

08

Inside Measuring Instruments

MeasurLink[®] ENABLED

Data Management Software by Mitutoyo

Measurement Data Network System

MeasurLink[®] is a measurement data management system based on databases (SQL Server). You can build a network to manage the measurement results and measuring instruments simply by combining the required functions.

MeasurLink[®] is a registered trademark of Mitutoyo Corporation in Japan and Mitutoyo America Corporation in the United States.



IP Codes

The code indicates the degree of protection against the ingress of foreign materials and water as defined in the IEC standard (IEC 60529). The number indicates the protection level. (Refer to page 3)



TÜV Rheinland Certification Marks

All products with the marks have passed the IP test carried out by the German accreditation organization, TÜV Rheinland.



Measuring Instruments Shipped with Inspection Certificate

Mitutoyo guarantees product quality as a leading precision measuring instrument manufacturer and ships measuring instruments with an inspection certificate that includes inspection data so that customers can use them with confidence.

ABSOLUTE[™]

ABSOLUTE Linear Encoder

Mitutoyo developed the unique ABSOLUTE method to retain position information after the power is turned off. The origin is set once - thereafter the live position is displayed when the power is turned on.



Digimatic Holtest



Holtest



ABSOLUTE Borematic



Inside Micrometers (Caliper Type)



Bore Gages

INDEX

Holtest

Digimatic Holtest	08-3
Holtest	08-7
Holtest (Type II)	08-11

Borematic

ABSOLUTE Borematic	08-13
--------------------------	-------

Inside Micrometers

Tubular Inside Micrometers (Single-Rod Type)	08-17
Tubular Inside Micrometers (Extension-Rod Type)	08-19
Tubular Inside Micrometers (Extension-Pipe Type)	08-22
Inside Micrometers (Caliper Type)	08-26
Inside Micrometers (Interchangeable-Rod Type)	08-29
Inside Micro Checker	08-30

Bore Gages

Bore Gages (Extra Small Holes)	08-31
Bore Gage Stand	08-34
Bore Gages (Small Holes)	08-35
Bore Gages	08-37
Bore Gages (Short Leg Type)	08-41
Bore Gages (Micrometer Head)	08-44
Bore Gages (Blind Holes)	08-47
ABSOLUTE Digimatic Bore Gages	08-49
Extension Rod	08-51
Recommended Indicators	08-52
Setting Rings	08-53
Bore Gage Checker	08-57

Digimatic Holtest SERIES 468 — Three-point Bore Micrometers

- These three-point bore Digimatic micrometers for inside measurement are suitable for highly accurate measurements.
- Can measure deep holes using an extension rod (optional).
- Can measure close to the bottom of a blind hole.
- Titanium-coated measuring pins provide excellent durability and impact resistance.
- Two values can be preset as a reference point, allowing you to store multiple measured values of setting rings and to quickly prepare for measurement.



SPECIFICATIONS

Metric				
Code No.	Range*2 (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)*1	Extension Rod (optional)
468-161	6 - 8	0.001	± 2 (maximum difference 2)	952322 (100 mm)
468-162	8 - 10			
468-163	10 - 12			
468-164	12 - 16			
468-165	16 - 20			
468-166	20 - 25			
468-167	25 - 30		± 3 (maximum difference 3)	952622 (150 mm)
468-168	30 - 40			
468-169	40 - 50			
468-170	50 - 63			
468-171	62 - 75			
468-172	75 - 88			
468-173	87 - 100		± 4 (maximum difference 4)	952623 (150 mm)
468-174	100 - 125			
468-175	125 - 150			
468-176	150 - 175			
468-177	175 - 200			
468-178	200 - 225			
468-179	225 - 250	± 5 (maximum difference 5)	952623 (150 mm)	
468-180	250 - 275			
468-181	275 - 300			
			± 6 (maximum difference 6)	

Inch / Metric				
Code No.	Range*2 (in)	Resolution	Maximum permissible error J_{MPE} (in)*1	Extension Rod (optional)
468-261	0.275 - 0.35	0.0005 in/ 0.001 mm	± 0.0001 (maximum difference 0.0001)	952322 (100 mm)
468-262	0.35 - 0.425			
468-263	0.425 - 0.5			
468-264	0.5 - 0.65			
468-265	0.65 - 0.8			
468-266	0.8 - 1			
468-267	1 - 1.2		± 0.00015 (maximum difference 0.00015)	952621 (150 mm)
468-268	1.2 - 1.6			
468-269	1.6 - 2			
468-270	2 - 2.5			
468-271	2.5 - 3			
468-272	3 - 3.5			
468-273	3.5 - 4		± 0.0002 (maximum difference 0.0002)	952622 (150 mm)
468-274	4 - 5			
468-275	5 - 6			
468-276	6 - 7			
468-277	7 - 8			
468-278	8 - 9			
468-279	9 - 10	± 0.00025 (maximum difference 0.00025)	952623 (150 mm)	
468-280	10 - 11			
468-281	11 - 12			
			± 0.0003 (maximum difference 0.0003)	

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
 - Battery life: Approx. 1.2 years under normal use
 - Position detection method: Electromagnetic induction-type rotary encoder
- *1 Additionally, the difference in permissible error allowable is limited to a value within this range, as given in parentheses, and is measured with the entire measuring surface in contact with the object measured.
- *2 The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).
- Note: Setting rings are optional.

DIMENSIONS

Unit: mm

Range	L2*	L1
6 - 8, 8 - 10, 10 - 12 mm	59	175 - 177
12 - 16, 16 - 20 mm	84	197 - 201
20 - 25, 25 - 30 mm	93	206 - 211
30 - 40, 40 - 50 mm	103	214 - 224
50 - 63, 62 - 75, 75 - 88, 87 - 100 mm	105	219 - 232
100 - 125, 125 - 150, 150 - 175, 175 - 200, 200 - 225, 225 - 250, 250 - 275, 275 - 300 mm	151	286 - 311

* L2 is maximum depth of measurement possible.
Note: External view differs depending on measurement range.

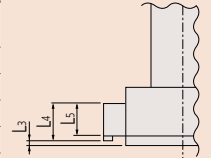


Measurement example



Reference dimensions when measuring a blind hole

Range (mm)	L3 (mm)	L4 (mm)	L5 (mm)
6 - 12	2 or below	—	2.5
12 - 20	0.3 or below	5.6	3.5
20 - 30		8.3	5.2
30 - 50		13.0	10.0
50 - 100	12.4 or below	17.0	14.0
100 - 300		21.0	13.8



Functions

- Zero-setting
- Origin restoration
- Data hold
- 2-point Preset
- Function lock
- inch/mm readout (inch/mm type)
- Automatic power ON/OFF
- Error alarm
- Data output

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)
02AZD730*	IP67	U-WAVE-T
02AZD880*	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

* Add suffix to Code No.; **G** for Asia, Europe and the Americas, **H** for Brazil and **J** for Korea.

Mounting bracket (optional)

A bracket used to fix a micrometer on the **MS-R** micrometer stand.
04AZB157



For details of Special-order Products, refer to page 13-16.

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)
02AZD730*	IP67	U-WAVE-T
02AZD880*	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

* Add suffix to Code No.; **G** for Asia, Europe and the Americas,
H for Brazil and **J** for Korea.

Interchangeable Head Sets



468-971

468-972

468-973

468-974

Metric		
Set code No.	Range* (mm)	Content of set
468-971	6 - 12	Display unit 6 - 12 mm 1 pc.
		Measuring head 6 - 8 mm 1 pc.
		8 - 10 mm 1 pc.
		10 - 12 mm 1 pc.
		Setting ring (ø8, ø10) 1 pc. each
		Extension rod (100 mm) 1 pc.
		Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.
468-972	12 - 20	Display unit 12 - 20 mm 1 pc.
		Measuring head 12 - 16 mm 1 pc.
		16 - 20 mm 1 pc.
		Setting ring (ø16) 1 pc.
		Extension rod (150 mm) 1 pc.
		Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.
		468-973
Measuring head 20 - 25 mm 1 pc.		
25 - 30 mm 1 pc.		
30 - 40 mm 1 pc.		
40 - 50 mm 1 pc.		
Setting ring (ø25, ø40) 1 pc. each		
Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.		
468-974	50 - 100	Display unit 50 - 100 mm 1 pc.
		Measuring head 50 - 63 mm 1 pc.
		62 - 75 mm 1 pc.
		75 - 88 mm 1 pc.
		87 - 100 mm 1 pc.
		Setting ring (ø62, ø87) 1 pc. each
		Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.

Inch / Metric		
Set code No.	Range* (in)	Content of set
468-976	0.275 - 0.5	Display unit 0.275 - 0.5 in 1 pc.
		Measuring head 0.275 - 0.35 in 1 pc.
		0.35 - 0.425 in 1 pc.
		0.425 - 0.5 in 1 pc.
		Setting ring (0.35 in DIA., 0.425 in DIA.) 1 pc. each
		Extension rod (100 mm) 1 pc.
		Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.
468-977	0.5 - 0.8	Display unit 0.5 - 0.8 in 1 pc.
		Measuring head 0.5 - 0.65 in 1 pc.
		0.65 - 0.8 in 1 pc.
		Setting ring (0.65 in DIA.) 1 pc.
		Extension rod (150 mm) 1 pc.
		Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.
		468-978
Measuring head 0.8 - 1 in 1 pc.		
1 - 1.2 in 1 pc.		
1.2 - 1.6 in 1 pc.		
1.6 - 2 in 1 pc.		
Setting ring (1 in DIA., 1.6 in DIA.) 1 pc. each		
Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.		
468-979	2 - 4	Display unit 2 - 4 in 1 pc.
		Measuring head 2 - 2.5 in 1 pc.
		2.5 - 3 in 1 pc.
		3 - 3.5 in 1 pc.
		3.5 - 4 in 1 pc.
		Setting ring (2.5 in DIA., 3.5 in DIA.) 1 pc. each
		Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.

* The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

Holtest

Digimatic Holtest SERIES 468 — Three-point Bore Micrometers

Interchangeable Head Sets



Setting rings are supplied as standard
($\varnothing 125$, $\varnothing 175$) (Packed separately)

468-975

Accessories (optional)

Refer to page 08-4.

Metric			Inch / Metric		
Set code No.	Range* (mm)	Content of set	Set code No.	Range* (in)	Content of set
468-975	100 - 200	Display unit	468-980	4 - 8	Display unit
		100 - 200 mm			4 - 8 in
		Measuring head			Measuring head
		100 - 125 mm			4 - 5 in
		125 - 150 mm			5 - 6 in
		150 - 175 mm			6 - 7 in
		175 - 200 mm			7 - 8 in
		Setting ring ($\varnothing 125$, $\varnothing 175$)			Setting ring (5 in DIA., 7 in DIA.)
1 pc. each	1 pc. each				
Extension rod (150 mm)	1 pc.	Extension rod (150 mm)	1 pc.		
Spanner	2 pcs.	Spanner	2 pcs.		
Hex wrench	1 pc.	Hex wrench	1 pc.		
Phillips screwdriver	1 pc.	Phillips screwdriver	1 pc.		

* The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

Accessories (optional)

Refer to page O8-4.

Non-interchangeable Head Sets



468-981

468-982

468-983

468-984

468-985

Metric				Inch / Metric			
Set code No.	Range*2 (mm)	Content of set	Extension rod (optional)	Set code No.	Range*2 (in)	Content of set	Extension rod (optional)
468-981	6 - 12	Display unit 6 - 8 mm 1 pc. 8 - 10 mm 1 pc. 10 - 12 mm 1 pc. Setting ring (ø8, ø10) 1 pc. each Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.	100 mm 1 pc.	468-986	0.275 - 0.5	Display unit 0.275 - 0.35 in 1 pc. 0.35 - 0.425 in 1 pc. 0.425 - 0.5 in 1 pc. Setting ring (0.35 in DIA., 0.425 in DIA.) 1 pc. each Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.	100 mm 1 pc.
468-982	12 - 25	Display unit 12 - 16 mm 1 pc. 16 - 20 mm 1 pc. 20 - 25 mm 1 pc. Setting ring (ø16, ø20) 1 pc. each Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 2 pcs.*1	468-987	0.5 - 1	Display unit 0.5 - 0.65 in 1 pc. 0.65 - 0.8 in 1 pc. 0.8 - 1 in 1 pc. Setting ring (0.65 in DIA., 0.8 in DIA.) 1 pc. each Spanner 2 pcs. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 2 pcs.*1
468-983	25 - 50	Display unit 25 - 30 mm 1 pc. 30 - 40 mm 1 pc. 40 - 50 mm 1 pc. Setting ring (ø30, ø40) 1 pc. each Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.	468-988	1 - 2	Display unit 1 - 1.2 in 1 pc. 1.2 - 1.6 in 1 pc. 1.6 - 2 in 1 pc. Setting ring (1.2 in DIA., 1.6 in DIA.) 1 pc. each Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.
468-984	50 - 75	Display unit 50 - 63 mm 1 pc. 62 - 75 mm 1 pc. Setting ring (ø62) 1 pc. Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.	468-989	2 - 3	Display unit 2 - 2.5 in 1 pc. 2.5 - 3 in 1 pc. Setting ring (2.5 in DIA.) 1 pc. Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.
468-985	75 - 100	Display unit 75 - 88 mm 1 pc. 87 - 100 mm 1 pc. Setting ring (ø87) 1 pc. Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.	468-990	3 - 4	Display unit 3 - 3.5 in 1 pc. 3.5 - 4 in 1 pc. Setting ring (3.5 in DIA.) 1 pc. Spanner 1 pc. Hex wrench 1 pc. Phillips screwdriver 1 pc.	150 mm 1 pc.

*1 Total 2 pcs. of extension rods: Code No. **952621** (for measuring range 12 to 16 mm, 16 to 20 mm) and code No. **952622** (for measuring range 20 to 25 mm).

Two extension rods cannot be connected due to the different mounting positions.

*2 The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).



Holtest SERIES 368 — Three-point/Two-point Bore Micrometers

- These are standard analog three-point bore micrometers. (A two-point contact type with measuring range of 2 to 6 mm diameter is available to measure extremely small holes.)
- Three-point bore micrometer allows stable measurement through self centering.
- Can measure close to the bottom of a blind hole.
- Titanium-coated measuring pins on the three-point type (over 6 mm range models) provide excellent durability and impact resistance.
- Three-point type can measure deep holes by attaching an extension rod (optional).



368-001
(Two-point contact type)

368-168
(Three-point contact type)

368-174
(Three-point contact type)

Measurement example



08 Inside Measuring Instruments

SPECIFICATIONS

Metric				
Code No.	Range*2 (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)*1	Extension Rod (optional)
(Two-point)		0.001	± 2 (maximum difference 2)	—
368-001	2 - 2.5			
368-002	2.5 - 3			
368-003	3 - 4			
368-004	4 - 5			
368-005	5 - 6			
(Three-point)		0.001	± 2 (maximum difference 2)	952322 (100 mm)
368-161	6 - 8			
368-162	8 - 10			
368-163	10 - 12			
368-164	12 - 16			
368-165	16 - 20			
368-166	20 - 25			
368-167	25 - 30			
368-168	30 - 40			
368-169	40 - 50			
368-170	50 - 63	0.005	± 3 (maximum difference 3)	952621 (150 mm)
368-171	62 - 75			
368-172	75 - 88			
368-173	87 - 100			
368-174	100 - 125			
368-175	125 - 150			
368-176	150 - 175			
368-177	175 - 200			
368-178	200 - 225			
368-179	225 - 250			
368-180	250 - 275			
368-181	275 - 300			
		± 5 (maximum difference 5)	952623 (150 mm)	
				± 6 (maximum difference 6)

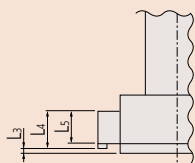
Inch							
Code No.	Range*2 (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)*1	Extension Rod (optional)			
(Two-point)		0.0001	± 0.0001 (maximum difference 0.0001)	—			
368-021	0.08 - 0.1						
368-022	0.1 - 0.12						
368-023	0.12 - 0.16						
368-024	0.16 - 0.2						
368-025	0.2 - 0.24						
368-026	0.24 - 0.28						
(Three-point)					0.0001	± 0.0001 (maximum difference 0.0001)	952322 (100 mm)
368-261	0.275 - 0.35						
368-262	0.35 - 0.425						
368-263	0.425 - 0.5						
368-264	0.5 - 0.65						
368-265	0.65 - 0.8						
368-266	0.8 - 1						
368-267	1 - 1.2						
368-268	1.2 - 1.6						
368-269	1.6 - 2						
368-270	2 - 2.5	0.0002	± 0.00015 (maximum difference 0.00015)	952621 (150 mm)			
368-271	2.5 - 3						
368-272	3 - 3.5						
368-273	3.5 - 4						
368-274	4 - 5						
368-275	5 - 6						
368-276	6 - 7						
368-277	7 - 8						
368-278	8 - 9						
368-279	9 - 10				± 0.0002 (maximum difference 0.0002)	952622 (150 mm)	
368-280	10 - 11						
368-281	11 - 12						
		± 0.00025 (maximum difference 0.00025)	952623 (150 mm)				
				± 0.0003 (maximum difference 0.0003)			

*1 Additionally, the difference in permissible error allowable is limited to a value within this range, as given in parentheses, and is measured with the entire measuring surface in contact with the object measured.

*2 The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed). Note: Setting rings are optional.

Reference dimensions when measuring a blind hole

Range (mm)	L ₃ (mm)	L ₄ (mm)	L ₅ (mm)
2 - 6	—	—	2
6 - 12	2 or below	—	2.5
12 - 20	0.3 or below	5.6	3.5
20 - 30		8.3	5.2
30 - 50		13.0	10.0
50 - 100		17.0	14.0
100 - 300	12.4 or below	21.0	13.8



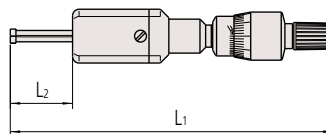
Typical application of Extension Rod



For details of Special-order Products, refer to page 13-16.

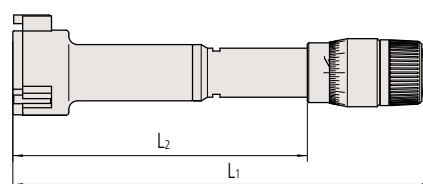
DIMENSIONS

Unit: mm



Range	L ₂	L ₁
2 - 2.5, 2.5 - 3 mm	12	103.5 - 104
3 - 4, 4 - 5, 5 - 6 mm	22	113 - 114

Note: External appearance differs depending on the measuring range.



Range	L ₂	L ₁
6 - 8, 8 - 10, 10 - 12 mm	59	102 - 104
12 - 16, 16 - 20 mm	82	126 - 130
20 - 25, 25 - 30 mm	94	137 - 142
30 - 40, 40 - 50 mm	102	145 - 155
50 - 63, 62 - 75, 75 - 88, 87 - 100 mm	105	150 - 163
100 - 125, 125 - 150, 150 - 175, 175 - 200, 200 - 225, 225 - 250, 250 - 275, 275 - 300 mm	161	227 - 252

Note: External appearance differs depending on the measuring range.

Holtest

Holtest SERIES 368 — Three-point/Two-point Bore Micrometers

Non-interchangeable Head Sets



368-906

368-907

368-911

368-912

Metric				Inch			
Set code No.	Range* (mm)	Graduation (mm)	Content of Set	Set code No.	Range* (in)	Graduation (in)	Content of Set
(Two-point) 368-906	2 - 3		Micrometer head unit 2 - 2.5 mm 1 pc. 2.5 - 3 mm 1 pc. Setting ring (ø2.5) 1 pc. Hex wrench 1 pc.	(Two-point) 368-926	0.08 - 0.12		Micrometer head unit 0.08 - 0.1 in 1 pc. 0.1 - 0.12 in 1 pc. Setting ring (0.1 in DIA.) 1 pc. Hex wrench 1 pc.
368-907	3 - 6	0.001	Micrometer head unit 3 - 4 mm 1 pc. 4 - 5 mm 1 pc. 5 - 6 mm 1 pc. Setting ring (ø4, ø5) 1 pc. each Hex wrench 1 pc.	368-927	0.12 - 0.28	0.0001	Micrometer head unit 0.12 - 0.16 in 1 pc. 0.16 - 0.2 in 1 pc. 0.2 - 0.24 in 1 pc. 0.24 - 0.28 in 1 pc. Setting ring (0.16 in DIA., 0.24 in DIA.) 1 pc. each Hex wrench 1 pc.
(Three-point) 368-911	6 - 12		Micrometer head unit 6 - 8 mm 1 pc. 8 - 10 mm 1 pc. 10 - 12 mm 1 pc. Setting ring (ø8, ø10) 1 pc. each Extension rod (100 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc.	(Three-point) 368-916	0.275 - 0.5		Micrometer head unit 0.275 - 0.35 in 1 pc. 0.35 - 0.425 in 1 pc. 0.425 - 0.5 in 1 pc. Setting ring (0.35 in DIA., 0.5 in DIA.) 1 pc. each Extension rod (100 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc.
368-912	12 - 20	0.005	Micrometer head unit 12 - 16 mm 1 pc. 16 - 20 mm 1 pc. Setting ring (ø16) 1 pc. Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc.	368-917	0.5 - 0.8	0.0002	Micrometer head unit 0.5 - 0.65 in 1 pc. 0.65 - 0.8 in 1 pc. Setting ring (0.65 in DIA.) 1 pc. Extension rod (150 mm) 1 pc. Spanner 2 pcs. Hex wrench 1 pc.

* The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

Non-interchangeable Head Sets



Metric				Inch			
Set code No.	Range* (mm)	Graduation (mm)	Content of Set	Set code No.	Range* (in)	Graduation (in)	Content of Set
368-913	20 - 50	0.005	Micrometer head unit	368-918	0.8 - 2	0.002	Micrometer head unit
			20 - 25 mm 1 pc.				0.8 - 1 in 1 pc.
			25 - 30 mm 1 pc.				1 - 1.2 in 1 pc.
			30 - 40 mm 1 pc.				1.2 - 1.6 in 1 pc.
			40 - 50 mm 1 pc.				1.6 - 2 in 1 pc.
			Setting ring (ø25, ø40) 1 pc. each				Setting ring (1 in DIA., 1.6 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.				Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.				Spanner 2 pcs.
			Hex wrench 1 pc.				Hex wrench 1 pc.
368-914	50 - 100	0.005	Micrometer head unit	368-919	2 - 4	0.002	Micrometer head unit
			50 - 63 mm 1 pc.				2 - 2.5 in 1 pc.
			62 - 75 mm 1 pc.				2.5 - 3 in 1 pc.
			75 - 88 mm 1 pc.				3 - 3.5 in 1 pc.
			87 - 100 mm 1 pc.				3.5 - 4 in 1 pc.
			Setting ring (ø62, ø87) 1 pc. each				Setting ring (2.5 in DIA., 3.5 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.				Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.				Spanner 2 pcs.
			Hex wrench 1 pc.				Hex wrench 1 pc.
368-915	100 - 200	0.005	Micrometer head unit	368-920	4 - 8	0.002	Micrometer head unit
			100 - 125 mm 1 pc.				4 - 5 in 1 pc.
			125 - 150 mm 1 pc.				5 - 6 in 1 pc.
			150 - 175 mm 1 pc.				6 - 7 in 1 pc.
			175 - 200 mm 1 pc.				7 - 8 in 1 pc.
			Setting ring (ø125, ø175) 1 pc. each				Setting ring (5 in DIA., 7 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.				Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.				Spanner 2 pcs.
			Hex wrench 1 pc.				Hex wrench 1 pc.

* The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

Holtest

Holtest (Type II) SERIES 368 — Three-point Bore Micrometers

- The Holtests (type II) have three contact points made of alloy steel for a more economically priced tool.
- Same accuracy as the titanium-coated Holtest models.
- Constant-force device allows stable measurement.
- Can measure deep holes using an extension rod (optional).



Measurement example



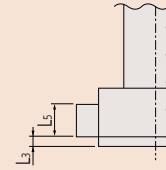
Reference dimensions when measuring a blind hole

Range (mm)	L ₃ (mm)	L ₅ (mm)
12 - 20	2.6 or below	3.5
20 - 30	3.4 or below	5.2
30 - 50		10.0
50 - 100		14.0
100 - 300	19.6 or below	13.8

SPECIFICATIONS

Metric Individual					Inch Individual				
Code No.	Range* ² (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)* ¹	Extension Rod (optional)	Code No.	Range* ² (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)* ¹	Extension Rod (optional)
368-764	12 - 16	0.005	±3 (maximum difference 3)	952621 (150 mm)	368-864	0.5 - 0.65	0.0002	±0.00015 (maximum difference 0.00015)	952621 (150 mm)
368-765	16 - 20				368-865	0.65 - 0.8			
368-766	20 - 25			952622 (150 mm)	368-866	0.8 - 1			
368-767	25 - 30				368-867	1 - 1.2			
368-768	30 - 40			952623 (150 mm)	368-868	1.2 - 1.6			
368-769	40 - 50				368-869	1.6 - 2			
368-770	50 - 63			±4 (maximum difference 4)	368-870	2 - 2.5			
368-771	62 - 75				368-871	2.5 - 3			
368-772	75 - 88			±5 (maximum difference 5)	368-872	3 - 3.5			
368-773	87 - 100				368-873	3.5 - 4			
368-774	100 - 125		±6 (maximum difference 6)	368-874	4 - 5				
368-775	125 - 150			368-875	5 - 6				
368-776	150 - 175		952623 (150 mm)	368-876	6 - 7				
368-777	175 - 200			368-877	7 - 8				
368-778	200 - 225		±0.00025 (maximum difference 0.00025)	368-878	8 - 9				
368-779	225 - 250			368-879	9 - 10				
368-780	250 - 275		±0.0003 (maximum difference 0.0003)	368-880	10 - 11				
368-781	275 - 300			368-881	11 - 12				

*1 Additionally, the difference in permissible error allowable is limited to a value within this range, as given in parentheses, and is measured with the entire measuring surface in contact with the object measured.
 *2 The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).
 Note: Setting rings are optional.



For details of Special-order Products, refer to page 13-16.

DIMENSIONS

Unit: mm	Range		
	L ₂	L ₁	
	82	126 - 130	
	94	137 - 142	
	102	145 - 155	
	105	150 - 163	
	161	227 - 252	

Note: External appearance differs depending on the measuring range.

Non-interchangeable Head Sets



368-991



368-992



368-993



Setting rings are supplied as standard (ø125, ø175) (Packed separately)

368-994

Metric			
Code No.	Range* (mm)	Graduation (mm)	Content of Set
368-991	12 - 20		Micrometer head unit
			12 - 16 mm 1 pc.
			16 - 20 mm 1 pc.
			Setting ring (ø16) 1 pc.
			Extension rod (150 mm) 1 pc.
368-992	20 - 50		Micrometer head unit
			20 - 25 mm 1 pc.
			25 - 30 mm 1 pc.
			30 - 40 mm 1 pc.
			40 - 50 mm 1 pc.
368-993	50 - 100	0.005	Micrometer head unit
			50 - 63 mm 1 pc.
			62 - 75 mm 1 pc.
			75 - 88 mm 1 pc.
			87 - 100 mm 1 pc.
368-994	100 - 200		Micrometer head unit
			100 - 125 mm 1 pc.
			125 - 150 mm 1 pc.
			150 - 175 mm 1 pc.
			175 - 200 mm 1 pc.
			Setting ring (ø125, ø175) 1 pc. each
			Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.
			Hex wrench 1 pc.

Inch			
Code No.	Range* (in)	Graduation (in)	Content of Set
368-995	0.5 - 0.8		Micrometer head unit
			0.5 - 0.65 in 1 pc.
			0.65 - 0.8 in 1 pc.
			Setting ring (0.65 in DIA.) 1 pc.
			Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.
			Hex wrench 1 pc.
368-996	0.8 - 2		Micrometer head unit
			0.8 - 1 in 1 pc.
			1 - 1.2 in 1 pc.
			1.2 - 1.6 in 1 pc.
			1.6 - 2 in 1 pc.
			Setting ring (1 in DIA., 1.6 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.
368-997	2 - 4	0.0002	Micrometer head unit
			2 - 2.5 in 1 pc.
			2.5 - 3 in 1 pc.
			3 - 3.5 in 1 pc.
			3.5 - 4 in 1 pc.
			Setting ring (2.5 in DIA., 3.5 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.
368-998	4 - 8		Micrometer head unit
			4 - 5 in 1 pc.
			5 - 6 in 1 pc.
			6 - 7 in 1 pc.
			7 - 8 in 1 pc.
			Setting ring (5 in DIA., 7 in DIA.) 1 pc. each
			Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.
			Hex wrench 1 pc.

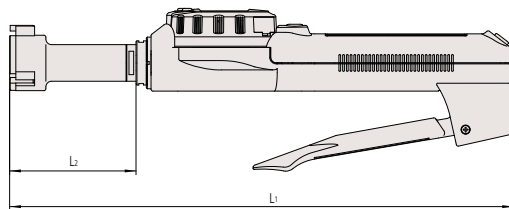
* The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

ABSOLUTE Borematic
SERIES 568 — ABSOLUTE Digimatic Snap-Open Bore Gages

- Activation handle with precision-balanced spring allows for easier inside-diameter measurements.
- Titanium-coated measuring pins provide excellent durability and impact resistance.
- Three-Point contact measuring head enables stable measurement.
- Can measure deep holes using an extension rod (optional).



DIMENSIONS



Unit: mm

Range	L2	L1
6 - 8, 8 - 10, 10 - 12 mm	83	284
12 - 16, 16 - 20 mm	53	255
20 - 25, 25 - 30 mm	59	261
30 - 40, 40 - 50 mm	67	269
50 - 63, 62 - 75, 75 - 88, 87 - 100, 100 - 113, 112 - 125 mm	75	277

Note: External appearance differs depending on the measuring range.

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 Data Management Software by Mitutoyo



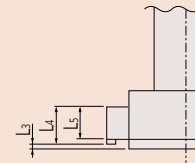
ABSOLUTE[™]

Measurement example



Reference dimensions when measuring a blind hole

Range (mm)	L3 (mm)	L4 (mm)	L5 (mm)
6 - 12	2 or below	—	2.5
12 - 20	0.3 or below	5.6	3.5
20 - 30		8.3	5.2
30 - 50		13.0	10.0
50 - 125		17.0	14.0



Functions

- GO/NO-GO judgment
- GO/NO-GO judgment zoom
- 2-Point Preset
- Zero-setting
- Data hold, Error alarm
- Low battery voltage alert
- Data output
- Function Lock
- 330° rotary display
- ON/OFF function
- inch/mm conversion (inch/mm type)

Optional Accessories

Code No.	Type	description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
905338	F	Connection cable (1 m)
905409	F	Connection cable (2 m)
06AFM380F	F	USB Input Tool Direct (2 m)
02AZD730*	IP67	U-WAVE-T
02AZD880*	Buzzer	U-WAVE-T
02AZD790F	F	Connection cable for U-WAVE-T (160 mm)
02AZE140F	F	Connection cable for U-WAVE-T For foot switch

* Add suffix to Code No.; **G** for Asia, Europe and the Americas, **H** for Brazil and **J** for Korea.

For details of Special-order Products, refer to page 13-16.

SPECIFICATIONS

Metric		Individual			
Code No.	Range*2 (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)*1	Mass (g)	Extension Rod (optional)
568-361-10	6 - 8	0.001	± 5 (maximum difference 5)	480	952322 (100 mm)
568-362-10	8 - 10			485	
568-363-10	10 - 12			485	
568-364-10	12 - 16			475	952621 (150 mm)
568-365-10	16 - 20			480	
568-366-10	20 - 25			540	
568-367-10	25 - 30		± 6 (maximum difference 6)	555	952622 (150 mm)
568-368-10	30 - 40			565	
568-369-10	40 - 50			610	
568-370-10	50 - 63			730	952623 (150 mm)
568-371-10	62 - 75			740	
568-372-10	75 - 88			790	
568-373-10	87 - 100			800	
568-374-10	100 - 113			900	
568-375-10	112 - 125			910	

Inch / Metric		Individual			
Code No.	Range*2 (in)	Resolution	Maximum permissible error J_{MPE} (in)*1	Mass (g)	Extension Rod (optional)
568-461-10	0.275 - 0.35	0.00005 in/ 0.001 mm	± 0.00025 (maximum difference 0.00025)	480	952322 (100 mm)
568-462-10	0.35 - 0.425			485	
568-463-10	0.425 - 0.5			485	
568-464-10	0.5 - 0.65			475	952621 (150 mm)
568-465-10	0.65 - 0.8			480	
568-466-10	0.8 - 1			540	
568-467-10	1 - 1.2		± 0.0003 (maximum difference 0.0003)	555	952622 (150 mm)
568-468-10	1.2 - 1.6			565	
568-469-10	1.6 - 2			610	
568-470-10	2 - 2.5			730	952623 (150 mm)
568-471-10	2.5 - 3			740	
568-472-10	3 - 3.5			790	
568-473-10	3.5 - 4			800	
568-474-10	4 - 4.5			900	
568-475-10	4.5 - 5			910	

- Response speed: Unlimited
- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Position detection method: Electrostatic capacitance type absolute encoder
- Battery life: Approx. 5 years under normal use. Approx. 10,000 hours in continuous use.

*1 Additionally, the difference in permissible error allowable is limited to a value within this range, as given in parentheses, and is measured with the entire measuring surface in contact with the object measured.

*2 The measurement range cannot be enlarged by measuring heads that are not standard-supplied (the accuracy is not guaranteed).

Note: Setting rings are optional.

ABSOLUTE Borematic
SERIES 568 — ABSOLUTE Digimatic Snap-Open Bore Gages

Interchangeable-head Bore Gage Sets



568-924-10



568-926-10

Optional Accessories

Refer to page 08-13.

Metric		
Code No.	Range (mm)	Content of Set
568-924-10	6 - 12	Display unit 1 pc.
		Measuring head 1 pc.
		6 - 8 mm 1 pc.
		8 - 10 mm 1 pc.
		10 - 12 mm 1 pc.
		Attachment 1 pc.
568-925-10	12 - 25	Setting ring (ø8, ø10) 1 pc. each
		Spanner 3 pcs.
568-926-10	25 - 50	Display unit 1 pc.
		Measuring head 1 pc.
		12 - 16 mm 1 pc.
		16 - 20 mm 1 pc.
		20 - 25 mm 1 pc.
		Attachment 2 pcs.
568-927-10	50 - 100	Setting ring (ø16, ø20) 1 pc. each
		Spanner 2 pcs.

Inch / Metric		
Code No.	Range (in)	Content of Set
568-928-10	0.275 - 0.5	Display unit 1 pc.
		Measuring head 1 pc.
		0.275 - 0.35 in 1 pc.
		0.35 - 0.425 in 1 pc.
		0.425 - 0.5 in 1 pc.
		Attachment 1 pc.
568-929-10	0.5 - 1	Setting ring (0.35 in DIA., 0.425 in DIA.) 1 pc. each
		Spanner 3 pcs.
568-930-10	1 - 2	Display unit 1 pc.
		Measuring head 1 pc.
		0.5 - 0.65 in 1 pc.
		0.65 - 0.8 in 1 pc.
		0.8 - 1 in 1 pc.
		Attachment 2 pcs.
568-936-10	2 - 4	Setting ring (0.65 in DIA., 0.8 in DIA.) 1 pc. each
		Spanner 2 pcs.

Non-interchangeable-head Snap-open Bore Gage Sets

Each set includes complete gages (display units and measuring heads for each size).



568-955-10



568-957-10



568-959-10

Metric			
Code No.	Range (mm)	Content of Set	
568-955-10	6 - 12	Display unit	1 pc.
		6 - 8 mm	1 pc.
		8 - 10 mm	1 pc.
		10 - 12 mm	1 pc.
		Setting ring (ø8, ø10)	1 pc. each
		Spanner	3 pcs.
568-956-10	12 - 25	Display unit	1 pc.
		12 - 16 mm	1 pc.
		16 - 20 mm	1 pc.
		20 - 25 mm	1 pc.
		Setting ring (ø16, ø20)	1 pc. each
		Spanner	2 pcs.
568-957-10	25 - 50	Display unit	1 pc.
		25 - 30 mm	1 pc.
		30 - 40 mm	1 pc.
		40 - 50 mm	1 pc.
		Setting ring (ø30, ø40)	1 pc. each
		Spanner	2 pcs.
568-958-10	50 - 75	Display unit	1 pc.
		50 - 63 mm	1 pc.
		62 - 75 mm	1 pc.
		Setting ring (ø62)	1 pc.
		Spanner	2 pcs.
568-959-10	75 - 100	Display unit	1 pc.
		75 - 88 mm	1 pc.
		87 - 100 mm	1 pc.
		Setting ring (ø87)	1 pc.
		Spanner	2 pcs.

Inch / Metric			
Code No.	Range (in)	Content of Set	
568-965-10	0.275 - 0.5	Display unit	1 pc.
		0.275 - 0.35 in	1 pc.
		0.35 - 0.425 in	1 pc.
		0.425 - 0.5 in	1 pc.
		Setting ring (0.35 in DIA., 0.425 in DIA.)	1 pc. each
		Spanner	3 pcs.
568-966-10	0.5 - 1	Display unit	1 pc.
		0.5 - 0.65 in	1 pc.
		0.65 - 0.8 in	1 pc.
		0.8 - 1 in	1 pc.
		Setting ring (0.65 in DIA., 0.8 in DIA.)	1 pc. each
		Spanner	2 pcs.
568-967-10	1 - 2	Display unit	1 pc.
		1 - 1.2 in	1 pc.
		1.2 - 1.6 in	1 pc.
		1.6 - 2 in	1 pc.
		Setting ring (1.2 in DIA., 1.6 in DIA.)	1 pc. each
		Spanner	2 pcs.
568-968-10	2 - 3	Display unit	1 pc.
		2 - 2.5 in	1 pc.
		2.5 - 3 in	1 pc.
		Setting ring (2.5 in DIA.)	1 pc.
		Spanner	2 pcs.
568-969-10	3 - 4	Display unit	1 pc.
		3 - 3.5 in	1 pc.
		3.5 - 4 in	1 pc.
		Setting ring (3.5 in DIA.)	1 pc.
		Spanner	2 pcs.

Inside Micrometers

Tubular Inside Micrometers SERIES 133 — Single-Rod Type

- Standard Single-rod Type inside micrometer.
- Carbide-tipped measuring faces.
- A reference gage is necessary for reference point setting.
- An optional reference gage, such as Gauge Block Accessory Set, CERA inside Micro Checker or a setting ring, is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22, 08-30, and 08-53 for details)



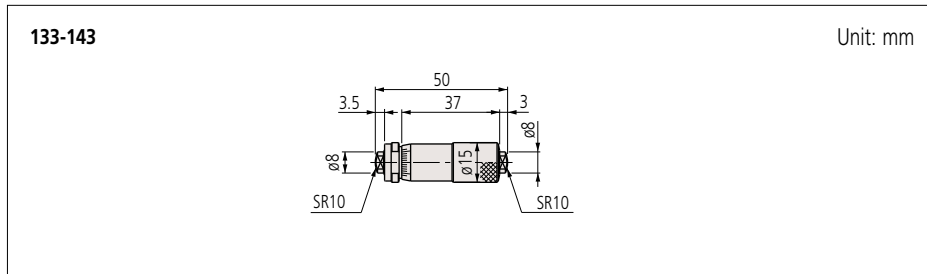
133-143

SPECIFICATIONS

Metric		Individual	
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
133-143	50 - 75	0.01	± 3

Inch		Individual	
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)
133-223	2 - 3	0.001	± 0.00015

DIMENSIONS



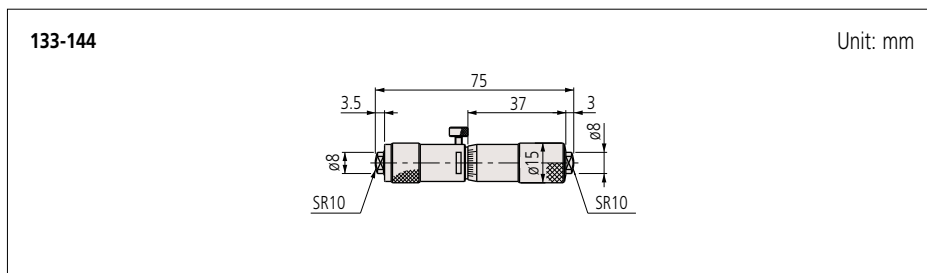
133-144

SPECIFICATIONS

Metric		Individual	
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
133-144	75 - 100	0.01	± 4

Inch		Individual	
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)
133-224	3 - 4	0.001	± 0.0002

DIMENSIONS



Measurement example



Micrometer Set



- 133-901 (Metric)**
 • Range: 50 - 150 mm (4 heads/set)
 • Models included:
133-143 133-144
133-145 133-146
 with fitted case



- 133-902 (Metric)**
 • Range: 50 - 300 mm (10 heads/set)
 • Models included:
133-143 133-144
133-145 133-146
133-147 133-148
133-149 133-150
133-151 133-152
 with fitted case

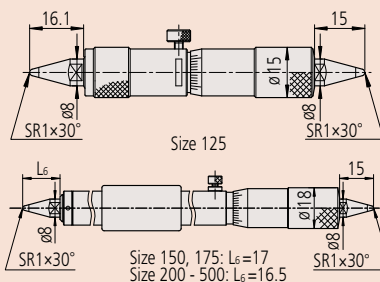
- 133-903 (Inch)**
 • Range: 2 - 6 in (4 heads/set)
 • Models included:
133-223 133-224
133-225 133-226
 with fitted case

- 133-904 (Inch)**
 • Range: 2 - 12 in (10 heads/set)
 • Models included:
133-223 133-224
133-225 133-226
133-227 133-228
133-229 133-230
133-231 133-232
 with fitted case

Special sizes and specifications other than standard can be custom-made by special order. Please contact your local Mitutoyo Sales Office for more information.

Example

Measuring face: point
 For models with a measuring range 100 - 500 mm



133-152

SPECIFICATIONS

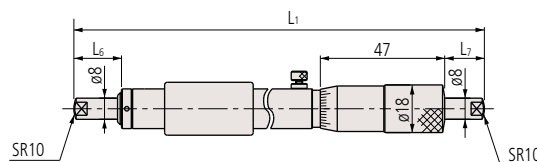
Metric		Individual	
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)
133-145	100 - 125	0.01	± 5
133-146	125 - 150		
133-147	150 - 175		
133-148	175 - 200		
133-149	200 - 225		± 6
133-150	225 - 250		
133-151	250 - 275		
133-152	275 - 300		
133-153	300 - 325		± 7
133-154	325 -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

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

DIMENSIONS

133-145 to 133-180

Unit: mm



Code No.	L ₁	L ₆	L ₇
133-145	100	5	3
133-146	125	5	3
133-147	150	18	15
133-148	175	18	15
133-149	200	18	15
⋮	⋮	⋮	⋮
133-180	975	18	15

Inside Micrometers

Tubular Inside Micrometers SERIES 137, 337 — Extension-Rod Type

- Wide range of inside measurements possible by combining extension rods and anvils with the micrometer head.
- A reference gage is necessary for reference point setting.
- Two types of measuring faces are available: with or without carbide tip. (The SERIES 337 is only available with carbide tip)
- An optional reference gage, such as Gauge Block Accessory Set, CERA inside Micro Checker or a setting ring (nominal size 300 mm or less), is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22, and 08-53 for details)



337-301

SPECIFICATIONS

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

Inch / Metric							
Code No.	Range (in)	Resolution	Spindle feed error* (in)	Micrometer head stroke (in)	Extension rods		Display unit (in)
					Qty	Size (in)	
337-102	8 - 9	0.0001 in/ 0.001 mm	0.00015	1	—	—	8 - 9
337-303	8 - 40				6	1, 2, 4 (2 pcs.), 8, 12	
337-304	8 - 60				7	1, 2, 4, 8, 12 (3 pcs.)	

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

• Battery life: Approx. 1.2 years under normal use

• Position detection method: Electromagnetic induction-type rotary encoder

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

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo



Applicable models:
SERIES 337

Measurement example



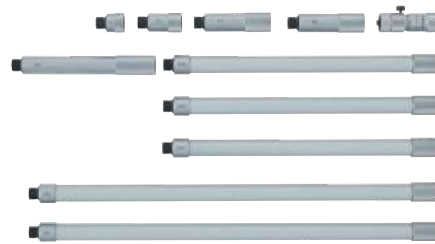
Functions

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

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)
02AZD730*	IP67	U-WAVE-T
02AZD880*	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

* Add suffix to Code No.; **G** for Asia, Europe and the Americas,
H for Brazil and **J** for Korea.



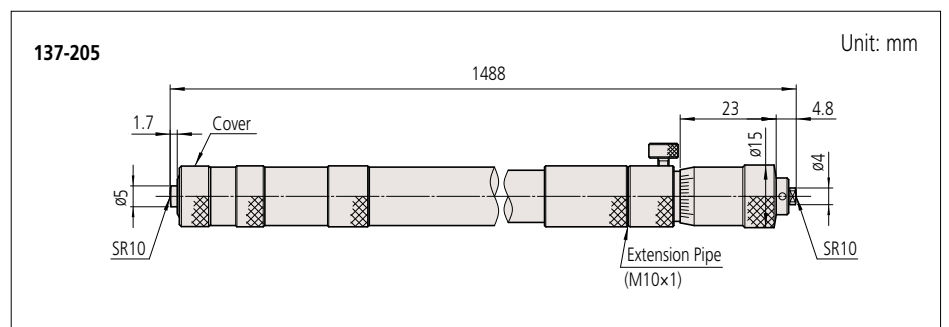
137-205

SPECIFICATIONS

Metric							
Code No.	Range (mm)	Graduation (mm)	Spindle feed error* (μm)	Micrometer head stroke (mm)	Extension rods		Main unit (mm)
					Qty	Size (mm)	
137-201	50 - 150	0.01	3	13	3	13, 25, 50	50 - 63
137-202	50 - 300				5	13, 25, 50 (2 pcs.), 100	
137-203	50 - 500				6	13, 25, 50 (2 pcs.), 100, 200	
137-204	50 - 1000				8	13, 25, 50 (2 pcs.), 100, 200 (2 pcs.), 300	
137-205	50 - 1500				10	13, 25, 50 (2 pcs.), 100, 200 (3 pcs.), 300 (2 pcs.)	
With carbide measuring face							
137-206	50 - 150	0.01	3	13	3	13, 25, 50	50 - 63
137-207	50 - 300				5	13, 25, 50 (2 pcs.), 100	
137-208	50 - 500				6	13, 25, 50 (2 pcs.), 100, 200	
137-209	50 - 1000				8	13, 25, 50 (2 pcs.), 100, 200 (2 pcs.), 300	
137-210	50 - 1500				10	13, 25, 50 (2 pcs.), 100, 200 (3 pcs.), 300 (2 pcs.)	
Inch							
Code No.	Range (in)	Graduation (in)	Spindle feed error* (in)	Micrometer head stroke (in)	Extension rods		Main unit (in)
					Qty	Size (in)	
137-211	2 - 6	0.001	0.00015	0.5	3	0.5, 1, 2	2 - 2.5
137-212	2 - 12				5	0.5, 1, 2 (2 pcs.), 4	
137-213	2 - 20				6	0.5, 1, 2 (2 pcs.), 4, 8	
137-214	2 - 40				8	0.5, 1, 2 (2 pcs.), 4, 8 (2 pcs.), 12	
137-215	2 - 60				10	0.5, 1, 2 (2 pcs.), 4, 8 (3 pcs.), 12 (2 pcs.)	
With carbide measuring face							
137-216	2 - 6	0.001	0.00015	0.5	3	0.5, 1, 2	2 - 2.5
137-217	2 - 12				5	0.5, 1, 2 (2 pcs.), 4	
137-218	2 - 20				6	0.5, 1, 2 (2 pcs.), 4, 8	
137-219	2 - 40				8	0.5, 1, 2 (2 pcs.), 4, 8 (2 pcs.), 12	
137-220	2 - 60				10	0.5, 1, 2 (2 pcs.), 4, 8 (3 pcs.), 12 (2 pcs.)	

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

DIMENSIONS



Inside Micrometers

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

- Micrometer head for Extension-rod Type inside micrometer.
- A reference gage is necessary for reference point setting.
- An optional reference gage, such as Gauge Block Accessory Set or a setting ring, is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22 and 08-53 for details)



137-011

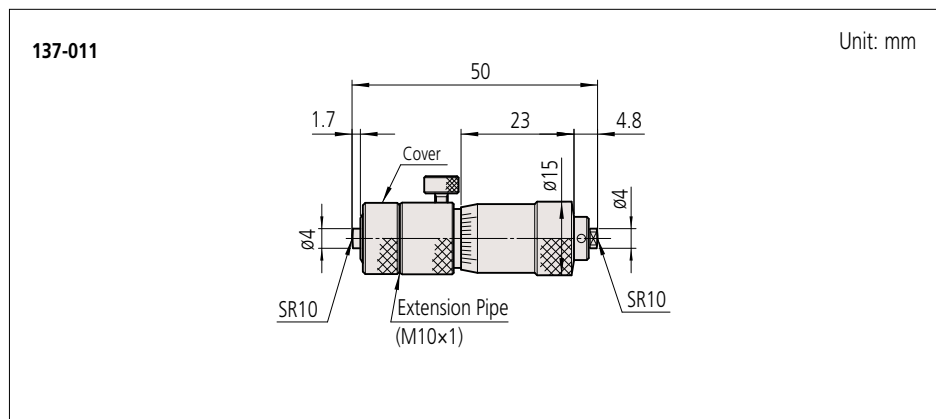
SPECIFICATIONS

Metric				
Code No.	Range (mm)	Spindle feed error* (μm)	Graduation (mm)	Micrometer head stroke (mm)
137-011	50 - 63	3	0.01	13
Carbide-tipped 137-013				

Inch				
Code No.	Range (in)	Spindle feed error* (in)	Graduation (in)	Micrometer head stroke (in)
137-012	2 - 2.5	0.00015	0.001	0.5
Carbide-tipped 137-014				

* "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

DIMENSIONS



Measurement example



Functions

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

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)
02AZD730*	IP67	U-WAVE-T
02AZD880*	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

* Add suffix to Code No.; **G** for Asia, Europe and the Americas,
H for Brazil and **J** for Korea.

Tubular Inside Micrometers SERIES 339 — Extension-Pipe Type

- Wide range of inside measurements possible by combining Extension pipes and anvils with the micrometer head.
- Carbide-tipped measuring faces.
- IP65 (water-proof) protection level that enables use in the presence of cutting fluid.
- A reference gage is necessary for reference point setting.



339-301

SPECIFICATIONS

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

Inch/Metric							
Code No.	Range (in)	Resolution	Spindle feed error* (in)	Micrometer head stroke (in)	Qty	Extension pipes Size (in)	Display unit (in)
339-102	8 - 9	0.0001 in/ 0.001 mm	0.00015	1	—	—	8 - 9
339-303	8 - 40				5	1, 2, 4, 8, 16	
339-304	8 - 80				8	1, 2, 4, 8 (2 pcs.), 16 (3 pcs.)	

- Power source: SR44 battery (1 pc.), **938882** included as standard (for operational checks)
- Battery life: Approx. 1.2 years under normal use
- Position detection method: Electromagnetic induction-type rotary encoder
- * "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the measuring range of the micrometer head

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

- Wide range of inside measurements possible by combining Extension pipes and anvils with the micrometer head.
- An optional reference gage is required for accurately setting the micrometer before measuring.
- Carbide-tipped measuring faces.



139-177

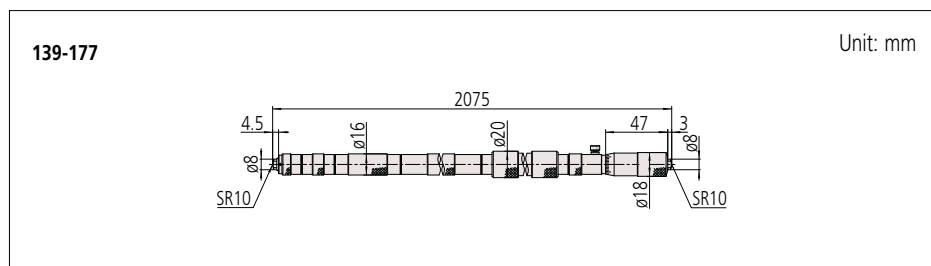
SPECIFICATIONS

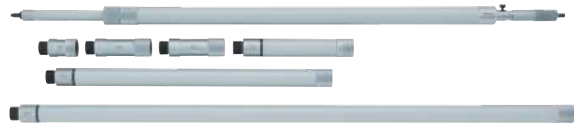
Metric							
Code No.	Range (mm)	Graduation (mm)	Spindle feed error* (μm)	Micrometer head stroke (mm)	Extension pipes		Main unit (mm)
					Qty	Size (mm)	
139-173	100 - 500	0.01	3	25	4	25, 50, 100, 200	100 - 125
139-174	100 - 900				5	25, 50, 100, 200, 400	
139-175	100 - 1300				6	25, 50, 100, 200, 400 (2 pcs.)	
139-176	100 - 1700				7	25, 50, 100, 200, 400 (3 pcs.)	
139-177	100 - 2100				8	25, 50, 100, 200, 400 (4 pcs.)	

Inch							
Code No.	Range (in)	Graduation (in)	Spindle feed error* (in)	Micrometer head stroke (in)	Extension pipes		Main unit (in)
					Qty	Size (in)	
139-178	4 - 20	0.001	0.00015	1	4	1, 2, 4, 8	4 - 5
139-179	4 - 36				5	1, 2, 4, 8, 16	
139-180	4 - 52				6	1, 2, 4, 8, 16 (2 pcs.)	
139-181	4 - 68				7	1, 2, 4, 8, 16 (3 pcs.)	
139-182	4 - 84				8	1, 2, 4, 8, 16 (4 pcs.)	

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

DIMENSIONS





140-158

SPECIFICATIONS

Metric

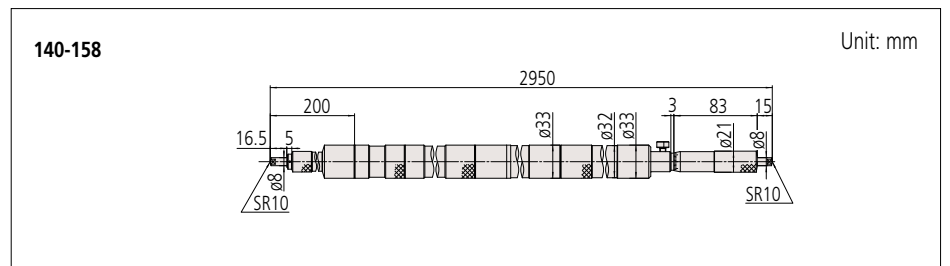
Code No.	Range (mm)	Graduation (mm)	Spindle feed error* (μm)	Micrometer head stroke (mm)	Extension pipes		Main unit (mm)
					Qty	Size (mm)	
140-157	1000 - 2000	0.01	6	50	5	50, 100 (2 pcs.), 200, 500	1000 - 1050
140-158	1000 - 3000				6	50, 100 (2 pcs.), 200, 500, 1000	
140-159	1000 - 4000				7	50, 100 (2 pcs.), 200, 500, 1000 (2 pcs.)	
140-160	1000 - 5000				8	50, 100 (2 pcs.), 200, 500, 1000 (3 pcs.)	

Inch

Code No.	Range (in)	Graduation (in)	Spindle feed error* (in)	Micrometer head stroke (in)	Extension pipes		Main unit (in)
					Qty	Size (in)	
140-161	40 - 80	0.001	0.0003	2	5	2, 4 (2 pcs.), 8, 20	40 - 42
140-162	40 - 120				6	2, 4 (2 pcs.), 8, 20, 40	
140-163	40 - 160				7	2, 4 (2 pcs.), 8, 20, 40 (2 pcs.)	
140-164	40 - 200				8	2, 4 (2 pcs.), 8, 20, 40 (3 pcs.)	

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

DIMENSIONS



Inside Micrometers

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

- Micrometer head for Extension-pipe Type inside micrometer.
- A reference gage is necessary for reference point setting.
- An optional reference gage, such as Gauge Block Accessory Set, CERA Inside Micro Checker or a setting ring, is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22, 08-30, and 08-53 for details)



139-001

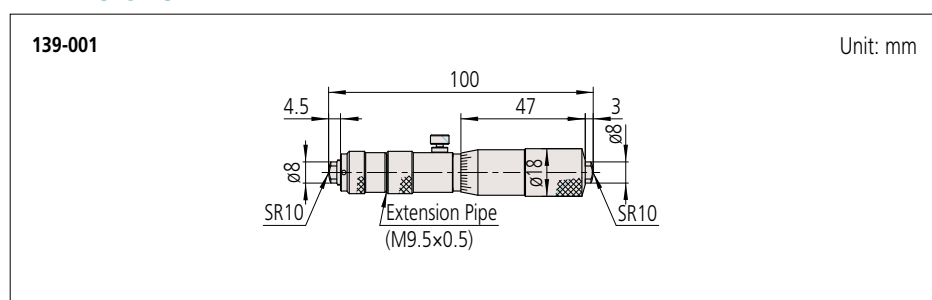
SPECIFICATIONS

Metric				
Code No.	Range (mm)	Spindle feed error* (μm)	Graduation (mm)	Micrometer head stroke (mm)
139-001	100 - 125	3	0.01	25

Inch				
Code No.	Range (in)	Spindle feed error* (in)	Graduation (in)	Micrometer head stroke (in)
139-002	4 - 5	0.00015	0.001	1

* "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

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)
02AZD730*	IP67	U-WAVE-T
02AZD880*	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
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

* Add suffix to Code No.; **G** for Asia, Europe and the Americas, **H** for Brazil and **J** for Korea.

Inside Micrometers
SERIES 345 — Caliper Type

- Useful for measuring workpieces with grooves that cannot be measured by a two-point or three-point inside micrometer.
- Carbide-tipped measuring faces.
- Equipped with a constant measuring-force device.
- An optional reference gage, such as Gauge Block Accessory Set, CERA Inside Micro Checker (more than 25 mm) or a setting ring (nominal size below 300 mm), is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22, 08-30, and 08-53 for details)



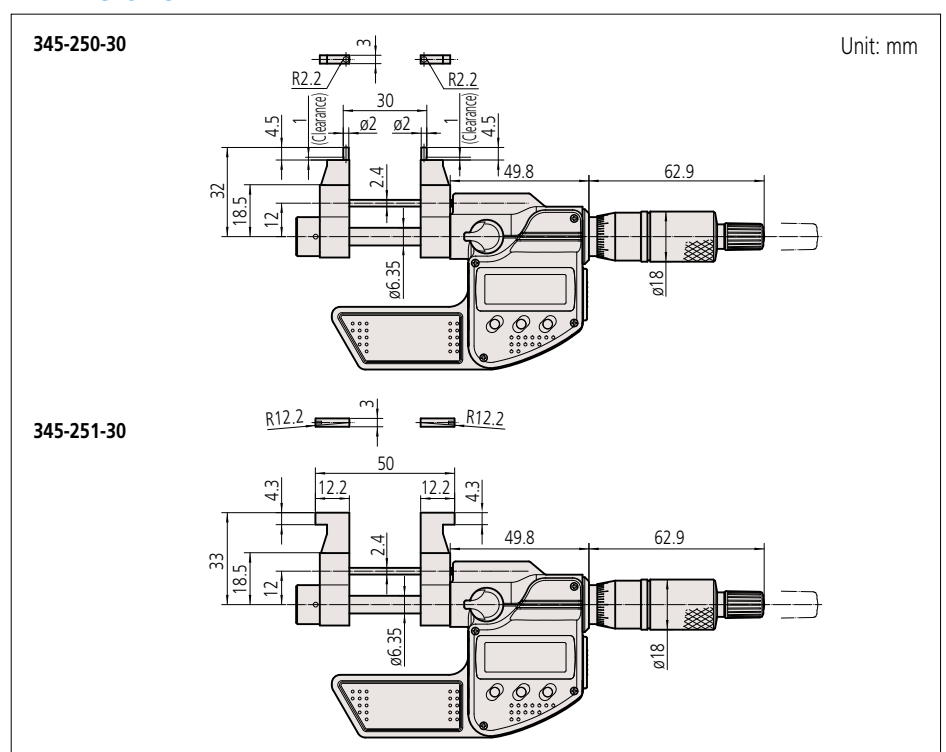
SPECIFICATIONS

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

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

- 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 induction-type rotary encoder
- Note 1: For the functions, refer to **SERIES 293** with SPC data output on page 02-7.
This model is NOT water-proof. Also, the origin setting is the free preset type.
- Note 2: The minimum pitch circle measurement is $\phi 5$ mm with pin type (**345-250-30**, **345-350-30**).

DIMENSIONS



Inside Micrometers

Inside Micrometers SERIES 145 — Caliper Type

- This is an analog version of the SERIES 345 calliper type micrometer for inside measurement.
- Carbide-tipped measuring faces.
- Equipped with a constant measuring-force device.
- An optional reference gage, such as Gauge Block Accessory Set, CERA Inside Micro Checker (more than 25 mm) or a setting ring (nominal size below 300 mm), is required for accurately setting the micrometer before measuring. (refer to pages 01-19 to 01-22, 08-30, and 08-53 for details)



145-185

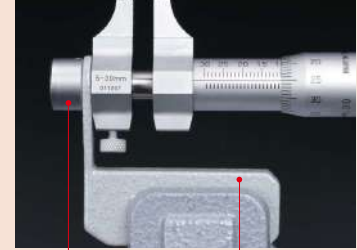
SPECIFICATIONS

Metric					
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Jaw	Mass (g)
145-185	5 - 30	0.01	± 5	Pin	130
145-186	25 - 50		± 6	Anvil	140

Inch					
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Jaw	Mass (g)
145-193	0.2 - 1.2	0.001	± 0.00025	Pin	130
145-194	1 - 2		± 0.0003	Anvil	140

Note: The minimum pitch circle measurement is $\varnothing 5$ mm with pin type (145-185, 145-193).

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



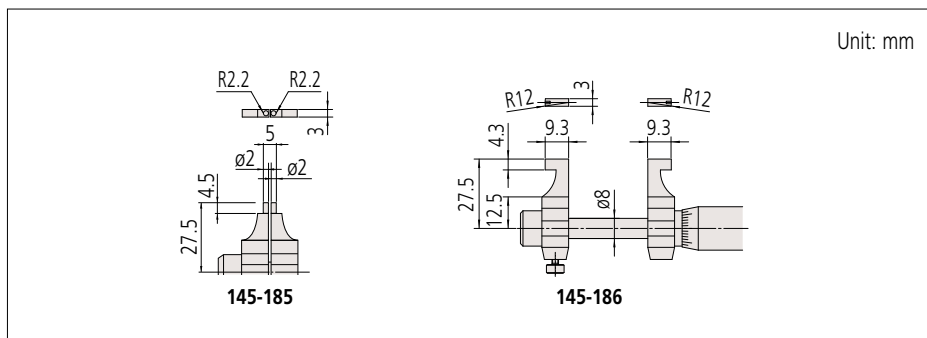
Cap (300401) Holder (300400)

Note 1: This instrument requires the cap and the holder for mounting on a micrometer stand.
Note 2: It may not be applicable to a custom specification.

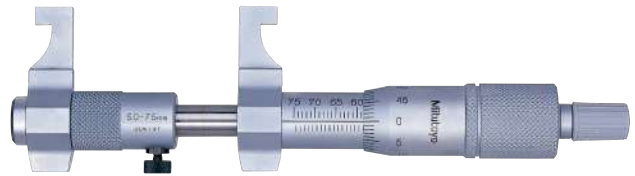
Optional Accessories

Refer to page 08-26.

DIMENSIONS



Unit: mm



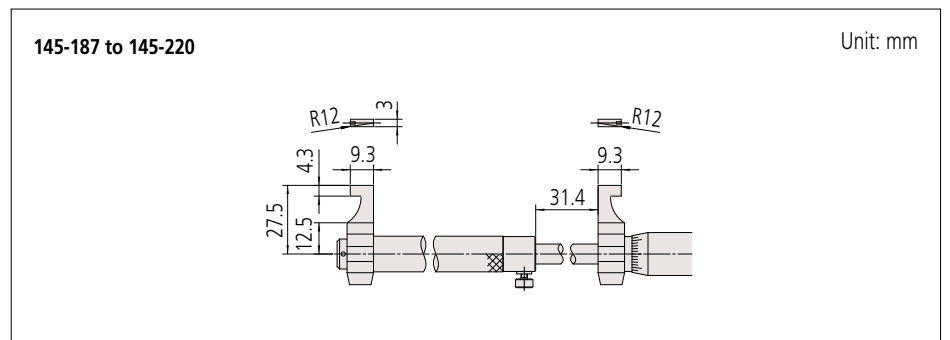
145-187

SPECIFICATIONS

Metric					
Code No.	Range (mm)	Graduation (mm)	Maximum permissible error J_{MPE} (μm)	Jaw	Mass (g)
145-187	50 - 75	0.01	± 7	Anvil	160
145-188	75 - 100		± 8		180
145-189	100 - 125		± 9		210
145-190	125 - 150		± 10		230
145-191	150 - 175		± 11		250
145-192	175 - 200		± 12		270
145-217	200 - 225		± 16		310
145-218	225 - 250		± 21		330
145-219	250 - 275				350
145-220	275 - 300				370
145-221	300 - 325				390
145-222	325 - 350				410
145-223	350 - 375				430
145-224	375 - 400				450
145-225	400 - 425				470
145-226	425 - 450				490
145-227	450 - 475				510
145-228	475 - 500				530

Inch					
Code No.	Range (in)	Graduation (in)	Maximum permissible error J_{MPE} (in)	Jaw	Mass (g)
145-195	2 - 3	0.001	± 0.00035	Anvil	160
145-196	3 - 4		± 0.0004		180

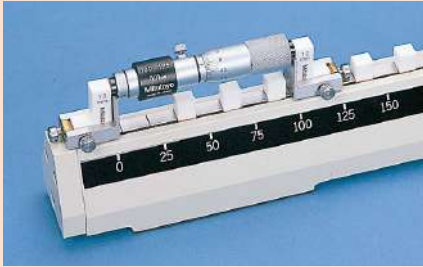
DIMENSIONS





CERA Inside Micro Checker SERIES 515

Measurement example



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



Standard accessory set



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

Wooden box (optional)

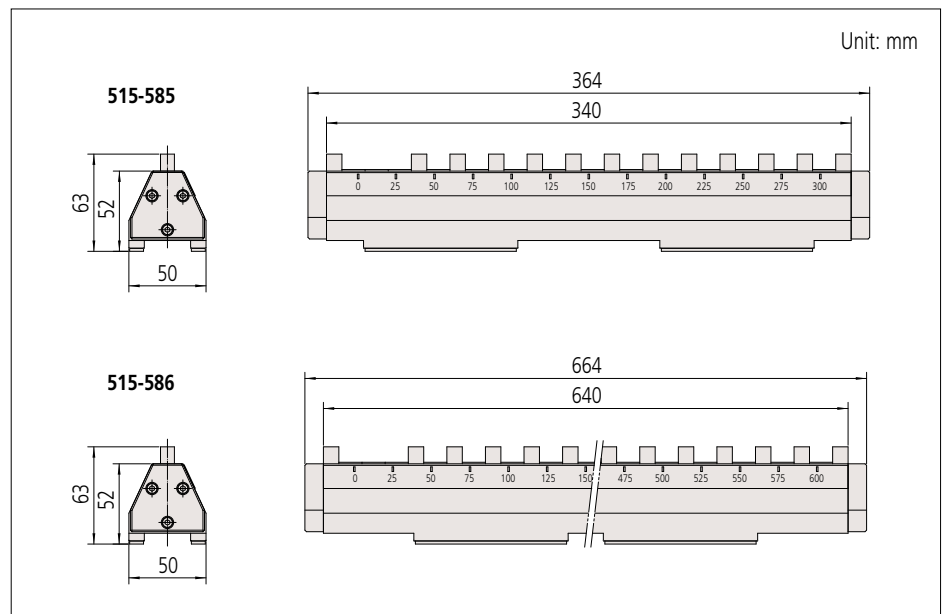
- 602160** (for 515-585)
- 602163** (for 515-586)

SPECIFICATIONS

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

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

DIMENSIONS



Bore Gages

Bore Gages SERIES 526 — for Extra Small Holes

- This bore gage is designed to measure small holes of 1 to 7 mm diameter.
- The dial indicator is optional. Refer to page 08-52 for recommended indicators.
- Optional stand (**215-120-10**) is available for efficient measurement of multiple small holes.



526-170-11

Note: The dial indicator and the dial protection cover are optional.
Refer to page 08-52 for details.

SPECIFICATIONS

Metric							
Code No.	Range (mm)	Accuracy* (μm)	Repeatability* (μm)	Bore gage	Dial indicator	Dial protection cover	Setting ring
526-170-10	0.95 - 1.55	4	1	526-170-10	Not supplied	Not supplied	Not supplied
526-160-10	1.50 - 3.95	4		526-160-10			
526-150-10	3.70 - 7.30	6		526-150-10			
526-172-20	0.95 - 1.55	4		526-170-10	2109AB-10 (Graduation: 0.001 mm)	21DZA000	
526-162-20	1.50 - 3.95	4		526-160-10			
526-152-20	3.70 - 7.30	6		526-150-10			
526-173-20	0.95 - 1.55	4		526-170-10	2046AB (Graduation: 0.01 mm)	21DZA000	
526-163-20	1.50 - 3.95	4		526-160-10			
526-153-20	3.70 - 7.30	6		526-150-10			
526-170-11	0.95 - 1.55	4		526-170-10	Not supplied	Not supplied	
526-160-11	1.50 - 3.95	4		526-160-10			
526-150-11	3.70 - 7.30	6		526-150-10			
526-172-21	0.95 - 1.55	4		526-170-10	2109AB-10 (Graduation: 0.001 mm)	21DZA000	
526-162-21	1.50 - 3.95	4		526-160-10			
526-152-21	3.70 - 7.30	6		526-150-10			
526-173-21	0.95 - 1.55	4		526-170-10	2046AB (Graduation: 0.01 mm)	21DZA000	
526-163-21	1.50 - 3.95	4		526-160-10			
526-153-21	3.70 - 7.30	6		526-150-10			

Inch								
Code No.	Range (in)	Accuracy* (in)	Repeatability* (in)	Bore gage	Dial indicator	Dial protection cover	Setting ring	
526-175-10	0.037 - 0.061	0.00016	0.00004	526-175-10	Not supplied	Not supplied	Not supplied	
526-165-10	0.059 - 0.156	0.00016		526-165-10				
526-155-10	0.146 - 0.287	0.00024		526-155-10				
526-176-20	0.037 - 0.061	0.00016		526-175-10	2923AB-10 (Graduation: 0.0001 in)	21DZA000		
526-166-20	0.059 - 0.156	0.00016		526-165-10				
526-156-20	0.146 - 0.287	0.00024		526-155-10				
526-175-11	0.037 - 0.061	0.00016		526-175-10	Not supplied	Not supplied		Supplied
526-165-11	0.059 - 0.156	0.00016		526-165-10				
526-155-11	0.146 - 0.287	0.00024		526-155-10				
526-176-21	0.037 - 0.061	0.00016		526-175-10	2923AB-10 (Graduation: 0.0001 in)	21DZA000		
526-166-21	0.059 - 0.156	0.00016		526-165-10				
526-156-21	0.146 - 0.287	0.00024		526-155-10				

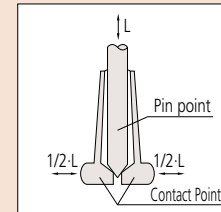
* Accuracy of the bore gage alone.

Note: Setting rings are not supplied with some models. Please purchase them separately if necessary. For details of setting rings, refer to page 08-53.

Measurement example



Measurement Principle



Setting Rings (Metric)

Nominal size

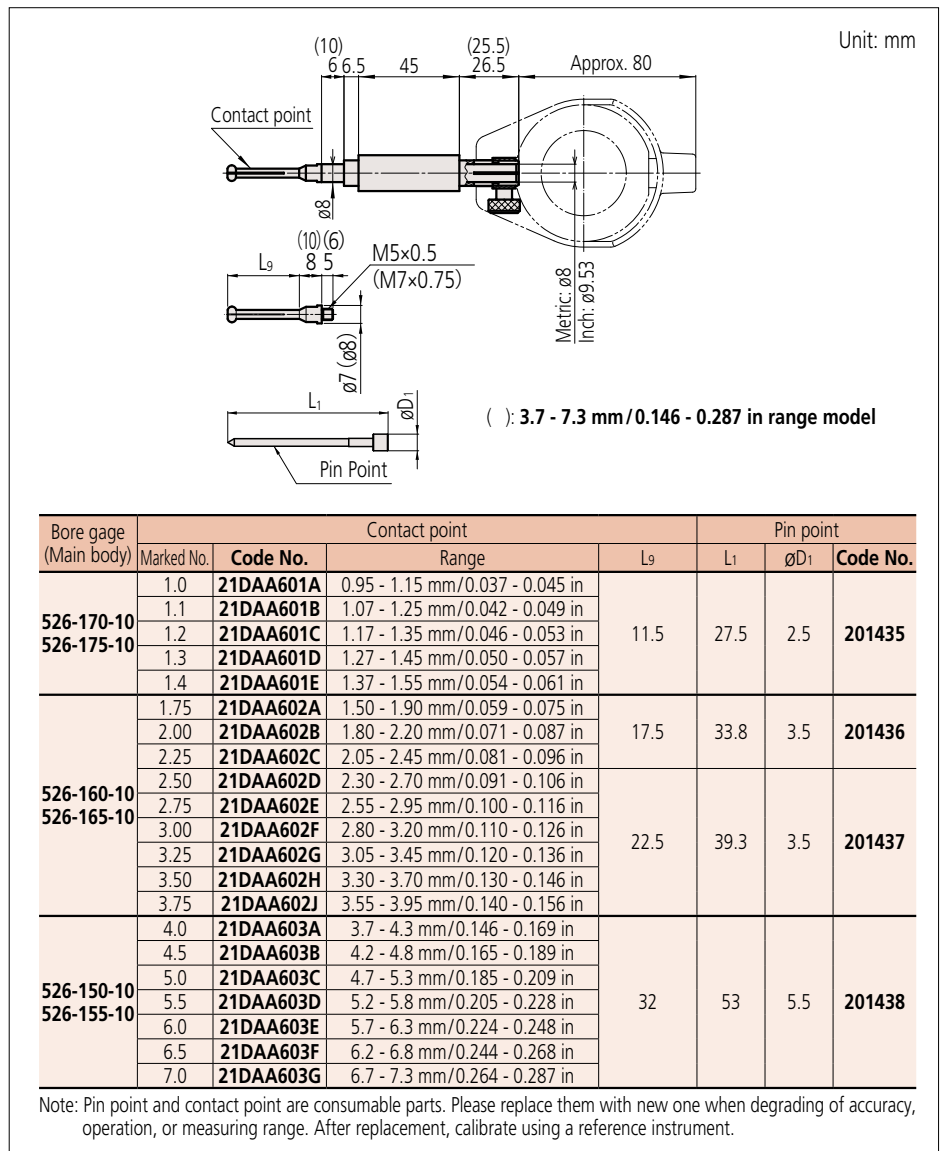
- Code No. 526-170-11 etc.
 - 177-220: 1.0 mm
 - 177-222: 1.1 mm
 - 177-225: 1.2 mm
 - 177-227: 1.3 mm
 - 177-230: 1.4 mm
- Code No. 526-160-11 etc.
 - 177-236: 1.75 mm
 - 177-239: 2.00 mm
 - 177-242: 2.25 mm
 - 177-208: 2.50 mm
 - 177-246: 2.75 mm
 - 177-248: 3.00 mm
 - 177-250: 3.25 mm
 - 177-252: 3.50 mm
 - 177-255: 3.75 mm
- Code No. 526-150-11 etc.
 - 177-204: 4.0 mm
 - 177-257: 4.5 mm
 - 177-205: 5.0 mm
 - 177-263: 5.5 mm
 - 177-267: 6.0 mm
 - 177-271: 6.5 mm
 - 177-275: 7.0 mm

Setting Rings (Inch)

Nominal size

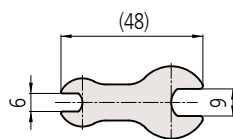
- Code No. 526-175-11 etc.
 - 177-350: 0.040 in
 - 177-351: 0.045 in
 - 177-352: 0.050 in
 - 177-353: 0.055 in
 - 177-354: 0.060 in
- Code No. 526-165-11 etc.
 - 177-355: 0.07 in
 - 177-356: 0.08 in
 - 177-357: 0.09 in
 - 177-358: 0.10 in
 - 177-359: 0.11 in
 - 177-360: 0.12 in
 - 177-361: 0.13 in
 - 177-362: 0.14 in
 - 177-363: 0.15 in
- Code No. 526-155-11 etc.
 - 177-364: 0.16 in
 - 177-365: 0.18 in
 - 177-366: 0.20 in
 - 177-367: 0.22 in
 - 177-368: 0.24 in
 - 177-369: 0.26 in
 - 177-370: 0.28 in

DIMENSIONS

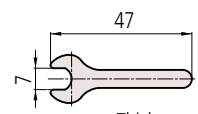


Spanner

210188



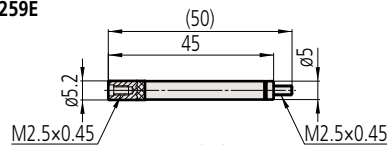
102148



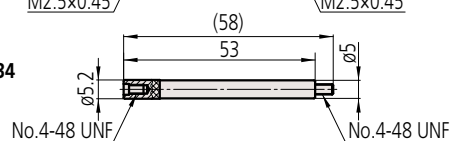
Thickness: 1.5

Extension rod

21AAA259E



213634



() : 3.7 - 7.3 mm / 0.146 - 0.287 in range model

Bore gage	Spanner	Extension rod
526-170-10	210188	21AAA259E
526-160-10		
526-150-10		
526-175-10	210188	213634
526-165-10		
526-155-10		

Note: This is not a component for extending the probing depth. (Standard Accessory)

Bore Gages

Bore Gages SERIES 526 — for Extra Small Holes

- This bore gage is designed to measure small holes of 7 to 18 mm diameter.
- The dial indicator is optional. Refer to page 08-52 for recommended indicators.
- Optional stand (**215-120-10**) is available for efficient measurement of multiple small holes.



526-101

Note: The dial indicator and the dial protection cover are optional. Refer to page 08-52 for details.

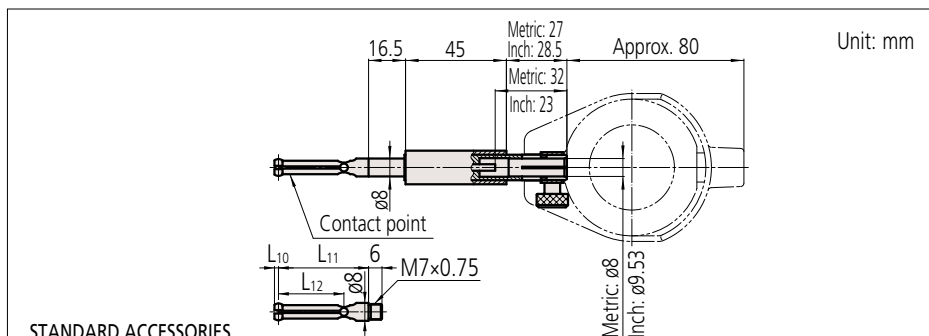
SPECIFICATIONS

Metric							
Code No.	Range (mm)	Accuracy* (µm)	Repeatability* (µm)	Bore gage	Dial indicator	Dial protection cover	Setting ring
526-101	7 - 10	4	2	526-101	Not supplied	Not supplied	Not supplied
526-102	10 - 18	6		526-102			
526-124-20	7 - 10	4		526-101	2109AB-10 (Graduation: 0.001 mm)	21DZA000	
526-125-20	10 - 18	6		526-102			
526-126-20	7 - 10	4		526-101	2046AB (Graduation: 0.01 mm)	21DZA000	
526-127-20	10 - 18	6		526-102			

Inch							
Code No.	Range (in)	Accuracy* (in)	Repeatability* (in)	Bore gage	Dial indicator	Dial protection cover	Setting ring
526-103	0.3 - 0.4	0.00016	0.00008	526-103	Not supplied	Not supplied	Not supplied
526-104	0.4 - 0.7	0.00024		526-104			
526-122-20	0.3 - 0.4	0.00016		526-103	2923AB-10 (Graduation: 0.0001 in)	21DZA000	
526-123-20	0.4 - 0.7	0.00024		526-104			
526-119-20	0.3 - 0.4	0.00016		526-103	2922AB (Graduation: 0.0005 in)	21DZA000	
526-120-20	0.4 - 0.7	0.00024		526-104			

* Accuracy of the bore gage alone.
Note: Setting rings are not supplied.
Please purchase them separately if necessary. For details of the setting rings, refer to page 08-53.

DIMENSIONS



STANDARD ACCESSORIES

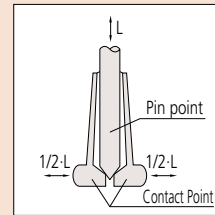
Bore gage (Main body)	Contact point						Spanner Code No.
	Marked No.	Code No.	Range	L10	L11	L12	
526-101 526-103	1	102469	7.0 - 7.5 mm/0.28 - 0.30 in	1.8	40	29.2	102148
	2	102470	7.5 - 8.0 mm/0.30 - 0.32 in				
	3	102471	8.0 - 8.5 mm/0.32 - 0.34 in				
	4	102472	8.5 - 9.0 mm/0.34 - 0.36 in				
	5	102473	9.0 - 9.5 mm/0.36 - 0.38 in				
	6	102474	9.5 - 10.0 mm/0.38 - 0.40 in				
526-102 526-104	1	102454	10 - 11 mm/0.40 - 0.44 in	2.7	46	38	102148
	2	102455	11 - 12 mm/0.44 - 0.48 in				
	3	102456	12 - 13 mm/0.48 - 0.52 in				
	4	102457	13 - 14 mm/0.52 - 0.56 in				
	5	102458	14 - 15 mm/0.56 - 0.60 in				
	6	102459	15 - 16 mm/0.60 - 0.64 in				
	7	102460	16 - 17 mm/0.64 - 0.68 in				
	8	102461	17 - 18 mm/0.68 - 0.72 in				

Note: Contact point is consumable part. Please replace it with new one when degrading of accuracy, operation, or measuring range.

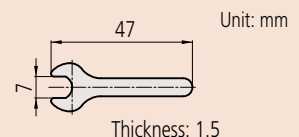
Measurement example



Measurement Principle



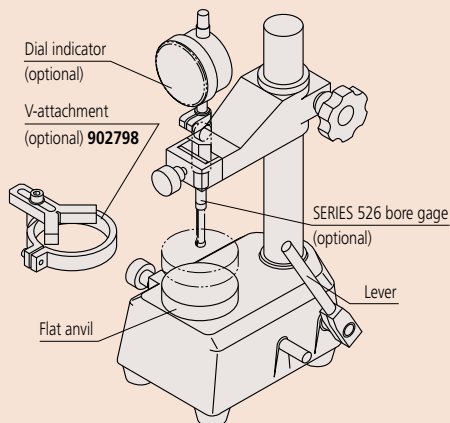
Spanner
102148



Bore Gage Stand SERIES 215

Operating Method

- Pulling the lever forwards moves the platen upwards and the instrument goes into measurement mode.
- The V-attachment (optional) aids positioning the workpiece on the platen and is useful when measuring a large number of the same size of workpiece.



- Optimal for efficient measurement of multiple small holes with a bore gage. (SERIES 526)

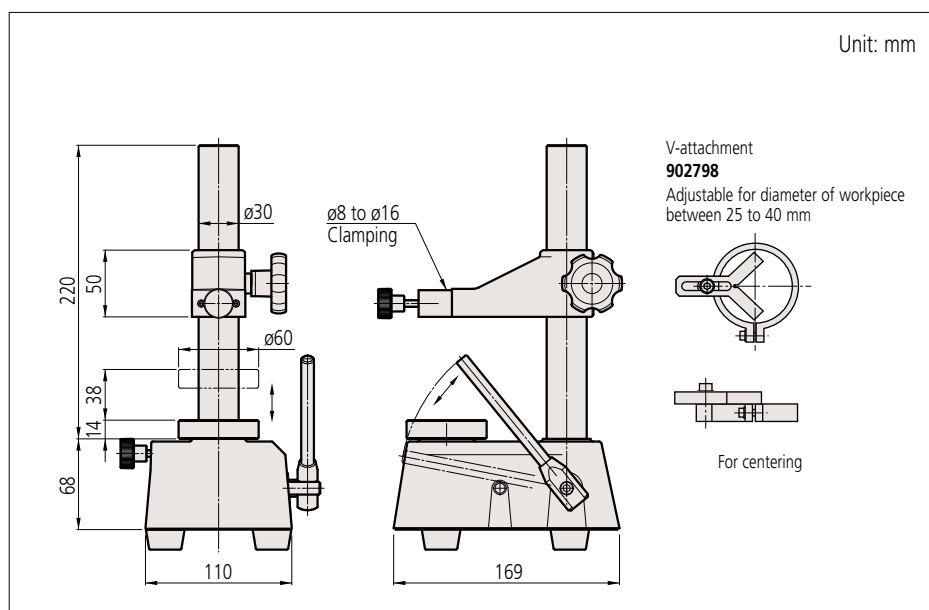


215-120-10

SPECIFICATIONS

Code No.	Measuring table displacement (mm)	Measuring table
215-120-10	38	Anvil (ø60 mm)

DIMENSIONS



Bore Gages

Bore Gages SERIES 511 — for Small Holes

- This bore gage is designed to measure the diameters of very small holes.
- The dial indicator is optional. Refer to page 08-52 for recommended indicators.
- Customized products with a longer rod below the grip or with a carbide anvil are available upon request.
- An optional setting ring is available for accurately setting the gage before measuring. Refer to pages 08-53 to 08-55.



511-201

Note: The dial indicator and the dial protection cover are optional. Refer to page 08-52 for details.

Measurement example



SPECIFICATIONS

Metric

Code No.	Range (mm)	Stroke of contact point (mm)	Accuracy* (μm)	Repeatability* (μm)	Adjacent error* (μm)	Measuring force (N)	Guide force (N)
511-209	6 - 10	0.5	5	2	2	2 or less	—
511-201	10 - 18.5	0.6					6 or less
511-210-20	6 - 10	0.5	5	2	2	2 or less	—
511-203-20	10 - 18.5	0.6					6 or less
511-211-20	6 - 10	0.5	5	2	2	2 or less	—
511-204-20	10 - 18.5	0.6					6 or less

Code No.	Content of set					Probing depth (mm)
	Bore gage	Dial indicator	Dial protection cover	Anvil	Interchangeable Washer	
511-209	511-209	Not supplied	Not supplied	9 pcs.	Not supplied	50
511-201	511-201				1 pc.	100
511-210-20	511-209	2109AB-10 (Graduation: 0.001 mm)	21DZA000	9 pcs.	Not supplied	50
511-203-20	511-201				1 pc.	100
511-211-20	511-209	2046AB (Graduation: 0.01 mm)	21DZA000	9 pcs.	Not supplied	50
511-204-20	511-201				1 pc.	100

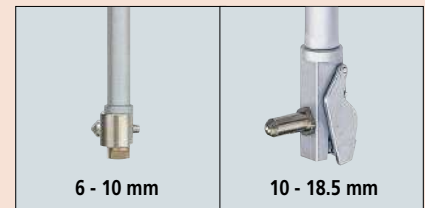
Inch

Code No.	Range (in)	Stroke of contact point (in)	Accuracy* (in)	Repeatability* (in)	Adjacent error* (in)	Measuring force (N)	Guide force (N)
511-214	0.24 - 0.4	0.020	0.0002	0.00008	0.00008	2 or less	—
511-205	0.4 - 0.74	0.024					6 or less
511-212-20	0.24 - 0.4	0.020	0.0002	0.00008	0.00008	2 or less	—
511-206-20	0.4 - 0.74	0.024					6 or less
511-213-20	0.24 - 0.4	0.020	0.0002	0.00008	0.00008	2 or less	—
511-207-20	0.4 - 0.74	0.024					6 or less

Code No.	Content of set					Probing depth (in)
	Bore gage	Dial indicator	Dial protection cover	Anvil	Interchangeable Washer	
511-214	511-214	Not supplied	Not supplied	9 pcs.	Not supplied	2
511-205	511-205				1 pc.	4
511-212-20	511-214	2923AB-10 (Graduation: 0.0001 in)	21DZA000	9 pcs.	Not supplied	2
511-206-20	511-205				1 pc.	4
511-213-20	511-214	2922AB (Graduation: 0.0005 in)	21DZA000	9 pcs.	Not supplied	2
511-207-20	511-205				1 pc.	4

* Accuracy of the bore gage alone.

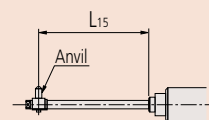
Contact Points



The dial protection cover, recommended indicators

Refer to page 08-52.

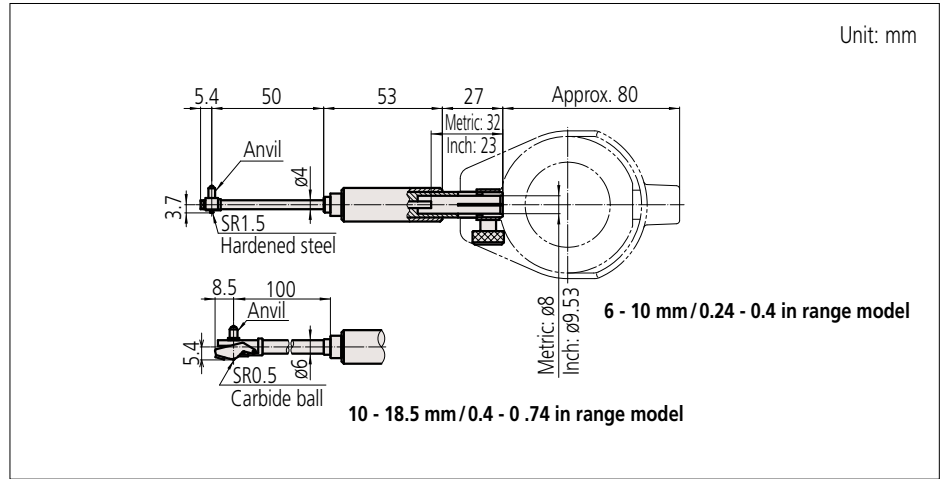
Example



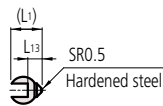
Length below the grip

Model	L15 (mm)
511-209	100, 150, 200, 250
511-201	50, 150, 200, 250, 300

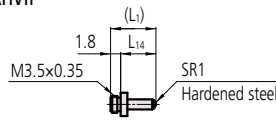
DIMENSIONS



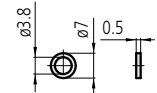
511-209 / 511-214
Anvil



511-201 / 511-205
Anvil



Interchangeable washer
(Supplied only with 511-201 / 511-205)



204355

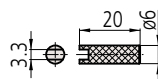
Unit: mm

STANDARD ACCESSORIES

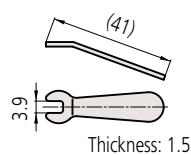
Bore gage (Main body)	Anvil					Interchangeable Washer	Spanner
	Marked No.	Code No.	Indication of measuring size	L ₁	L ₁₃	Code No.	Code No.
511-209 511-214	1	952168	6.0 mm / 0.24 in	4.7	1.2	Not supplied	206709
	2	952169	6.5 mm / 0.26 in	5.3	1.7		
	3	952170	7.0 mm / 0.28 in	5.8	2.2		
	4	952414	7.5 mm / 0.30 in	6.3	2.7		
	5	952415	8.0 mm / 0.32 in	6.8	3.2		
	6	952416	8.5 mm / 0.34 in	7.3	3.7		
	7	952417	9.0 mm / 0.36 in	7.8	4.2		
	8	952418	9.5 mm / 0.38 in	8.3	4.7		
	9	952419	10.0 mm / 0.40 in	8.8	5.2		

Bore gage (Main body)	Anvil					Interchangeable Washer	Spanner
	Marked No.	Code No.	Indication of measuring size	L ₁	L ₁₄	Code No.	Code No.
511-201 511-205	1	204356	10 mm / 0.40 in	3.8	2	204355	204354
	2	204357	11 mm / 0.44 in	4.8	3		
	3	204358	12 mm / 0.48 in	5.8	4		
	4	204359	13 mm / 0.52 in	6.8	5		
	5	204360	14 mm / 0.56 in	7.8	6		
	6	204361	15 mm / 0.60 in	8.8	7		
	7	204362	16 mm / 0.64 in	9.8	8		
	8	204363	17 mm / 0.68 in	10.8	9		
	9	204364	18 mm / 0.72 in	11.8	10		

Spanner
206709



204354



Unit: mm

Bore Gages

Bore Gages SERIES 511

- This is a bore gage for measuring 18 to 400 mm inside diameter. It is suitable for highly accurate measurements.
- Carbide-tipped contact point and anvil for durability and wear resistance.
- Optional extension rods can be attached for measuring deep holes.



511-702

Note: The dial indicator and the dial protection cover are optional. Refer to page 08-52 for details.

SPECIFICATIONS

Metric							
Code No.	Range (mm)	Stroke of contact point (mm)	Accuracy* (μm)	Repeatability* (μm)	Adjacent error* (μm)	Measuring force (N)	Guide force (N)
511-701	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-702	35 - 60						
511-703	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-704	100 - 160						
511-705	160 - 250						
511-706	250 - 400						
511-721-20	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-722-20	35 - 60						
511-723-20	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-724-20	100 - 160						
511-725-20	160 - 250						
511-726-20	250 - 400						
511-711-20	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-712-20	35 - 60						
511-713-20	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-714-20	100 - 160						
511-715-20	160 - 250						
511-716-20	250 - 400						
511-921-20	18 - 150	See SPECIFICATIONS of 511-701/702/703					
511-922-20							
511-925-10							

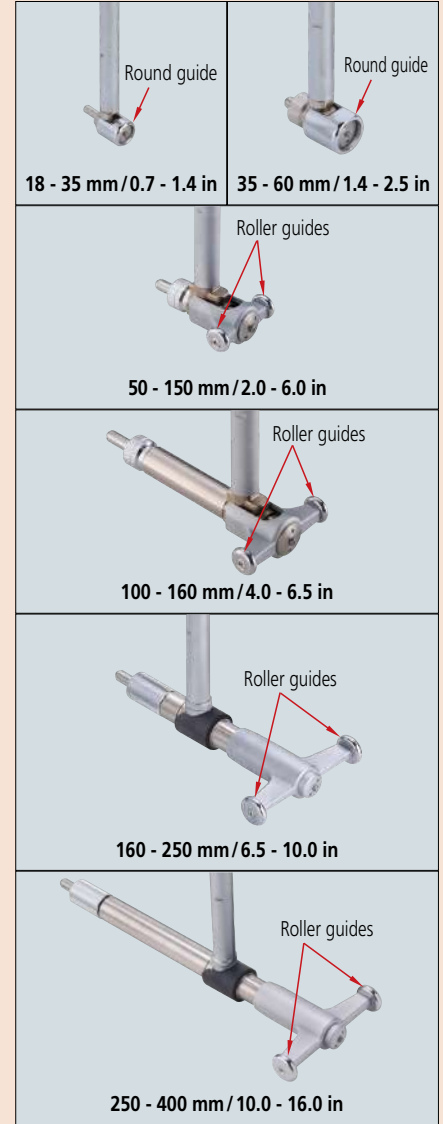
Code No.	Content of set							
	Bore gage	Dial indicator	Dial protection cover	Anvil	Interchangeable Washer	Sub-Anvil	Spanner	Probing depth (mm)
511-701	511-701	Not supplied	Not supplied	9 pcs.	2 pcs.	Not supplied	1 pc.	100
511-702	511-702			6 pcs.	4 pcs.			
511-703	511-703			11 pcs.		7 pcs.	1 pc.	Not supplied
511-704	511-704			13 pcs.	5 pcs.			
511-705	511-705			6 pcs.		9 pcs.	2 pcs.	1 pc.
511-706	511-706			5 pcs.	4 pcs.			
511-721-20	511-701	2109AB-10 (Graduation: 0.001 mm)	21DZA000	9 pcs.		2 pcs.	Not supplied	1 pc.
511-722-20	511-702			6 pcs.	4 pcs.	1 pc.		
511-723-20	511-703			11 pcs.			7 pcs.	1 pc.
511-724-20	511-704			13 pcs.	5 pcs.	1 pc.		
511-725-20	511-705	6 pcs.	9 pcs.	2 pcs.			1 pc.	
511-726-20	511-706	5 pcs.			4 pcs.	1 pc.		150
511-711-20	511-701	2046AB (Graduation: 0.01 mm)	21DZA000	9 pcs.			2 pcs.	
511-712-20	511-702			6 pcs.	4 pcs.	1 pc.	Not supplied	
511-713-20	511-703			11 pcs.				7 pcs.
511-714-20	511-704			13 pcs.	5 pcs.	1 pc.	250	
511-715-20	511-705	6 pcs.	9 pcs.	2 pcs.				1 pc.
511-716-20	511-706	5 pcs.			4 pcs.	1 pc.	150	
511-921-20	Set of	2046AB	21DZA000	See SPECIFICATIONS of 511-701/702/703				
511-922-20	511-701/	2109AB-10						
511-925-10	702/703	543-310B						

* Accuracy of the bore gage alone.

Note 1: A 50 mm sub-anvil is supplied with 511-703, and a 75 mm sub-anvil is supplied with 511-706.

Note 2: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

Contact Points



Extension Rod

Refer to page 08-51.

The dial protection cover, recommended indicators

Refer to page 08-52.

Setting rings

Refer to pages 08-53 to 08-56.

Recommended Digimatic Indicators (see Chapter 07)

- Metric type: **543-310B-10** (0.001 mm)
- Inch type: **543-312B-10** (0.001 mm/0.00005 in)



- The ID measurement can be performed easily since the minimum value is detected automatically.
- Up to three combinations of master value and tolerance value can be set.
- Nine measurement results (maximum) can be saved and recalled from memory (when no external device is connected). Refer to page 07-15 for details.

- Metric type: **543-700B** (0.0005 mm)
- Inch type: **543-702B** (0.0005 mm/0.00002 in)



- When using with **543-700B** or **543-702B**, modification of the setting is required. Refer to page 07-5 for details.

Anvil

A carbide ball is used for the contact point. It is more abrasion resistant than a hardened steel ball and, as its surface is smoother than that of a carbide tip, the workpiece is less liable to be marked.

Comparison of abrasion resistance

Hardened steel ball
(conventional model)

Carbide ball
(current model)



Abrasion depth: 0.1 mm
750 HV or more

Abrasion depth: 0.001 mm
1350 HV or more

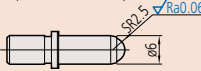
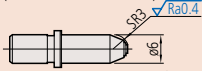
Inspection method

- Load a 0.5 N weight on the anvil, and slide for 1,000 m on abrasive paper of 9 μm (#2000) particle size.

Comparison of marks on the workpiece

Carbide tip
(conventional model)

Carbide ball
(current model)



Result of contour measurement



Vertical magnification: 2,000
Horizontal magnification: 200

Result of contour measurement



Vertical magnification: 2,000
Horizontal magnification: 200

Inspection method

- Load a 4 N weight on the anvil, and slide on the aluminum plate back and forth for 20 times.

SPECIFICATIONS

Inch							
Code No.	Range (in)	Stroke of contact point (in)	Accuracy* (in)	Repeatability* (in)	Adjacent error* (in)	Measuring force (N)	Guide force (N)
511-731	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-732	1.4 - 2.5					5 or less	10 or less
511-733	2.0 - 6.0					6 or less	15 or less
511-734	4.0 - 6.5	0.063	0.00008	0.00002	0.00004	4 or less	6 or less
511-735	6.5 - 10.0					5 or less	10 or less
511-736	10.0 - 16.0					6 or less	15 or less
511-751-20	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-752-20	1.4 - 2.5					5 or less	10 or less
511-753-20	2.0 - 6.0					6 or less	15 or less
511-754-20	4.0 - 6.5	0.063	0.00008	0.00002	0.00004	4 or less	6 or less
511-755-20	6.5 - 10.0					5 or less	10 or less
511-756-20	10.0 - 16.0					6 or less	15 or less
511-741-20	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-742-20	1.4 - 2.5					5 or less	10 or less
511-743-20	2.0 - 6.0					6 or less	15 or less
511-744-20	4.0 - 6.5	0.063	0.00008	0.00002	0.00004	4 or less	6 or less
511-745-20	6.5 - 10.0					5 or less	10 or less
511-746-20	10.0 - 16.0					6 or less	15 or less
511-931-20	0.7 - 6.0	See SPECIFICATIONS of 511-731/732/733					
511-932-20							
511-935-10							

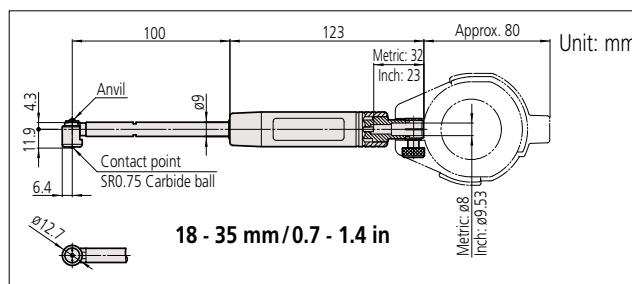
Code No.	Bore gage	Dial indicator	Dial protection cover	Content of set				Probing depth (in)				
				Anvil	Interchangeable Washer	Sub-Anvil	Spanner					
511-731	511-731	Not supplied	Not supplied	9 pcs.	2 pcs.	Not supplied	1 pc.	4				
511-732	511-732			6 pcs.	4 pcs.			1 pc.	Not supplied	6		
511-733	511-733			11 pcs.		7 pcs.	1 pc.				Not supplied	10
511-734	511-734			13 pcs.								
511-735	511-735			6 pcs.	4 pcs.	1 pc.	Not supplied	6				
511-736	511-736			5 pcs.					7 pcs.	1 pc.	Not supplied	10
511-751-20	511-731	2923AB-10 (Graduation: 0.0001 in)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	4				
511-752-20	511-732			6 pcs.	4 pcs.			1 pc.	Not supplied	6		
511-753-20	511-733			11 pcs.		7 pcs.	1 pc.				Not supplied	10
511-754-20	511-734			13 pcs.								
511-755-20	511-735			6 pcs.	4 pcs.	1 pc.	Not supplied	6				
511-756-20	511-736			5 pcs.					7 pcs.	1 pc.	Not supplied	10
511-741-20	511-731	2922AB (Graduation: 0.0005 in)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	4				
511-742-20	511-732			6 pcs.	4 pcs.			1 pc.	Not supplied	6		
511-743-20	511-733			11 pcs.		7 pcs.	1 pc.				Not supplied	10
511-744-20	511-734			13 pcs.								
511-745-20	511-735			6 pcs.	4 pcs.	1 pc.	Not supplied	6				
511-746-20	511-736			5 pcs.					7 pcs.	1 pc.	Not supplied	10
511-931-20	Set of	2922AB	21DZA000	See SPECIFICATIONS of 511-731/732/733								
511-932-20	511-731/	2923AB-10										
511-935-10	732/733	543-312B										

* Accuracy of the bore gage alone.

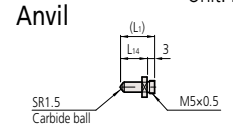
Note 1: A 2" sub-anvil is supplied with **511-733**, and a 3" sub-anvil is supplied with **511-736**.

Note 2: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

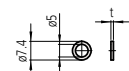
DIMENSIONS



Unit: mm



Interchangeable washer

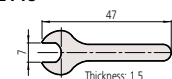


t (mm)	Code No.
0.5	205623
1	205624

STANDARD ACCESSORIES

Bore gage (Main body)	Anvil				
	Marked No.	Code No.	Indication of measuring size	L1	L14
511-701 511-731	1	21DZA213A	18 mm/0.71 in	5.5	2.5
	2	21DZA213B	20 mm/0.79 in	7.5	4.5
	3	21DZA213C	22 mm/0.87 in	9.5	6.5
	4	21DZA213D	24 mm/0.94 in	11.5	8.5
	5	21DZA213E	26 mm/1.02 in	13.5	10.5
	6	21DZA213F	28 mm/1.10 in	15.5	12.5
	7	21DZA213G	30 mm/1.18 in	17.5	14.5
	8	21DZA213H	32 mm/1.26 in	19.5	16.5
	9	21DZA213J	34 mm/1.34 in	21.5	18.5

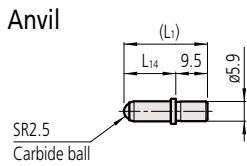
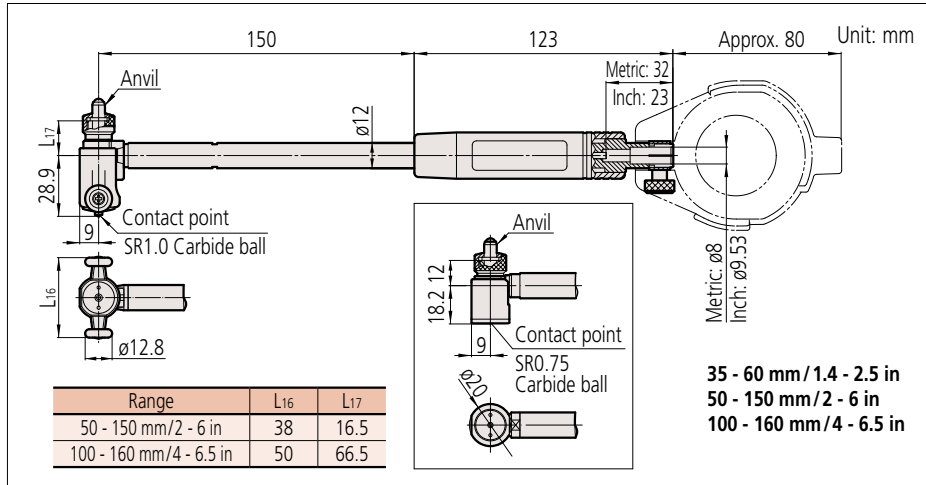
Spanner 102148



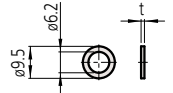
Bore Gages

Bore Gages SERIES 511

DIMENSIONS



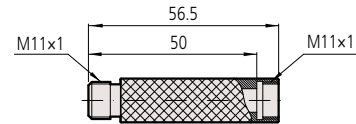
Interchangeable washer



t (mm)	Code No.
0.5	205457
1	205458
2	205459
3	205460

Sub-anvil

(Supplied only for 511-703 / 733)



102178

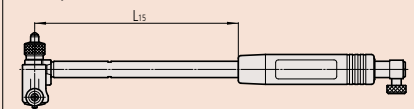
Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

STANDARD ACCESSORIES

Bore gage (Main body)	Anvil				
	Marked No.	Code No.	Indication of measuring size	L ₁	L ₁₄
511-702 511-732	1	21DZA232A	35 mm / 1.38 in	15	5.5
	2	21DZA232B	40 mm / 1.57 in	20	10.5
	3	21DZA232C	45 mm / 1.77 in	25	15.5
	4	21DZA232D	50 mm / 1.97 in	30	20.5
	5	21DZA232E	55 mm / 2.17 in	35	25.5
	6	21DZA232F	60 mm / 2.36 in	40	30.5
511-703 511-733 () Using 50 mm / 2 in Sub-Anvil	1	21DZA232A	50 mm (100 mm) / 1.97 in (3.94 in)	15	5.5
	2	21DZA232B	55 mm (105 mm) / 2.17 in (4.13 in)	20	10.5
	3	21DZA232C	60 mm (110 mm) / 2.36 in (4.33 in)	25	15.5
	4	21DZA232D	65 mm (115 mm) / 2.55 in (4.53 in)	30	20.5
	5	21DZA232E	70 mm (120 mm) / 2.74 in (4.72 in)	35	25.5
	6	21DZA232F	75 mm (125 mm) / 2.93 in (4.92 in)	40	30.5
	7	21DZA232G	80 mm (130 mm) / 3.12 in (5.12 in)	45	35.5
	8	21DZA232H	85 mm (135 mm) / 3.31 in (5.31 in)	50	40.5
	9	21DZA232J	90 mm (140 mm) / 3.50 in (5.51 in)	55	45.5
	10	21DZA232L	95 mm (145 mm) / 3.69 in (5.71 in)	60	50.5
	11	21DZA232M	100 mm (150 mm) / 3.88 in (5.91 in)	65	55.5
511-704 511-734	1	21DZA232A	100 mm / 3.94 in	15	5.5
	2	21DZA232B	105 mm / 4.13 in	20	10.5
	3	21DZA232C	110 mm / 4.33 in	25	15.5
	4	21DZA232D	115 mm / 4.53 in	30	20.5
	5	21DZA232E	120 mm / 4.72 in	35	25.5
	6	21DZA232F	125 mm / 4.92 in	40	30.5
	7	21DZA232G	130 mm / 5.12 in	45	35.5
	8	21DZA232H	135 mm / 5.31 in	50	40.5
	9	21DZA232J	140 mm / 5.51 in	55	45.5
	10	21DZA232L	145 mm / 5.71 in	60	50.5
	11	21DZA232M	150 mm / 5.91 in	65	55.5
	12	21DZA232N	155 mm / 6.10 in	70	60.5
	13	21DZA232P	160 mm / 6.30 in	75	65.5

Special sizes and specifications other than standard can be custom-made by special order. Please contact your local Mitutoyo Sales Office for more information.

Example

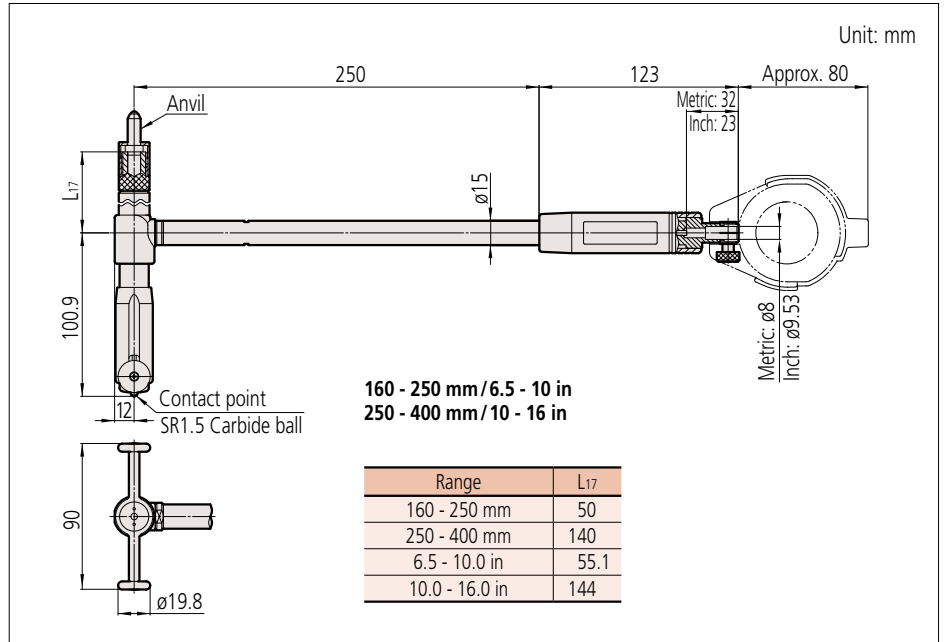


Length below the grip

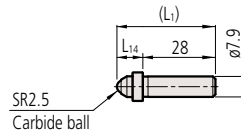
Model	L ₁₅ (mm)
511-701	150, 200, 250, 300, 400, 500
511-702 / 703 / 704	100, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000
511-705 / 706	100, 150, 200, 300, 400, 500, 600, 700, 800, 900, 1000

Note: The length over listed above is not available.

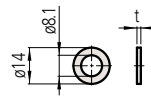
DIMENSIONS



Anvil



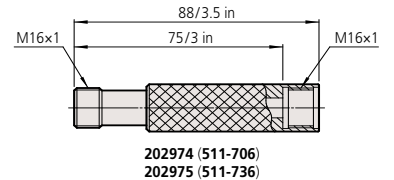
Interchangeable washer



t (mm)	Code No.
0.5	205467
1	205461
2	205462
3	205463
4	205464
5	205465
6	205466

Sub-anvil

Supplied only for **511-706 (202974)**
and **511-736 (202975)**



Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

STANDARD ACCESSORIES

Bore gage (Main body)	Anvil				
	Marked No.	Code No.	Indication of measuring size	L1	L14
511-705 511-735	1	21DZA241A	160 mm/6.50 in	38	10
	2	21DZA241B	175 mm/7.09 in	53	25
	3	21DZA241C	190 mm/7.68 in	68	40
	4	21DZA241D	205 mm/8.27 in	83	55
	5	21DZA241E	220 mm/8.86 in	98	70
	6	21DZA241F	235 mm/9.45 in	113	85
511-706 511-736 () Using 75 mm/3 in Sub-Anvil	1	21DZA241A	250 mm (325 mm)/10.00 in (13.00 in)	38	10
	2	21DZA241B	265 mm (340 mm)/10.59 in (13.59 in)	53	25
	3	21DZA241C	280 mm (355 mm)/11.18 in (14.18 in)	68	40
	4	21DZA241D	295 mm (370 mm)/11.77 in (14.77 in)	83	55
	5	21DZA241E	310 mm (385 mm)/12.36 in (15.36 in)	98	70

Bore Gages

Bore Gages SERIES 511 — Short Leg Type

- This is a bore gage for measuring 18 to 160 mm inside diameter.
- With a short length below the grip, a lightweight and easy-to-handle body makes it easier to insert the gage in a narrow space or perform measurements on a table.
- Carbide-tipped contact point and anvil for durability and wear resistance.



511-761

Note: The dial indicator and the dial protection cover are optional.
Refer to page 08-52 for details.

SPECIFICATIONS

Metric

Code No.	Range (mm)	Stroke of contact point (mm)	Accuracy* (μm)	Repeatability* (μm)	Adjacent error* (μm)	Measuring force (N)	Guide force (N)
511-761	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-762	35 - 60						
511-763	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-764	100 - 160						
511-771-20	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-772-20	35 - 60						
511-773-20	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-774-20	100 - 160						
511-766-20	18 - 35	1.2	2	0.5	1	4 or less	6 or less
511-767-20	35 - 60						
511-768-20	50 - 150	1.6	2	0.5	1	5 or less	10 or less
511-769-20	100 - 160						

Code No.	Content of set							Probing depth (mm)	
	Bore gage	Dial indicator	Dial protection cover	Anvil	Interchangeable Washer	Sub-Anvil	Spanner		
511-761	511-761	Not supplied	Not supplied	9 pcs.	2 pcs.	Not supplied	1 pc.	50	
511-762	511-762			6 pcs.	4 pcs.	1 pc.	Not supplied		Not supplied
511-763	511-763			11 pcs.					
511-764	511-764			13 pcs.					
511-771-20	511-761	2109AB-10 (Graduation: 0.001 mm)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	50	
511-772-20	511-762			6 pcs.	4 pcs.	1 pc.	Not supplied		Not supplied
511-773-20	511-763			11 pcs.					
511-774-20	511-764			13 pcs.					
511-766-20	511-761	2046AB (Graduation: 0.01 mm)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	50	
511-767-20	511-762			6 pcs.	4 pcs.	1 pc.	Not supplied		Not supplied
511-768-20	511-763			11 pcs.					
511-769-20	511-764			13 pcs.					

* Accuracy of the bore gage alone.

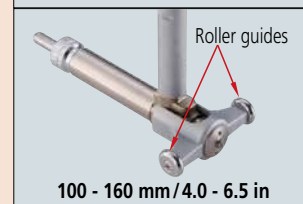
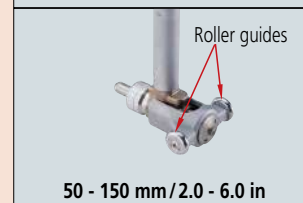
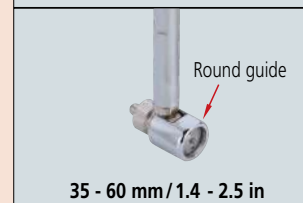
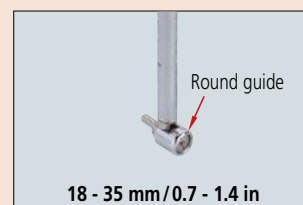
Note 1: A 50 mm sub-anvil is supplied with 511-763.

Note 2: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

Measurement example



Contact Points



The dial protection cover, recommended indicators

Refer to page 08-52.

SPECIFICATIONS

Inch							
Code No.	Range (in)	Stroke of contact point (in)	Accuracy* (in)	Repeatability* (in)	Adjacent error* (in)	Measuring force (N)	Guide force (N)
511-781	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-782	1.4 - 2.5						
511-783	2.0 - 6.0						
511-784	4.0 - 6.5	0.063				5 or less	10 or less
511-791-20	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-792-20	1.4 - 2.5						
511-793-20	2.0 - 6.0						
511-794-20	4.0 - 6.5	0.063				5 or less	10 or less
511-786-20	0.7 - 1.4	0.047	0.00008	0.00002	0.00004	4 or less	6 or less
511-787-20	1.4 - 2.5						
511-788-20	2.0 - 6.0						
511-789-20	4.0 - 6.5	0.063				5 or less	10 or less

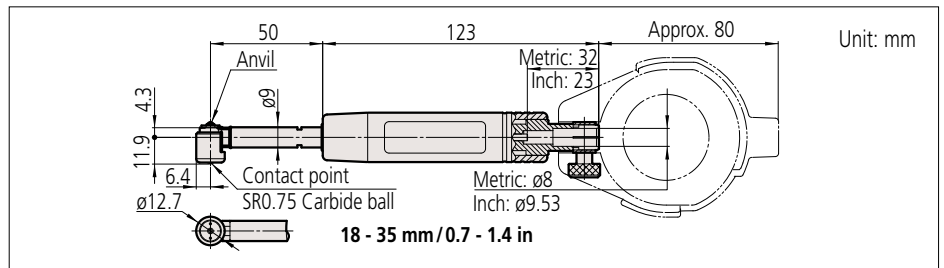
Code No.	Bore gage	Dial indicator	Dial protection cover	Content of set				Probing depth (in)		
				Anvil	Interchangeable Washer	Sub-Anvil	Spanner			
511-781	511-781	Not supplied	Not supplied	9 pcs.	2 pcs.	Not supplied	1 pc.	2		
511-782	511-782			6 pcs.	4 pcs.		Not supplied		Not supplied	
511-783	511-783			11 pcs.						1 pc.
511-784	511-784			13 pcs.						Not supplied
511-791-20	511-781	2923AB-10 (Graduation: 0.0001 in)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	2		
511-792-20	511-782			6 pcs.	4 pcs.		1 pc.		Not supplied	
511-793-20	511-783			11 pcs.						
511-794-20	511-784			13 pcs.						
511-786-20	511-781	2922AB (Graduation: 0.0005 in)	21DZA000	9 pcs.	2 pcs.	Not supplied	1 pc.	2		
511-787-20	511-782			6 pcs.	4 pcs.		1 pc.		Not supplied	
511-788-20	511-783			11 pcs.						
511-789-20	511-784			13 pcs.						

* Accuracy of the bore gage alone.

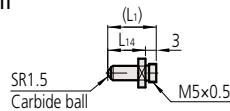
Note 1: A 2" sub-anvil is supplied with 511-783.

Note 2: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

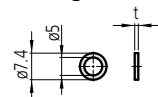
DIMENSIONS



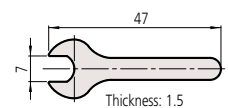
Anvil



Interchangeable washer



Spanner 102148



t (mm)	Code No.
0.5	205623
1	205624

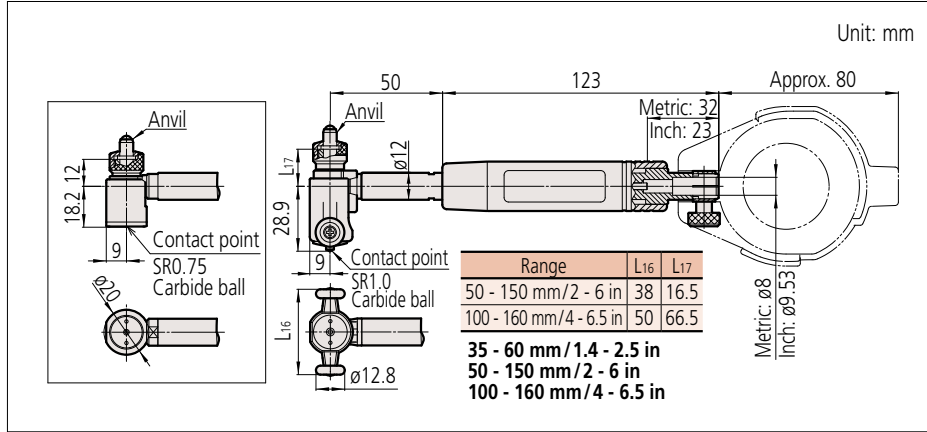
STANDARD ACCESSORIES

Bore gage (Main body)	Anvil				
	Marked No.	Code No.	Indication of measuring size	L1	L14
511-761 511-781	1	21DZA213A	18 mm/0.71 in	5.5 mm/0.22 in	2.5 mm/0.10 in
	2	21DZA213B	20 mm/0.79 in	7.5 mm/0.30 in	4.5 mm/0.18 in
	3	21DZA213C	22 mm/0.87 in	9.5 mm/0.37 in	6.5 mm/0.26 in
	4	21DZA213D	24 mm/0.94 in	11.5 mm/0.45 in	8.5 mm/0.33 in
	5	21DZA213E	26 mm/1.02 in	13.5 mm/0.53 in	10.5 mm/0.41 in
	6	21DZA213F	28 mm/1.10 in	15.5 mm/0.61 in	12.5 mm/0.49 in
	7	21DZA213G	30 mm/1.18 in	17.5 mm/0.69 in	14.5 mm/0.57 in
	8	21DZA213H	32 mm/1.26 in	19.5 mm/0.77 in	16.5 mm/0.65 in
	9	21DZA213J	34 mm/1.34 in	21.5 mm/0.85 in	18.5 mm/0.73 in

Bore Gages

Bore Gages SERIES 511 — Short Leg Type

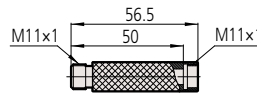
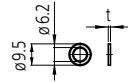
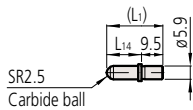
DIMENSIONS



Recommended Digimatic Indicators

Refer to page 08-38.

Anvil Interchangeable washer Sub-anvil (Supplied only for 511-763 and 511-783.)



t (mm)	Code No.
0.5	205457
1	205458
2	205459
3	205460

Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

STANDARD ACCESSORIES

Bore gage (Main body)	Anvil				
	Marked No.	Code No.	Indication of measuring size	L1	L14
511-762 511-782	1	21DZA232A	35 mm / 1.38 in	15	5.5
	2	21DZA232B	40 mm / 1.57 in	20	10.5
	3	21DZA232C	45 mm / 1.77 in	25	15.5
	4	21DZA232D	50 mm / 1.97 in	30	20.5
	5	21DZA232E	55 mm / 2.17 in	35	25.5
	6	21DZA232F	60 mm / 2.36 in	40	30.5
511-763 511-783 () Using 50 mm / 2 in Sub-Anvil	1	21DZA232A	50 mm (100 mm) / 1.97 in (3.94 in)	15	5.5
	2	21DZA232B	55 mm (105 mm) / 2.17 in (4.13 in)	20	10.5
	3	21DZA232C	60 mm (110 mm) / 2.36 in (4.33 in)	25	15.5
	4	21DZA232D	65 mm (115 mm) / 2.55 in (4.53 in)	30	20.5
	5	21DZA232E	70 mm (120 mm) / 2.74 in (4.72 in)	35	25.5
	6	21DZA232F	75 mm (125 mm) / 2.93 in (4.92 in)	40	30.5
	7	21DZA232G	80 mm (130 mm) / 3.12 in (5.12 in)	45	35.5
	8	21DZA232H	85 mm (135 mm) / 3.31 in (5.31 in)	50	40.5
	9	21DZA232J	90 mm (140 mm) / 3.50 in (5.51 in)	55	45.5
	10	21DZA232L	95 mm (145 mm) / 3.69 in (5.71 in)	60	50.5
	11	21DZA232M	100 mm (150 mm) / 3.88 in (5.91 in)	65	55.5
511-764 511-784	1	21DZA232A	100 mm / 3.94 in	15	5.5
	2	21DZA232B	105 mm / 4.13 in	20	10.5
	3	21DZA232C	110 mm / 4.33 in	25	15.5
	4	21DZA232D	115 mm / 4.53 in	30	20.5
	5	21DZA232E	120 mm / 4.72 in	35	25.5
	6	21DZA232F	125 mm / 4.92 in	40	30.5
	7	21DZA232G	130 mm / 5.12 in	45	35.5
	8	21DZA232H	135 mm / 5.31 in	50	40.5
	9	21DZA232J	140 mm / 5.51 in	55	45.5
	10	21DZA232L	145 mm / 5.71 in	60	50.5
	11	21DZA232M	150 mm / 5.91 in	65	55.5
	12	21DZA232N	155 mm / 6.10 in	70	60.5
	13	21DZA232P	160 mm / 6.30 in	75	65.5

Bore Gages SERIES 511 — with Micrometer Head

Measurement example



The dial protection cover, recommended indicators

Refer to page 08-52.

- Micrometer head is attached to the anvil for convenient and accurate dimensional measurements.
- Carbide-tipped contact point for durability and wear resistance.



511-803

Note: The dial indicator and the dial protection cover are optional. Refer to page 08-52 for details.

SPECIFICATIONS

Metric							
Code No.	Range (mm)	Stroke of contact point (mm)	Accuracy* (μm)	Repeatability* (μm)	Adjacent error* (μm)	Measuring force (N)	Guide force (N)
511-803	60 - 100	1.6	2	0.5	1	5 or less	10 or less
511-804	100 - 160						15 or less
511-805	150 - 250					6 or less	20 or less
511-806	250 - 400						15 or less
511-807	400 - 600						20 or less
511-808	600 - 800	1.6	2	0.5	1	5 or less	10 or less
511-823-20	60 - 100						15 or less
511-824-20	100 - 160					6 or less	20 or less
511-825-20	150 - 250						15 or less
511-826-20	250 - 400						20 or less
511-827-20	400 - 600	1.6	2	0.5	1	5 or less	10 or less
511-828-20	600 - 800						15 or less
511-813-20	60 - 100					6 or less	20 or less
511-814-20	100 - 160						15 or less
511-815-20	150 - 250						20 or less
511-816-20	250 - 400	6 or less	15 or less				
511-817-20	400 - 600		20 or less				
511-818-20	600 - 800		15 or less				

Code No.	Bore gage	Content of set				Sub-Anvil	Spanner	Probing depth (mm)
		Dial indicator	Dial protection cover	Micrometer head				
511-803	511-803	Not supplied	Not supplied	1 pc.	2 pcs.	3 pcs.	2 pcs.	150
511-804	511-804							
511-805	511-805							
511-806	511-806							
511-807	511-807							
511-808	511-808	2109AB-10 (Graduation: 0.001 mm)	21DZA000	1 pc.	2 pcs.	3 pcs.	2 pcs.	150
511-823-20	511-803							
511-824-20	511-804							
511-825-20	511-805							
511-826-20	511-806							
511-827-20	511-807	2046AB (Graduation: 0.01 mm)	21DZA000	1 pc.	2 pcs.	3 pcs.	2 pcs.	150
511-828-20	511-808							
511-813-20	511-803							
511-814-20	511-804							
511-815-20	511-805							
511-816-20	511-806	2 pcs.	2 pcs.	2 pcs.	2 pcs.	2 pcs.	250	
511-817-20	511-807							
511-818-20	511-808							

* Accuracy of the bore gage alone.

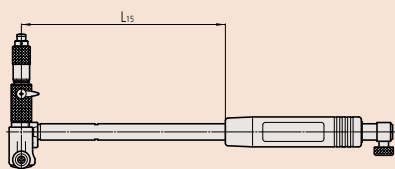
Note 1: Storage boxes for 511-807/808 models are made of wood. The boxes of other models are made of plastic.

Note 2: It is not permissible to expand measuring range using sub-anvils other than as supplied as standard accessories.

(The measurement accuracy in such cases is not guaranteed.)

Special sizes and specifications other than standard can be custom-made by special order. Please contact your local Mitutoyo Sales Office for more information.

Example



Length below the grip

Model	L ₁₅ (mm)
511-803/804	50, 100, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000
511-805/806/807/808	50, 100, 150, 200, 300, 400, 500, 600, 700, 800, 900, 1000

Note: The length over listed above is not available.

Bore Gages

Bore Gages SERIES 511 — with Micrometer Head

SPECIFICATIONS

Inch							
Code No.	Range (in)	Stroke of contact point (in)	Accuracy* (in)	Repeatability* (in)	Adjacent error* (in)	Measuring force (N)	Guide force (N)
511-833	2.4 - 4.0	0.063	0.00008	0.00002	0.00004	5 or less	10 or less
511-834	4.0 - 6.4						
511-835	6.0 - 10.0					6 or less	15 or less
511-836	10.0 - 16.0						
511-837	16.0 - 24.0						
511-838	24.0 - 32.0	0.063	0.00008	0.00002	0.00004	5 or less	10 or less
511-853-20	2.4 - 4.0						
511-854-20	4.0 - 6.4					6 or less	15 or less
511-855-20	6.0 - 10.0						
511-856-20	10.0 - 16.0						
511-857-20	16.0 - 24.0	0.063	0.00008	0.00002	0.00004	5 or less	10 or less
511-858-20	24.0 - 32.0						
511-843-20	2.4 - 4.0					6 or less	15 or less
511-844-20	4.0 - 6.4						
511-845-20	6.0 - 10.0						
511-846-20	10.0 - 16.0	0.063	0.00008	0.00002	0.00004	5 or less	10 or less
511-847-20	16.0 - 24.0						
511-848-20	24.0 - 32.0					6 or less	15 or less

Recommended Digimatic Indicators

Refer to page 08-38.

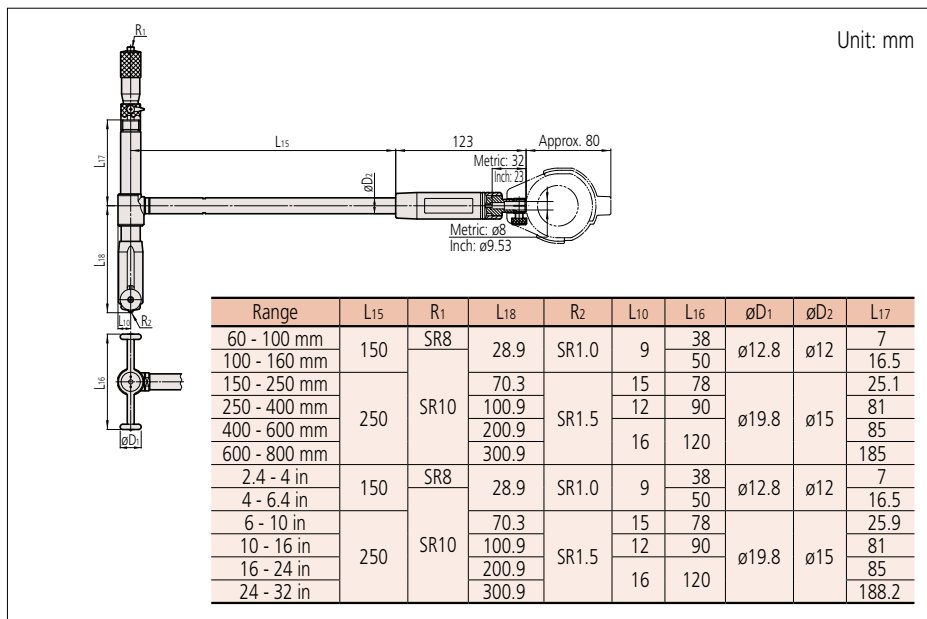
Code No.	Content of set						Probing depth (in)	
	Bore gage	Dial indicator	Dial protection cover	Micrometer head	Sub-Anvil	Spanner		
511-833	511-833	Not supplied	Not supplied	1 pc.	2 pcs.	3 pcs.	6	
511-834	511-834				3 pcs.			
511-835	511-835				4 pcs.	2 pcs.	10	
511-836	511-836				3 pcs.			
511-837	511-837				2 pcs.			
511-838	511-838	2 pcs.	2923AB-10 (Graduation: 0.0001 in)	21DZA000	1 pc.	2 pcs.	3 pcs.	4
511-853-20	511-833	3 pcs.						
511-854-20	511-834	4 pcs.				2 pcs.	6	
511-855-20	511-835	3 pcs.						
511-856-20	511-836	2 pcs.						
511-857-20	511-837	2 pcs.	2 pcs.	10				
511-858-20	511-838	2 pcs.						
511-843-20	511-833	2 pcs.			2922AB (Graduation: 0.0005 in)	21DZA000	1 pc.	2 pcs.
511-844-20	511-834	3 pcs.						
511-845-20	511-835	4 pcs.	2 pcs.	6				
511-846-20	511-836	3 pcs.						
511-847-20	511-837	2 pcs.						
511-848-20	511-838	2 pcs.	2 pcs.	10				

* Accuracy of the bore gage alone.

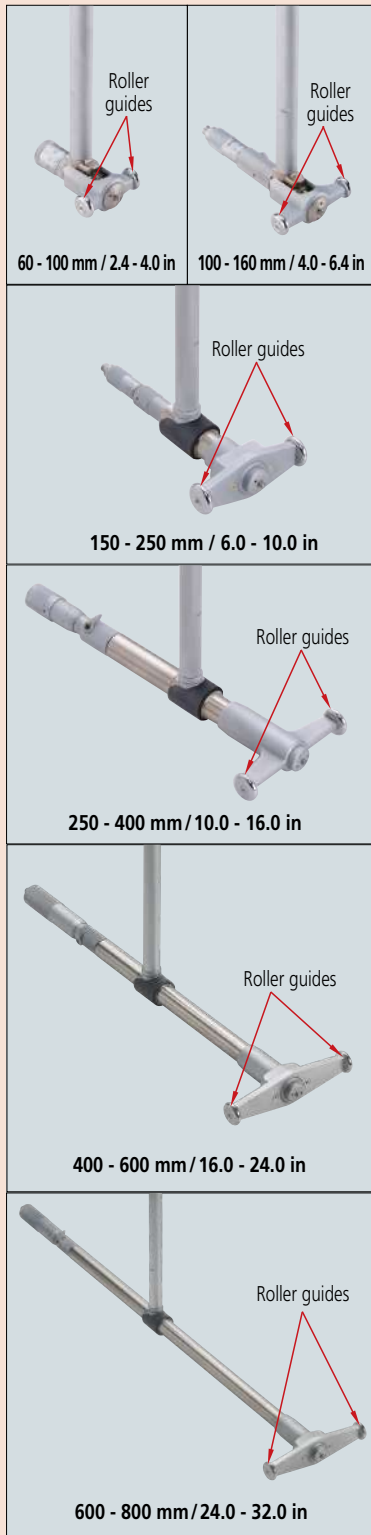
Note 1: Storage boxes for 511-837/838 models are made of wood. The boxes of other models are made of plastic.

Note 2: It is not permissible to expand measuring range using sub-anvils other than as supplied as standard accessories. (The measurement accuracy in such cases is not guaranteed.)

DIMENSIONS

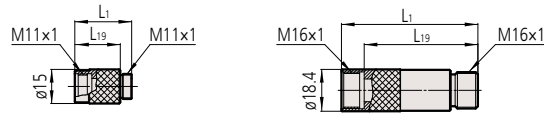


Contact Points



Sub-anvil

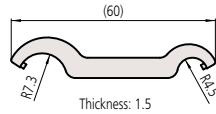
Unit: mm



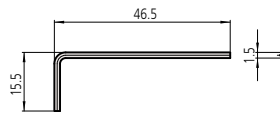
Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

Spanner

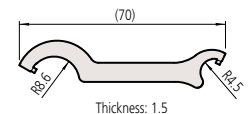
301336



202863



200154



STANDARD ACCESSORIES

Metric								
Bore gage (Main body)	Micrometer head			Sub-Anvil				Spanner
	Code No.	Stroke (mm)	Screw size	Marked No. (mm)	Code No.	L ₁ (mm)	L ₁₉ (mm)	Code No.
511-803	21DZA267	10	M11×1	10	208892	15	10	301336 (2 pcs.) 202863 (1 pc.)
				20	208894	25	20	
511-804	21DZA268	13	M11×1	10	208892	15	10	301336 (2 pcs.)
				20	208894 (2 pcs.)	25	20	
511-805	21DZA268	13	M11×1	10	208892	15	10	301336 (2 pcs.)
				20	208894 (2 pcs.)	25	20	
				50	21DAA492	55	50	
511-806	953118	25	M16×1	25	208926	35	25	200154 (2 pcs.)
				50	208928 (2 pcs.)	60	50	
511-807	953120	50	M16×1	50	208928	60	50	200154 (2 pcs.)
				100	208932	110	100	
511-808	953120	50	M16×1	50	208928	60	50	200154 (2 pcs.)
				100	208932	110	100	

Inch								
Bore gage (Main body)	Micrometer head			Sub-Anvil				Spanner
	Code No.	Stroke (in)	Screw size	Marked No. (in)	Code No.	L ₁ (in)	L ₁₉ (in)	Code No.
511-833	21DZA272	0.4	M11×1	0.4	208893	0.6	0.4	301336 (2 pcs.) 202863 (1 pc.)
				0.8	208895	1.0	0.8	
511-834	21DZA273	0.5	M11×1	0.4	208893	0.6	0.4	301336 (2 pcs.)
				0.8	208895 (2 pcs.)	1.0	0.8	
511-835	21DZA273	0.5	M11×1	0.4	208893	0.6	0.4	301336 (2 pcs.)
				0.8	208895 (2 pcs.)	1.0	0.8	
				2	21DAA493	2.2	2	
511-836	21DZA275	1.0	M16×1	1	208927	1.4	1	200154 (2 pcs.)
				2	208929 (2 pcs.)	2.4	2	
511-837	902313	2.0	M16×1	2	208929	2.4	2	200154 (2 pcs.)
				4	208933	4.4	4	
511-838	902313	2.0	M16×1	2	208929	2.4	2	200154 (2 pcs.)
				4	208933	4.4	4	

Bore Gages

Bore Gages SERIES 511 — for Blind Holes

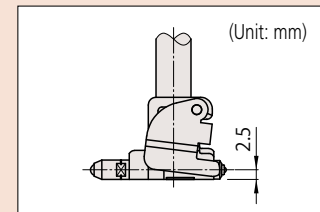
- This is a bore gage for measuring diameters near the bottom of a hole.
- Carbide-tipped contact point and anvil for durability and wear resistance.
- Optional extension rods can be attached for measuring deep holes.



511-415

Note: The dial indicator and the dial protection cover are optional. Refer to page 08-52 for details.

Measurement example



Extension Rod

Refer to page 08-51.

The dial protection cover, recommended indicators

Refer to page 08-52.

SPECIFICATIONS

Metric														
Code No.	Range (mm)	Stroke of contact point (mm)	Accuracy* (μm)	Repeatability* (μm)	Adjacent error* (μm)	Measuring force (N)	Guide force (N)	Content of set					Probing depth (mm)	
								Bore gage	Dial indicator	Dial protection cover	Anvil	Washer		
511-415	15 - 35							511-415						
511-416	35 - 60	1.2	4	1	1	4 or less	6 or less	511-416	Not supplied	Not supplied		6 pcs.	4 pcs.	150
511-417	50 - 150					5 or less	10 or less	511-417				11 pcs.		
511-425-20	15 - 35							511-415	2046AB			11 pcs.	1 pc.	
511-426-20	35 - 60	1.2	4	1	1	4 or less	6 or less	511-416	(Graduation: 0.01 mm)	21DZA000		6 pcs.	4 pcs.	150
511-427-20	50 - 150					5 or less	10 or less	511-417				11 pcs.		
511-435-20	15 - 35							511-415	2109AB-10			11 pcs.	1 pc.	
511-436-20	35 - 60	1.2	4	1	1	4 or less	6 or less	511-416	(Graduation: 0.001 mm)	21DZA000		6 pcs.	4 pcs.	150
511-437-20	50 - 150					5 or less	10 or less	511-417				11 pcs.		

Inch														
Code No.	Range (in)	Stroke of contact point (in)	Accuracy* (in)	Repeatability* (in)	Adjacent error* (in)	Measuring force (N)	Guide force (N)	Content of set					Probing depth (in)	
								Bore gage	Dial indicator	Dial protection cover	Anvil	Washer		
511-418	0.6 - 1.4							511-418				11 pcs.	1 pc.	
511-419	1.4 - 2.4	0.047	0.00016	0.00004	0.00004	4 or less	6 or less	511-419	Not supplied	Not supplied		6 pcs.	4 pcs.	6
511-420	2.0 - 6.0					5 or less	10 or less	511-420				11 pcs.		
511-428-20	0.6 - 1.4							511-418	2922AB			11 pcs.	1 pc.	
511-429-20	1.4 - 2.4	0.047	0.00016	0.00004	0.00004	4 or less	6 or less	511-419	(Graduation: 0.0005 in)	21DZA000		6 pcs.	4 pcs.	6
511-430-20	2.0 - 6.0					5 or less	10 or less	511-420				11 pcs.		
511-438-20	0.6 - 1.4							511-418	2923AB-10			11 pcs.	1 pc.	
511-439-20	1.4 - 2.4	0.047	0.00016	0.00004	0.00004	4 or less	6 or less	511-419	(Graduation: 0.0001 in)	21DZA000		6 pcs.	4 pcs.	6
511-440-20	2.0 - 6.0					5 or less	10 or less	511-420				11 pcs.		

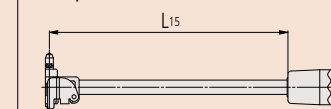
* Accuracy of the bore gage alone.

Note 1: A 10 mm (0.4 in) sub-anvil is supplied with 511-415/425-20/435-20/418/428-20/438-20 and a 50 mm (2 in) sub-anvil is supplied with 511-417/427-20/437-20/420/430-20/440-20.

Note 2: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

Special sizes and specifications other than standard can be custom-made by special order. Please contact your local Mitutoyo Sales Office for more information.

Example



Length below the grip

Model	L15 (mm)
511-415/416/417	50, 150, 200, 250, 300, 400, 500

Contact Points



15 - 35 mm / 0.6 - 1.4 in

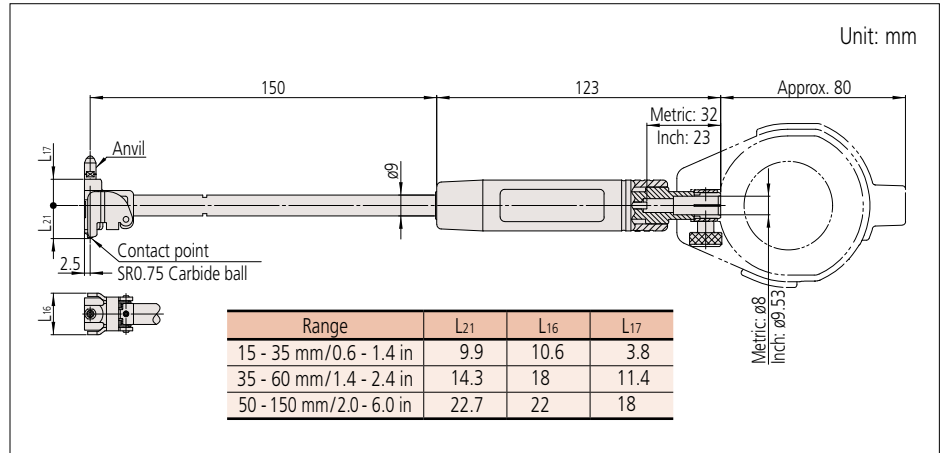
35 - 60 mm / 1.4 - 2.4 in

50 - 150 mm / 2.0 - 6.0 in

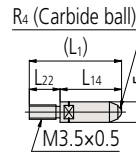
Recommended Digimatic Indicators

Refer to page 08-38.

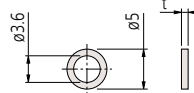
DIMENSIONS



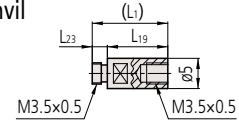
Anvil



Interchangeable washer

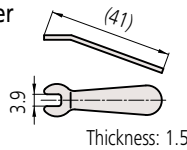


Sub-anvil

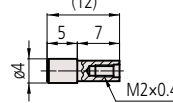


Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

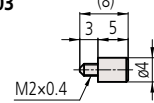
Spanner 204354



Washer holder 212202



Locking screw 212203



STANDARD ACCESSORIES

Bore gage (Main body)	Anvil							Interchangeable washer		Sub-Anvil		
	Marked No.	Code No.	Indication of measuring size	L1	L22	R4	L14	Code No.	t	Code No.	L23	L19
511-415 511-418 () Using 10 mm / 0.4 in Sub-Anvil	1	21DZA376A	15 mm (25 mm) / 0.59 in (0.98 in)	4.5	2.5	SR1	2	212127	0.5 mm / 0.02 in	21DAA563	2.5	10 mm / 0.4 in
	2	21DZA376B	16 mm (26 mm) / 0.63 in (1.02 in)	5.5			3					
	3	21DZA376C	17 mm (27 mm) / 0.67 in (1.06 in)	6.5			4					
	4	21DZA376D	18 mm (28 mm) / 0.71 in (1.10 in)	7.5			5					
	5	21DZA376E	19 mm (29 mm) / 0.75 in (1.14 in)	8.5			6					
	6	21DZA376F	20 mm (30 mm) / 0.79 in (1.18 in)	9.5			7					
	7	21DZA376G	21 mm (31 mm) / 0.83 in (1.22 in)	10.5		SR1.5	8					
	8	21DZA376H	22 mm (32 mm) / 0.87 in (1.26 in)	11.5			9					
	9	21DZA376J	23 mm (33 mm) / 0.91 in (1.30 in)	12.5			10					
	10	21DZA376L	24 mm (34 mm) / 0.94 in (1.34 in)	13.5			11					
	11	21DZA376M	25 mm (35 mm) / 0.98 in (1.38 in)	14.5			12					
511-416 511-419	1	21DZA404A	35 mm / 1.38 in	17.5			7.5					
	2	21DZA404B	40 mm / 1.57 in	22.5	15							
	3	21DZA404C	45 mm / 1.77 in	27.5	20							
	4	21DZA404D	50 mm / 1.97 in	32.5	25							
	5	21DZA404E	55 mm / 2.17 in	37.5	30							
	6	21DZA404F	60 mm / 2.36 in	42.5	35							
511-417 511-420 () Using 50 mm / 2 in Sub-Anvil	1	21DZA404A	50 mm (100 mm) / 1.97 in (3.94 in)	17.5	7.5	SR1.5	10	212127 212128 212129 212130	0.5 mm / 0.02 in 1.0 mm / 0.04 in 2.0 mm / 0.08 in 3.0 mm / 0.12 in	21DAA596	7.5	50 mm / 2 in
	2	21DZA404B	55 mm (105 mm) / 2.17 in (4.13 in)	22.5			15					
	3	21DZA404C	60 mm (110 mm) / 2.36 in (4.33 in)	27.5			20					
	4	21DZA404D	65 mm (115 mm) / 2.56 in (4.53 in)	32.5			25					
	5	21DZA404E	70 mm (120 mm) / 2.76 in (4.72 in)	37.5			30					
	6	21DZA404F	75 mm (125 mm) / 2.95 in (4.92 in)	42.5			35					
	7	21DZA404G	80 mm (130 mm) / 3.15 in (5.12 in)	47.5			40					
	8	21DZA404H	85 mm (135 mm) / 3.35 in (5.31 in)	52.5			45					
	9	21DZA404J	90 mm (140 mm) / 3.54 in (5.51 in)	57.5			50					
	10	21DZA404L	95 mm (145 mm) / 3.74 in (5.71 in)	62.5			55					
	11	21DZA404M	100 mm (150 mm) / 3.94 in (5.91 in)	67.5			60					

Bore Gages SERIES 511 — ABSOLUTE Digimatic Bore Gages

- An easy-to-use digital bore gage with preset and data output functions not available on analog models for use in various applications. Analog bar indicator allows for fast Go/No-go judgements.
- The minimum value holding function provides easy measurement of hole diameters.

- ABS (ABSOLUTE) type bore gages are not subject to overspeed error.
- The display and grip can be rotated up to 320° and the display can be inclined up to 90°, so that it is easily readable from any direction.
- Up to four extension rods (optional) can be used for measuring at the bottom of a hole 2 m deep.



511-501

SPECIFICATIONS

Metric	511-501	511-502
Code No.	511-501	511-502
Range	45 - 100 mm	100 - 160 mm
Stroke of contact point	1.2 mm	
Resolution	0.001 mm	
Wide range accuracy*1	0.003 mm or less	
Adjacent error	0.002 mm or less	
Repeatability	0.002 mm or less	
Measuring force	5 N or less	
Guide force	10 N or less	
Power source	SR44 battery (2 pcs.), 938882 included as standard (for operational checks)	
Battery life*2	Approx. 2,000 hours under normal use.	
Position detection method	ABSOLUTE electrostatic linear encoder	
Sampling frequency*3	50 times/s	
Dust / Water protection level*4	IP53 (IEC 60529, JIS C 0920)	
Display	· 7 segments 6 digits decimal numeric with minus sign, Unit (mm) · Tolerance judge indication · Analog indication	
Net weight	500 g	570 g

Inch	511-521	511-522
Code No.	511-521	511-522
Range	1.8 - 4.0 in	4.0 - 6.5 in
Stroke of contact point	0.048 in/1.2 mm	
Resolution	0.00005 in/0.001 mm	
Wide range accuracy*1	0.0001 in/0.003 mm or less	
Adjacent error	0.00008 in/0.002 mm or less	
Repeatability	0.0001 in/0.002 mm or less	
Measuring force	5 N or less	
Guide force	10 N or less	
Power source	SR44 battery (2 pcs.), 938882 included as standard (for operational checks)	
Battery life*2	Approx. 2,000 hours under normal use.	
Position detection method	ABSOLUTE electrostatic linear encoder	
Sampling frequency*3	50 times/s	
Dust / Water protection level*4	IP53 (IEC 60529, JIS C 0920)	
Display	· 7 segments 6 digits decimal numeric with minus sign, Unit (in/mm) · Tolerance judge indication · Analog indication	
Net weight	500 g	570 g

*1 A quantizing error is excluded.
 *2 When the usage time per day is eight hours.
 *3 If the contact point detecting speed is over 50 μm/s, the peak value may not be displayed correctly.
 *4 The level indicated is valid only if the output connector cap is installed.

Measurement example



Function

- Preset function
- Master value registration (3 values maximum)
- Tolerance judgment
- Upper/lower limit registration (3 values maximum)
- Minimum value holding
- Data output
- Display rotation (320°)
- Display inclination (90°, 7 steps)
- Low battery alarm display
- Error display

Extension Rod (optional)

250 mm (10 in): **21DZA089**
 500 mm (20 in): **21DZA081**
 Up to four extension rods can be joined, and a maximum length of 2 m is allowed.

Optional Accessories

Code No.	Type	description
264-020	—	USB Input Tool Series USB Keyboard Signal Conversion Type IT-020U
905338	F	Connection cable (1 m)
905409	F	Connection cable (2 m)
06AFM380F	F	USB Input Tool Direct (2 m)
02AZD730*	IP67	U-WAVE-T
02AZD880*	Buzzer	U-WAVE-T
02AZD790F	F	Connection cable for U-WAVE-T (160 mm)
02AZE140F	F	Connection cable for U-WAVE-T For foot switch
02AZD810D	—	U-WAVE-R

* Add suffix to Code No.; **G** for Asia, Europe and the Americas,
H for Brazil and **J** for Korea.

Gauge Blocks and Block Sets for Setting the Origin or Master Value (optional)

- Typical application



- Rectangular gauge blocks
- Note: Available only for 511-501/521

516-118-10
516-118-60 with calibration certificate

Description*	Code No.	Qty	
Nominal length (mm)	1	611611-021	1
	2	611612-021	1
	3	611613-021	1
	5	611615-021	1
	10	611671-021	1
	20	611672-021	1
	30	611673-021	1
	40	611674-021	1
Flat jaw	630030	1 pair (2 pcs.)	
Holder 160 mm	619004	1	
Inspection certificate (8 pcs.)	—	1	

* Equivalent to JIS B 7506 Grade 0

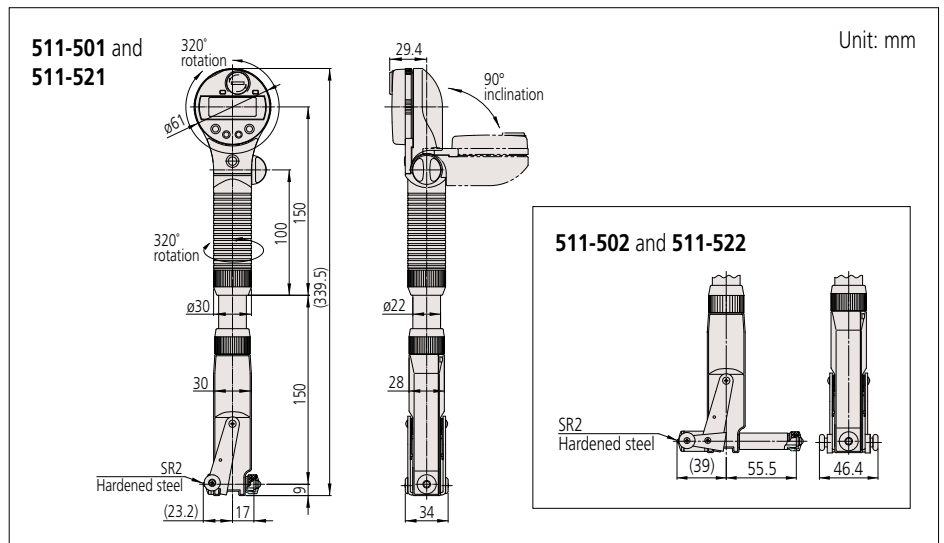
- Square gauge blocks
- Note: Available only for 511-501/521

516-119-10
516-119-60 with calibration certificate

Description*	Code No.	Qty	
Nominal length (mm)	1	614611-021	1
	2	614612-021	1
	3	614613-021	1
	5	614615-021	1
	10	614671-021	1
	20	614672-021	1
	30	614673-021	1
	40	614674-021	1
Flat jaw	619072	1 pair (2 pcs.)	
Tie rod 3 in	619062	1	
Tie rod 2 1/4 in	619063	1	
Tie rod 1 1/2 in	619064	1	
Flat head screw 1 1/4 in	619057	2	
Flat head screw 5/8 in	619058	2	
Inspection certificate (8 pcs.)	—	1	

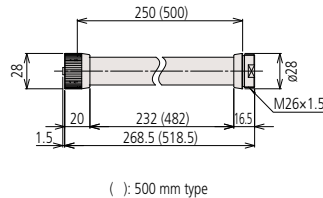
* Equivalent to JIS B 7506 Grade 0

DIMENSIONS



Extension rod (optional)

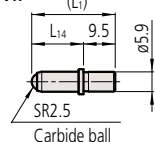
Unit: mm



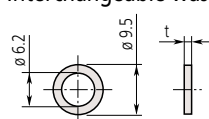
STANDARD ACCESSORIES

Bore gage	Anvil					Interchangeable washer	
	(Main body)	Marked No.	Code No.	Indication of measuring size	L ₁ (mm)	L ₁₄ (mm)	Code No.
511-501 511-521	1	21DZA232A	45 mm/1.8 in	15	5.5	205457 205458 205459 205460	0.5 mm/0.02 in 1.0 mm/0.04 in 2.0 mm/0.08 in 3.0 mm/0.12 in
	2	21DZA232B	50 mm/2.0 in	20	10.5		
	3	21DZA232C	55 mm/2.2 in	25	15.5		
	4	21DZA232D	60 mm/2.4 in	30	20.5		
	5	21DZA232E	65 mm/2.6 in	35	25.5		
	6	21DZA232F	70 mm/2.8 in	40	30.5		
	7	21DZA232G	75 mm/3.0 in	45	35.5		
	8	21DZA232H	80 mm/3.2 in	50	40.5		
	9	21DZA232J	85 mm/3.4 in	55	45.5		
	10	21DZA232L	90 mm/3.6 in	60	50.5		
	11	21DZA232M	95 mm/3.8 in	65	55.5		
	12	21DZA232N	100 mm/4.0 in	70	60.5		
511-502 511-522	1	21DZA232A	100 mm/4.0 in	15	5.5	205457 205458 205459 205460	0.5 mm/0.02 in 1.0 mm/0.04 in 2.0 mm/0.08 in 3.0 mm/0.12 in
	2	21DZA232B	105 mm/4.2 in	20	10.5		
	3	21DZA232C	110 mm/4.4 in	25	15.5		
	4	21DZA232D	115 mm/4.6 in	30	20.5		
	5	21DZA232E	120 mm/4.8 in	35	25.5		
	6	21DZA232F	125 mm/5.0 in	40	30.5		
	7	21DZA232G	130 mm/5.2 in	45	35.5		
	8	21DZA232H	135 mm/5.4 in	50	40.5		
	9	21DZA232J	140 mm/5.6 in	55	45.5		
	10	21DZA232L	145 mm/5.8 in	60	50.5		
	11	21DZA232M	150 mm/6.0 in	65	55.5		
	12	21DZA232N	155 mm/6.2 in	70	60.5		
	13	21DZA232P	160 mm/6.4 in	75	65.5		

Anvil



Interchangeable washer



Unit: mm

Bore Gages

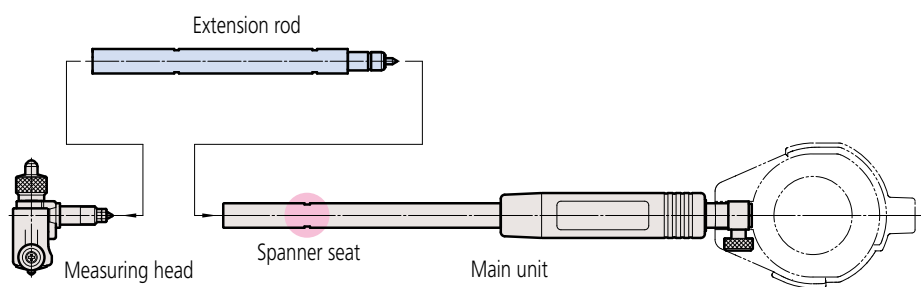
Extension Rod SERIES 511 — Accessories for Bore Gages

- Extension rods are available to assist in deep-hole measurement. (For applicable combination with bore gages, see the table below)

Note 1: When using a 500 mm (or longer) extension rod, use the bore gage in an upright position.

Note 2: Only one extension rod can be attached to a bore gage. It is not possible to use more than one extension rod.

Note 3: The extension rod cannot be used for products with a custom size or custom specifications.



SPECIFICATIONS

Applicable model Code No.	Extension rod length (mm)					Extension rod diameter (mm)	Spanner code No.
	125	250	500	750	1000		
511-701/511-731 511-415/511-418 511-416/511-419 511-417/511-420	953549	953550	953551	—	—	ø9	102148 (2 pcs.)
511-702/511-732 511-703/511-733 511-704/511-734 511-803/511-833 511-804/511-834	953552	953553	953554	953555	953556	ø12	212556 (2 pcs.)
511-705/511-735 511-706/511-736 511-805/511-835 511-806/511-836 511-807/511-837 511-808/511-838	953557	952361	953558	953559	953560	ø15	212556 (2 pcs.)

Note 1: If an extension rod is attached, the measuring accuracy may degrade due to factors such as rod deflection.

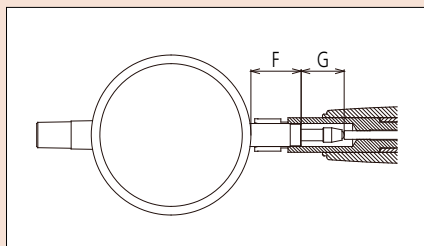
Note 2: Spanner is supplied as standard.

Recommended Indicators Accessories for Bore Gages

Note: Among indicators other than those recommended, the following types of indicator cannot be used.

- Indicators with a total length of F and G of less than 31.8 mm
- Indicators with a measuring range of more than 12.7 mm (ISO/JIS Type)/0.9 in (ASME/ANSI Type)
- Dust-proof and water-proof indicators with a spindle covered with rubber

Please contact us if you have any questions about products.



- These are the recommended indicators for bore gages. Select the best one for your application.

RECOMMENDED INDICATORS



2046AB
Graduation 0.01 mm,
Measuring range 10 mm
Refer to page 07-26 for
details.



2109AB-10
Graduation 0.001 mm,
Measuring range 1 mm
Refer to page 07-28 for
details.



2972AB
One revolution type,
Graduation 0.01 mm,
Measuring range 1 mm
Refer to page 07-40 for
details.



2900AB-10
One revolution type,
Graduation 0.001 mm,
Measuring range 0.08 mm
Refer to page 07-34 for
details.



543-310B-10
ABSOLUTE Digimatic
Indicator
Resolution 0.001 mm
Refer to page 07-15 for
details.



543-700B
Resolution 0.0005 mm
Refer to page 07-5 for
details.

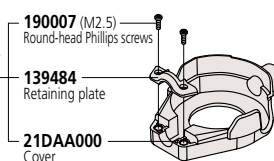
Note: Settings should be modified prior to use. Refer to the user's manual for details.

DIAL PROTECTION COVER

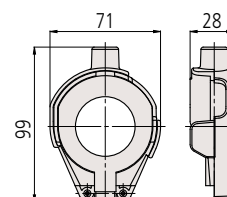
- The cover protects the indicator from unexpected impact while handling the bore gage.
- Can also be used for **543-310B-10**, an ABS Digimatic indicator for bore gages.
Note: This protect cover is intended to be attached to a bore gage and cannot be used for a dial indicator or Digimatic indicator alone.



Dial protection cover
set code No.
21DZA000



- 190007** (M2.5)
Round-head Phillips screws
- 139484**
Retaining plate
- 21DAA000**
Cover



Unit: mm

Bore Gages

Setting Rings

SERIES 177 — Accessories for Inside Micrometers, Holtest and Dial Bore Gages

- Used for quick and accurate setting of dial bore gages, Holtest, and inside micrometers.
- Actual diameter is marked in 0.001 mm increments. (Measuring position of dimension is the center of the height T.)

Made-to-order

- Custom-made setting rings
Mitutoyo can manufacture settings rings to the size and design you need.
- Nominal size range
1 mm to 305 mm/0.04 in to 12 in (steel)
4 mm to 50 mm/0.16 in to 2 in (ceramic)
- Nominal size increment
0.01 mm (up to 45 mm)
0.02 mm (over 45 mm)
0.0001 in (inch)

Steel Setting Rings



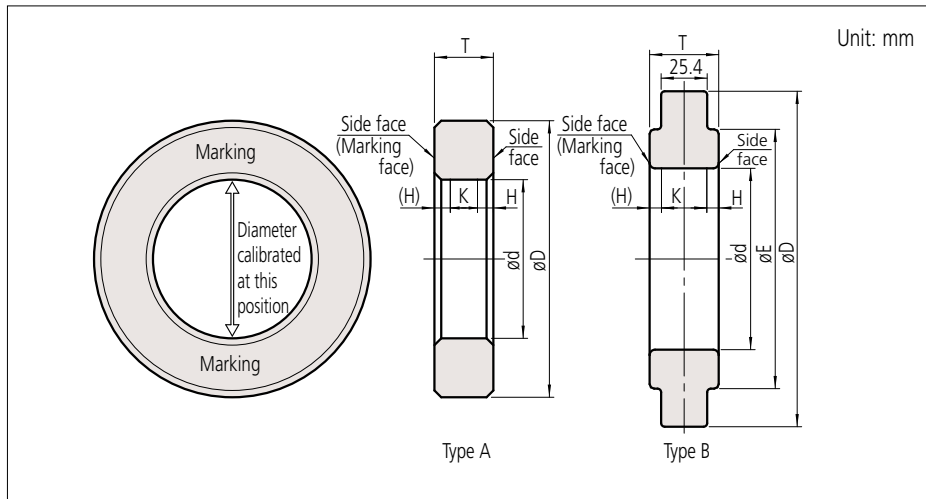
177-300

CERA Setting Rings



177-432

DIMENSIONS



Suffix

177-*-62:** With Inspection Certificate (provides a record of the calibrated diameter) and Calibration Certificate

177-*-82:** With Inspection Certificate (provides a record of the calibrated diameter), Calibration Certificate, and Traceability System Chart

Note 1: The Inspection Certificate is not a substitute for a calibration certificate as it is undated.

Note 2: A more detailed inspection certificate describing roundness and cylindricity is available on request.

SPECIFICATIONS

Steel Setting Rings

Metric										
Code No.	Nominal size ϕ D (mm)	Dimensions (mm)			Type	Accuracy				
		ϕ D	ϕ E	T		Tolerance between the nominal size and the actual diameter (μ m)	Uncertainty of marked diameter value* ¹ (μ m)	Roundness/Cylindricity* ² (μ m)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
177-220	1	20	—	4	A	± 10	1.5	1.0	1.6	0.8
177-222	1.1	20	—	4	A	± 10	1.5	1.0	1.6	0.8
177-225	1.2	20	—	4	A	± 10	1.5	1.0	1.6	0.8
177-227	1.3	20	—	4	A	± 10	1.5	1.0	1.6	0.8
177-230	1.4	20	—	4	A	± 10	1.5	1.0	1.6	0.8
177-236	1.75	25	—	5	A	± 10	1.5	1.0	1.6	1.8
177-239	2	25	—	5	A	± 10	1.5	1.0	1.6	1.8
177-242	2.25	25	—	5	A	± 10	1.5	1.0	1.6	1.8
177-208	2.5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-246	2.75	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-248	3	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-250	3.25	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-252	3.5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-255	3.75	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-204	4	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-257	4.5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-205	5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-263	5.5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-267	6	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-271	6.5	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-275	7	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-125	8	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-279	9	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-126	10	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-284	12	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-132	14	38	—	10	A	± 10	1.5	1.0	2.0	6.0
177-177	16	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-133	17	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-285	18	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-286	20	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-139	25	53	—	15	A	± 10	1.5	1.0	3.2	8.6
177-288	30	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-140	35	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-290	40	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-178	45	85	—	15	A	± 10	1.5	1.0	3.7	7.6
177-146	50	85	—	20	A	± 20	1.5	1.0	3.7	12.6
177-292	60	112	—	20	A	± 20	1.5	1.0	3.7	12.6
177-314	62	112	—	20	A	± 20	1.5	1.5	3.7	12.6
177-147	70	112	—	20	A	± 20	1.5	1.5	3.7	12.6
177-316	75	125	—	25	A	± 20	1.5	1.5	4.2	16.6
177-294	80	125	—	25	A	± 20	1.5	1.5	4.2	16.6
177-318	87	140	—	25	A	± 20	1.5	1.5	4.2	16.6
177-148	90	140	—	25	A	± 20	1.5	1.5	4.2	16.6
177-296	100	160	—	25	A	± 20	1.5	2.0	4.2	16.6
177-298	125	210	168	38.1 (25.4)	B	± 20	2.5	2.0	5.3	27.5
177-300	150	235	187		B	± 20	2.5	2.0	5.3	27.5
177-302	175	260	215		B	± 20	2.5	2.5	5.3	27.5
177-304	200	311	244		B	± 20	2.5	2.5	5.3	27.5
177-306	225	337	264		B	± 20	2.5	2.5	5.3	27.5
177-308	250	362	290		B	± 20	2.5	3.0	5.3	27.5
177-310	275	413	321		B	± 20	2.5	3.0	5.3	27.5
177-312	300	438	340		B	± 20	2.5	3.0	5.3	27.5

*1 Actual diameter is marked in 0.001 mm increments. (Dimension measuring position is the center of the height T.)

*2 Cylindricity is defined as per JIS B 0621 Definitions and designations of geometrical deviations, Section 4.4 "Cylindricity." Cylindricity is measured using three cross-sections between the top and bottom face of a ring, namely, close to the face near each side and the center.

Bore Gages

Setting Rings

SERIES 177 — Accessories for Inside Micrometers, Holtest and Dial Bore Gages

Inch										
Code No.	Nominal size ϕ D (in)	Dimensions (mm)			Type	Accuracy				
		ϕ D	ϕ E	T		Tolerance between the nominal size and the actual diameter (in)	Uncertainty of marked diameter value* ¹ (in)	Roundness/Cylindricity* ² (in)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
177-209	0.1	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-206	0.16	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-207	0.24	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-281	0.275	25	—	7	A	± 0.0004	0.00006	0.00004	2.0	3.0
177-179	0.35	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-283	0.425	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-180	0.5	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-181	0.6	38	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-182	0.65	45	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-183	0.7	45	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-287	0.8	45	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-184	1	53	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-289	1.2	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-185	1.4	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-291	1.6	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-186	1.8	85	—	15	A	± 0.0004	0.00006	0.00004	3.7	7.6
177-187	2	85	—	20	A	± 0.0008	0.00006	0.00004	3.7	12.6
177-293	2.4	112	—	20	A	± 0.0008	0.00006	0.00004	3.7	12.6
177-315	2.5	112	—	20	A	± 0.0008	0.00006	0.00006	4.2	11.6
177-188	2.8	112	—	20	A	± 0.0008	0.00006	0.00006	4.2	11.6
177-317	3	125	—	25	A	± 0.0008	0.00006	0.00006	4.2	16.6
177-295	3.2	125	—	25	A	± 0.0008	0.00006	0.00006	4.2	16.6
177-319	3.5	140	—	25	A	± 0.0008	0.00006	0.00006	4.2	16.6
177-189	3.6	140	—	25	A	± 0.0008	0.00006	0.00006	4.2	16.6
177-297	4	160	—	25	A	± 0.0008	0.00006	0.00008	4.2	16.6
177-299	5	210	168	38.1	B	± 0.0008	0.00010	0.00008	5.3	27.5
177-301	6	235	187	38.1	B	± 0.0008	0.00010	0.00008	5.3	27.5
177-303	7	260	215	38.1	B	± 0.0008	0.00010	0.00010	5.3	27.5
177-305	8	311	244	38.1	B	± 0.0008	0.00010	0.00010	5.3	27.5
177-307	9	337	264	38.1	B	± 0.0008	0.00010	0.00010	5.3	27.5
177-309	10	362	290	38.1	B	± 0.0008	0.00010	0.00012	5.3	27.5
177-311	11	413	321	38.1	B	± 0.0008	0.00010	0.00012	5.3	27.5
177-313	12	438	340	38.1	B	± 0.0008	0.00010	0.00012	5.3	27.5

*1 Actual diameter is marked in 0.001 mm increments. (Dimension measuring position is the center of the height T.)

*2 Cylindricity is defined as per JIS B 0621 Definitions and designations of geometrical deviations, Section 4.4 "Cylindricity."

Cylindricity is measured using three cross-sections between the top and bottom face of a ring, namely, close to the face near each side and the center.

SPECIFICATIONS

CERA Setting Rings

Metric										
Code No.	Nominal size ϕ D (mm)	Dimensions (mm)			Type	Accuracy				
		ϕ D	ϕ E	T		Tolerance between the nominal size and the actual diameter (μ m)	Uncertainty of marked diameter value* ¹ (μ m)	Roundness/Cylindricity* ² (μ m)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
177-418	4	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-420	6	25	—	7	A	± 10	1.5	1.0	1.7	3.6
177-423	8	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-424	10	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-425	12	32	—	10	A	± 10	1.5	1.0	2.0	6.0
177-427	16	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-429	20	45	—	10	A	± 10	1.5	1.0	2.0	6.0
177-430	25	53	—	15	A	± 10	1.5	1.0	3.2	8.6
177-431	30	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-432	35	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-433	40	71	—	15	A	± 10	1.5	1.0	3.2	8.6
177-434	45	85	—	15	A	± 10	1.5	1.0	3.7	7.6

Inch										
Code No.	Nominal size ϕ D (in)	Dimensions (mm)			Type	Accuracy				
		ϕ D	ϕ E	T		Tolerance between the nominal size and the actual diameter (in)	Uncertainty of marked diameter value* ¹ (in)	Roundness/Cylindricity* ² (in)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
177-518	0.16	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-520	0.24	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-522	0.275	25	—	7	A	± 0.0004	0.00006	0.00004	1.7	3.6
177-523	0.35	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-524	0.425	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-525	0.5	32	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-527	0.65	45	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-529	0.8	45	—	10	A	± 0.0004	0.00006	0.00004	2.0	6.0
177-530	1	53	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-531	1.2	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-532	1.4	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-533	1.6	71	—	15	A	± 0.0004	0.00006	0.00004	3.2	8.6
177-534	1.8	85	—	15	A	± 0.0004	0.00006	0.00004	3.7	7.6

*1 Actual diameter is marked in 0.001 mm increments. (Dimension measuring position is the center of the height T.)

*2 Cylindricity is defined as per JIS B 0621 Definitions and designations of geometrical deviations, Section 4.4 "Cylindricity." Cylindricity is measured using three cross-sections between the top and bottom face of a ring, namely, close to the face near each side and the center.

Bore Gages

Bore Gage Checker SERIES 515

- The Bore Gage Checker allows easy setting of dial bore gages with ranges of 18 mm (0.7 in) through 400 mm (16 in) using gauge blocks.
- Can be used in both vertical and horizontal positions.



515-590

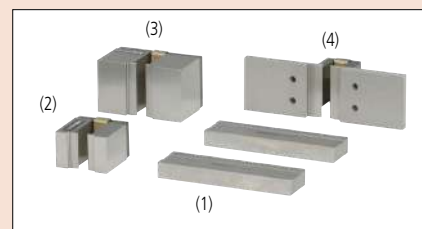
SPECIFICATIONS

Code No.	Applicable range	Flatness of parallel jaw	Parallelism of parallel jaw
515-590	18 - 400 mm (0.7 - 16 in)	0.5 μ m	1 μ m

Measurement example



Standard Accessories



- (1) Parallel jaw 2 pcs. **630030**
- (2) Attachment A **940088**
- (3) Attachment B **940089**
- (4) Attachment C **940090**

