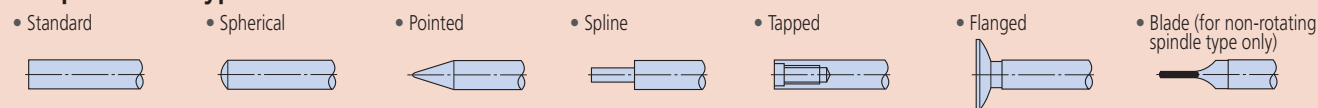


Custom-built Products (Product Example Introductions)

Micrometer heads have applications in many fields of science and industry and Mitutoyo offers a wide range of standard models to meet customers' needs. However, in those cases where the standard product is not suitable, Mitutoyo can custom build a head incorporating features better suited to your special application. Please feel free to contact Mitutoyo about the possibilities - even if only one custom-manufactured piece is required.

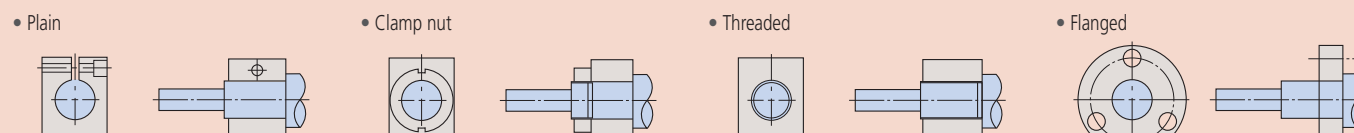
1. Spindle-end types



Note: Long spindle type is also available. Please consult Mitutoyo.

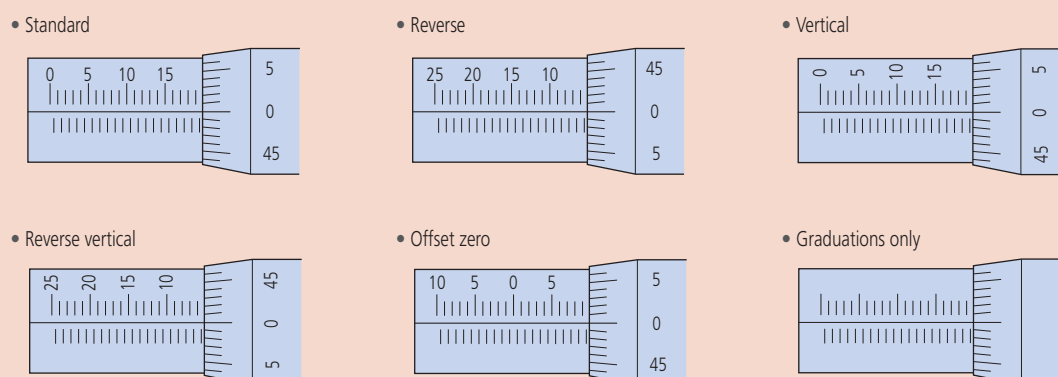
2. Stem types

A custom stem can be manufactured to suit the mounting fixture.



3. Scale graduation schemes

Various barrel and thimble scale graduation schemes, such as reverse and vertical, are available. Please consult Mitutoyo for ordering a custom scheme not shown here.



4. Logo engraving

A specific logo can be engraved as required.

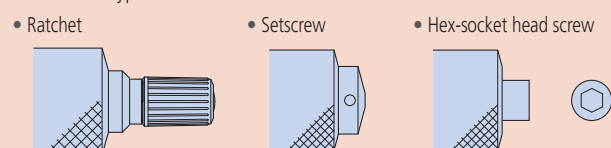
5. Motor Coupling

Couplings for providing motor drive to a head can be designed.



6. Thimble mounting

Thimble mounting methods including a ratchet, setscrew, and hex-socket head screw types are available.



7. Spindle-thread pitch

Pitches of 1 mm for fast-feed applications or 0.25 mm and 0.1 mm for fine-feed can be supplied as alternatives to the standard 0.5 mm. Inch pitches are also supported. Please consult Mitutoyo for details.

8. Lubricant for spindle threads

Lubrication arrangements can be specified by the customer.

9. All-stainless construction

All components of a head can be manufactured in stainless steel.

10. Simple packaging

Large-quantity orders of micrometer heads can be delivered in simple packaging for OEM purposes.

11. Spindle and nut (Precision lead screw)

The spindle can be used as a precision lead screw. The nut is machined in accordance with the specified dimensions. For details, refer to "Precision Leadscrews" on page B-126.

12. Accuracy inspection certificate

An accuracy inspection certificate can be supplied at extra cost. For detailed information, contact the nearest Mitutoyo Sales Office.



Digimatic Holtest

Refer to pages C-3 to C-6 for details.



Holtest

Refer to pages C-7 to C-12 for details.



ABSOLUTE Borematic

Refer to pages C-13 to C-16 for details.



Inside Micrometers (Caliper Type)

Refer to pages C-25 to C-26 for details.



Bore Gages

Refer to pages C-35 to C-38 for details.

Bore Gages for Blind Holes

Refer to pages C-45 to C-46 for details.

Holtest

Digimatic Holtest SERIES 468 — Three-point Internal Micrometers

- Three-point internal micrometer with large LCD readout. (Character height 7.4 mm)
- Deep holes can be measured by attaching an Extension Rod (optional).
- Measurements can be made close to the bottom of a blind hole.
- Titanium-coated measuring pins provide excellent durability and impact resistance.
- Two preset values can be stored as reference points.



468-161



468-168



468-174

SPECIFICATIONS

Metric					Inch / Metric					
Order No.	Range*2 (mm)	Resolution (mm)	Maximum permissible error J_{MPE} (μm)*1	Extension Rod (optional)	Order No.	Range*2 (in)	Resolution	Maximum permissible error J_{MPE} (in)*1	Extension Rod (optional)	
468-161	6 - 8	0.001	±2 (maximum difference 2)	952322 (100 mm)	468-261	0.275 - 0.35	0.0005 in / 0.001 mm	±0.0001 (maximum difference 0.0001)	952322 (100 mm)	
468-162	8 - 10				468-262	0.35 - 0.425				
468-163	10 - 12				468-263	0.425 - 0.5				
468-164	12 - 16		±3 (maximum difference 3)	952621 (150 mm)	468-264	0.5 - 0.65		±0.00015 (maximum difference 0.00015)	952621 (150 mm)	
468-165	16 - 20				468-265	0.65 - 0.8				
468-166	20 - 25				468-266	0.8 - 1				
468-167	25 - 30				468-267	1 - 1.2				
468-168	30 - 40				468-268	1.2 - 1.6				
468-169	40 - 50				468-269	1.6 - 2				
468-170	50 - 63				468-270	2 - 2.5				
468-171	62 - 75		±4 (maximum difference 4)	952622 (150 mm)	468-271	2.5 - 3	0.0001 in / 0.001 mm	±0.0002 (maximum difference 0.0002)	952623 (150 mm)	
468-172	75 - 88				468-272	3 - 3.5				
468-173	87 - 100				468-273	3.5 - 4				
468-174	100 - 125		±5 (maximum difference 5)		468-274	4 - 5	±0.00025 (maximum difference 0.00025)			
468-175	125 - 150				468-275	5 - 6				
468-176	150 - 175				468-276	6 - 7				
468-177	175 - 200		±6 (maximum difference 6)		468-277	7 - 8	±0.0003 (maximum difference 0.0003)			
468-178	200 - 225				468-278	8 - 9				
468-179	225 - 250				468-279	9 - 10				
468-180	250 - 275				468-280	10 - 11				
468-181	275 - 300				468-281	11 - 12				

• Battery: SR44 (1 pc.), 938882, for initial operational checks (standard accessory)
• Battery life: Approx. 1.2 years under normal use • Scale type: Electromagnetic induction-type rotary encoder
*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	197.5 - 201.5
20 - 25, 25 - 30 mm	93	206.9 - 211.9
30 - 40, 40 - 50 mm	103.8	214.7 - 224.7
50 - 63, 62 - 75, 75 - 88, 87 - 100 mm	105.4	219.6 - 232.6
100 - 125, 125 - 150, 150 - 175, 175 - 200, 200 - 225, 225 - 250, 250 - 275, 275 - 300 mm	151.4	286.3 - 311.3

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

Mitutoyo

C-3

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo



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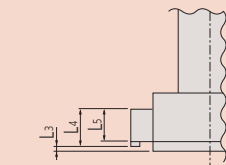


Measurement example



You can measure the diameter of a blind hole to the bottom.

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

Order No.	Type	description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch

Mounting bracket (optional)

04AZB157

For details of Special-order Products, refer to page C-57.

Optional Accessories

Order No.	Type	description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch

Interchangeable-Head Sets



Metric		
Set Order 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.
468-972	12 - 20	Phillips screwdriver 1 pc.
		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.
468-973	20 - 50	Phillips screwdriver 1 pc.
		Display unit 20 - 50 mm 1 pc.
		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.
468-974	50 - 100	Spanner 2 pcs.
		Hex wrench 1 pc.
		Phillips screwdriver 1 pc.
		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.

Inch / Metric		
Set Order 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.
468-977	0.5 - 0.8	Phillips screwdriver 1 pc.
		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.
468-978	0.8 - 2	Phillips screwdriver 1 pc.
		Display unit 0.8 - 2 in 1 pc.
		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.
468-979	2 - 4	Spanner 2 pcs.
		Hex wrench 1 pc.
		Phillips screwdriver 1 pc.
		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.

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

Holtest

Interchangeable-Head Sets



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

468-975

Metric		
Set Order No.	Range* (mm)	Content of set
468-975	100 - 200	Display unit
		100 - 200 mm 1 pc.
		Measuring head
		100 - 125 mm 1 pc.
		125 - 150 mm 1 pc.
		150 - 175 mm 1 pc.
		175 - 200 mm 1 pc.
		Setting ring ($\varnothing 125$, $\varnothing 175$) 1 pc. each
		Extension rod (150 mm) 1 pc.
		Spanner 2 pcs.
		Hex wrench 1 pc.
		Phillips screwdriver 1 pc.

Inch / Metric		
Set Order No.	Range* (in)	Content of set
468-980	4 - 8	Display unit
		4 - 8 in 1 pc.
		Measuring head
		4 - 5 in 1 pc.
		5 - 6 in 1 pc.
		6 - 7 in 1 pc.
		7 - 8 in 1 pc.
		Setting ring 1 pc. each
		(5 in DIA., 7 in DIA.)
		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).

Accessories (optional)

Refer to page C-4.

Accessories (optional)

Refer to page C-4.

Non-Interchangeable-Head Sets



Metric				Inch / Metric			
Set Order No.	Range*2 (mm)	Content of set	Extension rod (optional)	Set Order 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: 1 pc. of Order No. **952621** (for measuring range 12 to 16 mm, 16 to 20 mm) and Order 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

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

- Titanium-coated measuring pins on the three-point type (over 6 mm range models) provide excellent durability and impact resistance.
- Three-point internal micrometer with measuring range 6 mm or longer allows stable measurement through self-centering.
- Measurement can be made close to the bottom of a blind hole.
- Deep holes can be measured by attaching an Extension Rod (optional) which is available on models over 6 mm (0.275 in) measuring range.



368-001
(Two-point contact type)



368-168
(Three-point contact type)



Measurement example



SPECIFICATIONS

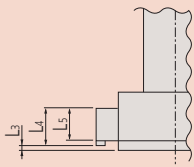
Metric					Inch				
Order No.	Range*2 (mm)	Graduation (mm)	Maximum permissible error <i>J</i> _{MPE} (μm)*1	Extension Rod (optional)	Order No.	Range*2 (in)	Graduation (in)	Maximum permissible error <i>J</i> _{MPE} (in)*1	Extension Rod (optional)
(Two-point)		0.001	±2 (maximum difference 2)	—	(Two-point)		0.0001	±0.0001 (maximum difference 0.0001)	—
368-001	2 - 2.5				368-021	0.08 - 0.1			
368-002	2.5 - 3				368-022	0.1 - 0.12			
368-003	3 - 4				368-023	0.12 - 0.16			
368-004	4 - 5				368-024	0.16 - 0.2			
368-005	5 - 6				368-025	0.2 - 0.24			
(Three-point)		0.005	±3 (maximum difference 3)	952322 (100 mm)	(Three-point)		0.0002	±0.00015 (maximum difference 0.00015)	952322 (100 mm)
368-161	6 - 8				368-261	0.275 - 0.35			
368-162	8 - 10				368-262	0.35 - 0.425			
368-163	10 - 12				368-263	0.425 - 0.5			
368-164	12 - 16				368-264	0.5 - 0.65			
368-165	16 - 20				368-265	0.65 - 0.8			
368-166	20 - 25		±4 (maximum difference 4)	952621 (150 mm)	368-266	0.8 - 1	±0.0002 (maximum difference 0.0002)	952621 (150 mm)	
368-167	25 - 30				368-267	1 - 1.2			
368-168	30 - 40				368-268	1.2 - 1.6			
368-169	40 - 50				368-269	1.6 - 2			
368-170	50 - 63		±5 (maximum difference 5)	952622 (150 mm)	368-270	2 - 2.5	±0.00025 (maximum difference 0.00025)	952622 (150 mm)	
368-171	62 - 75				368-271	2.5 - 3			
368-172	75 - 88				368-272	3 - 3.5			
368-173	87 - 100				368-273	3.5 - 4			
368-174	100 - 125				368-274	4 - 5			
368-175	125 - 150				368-275	5 - 6			
368-176	150 - 175	368-276			6 - 7				
368-177	175 - 200	368-277			7 - 8				
368-178	200 - 225	±6 (maximum difference 6)	952623 (150 mm)	368-278	8 - 9	±0.0003 (maximum difference 0.0003)	952623 (150 mm)		
368-179	225 - 250			368-279	9 - 10				
368-180	250 - 275			368-280	10 - 11				
368-181	275 - 300			368-281	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.



You can measure the diameter of a blind hole to the bottom.

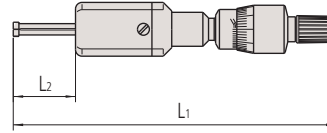
Range (mm)	L ₃ (mm)	L ₄ (mm)	L ₅ (mm)
2 - 6	—	—	2
6 - 12	2 or below	—	2.5
12 - 20	0.3 or below	5.6	3.5
20 - 30		8.3	5.2
30 - 50		13.0	10.0
50 - 100		17.0	14.0
100 - 300	12.4 or below	21.0	13.8



For details of Special-order Products, refer to page C-57.

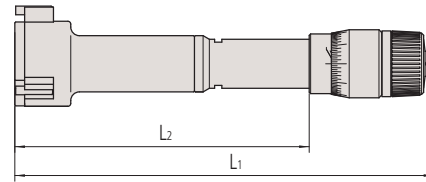
DIMENSIONS

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 Internal Micrometers

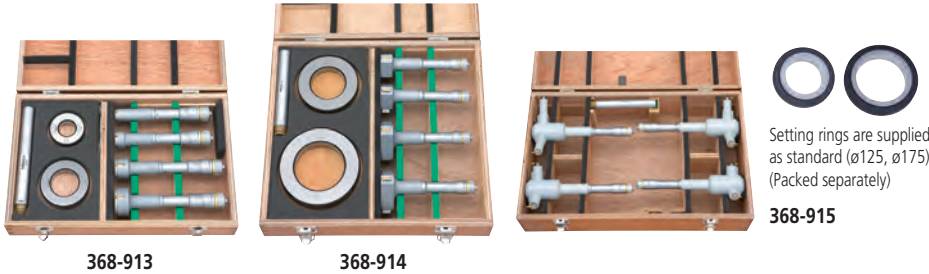
Non-Interchangeable-Head Sets



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

Non-Interchangeable-Head Sets



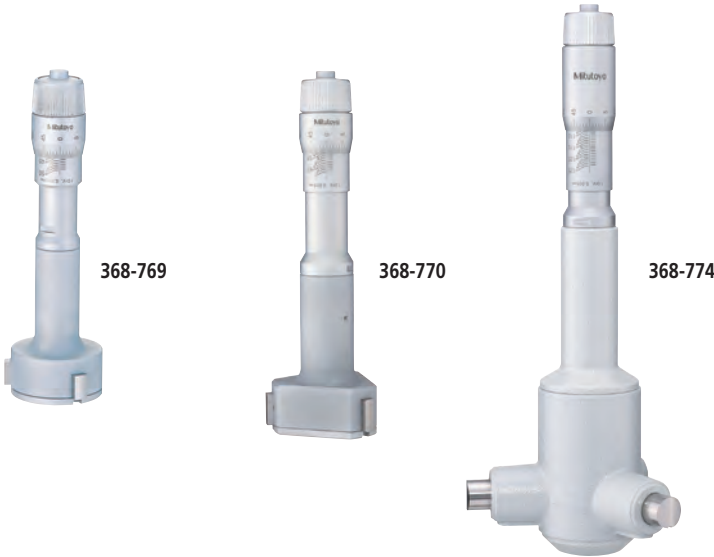
Metric				Inch			
Set Order No.	Range* (mm)	Graduation (mm)	Content of Set	Set Order No.	Range* (in)	Graduation (in)	Content of Set
(Three-point)				(Three-point)			
368-913	20 - 50	0.005	Micrometer head unit	368-918	0.8 - 2	0.0002	Micrometer head unit
			20 - 25 mm 1 pc.				0.8 - 1 in 1 pc.
			25 - 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
368-914	50 - 100	0.005	Extension rod (150 mm) 1 pc.		368-919	2 - 4	Extension rod (150 mm) 1 pc.
			Spanner 2 pcs.				Spanner 2 pcs.
			Hex wrench 1 pc.				Hex wrench 1 pc.
			Micrometer head unit				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.
368-915	100 - 200	0.005	75 - 88 mm 1 pc.		368-920	4 - 8	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.
			Micrometer head unit				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 Internal Micrometers

- Holtests type II is equipped with contact points of alloy steel and has the same accuracy as the titanium model.
- For details of Setting Rings, refer to page C-52.
- Constant-force device allows stable measurement.
- Deep holes can be measured by attaching an Extension Rod (optional).



SPECIFICATIONS

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

DIMENSIONS

Unit: mm

Range	L2	L1
12 - 16, 16 - 20	82	126 - 130
20 - 25, 25 - 30	94	137 - 142
30 - 40, 40 - 50	102	145 - 155
50 - 63, 62 - 75, 75 - 88, 87 - 100	105	150 - 163
100 - 125, 125 - 150, 150 - 175, 175 - 200	161	227 - 252
200 - 225, 225 - 250, 250 - 275, 275 - 300	161	227 - 252

Note: External appearance differs depending on the measuring range.

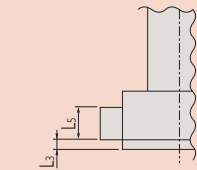


Measurement example



You can measure the diameter of a blind hole to the bottom.

Range (mm)	L3 (mm)	L5 (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



For details of Special-order Products, refer to page C-57.

Non-Interchangeable-Head Sets



Metric			
Order No.	Range* (mm)	Graduation (mm)	Content of Set
368-991	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.
368-992	20 - 50	0.005	Spanner 2 pcs.
			Hex wrench 1 pc.
			Micrometer head unit
			20 - 25 mm 1 pc.
			25 - 30 mm 1 pc.
368-993	50 - 100	0.005	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.
368-994	100 - 200	0.005	Hex wrench 1 pc.
			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			
Order No.	Range* (in)	Graduation (in)	Content of Set
368-995	0.5 - 0.8	0.005	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.
368-996	0.8 - 2	0.005	Spanner 2 pcs.
			Hex wrench 1 pc.
			Micrometer head unit
			0.8 - 1 in 1 pc.
			1 - 1.2 in 1 pc.
368-997	2 - 4	0.0002	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.
368-998	4 - 8	0.0002	Hex wrench 1 pc.
			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).

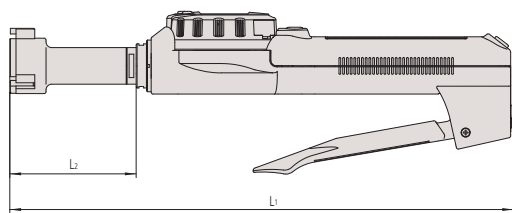
Holtest

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

- The Borematic allows quick and easy measurement with lever operation.
- Titanium-coated measuring pins provide excellent durability and impact resistance.
- Three-Point contact measuring head enables stable measurement.
- Deep holes can be measured by attaching 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.

MeasurLink[®] ENABLED
Data Management Software by Mitutoyo



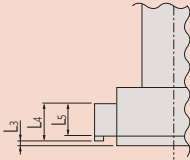
ABSOLUTE[™]

Measurement example



You can measure the diameter of a blind hole to the bottom.

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

Order No.	Type	description
905338	F	Connecting cable (1 m)
905409	F	Connecting cable (2 m)
06AFM380F	F	USB Input Tool Direct (2 m)
02AZD790F	F	Connecting cables for U-WAVE-T (160 mm)
02AZE140F	F	Connecting cables for U-WAVE-T For foot switch

For details of Special-order Products, refer to page C-57.

SPECIFICATIONS

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

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

- Response speed: Unlimited
- Battery: SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
- Scale type: Electrostatic capacitance type absolute encoder
- Battery life: Approx. 5,000 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



568-926

Metric		
Order No.	Range (mm)	Content of Set
568-924	6 - 12	Display unit 1 pc.
		Measuring head
		6 - 8 mm 1 pc.
		8 - 10 mm 1 pc.
		10 - 12 mm 1 pc.
		Attachment 1 pc.
		Setting ring (ø8, ø10) 1 pc. each
Spanner 3 pcs.		
568-925	12 - 25	Display unit 1 pc.
		Measuring head
		12 - 16 mm 1 pc.
		16 - 20 mm 1 pc.
		20 - 25 mm 1 pc.
		Attachment 2 pcs.
		Setting ring (ø16, ø20) 1 pc. each
Spanner 2 pcs.		
568-926	25 - 50	Display unit 1 pc.
		Measuring head
		25 - 30 mm 1 pc.
		30 - 40 mm 1 pc.
		40 - 50 mm 1 pc.
		Attachment 1 pc.
		Setting ring (ø30, ø40) 1 pc. each
Spanner 2 pcs.		
568-927	50 - 100	Display unit 1 pc.
		Measuring head
		50 - 63 mm 1 pc.
		62 - 75 mm 1 pc.
		75 - 88 mm 1 pc.
		87 - 100 mm 1 pc.
		Attachment 1 pc.
Setting ring (ø62, ø87) 1 pc. each		
Spanner 2 pcs.		

Inch / Metric		
Order No.	Range (in)	Content of Set
568-928	0.275 - 0.5	Display unit 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.
		Attachment 1 pc.
		Setting ring (0.35 in DIA., 0.425 in DIA.) 1 pc. each
Spanner 3 pcs.		
568-929	0.5 - 1	Display unit 1 pc.
		Measuring head
		0.5 - 0.65 in 1 pc.
		0.65 - 0.8 in 1 pc.
		0.8 - 1 in 1 pc.
		Attachment 2 pcs.
		Setting ring (0.65 in DIA., 0.8 in DIA.) 1 pc. each
Spanner 2 pcs.		
568-930	1 - 2	Display unit 1 pc.
		Measuring head
		1 - 1.2 in 1 pc.
		1.2 - 1.6 in 1 pc.
		1.6 - 2 in 1 pc.
		Attachment 1 pc.
		Setting ring (1.2 in DIA., 1.6 in DIA.) 1 pc. each
Spanner 2 pcs.		
568-936	2 - 4	Display unit 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.
		Attachment 1 pc.
Setting ring (2.5 in DIA., 3.5 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



568-957



568-959

Metric		
Order No.	Range (mm)	Content of Set
568-955	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 3 pcs.
568-956	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.
568-957	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 2 pcs.
568-958	50 - 75	Display unit
		50 - 63 mm 1 pc.
		62 - 75 mm 1 pc.
		Setting ring (ø62) 1 pc.
		Spanner 2 pcs.
568-959	75 - 100	Display unit
		75 - 88 mm 1 pc.
		87 - 100 mm 1 pc.
		Setting ring (ø87) 1 pc.
		Spanner 2 pcs.

Inch / Metric		
Order No.	Range (in)	Content of Set
568-965	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 3 pcs.
568-966	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.
568-967	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 2 pcs.
568-968	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 2 pcs.
568-969	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 2 pcs.

Inside Micrometers

Tubular Inside Micrometers
SERIES 133 — Single-Rod Type

- Standard Single-Rod Type inside micrometer.
- Carbide measuring faces.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings (nominal size below 300 mm), CERA Inside Micro Checker and Gauge Block Accessory Sets are available as reference gages datum adjustment. (Refer to pages C-28, C-52, and E-17 to E-20 for details)



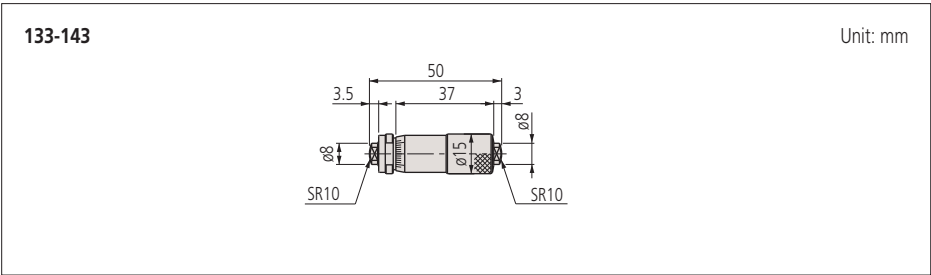
133-143

SPECIFICATIONS

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

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

DIMENSIONS



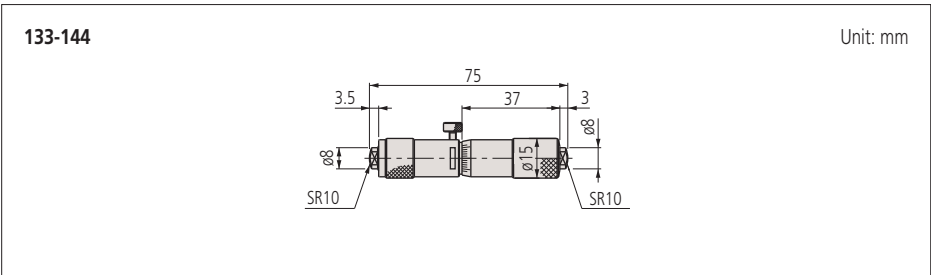
133-144

SPECIFICATIONS

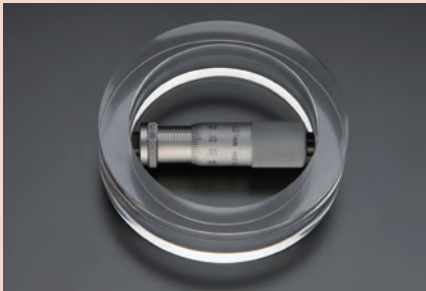
Metric		Individual		
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error <i>J_{MPE}</i> (μm)	
133-144	75 - 100	0.01	±4	

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

DIMENSIONS



Measurement example



A collection of various precision measuring tools, including calipers, depth gauges, and micrometers, arranged in a black carrying case. The tools are organized in rows, with some labeled with their specifications, such as '275.00mm', '250.00mm', '225.00mm', '200.00mm', '175.00mm', and '150.00mm'. A small screwdriver is also visible in the top left corner.

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



SPECIFICATIONS

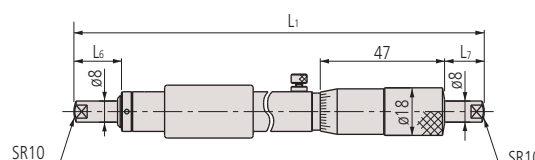
Metric	Individual		
Order No.	Range (mm)	Graduation (mm)	Maximum permissible error $J_{MPE} (\mu m)$
133-145	100 - 125	0.01	±5
133-146	125 - 150		
133-147	150 - 175		
133-148	175 - 200		
133-149	200 - 225		
133-150	225 - 250		±6
133-151	250 - 275		
133-152	275 - 300		
133-153	300 - 325		±7
133-154	325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

Inch	Individual		
Order No.	Range (in)	Graduation (in)	Maximum permissible error /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		
133-230	9 - 10		±0.0003
133-231	10 - 11		
133-232	11 - 12		

C

133-145 to 133-180

Unit: mm



Order No.	L1	L6	L7
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
1	1	1	1
1	1	1	1
1	1	1	1
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.
- Two types of measuring faces are available; with or without carbide tip. (The **337** Series is only available with carbide tip)
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- An inside length standard is required for accurately setting the micrometer.



337-301

SPECIFICATIONS

Metric							
Order 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							
Order 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.)	

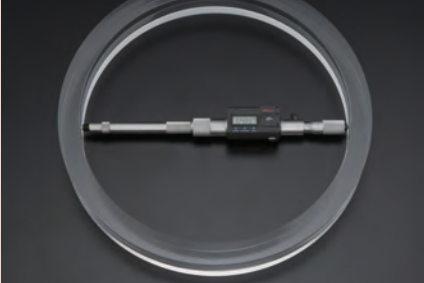
- Battery and Scale Type: SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
 - Battery life: Approx. 1.2 years under normal use
 - Scale type: Electromagnetic induction-type rotary encoder
- * "Spindle feed error" refers to the difference between the maximum and minimum indication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

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Applicable models:
SERIES **337**

Measurement example

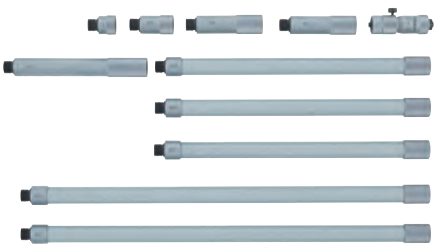


Functions

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

Optional Accessories

Order No.	Type	description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch



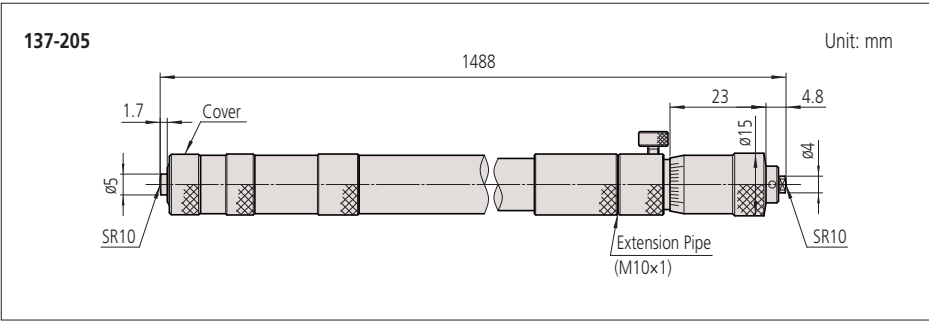
137-205

SPECIFICATIONS

Metric							
Order 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							
Order 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.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-52 and E-17 to E-20 for details)



137-011

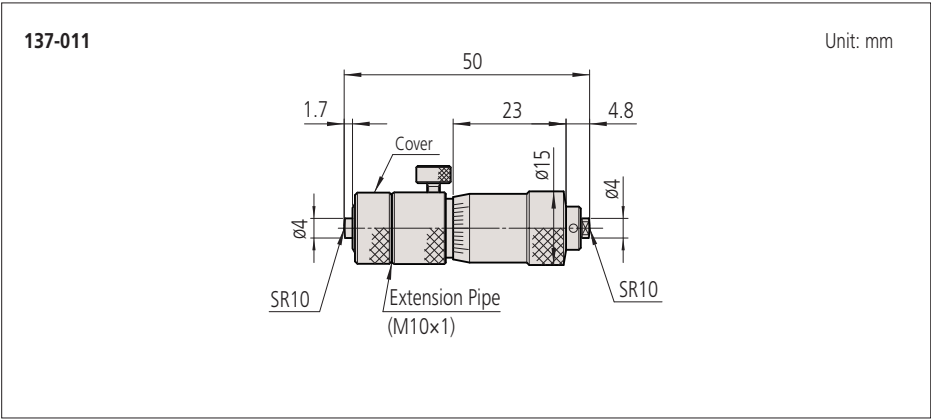
SPECIFICATIONS

Metric				
Order 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				
Order 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



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Measurement example



Functions

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

Optional Accessories

Order No.	Type	description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch

Inside Micrometers

Tubular Inside Micrometers SERIES 339 — Extension-Pipe Type

- Wide range of inside measurements possible by combining Extension Pipes and anvils with the micrometer head.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- An inside length standard is required for accurately setting the micrometer.
- IP65 (water-proof) protection level that enables use in the presence of cutting fluid.



SPECIFICATIONS

Metric							
Order 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							
Order 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.)	

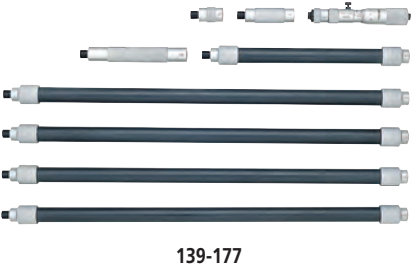
- Battery and Scale Type: SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
 - Battery life: Approx. 1.2 years under normal use
 - Scale type: Electromagnetic induction-type rotary encoder
- * "Spindle feed error" refers to the difference between the maximum and minimum indication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

Inside Micrometers

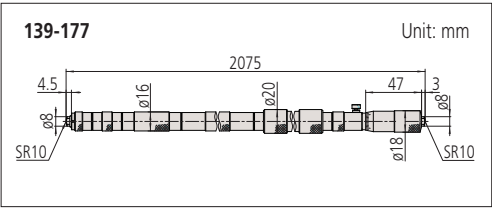
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Tubular Inside Micrometers
SERIES 139, 140 — Extension-Pipe Type

- Wide range of inside measurements possible by combining Extension Pipes and anvils with the micrometer head.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- An inside length standard is required for accurately setting the micrometer.



DIMENSIONS



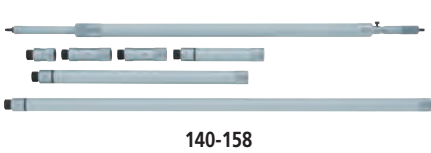
SPECIFICATIONS

Metric						
Order No.	Range (mm)	Graduation (mm)	Spindle feed error* (μ m)	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						
Order 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



SPECIFICATIONS

Metric						
Order No.	Range (mm)	Graduation (mm)	Spindle feed error* (μ m)	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						
Order 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



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

- Micrometer head for Extension-Pipe Type inside micrometer.
- The sleeve is rotated to adjust the reference point adjustment when setting to a length standard.
- Optional Setting Rings, CERA Inside Micro Checker and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-28, C-52, and E-17 to E-20 for details)



139-001

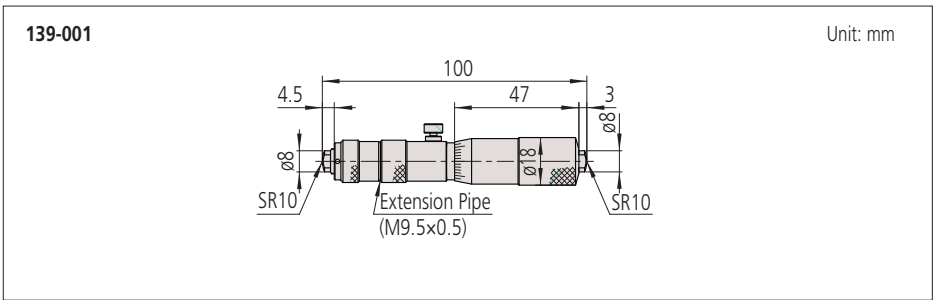
SPECIFICATIONS

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

Inch				
Order 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



Inside Micrometers

Inside Micrometers
SERIES 345 — Caliper Type

- Carbide measuring faces.
- Equipped with a constant measuring-force device.
- Optional Setting Rings (nominal size below 300 mm), CERA Inside Micro Checker (more than 25 mm) and Gauge Block Accessory Sets are available as reference gages for datum adjustment. (Refer to pages C-28, C-52, and E-17 to E-20 for details)



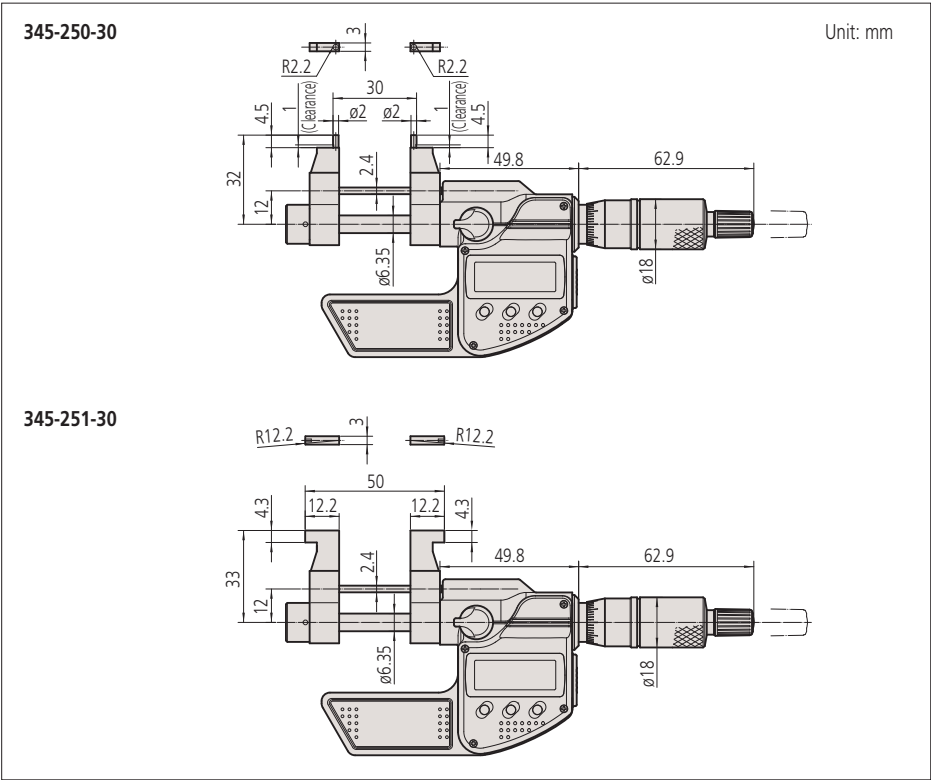
SPECIFICATIONS

Metric					
Order No.	Range (mm)	Resolution (mm)	Maximum permissible error <i>J</i> _{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					
Order No.	Range (in)	Resolution	Maximum permissible error <i>J</i> _{MPE} (in)	Jaw	Mass (g)
345-350-30	0.2 - 1.2	0.0005 in/ 0.001 mm	±0.00025	Pin	320
345-351-30	1 - 2		±0.0003	Anvil	325

- Battery and Scale Type: SR44 (1 pc.), **938882**, for initial operational checks (standard accessory)
 - Battery life: Approx. 2.4 years under normal use
 - Scale type: Electromagnetic induction-type rotary encoder
- Note 1: For the functions, refer to **293** Series with SPC data output on page B-7.
This model is NOT water-proof. Also, the origin setting is the free preset type.
- Note 2: The minimum pitch circle measurement is $\varnothing 5$ mm with pin type (**345-250-30**, **345-350-30**).

DIMENSIONS



Measurement example



Optional Accessories

Order No.	Type	description
05CZA662	B	Connecting cable (1 m)
05CZA663	B	Connecting cable (2 m)
06AFM380B	B	USB Input Tool Direct (2 m)
02AZD790B	B	Connecting cables for U-WAVE-T (160 mm)
02AZE140B	B	Connecting cables for U-WAVE-T For foot switch

Inside Micrometers

Inside Micrometers
SERIES 141 — Interchangeable-Rod Type

- Wide range of inside measurements possible by combining one or more Interchangeable Rods.
- For models supplied with more than one Interchangeable Rod, the full measuring range is achieved by combining spacing collars with the rods.



141-101

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

Measurement example



SPECIFICATIONS

Metric					
Order No.	Range (mm)	Spindle feed error*2 (μm)	Graduation (mm)	Micrometer head stroke (mm)	Remarks
141-101 / 141-103*1	25 - 50	3	0.01	7	with 2 rods
141-205 / 141-211*1	50 - 200			13	with 3 rods
141-206 / 141-212*1	50 - 300				with 5 rods
141-117	200 - 500			25	with 3 rods
141-118	200 - 1000				with 8 rods

Inch					
Order No.	Range (in)	Spindle feed error*2 (in)	Graduation (in)	Micrometer head stroke (in)	Remarks
141-102 / 141-104*1	1 - 2	0.00015	0.001	0.25	with 2 rods
141-208 / 141-214*1	2 - 8			0.5	with 3 rods
141-233 / 141-215*1	2 - 12				with 5 rods
141-121	8 - 20			1	with 3 rods
141-122	8 - 40				with 8 rods

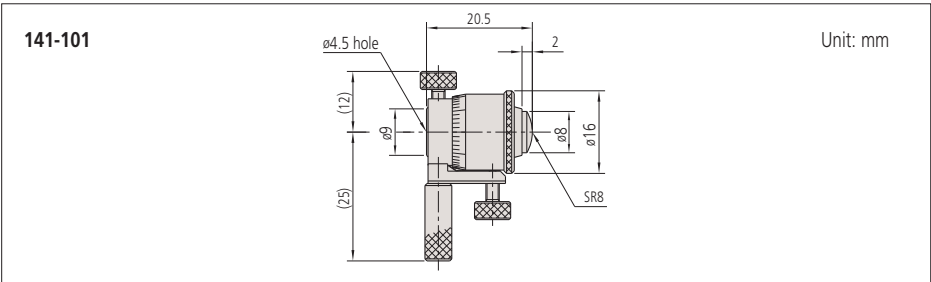
*1 With carbide measuring face
*2 "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

Metric Micrometer head only model				
Order No.	Range (mm)	Spindle feed error*2 (μm)	Graduation (mm)	Micrometer head stroke (mm)
141-001 / 141-003*1	25 - 32	3	0.01	7
141-025 / 141-027*1	50 - 63			13
141-009 / 141-011*1	200 - 225			25

Inch Micrometer head only model				
Order No.	Range (in)	Spindle feed error*2 (in)	Graduation (in)	Micrometer head stroke (in)
141-002 / 141-004*1	1 - 1.25	0.00015	0.001	0.25
141-026 / 141-028*1	2 - 2.5			0.5
141-010 / 141-012*1	8 - 9			1

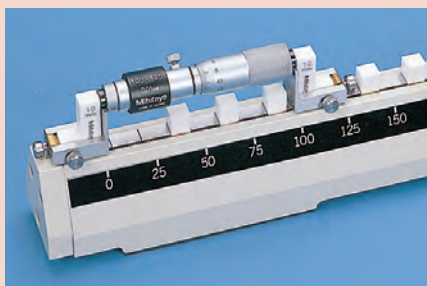
*1 With carbide measuring face
*2 "Spindle feed error" refers to the difference between the maximum and minimum indication error values within the specification range of the micrometer head

DIMENSIONS





Measurement example



Standard accessory set



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

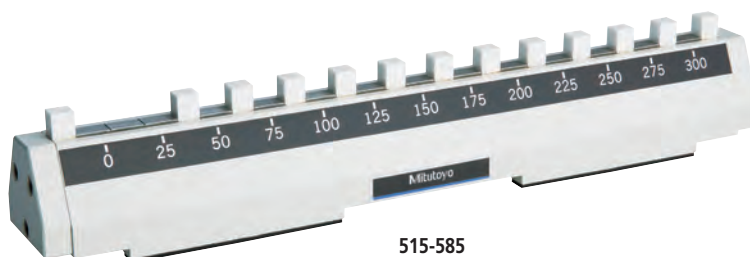
Wooden box (optional)

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

Inside Micrometers

CERA Inside Micro Checker SERIES 515

- 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**.



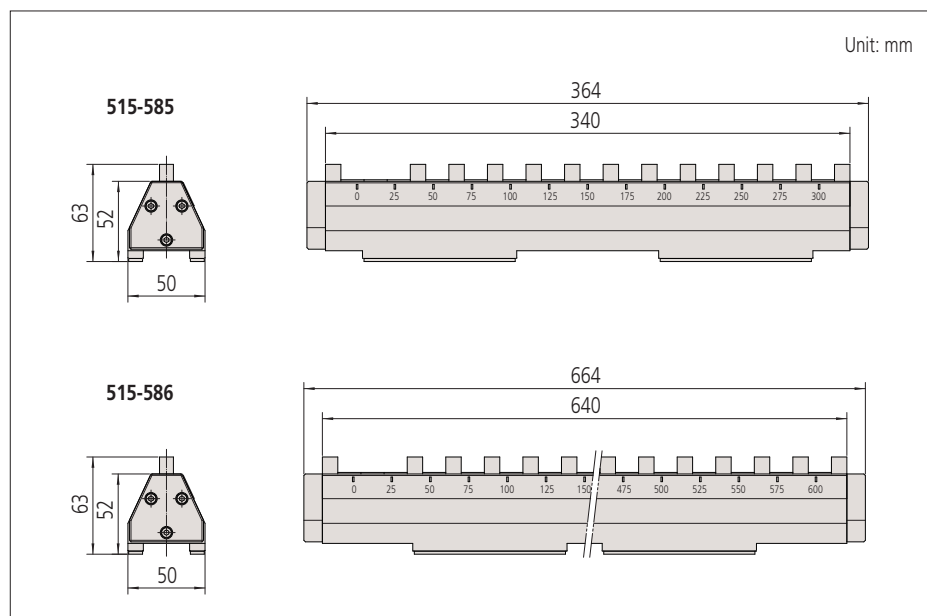
515-585

SPECIFICATIONS

Order 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 series allows for agile and highly accurate comparative measurement of $\varnothing 1$ to 7 mm inside diameters.
- We offer an array of indicators. Contact us if you prefer any indicator other than the standard recommended indicator.
- 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.

SPECIFICATIONS

Metric							
Order 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	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								
Order 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.

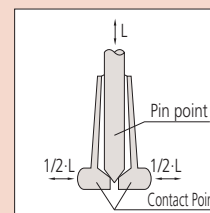
Note: Setting rings are not supplied with some models. Please purchase them separately if necessary. For details of setting rings, refer to page C-52.

Mitutoyo

Measurement example



Measurement Principle



Setting Rings (Metric)

Nominal size

- Order 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

- Order 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

- Order 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

- Order 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

- Order 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

- Order 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

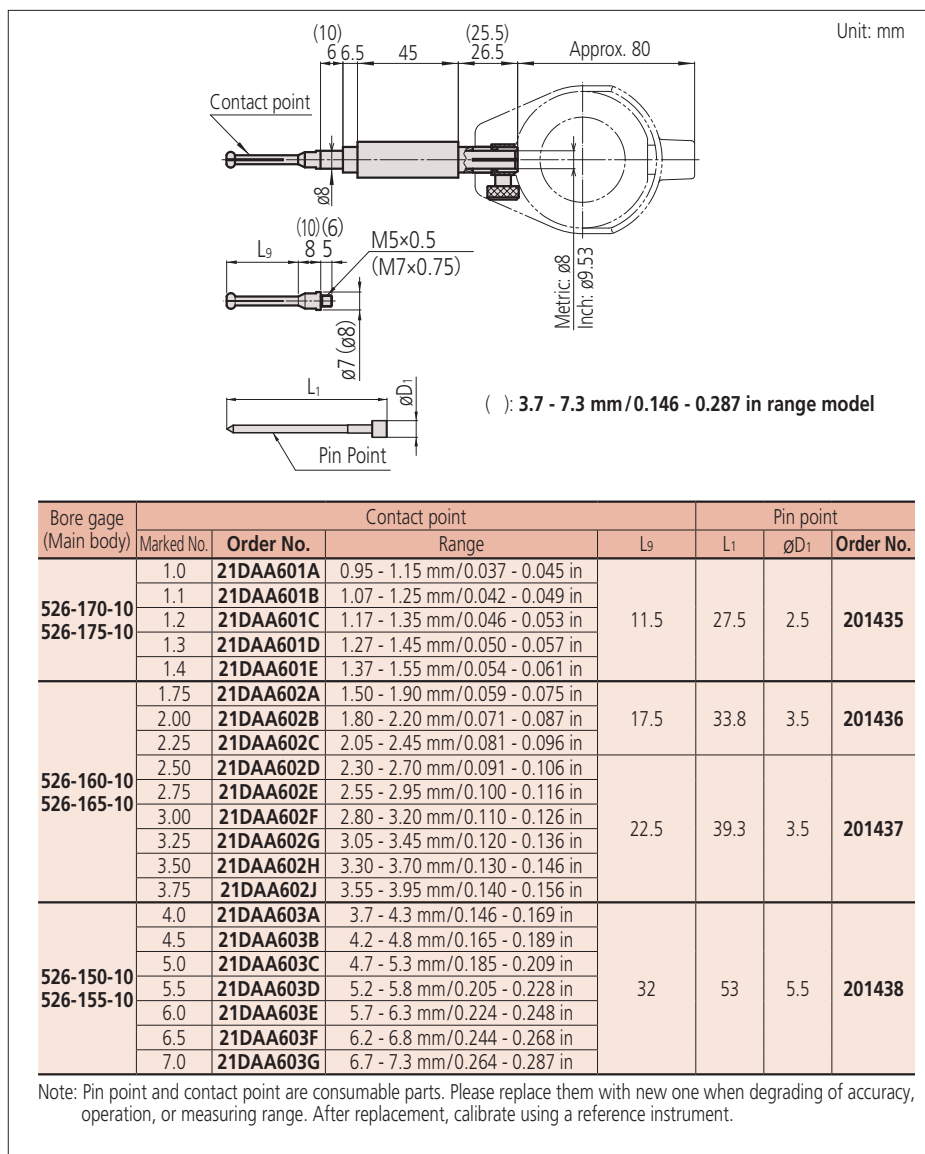
177-369: 0.26 in

177-370: 0.28 in

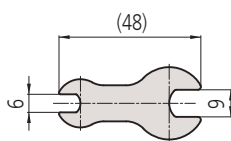
The dial protection cover, recommended indicators

Refer to page C-50.

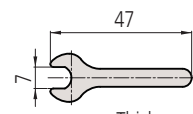
DIMENSIONS



Spanner
210188

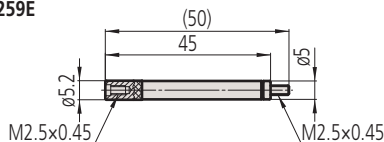


102148

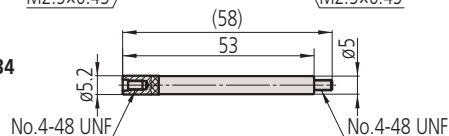


Thickness: 1.5

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)