelism
169-101	0 - 25mm	0.01mm	±4μm	1μm	3μm
Inch					
Order No.	Range	Graduation	Accuracy	Flatness	Parallelism
169-103	0 - 1"	.001"	±.0002"	.00004"	.00015"

DIMENSIONS



Micrometer

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

Disk Micrometers SERIES 323, 223, 123

- Measures "root tangent length" of spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments".
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard (except for 0-25mm/0-1" measuring range).



SPECIFICATIONS

Metric					
Order No.	Range	Resolution	Accuracy*	Anvil dia.	Measurable module
Digimatic (LCD)					
323-250-30	0 - 25mm	0.001mm	±4μm	ø20mm	0.5 - 6
323-251-30	25 - 50mm				
323-252-30	50 - 75mm				
323-253-30	75 - 100mm				
			±6μm		

* Excluding quantizing error

Metric					
Order No.	Range	Graduation	Accuracy	Anvil dia.	Measurable module
Mechanical counter model					
223-101	0 - 25mm	0.01mm	±4μm	ø20mm	0.5 - 6
223-102	25 - 50mm				
Analog					
123-101	0 - 25mm	0.01mm	±4μm	ø20mm	0.5 - 6
123-113*					
123-102					
123-114*					
123-103	25 - 50mm	0.01mm	±6μm	ø20mm	0.5 - 6
123-115*					
123-104	50 - 75mm	0.01mm	±6μm	ø20mm	0.5 - 6
123-116*					
123-105	100 - 125mm	0.01mm	±7μm	ø30mm	0.7 - 11
123-106					
123-107	125 - 150mm	0.01mm	±8μm	ø30mm	0.7 - 11
123-108					
123-109	150 - 175mm	0.01mm	±8μm	ø30mm	0.7 - 11
123-110					
123-111	175 - 200mm	0.01mm	±9μm	ø30mm	0.7 - 11
123-112					
123-112	200 - 225mm	0.01mm	±9μm	ø30mm	0.7 - 11
123-110					
123-111	225 - 250mm	0.01mm	±9μm	ø30mm	0.7 - 11
123-112					
123-112	250 - 275mm	0.01mm	±9μm	ø30mm	0.7 - 11
123-112					
123-112	275 - 300mm	0.01mm	±9μm	ø30mm	0.7 - 11
123-112					

* The measuring disks have carbide tips.

Inch/Metric					
Order No.	Range	Resolution	Accuracy*	Anvil dia.	Measurable module
Digimatic (LCD)					
323-350-30	0 - 1"	0.0005"/0.001mm	±.0002"	.787"	0.5 - 6
323-351-30	1" - 2"				
323-352-30	2" - 3"				
323-353-30	3" - 4"				

* Excluding quantizing error

Inch					
Order No.	Range	Graduation	Accuracy	Anvil dia.	Measurable module
Mechanical counter model					
223-125	0 - 1"	.001"	±.0002"	.787"	0.5 - 6
Analog					
123-125	0 - 1"	.001"	±.0002"	.787"	0.5 - 6
123-126	1" - 2"				
123-127	2" - 3"				
123-128	3" - 4"				



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



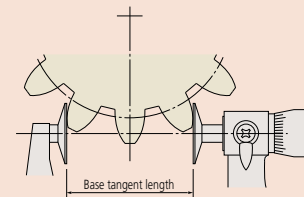
IP Codes (series 323)

- 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

- Flatness: 1μm/.00004" for models up to 100mm/4"
1.6μm/.000063" for models over 100mm/4"
- Parallelism: 4μm for models up to 50mm
.0002" for models up to 2"
6μm for models up to 100mm
.0003" for models up to 4"
(5+R/75)μm for models over 100mm,
R = max. range (mm)
fraction rounded up

Root tangent length of gear (En)



Battery for series 323

SR44 (1 pc), **938882**, for initial operational checks (standard accessory)
Battery life: Approx. 2.4 years under normal use (for series 323)
Length standard: Electromagnetic rotary sensor (for series 323)
Standard accessories: Reference bar, 1 pc
(except for measuring range 0-25mm (0-1") models)
Spanner (301336), 1 pc

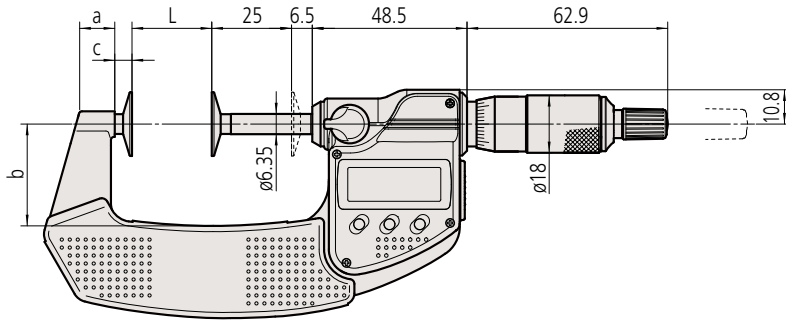
Optional accessories for series 323

Connecting cables
1m: **05CZA662**
2m: **05CZA663**
USB Input Tool Direct
USB-ITN-B (2m): **06ADV380B**
Connecting cables for **U-WAVE-T**
02AZD790B 160mm
For foot switch: **02AZE140B**
Refer to page B-68 for details.

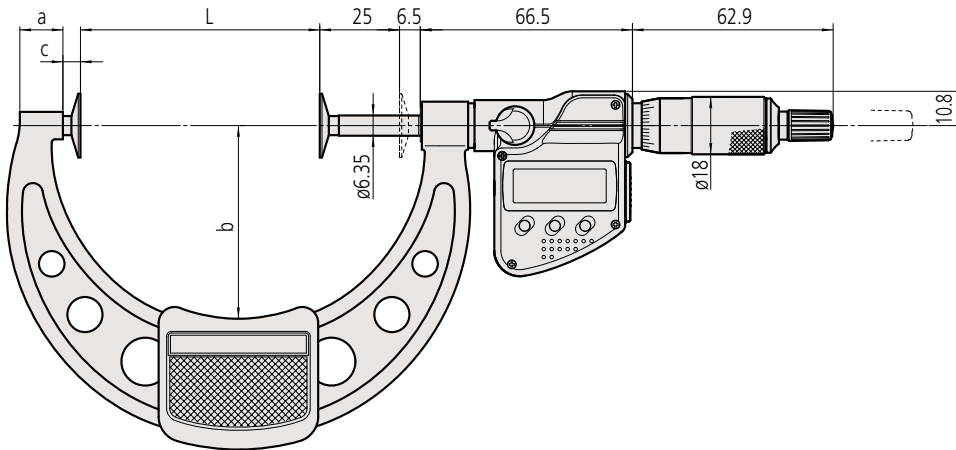
DIMENSIONS

Digital models up to 75mm measuring range

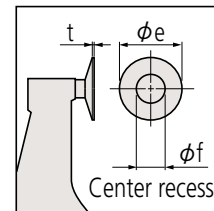
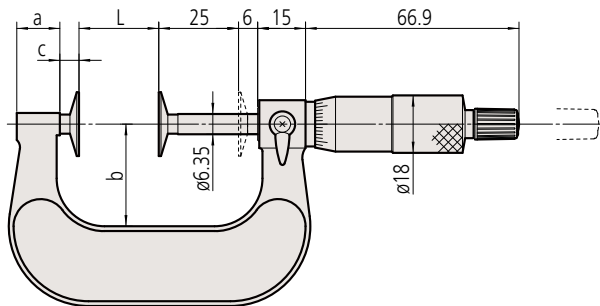
Unit: mm



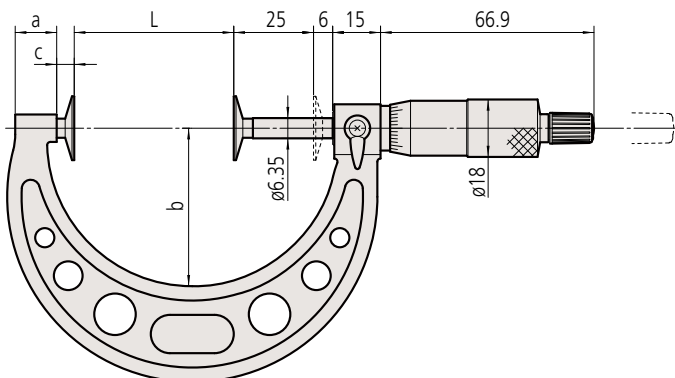
Digital models up to 100mm measuring range



Analog models up to 50mm measuring range



Analog over 50mm measuring range



Range	L	a	b	c	e	f	t
Digimatic (LCD)							
0 - 25mm	0	9.2	25	4.5	20	8	0.7
25 - 50mm	25	11	31	5.4			
50 - 75mm	50	12.2	50	5.5			
75 - 100mm	75	14	60	5.5			
Analog							
0 - 25mm	0	13.8	25	5.7	20	8	0.7
25 - 50mm	25		32				
50 - 75mm	50	12	49	5.5			
75 - 100mm	75	14	63				
100 - 125mm	100	12	79	6	30	12	1
125 - 150mm	125	15	94				
150 - 175mm	150	16	106				
175 - 200mm	175	15	118				
200 - 225mm	200	14	130				
225 - 250mm	225		143				
250 - 275mm	250	15	156				
275 - 300mm	275		169				

* Data in () applies to those with carbide-faced disks.

Micrometer

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

Gear Tooth Micrometers

SERIES 324, 124 — Interchangeable Ball Anvil / Spindle Tip Type

- Measures over-pin diameter of gears using precision steel (or carbide) ball anvils / spindle tips.
- Series 324: IP65 Digimatic gear tooth micrometers.
- Determination of the over-pin diameter: refer to "Quick Guide to Precision Measuring Instruments".
- Interchangeable ball anvils / spindle tips for various gear modules (0.5-5.25) are optional.
- Equipped with Ratchet Stop for constant measuring force.
- Ball anvil / spindle tips: optional.



324-251-30



124-173

SPECIFICATIONS

Metric			
Order No.	Range	Resolution	Accuracy*
Digimatic (LCD)			
324-251-30	0 - 25mm	0.001mm	±4μm
324-252-30	25 - 50mm		
324-253-30	50 - 75mm		
324-254-30	75 - 100mm		
			±5μm

* Excluding quantizing error

Metric			
Order No.	Range	Graduation	Accuracy
Analog			
124-173	0 - 25mm	0.01mm	±4μm
124-174	25 - 50mm		
124-175	50 - 75mm		
124-176	75 - 100mm		
124-177	100 - 125mm		
124-178	125 - 150mm		
124-179	150 - 175mm		
124-180	175 - 200mm		
124-181	200 - 225mm		
124-182	225 - 250mm		
124-183	250 - 275mm	±7μm	
124-195	275 - 300mm		

Inch/Metric			
Order No.	Range	Resolution	Accuracy*
Digimatic (LCD)			
324-351-30	0 - 1"	.00005"/ 0.001mm	±.0002"
324-352-30	1" - 2"		
324-353-30	2" - 3"		
324-354-30	3" - 4"		
			±.00025"

* Excluding quantizing error



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



IP Codes (series 324)

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.



Optional accessories

- Interchangeable ball anvil / spindle tip set

Order No.	Diameter* (mm)	Gear module	Dia. pitch
124-801	ø0.8	0.5 - 0.55	50
124-802	ø1.0	0.6 - 0.65	45
124-803	ø1.191 (³ / ₆₄ "*)	0.7 - 0.8	35 - 30
124-821	ø1.5	0.9 - 1	28 - 26
124-804	ø1.588 (¹ / ₁₆ "*)	0.9 - 1	28 - 26
124-805	ø2.0	1.25	22
124-806	ø2.381 (³ / ₃₂ "*)	1.5	17
124-822	ø2.5	1.5	17
124-807	ø3.0	1.75	15
124-808	ø3.175 (¹ / ₈ "*)	—	14
124-823	ø3.5	2	13
124-809	ø3.969 (⁵ / ₃₂ "*)	2	13
124-810	ø4.0	2.25	11
124-824	ø4.5	2.5	10
124-811	ø4.763 (³ / ₁₆ "*)	2.5	10
124-812	ø5.0	2.75	9
124-813	ø5.556 (⁷ / ₃₂ "*)	3.0 - 3.25	8
124-814	ø6.0	3.5	7
124-815	ø6.35 (¹ / ₄ "*)	3.75	7
124-816	ø7.0	4.0	6.5
124-817	ø7.144 (⁹ / ₃₂ "*)	4.25	6
124-818	ø7.938 (⁵ / ₁₆ "*)	4.5	5.5
124-819	ø8.0	4.75	5.5
124-820	ø8.731 (¹¹ / ₃₂ "*)	5.0 - 5.25	5

* ø2mm or less/ carbide-tipped type

Battery for series 324

SR44 (1 pc), 938882, for initial operational checks (standard accessory)

Battery life: Approx. 2.4 years under normal use (for series 324)

Length standard: Electromagnetic rotary sensor (for series 324)

Standard accessories: Reference bar, 1 pc

(except for measuring range 0-25mm (0-1") models)

Spanner (301336), 1 pc

Optional accessories

Connecting cables for series 324

1m: 05CZA662

2m: 05CZA663

USB Input Tool Direct

USB-ITN-B (2m): 06ADV380B

SPC cables for U-WAVE w/ data switch (160mm):

02AZD790B

For foot switch: 02AZE140B

(Refer to page B-68 for details.)

Micrometer

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

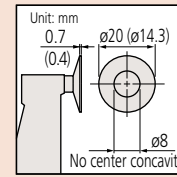
Disk Micrometers

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

- Measures "root tangent length" of spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments".
- Non-rotating spindle type.
- Measurable range of gear pitch: 0.5 to 6 module (series 227: 0.4 to 3 module).
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard (except for 0-25mm/0-1" measuring range).



Anvil



(): Adjustable measuring force type

Battery for series 369 and 227

SR44 (1 pc), **938882**, for initial operational checks (standard accessory)

Battery life: Approx. 2.4 years under normal use (for series 369-2XX, 3XX)

Approx. 1 year under normal use (for series 369-4XX)

Approx. 3 years under normal use (for series 227-2XX)

Length standard: Electromagnetic rotary sensor (for series 369-2XX, 3XX)

Electrostatic capacity absolute sensor (for series 369-4XX, 2XX)

Standard accessories: Reference bar, 1 pc (except for measuring range 0-10mm / 0-15mm / 0-25mm / 0-30mm (0-1"/0-1.2") models)

Spanner (301336), 1 pc (for series 169-2XX, 369-2XX, 3XX)
Screwdriver (No.210183), 1pc (for series 227-2XX)

Optional accessories

- Connecting cables for **369-250-30** to **369-253-30**, **369-350-30** to **369-353-30**
1m: **05CZA662**
2m: **05CZA663**

- **USB Input Tool Direct**
USB-ITN-B (2m): **06ADV380B**

- SPC cables for U-WAVE w/ data switch (160mm):
02AZD790B

- For foot switch: **02AZE140B**
(Refer to page B-68 for details.)

- SPC cables for Quickmike and micrometers with adjustable measuring force device

- 937387**: SPC cable (1m)*
965013: SPC cable (2m)*

- only for Quickmike and micrometers with adjustable measuring force device

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

- For footswitch: **02AZE140E**



Quickmike

Provides a speedy spindle feed of 10mm per thimble rotation, which enables widely differently sized features to be measured quickly.

Quickmike type with adjustable measuring force

Digimatic micrometer dedicated to applications requiring a constant/low measuring force such as measuring wire, paper, and plastic/rubber parts.

SPECIFICATIONS

Metric								
	Order No.	Range	Resolution	Accuracy*	Anvil dia.	Flatness	Parallelism	Measuring force
Digimatic (LCD)	369-250-30	0 - 25mm	0.001mm	±4µm	ø20	1µm	4µm	—
	369-251-30	25 - 50mm						
	369-252-30	50 - 75mm		±6µm			6µm	
	369-253-30	75 - 100mm						
Quickmike type (LCD)	369-411	0 - 30mm	±4µm	ø14.3	3µm	0.5N - 2.5N		
	369-412	25 - 55mm					2N - 10N	
Quickmike type adjustable measuring force (LCD)	227-221	0 - 15mm	±4µm	ø14.3	3µm	0.5N - 2.5N		
	227-223	0 - 10mm					2N - 10N	

* Excluding quantizing error

Metric								
	Order No.	Range	Graduation	Accuracy	Anvil dia.	Flatness	Parallelism	Measuring force
Analog	169-201	0 - 25mm	0.01mm	±4µm	ø20	1µm	4µm	—
	169-202	25 - 50mm						
	169-205	50 - 75mm		±6µm			6µm	
	169-207	75 - 100mm						

Inch/Metric								
	Order No.	Range	Resolution	Accuracy*	Anvil dia.	Flatness	Parallelism	Measuring force
Digimatic (LCD)	369-350-30	0 - 1"	.00005"/ 0.001mm	±.0002"	ø20	.00004"	.0002"	—
	369-351-30	1" - 2"						
	369-352-30	2" - 3"		±.0003"			.0003"	
	369-353-30	3" - 4"						
Quickmike type (LCD)	369-421	0 - 1.2"	±.0002"	ø20	.00004"	.0002"	—	
	369-422	1" - 2.2"						

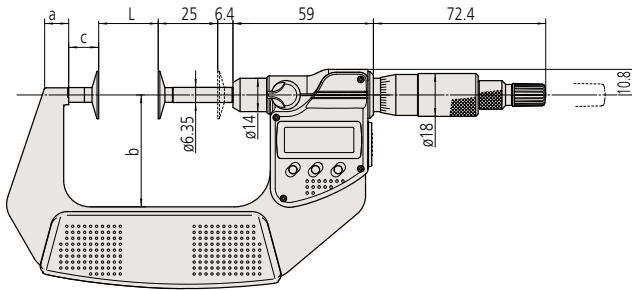
* Excluding quantizing error

Inch								
	Order No.	Range	Graduation	Accuracy	Anvil dia.	Flatness	Parallelism	Measuring force
Analog	169-203	0 - 1"	.001"	±.0002"	ø20	.00004"	.0002"	—
	169-204	1" - 2"						
	169-206	2" - 3"		±.0003"			.0003"	
	169-208	3" - 4"						

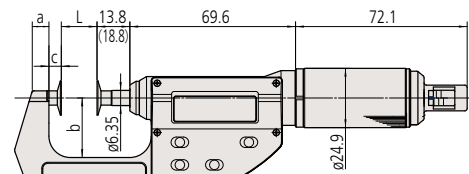
DIMENSIONS

Unit: mm

Digital models up to 75mm

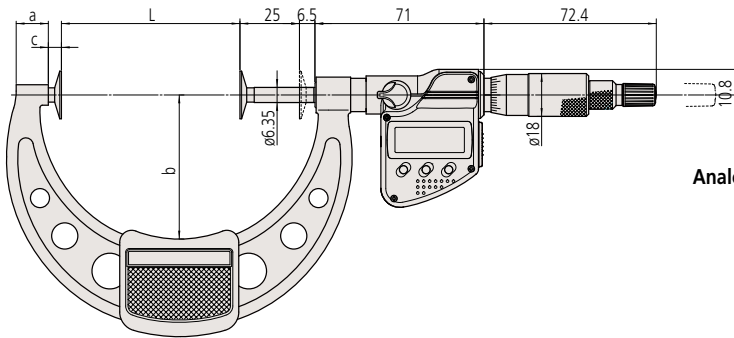


Adjustable measuring force type

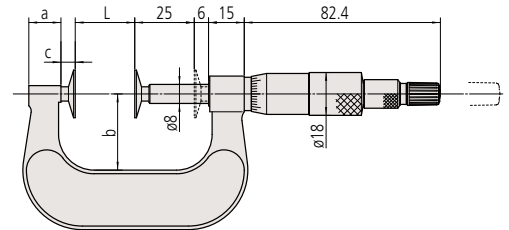


(): Order No.227-223

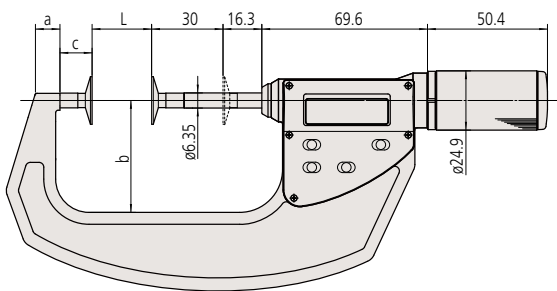
Digital models over 75mm



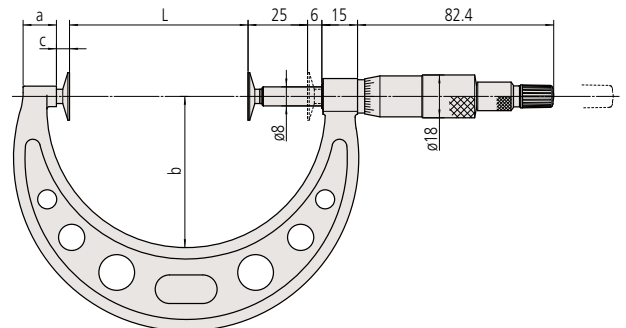
Analog models up to 50mm



Quickmike type



Analog models over 50mm



Digital models

Range	L	a	b	c
0 - 25mm	0	7	32	12.9
25 - 50mm	25	9.8	47	
50 - 75mm	50	11.2	60	5.5
75 - 100mm	75	13.5		
0 - 30mm*	0	8.5	36	13.5
25 - 55mm*	25	10.3	47	

*Quickmike type

Analog models

Range	L	a	b	c
0 - 25mm	0	13.8	25	5.7
25 - 50mm	25		32	
50 - 75mm	50	12	49	5.5
75 - 100mm	75	14	63	