

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.



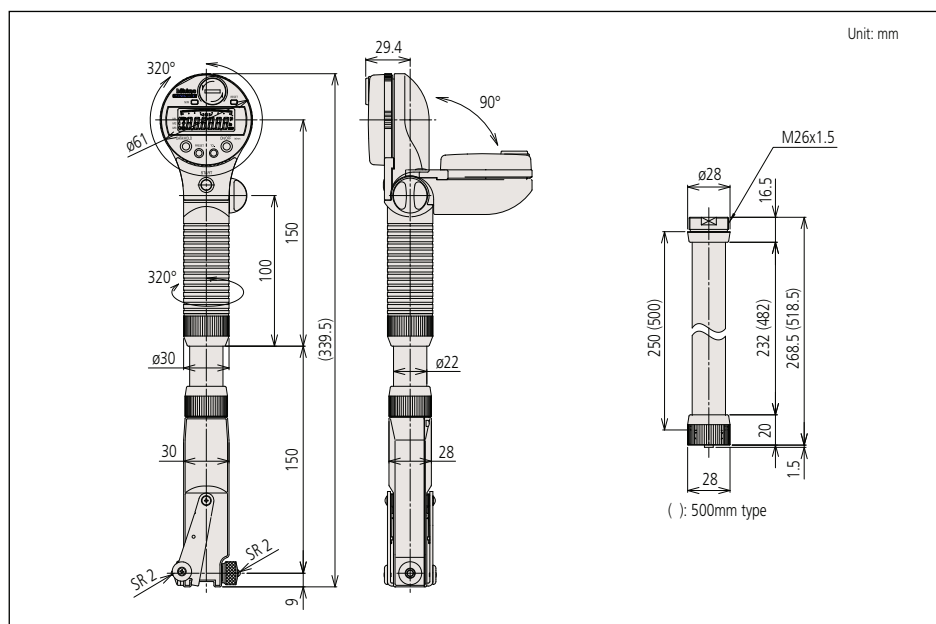
- Up to three sets of master value and upper/lower tolerance values can be memorized and recalled at the push of a button.
- An analog bar indicator is integrated to enhance ease of reading.
- GO/±NG judgment is performed by setting the upper and lower tolerances.
- Up to four rods (250mm or 500mm) can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



ABSOLUTE[®]
Absolute System Patented by MITUTOYO

(Refer to page VIII for details.)

Technical Data

Resolution: 0.001mm or .0005"/0.001mm
 Display: LCD Character Height 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, overflow 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

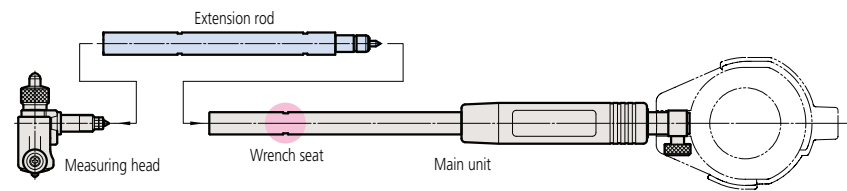
Using four extension rods

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" 35-60mm/1.4"-2.5" 50-150mm/2"-6"
953552	953553	953554	953555	953556	ø12	212556	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.



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.

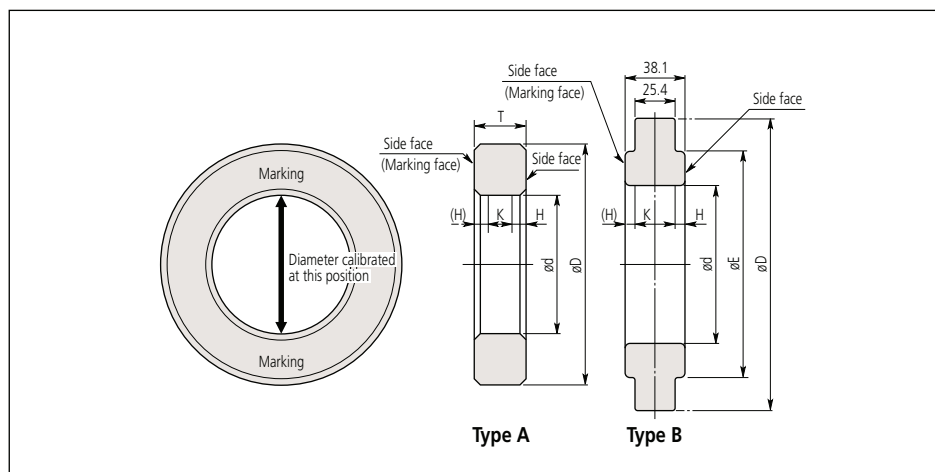
Steel Setting Rings



Ceramic Setting Rings



DIMENSIONS

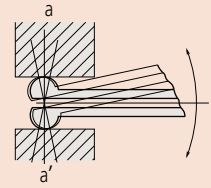


Suffix

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

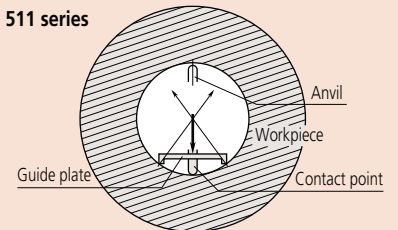
Reading the indicated value

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.

SPECIFICATION

Steel Setting Rings

Metric

Nominal size ød	Order No.	Dimensions (mm)			Type	Accuracy				
		øD	øE	T		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)			Type	Accuracy				
		øD	øE	T		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)			Type	Accuracy				
		øD	øE	T		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)			Type	Accuracy				
		øD	øE	T		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 (25.4)	B	±.0008"	±.00010"	.00008"	.209"	1.083"
6"	177-301	235	187		B	±.0008"	±.00010"	.00008"	.209"	1.083"
7"	177-303	260	215		B	±.0008"	±.00010"	.00010"	.209"	1.083"
8"	177-305	311	244		B	±.0008"	±.00010"	.00010"	.209"	1.083"
9"	177-307	337	264		B	±.0008"	±.00010"	.00010"	.209"	1.083"
10"	177-309	362	290		B	±.0008"	±.00010"	.00012"	.209"	1.083"
11"	177-311	413	321		B	±.0008"	±.00010"	.00012"	.209"	1.083"
12"	177-313	438	340		B	±.0008"	±.00010"	.00012"	.209"	1.083"

Cera Setting Rings

Metric

Nominal size ød	Order No.	Dimensions (mm)			Type	Accuracy				
		øD	øE	T		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)			Type	Accuracy				
		øD	øE	T		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.