

Bore Gages

For easy and accurate measurement of inside diameters

Bore Gages SERIES 511 — for Blind Holes

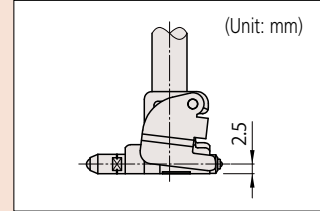
- Capable of ID (inside diameter) measurement close to the bottom of a hole.
- Carbide contact point ensuring high durability and wear resistance.
- Grip is large and hollow to reduce effect of body heat on high-accuracy measurements.
- The indicator (dial indicator, Digimatic indicator) and dial protection cover are optional. Select an indicator from the recommended dial indicators and Digimatic indicators. Please contact us for advice when using an indicator other than the recommended indicators.
- Optional Extension Rods can be attached for measuring deep holes. (For details, refer to page C-45.)
- 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-46 and C-47.)



511-416



511-417



Technical Data

- Accuracy: Metric models 4 μ m
Inch models 0.00016 in
- Repeatability: Metric models 1 μ m
Inch models 0.00004 in
- Adjacent error: Metric models 1 μ m
Inch models 0.00004 in

Optional Accessories

- Dial indicator (See Chapter F)
- Dial protection cover: **21DZA000**

Recommended Dial Indicators (see Chapter F)

- Metric models: **2046SB** (0.01 mm)
2972TB (0.01 mm - One-revolution type)
2109SB-10 (0.001 mm)
2900SB-10 (0.001 mm - One-revolution type)
- Inch models: **2922SB** (0.0005 in)
2977TB (0.0005 in - One-revolution type)
2923SB-10 (0.0001 in)
2910SB-10 (0.0001 in - One-revolution type)

Recommended Digimatic Indicators (see Chapter F)

- Metric models: **543-310B** (0.001 mm)
 - Inch models: **543-312B** (0.001 mm/0.00005 in)
- Note: Indicators equipped with rubber bellows, such as water-proof types, cannot be used.

Note: The dial indicator and protection cover are optional.

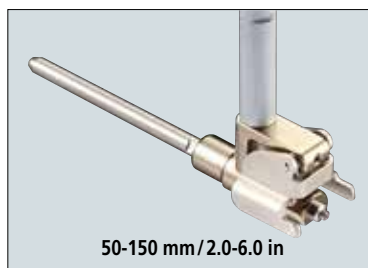
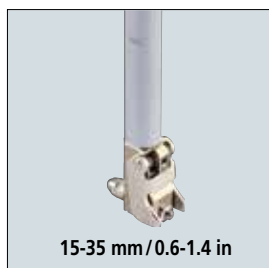
SPECIFICATIONS

Metric										
Order No.	Range (mm)	Stroke of contact point (mm)	Measuring force (N)	Guide force (N)	Content of set					Probing depth (mm)
					Bore gage	Dial indicator	Dial protection cover	Anvil	Washer	
511-415	15 - 35	1.2	4 or less	6 or less	511-415	Not supplied	Not supplied	11 pcs.	1 pc.	150
511-416	35 - 60		5 or less	10 or less	511-416			6 pcs.	4 pcs.	
511-417	50 - 150	1.2	4 or less	6 or less	511-415	2046SB (Graduation: 0.01 mm)	21DZA000	11 pcs.	1 pc.	150
511-425	15 - 35		5 or less	10 or less	511-416			6 pcs.	4 pcs.	
511-426	35 - 60	1.2	4 or less	6 or less	511-415	2109SB-10 (Graduation: 0.001 mm)	21DZA000	11 pcs.	1 pc.	150
511-427	50 - 150		5 or less	10 or less	511-416			6 pcs.	4 pcs.	
511-435	15 - 35	1.2	4 or less	6 or less	511-415	2109SB-10 (Graduation: 0.001 mm)	21DZA000	11 pcs.	1 pc.	150
511-436	35 - 60		5 or less	10 or less	511-416			6 pcs.	4 pcs.	
511-437	50 - 150	1.2	4 or less	6 or less	511-415	2109SB-10 (Graduation: 0.001 mm)	21DZA000	11 pcs.	1 pc.	150
511-438	15 - 35		5 or less	10 or less	511-416			6 pcs.	4 pcs.	

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

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

Contact Points



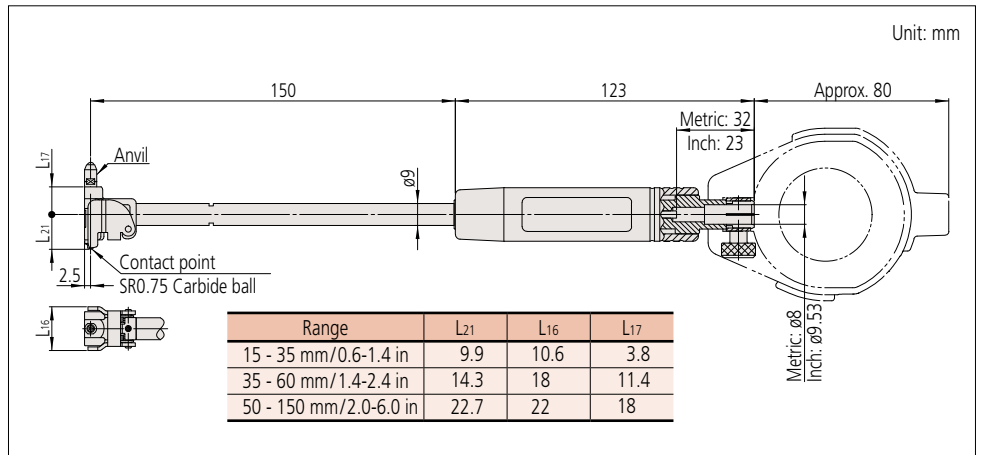
Inch										
Order No.	Range (in)	Stroke of contact point (in)	Measuring force (N)	Guide force (N)	Content of set					Probing depth (in)
					Bore gage	Dial indicator	Dial protection cover	Anvil	Washer	
511-418	0.6 - 1.4	0.047	4 or less	6 or less	511-418	Not supplied	Not supplied	11 pcs.	1 pc.	6
511-419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

Recommended Digimatic Indicators (see Chapter F)

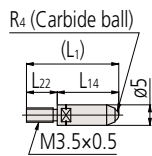
- Metric models: **543-310B (ID-C112GXB)**: 0.001 mm)
- Inch models: **543-312B (ID-C112GEXB)**: 0.001 mm/0.00005 in)
- The ID measurement can be performed easily since the minimum value is detected automatically.
- Up to three combinations of master value and the tolerance value can be set.
- Nine measurement results (maximum) can be saved and recalled from memory (when no external device is connected).
- Refer to page F-14 for details.



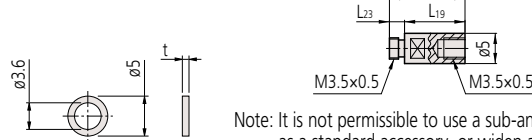
DIMENSIONS



Anvil

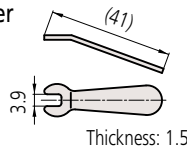


Interchangeable washer Sub-anvil

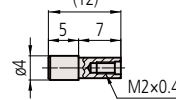


Note: It is not permissible to use a sub-anvil other than as supplied as a standard accessory, or widen a measuring range by using multiple sub-anvils. (The measurement accuracy in such cases is not guaranteed.)

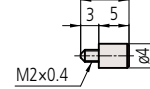
Spanner 204354



Washer holder 212202



Locking screw 212203



STANDARD ACCESSORIES

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