

Ultra-high Accuracy Digimatic Micrometer SERIES 293

- The flagship model, featuring unparalleled high accuracy and resolution.
- Maximum Permissible Error (J_{MPE}) of $\pm 0.5 \mu\text{m}$ is achieved with our innovative 0.1 μm resolution ABS (absolute) rotary sensor and screw machining technology.
- A highly rigid frame and high-performance constant-force mechanism allow stable measurements.
- 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.



Measurement example



Recommended micrometer stand: 156-101-10

SPECIFICATIONS

	Metric	Inch/Metric
Code No.	293-100-20	293-130-20
Measuring range	0 - 25 mm	0 - 1 in
Resolution	0.0001 mm/0.0005 mm (switchable)	0.000005 in/0.00002 in 0.0001 mm/0.0005 mm (switchable)
Maximum permissible error J_{MPE}	$\pm 0.5 \mu\text{m}$	± 0.00002 in
Flatness	0.3 μm	0.000012 in
Parallelism	0.6 μm	0.000024 in
Measuring surface	$\phi 3.2 \text{ mm}$	
Measuring force	7 to 9 N	
Position detection method	Electromagnetic induction type ABS rotary sensor	
Mass	405 g (445 g with heat shield attached)	
Power source	Lithium battery (CR2032) x1	
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 function that holds the display of value is useful when it is difficult to see the measured value at the measurement point. When the function is cancelled, the previous zero-set point or a measured value with reference to the origin is displayed.

Resolution switching:

The resolution of the display can be switched. If 0.1 μm measurement is not required, the resolution can be switched to 0.5 μm .

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.

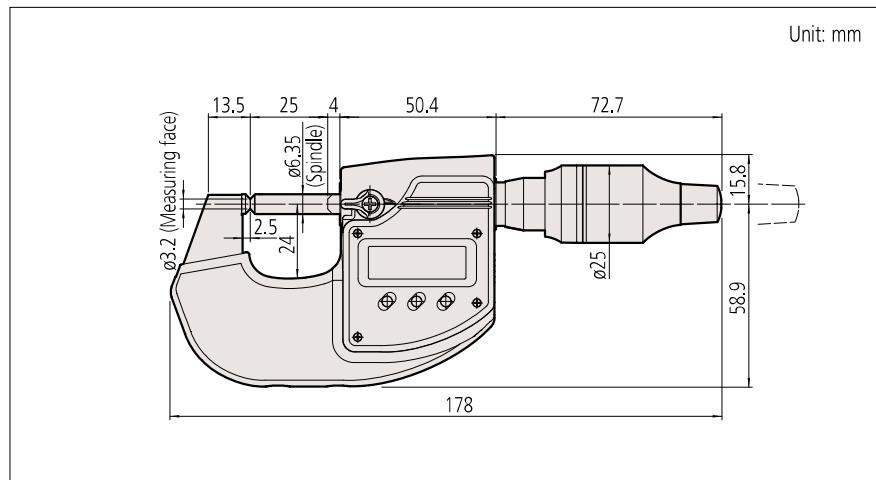
Error display:

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.

Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch

DIMENSIONS**Standard Accessories**

Heat shield (04AAB969A: 293-100-20
04AAB969B: 293-130-20) x1

Spanner (200877) x1

Screwdriver (04AAB985) x1

Cleaning paper for measuring faces 20 sheets

Inspection certificate



Note: To install the heat shield, use the screws attached to the bottom of the micrometer frame.

Micrometer

02
Micrometers

High-speed and High-accuracy Digimatic Micrometer QuantuMike

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

- The spindle moves four times faster than that of the standard micrometer, enabling faster, easier measurement even when it is repeated many times over.
- The approach speed warning function can detect collision with a workpiece at excessive speed, helping inexperienced users obtain reliable and accurate measurement results.

- The calculation function can calculate offsets added to measurement results before they are passed to a machine. This eliminates errors and the effort needed for calculation, helping reduce the number of rejected machined items.
- The Calibration alert function helps with effective measuring instrument management.
- Bidirectional serial communication supported.



293-140-40

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE fit

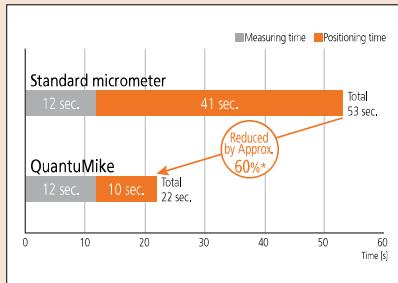


DIGIMATIC S1

Measurement example

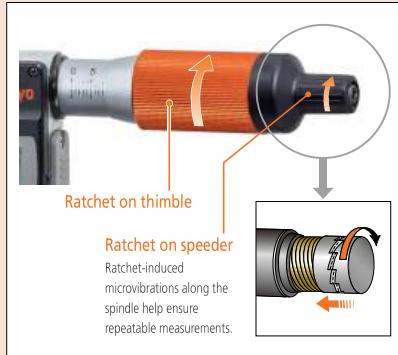


Comparison of time needed to measure a 6-stepped workpiece (with one hand)



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

Ratchet thimble mechanism



SPECIFICATIONS

Outside Micrometers (Digimatic)

Metric

Code No.	Range (mm)	Resolution (mm)	Measuring force ^{*1} (N)	Maximum permissible error J_{MPE} (μ m)	Flatness (μ m)	Parallelism (μ m)	Mass (g)
With SPC data output							
293-140-40	0 - 25	0.001	7 to 12	± 1	0.3	1	265
293-141-40	25 - 50			± 2		2	325
293-142-40	50 - 75					465	
293-143-40	75 - 100					620	

Inch/Metric

Code No.	Range (in)	Resolution	Measuring force ^{*1} (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Mass (g)
With SPC data output							
293-180-40	0 - 1	0.00005 in/ 0.001 mm	7 to 12	± 0.00005	0.000012	0.00004	265
293-181-40	1 - 2			± 0.0001		0.00008	325
293-182-40	2 - 3			± 0.0001		0.00008	465
293-183-40	3 - 4						620

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

• Power source: CR2032 battery (1 pc.), included as standard (for operational checks)

• Battery life: Approx. 2 years under normal use

• Position detection method: Electromagnetic rotary sensor

• Standard accessories: Setting standard, 1 pc. (except for 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

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

*2 Rustproofing shall be applied after use.

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 function that holds the display of value is useful when it is difficult to see the measured value at the measurement point.

When the function is cancelled, the previous zero-set point or a measured value with reference to the origin is displayed.

Calibration alert:

This function gives an alert when the instrument is approaching its calibration date and again on the actual calibration due date, helping to ensure better measuring instrument management by preventing missed calibrations.

Approach speed warning:

Reduces variation in measurement values and improves reliability of measurements.

Tolerance judgment:

The function determines whether a measured value is within the range between the upper and lower tolerance limits and displays the result with a tolerance judgment mark.

Function lock:

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

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.

Key customization:

Frequently used functions can be assigned to buttons and called back easily, improving work efficiency.

Measurement data output:

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

Error display:

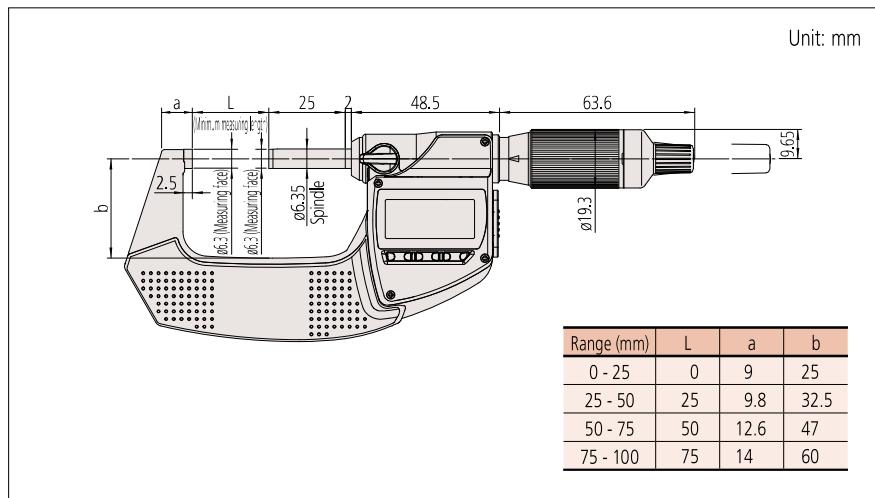
In the unlikely event of a display overflow or calculation error, an error message is displayed and measurement stops. Measurement cannot continue until the error is corrected.

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.

Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
06AGL111	SA	Connection cable (1 m)
06AGL121	SA	Connection cable (2 m)
06AGQ001A	SA	USB Input Tool Direct (2 m)
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF960	IP67	Connecting unit for U-WAVE-TM/TMB

DIMENSIONS



Micrometer

02
Micrometers

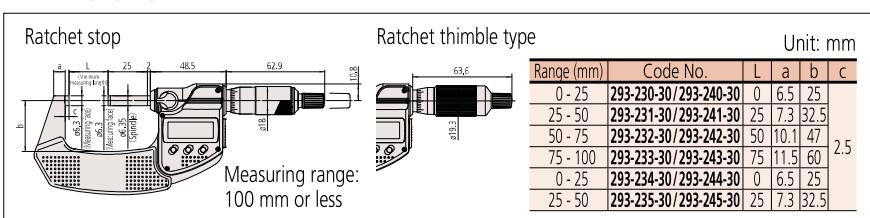
Coolant Proof Micrometers SERIES 293 — IP65 Digimatic Micrometer

- Accurate and highly environmentally resistant, assisting with many types of measurements.
- Ratchet thimble provides better operability for one-handed operation.

SPECIFICATIONS

Metric	Code No.	Range (mm)	Resolution (mm)	Measuring force*1 (N)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Flatness (μm)	Constant measuring force	Mass (g)		
With SPC data output											
293-230-30	0 - 25	0.001	5 - 10	±1	1	0.3	With ratchet stop	270			
293-231-30	25 - 50							330			
293-232-30	50 - 75			±2	2			470			
293-233-30	75 - 100							625			
293-234-30	0 - 25		7 - 12	±1	1			280			
293-235-30	25 - 50							340			
293-236-30	50 - 75			±2	2			480			
293-237-30	75 - 100							635			
Without SPC data output											
293-240-30	0 - 25	0.001	5 - 10	±1	1	0.3	With ratchet stop	270			
293-241-30	25 - 50							330			
293-242-30	50 - 75			±2	2			470			
293-243-30	75 - 100							625			
293-244-30	0 - 25		7 - 12	±1	1			280			
293-245-30	25 - 50							340			
293-246-30	50 - 75			±2	2			480			
293-247-30	75 - 100							635			
Inch / Metric	Code No.	Range (in)	Resolution	Measuring force*1 (N)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Flatness (in)	Constant measuring force	Mass (g)		
With SPC data output											
293-330-30	0 - 1	0.00005 in /0.001 mm	5 - 10	±0.00005	0.00004	0.000012	With ratchet stop	270			
293-331-30	1 - 2							330			
293-332-30	2 - 3			±0.0001	0.00008			470			
293-333-30	3 - 4							625			
293-334-30	0 - 1		7 - 12	±0.00005	0.00004			280			
293-335-30	1 - 2							340			
293-336-30	1 - 2			±0.0001	0.00004			480			
Without SPC data output	293-340-30	0 - 1						635			
293-341-30	1 - 2	0.00005 in /0.001 mm	5 - 10	±0.00005	0.00004	0.000012	With ratchet stop	270			
293-342-30	2 - 3							330			
293-343-30	3 - 4			±0.0001	0.00008			470			
293-344-30	0 - 1							625			
293-345-30	1 - 2		7 - 12	±0.00005	0.00004			280			
293-346-30	2 - 3							340			
293-347-30	3 - 4			±0.0001	0.00008			480			
293-348-30	0 - 1		5 - 10	±0.00005	0.00004			635			
293-349-30	1 - 2							275			
Dust/water protection level: IP65 (IEC60529)*2											
Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)											
Battery life: Approx. 2.4 years under normal use											
Position detection method: Electromagnetic rotary sensor											
Standard accessories: Setting standard, 1 pc. (except for 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.											
*1 Measuring force when using the speeder ratchet (Apply a measuring force in the same condition as for measurement and then set the origin.)											
*2 Rustproofing shall be applied after use.											
Note: All digits of models over 125 mm (5 in) measuring range are presettable.											

DIMENSIONS



MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}



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:

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:

The function that holds the display of value is useful when it is difficult to see the measured value at the measurement point. When the function is cancelled, the previous zero-set point or a measured value with reference to the origin is displayed.

Data output*:

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

* 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 display:

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 indicator 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.

Optional Accessories

Refer to page 02-8.

Micrometer sets

293-962-30 (Metric)

- Range: 0 - 75 mm (3 pcs./set)

• Models included:

293-230-30, 293-231-30, 293-232-30

293-963-30 (Metric)

- Range: 0 - 100 mm (4 pcs./set)

• Models included:

293-230-30, 293-231-30, 293-232-30, 293-233-30

293-966-30 (Metric)

- Range: 0 - 50 mm (2 pcs./set)

• Models included:

293-330-30, 293-331-30, 293-332-30

293-961-30 (Inch/Metric)

- Range: 0 - 3 in (4 pcs./set)

• Models included:

293-330-30, 293-331-30, 293-332-30, 293-333-30



Functions

Refer to page 02-7.

Optional Accessories

Only for models with data output function

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Coolant Proof Micrometers SERIES 293 — IP65 Digimatic Micrometer

- Accurate and highly environmentally resistant, assisting with many types of measurements.
- 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.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Measuring force*1 (N)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Flatness (μm)	Constant measuring force	Mass (g)		
With SPC data output										
293-250-30	100 - 125	0.001	5 - 10	± 2	3	0.3	With ratchet stop	600		
293-251-30	125 - 150							740		
293-252-30	150 - 175							800		
293-253-30	175 - 200		5 - 10	± 3	4			970		
293-254-30	200 - 225							1100		
293-255-30	225 - 250		5 - 10	± 4	5			1270		
293-256-30	250 - 275							1370		
293-257-30	275 - 300							1590		

Inch/Metric

Code No.	Range (in)	Resolution	Measuring force*1 (N)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Flatness (in)	Constant measuring force	Mass (g)		
With SPC data output										
293-350-30	4 - 5	0.0001 in / 0.001 mm	5 - 10	± 0.0001	0.00012	0.00012	With ratchet stop	600		
293-351-30	5 - 6							740		
293-352-30	6 - 7							800		
293-353-30	7 - 8		5 - 10	± 0.00015	0.00016			970		
293-354-30	8 - 9							1100		
293-355-30	9 - 10		5 - 10	± 0.0002	0.0002			1270		
293-356-30	10 - 11							1370		
293-357-30	11 - 12							1590		

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

*2 Rustproofing shall be applied after use.

Note: All digits of models over 125 mm (5 in) measuring range are presettable.

DIMENSIONS

Unit: mm						
Range (mm)	Code No.	L	a	b	c	
100 - 125	293-250-30	100	16.7	76	5.3	
125 - 150	293-251-30	125	18.8	90	5.7	
150 - 175	293-252-30	150	19.1	103	6.1	
175 - 200	293-253-30	175	18.2	115	6.3	
200 - 225	293-254-30	200	16.8	126	6.7	
225 - 250	293-255-30	225	139	5.5		
250 - 275	293-256-30	250	152			
275 - 300	293-257-30	275	166	6.5		

Ratchet stop type over 100 mm

Digimatic Outside Micrometers SERIES 293

- This large Digimatic micrometer series is available in various sizes up to 500 mm. It features a ratchet stop for constant measuring force.
 - Measuring faces: Carbide tipped

- All models have a measurement data output function that is useful for measuring large workpieces. This function allows you to easily send data via an optional communication cable or wireless system and import it to spreadsheet software or use it in various applications.



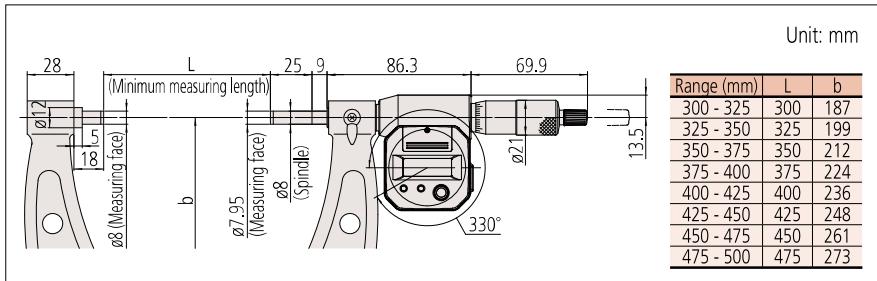
293-582

SPECIFICATIONS

Metric								
Code No.	Range (mm)	Resolution (mm)	Measuring force (N)	Maximum permissible error λ_{MPE} (μm)	Flatness (μm)	Parallelism (μm)		
With SPC data output								
293-582	300 - 325	0.001	10 - 15	± 6	0.6	5		
293-583	325 - 350					6		
293-584	350 - 375							
293-585	375 - 400		10 - 15	± 7		7		
293-586	400 - 425			± 8				
293-587	425 - 450							
293-588	450 - 475		10 - 15	± 8		7		
293-589	475 - 500							
Inch / Metric								
Code No.	Range (in)	Resolution	Measuring force (N)	Maximum permissible error λ_{MPE} (in)	Flatness (in)	Parallelism (in)		
With SPC data output								
293-782	12 - 13	0.0001 in / 0.001 mm	10 - 15	± 0.0003	0.000024	0.0002		
293-783	13 - 14					0.00024		
293-784	14 - 15							
293-785	15 - 16		10 - 15	± 0.00035		0.00028		
293-786	16 - 17			± 0.0004				
293-787	17 - 18							
293-788	18 - 19		10 - 15	± 0.0004		0.00028		
293-789	19 - 20							

- Power source: SR44 battery (2 pcs.), **938882** included as standard (for operational checks)
 - Battery life: Approx. 1.8 years under normal use
 - Position detection method: Electromagnetic rotary sensor
 - Standard accessories: Setting standard, 1 pc., Spanner (**200154**), 1 pc.

DIMENSIONS



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:

The function that holds the display of value is useful when it is difficult to see the measured value at the measurement point. When the function is cancelled, the previous zero-set point or a measured value with reference to the origin is displayed.

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 display:

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 indicator appears well before the micrometer becomes unusable.

Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
04AZB512	CR	Connection cable (1 m)
04AZB513	CR	Connection cable (2 m)
959149	C	Connection cable (1 m)
959150	C	Connection cable (2 m)
06AFM380C	C	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790C	C	Connection cable for U-WAVE-T (160 mm)
02AZE140C	C	Connection cable for U-WAVE-T For foot switch



Digimatic Outside Micrometers SERIES 293

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.

Error display:

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 indicator appears well before the micrometer becomes unusable.

- Simple design with no data output for accuracy at a lower cost.
 - Provided only with an origin-set button for easy origin setting.
 - Extended battery life of approximately 2.4 years, which helps reduce the number of battery replacements required.
 - Equipped with Ratchet Stop for constant measuring force.
 - Measuring faces: Carbide tipped



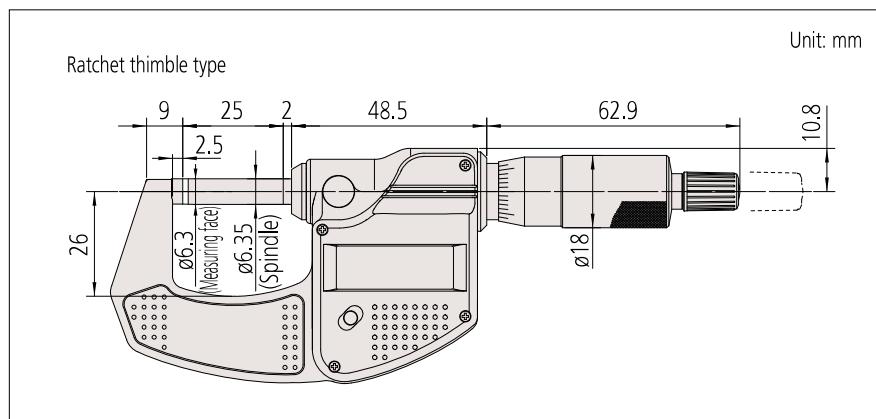
293-821-30

SPECIFICATIONS

Metric	With ratchet stop						
Code No.	Range (mm)	Resolution (mm)	Measuring force (N)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Mass (g)
Without SPC data output							
293-821-30	0 - 25	0.001	5 - 10	± 2	0.3	2	270
Inch/Metric With ratchet stop							
Code No.	Range (in)	Resolution	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Mass (g)
Without SPC data output							
293-831-30	0 - 1	0.00005 in/0.001 mm	5 - 10	± 0.0001	0.000012	0.00008	270
Inch/Metric With friction thimble							
Code No.	Range (in)	Resolution	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Mass (g)
Without SPC data output							
293-832-30	0 - 1	0.00005 in/0.001 mm	5 - 10	$+0.0001$	0.000012	0.00008	270

- Power source: SR44 battery (1 pc), **938882** included as standard (for operational checks)
 - Battery life: Approx. 2.4 years under normal use
 - Position detection method: Electromagnetic rotary sensor
 - Spanner (**301336**), 1 pc.

DIMENSIONS



Micrometer

02
Micrometers

Quickmike SERIES 293 — IP65 ABSOLUTE Digimatic Micrometers

- The Quickmike provides a speedy spindle feed of 10 mm per thimble rotation which enables quick measurements of many different-sized features.

- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



293-666-20

SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Measuring force (N)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Constant measuring force	Mass (g)
With SPC data output								
293-666-20	0 - 30							275
293-667-20	25 - 55	0.001	5 - 12	± 2	0.3	2	Yes	340
293-668-20	50 - 80			± 3				480
293-669-20	75 - 105					3		585

Inch / Metric

Code No.	Range (in)	Resolution	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Constant measuring force	Mass (g)
With SPC data output								
293-676-20	0 - 1.2							275
293-677-20	1 - 2.2	0.00005 in / 0.001 mm	5 - 12	± 0.0001	0.000012	0.00008	Yes	340
293-678-20	2 - 3.2			± 0.00015				480
293-679-20	3 - 4.2					0.00012		585

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Battery life: Approx. 5 years under normal use
- Position detection method: Electrostatic capacity absolute sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 30 mm (0 to 1.2 in) models)
- Maximum response speed: without limit
- The non-rotating spindle enables even inexperienced operators to perform measurements repeatedly and accurately.

MeasurLink™ ENABLED
Data Management Software by Mitutoyo

ABSOLUTE™



Dust and Water-Protected
www.tuv.com
ID: 0000000000

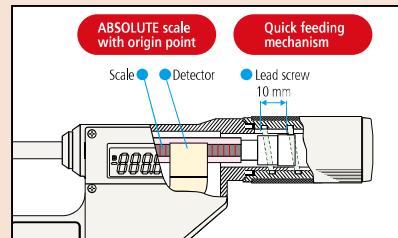
Measurement example



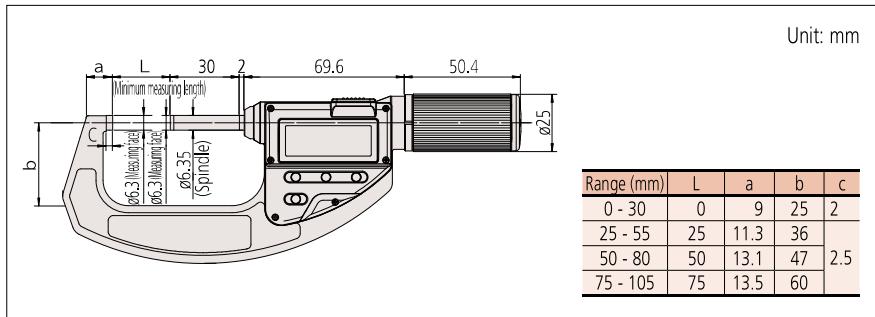
Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch

Mechanism



DIMENSIONS



ABSOLUTE Digimatic Micrometers SERIES 227 — with Adjustable Measuring Force

Measurement example



Functions

Adjustable measuring force mechanism, Origin point setting, Zero setting, Hold, Function Lock, Auto power off, Measurement data output, Error display

Optional Accessories

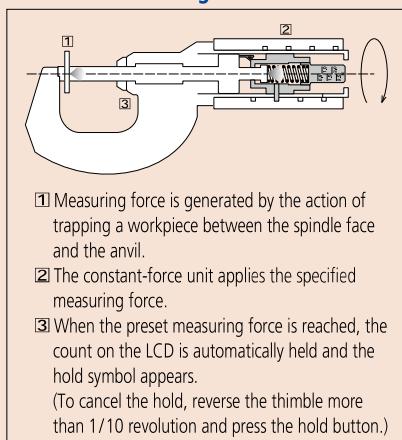
Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch

Adjustable Measuring Force



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

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.)

- Digimatic micrometer equipped with a constant/low measuring force mechanism. The measurement-value hold function automatically retains the data at a specified measuring force. (Pressing with a larger force than the specified measuring force does not affect the measurement result.)
- It is suitable for measuring flexible workpieces such as electric wire, paper, and rubber.
- Non-rotating spindle reduces workpiece deformation.
- Measuring faces: Carbide tipped



227-201-20

SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Measuring force (N)	Maximum permissible error J_{MPE} (μ m)	Flatness (μ m)	Parallelism (μ m)	Measuring force (N)	Accuracy of the selected measuring force* (N)	Repeatability of measuring force* (N)	Mass (g)
With SPC data output										
227-201-20	0 - 15		0.5 - 2.5 (adjustable)				0.5, 1.0, 1.5, 2.0, 2.5	$\pm (0.1 + \text{the selected measuring force}/10)$	within 0.1	300
227-203-20	15 - 30	0.001		± 2	0.3	2	2, 4, 6, 8, 10	$\pm (0.4 + \text{the selected measuring force}/10)$	within 0.4	380
227-205-20	0 - 10		2 - 10 (adjustable)							345
227-206-20	10 - 20									425
227-207-20	20 - 30									415

Inch / Metric

Code No.	Range (in)	Resolution	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring force (N)	Accuracy of the selected measuring force* (N)	Repeatability of measuring force* (N)	Mass (g)
With SPC data output										
227-211-20	0 - 0.6		0.5 - 2.5 (adjustable)				0.5, 1.0, 1.5, 2.0, 2.5	$\pm (0.1 + \text{the selected measuring force}/10)$	within 0.1	300
227-213-20	0.6 - 1.2	0.00005 in/ 0.001 mm		± 0.0001	0.000012	0.00008	2, 4, 6, 8, 10	$\pm (0.4 + \text{the selected measuring force}/10)$	within 0.4	380
227-215-20	0 - 0.4		2 - 10 (adjustable)							345
227-216-20	0.4 - 0.8									425
227-217-20	0.8 - 1.2									415

• Measurement posture: horizontal orientation only (Recommended spindle inclination: within $\pm 3^\circ$)

• Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)

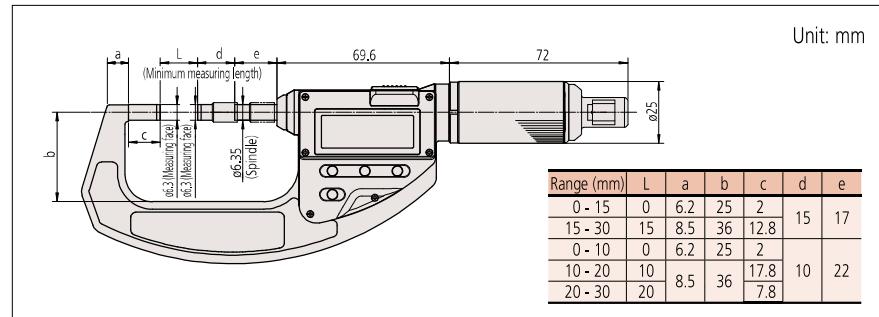
• Battery life: Approx. 5 years under normal use

• Position detection method: Electrostatic capacity absolute sensor

• Standard accessories: Setting stand, 1 pc. (except for measuring range 0 to 15 mm (0 to 0.6 in)/0 to 10 mm (0 to 0.4 in) models), Screwdriver (**210183**), 1 pc.

* These values are guaranteed when micrometer is used in a horizontal orientation (within ± 3 degrees)

DIMENSIONS



Outside Micrometers

SERIES 406 — Non-rotating Spindle Type

- Non-rotating spindle eliminates torque on workpiece. Therefore, it is suitable for measuring flexible workpieces such as rubber and paper or thin workpieces such as film.

- Measuring faces: Carbide tipped
- Spindle Ø6.35 mm
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)
With SPC data output					
406-250-30	0 - 25				
406-251-30	25 - 50	0.001	±3	0.3	3
406-252-30	50 - 75				
406-253-30	75 - 100		±4		4

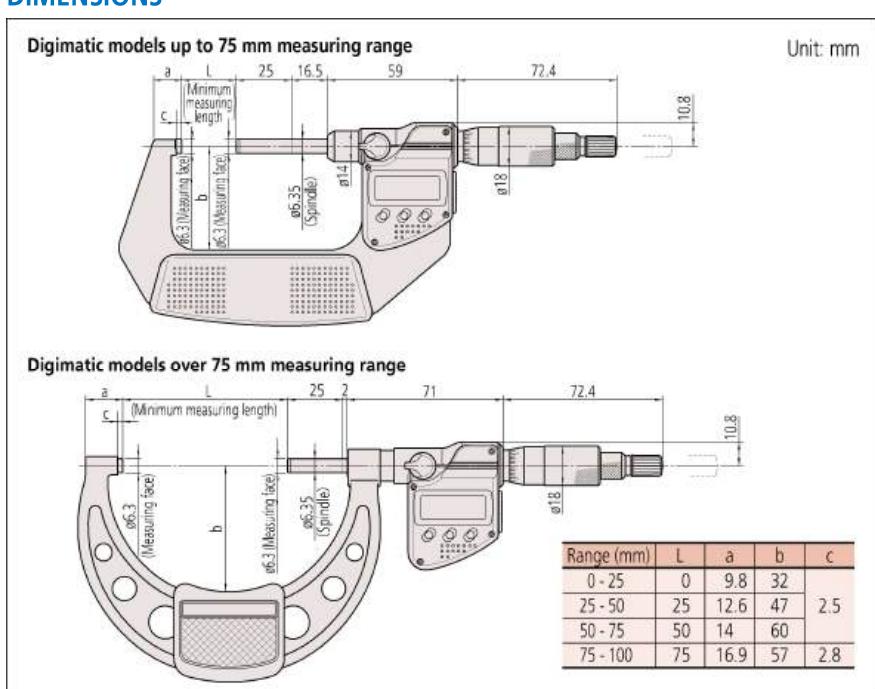
Inch/Metric

Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
With SPC data output					
406-350-30	0 - 1				
406-351-30	1 - 2	0.00005 in / 0.001 mm	±0.00015	0.000012	0.00012
406-352-30	2 - 3				
406-353-30	3 - 4		±0.0002		0.00016

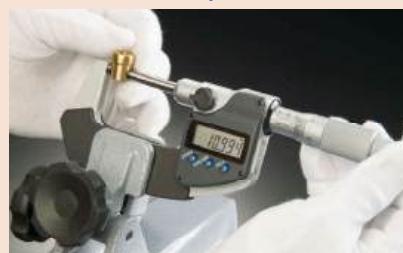
- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (301336), 1 pc.

Note: For functional details of series 406, refer to page 02-7. Please note that these models are not water-proof.

DIMENSIONS



Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}



Applicable models:
340-251-30, 340-252-30, 340-351-30, 340-352-30

Measurement example



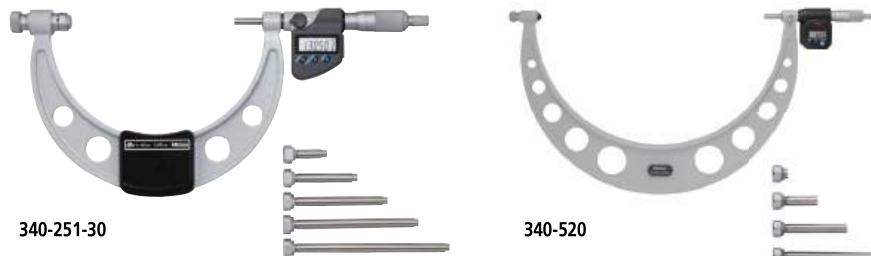
Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable for 340-251-30, 340-252-30, 340-351-30 and 340-352-30 (1 m)
05CZA663	B	Connection cable for 340-251-30, 340-252-30, 340-351-30 and 340-352-30 (2 m)
04AZB512	CR	Connection cable (1 m) for 340-5XX, 340-7XX
04AZB513	CR	Connection cable (2 m) for 340-5XX, 340-7XX
959149	C	Connection cable (1 m) for 340-5XX, 340-7XX
959150	C	Connection cable (2 m) for 340-5XX, 340-7XX
06AFM380B	B	USB Input Tool Direct (2 m)
06AFM380C	C	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
02AZD790C	C	Connection cable for U-WAVE-T (160 mm)
02AZE140C	C	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM*
264-623	Buzzer	U-WAVE-TM*
264-626	IP67	U-WAVE-TMB*
264-627	Buzzer	U-WAVE-TMB*
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB*

* Only **340-251-30, 340-252-30, 340-351-30** and
340-352-30 can be attached.

Outside Micrometers SERIES 340 — with Interchangeable Anvils

- Wide measuring range with interchangeable anvils.
- Measuring face of the spindle is carbide tipped (standard model).
- IP65 water/dust protection.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)	Interchangeable anvils	Setting Standard Qty	Setting Standard Size (mm)	Micrometer head stroke (mm)
With SPC data output									
340-251-30*	0 - 75			0.6	2	6 pcs.	5	25 - 125	
	75 - 150				3				
	150 - 300				5		6	150 - 275	
340-520	300 - 400				6			300 - 375	
340-521	400 - 500				7			400 - 475	
340-522	500 - 600				8			500 - 575	
340-523	600 - 700				9			600 - 675	
340-524	700 - 800				10			700 - 775	
340-525	800 - 900				11			800 - 875	
340-526	900 - 1000				12			900 - 975	

Inch/Metric

Code No.	Range (in)	Resolution	Spindle feed error (in)	Flatness (in)	Parallelism (in)	Interchangeable anvils	Setting Standard Qty	Setting Standard Size (in)	Micrometer head stroke (in)
With SPC data output									
340-351-30*	0 - 6	0.00005 in/ 0.001 mm		0.000024	0.00012	6 pcs.	5	1 - 5	
340-352-30*	6 - 12			0.00002				6 - 11	
340-720	12 - 18			0.000015	0.00028	6 pcs.		12 - 17	
340-721	18 - 24	0.0001 in/ 0.001 mm		0.00004	0.00036		6	18 - 23	
340-722	24 - 30				0.0004			24 - 29	
340-723	30 - 36				0.00044			30 - 35	

* IP65 model.

• Power source for **340-251-30, 340-252-30, 340-351-30, 340-352-30**: SR44 battery (1 pc.), **938882** included as standard (for operational checks)

Power source for **340-520** to **340-526, 340-720** to **340-723**: SR44 battery (2 pcs.), **938882** included as standard (for operational checks)

• Battery life: Approx. 2.4 years under normal use (for **340-2XX, 340-3XX**)

Approx. 1.8 years under normal use (for **340-5XX, 340-7XX**)

• Position detection method: Electromagnetic rotary sensor (for **series 340**)

• Standard accessories: Spanner (**301336**), 1 pc.

(for maximum measuring range up to 300 mm (12 in)), Spanner (**200154**), 1 pc.

(for maximum measuring range 400 mm (16 in) or over)

Note 1: For functional details of **340-251-30, 340-252-30, 340-351-30, 340-352-30**, refer to page 02-7.

Please note that origin setting of these models is by presetting.

Optional connection cable is available only for water-proof type (Digimatic model).

Note 2: For functional details of **340-520** to **340-723**, refer to page 02-9.

Micrometer

02
Micrometers

Outside Micrometers SERIES 340 — with Interchangeable Anvils

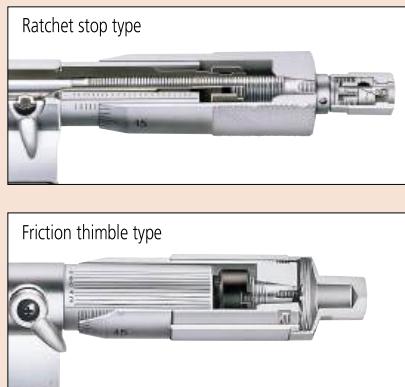
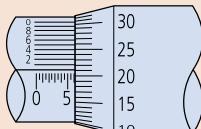
DIMENSIONS

Over 400 mm up to 1000 mm

Unit: mm

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

Outside Micrometers (Digimatic)

**Measurement example****Mechanism****Micrometer with Vernier scale (graduation: 0.001 mm)****Outside Micrometers
SERIES 102**

- Standard analog micrometer. Thanks to a heat-insulated frame, it is resistant to heat and therefore delivers accurate measurement results.
- Cut-away frame (behind anvil) for measuring in hard-to-reach places.
- Equipped with Ratchet Stop for constant measuring force.
- Measuring faces: Carbide tipped

**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Graduation (mm)	Measuring force (N)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Constant measuring force		
102-301	0 - 25	0.01	5 - 10	± 2	0.6	2	Ratchet stop		
102-302	25 - 50								
102-303	50 - 75			± 3		3			
102-304	75 - 100								

Metric With vernier scale

Code No.	Range (mm)	Graduation (mm)	Measuring force (N)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Constant measuring force
102-311	0 - 25	0.001	5 - 10	± 1	0.3	1	Ratchet stop
102-313	25 - 50						
102-312	50 - 75			± 2			

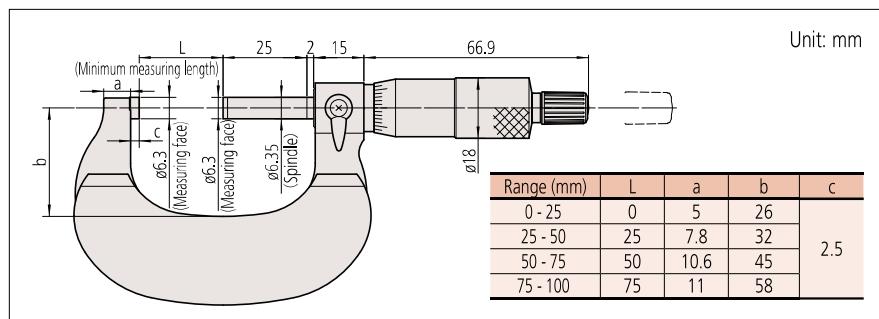
Inch

Code No.	Range (in)	Graduation (in)	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Constant measuring force			
102-327-10	0 - 1	0.0001	5 - 10	± 0.0001	0.000024	0.00008	Ratchet stop			
102-329-10	1 - 2									
102-328-10	2 - 3									
102-330-10	3 - 4			± 0.00015						
102-331-10	4 - 5									
102-332-10	5 - 6									

Metric Micrometer set

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

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm models)
- Spanner (301336), 1 pc. (for measuring range 0 to 25 mm/25 to 50 mm models)
- Spanner (200877), 1 pc. (for measuring range 50 to 75 mm/75 to 100 mm models)

DIMENSIONS

Ratchet Thimble Micrometer SERIES 102 — Outside Micrometers



- The ratchet thimble mechanism enables easy one-handed operation, useful for inspecting samples during the manufacturing process.
 - Ratchet function works both from the thimble and the speeder.
 - Clearly audible ratchet operation for reassurance that measurement is being performed at constant, preset force.
 - Heat-insulated frame.
 - Measuring faces: Carbide tipped



102-701

SPECIFICATIONS

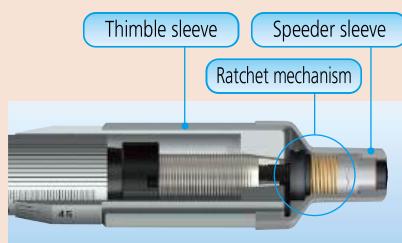
Inch	Range (in)	Graduation (in)	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Mass (g)
Code No.	Range (in)	Graduation (in)	Measuring force (N)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Mass (g)
102-717	0 - 1	0.0001	5 - 10	± 0.0001	0.000024	0.00008	180
102-718	1 - 2						270

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (**301336**), 1 pc.

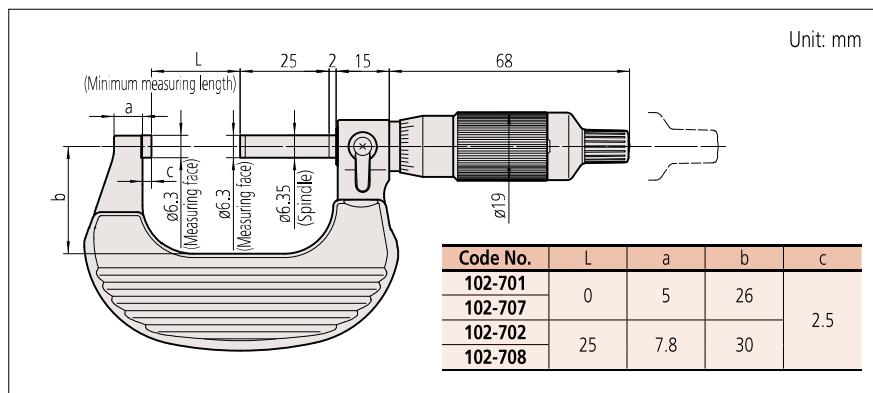
Measurement example



Internal structure



DIMENSIONS





Measurement example



103-913-40

- Range: 0 - 150 mm (6 pcs./set)
- Models included: **103-137, 103-138, 103-139, 103-140, 103-141, 103-142**, 5 micrometer standards



103-914-40

- Range: 0 - 300 mm (12 pcs./set)
- Models included: **103-137, 103-138, 103-139, 103-140, 103-141, 103-142, 103-143, 103-144, 103-145, 103-146, 103-147, 103-148**, 11 micrometer standards



103-915

- Range: 150 - 300 mm (6 pcs./set)
- Models included: **103-143, 103-144, 103-145, 103-146, 103-147, 103-148**, 6 micrometer standards

103-927-10

- Range: 0 - 75 mm (3 pcs./set)
- Models included: **103-137, 103-138, 103-139-10**

103-913-50

- Range: 50 - 150 mm (6 pcs./set)
- Models included: **103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10**

103-914-50

- Range: 50 - 300 mm (12 pcs./set)
- Models included: **103-137, 103-138, 103-139-10, 103-140-10, 103-141-10, 103-142-10, 103-143-10, 103-144-10, 103-145-10, 103-146-10, 103-147-10, 103-148-10**

103-915-10

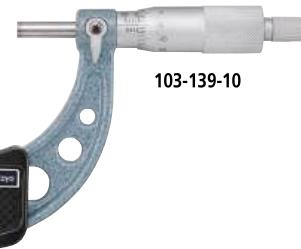
- Range: 150 - 300 mm (6 pcs./set)
- Models included: **103-143-10, 103-144-10, 103-145-10, 103-146-10, 103-147-10, 103-148-10**

Outside Micrometers SERIES 103

- This is a simple, classic analog micrometer that represents the roots of our company's foundation.



- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



Metric With ratchet stop

Code No.	Range (mm)	Measuring force (N)	Graduation (mm)	MPE*1 (μm)	Flatness (μm)	Parallelism (μm)
103-129	0 - 25	5 - 10	0.001	±2	0.6	2
103-130	25 - 50			±3		3
103-139-10	50 - 75			±4		4
103-140-10	75 - 100			±5		5
103-141-10	100 - 125			±6		6
103-142-10	125 - 150			±7		7
103-143-10	150 - 175			±8		8
103-144-10	175 - 200			±9		9
103-145-10	200 - 225			±10		10
103-146-10	225 - 250			±11		11
103-147-10	250 - 275			±12		
103-148-10	275 - 300			±13		
103-149	300 - 325	10 - 15	0.01	±14	1	12
103-150	325 - 350			±15		
103-151	350 - 375			±16		
103-152	375 - 400			±17		
103-153	400 - 425			±18		
103-154	425 - 450			±19		
103-155	450 - 475			±20		
103-156	475 - 500			±21		
103-157	500 - 525			±22		
103-158	525 - 550			±23		
103-159	550 - 575			±24		
103-160	575 - 600			±25		
103-161	600 - 625			±26		
103-162	625 - 650			±27		
103-163	650 - 675			±28		
103-164	675 - 700			±29		
103-165	700 - 725			±30		
103-166	725 - 750			±31		
103-167	750 - 775			±32		
103-168	775 - 800			±33		
103-169	800 - 825			±34		
103-170	825 - 850			±35		
103-171	850 - 875			±36		
103-172	875 - 900			±37		
103-173	900 - 925			±38		
103-174	925 - 950			±39		
103-175	950 - 975			±40		
103-176	975 - 1000			±41		

Metric With ratchet stop

Code No.	Range (mm)	Measuring force (N)	Graduation (mm)	MPE*1 *2 (μm)	Flatness (μm)	Parallelism (μm)
103-137	0 - 25	5 - 10	0.01	±2	0.6	2
103-138	25 - 50			±3		3
103-255	50 - 75			±4		
103-256	75 - 100			±5		
103-257	100 - 125			±6		
103-258	125 - 150			±7		

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

*1 MPE: Maximum permissible error J_{MPE}

*2 Maximum permissible error of the indication measured by contacting the full measuring face with the object to be measured. J_{MPE} is a term specified by JIS B 7502: 2016 which has been prepared based on ISO 3611: 2010 with some modifications of the technical contents. The measurement method has not been changed from JIS B 7502: 1994. For details refer to page 13-10.

Micrometer

Inch	With ratchet stop					
Code No.	Range (in)	Measuring force (N)	Graduation (in)	MPE* ¹ (in)	Flatness (in)	Parallelism (in)
103-177	0 - 1	5 - 10	0.001	±0.0001	0.000024	0.00008
103-131						
103-178						
103-132						
103-179				±0.00015	0.000024	0.00012
103-180						
103-181						
103-182						
103-183	5 - 6	0.001	±0.0002	0.000024	0.00016	0.0002
103-184						
103-185						
103-186						
103-187			±0.00025	0.000024	0.00028	0.00032
103-188						
103-189						
103-190						
103-191	14 - 15	10 - 15	±0.00035	0.00004	0.00024	0.00036
103-192						
103-193						
103-194						
103-195			±0.0004	0.00004	0.00044	0.00048
103-196						
103-197						
103-198						
103-199	22 - 23	5 - 10	±0.00045	0.000024	0.00028	0.00032
103-200						
103-201						
103-202						
103-203			±0.0005	0.000024	0.00036	0.0004
103-204						
103-205						
103-206						
103-207	30 - 31	0.001	±0.0006	0.000024	0.00044	0.00048
103-208						
103-209						
103-210						
103-211			±0.00065	0.000024	0.00052	0.00056
103-212						
103-213						
103-214						
103-215	38 - 39	10 - 15	±0.0007	0.000024	0.00056	0.00060
103-216						
103-259						
103-217						
103-218			±0.0008	0.000024	0.00060	0.00064
103-219						
103-220						
103-221						
103-222	7 - 8	0.0001	±0.00015	0.000024	0.00012	0.00016
103-223						
103-224						
103-225						
103-226			±0.0002	0.000024	0.0002	0.00024
103-227						
103-228						
103-229						
Inch	With friction thimble					
Code No.	Range (in)	Measuring force (N)	Graduation (in)	MPE* ¹ * ² (in)	Flatness (in)	Parallelism (in)
103-135	0 - 1	5 - 10	0.0001	±0.0001	0.000024	0.00008
103-136	1 - 2					

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

*1 MPE: Maximum permissible error J_{MPE}

*2 Maximum permissible error of the indication measured by contacting the full measuring face with the object to be measured. J_{MPE} is a term specified by JIS B 7502: 2016 which has been prepared based on ISO 3611: 2010 with some modifications of the technical contents. The measurement method has not been changed from JIS B 7502: 1994. For details refer to page 13-10.



103-904-10

- Range: 0 - 6 in (6 pcs./set)
- Models included: 103-177, 103-178, 103-179, 103-180, 103-181, 103-182, 5 micrometer standards



103-905-10

- Range: 0 - 12 in (12 pcs./set)
- Models included: All micrometers of 103-904-10 and 103-906 in one set, 11 micrometer standards



103-906

- Range: 6 - 12 in (6 pcs./set)
- Models included: 103-183, 103-184, 103-185, 103-186, 103-187, 103-188, 6 micrometer standards

103-907-40

- Range: 0 - 6 in (6 pcs./set)
- Models included: 103-135, 103-136, 103-217, 103-218, 103-219, 103-220

103-908-40

- Range: 0 - 12 in (12 pcs./set)
- Models included: 103-135, 103-136, 103-217, 103-218, 103-219, 103-220, 103-221, 103-222, 103-223, 103-224, 103-225, 103-226

103-909

- Range: 6 - 12 in (6 pcs./set)
- Models included: 103-221, 103-222, 103-223, 103-224, 103-225, 103-226

103-929

- Range: 0 - 3 in (3 pcs./set)
- Models included: 103-177, 103-178, 103-179

- Range: 0 - 4 in (4 pcs./set)
- Models included: 103-177, 103-178, 103-179, 103-180

Outside Micrometers SERIES 103

DIMENSIONS

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

Unit: mm

Range (mm)	L	a	b	c
0 - 25	0	9	28	2.5
25 - 50	25	10	38	
50 - 75	50	12	49	
75 - 100	75	14	60	
100 - 125	100	16.7	79	
125 - 150	125	18.8	94	
150 - 175	150	19.1	106	
175 - 200	175	18.2	118	
200 - 225	200	16.8	130	
225 - 250	225		143	
250 - 275	250		156	6.5
275 - 300	275		169	

DIMENSIONS

Models 325 mm to 1000 mm

Unit: mm

Range (mm)	L	a	b	c
300 - 325	300			18
325 - 350	325			
350 - 375	350			
375 - 400	375			
400 - 425	400			
425 - 450	425			
450 - 475	450			
475 - 500	475			
500 - 525	500			
525 - 550	525			
550 - 575	550			28
575 - 600	575			
600 - 625	600			
625 - 650	625			
		355	15	
Range (mm)	L	a	b	c
650 - 675	650			40
675 - 700	675			
700 - 725	700			
725 - 750	725			
750 - 775	750			
775 - 800	775			
800 - 825	800			
825 - 850	825			
850 - 875	850			
875 - 900	875			40
900 - 925	900			
925 - 950	925			
950 - 975	950			
975 - 1000	975			

Micrometer

02
Micrometers

Digit Outside Micrometers SERIES 193

- Mechanical digit counter with 0.01 mm or 0.001 in resolution for quick and error-free reading.
- Counter resolution 0.01 mm
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric With ratchet stop

Code No.	Range (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Graduation (mm)
193-111	0 - 25	± 2	0.6	2	0.001 (reading is obtained with vernier)
193-112	25 - 50			3	
193-113	50 - 75			2	0.01
193-114	75 - 100			3	
193-101	0 - 25	± 2	0.6	2	0.001 (reading is obtained with vernier)
193-102	25 - 50			3	
193-103	50 - 75			2	0.01
193-104	75 - 100			3	

Inch With friction thimble

Code No.	Range (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Graduation (in)
193-211	0 - 1	± 0.0001	0.000024	0.00008	0.0001
193-212	1 - 2				

Inch With ratchet stop

Code No.	Range (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Graduation (in)
193-213	2 - 3	± 0.0001	0.000024	0.00008	0.0001
193-214	3 - 4	± 0.00015			

Metric Micrometer set

Code No.	Range (mm)	Models included	Flatness (μm)	Parallelism (μm)
193-901	0 - 75 (3 pcs./set)	• 193-101, 193-102, 193-103 • 2 micrometer standards	0.6	2
193-902	0 - 100 (4 pcs./set)	• 193-101, 193-102, 193-103, 193-104 • 3 micrometer standards		3

Inch Micrometer set

Code No.	Range (in)	Models included	Flatness (in)	Parallelism (in)
193-923	0 - 3 (3 pcs./set)	• 193-211, 193-212, 193-213 • 2 micrometer standards	0.000024	0.00008

• Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

Measurement example



193-901

- Range: 0 - 75 mm
 - Graduation: 0.01 mm
 - Models included: 193-101, 193-102, 193-103, 193-104
- 2 micrometer standards

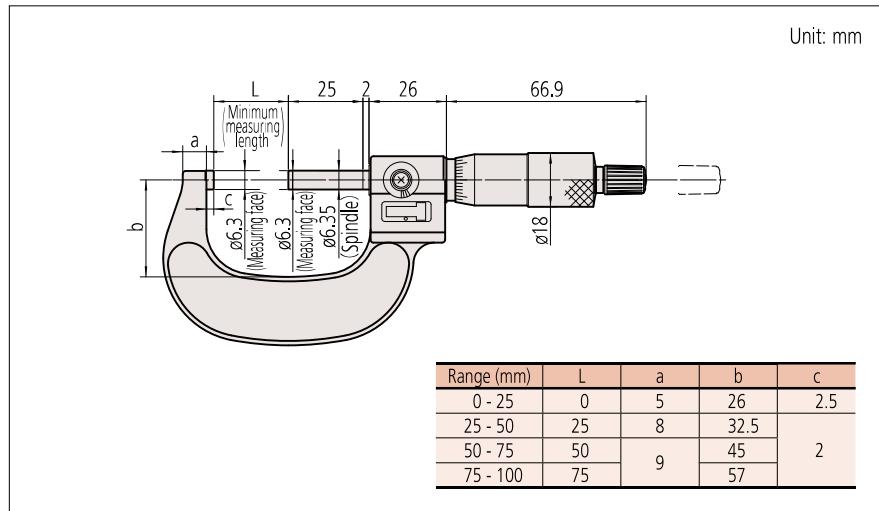


193-902

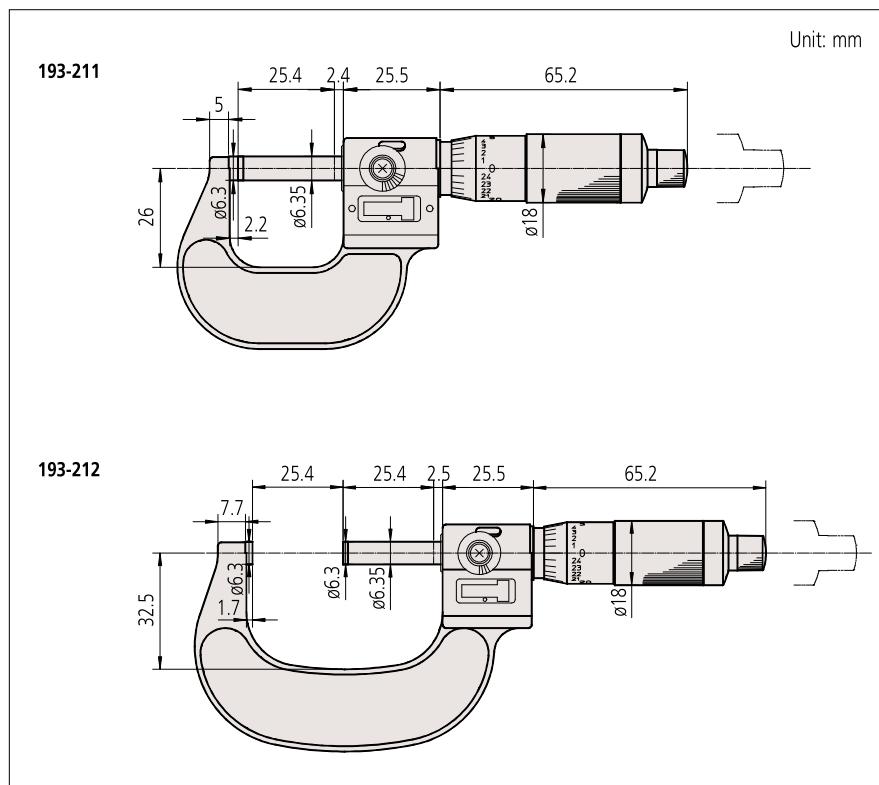
- Range: 0 - 100 mm
 - Graduation: 0.01 mm
 - Models included: 193-101, 193-102, 193-103, 193-104
- 3 micrometer standards

Digit Outside Micrometers SERIES 193

DIMENSIONS



DIMENSIONS



Outside Micrometers

SERIES 104 — with Interchangeable Anvils

- Wide measuring range with interchangeable anvils.
- Measuring face of the spindle is carbide tipped (standard model).

- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)	Interchangeable anvils	Setting Standard Qty	Setting Standard Size (mm)	Micrometer head stroke (mm)
Analog									
104-171*	0 - 50				2	1 pc.	1	25	
104-139A	0 - 100				3	4 pcs.	3	25 - 75	
104-135A	0 - 150					6 pcs.	5	25 - 125	
104-161A	50 - 150				4	4 pcs.	4	50 - 125	
104-140A	100 - 200						4	100 - 175	
104-136A	150 - 300				5	6 pcs.	6	150 - 275	
104-141A	200 - 300							200 - 275	
104-142A	300 - 400				6			300 - 375	
104-143A	400 - 500				7			400 - 475	
104-144A	500 - 600				8			500 - 575	
104-145A	600 - 700				9			600 - 675	
104-146A	700 - 800				10			700 - 775	
104-147A	800 - 900				11			800 - 875	
104-148A	900 - 1000				12			900 - 975	

Inch

Code No.	Range (in)	Graduation (in)	Spindle feed error (in)	Flatness (in)	Parallelism (in)	Interchangeable anvils	Setting Standard Qty	Setting Standard Size (in)	Micrometer head stroke (in)
Analog									
104-165	0 - 2	0.0001			0.00008	1 pc.	1	1	
104-149	0 - 4				0.00012	4 pcs.	3	1 - 3	
104-137	0 - 6				0.00016	6 pcs.	5	1 - 5	
104-162	2 - 6				0.0002	4 pcs.	4	2 - 5	
104-150	4 - 8					6 pcs.	6	6 - 11	
104-138	6 - 12							8 - 11	
104-151	8 - 12				0.00024	4 pcs.	4	12 - 15	
104-152	12 - 16				0.00028	6 pcs.	6	12 - 17	
104-201	12 - 18				0.00032	4 pcs.	4	16 - 19	
104-153	16 - 20				0.00036	6 pcs.	6	18 - 23	
104-202	18 - 24				0.0004	4 pcs.	4	20 - 23	
104-154	20 - 24				0.00044	6 pcs.	6	24 - 27	
104-155	24 - 28				0.00048	4 pcs.	4	28 - 31	
104-203	24 - 30					6 pcs.	6	30 - 35	
104-156	28 - 32							32 - 35	
104-204	30 - 36							36 - 39	
104-157	32 - 36							36 - 41	
104-158	36 - 40								
104-205	36 - 42								

* The frame is fitted with a heat shield.

Outside Micrometers

SERIES 104 — with Interchangeable Anvils

DIMENSIONS

104-135A							Unit: mm
Interchangeable Anvil							L: Range (mm)
Range	0 - 150 mm models	0 - 25	25 - 50	50 - 75	75 - 100	100 - 125	125 - 150
Range	150 - 300 mm models	150 - 175	175 - 200	200 - 225	225 - 250	250 - 275	275 - 300
Code No.	303950	303951	303952	303953	303954	303955	
c: Overall length (mm)	135	110	85	60	35	10	
Interchangeable anvil	M1	M2	M3	M4	M5	M6	
L: Range (mm)							
Range	300 - 400 mm models	300 - 325	325 - 350	350 - 375	375 - 400		
Range	400 - 500 mm models	400 - 425	425 - 450	450 - 475	475 - 500		
Range	500 - 600 mm models	500 - 525	525 - 550	550 - 575	575 - 600		
Range	600 - 700 mm models	600 - 625	625 - 650	650 - 675	675 - 700		
Range	700 - 800 mm models	700 - 725	725 - 750	750 - 775	775 - 800		
Range	800 - 900 mm models	800 - 825	825 - 850	850 - 875	875 - 900		
Range	900 - 1000 mm models	900 - 925	925 - 950	950 - 975	975 - 1000		
Code No.	304001	304002	304003	304004			
c: Overall length (mm)	87	62	37	12			
Interchangeable anvil	M3	M4	M5	M6			

Outside Micrometers

SERIES 105 — with Anvil Extension Collars

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



Extension collar



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



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

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Extension Collars	Setting Standard	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)
105-103	500 - 600					8	
105-104	600 - 700					9	
105-105	700 - 800	0.01	1 pc. (50 mm)	2 pcs.	6	1.3	10
105-106	800 - 900					11	
105-107	900 - 1000					12	

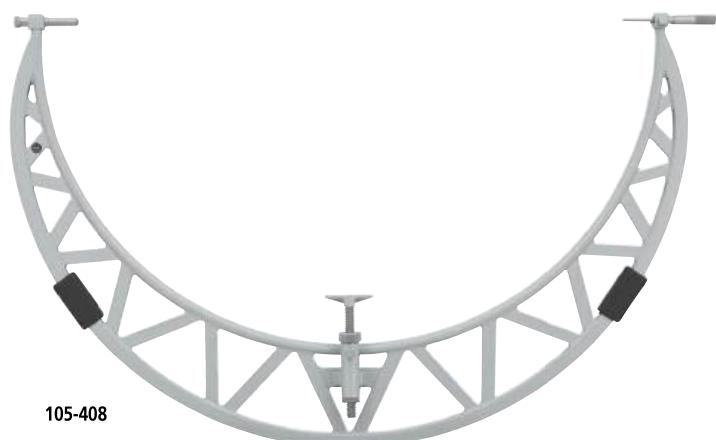
- Standard Accessories: Spanner (200154), 1 pc.

Measurement example

Outside Micrometers

SERIES 105 — with Anvil Extension Collars

- Square and round pipes are combined to create a lightweight, rigid frame.
- Wide measuring range with anvil extension collars.
- 50 mm/2 in spindle stroke.
- Includes workpiece stopper.
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.

**SPECIFICATIONS****Metric**

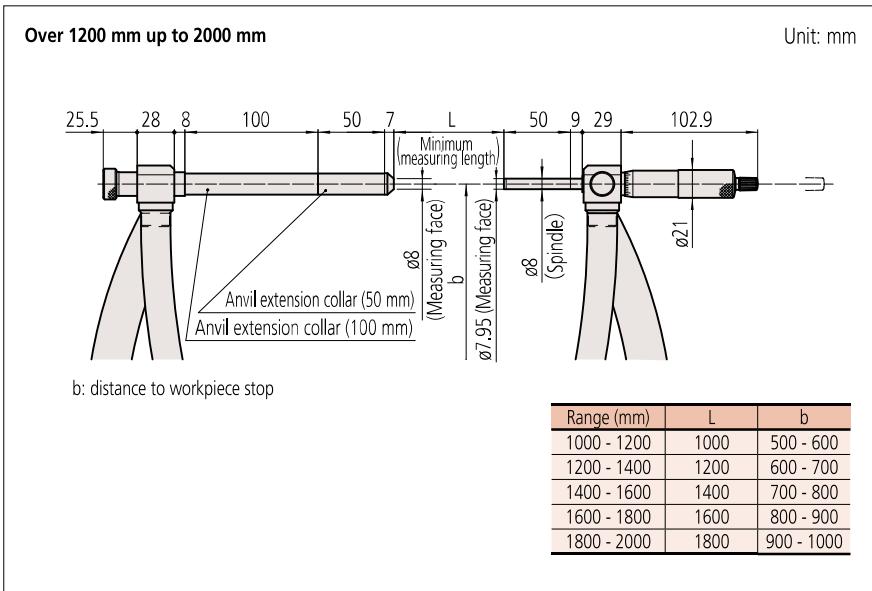
Code No.	Range (mm)	Graduation (mm)	Extension Collars	Setting Standard (pcs.)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)
(every 100 mm)							
105-408	1000 - 1100						13
105-409	1100 - 1200						14
105-410	1200 - 1300						15
105-411	1300 - 1400						16
105-412	1400 - 1500						17
105-413	1500 - 1600						18
105-414	1600 - 1700						19
105-415	1700 - 1800						20
105-416	1800 - 1900						21
105-417	1900 - 2000						22
(every 200 mm)							
105-418	1000 - 1200						14
105-419	1200 - 1400						16
105-420	1400 - 1600	0.01	2 pcs. (50 mm, 100 mm)	2	6	1.3	18
105-421	1600 - 1800						20
105-422	1800 - 2000						22

Inch

Code No.	Range (in)	Graduation (in)	Extension Collars	Setting Standard (pcs.)	Spindle feed error (in)	Flatness (in)	Parallelism (in)
105-428	40 - 44						0.00052
105-429	44 - 48						0.00056
105-430	48 - 52						0.00060
105-431	52 - 56						0.00064
105-432	56 - 60						0.00068
105-433	60 - 64						0.00072
105-434	64 - 68						0.00076
105-435	68 - 72						0.00080
105-436	72 - 76						0.00084
105-437	76 - 80						0.00088

- Standard Accessories: Spanner (200154), 1 pc.

DIMENSIONS



Measurement example**Typical indicator choice**Dial indicator (0.01 mm): **2046AB**Dial indicator (0.001 mm): **2109AB-10**ABS Digimatic Indicator (0.01 mm): **543-710B**ABS Digimatic Indicator (0.0005 mm): **543-700B**

Indicator Type Micrometers SERIES 107

- Designed to mount a dial indicator for direct GO/±NG judgment for mass-produced parts.
- Anvil retracting trigger for quick measurement.

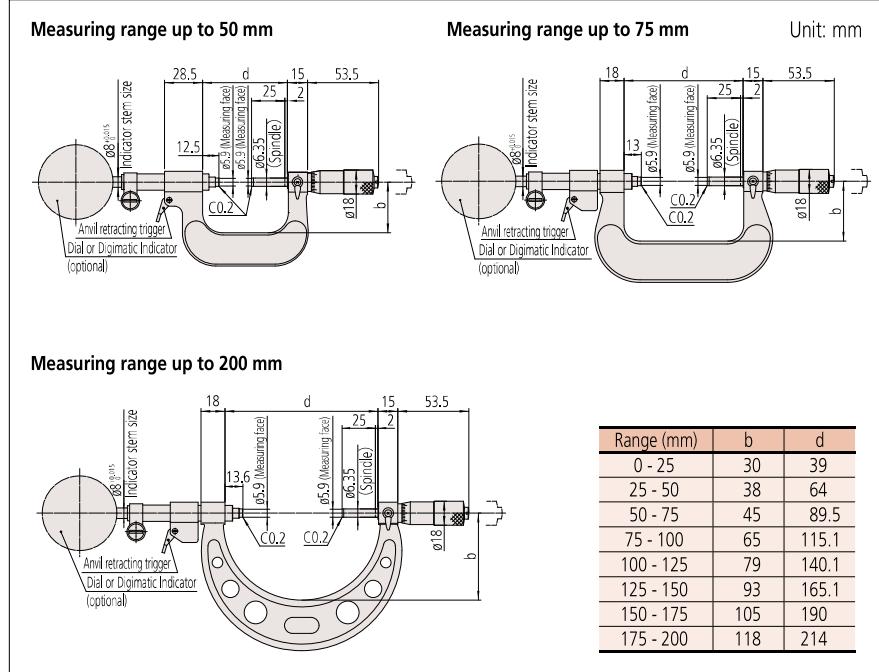
- Various kinds of indicators* are available depending on the measurement type (accuracy required, measuring range, etc.).
- Measuring faces: Carbide tipped
- Anvil stroke: 3 mm

* Only stems of Ø8 diameter are supported, but even these may not be supported by some models. Please contact our Customer Support Center or your nearest Mitutoyo sales office for detailed specifications.

**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)	
107-201	0 - 25	3	0.6	2	
107-202	25 - 50				
107-203	50 - 75				
107-204	75 - 100		0.6		
107-205	100 - 125				
107-206	125 - 150				
107-207	150 - 175				
107-208	175 - 200		4		

- Setting standard, 1 pc. (except for measuring range 0 to 25 mm models), Spanner (**301336**), 1 pc.

DIMENSIONS

Caliper Type Micrometers SERIES 343

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



SPECIFICATIONS

Metric

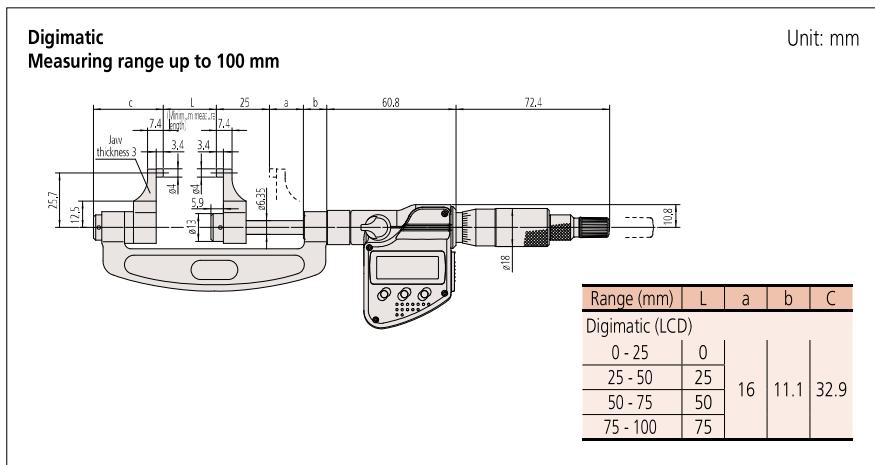
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)
With SPC data output					
343-250-30	0 - 25	0.001	± 5	0.3	3
343-251-30	25 - 50		± 6		
343-252-30	50 - 75		± 7		
343-253-30	75 - 100		± 8		4

Inch/Metric

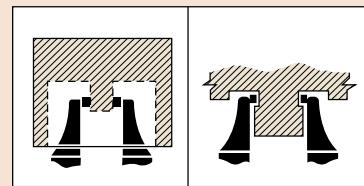
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
With SPC data output					
343-350-30	0 - 1	0.00005 in / 0.001 mm	± 0.00025	0.000012	0.00012
343-351-30	1 - 2		± 0.0003		
343-352-30	2 - 3		± 0.00035		
343-353-30	3 - 4		± 0.0004		0.00016

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
 - Battery life: Approx. 2.4 years under normal use
 - Position detection method: Electromagnetic rotary sensor
 - Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.
- Note: For functional details of **series 343**, refer to page 02-7.
Please note that these models are not water-proof.

DIMENSIONS



Measurement example



Optional Accessories (for series 343)

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Caliper Type Micrometers SERIES 143



143-101

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)
143-101	0 - 25	0.01	± 5	0.3	3
143-102	25 - 50		± 6		
143-103	50 - 75		± 7		
143-104	75 - 100		± 8		4
143-105	100 - 125		± 9		
143-106	125 - 150		± 10		
143-107	150 - 175		± 11		5
143-108	175 - 200		± 12		
143-109	200 - 225				6
143-110	225 - 250				
143-111	250 - 275				7
143-112	275 - 300				

Inch

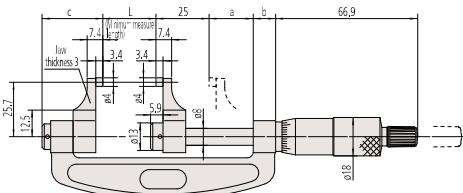
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
143-121	0 - 1	0.001	± 0.00025	0.000012	0.00012
143-122	1 - 2		± 0.0003		
143-123	2 - 3		± 0.00035		

• Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

DIMENSIONS

Analog

Measuring range up to 300 mm



Unit: mm

Range (mm)	L	a	b	C
Analog	20.8	10.6	28.6	
0 - 25				
25 - 50				
50 - 75				
75 - 100				
100 - 125				
125 - 150				
150 - 175				
175 - 200				
200 - 225				
225 - 250				
250 - 275				
275 - 300				

Micrometer

02
Micrometers

Screw Thread Micrometers SERIES 125

- Directly indicates screw pitch diameter (no need for calculation).
- Fixed anvil type. Select the right model to meet the specifications of your screw thread.
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard for adjusting zero point for metric (unified) 60° threads.



125-103

SPECIFICATIONS

Metric

Code No.	Thread to be measured (Metric/Unified)	Range (mm)	Spindle feed error (µm)	Graduation (mm)
125-101	0.4 - 0.5 mm/64 - 48 TPI			
125-102	0.6 - 0.9 mm/44 - 28 TPI			
125-103	1 - 1.75 mm/24 - 14 TPI	0 - 25		
125-104	2 - 3 mm/13 - 9 TPI			
125-105	3.5 - 5 mm/8 - 5 TPI			
125-106	0.4 - 0.5 mm/64 - 48 TPI			
125-107	0.6 - 0.9 mm/44 - 28 TPI			
125-108	1 - 1.75 mm/24 - 14 TPI	25 - 50		
125-109	2 - 3 mm/13 - 9 TPI			
125-110	3.5 - 5 mm/8 - 5 TPI			
125-111	0.6 - 0.9 mm/44 - 28 TPI		3	0.01
125-112	1 - 1.75 mm/24 - 14 TPI			
125-113	2 - 3 mm/13 - 9 TPI	50 - 75		
125-114	3.5 - 5 mm/8 - 5 TPI			
125-115	5.5 - 7 mm/4.5 - 3.5 TPI			
125-116	0.6 - 0.9 mm/44 - 28 TPI			
125-117	1 - 1.75 mm/24 - 14 TPI			
125-118	2 - 3 mm/13 - 9 TPI	75 - 100		
125-119	3.5 - 5 mm/8 - 5 TPI			
125-120	5.5 - 7 mm/4.5 - 3.5 TPI			

- Standard Accessories: Spanner (301336), 1 pc.

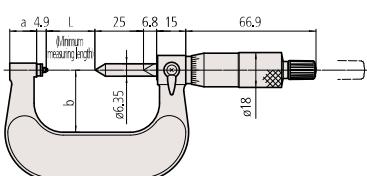
Note: A matching setting standard is supplied with each model (except for 0 to 25 mm measuring range). (Refer to page 02-73 for details.) The setting standard is for metric threads (unified) 60°.

Measurement example

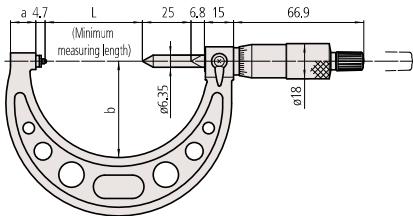


DIMENSIONS

125-101, 125-106



125-111, 125-116



Unit: mm

Range (mm)	L	a	b
0 - 25	0	13.8	25
25 - 50	25		32

Range (mm)	L	a	b
50 - 75	50	12	49
75 - 100	75	14	63

**Measurement example****Optional Accessories (for series 326)**

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

- For Metric/Unified threads (pair)

Code No.	Matching anvils/spindle tips included (mm)		
126-801	0.4 - 0.5/64 - 48 TPI		
126-802	0.6 - 0.9/44 - 28 TPI		
126-803	1 - 1.75/24 - 14 TPI		
126-804	2 - 3/13 - 9 TPI		
126-805	3.5 - 5/8 - 5 TPI		
126-806	5.5 - 7/4.5 - 3.5 TPI		
126-800	Set with one each of 126-801 to 126-806		
• For Whitworth threads (pair)			
Code No.	Matching anvils/ spindle tips included (mm)	Code No.	
126-811	64 - 48 TPI	126-817	14 - 10 TPI
126-812	48 - 40 TPI	126-818	10 - 7 TPI
126-813	40 - 32 TPI	126-819	7 - 4.5 TPI
126-814	32 - 24 TPI	126-820	4.5 - 3.5 TPI
126-815	24 - 18 TPI	126-810	Set with one each of 126-811 to 126-820
126-816	18 - 14 TPI		

Screw Thread Micrometers SERIES 326, 126 — Interchangeable Anvil/Spindle Tip Type

- This is a screw thread micrometer with changeable anvil and spindle tips. It enables direct reading of screw pitch diameter. Both analog and digital types are available.
- Interchangeable anvil and spindle tips are optional. Select the right model to meet the specifications of your screw thread.
- Equipped with Ratchet Stop for constant measuring force.
- Supplied with a setting standard for adjusting zero point for metric (unified) 60° threads.

Interchangeable anvils/
spindle tips (optional)**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Resolution (mm)	Spindle feed error (μm)
With SPC data output			
326-251-30	0 - 25		
326-252-30	25 - 50	0.001	3
326-253-30	50 - 75		
326-254-30	75 - 100		

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard Accessories: Spanner (301336), 1 pc.

Note 1: A matching setting standard is supplied with each model (except for 0 to 25 mm measuring range). (Refer to page 02-73 for details.) The setting standard is for metric threads (unified) 60°.

Note 2: For functional details, refer to page 02-7. Please note that origin setting of these models is by presetting. Optional connection cable is available only for water-proof type (Digimatic model).

Inch/Metric

Code No.	Range (in)	Resolution	Spindle feed error (in)
With SPC data output			
326-351-30	0 - 1		
326-352-30	1 - 2	0.00005 in/	
326-353-30	2 - 3	0.001 mm	
326-354-30	3 - 4		0.00015

**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Graduation (mm)	Spindle feed error (μm)
126-125	0 - 25		
126-126	25 - 50		
126-127	50 - 75		
126-128	75 - 100		
126-129	100 - 125		
126-130	125 - 150		
126-131	150 - 175	0.01	3
126-132	175 - 200		
126-133	200 - 225		
126-134	225 - 250		
126-135	250 - 275		
126-136	275 - 300		

Inch

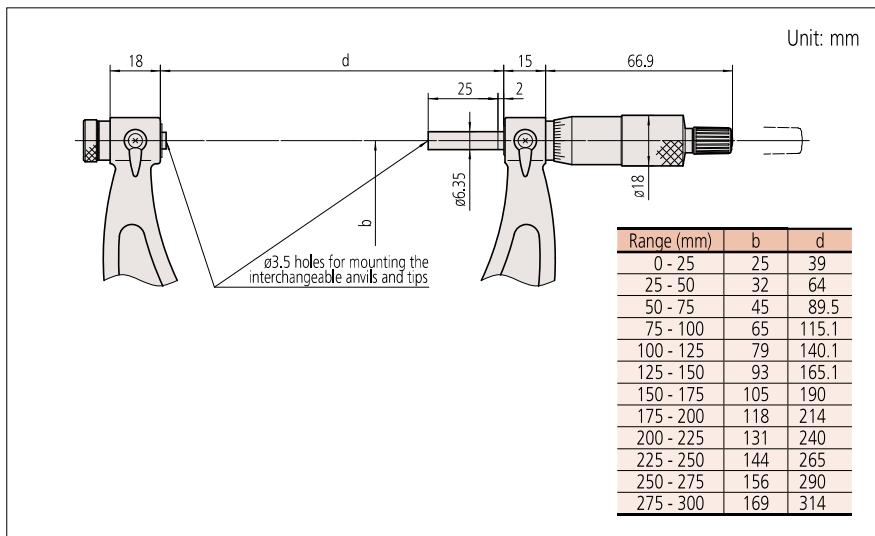
Code No.	Range (in)	Graduation (in)	Spindle feed error (in)
126-137	0 - 1		
126-138	1 - 2		
126-139	2 - 3		
126-140	3 - 4		
126-141	4 - 5		
126-142	5 - 6		
126-143	6 - 7		
126-901	0 - 1	0.001	0.00015
126-902	1 - 2		
126-903	2 - 3		
126-904	3 - 4		
126-905	4 - 5		
126-906	5 - 6		

- Standard Accessories: Spanner (301336), 1 pc.

Note: A matching setting standard is supplied with each model (except for 0 to 25 mm measuring range). (Refer to page 02-73 for details.) The setting standard is for metric threads (unified) 60°.

Screw Thread Micrometers SERIES 326, 126 — Interchangeable Anvil/Spindle Tip Type

DIMENSIONS



Technical description

- Anvils/spindle tips

- Allowable error of the angle of anvils and spindle tips

Type	Metric (Unified)	Whitworth (Unified)	Half angle error α
		W1	$\pm 30^\circ$
M1 (U1)	W2	$\pm 30^\circ$	
	W3	$\pm 20^\circ$	
M2 (U2)	W4	$\pm 20^\circ$	
	W5	$\pm 15^\circ$	
M3 (U3)	W6	$\pm 15^\circ$	
M4 (U4)	W7	$\pm 10^\circ$	
	W8	$\pm 10^\circ$	
M5 (U5)	W9	$\pm 10^\circ$	
M6 (U6)	W10	$\pm 10^\circ$	

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 $\theta=60^\circ$ Whitworth $\theta=55^\circ$



Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Disc Micrometers SERIES 323

- Measures "root tangent length" of spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Equipped with Ratchet Stop for constant measuring force.



323-250-30

SPECIFICATIONS

Metric

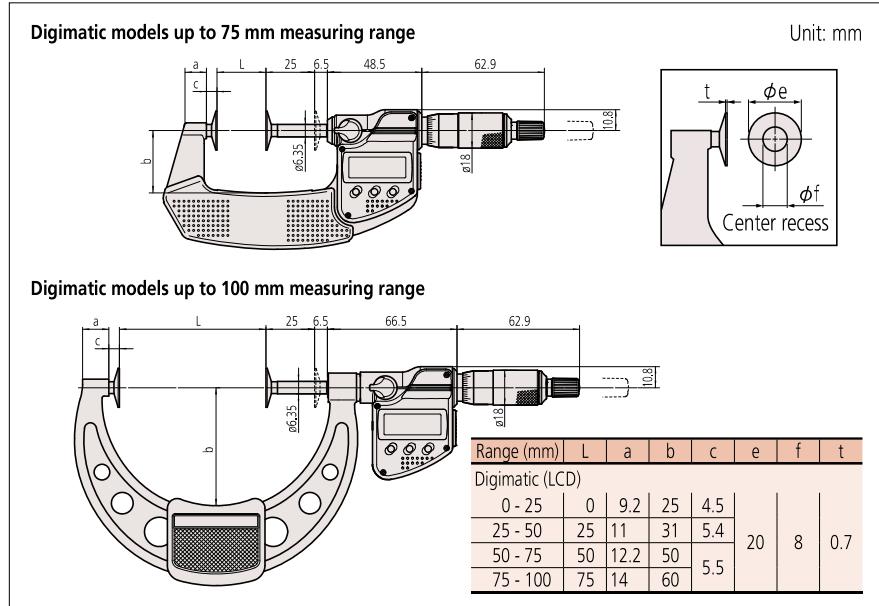
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Anvil dia. (mm)	Measurable module
With SPC data output							
323-250-30	0 - 25						
323-251-30	25 - 50		± 4				
323-252-30	50 - 75	0.001		1	4		
323-253-30	75 - 100		± 6		6	$\phi 20$	0.5 - 6

Inch / Metric

Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Anvil dia. (in)	Measurable module
With SPC data output							
323-350-30	0 - 1						
323-351-30	1 - 2	0.00005 in / 0.001 mm	± 0.0002		0.00004	0.0002	
323-352-30	2 - 3					$\phi 0.787$	0.5 - 6
323-353-30	3 - 4		± 0.0003		0.0003		

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
 - Battery life: Approx. 2.4 years under normal use
 - Position detection method: Electromagnetic rotary sensor
 - Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (**301336**), 1 pc.
- Note 1: Root tangent length measurement is not available for some types of gears.
Note 2: For functional details, refer to page 02-7.
Optional connection cable is available only for water-proof type (Digimatic model).

DIMENSIONS



Micrometer

02
Micrometers

Disc Micrometers SERIES 223, 123

- Can be used for making root tangent measurements on spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Equipped with Ratchet Stop for constant measuring force.



123-101

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Anvil dia. (mm)	Measurable module
Mechanical counter model							
223-101	0 - 25	0.01	± 4	1	4	$\varnothing 20$	0.5 - 6
223-102	25 - 50						
Analog							
123-101	0 - 25	0.01	± 4	1	4	$\varnothing 20$	0.5 - 6
123-113*							
123-102	25 - 50		± 6	1	6	$\varnothing 20$	0.5 - 6
123-114*							
123-103	50 - 75		± 7	1.6	7	$\varnothing 30$	0.7 - 11
123-115*							
123-104	75 - 100		± 8	1.6	8	$\varnothing 30$	0.7 - 11
123-116*							
123-105	100 - 125		± 9	1.6	9	$\varnothing 30$	0.7 - 11
123-106	125 - 150						
123-107	150 - 175						
123-108	175 - 200						
123-109	200 - 225						
123-110	225 - 250						
123-111	250 - 275						
123-112	275 - 300						

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Anvil dia. (in)	Measurable module
Mechanical counter model							
223-125	0 - 1	0.001	± 0.0002	0.00004	0.0002	$\varnothing 0.787$	0.5 - 6
Analog							
123-125	0 - 1	0.001	± 0.0002	0.00004	0.0002	$\varnothing 0.787$	0.5 - 6
123-126	1 - 2				0.0003		
123-127	2 - 3		± 0.0003		0.0003		
123-128	3 - 4						

* The measuring discs have carbide tips.

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.
- Note: Root tangent length measurement is not available for some types of gears.

Special Purpose Micrometers

Disc Micrometers

SERIES 223, 123

DIMENSIONS

Analog models up to 50 mm measuring range

Unit: mm

Analog models over 50 mm measuring range

Range (mm)	L	a	b	c	e	f	t
0 - 25	0	13.8	25	5.7	20	8	0.7
25 - 50	25		32			(9.8)	(0.7)
50 - 75	50	12	49		5.5		
75 - 100	75	14	63				
100 - 125	100	12	79				
125 - 150	125	14.5	94				
150 - 175	150	15.2	106				
175 - 200	175	14.5	118				
200 - 225	200		130				
225 - 250	225	13.5	143				
250 - 275	250		156				
275 - 300	275	14.5	169				

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

Micrometer

02
Micrometers

Gear Tooth Micrometers SERIES 324 — Interchangeable Ball Anvil/Spindle Tip Type

- This specialized micrometer series measures gear over-pin diameters. Attach optional ball probes to each measuring face before use.
- Determination of the over-pin diameter: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.

- Interchangeable ball anvils/spindle tips for various gear modules (0.5 to 5.25) are optional.



SPECIFICATIONS

Metric			
Code No.	Range (mm)	Resolution (mm)	Spindle feed error (μm)
With SPC data output			
324-251-30	0 - 25	0.001	3
324-252-30	25 - 50		
324-253-30	50 - 75		
324-254-30	75 - 100		

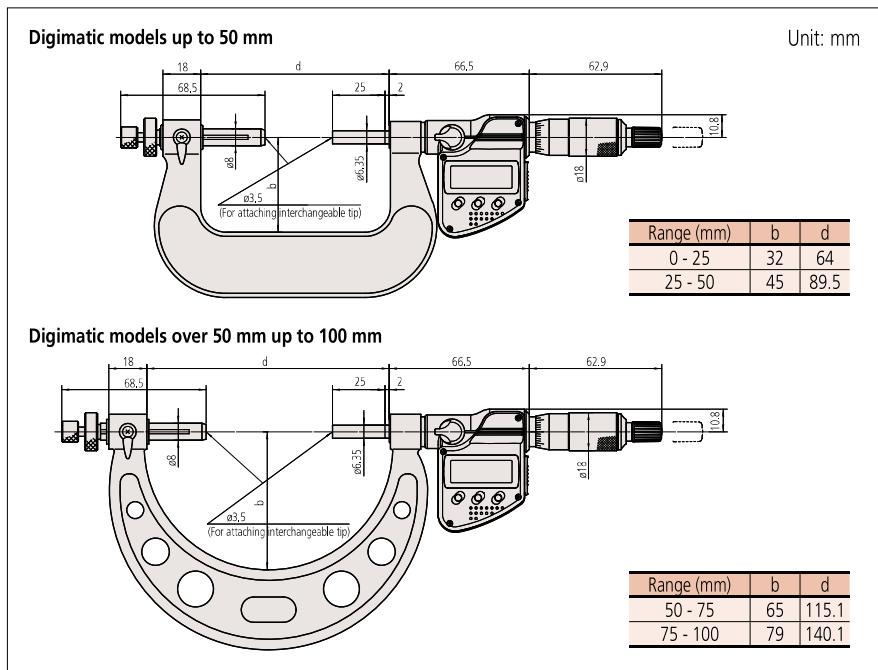
Inch / Metric			
Code No.	Range (in)	Resolution	Spindle feed error (in)
With SPC data output			
324-351-30	0 - 1	0.00005 in/ 0.001 mm	0.00015
324-352-30	1 - 2		
324-353-30	2 - 3		
324-354-30	3 - 4		

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
 - Battery life: Approx. 2.4 years under normal use
 - Position detection method: Electromagnetic rotary sensor
 - Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (**301336**), 1 pc.
- Note: For functional details, refer to page 02-7.

Please note that origin setting of these models is by presetting. Optional connection cable is available only for waterproof type (Digimatic model).

Special Purpose Micrometers

DIMENSIONS



MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}



Dust and Water-Protected
www.tuv.com
ID: 0000040191

Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Gear Tooth Micrometers

SERIES 124 — Interchangeable Ball Anvil/Spindle Tip Type

Optional Accessories

- Interchangeable ball anvil/spindle tip set

Code No.	Diameter* (mm)	Gear module	Dia. pitch
124-801	0.8	0.5 - 0.55	50
124-802	1.0	0.6 - 0.65	45
124-803	1.191 ($\frac{3}{16}$ in)	0.7 - 0.8	35 - 30
124-821	1.5	0.9 - 1	28 - 26
124-804	1.588 ($\frac{1}{16}$ in)	0.9 - 1	28 - 26
124-805	2.0	1.25	22
124-806	2.381 ($\frac{3}{32}$ in)	1.5	17
124-822	2.5	1.5	17
124-807	3.0	1.75	15
124-808	3.175 ($\frac{1}{8}$ in)	—	14
124-823	3.5	2	13
124-809	3.969 ($\frac{5}{32}$ in)	2	13
124-810	4.0	2.25	11
124-824	4.5	2.5	10
124-811	4.763 ($\frac{3}{16}$ in)	2.5	10
124-812	5.0	2.75	9
124-813	5.556 ($\frac{7}{32}$ in)	3.0 - 3.25	8
124-814	6.0	3.5	7
124-815	6.35 ($\frac{1}{4}$ in)	3.75	7
124-816	7.0	4.0	6.5
124-817	7.144 ($\frac{9}{32}$ in)	4.25	6
124-818	7.938 ($\frac{5}{16}$ in)	4.5	5.5
124-819	8.0	4.75	5.5
124-820	8.731 ($\frac{11}{32}$ in)	5.0 - 5.25	5

* 2 mm less for carbide-tipped type

- Intended for making over-pin diameter measurements on gears using precision ball anvils/spindle tips (optional).
- Determination of the over-pin diameter: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Interchangeable ball anvils/spindle tips for various gear modules (0.5 to 5.25) are optional.
- Equipped with Ratchet Stop for constant measuring force.



124-173

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Spindle feed error (μm)
124-173	0 - 25		
124-174	25 - 50		
124-175	50 - 75		
124-176	75 - 100		
124-177	100 - 125		
124-178	125 - 150		
124-179	150 - 175		
124-180	175 - 200		
124-181	200 - 225		
124-182	225 - 250		
124-183	250 - 275		
124-195	275 - 300	0.01	3

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm models), Spanner (301336), 1 pc.

DIMENSIONS

Analog models up to 50 mm			Unit: mm
18 (28) 68.5 (83.5)	d	25 15 2 55.92 (56.92)	66.9 81.0
(For attaching interchangeable tip)			
Analog models over 50 mm up to 300 mm			
18 (28) 68.5 (83.5)	d	25 15 2 55.92 (56.92)	66.9 (69.9) 81.0
(For attaching interchangeable tip)			
(124-195)			
Range (mm)			
0 - 25	b	d	
25 - 50	45	89.5	
Range (mm)			
50 - 75	65	115.1	
75 - 100	79	140.1	
100 - 125	93	165.1	
125 - 150	105	190	
150 - 175	118	214	
175 - 200	131	240	
200 - 225	144	265	
225 - 250	156	290	
250 - 275	169	314	
275 - 300	187	352	

Disc Micrometers

SERIES 369 — Non-rotating Spindle Type

- Can be used for making root tangent measurements on spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Non-rotating spindle eliminates torque on workpiece.
- Measurable range of gear pitch: 0.5 to 6 module.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Anvil dia. (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Measuring force (N)
With SPC data output							
369-250-30	0 - 25			± 4		4	
369-251-30	25 - 50	0.001	ø20		1		3 - 8
369-252-30	50 - 75			± 6		6	
369-253-30	75 - 100						

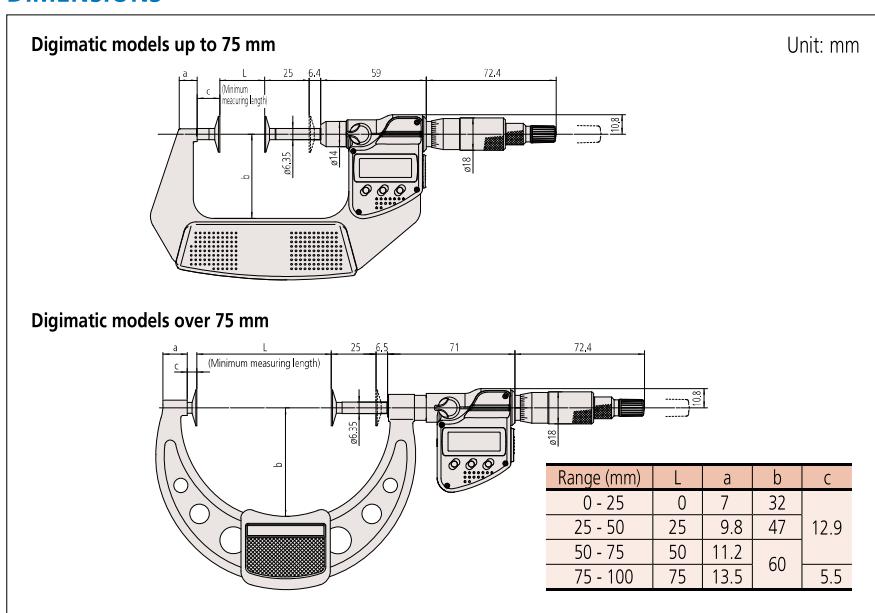
Inch / Metric

Code No.	Range (in)	Resolution	Anvil dia. (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring force (N)
With SPC data output							
369-350-30	0 - 1			± 0.0002		0.0002	
369-351-30	1 - 2	0.00005 in / 0.001 mm	ø0.787		0.00004		3 - 8
369-352-30	2 - 3			± 0.0003		0.0003	
369-353-30	3 - 4						

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (301336), 1 pc.

Note 1: For functional details, refer to page 02-7. Please note that these models are not water-proof.
Note 2: Root tangent length measurement is not available for some types of gears.

DIMENSIONS



Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Disc Micrometers

SERIES 369, 227 — Non-rotating Spindle Type

- Can be used for making root tangent measurements on spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Non-rotating spindle eliminates torque on workpiece.
- 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.



SPECIFICATIONS

Metric

	Code No.	Range (mm)	Resolution (mm)	Anvil dia. (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Measuring force (N)
Quickmike type	369-411-20	0 - 30	0.001	$\varnothing 20$	± 4	1	4	3 - 8
	369-412-20	25 - 55					3	0.5 - 2.5
Quickmike type adjustable measuring force	227-221-20	0 - 15	0.001	$\varnothing 14.3$	± 4	1	2 - 10	0.5 - 2.5
	227-223-20	0 - 10					3	2 - 10

Inch/Metric

	Code No.	Range (in)	Resolution	Anvil dia. (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring force (N)
Quickmike type	369-421-20	0 - 1.2	0.00005 in / 0.001 mm	$\varnothing 0.787$	± 0.0002	0.00004	0.0002	3 - 8
	369-422-20	1 - 2.2						

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
 - Battery life: Approx. 5 years under normal use
 - Position detection method: Electrostatic capacity absolute sensor
 - Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 10 mm/0 to 15 mm/0 to 30 mm (0 to 1/0 to 1.2 in) models), Screwdriver (210183), 1 pc.
- Note: Root tangent length measurement is not available for some types of gears.

DIMENSIONS

Quickmike type					Unit: mm	
a	c	L	30	16.3	69.6	50.4
13.8	13.8	16.3	30	16.3	69.6	50.4
13.8	13.8	16.3	30	16.3	69.6	50.4
Range (mm)	L	a	b	c		
0 - 30	0	8.5	36		13.5	
25 - 55	25	10.3	47			

Quickmike adjustable measuring force type				
a	c	L	69.6	72
13.8	13.8	16.3	69.6	72
13.8	13.8	16.3	69.6	72
Range (mm)	L	a	b	c
0 - 15	0	6.2	25	5.2
0 - 10				

Disc Micrometers

SERIES 169 — Non-rotating Spindle Type

- Can be used for making root tangent measurements on spur gears and helical gears.
- Determination of the root tangent length: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Non-rotating spindle eliminates torque on workpiece.
- Measurable range of gear pitch: 0.5 to 6 module.
- Equipped with Ratchet Stop for constant measuring force.



169-201-10

SPECIFICATIONS

Metric

	Code No.	Range (mm)	Graduation (mm)	Anvil dia. (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Measuring force (N)	
Analog	169-201-10	0 - 25	0.01	$\varnothing 20$	± 4	1	4	3 - 8	
	169-202-10	25 - 50							
	169-205-10	50 - 75			± 6	6	6		
	169-207-10	75 - 100							

Inch

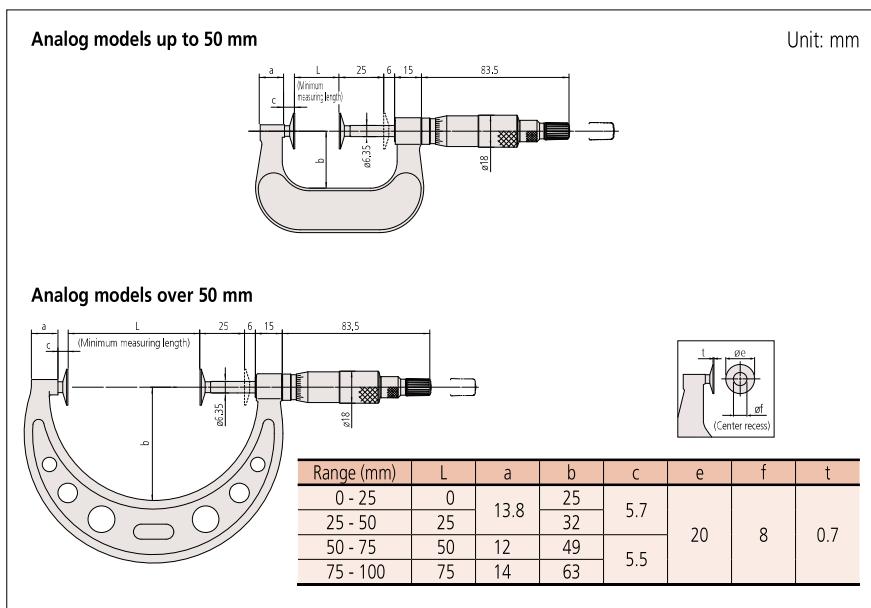
	Code No.	Range (in)	Graduation (in)	Anvil dia. (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring force (N)	
Analog	169-203-10	0 - 1	0.001	$\varnothing 0.787$	± 0.0002	0.0002	0.0002	3 - 8	
	169-204-10	1 - 2							
	169-206-10	2 - 3			± 0.0003	0.00004	0.0003		
	169-208-10	3 - 4							

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)

Spanner (301336), 1 pc.

Note: Root tangent length measurement is not available for some types of gears.

DIMENSIONS



Paper Thickness Micrometers

SERIES 169 — Non-rotating Spindle Type

Measurement example



- For paper thickness measurement.
- Non-rotating spindle eliminates torque on workpiece.

- Anvil diameter: ø14.3 mm (without recess)
- Equipped with Ratchet Stop for constant measuring force. (8.02 ± 0.8 N)



169-101-10

SPECIFICATIONS

Metric

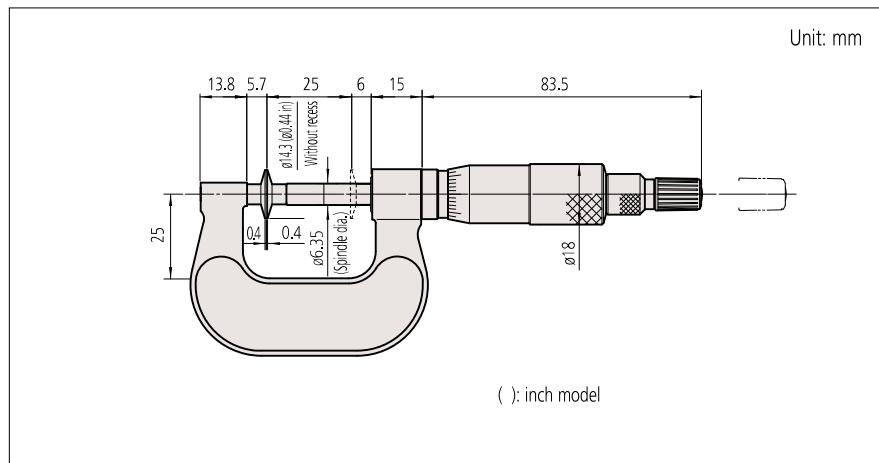
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (µm)	Flatness (µm)	Parallelism (µm)
169-101-10	0 - 25	0.01	±4	1	3

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
169-103-10	0 - 1	0.001	±0.0002	0.00004	0.00015

- Standard Accessories: Spanner (301336), 1 pc.

DIMENSIONS



Sheet Metal Micrometers SERIES 389

- The U-shaped micrometer is ideal for measuring the thickness of sheet metal at a considerable distance from the edge.
- IP65 water/dust protection (except for 389-514 and 389-714).

- Measuring faces: Carbide tipped
- Profile of measuring faces: Flat-Flat, Spherical-Flat and Spherical-Spherical.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Throat depth (mm)	Measuring surfaces
Digimatic							
389-251-30							F-F
389-261-30	0 - 25		± 4	0.6		150	S-F
389-271-30							S-S
389-514		0.001	± 5	1	3	300*	F-F
389-252-30							S-F
389-262-30	25 - 50		± 4	0.6		150	S-S
389-272-30							

Inch/Metric

Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Throat depth (in)	Measuring surfaces
Digimatic							
389-351-30							F-F
389-361-30	0 - 1		± 0.0002	0.000024		6	S-F
389-371-30							S-S
389-714		0.00005 in/ 0.001 mm	± 0.00025	0.00004	0.00012	12*	F-F
389-352-30							S-F
389-362-30	1 - 2		± 0.0002	0.000024		6	S-S
389-372-30							

- Power source for 389-2XX, 3XX: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Power source for 389-514, 714: SR44 battery (2 pcs.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use (for 389-2XX, 3XX), Approx. 1.8 years under normal use (for 389-514, 714)
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (301336), 1 pc. (for 389-2XX, 3XX)
Spanner (200154), 1 pc. (for 389-514, 714)

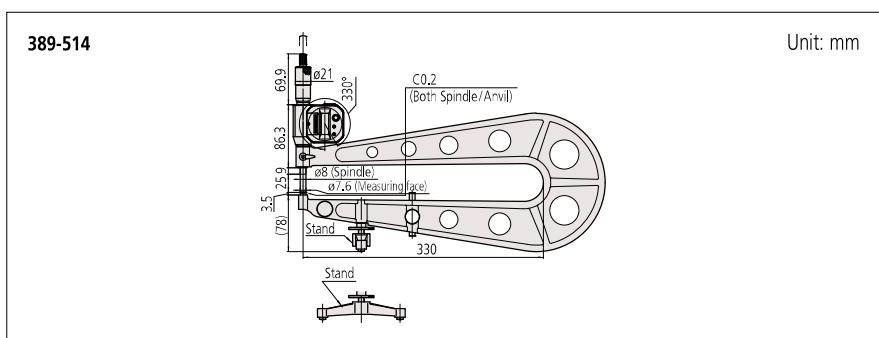
* Models with a 300 mm (12 in) throat are equipped with a stand for convenience of measurement in the horizontal orientation as standard.

Note 1: For functional details of 389-251-30/389-252-30/389-351-30/389-352-30 refer to page 02-7.

Note 2: For functional details of 389-514/389-714 refer to page 02-9.

Note 3: In spherical-flat anvil type micrometers, the measuring face on the anvil side is spherical.

DIMENSIONS

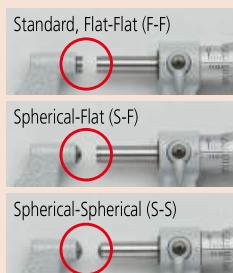


Applicable models: series 389
(excluding 389-514 and 389-714)

Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m): for series 389
05CZA663	B	Connection cable (2 m): for series 389
04AZB512	CR	Connection cable (1 m): for 389-514
04AZB513	CR	Connection cable (2 m): for 389-514
959149	C	Connection cable (1 m): for 389-514
959150	C	Connection cable (2 m): for 389-514
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm): for series 389
02AZE140B	B	Connection cable for U-WAVE-T: for series 389 For foot switch
264-622	IP67	U-WAVE-TM*
264-623	Buzzer	U-WAVE-TM*
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB*

* Cannot be used with 389-514.



Sheet Metal Micrometers

SERIES 118

- The U-shaped micrometer is ideal for measuring the thickness of sheet metal at a considerable distance from the edge.
- Measuring faces: Carbide tipped
- Profile of measuring faces: Flat-Flat, Spherical-Flat and Spherical-Spherical.
- Equipped with Ratchet Stop for constant measuring force.



118-102

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Throat depth (mm)	Measuring surfaces
Analog							
118-101						100	F-F
118-102	0 - 25	0.01	± 4	0.6		150	S-F
118-114						300*	S-S
118-118			± 5	1		150	F-F
118-103						300*	S-S
118-110	25 - 50		± 4	0.6		150	
118-126							

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Throat depth (in)	Measuring surfaces
Analog							
118-129						6	F-F
118-116	0 - 1	0.0001	± 0.0002	0.000024		0.00012	S-F
118-120							S-S
118-107		0.001	± 0.00025	0.00004		12*	
118-112	1 - 2		± 0.0002	0.000024		6	F-F

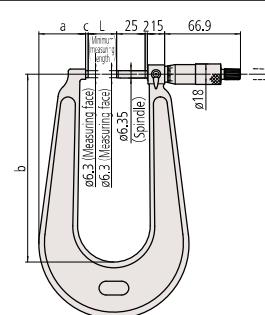
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
- Spanner (200877), 1 pc. (for 118-1XX)
- Spanner (200154), 1 pc. (for 118-103/107)

* Models with a 300 mm (12 in) throat are equipped with a stand for convenience of measurement in the horizontal orientation as standard.

Note: In spherical-flat anvil type micrometers, the measuring face on the anvil side is spherical.

DIMENSIONS

Analog models



Unit: mm

Code No.	L	a	b	c
118-101	34	110		
118-102	0	43	160	2.5
118-114				
118-118	25	41	165	
118-110				

Sheet Metal Micrometer SERIES 119

- Large diameter dial model enables easy and quick measurement of sheet metal thickness.
- Adjustable anvil.
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



119-202

Measurement example



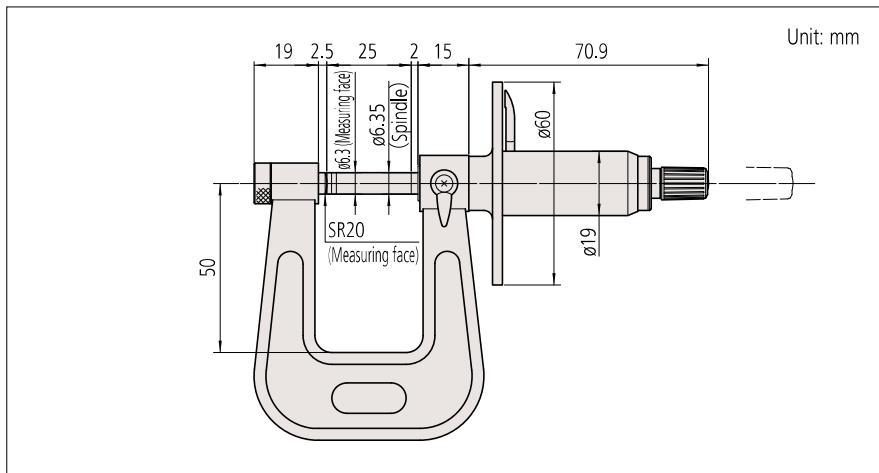
SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Throat depth (mm)
119-202	0 - 25	0.01	± 4	50

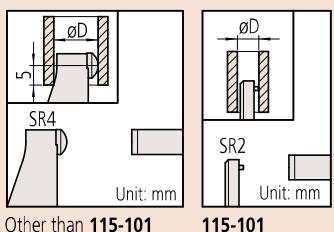
- Standard Accessories: Spanner (200168), 1 pc.

DIMENSIONS





Applicable models: series 395

Measurement example**Optional Accessories**

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable for series 395 (1 m)
05CZA663	B	Connection cable for series 395 (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

**Tube Micrometers
SERIES 395, 115, 295**

- The spherical anvil-type micrometer is convenient for measuring cylindrical workpieces. The spherical anvil comes into contact with a workpiece at a point instead of a surface area, thus increasing measurement accuracy.

- IP65 water/dust protection (series 395).
- Equipped with Ratchet Stop for constant measuring force.

**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	øD (mm)	Flatness (μm)
Digimatic					
395-251-30	0 - 25				
395-252-30	25 - 50	0.001	±2	ø15	0.3
395-253-30	50 - 75				
395-254-30	75 - 100		±3	ø20	

Inch/Metric

Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	øD (in)	Flatness (in)
Digimatic					
395-351-30	0 - 1				
395-352-30	1 - 2	0.00005 in/	±0.0001	ø0.59	0.000012
395-353-30	2 - 3	0.001 mm		ø0.75	
395-354-30	3 - 4		±0.00015	ø0.79	

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

Note: For functional details, refer to page 02-7.

Optional connection cable is available only for water-proof type (Digimatic model).

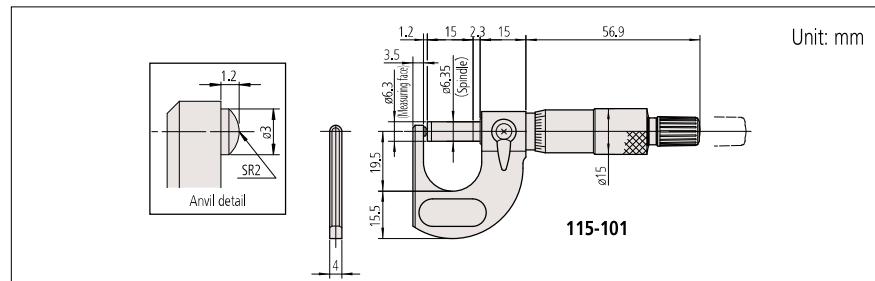
**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	øD (mm)	Flatness (μm)
Analog					
115-101	0 - 15				
115-115	0 - 25				
115-116	25 - 50	0.01	±3	ø10	0.6
115-117	50 - 75			ø11	
115-118	75 - 100		±4	ø17	
				ø18	

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	øD (in)	Flatness (in)
Analog					
115-153	0 - 1	0.0001	±0.00015	ø0.40	0.000024
Mechanical counter model					
295-153	0 - 1	0.0001	±0.00015	ø0.40	0.000024

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 15 mm/0 to 25 mm (0 to 1 in) models), Spanner (200168), 1 pc. (for 115-101), Spanner (301336), 1 pc. (for models other than 115-101)

DIMENSIONS

Micrometer

02
Micrometers

Tube Micrometers

SERIES 395, 115, 295 — Spherical Anvil and Spindle Type

- Designed to measure workpieces with concave-concave surfaces. The spherical anvil and spindle respectively come into contact with the workpiece at a point, thus increasing measurement accuracy.



395-271-30

SPECIFICATIONS

Metric				
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	$\varnothing D$ (mm)
Digimatic				
395-271-30	0 - 25			$\varnothing 15$
395-272-30	25 - 50	0.001	± 2	$\varnothing 19$
395-273-30	50 - 75			
395-274-30	75 - 100		± 3	$\varnothing 20$

Inch / Metric				
Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	$\varnothing D$ (in)
Digimatic				
395-371-30	0 - 1	0.00005 in	± 0.0001	$\varnothing 0.59$
395-372-30	1 - 2	0.001 mm		$\varnothing 0.75$
395-373-30	2 - 3			
395-374-30	3 - 4		± 0.00015	$\varnothing 0.79$

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

Note: For functional details, refer to page 02-7.

Optional connection cable is available only for water-proof type (Digimatic model).



115-215

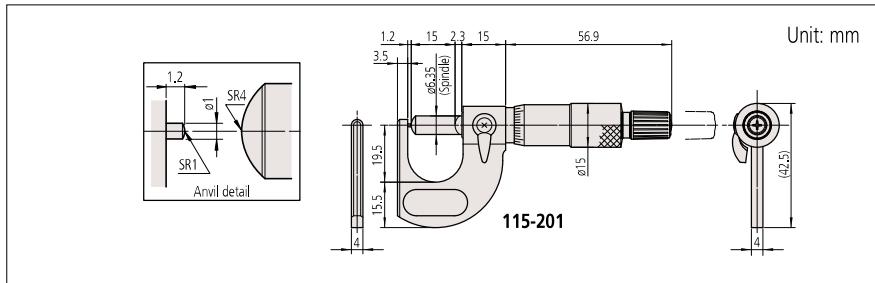
SPECIFICATIONS

Metric				
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	$\varnothing D$ (mm)
Analog				
115-201	0 - 15			$\varnothing 5.5$
115-215	0 - 25			$\varnothing 10$
115-216	25 - 50	0.01	± 3	$\varnothing 11$
115-217	50 - 75			$\varnothing 17$
115-218	75 - 100		± 4	$\varnothing 18$
Mechanical counter model				
295-215	0 - 25	0.01	± 3	$\varnothing 10$

Inch				
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	$\varnothing D$ (in)
Analog				
115-253	0 - 1	0.0001		$\varnothing 0.40$
115-242	1 - 2	0.001	± 0.00015	$\varnothing 0.44$
115-243	2 - 3			$\varnothing 0.67$
Mechanical counter model				
295-253	0 - 1	0.0001	± 0.00015	$\varnothing 0.40$

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 15 mm/0 to 25 mm (0 to 1 in) models)
- Spanner (200168), 1 pc. (for 115-201), Spanner (301336), 1 pc. (for models other than 115-201)

DIMENSIONS



Mitutoyo

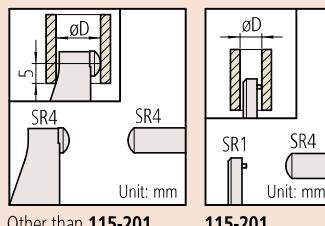
MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}



Applicable models: series 395

Measurement example

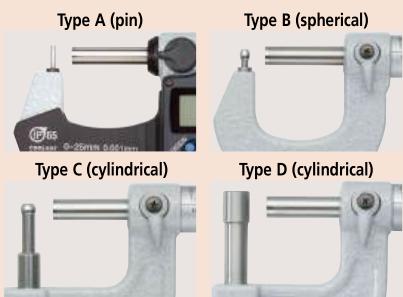


Optional Accessories

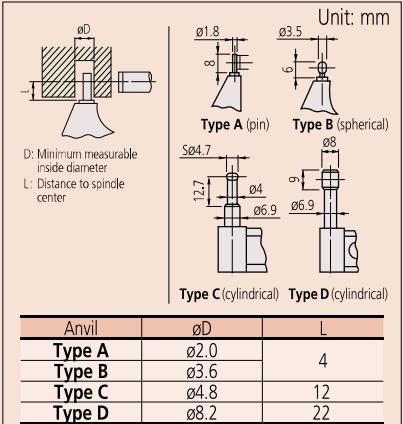
Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable for series 395 (1 m)
05CZA663	B	Connection cable for series 395 (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

MeasurLink[®] ENABLED
Data Management Software by MitutoyoU-WAVE^{fit}

Applicable models: series 395

Measurement example**Optional Accessories**

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable for series 395 (1 m)
05CZA663	B	Connection cable for series 395 (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Anvil shape**Tube Micrometers
SERIES 395, 115, 295 — Spherical and Cylindrical Anvil Type**

- Designed to measure the wall thickness of various tubing.
- Spindle face: Carbide tipped
- IP65 water/dust protection (series 395).
- Equipped with Ratchet Stop for constant measuring force.

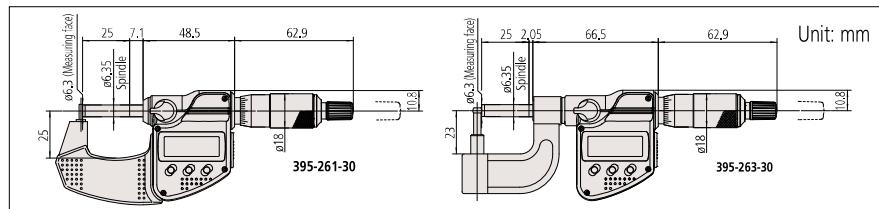
**SPECIFICATIONS**

Metric					Inch / Metric				
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μ m)	Remarks	Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Remarks
Digimatic					Digimatic				
395-261-30	0 - 25	0.001	± 3	Type A	395-362-30	0 - 1	0.00005 in/	Type B	
395-262-30				Type B	395-363-30	0.001 mm		Type C	
395-263-30				Type C	395-364-30		± 0.00015	Type D	
395-264-30				Type D					

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Spanner (301336), 1 pc.

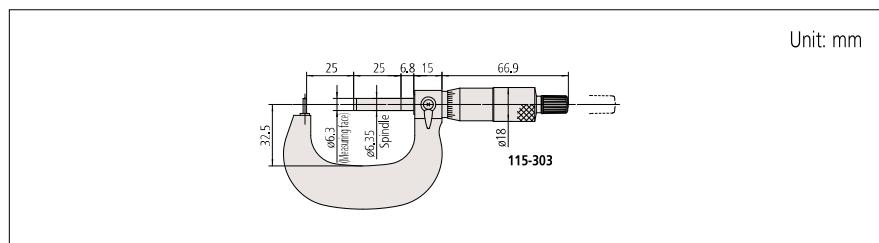
Note: For functional details, refer to page 02-7.

Optional connection cable is available only for water-proof type (Digimatic model).

DIMENSIONS**SPECIFICATIONS**

Metric					Inch								
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μ m)	Remarks	Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Remarks				
Analog					Analog								
115-302	0 - 25	0.01	± 3	Type A	115-305	0 - 1	0.001	± 0.00015	Type A				
115-308				Type B	115-313					Type C			Type D
115-303	25 - 50			Type A	115-314				0.0001				
115-309				Type B									
115-315	0 - 25			Type C									
115-316		Type D											

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
- Spanner (301336), 1 pc.

DIMENSIONS

Micrometer

02
Micrometers

Spline Micrometers SERIES 331

- The anvil and spindle have a small diameter for measuring splined shafts, slots and keyways.
- IP65 water/dust protection.
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric						
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Measuring face
Digimatic	331-251-30	0 - 25	0.001	±2	0.3	Type A
	331-252-30	25 - 50		±3		
	331-253-30	50 - 75		±2		
	331-254-30*	75 - 100		±3		
	331-261-30	0 - 25		±2		Type B
	331-262-30	25 - 50		±2		
	331-263-30	50 - 75		±3		
Inch/Metric	331-264-30*	75 - 100		±3		
Inch/Metric						
Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring face
Digimatic	331-351-30	0 - 1	0.00005 in/ 0.001 mm	±0.0001	0.00008	Type A
	331-352-30	1 - 2		±0.00015	0.00012	
	331-353-30	2 - 3		±0.0001	0.00008	
	331-354-30	3 - 4		±0.00015	0.00012	
	331-361-30	0 - 1		±0.0001	0.00008	Type B
	331-362-30	1 - 2		±0.00015	0.00012	
	331-363-30	2 - 3		±0.0001	0.00008	
	331-364-30	3 - 4		±0.00015	0.00012	

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

* Made to order.

Note: For functional details, refer to page 02-7.

Optional connection cable is available only for water-proof type (Digimatic model).

DIMENSIONS

Digimatic models							Unit: mm
Models up to 75 mm measuring range							
a	c	L	25	12	48.5	62.9	
25	12	66.5	62.9				
Code No.	L	a	b	c			
331-251-30	0	7.3	32.5				
331-261-30	25	10.1	47				
331-252-30	50	11.5	60				
331-262-30	75	16.7	76	20.3			
331-253-30					17.5		
331-263-30							
331-254-30							
331-264-30							

Digimatic models						
Models over 75 mm measuring range						
a	c	L	25	12	66.5	62.9
25	12	66.5	62.9			
Code No.	L	a	b	c		
331-251-30	0	7.3	32.5			
331-261-30	25	10.1	47			
331-252-30	50	11.5	60			
331-262-30	75	16.7	76	20.3		
331-253-30					17.5	
331-263-30						
331-254-30						
331-264-30						

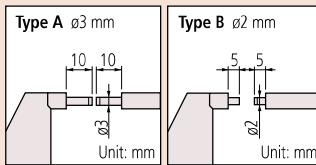
MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}

IP 65

TÜV Rheinland
CERTIFIED
Dust and Water-Protected
www.tuv.com
ID: 0000000191

Measurement example



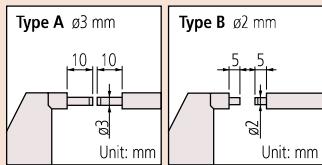
Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Spline Micrometers

SERIES 111, 131

- The anvil and spindle have a small diameter for measuring splined shafts, slots and keyways.
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)	Measuring face
Analog						
111-215	0 - 25					Type B
111-115	0 - 25		±3		2	
111-116	25 - 50					
111-117	50 - 75					
111-118	75 - 100					
111-119	100 - 125		±4		3	
111-120	125 - 150					
111-121	150 - 175					
111-122	175 - 200		±5			
111-123	200 - 225					
111-124	225 - 250					
111-125	250 - 275					
111-126	270 - 300		±6		5	
Mechanical counter model						
131-115	0 - 25	0.01	±3	0.3	2	Type A

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)	Measuring face
Analog						
111-166	0 - 1	0.0001	±0.00015	0.000012	0.00008	Type A
131-166			±0.000015			

• Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

DIMENSIONS

Analog models					Unit: mm
Models up to 300 mm measuring range					
Code No.	L	a	b	c	
111-215	0	10	38		17.5
111-115	25	12	49		
111-116	50	14	60		
111-117	75	16.7	79	20.3	
111-118	100	18.8	94	20.7	
111-119	125	19.1	106	21.1	
111-120	150	18.2	118	21.3	
111-121	175	16.8	130	21.7	
111-122	200		143	20.5	
111-123	225		156		
111-124	250	18	169	21.5	
111-125	275		181		
111-126					

Micrometer

02
Micrometers

Point Micrometers SERIES 342

- Pointed spindle and anvil for measuring the web thickness of drills, small grooves, keyways, and other hard-to-reach dimensions.
- The measuring points (carbide tipped) have approximately 0.3 mm radius.

- Measuring faces: Carbide tipped
- IP65 water/dust protection
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric				
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J _{MPE} (μm)	Point
Digimatic (With carbide tip)				
342-251-30	0 - 25	0.001	±2	15°
342-252-30	25 - 50			
342-253-30	50 - 75		±3	
342-254-30	75 - 100	0.001	±3	30°
342-261-30	0 - 25			
342-262-30	25 - 50		±2	
342-263-30	50 - 75	0.001	±3	30°
342-264-30	75 - 100			

Inch / Metric				
Code No.	Range (in)	Resolution	Maximum permissible error J _{MPE} (in)	Point
Digimatic (With carbide tip)				
342-351-30	0 - 1	0.00005 in/ 0.001 mm	±0.00015	15°
342-352-30	1 - 2			
342-353-30	2 - 3	0.00005 in/ 0.001 mm	±0.00015	30°
342-354-30	3 - 4			
342-361-30	0 - 1	0.00005 in/ 0.001 mm	±0.0001	15°
342-362-30	1 - 2			
342-363-30	2 - 3	0.00005 in/ 0.001 mm	±0.00015	30°
342-364-30	3 - 4			

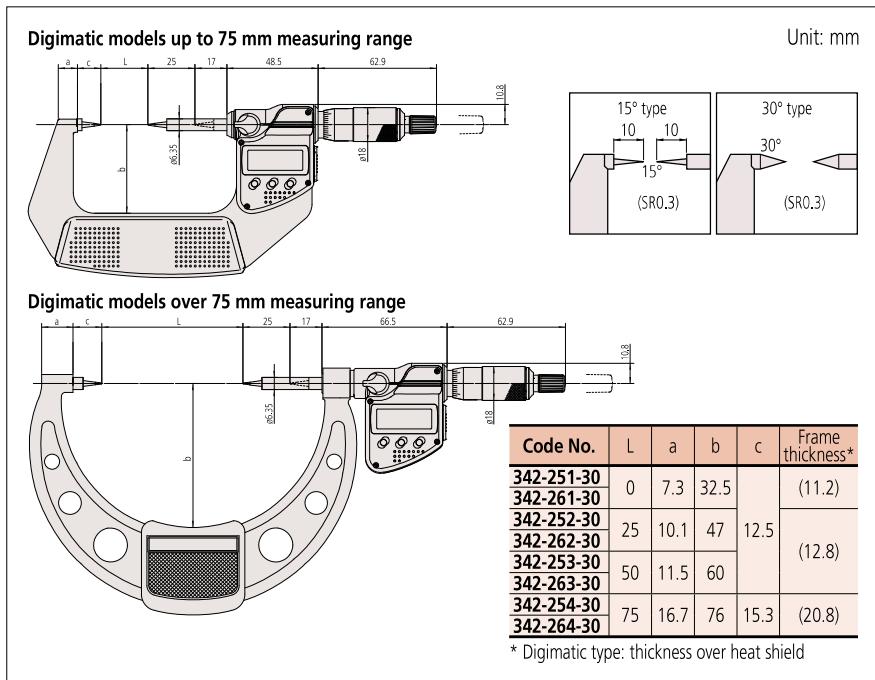
- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

Note: For functional details, refer to page 02-7.

Optional connection cable is available only for water-proof type (Digimatic model).

Special Purpose Micrometers

DIMENSIONS



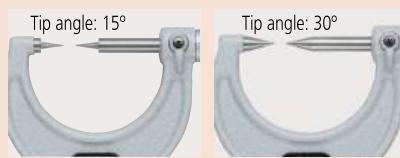
MeasurLink[®] ENABLED
Data Management Software by Mitutoyo

U-WAVE^{fit}



Dust and
Water-
Protected
www.tuv.com
ID: 0000000191

Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

Point Micrometers

SERIES 112, 142

- Pointed spindle and anvil for measuring the web thickness of drills, small grooves, keyways, and other hard-to-reach dimensions.
- The measuring points have approximately 0.3 mm radius.
- Carbide measuring tips are also available.
- Equipped with Ratchet Stop for constant measuring force.



112-201

SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Point
Analog				
112-153	0 - 25	0.01	± 3	15°
112-154	25 - 50			
112-155	50 - 75		± 4	30°
112-156	75 - 100			
112-201	0 - 25	0.01	± 3	15°
112-202	25 - 50			
112-203	50 - 75		± 4	30°
112-204	75 - 100			
Analog (With carbide tip)				
112-165	0 - 25	0.01	± 3	15°
112-166	25 - 50			
112-167	50 - 75		± 4	30°
112-168	75 - 100			
112-213	0 - 25	0.01	± 3	15°
112-214	25 - 50			
112-215	50 - 75		± 4	30°
112-216	75 - 100			
Mechanical counter model				
142-153	0 - 25	0.01	± 3	15°
142-201				30°

• Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

DIMENSIONS

Analog models measuring range						Unit: mm
Code No.	L	a	b	c	Frame thickness	
112-153	0	10	38		(9)	
112-154	25	12	49		(10)	
112-155	50	14	60		(11)	
112-156	75	16.7	79	15.3	(13)	

V-Anvil Micrometers SERIES 314 — 3 Flutes

- Measures the outside diameter of cutting tools (such as taps, reamers, end mills) with an odd number of flutes.
- Measures pitch diameter: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.



SPECIFICATIONS

Metric					
For 3-flute cutting tools					
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{WPE} (μm)	Anvil	Remarks
Digimatic 314-251-30	1 - 15	0.001	± 4	60°	w/groove
314-252-30	10 - 25				
314-253-30	25 - 40				
314-261-30	1 - 15				
314-262-30	10 - 25				

- Flatness: 0.3 μm/0.000012 in (Spindle), 1.0 μm/0.00004 in (Anvil)
- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Spanner (**301336**), 1 pc. (for maximum measuring range up to 40 mm (1.6 in)), Setting Standards for V-Anvil Micrometer

Note: For functional details, refer to page 02-7.

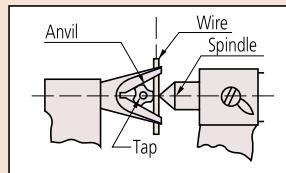
The models above use the same connection cables and connection units as our IP rated micrometers but these digital V-Anvil Micrometers are not IP rated.

Inch/Metric					
For 3-flute cutting tools					
Code No.	Range (in)	Resolution	Maximum permissible error J_{WPE} (in)	Anvil	Remarks
Digimatic 314-351-30	0.05 - 0.6	0.00005 in/ 0.001 mm	± 0.0002	60°	w/groove
314-352-30	0.4 - 1				
314-353-30	1 - 1.6				
314-361-30	0.05 - 0.6				
314-362-30	0.4 - 1				

Measurement example



Pitch diameter measurement of tap by single-wire method



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB

V-Anvil Micrometers

SERIES 114 — 3 Flutes and 5 Flutes

- Measures the outside diameter of cutting tools (such as taps, reamers, end mills) with an odd number of flutes.
- Measures pitch diameter: refer to "Quick Guide to Precision Measuring Instruments" on page 13-8.
- Measuring faces: Carbide tipped
- Equipped with Ratchet Stop for constant measuring force.



114-121

SPECIFICATIONS

Metric For 3-flute cutting tools

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Anvil	Remarks
Analog Anvil, Spindle (With carbide tip)					
114-204	2.3 - 25	0.01	± 4	60°	—
114-101	1 - 15	0.01	± 4	60°	w/groove
114-102	10 - 25		± 5		—
114-103	25 - 40		± 6		—
114-104	40 - 55		± 7		—
114-105	55 - 70		± 8		—
114-106	70 - 85		± 9		—
114-107	85 - 100		± 4		—
114-108	100 - 115		± 4		—
114-109	115 - 130		± 4		—
114-110	130 - 145		± 4		—
114-161	1 - 15		± 4		—
114-162	10 - 25		± 4		—

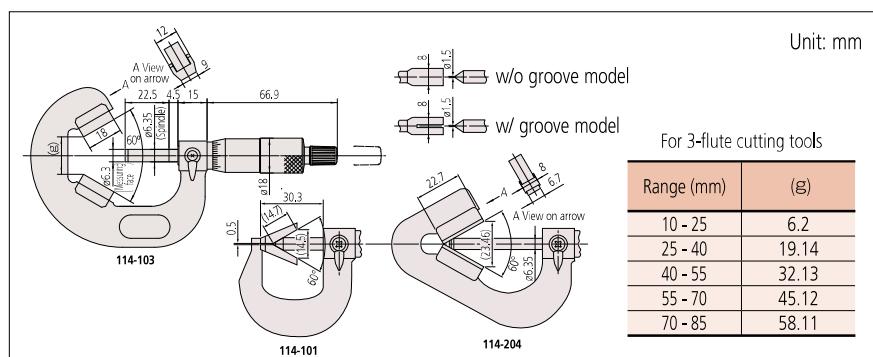
Metric For 5-flute cutting tools

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Anvil	Remarks
Analog Anvil, Spindle (With carbide tip)					
114-137	2.3 - 25	0.01	± 4	108°	—
114-121	5 - 25	0.01	± 4	108°	w/groove
114-122	25 - 45		± 5		—
114-123	45 - 65		± 6		—
114-124	65 - 85		± 7		—
114-165	5 - 25		± 4		—

• Flatness: 0.6 μm /0.000024 in (Spindle), 1.3 μm /0.000052 in (Anvil)

• Standard accessories: Spanner (301336), 1 pc. (for 114-204, 202, 101, 102, 103, 104, 161, 162, 163, 113, 114, 137, 135, 121, 122, 165)
Spanner (200877), 1 pc. (for 114-105, 106, 107, 108, 109, 110, 123, 124)
Setting Standards for V-Anvil Micrometer

DIMENSIONS



Blade Micrometers SERIES 422 — Non-rotating Spindle Type

- The anvil and the spindle have a blade for measuring the groove diameter of shafts, keyways and other hard-to-reach areas.
- Carbide-tipped measuring faces are available.
- Non-rotating spindle type.
- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric					
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark
Digimatic					
422-230-30	0 - 25				
422-231-30	25 - 50		± 3	3	Type A
422-232-30	50 - 75		± 4	4	
422-233-30	75 - 100				
422-260-30	0 - 25				
422-261-30	25 - 50				Type B
422-270-30			± 3	3	Type C
422-271-30	0 - 25				Type D

Inch / Metric					
Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Digimatic					
422-330-30	0 - 1				
422-331-30	1 - 2		± 0.00015	0.00015	Type A
422-332-30	2 - 3		± 0.0002	0.0002	
422-333-30	3 - 4				
422-360-30	0 - 1				
422-361-30	1 - 2				Type B
422-370-30			± 0.00015	0.00015	Type C
422-371-30	0 - 1				Type D

Metric					
Quickmike type					
Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark
Digimatic					
422-411-20	0 - 30	0.001	± 3	3	Type A
422-412-20	25 - 55				

Inch / Metric					
Quickmike type					
Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Digimatic					
422-421-20	0 - 1.2	0.00005 in/ 0.001 mm	± 0.00015	0.00015	Type A
422-422-20	1 - 2.2				

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use (for **422-2XX, 3XX**)
Approx. 5 years under normal use (for **422-4XX**)
- Position detection method: Electromagnetic rotary sensor (for **422-2XX, 3XX**)
Electrostatic capacity absolute sensor (for **422-4XX**)
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm/0 to 30 mm (0 to 1 in/0 to 1.2 in) models), Spanner (**301336**), 1 pc. (for **422-2XX, 3XX**)

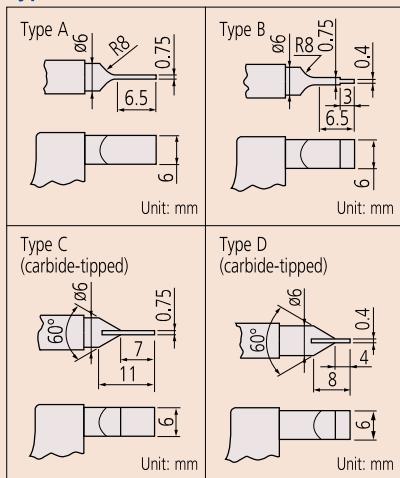
Note 1: For functional details, refer to page 02-7. Please note that these models are not water-proof.
Note 2: A heat shield is provided with Digimatic models as standard.

Applicable models:
series 422 Quickmike type

Measurement example



Type and dimensions

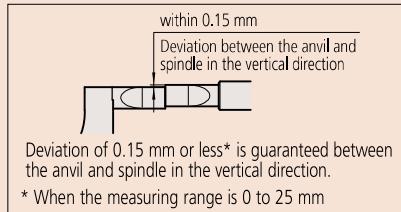


Optional Accessories

Code No.	Type	Description
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM*
264-623	Buzzer	U-WAVE-TM*
264-626	IP67	U-WAVE-TMB*
264-627	Buzzer	U-WAVE-TMB*
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB*

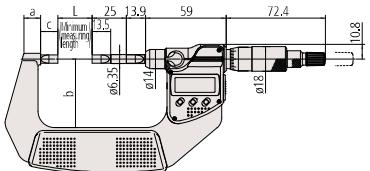
* Only **series 422** (except for Quickmike type) can be attached.

Deviation between the anvil and spindle in the vertical direction

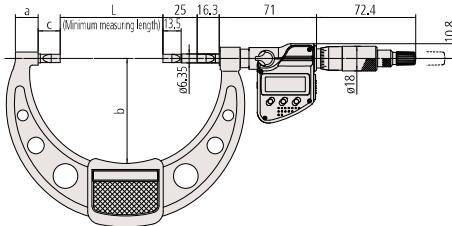


DIMENSIONS

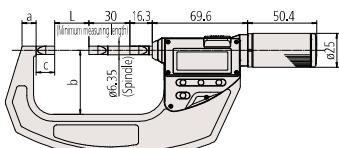
Digimatic models up to 50 mm measuring range



Digimatic models over 50 mm to 100 mm measuring range Unit: mm



Quickmike type



Code No.	L	a	b	C
422-230-30	0	11	31	12.5
422-231-30	25	12.2	50	12.6
422-232-30	50	14.6	57	13
422-233-30	75	16.7	76	16
422-260-30	0	11	31	12.5
422-261-30	25	12.2	50	12.6
422-270-30	0	11	31	12.5
422-271-30				
422-411-20		8.5	36	13.5
422-412-20	25	10.3	47	

Micrometer

02
Micrometers

Blade Micrometers

SERIES 122 — Non-rotating Spindle Type

- The anvil and the spindle have a blade for measuring the groove diameter of shafts, keyways and other hard-to-reach areas.
- Carbide-tipped measuring faces are available.
- Equipped with Ratchet Stop for constant measuring force.
- Non-rotating spindle type.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Remark
Analog					
122-101-10	0 - 25		± 3	3	
122-102-10	25 - 50		± 4	4	
122-103-10	50 - 75		± 5	5	
122-104-10	75 - 100		± 6	6	
122-105-10	100 - 125		± 3	3	Type B
122-106-10	125 - 150				
122-107-10	150 - 175				
122-108-10	175 - 200				
122-109-10	200 - 225				
122-110-10	225 - 250				
122-115-10	250 - 275				
122-116-10	275 - 300				
122-111-10	0 - 25				
122-112-10	25 - 50				
Analog (With carbide tip)					
122-161-10	0 - 25				Type C
122-162-10	25 - 50				Type D
122-141-10	0 - 25				
122-142-10	25 - 50				

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Remark
Analog					
122-125-10	0 - 1		± 0.00015	0.00015	
122-126-10	1 - 2		± 0.0002	0.0002	
122-127-10	2 - 3		± 0.00015	0.00015	Type A
122-128-10	3 - 4				
122-135-10	0 - 1				Type B
122-151-10					Type D

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (301336), 1 pc.

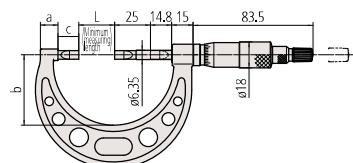
Note: A heat shield is provided with 122-125-10, 122-135-10, 122-151-10 as standard.

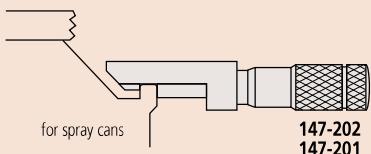
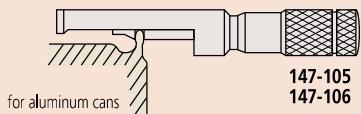
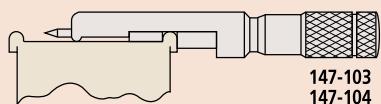
Special Purpose Micrometers

DIMENSIONS

Analog models up to 25 mm measuring range					Unit: mm
a	25	14.8	15	83.5	
c	15			81.0	
L					
Code No.	L	a	b	C	
122-101-10	0	7.8	32	15	
122-102-10	25	12.2	49		
122-103-10	50	14.6	60	14.5	
122-104-10	75	16.7	79	17.5	
122-105-10	100	18.8	94	17.9	
122-106-10	125	19.1	106	18.3	
122-107-10	150	18.2	118	18.5	
122-108-10	175	16.8	130	18.9	
122-109-10	200		143	17.7	
122-110-10	225		156		
122-115-10	250		169		
122-116-10	275		181	18.7	

Analog models over 25 mm to 300 mm measuring range



Measurement example

Can Seam Micrometers SERIES 147

- Measures the width, height, and depth of can seams.



147-103

SPECIFICATIONS**Metric**

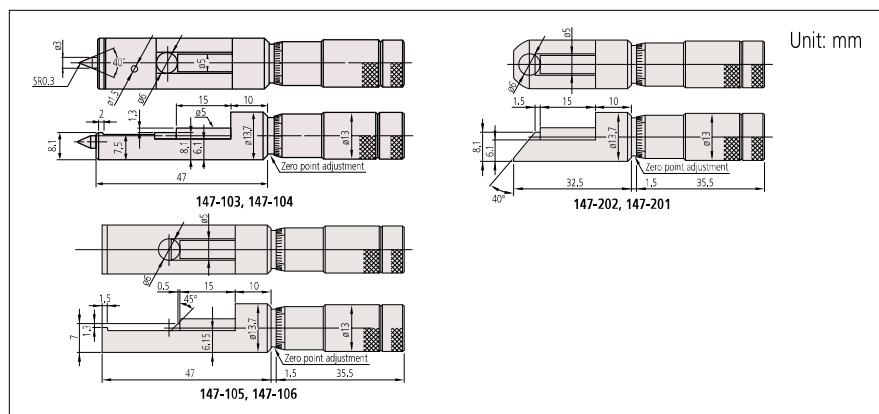
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Remarks
147-103*				—
147-105	0 - 13	0.01	± 3	for aluminum cans
147-202				for spray cans

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Remarks
147-104*				—
147-106	0 - 0.5	0.001	± 0.00015	for aluminum cans
147-201				for spray cans

• Standard Accessories: Spanner (200168), 1 pc. Spanner (202863), 1 pc.

* For depth measurements up to 5 mm.

DIMENSIONS

Hub Micrometers SERIES 147

Measurement example

147-301

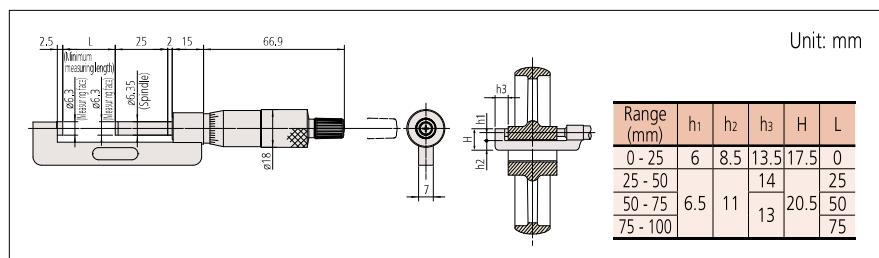
SPECIFICATIONS**Metric**

Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)
147-301	0 - 25				
147-302	25 - 50	0.01	± 2		
147-303	50 - 75		± 3	0.6	3
147-304	75 - 100				

Inch

Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Flatness (in)	Parallelism (in)
147-351	0 - 1				
147-352	1 - 2				
147-353	2 - 3				
147-354	3 - 4				

• Standard Accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (301336), 1 pc.

DIMENSIONS

Micrometer

02
Micrometers

Crimp Height Micrometers SERIES 342

- Measures the height of crimp contacts.
- Point spindle
- IP65 water/dust protection (Digimatic model).

- Equipped with Ratchet Stop for constant measuring force.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μ m)
Digimatic			
342-271-30	0 - 20	0.001	± 3
Quickmike			
342-451-20	0 - 15	0.001	± 3

Inch / Metric

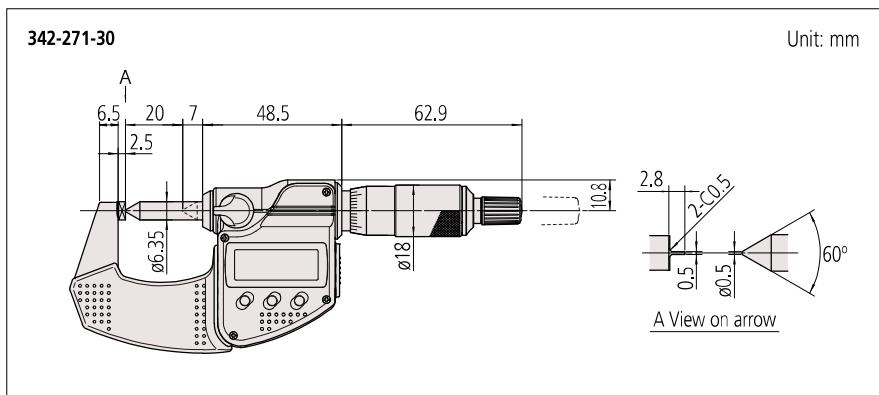
Code No.	Range (in)	Resolution	Maximum permissible error J_{MPE} (in)
Digimatic			
342-371-30	0 - 0.8	0.00005 in / 0.001 mm	± 0.00015

- Power source: SR44 battery (1 pc.), 938882 included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use (for 342-271-30/342-371-30)
Approx. 5 years under normal use (for 342-451-20)
- Position detection method: Electromagnetic rotary sensor (for 342-271-30/342-371-30)
Electrostatic capacity absolute sensor (for 342-451-20)
- Standard accessories: Spanner (301336), 1 pc. (except for 342-451-20)

Note: For functional details, refer to page 02-7.
Optional connection cable is available only for water-proof type (Digimatic model).

Special Purpose Micrometers

DIMENSIONS



MeasurLink™ ENABLED
Data Management Software by Mitutoyo
U-WAVE fit

ABSOLUTE™

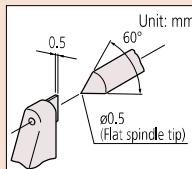
IP 65



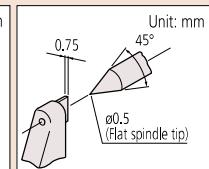
Measurement example



Anvil and spindle tip detail



342-271-30, 342-371-30



342-451-20

Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM*
264-623	Buzzer	U-WAVE-TM*
264-626	IP67	U-WAVE-TMB*
264-627	Buzzer	U-WAVE-TMB*
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB*

* 342-271-30 and 342-371-30 can be attached.
Not available for 342-451-20.

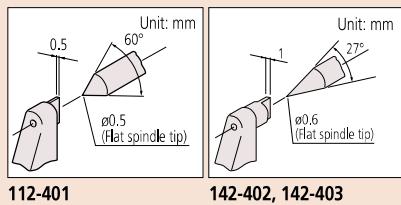
Crimp Height Micrometers SERIES 112,142

- Measures the height of crimp contacts.
- Point spindle
- Equipped with Ratchet Stop for constant measuring force.



112-401

Anvil and spindle tip detail



112-401

142-402, 142-403

SPECIFICATIONS

Metric	Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
Mechanical counter model				
	142-402	0 - 25	0.01	
	142-403		0.001	±3

Metric	Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
Analog				
	112-401	0 - 25	0.01	±3

- Standard accessories: Spanner (301336), 1 pc.

Micrometer

02
Micrometers

"Uni-Mike" SERIES 317, 117 — Interchangeable Anvil Type

- Measures tubing thickness, shoulder-edge distance, rivet head height, etc., with interchangeable anvils (flat anvil, rod anvil, V-anvil).
- IP65 water/dust protection (series 317).
- Equipped with Ratchet Stop for constant measuring force.



317-251-30

SPECIFICATIONS

Metric					
Code No.	Range (mm)	Resolution (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)
Digimatic					
317-251-30	0 - 25	0.001	3	0.6 (Spindle face)/ 2 (Anvil face)	3
317-252-30	25 - 50				
Inch/Metric					
Code No.	Range (in)	Resolution	Spindle feed error (in)	Flatness (in)	Parallelism (in)
Digimatic					
317-351-30	0 - 1	0.00005 in/0.001 mm	0.00015	0.000024 (Spindle face)/ 0.00008 (Anvil face)	0.00012
317-352-30	1 - 2				

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Battery life: Approx. 2.4 years under normal use
- Position detection method: Electromagnetic rotary sensor
- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (**301336**), 1 pc.

Note: For functional details, refer to page 02-7.

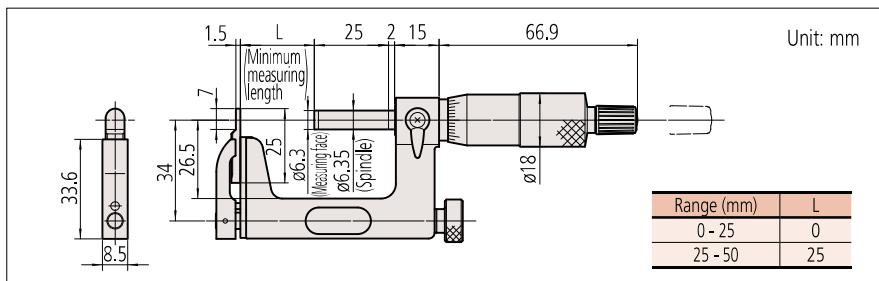
Optional connection cable is available only for water-proof type (Digimatic model).

SPECIFICATIONS

Metric					
Code No.	Range (mm)	Graduation (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)
Analog					
117-101	0 - 25	0.01	3	0.6 (Spindle face)/ 2 (Anvil face)	3
117-102	25 - 50				
Inch					
Code No.	Range (in)	Graduation (in)	Spindle feed error (in)	Flatness (in)	Parallelism (in)
Analog					
117-107	0 - 1	0.0001	0.00015	0.000024 (Spindle face)/ 0.00008 (Anvil face)	0.00012
117-108	1 - 2				

- Standard accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models), Spanner (**200877**), 1 pc.

DIMENSIONS



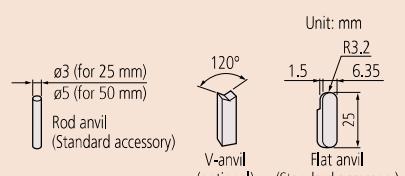
Applicable models: series 317

Measurement example



Optional Accessories

Code No.	Type	Description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
05CZA662	B	Connection cable (1 m)
05CZA663	B	Connection cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD730G	IP67	U-WAVE-T
02AZD880G	Buzzer	U-WAVE-T
02AZE200	—	U-WAVE-T mounting bracket
02AZD790B	B	Connection cable for U-WAVE-T (160 mm)
02AZE140B	B	Connection cable for U-WAVE-T For foot switch
264-622	IP67	U-WAVE-TM
264-623	Buzzer	U-WAVE-TM
264-626	IP67	U-WAVE-TMB
264-627	Buzzer	U-WAVE-TMB
02AZF310	IP67	Connecting unit for U-WAVE-TM/TMB



Code No.	Item
201216	Flat anvil (standard accessory)
201217	Rod anvil (standard accessory for 117-101/ 117-107/317-251-30/317-351-30)
201379	Rod anvil (standard accessory for 117-102/ 117-108/317-252-30/317-352-30)
201218	V-anvil (optional)
950758	Round Base for series 117, for 0-25 mm Ø58x14.2 mm (optional)

Measurement example

Limit Micrometers SERIES 113

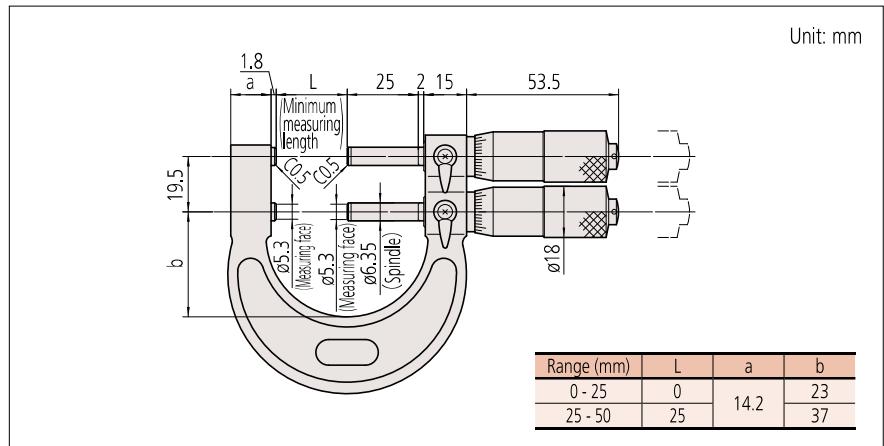
- Can be used as a Go/No-go gage by setting the upper and lower limits.

- Measuring faces: Carbide tipped

**SPECIFICATIONS**

Metric		Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Flatness (μm)	Parallelism (μm)
Code No.		0 - 25	0.01	± 3	0.6	3
	113-103	25 - 50				

- Standard Accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm and 0 to 1 in models)
Spanner (20087), 1 pc.

DIMENSIONS

Indicating Micrometers SERIES 510

- The micrometer with a built-in dial indicator enables accurate Go/No-go judgement without interruption. Pushing the retractable anvil button causes the anvil and pointer to move, enabling speedy measurements.
- Easy to use when operating one-handed due to retractable anvil.

- In the 25 mm measuring range, models are available that offer left or right positioning of the anvil-retraction button.
- Greatly improved accuracy: indication error and graduation of 1 µm.
- IP protection level: 54, coolant-splash resistant during grinding process.



SPECIFICATIONS

Metric

Code No.	Range (mm)	Spindle feed error (µm)	Flatness (µm)	Parallelism (µm)	Dispersion of indication (µm)	Dial indication accuracy (µm)	Indicating range (mm)	Graduation (mm)	Dial graduation (mm)	Measuring force (N)	Anvil retraction button	Mass (g)
510-121	0 - 25	3	0.3	0.6	0.4	1	±0.06	0.001	0.001	5 - 10	Right side	520

Inch

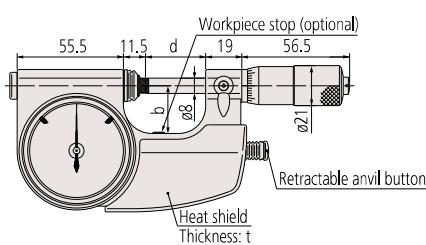
Code No.	Range (in)	Spindle feed error (in)	Flatness (in)	Parallelism (in)	Dispersion of indication (in)	Dial indication accuracy (in)	Indicating range (in)	Graduation (in)	Dial graduation (in)	Measuring force (N)	Anvil retraction button	Mass (g)
510-131	0 - 1	0.00015	0.000012	0.000024	0.00002	0.00005	±0.0023	0.0001	0.00005	5 - 10	Right side	520

- Standard Accessories: Spanner (200154), 1 pc.

DIMENSIONS

Up to 25 mm measuring range (anvil-retraction button on the right side)

Unit: mm



Range (mm)	b	d	t
0 - 25	25	31.5	16.4

Measurement example

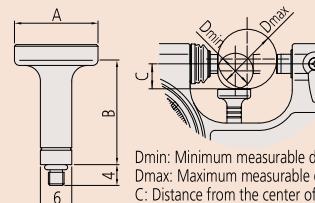


Workpiece stop (optional)

- Produces more stable measurement.
- Three types are available to suit workpieces of different sizes.

Unit: mm

Range	A	B
Workpiece stop A 04AZA124	ø16	23
Workpiece stop B 04AZA125	ø14	20.5
Workpiece stop C 04AZA126	ø14	15



Dmin: Minimum measurable diameter
Dmax: Maximum measurable diameter
C: Distance from the center of the workpiece to the upper surface of the workpiece stop

- Code No. 510-121, 510-141, 510-131, 510-151 Unit: mm

	Dmin	Dmax	C
Workpiece stop A	N/A	N/A	N/A
Workpiece stop B	4	16	5.0
Workpiece stop C	15	25	10.5

- 510-122 and 510-132

	Dmin	Dmax	C
Workpiece stop A	25	37	15.5
Workpiece stop B	30	42	18.0
Workpiece stop C	41	50	23.5

- 510-123 and 510-133

	Dmin	Dmax	C
Workpiece stop A	50	61	27.5
Workpiece stop B	54	66	30.0
Workpiece stop C	65	75	35.5

- 510-124 and 510-134

	Dmin	Dmax	C
Workpiece stop A	75	87	40.5
Workpiece stop B	80	92	43.0
Workpiece stop C	91	100	48.2

Measurement example

510-141

SPECIFICATIONS**Metric**

Code No.	Range (mm)	Spindle feed error (μm)	Flatness (μm)	Parallelism (μm)	Dispersion of indication (μm)	Dial indication accuracy (μm)	Indicating range (mm)	Graduation (mm)	Dial graduation (mm)	Measuring force (N)	Anvil retraction button	Mass (g)
510-141	0 - 25											530
510-122	25 - 50	3	0.3	0.6		0.4	1	± 0.06	0.001	0.001	5 - 10	Left side
510-123	50 - 75											670
510-124	75 - 100			1								820
												970

Inch

Code No.	Range (in)	Spindle feed error (in)	Flatness (in)	Parallelism (in)	Dispersion of indication (in)	Dial indication accuracy (in)	Indicating range (in)	Graduation (in)	Dial graduation (in)	Measuring force (N)	Anvil retraction button	Mass (g)
510-151	0 - 1				0.000024							530
510-132	1 - 2	0.00015	0.00012		0.00002	0.00005	± 0.0023	0.0001	0.00005	5 - 10	Left side	670
510-133	2 - 3				0.00004							820
510-134	3 - 4											970

- Standard Accessories: Setting standard, 1 pc. (except for measuring range 0 to 25 mm (0 to 1 in) models)
Spanner (200154), 1 pc.

DIMENSIONS

Up to 25 mm measuring range (anvil-retraction button on the left side)				Over 25 mm measuring range (anvil-retraction button on the left side)				Unit: mm
55.5	11.5	d	19	55.5	11.5	d	19	
Workpiece stop (optional)				Workpiece stop (optional)				
Retractable anvil button				Retractable anvil button				
Heat shield				Heat shield				
Thickness: t				Thickness: t				

Dial Snap Meters SERIES 523

- The snap meter with a built-in dial indicator enables accurate Go/No-go judgement without interruption. Pushing the retractable anvil button causes the anvil and pointer to move, enabling speedy measurements.
- Designed for use with a stand to enable a more stable measurement.

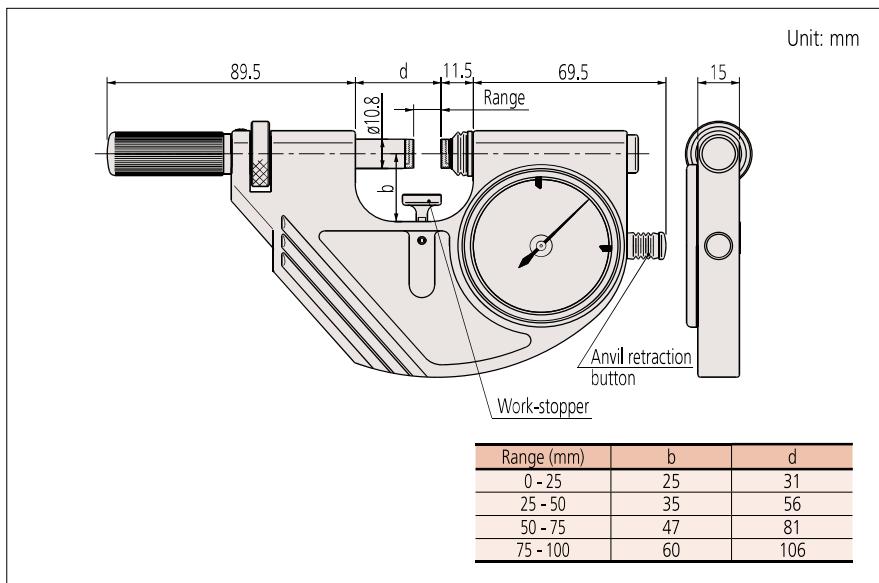
- Greatly improved accuracy: indication accuracy and graduation of 1 μm .
- IP protection level: 54, coolant-splash resistant during grinding process.
- Hard-coated crystal: enhanced oil and scratch resistance.

**SPECIFICATIONS****Metric**

Code No.	Range (mm)	Dial graduation (mm)	Measuring force (N)	Flatness (μm)	Parallelism (μm)	Dispersion of indication (μm)	Dial indication accuracy (μm)	Indicating range (mm)	Mass (g)
523-121	0 - 25				0.6				740
523-122	25 - 50	0.001	5 - 10	0.3		0.4	1	± 0.06	840
523-123	50 - 75				1				950
523-124	75 - 100								1080

Inch

Code No.	Range (in)	Dial graduation (in)	Measuring force (N)	Flatness (in)	Parallelism (in)	Dispersion of indication (in)	Dial indication accuracy (in)	Indicating range (in)	Mass (g)
523-131	0 - 1				0.000024				740
523-132	1 - 2	0.00005	5 - 10	0.000012		0.00002		± 0.0023	840
523-133	2 - 3				0.00004		0.00005		950
523-134	3 - 4								1080

DIMENSIONS**Measurement example**

Mounting example

ABS Digimatic Indicator



Linear Gage and counter

Typical indicators used with gage

- ID-C (0.0005 mm): **543-700B**
- LGF-L (0.0001 mm): **542-192** & Counter **542-075** & Conversion plug **21HZA195**

**Snap Meters
SERIES 523**

- The snap meter with an external indicator enables accurate Go/No-go judgement without interruption. Pushing the retractable anvil button causes the anvil and pointer to move, enabling speedy measurements.
- Select your preferred indicator. The measurement result can be externally output using an indicator with an output function.
- Measuring faces: Carbide tipped

523-141
(Indicator: optional)**SPECIFICATIONS****Metric**

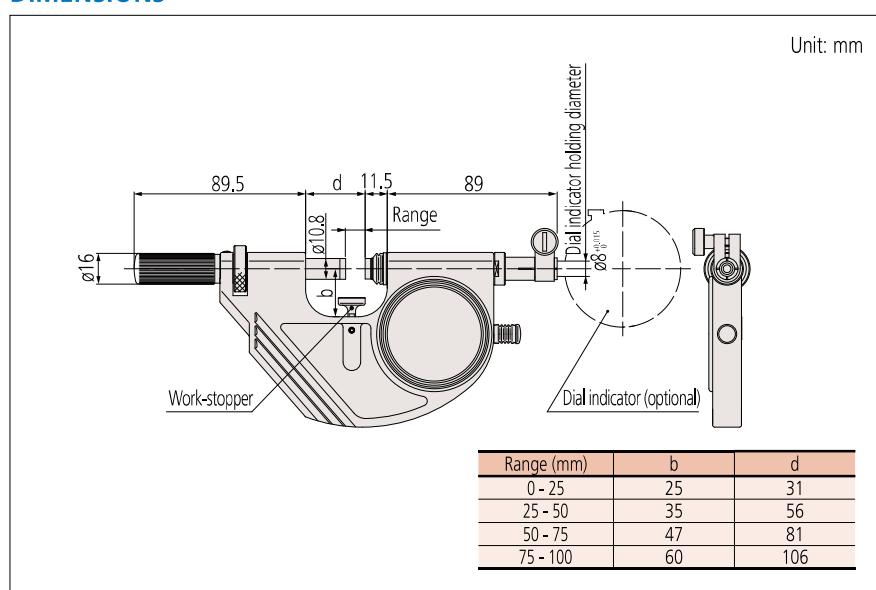
Code No.	Range (mm)	Anvil movement (mm)	Measuring force* (N)	Repeatability of indication (μm)	Flatness (μm)	Parallelism (μm)	Mass (g)
523-141	0 - 25					0.6	710
523-142	25 - 50						810
523-143	50 - 75						920
523-144	75 - 100					1	1050

Inch

Code No.	Range (in)	Anvil movement (in)	Measuring force* (N)	Repeatability of indication (in)	Flatness (in)	Parallelism (in)	Mass (g)
523-151	0 - 1					0.000024	710
523-152	1 - 2						810
523-153	2 - 3						920
523-154	3 - 4					0.00004	1050

* Measuring force before an indicator is mounted.

Measured at the position where the anvil is retracted by 1 mm from the free position without installing the indicator.

DIMENSIONS

Micrometer

02
Micrometers

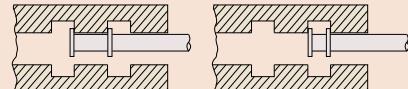
Groove Micrometers SERIES 146

- Flanged spindle and anvil for measuring width and location of grooves inside bores and tubes.
- Two-directional ratchet stop.
- For OD (except for 0 - 25 mm) and ID measurements, a master gage is required for adjusting the reference point.
- Non-rotating spindle.



146-221

Measurement example



SPECIFICATIONS

Metric

Code No.	Range Inside (mm)	Range Outside (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Parallelism (μm)	Flange (mm)			
146-221	1.6 - 26.5	0 - 25	0.01	± 10	10	$\varnothing 6.35$			
146-222						$\varnothing 12.7$			
146-223	26.5 - 51.5	25 - 50				$\varnothing 6.35$			
146-224						$\varnothing 12.7$			
146-225	51.5 - 76.5	50 - 75	0.01	± 10	10	$\varnothing 12.7$			
	76.5 - 101.5	75 - 100				$\varnothing 12.7$			

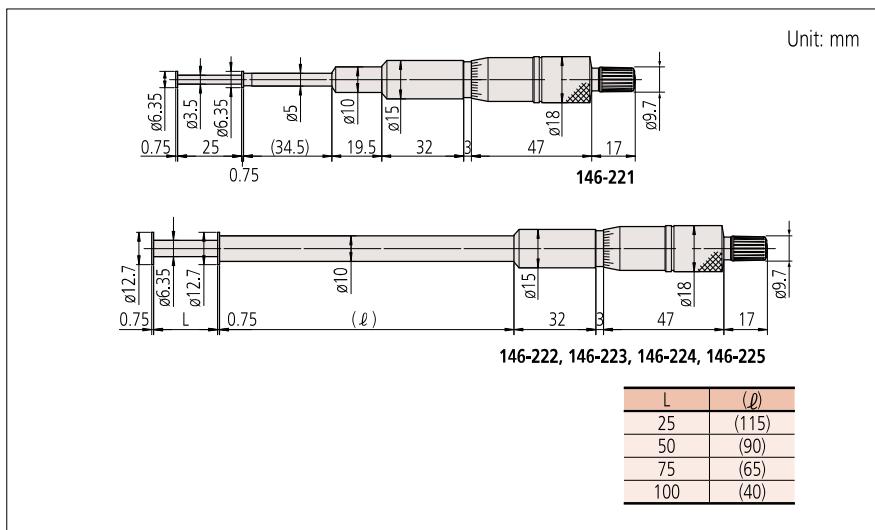
Inch

Code No.	Range Inside (in)	Range Outside (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Parallelism (in)	Flange (in)			
146-231	0.055 - 1.05	0 - 1	0.001	± 0.0004	0.0004	$\varnothing 0.25$			
146-232						$\varnothing 0.5$			
146-233	1.05 - 2.05	1 - 2				$\varnothing 0.25$			
146-234						$\varnothing 0.5$			
146-235	2.05 - 4.05	2 - 4				$\varnothing 0.5$			

• Standard accessories: Spanner (301336), 1 pc.

Special Purpose Micrometers

DIMENSIONS



Measurement example**Functions**

ABS measurement function:

after a data is displayed, next measurement can be performed without zero-setting. Also, the ABS origin point can be changed with ORIGIN switch.

INC measurement function:

clears the displayed data at any point. The comparative measurement can be easily performed.

Low battery alarm:

notifies that the battery is wearing down with "B" mark before becoming immeasurable. Thus, the timing for battery replacement can be confirmed in advance.

Typical applications:

- Measurement of small workpieces:
Pearl, jewel, engine tappet shim, screws.

- Measurement of thin workpieces:

Printing paper, polyethylene bags, sheet material, noodles and other food products, medium substrate, foil, thin plate, filter cloth and other medical supplies.

- Measurement of thin lines and bars: Fishing line, dental reamers, spaghetti, drill for PCBs, wiring.

QUICKmini SERIES 700

- Lightweight and palm-sized.
- Highly suitable for quick dimensional inspection of small, thin and delicate objects.



700-119-30

SPECIFICATIONS

Metric

Code No.	Range (mm)	Resolution (mm)	Accuracy* (mm)	Maximum response speed	Measuring force (N)	Mass (g)
700-119-30	0 - 12	0.01	±0.02	Unlimited	2 or less	100

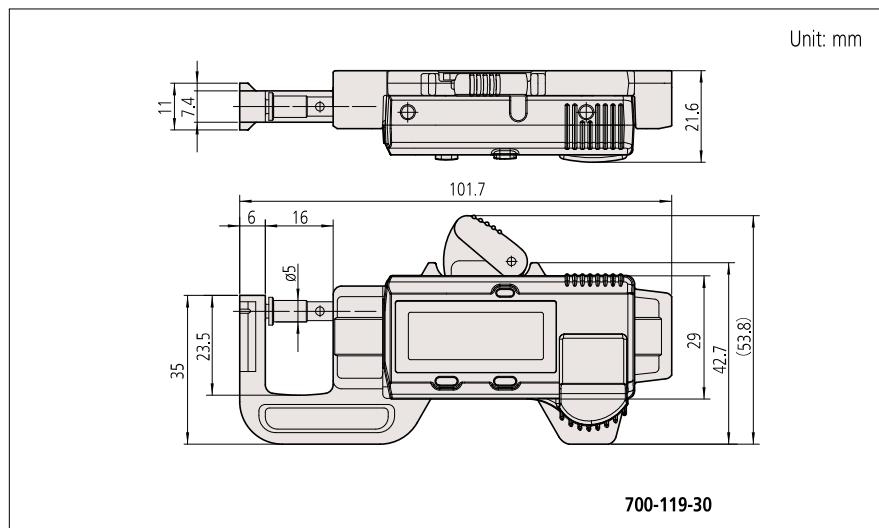
Inch/Metric

Code No.	Range (in)	Resolution	Accuracy* (in)	Maximum response speed	Measuring force (N)	Mass (g)
700-118-30	0 - 0.5	0.0005 in/0.01 mm	±0.001	Unlimited	2 or less	100

- Power source: SR44 battery (1 pc), 938882 included as standard (for operational checks)

- Battery life: Approx. 5 years under normal use

* Excluding quantizing error of ±1 count

DIMENSIONS

700-119-30

Telescoping Gage Set SERIES 155

- The tools are for comparing and measuring the diameters of extremely small holes or the widths of narrow grooves that are hard to measure with the other measuring instruments.
- A spring-loaded plunger expands within a bore (or groove) and is locked in place allowing diameter measurements (or width) with an outside micrometer after extraction.



Typical application



SPECIFICATIONS

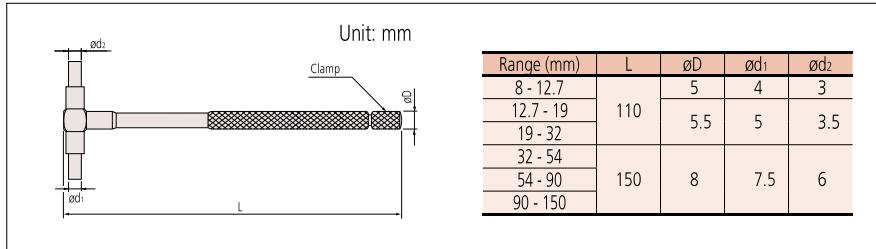
Metric

Code No.	Range (mm)
6-gage Set	
155-905	8 - 150
Gages included	
155-127	8 - 12.7
155-128	12.7 - 19
155-129	19 - 32
155-130	32 - 54
155-131	54 - 90
155-132	90 - 150
5-gage Set	
155-904	0.5 - 6
Gages included	
155-122	0.5 - 0.75
155-123	0.75 - 1.25
155-124	1.25 - 2.125
155-125	2.125 - 3.5
155-126	3.5 - 6

Inch

Code No.	Range (in)
6-gage Set	
155-903	0.313 - 6
Gages included	
155-121	0.313 - 0.5
155-122	0.5 - 0.75
155-123	0.75 - 1.25
155-124	1.25 - 2.125
155-125	2.125 - 3.5
155-126	3.5 - 6
4-gage Set	
155-907	0.313 - 2.125
Gages included	
155-121	0.313 - 0.5
155-122	0.5 - 0.75
155-123	0.75 - 1.25
155-124	1.25 - 2.125

DIMENSIONS



Typical application

Optical Parallels SERIES 157

- Designed to inspect parallelism and flatness of measuring faces of micrometers. For details, refer to "Quick Guide to Precision Measuring Instruments" on page 13-9.
- Each set consists of 4 sizes to enable testing parallelism at quarter-turn positions of the micrometer spindle.



157-903

SPECIFICATIONS**Metric**

Code No.	Range of micrometer to be checked (mm)	Sizes of parallels included in set (mm)	Diameter (mm)	Flatness (μm)	Parallelism (μm)	Remarks (mm)
157-903	0 - 25	12.00, 12.12, 12.25, 12.37				For 25
157-904	25 - 50	25.00, 25.12, 25.25, 25.37	ø30	0.1	0.2	For 50

Inch

Code No.	Range of micrometer to be checked (in)	Sizes of parallels included in set (in)	Diameter (mm)	Flatness (μm)	Parallelism (μm)	Remarks (mm)
157-901	0 - 1	0.5000, 0.5062, 0.5125, 0.5187				For 25
157-902	1 - 2	1.0000, 1.0062, 1.0125, 1.0187	ø30	0.1	0.2	For 50

Note: Also available individually, using the following Code No.

Metric

Code No.	Thickness (mm)
157-101	12.00
157-102	12.12
157-103	12.25
157-104	12.37

Metric

Code No.	Thickness (mm)
157-105	25.00
157-106	25.12
157-107	25.25
157-108	25.37

Inch

Code No.	Thickness (in)
157-109	0.5000
157-110	0.5062
157-111	0.5125
157-112	0.5187

Inch

Code No.	Thickness (in)
157-113	1.0000
157-114	1.0062
157-115	1.0125
157-116	1.0187

Optical Flats SERIES 158

Typical application

- Used for inspecting the flatness of measuring faces with high accuracy. For details, refer to "Quick Guide to Precision Measuring Instruments" on page 13-9.



158-118

SPECIFICATIONS**Metric**

Code No.	Thickness (mm)	Diameter (mm)	Flatness grade (μm)
158-117	12	45	0.2
158-118			0.1
158-119	15	60	0.2
158-120			0.1

Inch

Code No.	Thickness (in)	Diameter (in)	Flatness grade (in)
158-121	0.5	1.8	0.000008
158-122			0.000004
158-123	0.6	2.4	0.000008
158-124			0.000004

Setting Standards for Outside Micrometers SERIES 167

- Used for setting the zero point on outside micrometers.



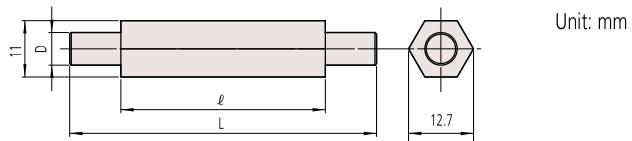
167-108

Typical application



SPECIFICATIONS and DIMENSIONS

167-101 to 167-103
167-141 to 167-143



Unit: mm

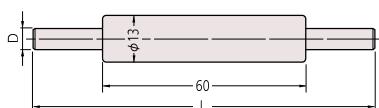
Metric

Code No.	Length $\langle\!\rangle$ (mm)	Accuracy (μm)	Parallelism (μm)	Flatness (μm)	l (mm)	Diameter $\langle\!\rangle D$ (mm)
167-101	25	± 1.5			18	6.35
167-102	50	± 2.0	2.0	0.3	40	
167-103	75	± 2.5				

Inch

Code No.	Length $\langle\!\rangle$ (in)	Accuracy (in)	Parallelism (in)	Flatness (in)	l (mm)	Diameter $\langle\!\rangle D$ (in)
167-141	1	± 0.00005			18	
167-142	2	± 0.0001	0.00008	0.000012	40	0.25
167-143	3	± 0.0001				

167-104 to 167-107
167-144 to 167-147



Unit: mm

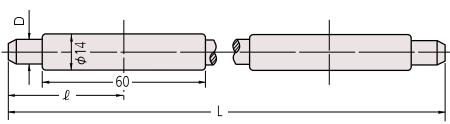
Metric

Code No.	Length $\langle\!\rangle$ (mm)	Accuracy (μm)	Parallelism (μm)	Flatness (μm)	Diameter $\langle\!\rangle D$ (mm)
167-104	100	± 3			
167-105	125	± 3.5	2.0	0.3	7.9
167-106	150	± 4			
167-107	175	± 4.5			

Inch

Code No.	Length $\langle\!\rangle$ (in)	Accuracy (in)	Parallelism (in)	Flatness (in)	Diameter $\langle\!\rangle D$ (in)
167-144	4	± 0.0001			
167-145	5		0.00008	0.000012	0.31
167-146	6	± 0.00015			
167-147	7				

167-108 to 167-119
167-148 to 167-159



Unit: mm

Metric

Code No.	Length $\langle\!\rangle$ (mm)	Accuracy (μm)	Parallelism (μm)	Flatness (μm)	l (mm)	Diameter $\langle\!\rangle D$ (mm)
167-108	200	± 5.0			47	
167-109	225	± 5.5			52	
167-110	250	± 6.0			57	
167-111	275	± 6.5			64	
167-112	300	± 7			69	
167-113	325	± 7.5			74	
167-114	350	± 8			80	
167-115	375	± 8.5			85	
167-116	400	± 9			90	
167-117	425	± 9.5			95	
167-118	450	± 10			101	
167-119	475	± 10.5				

Inch

Code No.	Length $\langle\!\rangle$ (in)	Accuracy (in)	Parallelism (in)	Flatness (in)	l (mm)	Diameter $\langle\!\rangle D$ (in)
167-148	8	± 0.00015			47	
167-149	9	± 0.0002			52	
167-150	10	± 0.0002			57	
167-151	11	± 0.0002			64	
167-152	12	± 0.00025	0.00008	0.000012	69	0.37
167-153	13	± 0.00025			74	
167-154	14	± 0.00025			80	
167-155	15	± 0.00025			85	
167-156	16	± 0.00025			90	
167-157	17	± 0.00025			95	
167-158	18	± 0.00025			101	
167-159	19	± 0.0003				

Micro Checker (holder only)

516-607

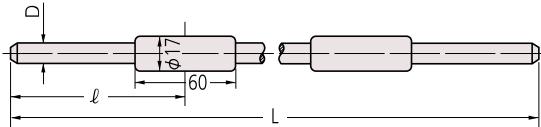


Setting Standards for Outside Micrometers

SERIES 167

167-120 to 167-404
167-160 to 167-180

Unit: mm

**Metric**

Code No.	Length $\angle D$ (mm)	Accuracy (μm)	Parallelism (μm)	Flatness (μm)	l (mm)	Diameter $\angle D$ (mm)
167-120	500	± 11			106	
167-121	525	± 11.5			112	
167-122	550	± 12			117	
167-123	575	± 12.5			122	
167-124	600	± 13			128	
167-125	625	± 13.5			133	
167-126	650	± 14			138	
167-127	675	± 14.5			142	
167-128	700	± 15			147	
167-129	725	± 15.5			153	
167-130	750	± 16			158	
167-131	775	± 16.5			164	
167-132	800	± 17			170	
167-133	825	± 17.5			175	
167-134	850	± 18			180	
167-135	875	± 18.5			185	
167-136	900	± 19			191	
167-137	925	± 19.5			196	
167-138	950	± 20			201	
167-139	975	± 20.5			207	
167-140	1000	± 21			211	
167-365	1025	± 21.5			217	
167-366	1050	± 22			222	
167-367	1075	± 22.5			227	
167-368	1100	± 23			232	
167-369	1125	± 23.5			238	
167-370	1150	± 24			243	
167-371	1175	± 24.5			248	
167-372	1200	± 25			254	
167-373	1225	± 25.5			259	
167-374	1250	± 26			264	
167-375	1275	± 26.5			269	
167-376	1300	± 27			275	
167-377	1325	± 27.5			280	
167-378	1350	± 28			285	
167-379	1375	± 28.5			291	
167-380	1400	± 29			296	
167-381	1425	± 29.5			301	
167-382	1450	± 30			306	
167-383	1475	± 30.5			312	
167-384	1500	± 31			317	
167-385	1525	± 31.5			322	
167-386	1550	± 32			328	
167-387	1575	± 32.5			333	
167-388	1600	± 33			338	
167-389	1625	± 33.5			343	
167-390	1650	± 34			349	
167-391	1675	± 34.5			354	
167-392	1700	± 35			359	
167-393	1725	± 35.5			364	
167-394	1750	± 36			370	
167-395	1775	± 36.5			375	
167-396	1800	± 37			380	
167-397	1825	± 37.5			386	
167-398	1850	± 38			391	
167-399	1875	± 38.5			396	
167-400	1900	± 39			401	
167-401	1925	± 39.5			407	
167-402	1950	± 40			412	
167-403	1975	± 40.5			417	
167-404	2000	± 41			423	

2.0 0.3 11.9

Inch

Code No.	Length $\angle D$ (in)	Accuracy (in)	Parallelism (in)	Flatness (in)	l (mm)	Diameter $\angle D$ (in)
167-160	20	± 0.0003			106	
167-161	21	± 0.0003			112	
167-162	22	± 0.0003			117	
167-163	23	± 0.0003			122	
167-164	24	± 0.0003			128	
167-165	25	± 0.00035			133	
167-166	26	± 0.00035			138	
167-167	27	± 0.00035			142	
167-168	28	± 0.00035			147	
167-169	29	± 0.00035			153	
167-170	30	± 0.00035	0.00008	0.000012	158	0.47
167-171	31	± 0.00035			164	
167-172	32	± 0.00035			170	
167-173	33	± 0.00035			175	
167-174	34	± 0.00035			180	
167-175	35	± 0.00035			185	
167-176	36	± 0.00035			191	
167-177	37	± 0.0004			196	
167-178	38	± 0.0004			201	
167-179	39	± 0.0004			207	
167-180	40	± 0.0004			211	

Note: Available up to 79 in

Micrometer

Setting Standards for Screw Thread Micrometers SERIES 167

- Used to set the zero point of screw thread micrometers.



Typical application



Metric		
Code No.	Length <L> (mm)	Accuracy (μm)
Metric (unified) $\Theta=60^\circ$		
167-261	25	± 4
167-262	50	± 5
167-263	75	± 6
167-264	100	± 7
167-265	125	± 8
167-266	150	± 9
167-267	175	± 10
167-268	200	± 11
167-269	225	± 12
167-270	250	± 13
167-271	275	± 14
Whitworth $\Theta=55^\circ$		
167-272	25	± 4
167-273	50	± 5
167-274	75	± 6
167-275	100	± 7
167-276	125	± 8
167-277	150	± 9
167-278	175	± 10
167-279	200	± 11
167-280	225	± 12
167-281	250	± 13
167-282	275	± 14

Inch		
Code No.	Length <L> (in)	Accuracy (in)
Metric (unified) $\Theta=60^\circ$		
167-294	1	± 0.00015
167-295	2	± 0.0002
167-296	3	± 0.00025
167-297	4	± 0.0003
167-298	5	± 0.00035
167-299	6	± 0.0004
Whitworth $\Theta=55^\circ$		
167-283	1	± 0.00015
167-284	2	± 0.0002
167-285	3	± 0.00025
167-286	4	± 0.0003
167-287	5	± 0.00035
167-288	6	± 0.0004

Setting Standards for V-anvil Micrometers SERIES 167

- Used for setting the zero point of V-anvil micrometers.



Typical application



Metric			
Code No.	Length <L> (mm)	Accuracy (μm)	Type
167-327	5	± 2	Plug
167-328	10		
167-329	25		
167-330	40	± 3	Ring
167-331	55		
167-332	70		
167-333	85	± 5	Ring
167-334	100		
167-335	115		
167-336	130		

Inch			
Code No.	Length <L> (in)	Accuracy (in)	Type
167-337	0.2		
167-338	0.4	± 0.0001	Plug
167-339	1		
167-340	1.6	± 0.00015	Ring

Measurement example

3-Wire Units SERIES 313

- Enables pitch diameter measurements of screw threads when attached to the measuring faces of both the spindle and anvil of a micrometer.



952141

SPECIFICATIONS

Code No. (One pair) (Support spindle dia.)	Wire dia. (mm)	Accuracy of wire diameter (mm)	Pitch		
			Metric thread (mm)	Unified thread (threads per inch)	Whitworth thread (threads per inch)
952131	0.170	±0.002	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

3-Wire Units set

Code No.	Set	Wire dia. (mm)	Support spindle dia. (mm)
313-101	18	0.170 - 3.200	6.35

Note 1: Special-specification 3-wire units with a wire diameter other than those listed above ($\phi 0.15$ mm or more) can also be made to order.

Note 2: Due to potential obstruction, the 3-wire unit cannot be used with screws having an external diameter exceeding $\phi 50$ mm.

Lubricant for Measuring Tools

- The oil is for maintaining measuring tools.

Note: May not be used for some parts such as the spindle of a dial indicator or Digimatic indicator.

207000
(32 ml)**SPECIFICATIONS**

Code No.	Product name	Remarks
207000*	Micrometer oil	Grease (32 ml)

* Not available in certain countries and regions.

Micrometer

02
Micrometers

Color-Coded Ratchet and Speeder Covers

- Ratchet and speeder covers in a choice of seven colors for use in instrument identification control schemes: red, blue, yellow, green, brown, black and gray.



SPECIFICATIONS

Analog type: 0 to 300 mm

Ratchet	Code No.	Speeder	Color	Material
04GZA239	04GAA260		Gray	
985056	301708		Black	
985061	301709		Red	
985081	301713		Blue	
985071	301711		Yellow	
985076	301712		Green	
985066	301710		Brown	
950700	—		Gray	Steel

Analog/Digimatic types: 300 to 1000 mm

Ratchet	Code No.	Speeder	Color	Material
04GZA243	04GAA260		Gray	
—	301708		Black	
—	301709		Red	
—	301713		Blue	
—	301711		Yellow	
—	301712		Green	
—	301710		Brown	
950701	—		Gray	Steel

Digimatic type 0 to 300 mm*

Ratchet	Code No.*	Speeder	Color	Material
04AZB661	04GAA260		Gray	
04GZA241	04GAA260		Gray	
—	301708		Black	
—	301709		Red	
—	301713		Blue	
—	301711		Yellow	
—	301712		Green	
—	301710		Brown	
951588	—		Gray	Steel

* Cannot be used for analog types.

Accessories, Options

Color-coded speeder covers



SPECIFICATIONS

Code No.	Color
04GAA899	Black
04GAA900	Red
04GAA901	Yellow
04GAA902	Green
04GAA903	Blue
04AAB208	Gray

Mitutoyo

Typical application

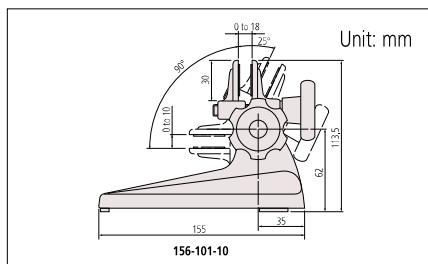
156-101-10

**Micrometer Stands
SERIES 156**

- Dedicated stand for micrometers.



156-101-10

DIMENSIONS**Typical application**

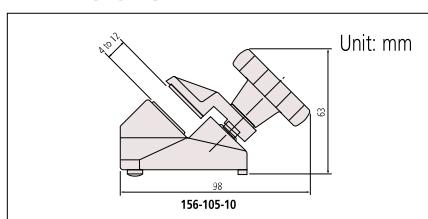
156-105-10



156-105-10

SPECIFICATIONS

Code No.	Measuring range of standard outside micrometer	Remarks
156-105-10	25, 50 mm (1, 2 in)	Fixed angle type

DIMENSIONS**Typical application**

156-102



156-102



156-103

SPECIFICATIONS

Code No.	Measuring range of standard outside micrometer	Remarks
156-102	100 - 300 mm (4 - 12 in)	Vertical type
156-103	325 - 1000 mm (13 - 40 in)	Vertical type

DIMENSIONS