Bore Gages

SERIES 526 — for Extra Small Holes

These gages are designed to measure the diameters of small holes. The radial displacement of the split-ball anvil is converted to axial displacement of the measuring rod, which is shown on the dial indicator.

FEATURES

- Optional stand (**215-120-10**) is available for efficient measurement of multiple small holes.

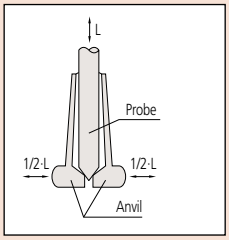
526-172

526-127

Technical Data

Accuracy: 4µm
6µm(10-18mm/.4-.7" range model)
Repeatability: 2µm
Graduation: 0.01mm, 0.001mm, .0005 or .0001"

Split-ball Anvil



Optional Accessories

——— : Setting ring (See page C-28.)
215-120-10:Stand for small holes

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Probe depth (D)
		Bore gage	Dial indicator	
0.95 - 1.55mm	**526-172***	526-170	2109SB-10	11.5mm
1.5 - 4mm	**526-162***	526-160		17.5, 22.5mm
3.7 - 7.3mm	**526-152***	526-150		32mm
7 - 10mm	**526-124**	526-101		56mm
10 - 18mm	**526-125**	526-102		62mm
0.95 - 1.55mm	**526-173***	526-170	2046SB	11.5mm
1.5 - 4mm	**526-163***	526-160		17.5, 22.5mm
3.7 - 7.3mm	**526-153***	526-150		32mm
7 - 10mm	**526-126**	526-101		56mm
10 - 18mm	**526-127**	526-102		62mm

*Provided with setting rings 0.001mm graduation 0.01mm graduation

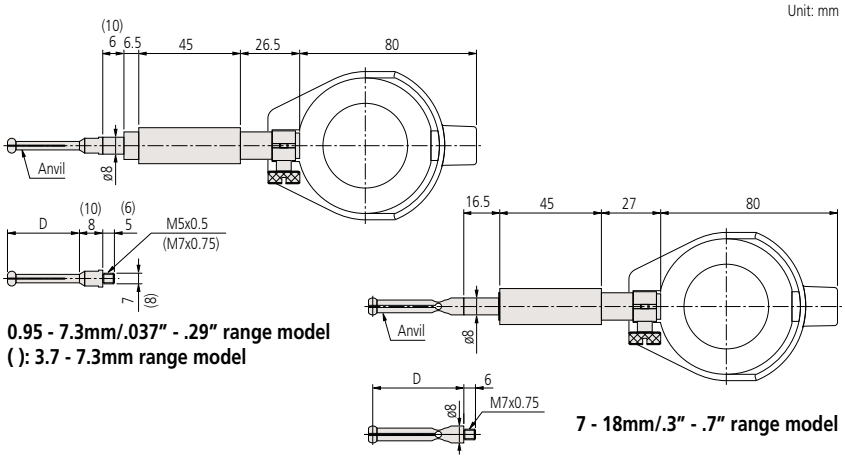
Inch

Range	Order No.	Content of set		Probe depth (D)
		Bore gage	Dial indicator	
.037" - .061"	**526-176***	526-175	2923SB-10	.45"
.06" - .155"	**526-166***	526-165		.68", .88"
.145" - .29"	**526-156***	526-155		1.25"
.3" - .4"	**526-122**	526-103		2.2"
.4" - .7"	**526-123**	526-104		2.4"
.3" - .4"	**526-119**	526-103	2922SB	2.2"
.4" - .7"	**526-120**	526-104		2.4"

*Provided with setting rings .0001" graduation .0005" graduation

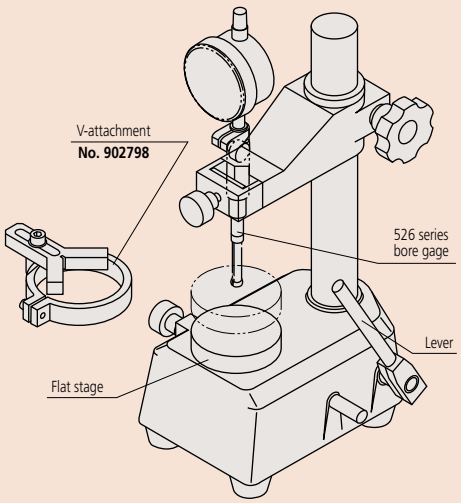
DIMENSIONS

Unit: mm



0.95 - 7.3mm/.037" - .29" range model
( ): 3.7 - 7.3mm range model

7 - 18mm/.3" - .7" range model



Bore Gages

SERIES 511 — for Small Holes

Technical Data

Accuracy: 5µm
Repeatability: 2µm
Graduation: 0.01mm, 0.001mm, .0005 or .0001"

Contact Point

6 - 10mm

10 - 18.5mm

Optional Accessory

——— : Setting ring (See page C-28.)

FEATURES

- The interchangeable anvils used on this gage are made of high-grade tool steel.
- The dial indicator is fully protected by a rugged cover.

511-204

C

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Probe depth
		Bore gage	Dial indicator	
6 - 10mm	**511-210**	511-209	2109SB-10	50mm
10 - 18.5mm	**511-203**	511-201		100mm
6 - 10mm	**511-211**	511-209	2046SB	50mm
10 - 18.5mm	**511-204**	511-201		100mm

0.001mm graduation 0.01mm graduation

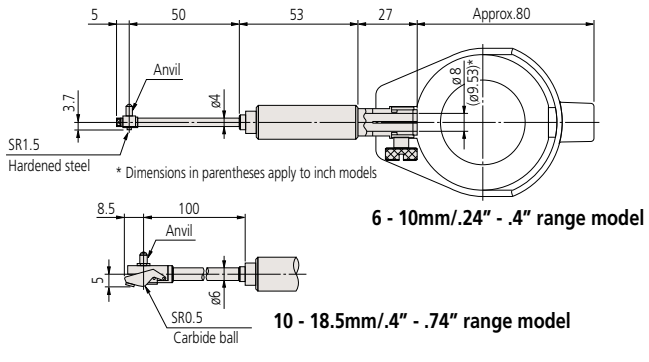
Inch

Range	Order No.	Content of set		Probe depth
		Bore gage	Dial indicator	
.24" - .4"	**511-212**	511-214	2923SB-10	2"
.4" - .74"	**511-206**	511-205		4"
.24" - .4"	**511-213**	511-214	2922SB	2"
.4" - .74"	**511-207**	511-205		4"

.0001" graduation .0005" graduation

DIMENSIONS

Unit: mm



6 - 10mm/.24" - .4" range model

10 - 18.5mm/.4" - .74" range model

Mitutoyo

Bore Gages

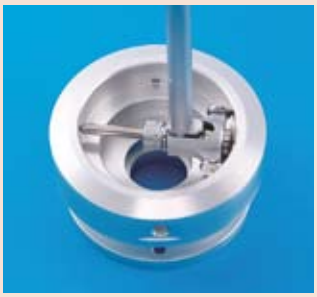
SERIES 511 — Standard Type

Mitutoyo offers a complete range of Bore Gages, all of them with interchangeable anvils and the necessary accessories to perform close-tolerance ID measurements.

FEATURES

- Allows inside diameter measurement with high accuracy.
- Longer effective stroke (compared with the conventional product)
- Carbide is used for the contact point ensuring high durability and wear resistance.
- High-accuracy measurement is aided by a large grip with a sponge-like structure that reduces heat transfer from the operator's hand by 50%.
- Interchangeable washers 0.5mm thick (standard accessories) are supplied as standard accessories to enable setting in small steps.
- Optional extension rods can be attached for measuring deep holes. (For details, refer to page C-27.)
- A Bore Gage Checker and a range of Setting Rings are available to aid in accurately setting a gage before making a measurement. (For details, refer to pages C-28, C-29 and C-30.)

511-713



New grip improves accuracy during prolonged use

Technical Data

Wide-range accuracy: 2 µm
Repeatability: 0.5 µm
Adjacent error: 1 µm

Optional Accessories

——— : Setting ring (See page C-28.)
——— : Extension rod (See page C-27.)

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
18 - 35mm	**511-701**	511-701	Not supplied	Not supplied	100mm
35 - 60mm	**511-702**	511-702			150mm
50 - 150mm	**511-703**	511-703			150mm
100 - 160mm	**511-704**	511-704			150mm
160 - 250mm	**511-705**	511-705			250mm
250 - 400mm	**511-706**	511-706			250mm
18 - 35mm	**511-721**	511-701	2109SB-10	21DZA000	100mm
35 - 60mm	**511-722**	511-702			150mm
50 - 150mm	**511-723**	511-703			150mm
100 - 160mm	**511-724**	511-704			150mm
160 - 250mm	**511-725**	511-705			250mm
250 - 400mm	**511-726**	511-706			250mm
18 - 35mm	**511-711**	511-701	2046SB	21DZA000	100mm
35 - 60mm	**511-712**	511-702			150mm
50 - 150mm	**511-713**	511-703			150mm
100 - 160mm	**511-714**	511-704			150mm
160 - 250mm	**511-715**	511-705			250mm
250 - 400mm	**511-716**	511-706			250mm

0.001mm graduation 0.01mm graduation

Inch

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
.7"-1.4"	**511-731**	511-731	Not supplied	Not supplied	4"
1.4"-2.5"	**511-732**	511-732			6"
2"-6"	**511-733**	511-733			6"
4"-6.5"	**511-734**	511-734			6"
6.5"-10"	**511-735**	511-735			10"
10"-16"	**511-736**	511-736			10"
.7"-1.4"	**511-751**	511-731	2923SB-10	21DZA000	4"
1.4"-2.5"	**511-752**	511-732			6"
2"-6"	**511-753**	511-733			6"
4"-6.5"	**511-754**	511-734			6"
6.5"-10"	**511-755**	511-735			10"
10"-16"	**511-756**	511-736			10"
.7"-1.4"	**511-741**	511-731	2922SB	21DZA000	4"
1.4"-2.5"	**511-742**	511-732			6"
2"-6"	**511-743**	511-733			6"
4"-6.5"	**511-744**	511-734			6"
6.5"-10"	**511-745**	511-735			10"
10"-16"	**511-746**	511-736			10"

.0001" graduation .0005" graduation

511-921

511-931

Metric

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Indicator		
18 - 150mm	**511-921**	511-701 511-702 511-703	2046SB	21DZA000	100mm (511-701) 150mm (511-702, 511-703)
	511-922		2109SB-10	21DZA000	
	511-925		543-264B	21DZA000	

Inch

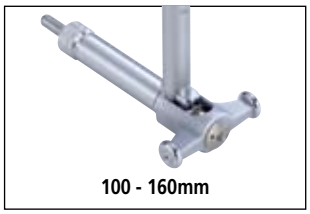
Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Indicator		
.7"-6"	**511-931**	511-731 511-732 511-733	2922SB	21DZA000	4" (511-731) 6" (511-732, 511-733)
	511-932		2923SB-10	21DZA000	
	511-935		543-266B	21DZA000	

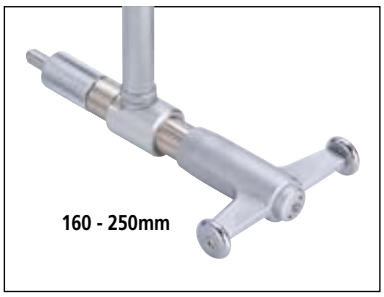
Contact Points

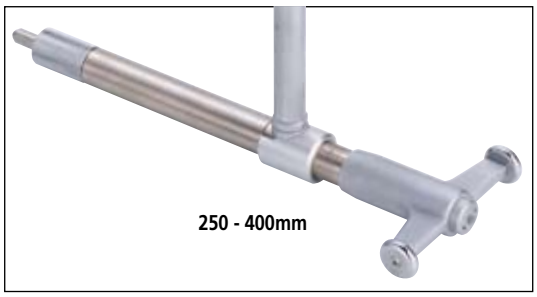

18 - 35mm


35 - 60mm


50 - 150mm


100 - 160mm

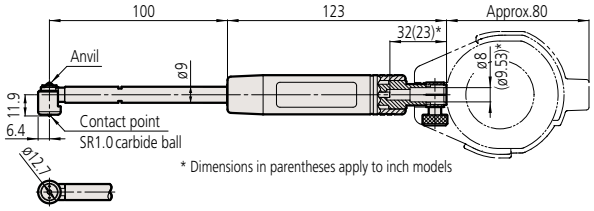

160 - 250mm


250 - 400mm

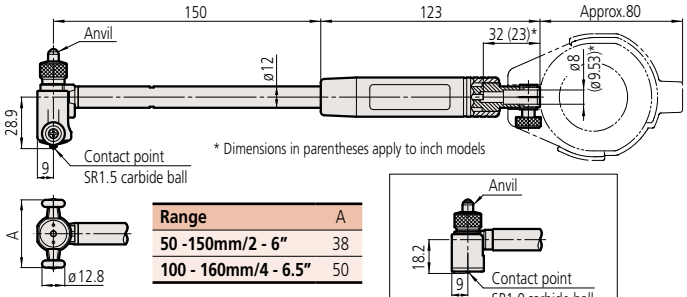
DIMENSIONS

Unit: mm

18 - 35mm/.7 - 1.4"

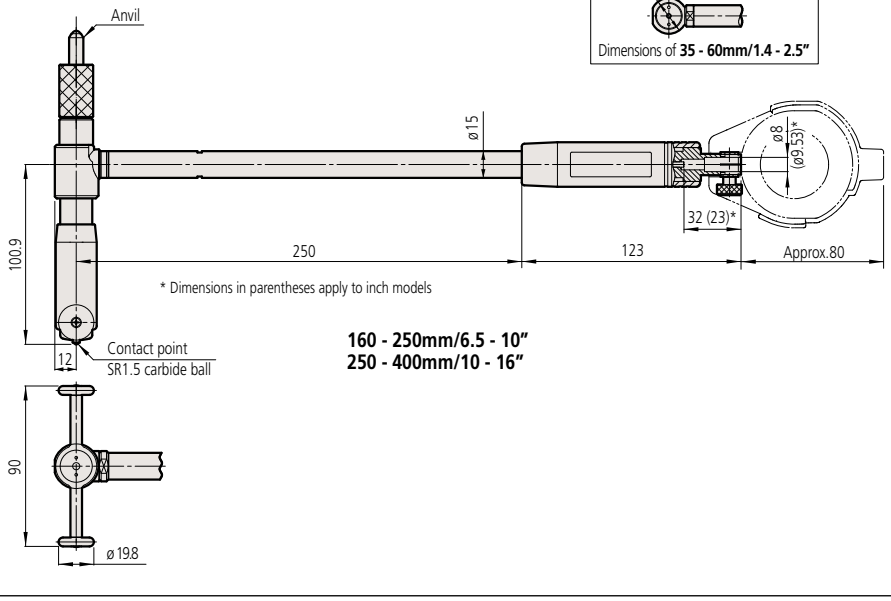


35 - 60mm/1.4 - 2.5"
50 -150mm/2-6"
100 -160mm/4-6.5"



Range	A
50 -150mm/2 - 6"	38
100 - 160mm/4 - 6.5"	50

Dimensions of **35 - 60mm/1.4 - 2.5"**



160 - 250mm/6.5 - 10"
250 - 400mm/10 - 16"

Mitutoyo

Bore Gages

SERIES 511 — with Micrometer Head

FEATURES

- Micrometer head is attached to the anvil for accurate dimensional setting.
- Allows inside diameter measurement with high accuracy.
- Longer effective stroke (compared with the conventional product)
- Carbide is used for the contact point ensuring high durability and wear resistance.
- High-accuracy measurement is aided by a large grip with a sponge-like structure that reduces heat transfer from the operator's hand by 50%.
- Wide measuring range with sub-anvils.
- Optional extension rods can be attached for measuring deep holes. (For details, refer to page C-27.)
- A Bore Gage Checker and a range of Setting Rings are available to aid in accurately setting a gage before making a measurement. (For details, refer to pages C-28, C-29 and C-30.)

511-813

511-814

Technical Data

Wide-range accuracy: 2 µm
Repeatability: 0.5 µm
Adjacent error: 1 µm

Optional Accessories

——— : Setting ring (See page C-28.)
——— : Extension rod (See page C-27.)

C

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
60 - 100mm	**511-803**	511-803	Not supplied	Not supplied	150mm
100 - 160mm	**511-804**	511-804			150mm
150 - 250mm	**511-805**	511-805			150mm
250 - 400mm	**511-806**	511-806			150mm
400 - 600mm	**511-807**	511-807			250mm
600 - 800mm	**511-808**	511-808			250mm
60 - 100mm	**511-823**	511-803	2109SB-10	21DZA000	150mm
100 - 160mm	**511-824**	511-804			150mm
150 - 250mm	**511-825**	511-805			150mm
250 - 400mm	**511-826**	511-806			150mm
400 - 600mm	**511-827**	511-807			250mm
600 - 800mm	**511-828**	511-808			250mm
60 - 100mm	**511-813**	511-803	2046SB	21DZA000	150mm
100 - 160mm	**511-814**	511-804			150mm
150 - 250mm	**511-815**	511-805			150mm
250 - 400mm	**511-816**	511-806			150mm
400 - 600mm	**511-817**	511-807			250mm
600 - 800mm	**511-818**	511-808			250mm

0.001mm graduation 0.01mm graduation

Inch

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
2.4"-4"	**511-833**	511-833	Not supplied	Not supplied	6"
4"-6.4"	**511-834**	511-834			6"
6"-10"	**511-835**	511-835			6"
10"-16"	**511-836**	511-836			6"
16"-24"	**511-837**	511-837			10"
24"-32"	**511-838**	511-838			10"
2.4"-4"	**511-853**	511-833	2923SB-10	21DZA000	6"
4"-6.4"	**511-854**	511-834			6"
6"-10"	**511-855**	511-835			6"
10"-16"	**511-856**	511-836			6"
16"-24"	**511-857**	511-837			10"
24"-32"	**511-858**	511-838			10"
2.4"-4"	**511-843**	511-833	2922SB	21DZA000	6"
4"-6.4"	**511-844**	511-834			6"
6"-10"	**511-845**	511-835			6"
10"-16"	**511-846**	511-836			6"
16"-24"	**511-847**	511-837			10"
24"-32"	**511-848**	511-838			10"

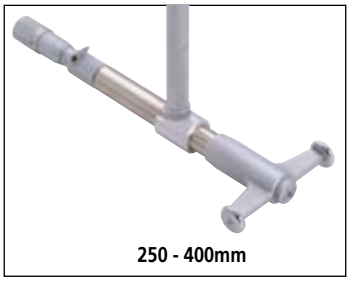
.0001" graduation .0005" graduation

Contact Points

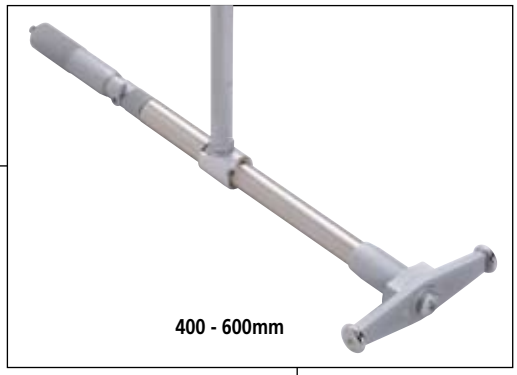
60 - 100mm

100 - 160mm

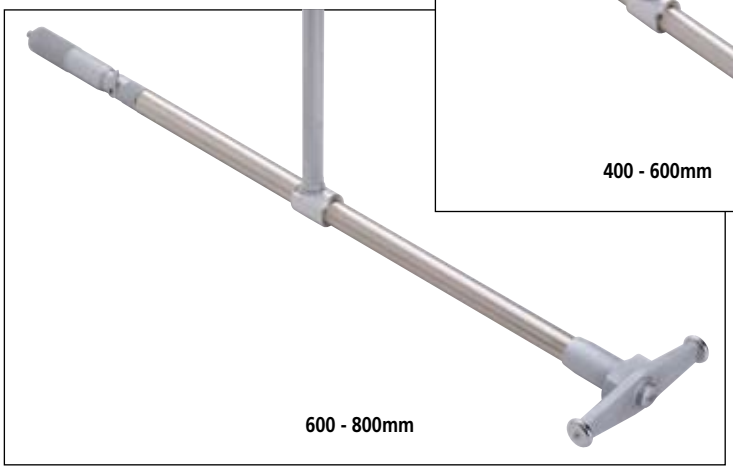
150 - 250mm



250 - 400mm



400 - 600mm

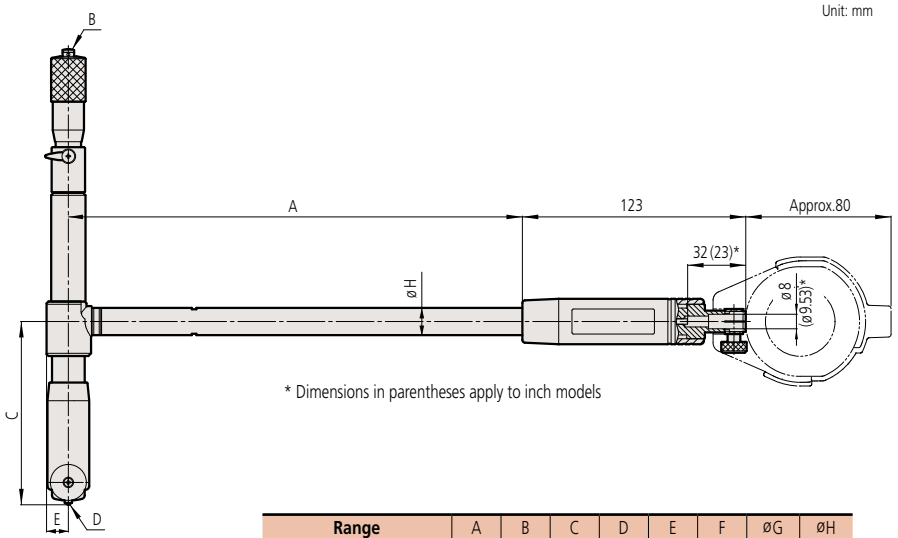


600 - 800mm

C

DIMENSIONS

Unit: mm



* Dimensions in parentheses apply to inch models

Range	A	B	C	D	E	F	øG	øH
60 - 100mm/2.4" - 4"	150	SR8	28.9	SR1.5	9	38	ø12.8	ø12
100 - 160mm/4" - 6.4"		SR10				50		
150 - 250mm/6" - 10"	250		70.3		12	78	ø19.8	ø15
250 - 400mm/10" - 16"			100.9			90		
400 - 600mm/16" - 24"			200.9		16	120		
600 - 800mm/24" - 32"			300.9					

Mitutoyo

Bore Gages

SERIES 511 — Short Leg Type

FEATURES

- Compact and lightweight due to the short length below the grip.
- Allows inside diameter measurement with high accuracy.
- Longer effective stroke (compared with the conventional product)
- Carbide is used for the contact point ensuring high durability and wear resistance.
- High-accuracy measurement is aided by a large grip with a sponge-like structure that reduces heat transfer from the operator's hand by 50%.
- Interchangeable washers 0.5mm thick (standard accessories) are supplied as standard accessories to enable setting in small steps.
- A Bore Gage Checker and a range of Setting Rings are available to aid in accurately setting a gage before making a measurement. (For details, refer to pages C-28, C-29 and C-30.)

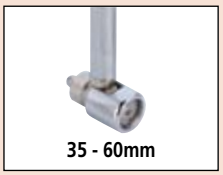
511-768

Technical Data

Wide-range accuracy: 2 µm
Repeatability: 0.5 µm
Adjacent error: 1 µm

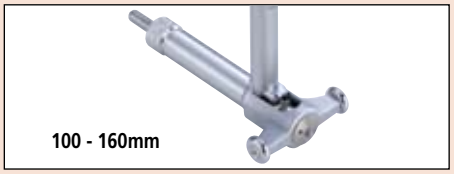
Contact Points

18 - 35mm



35 - 60mm

50 - 150mm



100 - 160mm

Optional Accessory

——— : Setting ring (See page C-28.)

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
18 - 35mm	**511-761**	511-761	Not supplied	Not supplied	50mm
35 - 60mm	**511-762**	511-762			50mm
50 - 150mm	**511-763**	511-763			50mm
100 - 160mm	**511-764**	511-764			50mm
18 - 35mm	**511-771**	511-761	2109SB-10	21DZA000	50mm
35 - 60mm	**511-772**	511-762			50mm
50 - 150mm	**511-773**	511-763			50mm
100 - 160mm	**511-774**	511-764			50mm
18 - 35mm	**511-766**	511-761	2046SB	21DZA000	50mm
35 - 60mm	**511-767**	511-762			50mm
50 - 150mm	**511-768**	511-763			50mm
100 - 160mm	**511-769**	511-764			50mm

0.001mm graduation 0.01mm graduation

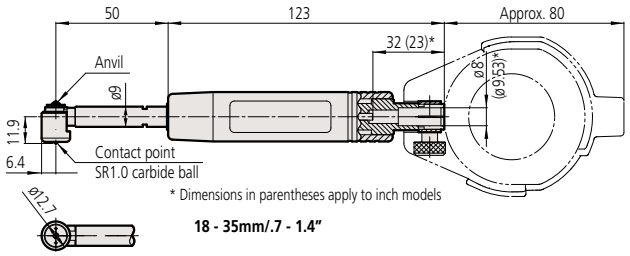
Inch

Range	Order No.	Content of set		Dial protection Cover Ass'y	Probe depth
		Bore gage	Dial indicator		
.7"-1.4"	**511-781**	511-781	Not supplied	Not supplied	2"
1.4"-2.5"	**511-782**	511-782			2"
2"-6"	**511-783**	511-783			2"
4"-6.5"	**511-784**	511-784			2"
.7"-1.4"	**511-791**	511-781	2923SB-10	21DZA000	2"
1.4"-2.5"	**511-792**	511-782			2"
2"-6"	**511-793**	511-783			2"
4"-6.5"	**511-794**	511-784			2"
.7"-1.4"	**511-786**	511-781	2922SB	21DZA000	2"
1.4"-2.5"	**511-787**	511-782			2"
2"-6"	**511-788**	511-783			2"
4"-6.5"	**511-789**	511-784			2"

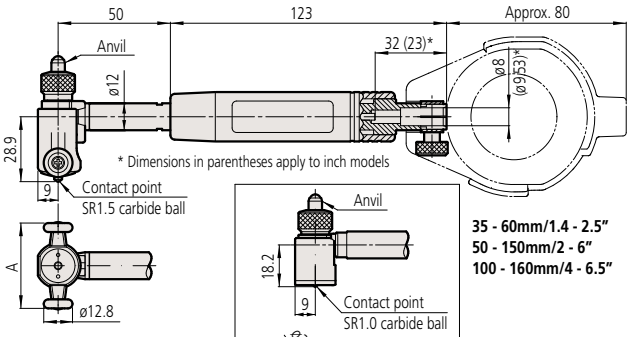
.0001" graduation .0005" graduation

DIMENSIONS

Unit: mm



18 - 35mm/.7 - 1.4"



Range	A
50 -150mm/2" - 6"	38
100 -160mm/4" - 6.5"	50

Dimension of **35 - 60mm/1.4 - 2.5"**

35 - 60mm/1.4 - 2.5"
50 - 150mm/2 - 6"
100 - 160mm/4 - 6.5"

Bore Gages

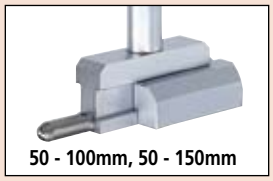
SERIES 511 — for Blind Holes

Technical Data

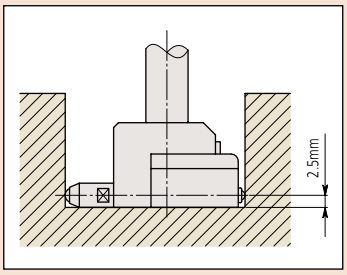
Accuracy: 5µm
Repeatability: 2µm
Graduation: 0.01mm, 0.001mm, .0005 or .0001"

Contact Points

15 - 35mm



50 - 100mm, 50 - 150mm



Optional Accessory

——: Setting ring (See page C-28.)

FEATURES

- Can measure ID at positions close to the bottom of blind holes.

511-412

C

SPECIFICATIONS

Metric

Range	Order No.	Content of set		Probe depth
		Bore gage	Dial indicator	
15 - 35mm	**511-421**	511-401	2109SB-10	150mm
35 - 60mm	**511-422**	511-402		150mm
50 - 100mm	**511-423**	511-403		150mm
50 - 150mm	**511-424**	511-404		150mm
15 - 35mm	**511-411**	511-401	2046SB	150mm
35 - 60mm	**511-412**	511-402		150mm
50 - 100mm	**511-413**	511-403		150mm
50 - 150mm	**511-414**	511-404		150mm

0.001mm graduation (w/ 2109SB-10)
0.01mm graduation (w/ 2046SB)

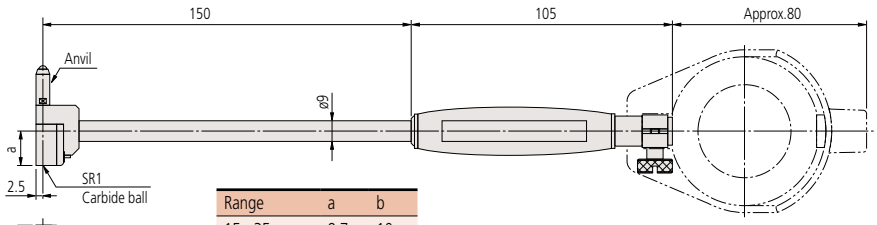
Inch

Range	Order No.	Content of set		Probe depth
		Bore gage	Dial indicator	
.6" - 1.4"	**511-441**	511-406	2923SB-10	6"
1.4" - 2.4"	**511-442**	511-407		6"
2" - 4"	**511-443**	511-408		6"
2" - 6"	**511-444**	511-409		6"
.6" - 1.4"	**511-431**	511-406	2922SB	6"
1.4" - 2.4"	**511-432**	511-407		6"
2" - 4"	**511-433**	511-408		6"
2" - 6"	**511-434**	511-409		6"

.0001" graduation (w/ 2923SB-10)
.0005" graduation (w/ 2922SB)

DIMENSIONS

Unit: mm



Range	a	b
15 - 35mm	9.7	10
35 - 60mm	14.7	18
50 - 100mm	23.7	22
50 - 150mm	23.7	22

Mitutoyo

ABSOLUTE Digimatic Bore Gages

SERIES 511

This ABSOLUTE Digimatic bore gages are exclusively designed for ID measurement.

511-521

FEATURES

- The minimum value holding function provides easy measurement of hole diameter.

- Up to three sets of master value and upper/lower tolerance values can be memorized and recalled at the push of a button.
- An analog bar indicator is integrated to enhance ease of reading.
- GO/±NG judgment is performed by setting the upper and lower tolerances.
- Up to four rods (250mm or 500mm) can be used.

SPECIFICATIONS

Metric

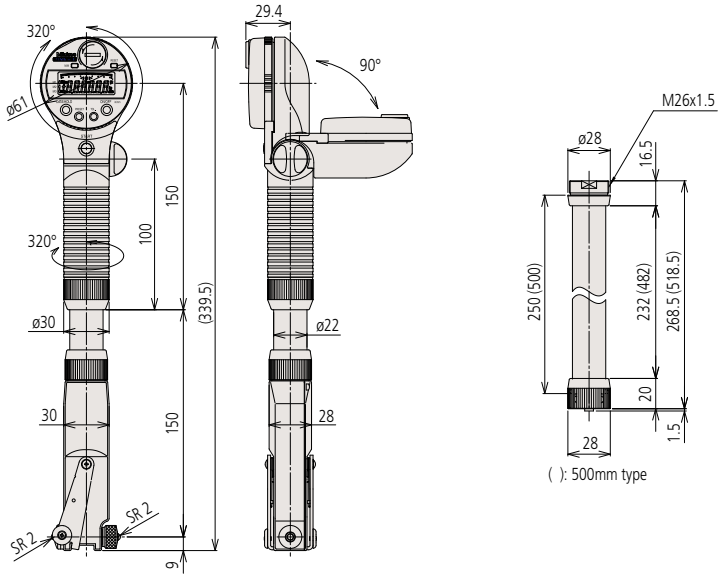
Range	Order No.	Probe depth
45 - 100mm	**511-501**	150mm
100 - 160mm	**511-502**	150mm

Inch/Metric

Range	Order No.	Probe depth
1.8 - 4"	**511-521**	6"
4 - 6.5"	**511-522**	6"

DIMENSIONS

Unit: mm



SPC

ABSOLUTE® Absolute System Patented by MITUTOYO

(Refer to page VIII for details.)

Technical Data

Resolution: 0.001mm or .0005"/0.001mm
Display: LCD Character Hight 8.5mm
Battery: SR44 (2pc.) (**938882**)
Battery life: Approx. 2000 hours under normal use

Function

Presetting, Preset, Power on/off, inch/mm conversion (inch/mm type only), Data output, GO/±NG tolerance judgment Min value holding, Data hold
Alarm: Low battery voltage, scale contamination, over-flow error, tolerance limit setting error

Optional Accessories

21DZA089: Extension rod 250 mm (10")
21DZA081: Extension rod 500 mm (20")
516-118-10: Setup metric rectangular gauge block set
516-119-10: Setup metric square gauge block set
905338: SPC cable (1m)
905409: SPC cable (2m)
02AZD790F: SPC cable for U-WAVE (160mm)
——— : Setting ring (See page C-28.)

Setting the Bore Gage to a master value using a gauge block set

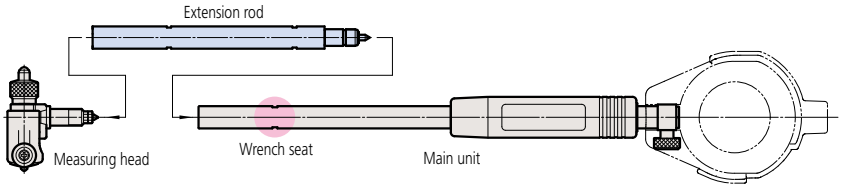
Using four extension rods

Extension Rods

Accessories for Bore Gages

FEATURES

- Extension rods (optional) are available to assist in deep-hole measurement.
- When several extension rods are joined together there is the possibility of small errors arising from the extra joints involved. Therefore it is good practice not to connect more than 2 rods to a bore gage at any one time. If possible use a single, longer, extension rod rather than several short ones.
- The extension rod can be used up to 1,000 mm.
- If using an extension rod longer than 500 mm, use the bore gage in the vertical orientation.
- Accuracy and satisfactory operation should be confirmed after connecting an extension rod.



*To separate an extension rod from the measuring head or main unit, use the dedicated wrench that engages with seats on the rod and main unit sleeve.

SPECIFICATIONS

Extension rod length					Extension rod diameter	Wrench Part No.	Applicable measuring range
125mm/5"	250mm/10"	500mm/20"	750mm/30"	1,000mm/40"			
953549	**953550**	**953551**	—	—	ø9	**102148**	18-35mm/.7"-1.4"
953552	**953553**	**953554**	**953555**	**953556**	ø12	**212556**	35-60mm/1.4"-2.5"
							50-150mm/2"-6"
							100-160mm/4"-6.5"
							60-100mm/2.4"-4"
							100-160mm/4"-6.4"
953557	**952361**	**953558**	**953559**	**953560**	ø15	**212556**	160-250mm/6.5"-10"
							250-400mm/10"-16"
							150-250mm/6"-10"
							250-400mm/10"-16"
							400-600mm/16"-24"
							600-800mm/24"-32"

*The compatible models are the Standard Bore Gage (refer to page C-20) and Micrometer Head Bore Gage (refer to page C-22).
*Accuracy may be affected by unintended deflections, etc., when using an extension rod.

Mitutoyo

Setting Rings

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

FEATURES

- Used for quick and accurate setting of dial bore gages, Holtest, and inside micrometers.
- Actual calibration value for the diameter is marked on each ring.
- No anticorrosion treatment is required when handling Ceramic Setting Rings normally, resulting in simple maintenance and storage.

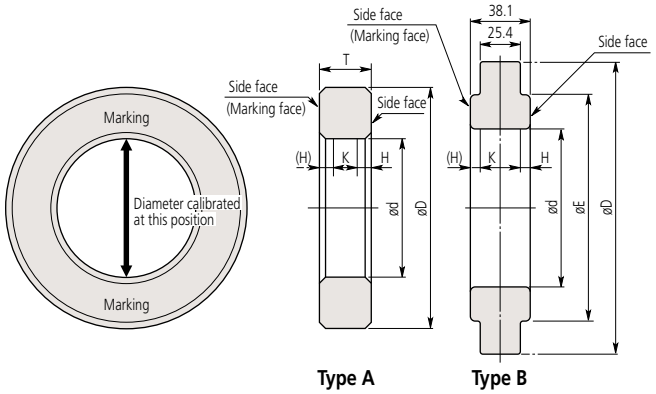
Steel Setting Rings

177-205 177-139 177-146 177-147 177-300

Ceramic Setting Rings

177-424 177-429 177-432

DIMENSIONS



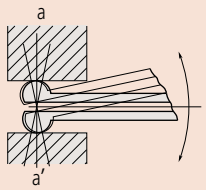
Type A Type B

Suffix

177-*-12**: With Inspection Certificate
177-*-62**: With Inspection Certificate and Calibration Certificate
177-*-82**: With Inspection Certificate, Calibration Certificate, and Traceability System Chart

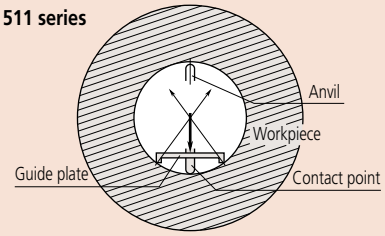
Reading the indicated value

526 series



- The 526 series has a gage head with high curvature. Alignment with the diameter (a-a') is achieved by rotating the gage head in the direction indicated by the arrow, and the reading is the minimum value read from the dial indicator.

511 series



- The 511 series provides a guide plate to align the setting ring diameter with the measurement axis of the bore gage.

C

SPECIFICATION

Steel Setting Rings

Metric

Nominal size ød	Order No.	Dimensions (mm) øD	øE	T	Type	Accuracy: Tolerance between the nominal size and the actual diameter (µm)	Uncertainty of marked dimension value (µm)	Roundness/ Cylindricity (µm)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
1mm	**177-220**	20	—	4	A	±10	±1.5	1	1.6	0.8
1.1mm	**177-222**	20	—	4	A	±10	±1.5	1	1.6	0.8
1.2mm	**177-225**	20	—	4	A	±10	±1.5	1	1.6	0.8
1.3mm	**177-227**	20	—	4	A	±10	±1.5	1	1.6	0.8
1.4mm	**177-230**	20	—	4	A	±10	±1.5	1	1.6	0.8
1.75mm	**177-236**	25	—	5	A	±10	±1.5	1	1.6	1.8
2mm	**177-239**	25	—	5	A	±10	±1.5	1	1.6	1.8
2.25mm	**177-242**	25	—	5	A	±10	±1.5	1	1.6	1.8
2.5mm	**177-208**	25	—	7	A	±10	±1.5	1	1.7	3.6
2.75mm	**177-246**	25	—	7	A	±10	±1.5	1	1.7	3.6
3mm	**177-248**	25	—	7	A	±10	±1.5	1	1.7	3.6
3.25mm	**177-250**	25	—	7	A	±10	±1.5	1	1.7	3.6
3.5mm	**177-252**	25	—	7	A	±10	±1.5	1	1.7	3.6
3.75mm	**177-255**	25	—	7	A	±10	±1.5	1	1.7	3.6
4mm	**177-204**	25	—	7	A	±10	±1.5	1	1.7	3.6
4.5mm	**177-257**	25	—	7	A	±10	±1.5	1	1.7	3.6
5mm	**177-205**	25	—	7	A	±10	±1.5	1	1.7	3.6
5.5mm	**177-263**	25	—	7	A	±10	±1.5	1	1.7	3.6
6mm	**177-267**	25	—	7	A	±10	±1.5	1	1.7	3.6
6.5mm	**177-271**	25	—	7	A	±10	±1.5	1	1.7	3.6
7mm	**177-275**	25	—	7	A	±10	±1.5	1	1.7	3.6
8mm	**177-125**	32	—	10	A	±10	±1.5	1	2.0	6.0
9mm	**177-279**	32	—	10	A	±10	±1.5	1	2.0	6.0
10mm	**177-126**	32	—	10	A	±10	±1.5	1	2.0	6.0
12mm	**177-284**	32	—	10	A	±10	±1.5	1	2.0	6.0
14mm	**177-132**	38	—	10	A	±10	±1.5	1	2.0	6.0

Nominal size ød	Order No.	Dimensions (mm) øD	øE	T	Type	Accuracy: Tolerance between the nominal size and the actual diameter (µm)	Uncertainty of marked dimension value (µm)	Roundness/ Cylindricity (µm)	Distance from the side face H (mm)	Size of warranted calibration surface K (mm)
16mm	**177-177**	45	—	10	A	±10	±1.5	1	2.0	6.0
17mm	**177-133**	45	—	10	A	±10	±1.5	1	2.0	6.0
18mm	**177-285**	45	—	10	A	±10	±1.5	1	2.0	6.0
20mm	**177-286**	45	—	10	A	±10	±1.5	1	2.0	6.0
25mm	**177-139**	53	—	15	A	±10	±1.5	1	3.2	8.6
30mm	**177-288**	71	—	15	A	±10	±1.5	1	3.2	8.6
35mm	**177-140**	71	—	15	A	±10	±1.5	1	3.2	8.6
40mm	**177-290**	71	—	15	A	±10	±1.5	1	3.2	8.6
45mm	**177-178**	85	—	15	A	±10	±1.5	1	3.7	7.6
50mm	**177-146**	85	—	20	A	±20	±1.5	1	3.7	12.6
60mm	**177-292**	112	—	20	A	±20	±1.5	1	3.7	12.6
62mm	**177-314**	112	—	20	A	±20	±1.5	1.5	3.7	12.6
70mm	**177-147**	112	—	20	A	±20	±1.5	1.5	3.7	12.6
75mm	**177-316**	125	—	25	A	±20	±1.5	1.5	4.2	16.6
80mm	**177-294**	125	—	25	A	±20	±1.5	1.5	4.2	16.6
87mm	**177-318**	140	—	25	A	±20	±1.5	1.5	4.2	16.6
90mm	**177-148**	140	—	25	A	±20	±1.5	1.5	4.2	16.6
100mm	**177-296**	160	—	25	A	±20	±1.5	2	4.2	16.6
125mm	**177-298**	210	168	38.1 (25.4)	B	±20	±1.5	2	5.3	27.5
150mm	**177-300**	235	187		B	±20	±1.5	2	5.3	27.5
175mm	**177-302**	260	215		B	±20	±1.5	2.5	5.3	27.5
200mm	**177-304**	311	244		B	±20	±1.5	2.5	5.3	27.5
225mm	**177-306**	337	264		B	±20	±1.5	2.5	5.3	27.5
250mm	**177-308**	362	290		B	±20	±1.5	3	5.3	27.5
275mm	**177-310**	413	321		B	±20	±1.5	3	5.3	27.5
300mm	**177-312**	438	340		B	±20	±1.5	3	5.3	27.5

Inch

Nominal size ød	Order No.	Dimensions (mm) øD	øE	T	Type	Accuracy: Tolerance between the nominal size and the actual diameter (inch)	Uncertainty of marked dimension value (inch)	Roundness/ Cylindricity (inch)	Distance from the side face H (inch)	Size of warranted calibration surface K (inch)
.1"	**177-209**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.16"	**177-206**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.24"	**177-207**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.275"	**177-281**	25	—	7	A	±.0004"	±.00006"	.00004"	.079"	.118"
.35"	**177-179**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.425"	**177-283**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.5"	**177-180**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.6"	**177-181**	38	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.65"	**177-182**	45	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.7"	**177-183**	45	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.8"	**177-287**	45	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
1"	**177-184**	53	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.2"	**177-289**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.4"	**177-185**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.6"	**177-291**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.8"	**177-186**	85	—	15	A	±.0004"	±.00006"	.00004"	.146"	.299"

Nominal size ød	Order No.	Dimensions (mm) øD	øE	T	Type	Accuracy: Tolerance between the nominal size and the actual diameter (inch)	Uncertainty of marked dimension value (inch)	Roundness/ Cylindricity (inch)	Distance from the side face H (inch)	Size of warranted calibration surface K (inch)
2"	**177-187**	85		20	A	±.0008"	±.00006"	.00004"	.146"	.496"
2.4"	**177-293**	112		20	A	±.0008"	±.00006"	.00004"	.146"	.496"
2.5"	**177-315**	112		20	A	±.0008"	±.00006"	.00006"	.165"	.457"
2.8"	**177-188**	112		20	A	±.0008"	±.00006"	.00006"	.165"	.457"
3"	**177-317**	125		25	A	±.0008"	±.00006"	.00006"	.165"	.654"
3.2"	**177-295**	125		25	A	±.0008"	±.00006"	.00006"	.165"	.654"
3.5"	**177-319**	140		25	A	±.0008"	±.00006"	.00006"	.165"	.654"
3.6"	**177-189**	140		25	A	±.0008"	±.00006"	.00006"	.165"	.654"
4"	**177-297**	160		25	A	±.0008"	±.00006"	.00008"	.165"	.654"
5"	**177-299**	210	168	38.1	B	±.0008"	±.00010"	.00008"	.209"	1.083"
6"	**177-301**	235	187	38.1	B	±.0008"	±.00010"	.00008"	.209"	1.083"
7"	**177-303**	260	215	38.1	B	±.0008"	±.00010"	.00010"	.209"	1.083"
8"	**177-305**	311	244	38.1	B	±.0008"	±.00010"	.00010"	.209"	1.083"
9"	**177-307**	337	264	38.1	B	±.0008"	±.00010"	.00010"	.209"	1.083"
10"	**177-309**	362	290	38.1	B	±.0008"	±.00010"	.00012"	.209"	1.083"
11"	**177-311**	413	321	38.1	B	±.0008"	±.00010"	.00012"	.209"	1.083"
12"	**177-313**	438	340	38.1	B	±.0008"	±.00010"	.00012"	.209"	1.083"

Cera Setting Rings

Metric

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

Inch

Nominal size ød	Order No.	Dimensions (mm) øD	øE	T	Type	Accuracy: Tolerance between the nominal size and the actual diameter (inch)	Uncertainty of marked dimension value (inch)	Roundness/ Cylindricity (inch)	Distance from the side face H (inch)	Size of warranted calibration surface K (inch)
.16"	**177-518**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.24"	**177-520**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.275"	**177-522**	25	—	7	A	±.0004"	±.00006"	.00004"	.067"	.142"
.35"	**177-523**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.425"	**177-524**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.5"	**177-525**	32	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.65"	**177-527**	45	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
.8"	**177-529**	45	—	10	A	±.0004"	±.00006"	.00004"	.079"	.236"
1"	**177-530**	53	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.2"	**177-531**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.4"	**177-532**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.6"	**177-533**	71	—	15	A	±.0004"	±.00006"	.00004"	.126"	.339"
1.8"	**177-534**	85	—	15	A	±.0004"	±.00006"	.00004"	.146"	.299"

*Actual dimensions marked in 0.001 mm increments.
*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 faces of a ring, namely, close to the faces two sides and the center.

Bore Gage Checker

SERIES 515

The Bore Gage Checker allows easy setting of dial bore gages with ranges of 18mm (.7") through 400mm (16") using gauge blocks.

515-590

SPECIFICATIONS

Order No.	Applicable range
515-590	18 -400mm (.7" - 16")

C

RM-120 Ring Master

Ring Gage Measuring Machine

FEATURES

- The laser holoscale incorporated in the RM-120 eliminates the need for a reference gauge block set and reference ring gages.
- Probe changing is not required for the entire measuring range.
- Enhanced repeatability and lower measuring force achieved with the air bearing on the probe carriage guide.
- Workpiece alignment is easy to perform with the specially designed measuring table which is capable of moving, tilting, elevating, and rotating through 90 degrees.
- The model with an analog meter enables even easier workpiece positioning.

565-201

SPECIFICATIONS

Model No.	RM-120
Range	ID: 6mm - 120mm
Resolution	0.0001mm (0.1µm)
Accuracy (20°C)	±(0.03+5D/1000)µm D = Measuring internal diameter (mm)
Repeatability (±2σ)	±0.2µm
Measuring unit	Laser Holoscale
Measuring force	Approx. 0.2N
Workpiece size	OD: 20mm to 200mm Thickness: Up to 40mm
Ambient temperature	20°C ±0.5°C
Air requirement	400KPa
Air consumption	Approx. 30 liters per minute
Dimensions (W x D x H)	720 x 494 x 875mm