

# Dial Test Indicators



## SERIES 513 — Dial Test Indicator Features

- Designed to probe surfaces that cannot be reached with a normal dial gage. Useful both for alignment and for measurement purposes.
- Mitutoyo's proprietary new design permits smooth pointer operation.
- Strong frame provides excellent rigidity and durability.
- The pointer and carbide contact point are only slightly magnetizable\*, and so they are hardly affected by a magnetic environment. In addition, models with a ruby contact point are available. The ruby contact point also has several times the abrasion resistance of carbide contact point and is safely usable with an electric discharge machine thanks to its being a non-conductor.
- Clear and concise wide dial face allows excellent visibility.
- The surface of the crystal is hard-coated for excellent scratch resistance.
- Flat crystal makes graduations easy to read. Moreover, the O-ring sealing method used for the bezel prevents water or oil penetration. (Note that this type is NOT water-proof.)
- The main unit is equipped with three dovetails to which the stem with dovetail groove  $\varnothing 6$  (standard accessory) can be attached. This greatly improves convenience as the attachment location can be adjusted as needed.
- Five types are available: horizontal, horizontal (20° tilted face), vertical, parallel, and universal, allowing users to select according to their needs.
- Metric Dial Test Indicator is inspected according to JIS B 7533:2015. Horizontal, horizontal (20° tilted face), and vertical types are inspected with the dial face in the upward orientation, while the parallel type is inspected with the dial face in the vertical orientation to guarantee their accuracy.

\* Magnetic material is used for some internal parts.

### Feature icons

Icon	Feature description
	High accuracy
	With revolution counter
	Long contact point
	Standard
	Double scale spacing
	Compact (Small face diameter)
	Carbide contact point
	Ruby contact point (Non-conductive and abrasion resistant)



Horizontal



Vertical



Horizontal (20° Tilted face)



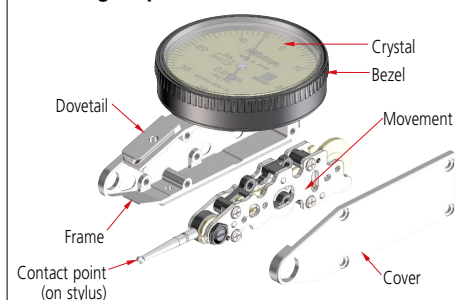
Parallel



Universal



### Naming of parts

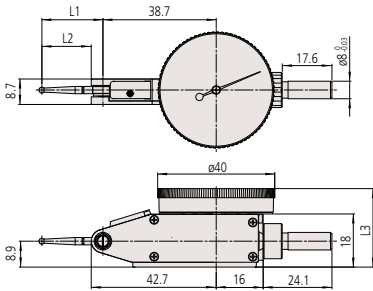




DIMENSIONS

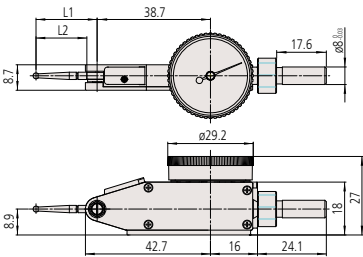
Horizontal

unit: mm



Order No.	L1	L2	L3
513-401-10E	14.7	11.2	27
513-471-10E			
513-405-10E/A/T			
513-475-10E	18.7	15.2	28
513-425-10E/A			
513-404-10E/A/T	20.9	17.4	27
513-474-10E			
513-424-10E/A/T	22.2	18.7	28
513-426-10E/A			
513-478-10E	37.4	33.9	27
513-414-10E/A/T			
513-415-10E/A/T			
513-477-10E	44.5	41.0	

Compact



Type	Order No.	L1	L2
Compact	513-465-10E	18.7	15.2
	513-464-10E	20.9	17.4
	513-466-10E	22.2	18.7

Note: A slight difference may occur depending on the center of the contact point, graduation plate, and stem fixing position, etc.

Special Set: 513-908-10E (Metric)

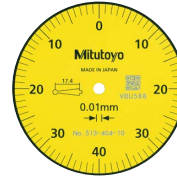
513-404-10E: Dial test indicator  
7014-10: Mini magnetic stand

513-907-10E (inch)

513-402-10E: Dial test indicator  
7014E-10: Mini magnetic stand



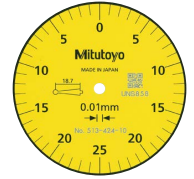
Dial Test Indicator  
SERIES 513 — Horizontal Type



Graduation: 0.01 mm  
Range: 0.8 mm

513-404-10E/10A/10T

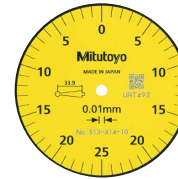
- Standard
- Carbide contact point



Graduation: 0.01 mm  
Range: 0.5 mm

513-424-10E/10A/10T

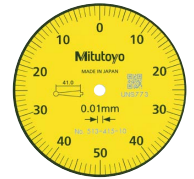
- Standard
- Double scale spacing
- Carbide contact point



Graduation: 0.01 mm  
Range: 0.5 mm

513-414-10E/10A/10T

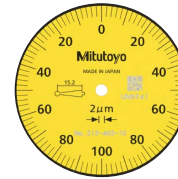
- Long contact point
- Carbide contact point
- Double scale spacing



Graduation: 0.01 mm  
Range: 1.0 mm

513-415-10E/10A/10T

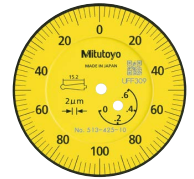
- Long contact point
- Carbide contact point



Graduation: 0.002 mm  
Range: 0.2 mm

513-405-10E/10A/10T

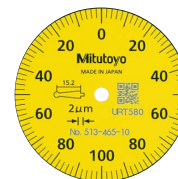
- Standard
- Carbide contact point



Graduation: 0.002 mm  
Range: 0.6 mm

513-425-10E/10A

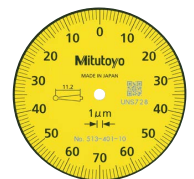
- With revolution counter
- Carbide contact point



Graduation: 0.002 mm  
Range: 0.2 mm

513-465-10E

- Compact
- Carbide contact point



Graduation: 0.001 mm  
Range: 0.14 mm

513-401-10E

- High accuracy
- Carbide contact point



Graduation: 0.0005 in  
Range: 0.03 in

513-402-10E/10T

- Standard
- Carbide contact point



Graduation: 0.0001 in  
Range: 0.008 in

513-403-10E/10T

- Standard
- Carbide contact point

Note: 513-4XX-10 is indicated on the dial face. But the Order No. for the Special Set provided with the stem etc. has a suffix (E or A or T) at the end.

# Dial Test Indicators

## SPECIFICATIONS

Order No.			Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (µm)				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point						
Basic set	Plus set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis											Repeatability					
513-424-10E	513-424-10A	513-424-10T	0.01	0.5	0-25-0	6	-	4	3	45	0.3 or less														
513-478-10E	-	-								41															
513-414-10E	513-414-10A	513-414-10T				10	10	5	5	3	45	0.2 or less													
513-426-10E	513-426-10A	-									41														
513-404-10E	513-404-10A	513-404-10T				0.8	0-40-0	9	-	4	1	45	0.3 or less												
513-474-10E	-	-		41																					
513-464-10E	-	-																							
513-415-10E	513-415-10A	513-415-10T		1.0	0-50-0	10	-	5	3	45	0.2 or less														
513-477-10E	-	-								41															
513-405-10E	513-405-10A	513-405-10T		0.002	0.2	0-100-0	4	-	2	1	45	0.3 or less													
513-475-10E	-	-	41																						
513-465-10E	-	-	0.6								7	5	4	3	45	0.4 or less									
513-425-10E	513-425-10A	-													41										
513-401-10E	-	-	0.001								0.14	0-70-0	4	-	3	45	0.3 or less								
513-471-10E	-	-		41																					

Order No.			Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point						
Basic set	Plus set	Full set				One rev.	Hysteresis	Repeatability																
513-402-10E	-	513-402-10T	0.0005	0.03	0-15-0	±0.0005	0.0002	±0.0002	45	0.3 or less														
513-472-10E	-	-								41														
513-412-10E	-	513-412-10T								0.00005	0.008	0-4-0	±0.0001	0.0001	±0.00004	45	0.3 or less							
513-479-10E	-	-															41							
513-462-10E	-	-								0.0001	0.008	0-4-0	±0.0001	0.0001	±0.00004	45	0.3 or less							
513-407-10E	-	513-407-10T	41																					
513-403-10E	-	513-403-10T																						
513-473-10E	-	-																						
513-463-10E	-	-																						

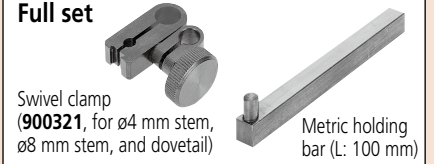
Order No.			Graduation	Range	Dial reading	Maximum permissible error (MPE)* (µm)				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-409-10E	-	513-409-10T	0.002 mm / 0.0001 in	0.2 mm / 0.0076 in	0-10-0 / 0-38-0	4	2	3	1	45	0.3 or less								

Order No.			Graduation	Range	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point
Basic set	Plus set	Full set				One rev.	Hysteresis	Repeatability										
513-406-10E	-	513-406-10T	0.0005 in / 0.01 mm	0.03 in / 0.7 mm	0-15-0 / 0-35-0	±0.0005	0.0002	±0.0002	45	0.3 or less								

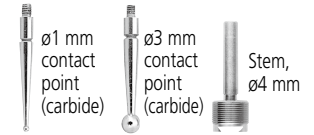
\* We guarantee the accuracy of completed products by inspecting them with the dial face facing upward.  
Note: Stem with dovetail groove is not included in the mass.

### Set Configuration: Metric and Metric/Inch

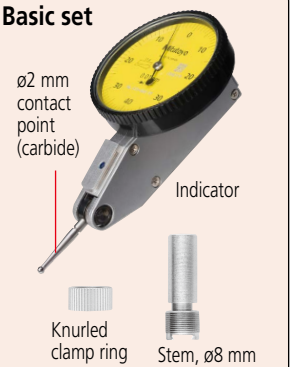
#### Full set



#### Plus set

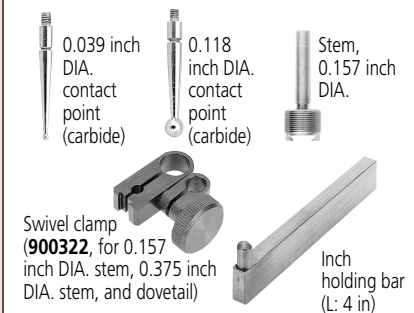


#### Basic set

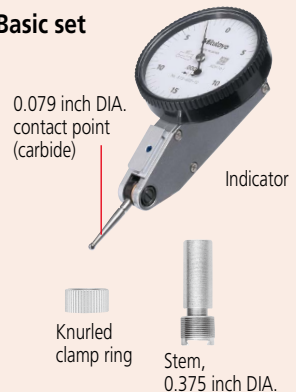


### Set Configuration: Inch and Inch/Metric

#### Full set



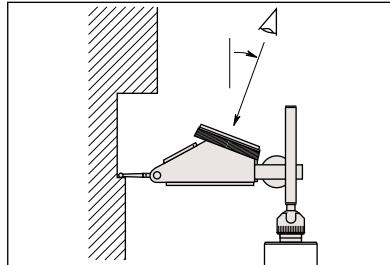
#### Basic set



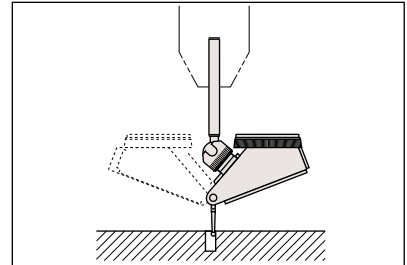


**Dial Test Indicator**  
**SERIES 513 — Horizontal (20° Tilted Face), Vertical, and Parallel Types**

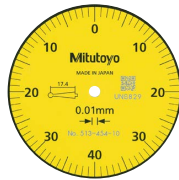
- Specially designed for easy viewing of dial.



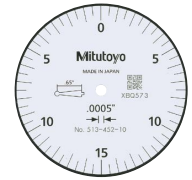
- The dial face obliquely faces upward, allowing users to read the graduations from the user's side. It is convenient when probing on the side of a large workpiece and the workbench is high.



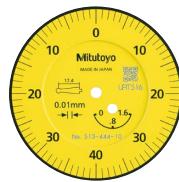
- Using the universal holder allows easy hole centering. The dial face always faces upward when the indicator is rotated, which makes reading easy.



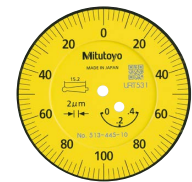
Carbide contact point



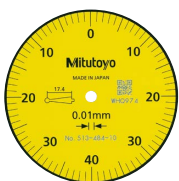
Carbide contact point



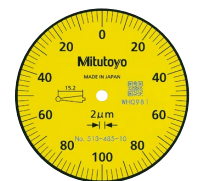
With revolution counter  
 Carbide contact point



With revolution counter  
 Carbide contact point



Carbide contact point



Carbide contact point

Note: 513-4XX-10 is indicated on the dial face. But the Order No. for the set provided with the stem etc. has a suffix (E or A or T) at the end.

# Dial Test Indicators



With revolution counter



Long contact point



Carbide contact point

## SPECIFICATIONS

Metric			Horizontal (20° tilted face) type												
Basic set	Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis						
513-444-10E	513-444-10A	513-444-10T	0.01	1.6	0-40-0	16	10	5	5	3	48	0.3 or less	✓	✓	✓
513-445-10E	513-445-10A	513-445-10T	0.002	0.4	0-100-0	6	5	2	4	1					

Inch			Horizontal (20° tilted face) type												
Basic set	Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				One rev.	First 2.5 rev.	Hysteresis	Repeatability						
—	513-442-10A	513-442-10T	0.0005	0.06	0-15-0	±0.0005	±0.0005	0.0002	±0.0002	48	0.3 or less	✓	✓	✓	Black dial
—	513-442-16A	513-442-16T													
—	513-446-10A	513-446-10T													
—	513-446-16A	513-446-16T	0.0001	0.016	0-4-0	±0.0002	±0.0002	0.0001	±0.00004	48	0.3 or less	✓	✓	✓	Black dial
—	513-443-10A	513-443-10T													
—	513-443-16A	513-443-16T													

Metric			Vertical type												
Basic set	Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis						
513-456-10E	—	—	0.01	0.5	0-25-0	6	—	5	4	3	46	0.3 or less	✓	✓	✓
513-454-10E	513-454-10A	513-454-10T		0.8	0-40-0	9	—	—	—	—					
513-455-10E	513-455-10A	513-455-10T	0.002	0.2	0-100-0	4	—	2	3	1	46	0.3 or less	✓	✓	✓

Inch			Vertical type												
Basic set	Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				One rev.	First 2.5 rev.	Hysteresis	Repeatability						
513-452-10E	—	513-452-10T	0.0005	0.03	0-15-0	±0.0005	—	0.0002	±0.0002	46	0.3 or less	✓	✓	✓	✓
513-453-10E	—	513-453-10T	0.0001	0.008	0-4-0	±0.0001	—	0.0001	±0.00004	46	0.3 or less	✓	✓	✓	✓

Metric			Parallel Type												
Basic set	Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis						
513-486-10E	—	—	0.01	0.5	0-25-0	6	—	5	4	3	53	0.3 or less	✓	✓	✓
513-484-10E	513-484-10A	513-484-10T		0.8	0-40-0	9	—	—	—	—					
513-485-10E	—	—	0.002	0.2	0-100-0	4	—	2	3	1	53	0.3 or less	✓	✓	✓

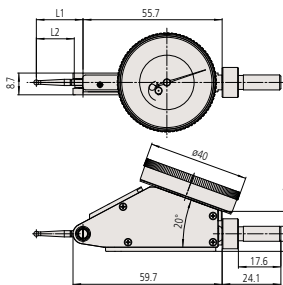
Inch			Parallel Type												
Basic set	Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)				Mass (g)	Measuring force (N)	With revolution counter	Long contact point	Carbide contact point	Remarks
	Plus set	Full set				One rev.	First 2.5 rev.	Hysteresis	Repeatability						
—	513-482-10A	513-482-10T	0.0005	0.03	0-15-0	±0.0005	—	0.0002	±0.0002	53	0.3 or less	✓	✓	✓	✓

\* Horizontal (20° Tilted Face) Type, Vertical type:  
 We guarantee the accuracy of completed products by inspecting them with the dial face facing upward.  
 Parallel Type: We guarantee the accuracy of completed products by inspecting them with the dial face vertical.  
 Note: 513-4XX-10 is indicated on the dial face. But the Order No. for the set provided with the stem etc. has a suffix (E or A or T) at the end.

## DIMENSIONS

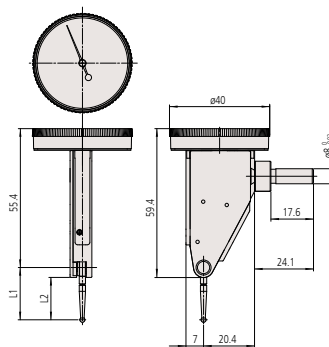
### Horizontal (20° Tilted Face) Type

unit: mm



Order No.	L1	L2
513-445-10E	18.7	15.2
513-444-10E	20.9	17.4

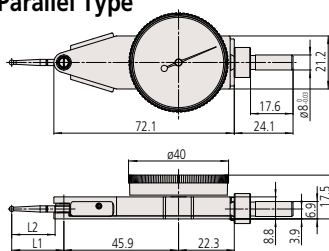
### Vertical Type



Order No.	L1	L2
513-484-10E	20.9	17.4
513-485-10E	18.7	15.2
513-486-10E	22.2	18.7

Order No.	L1	L2
513-454-10E	20.9	17.4
513-455-10E	18.7	15.2
513-456-10E	22.2	18.7

### Parallel Type



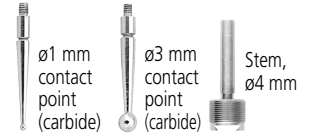
Note: A slight difference may occur depending on the center of the contact point, graduation plate, and stem fixing position, etc.

## Set Configuration: Metric

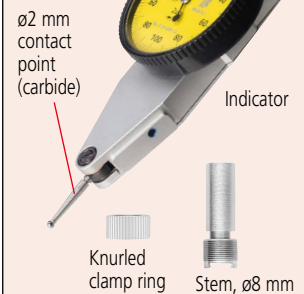
### Full set

Swivel clamp (900321, for ø4 mm stem, ø8 mm stem, and dovetail) Metric holding bar (L: 100 mm)

### Plus set



### Basic set

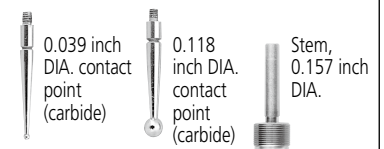


## Set Configuration: Inch

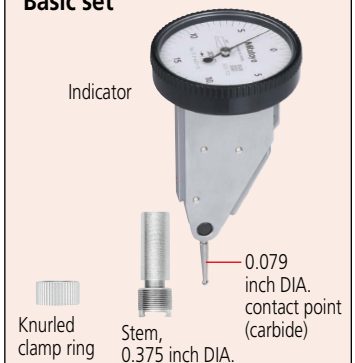
### Full set

Swivel clamp (900322, for 0.157 inch DIA. stem, 0.375 inch DIA. stem, and dovetail) Inch holding bar (L: 4 in)

### Plus set



### Basic set





Dial Test Indicator  
SERIES 513 — Universal Type

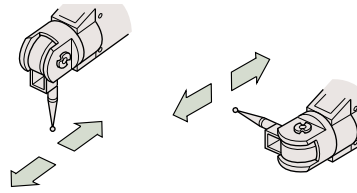
Set Configuration: Metric

**Full set**

- Swivel clamp (900321 for  $\varnothing 4$  mm stem,  $\varnothing 8$  mm stem, dovetail)
- $\varnothing 1$  mm contact point (carbide)
- $\varnothing 3$  mm contact point (carbide)
- Stem,  $\varnothing 4$  mm
- Spare  $\varnothing 2$  mm contact point (carbide)
- Metric holding bar (L: 100 mm)

**Basic set**

- $\varnothing 2$  mm contact point (carbide) (102825)
- $\varnothing 8$  mm stem
- Indicator
- Knurled clamp ring
- Spanner (102037)



- The direction of the probe movement can be freely changed by rotating the contact point section of the indicator.



513-304-10E

Set Configuration: Inch

**Full set**

- (900322 for 0.157 inch DIA stem, 0.375 inch DIA. stem, dovetail)
- 0.039 inch DIA. contact point (carbide)
- 0.118 inch DIA. contact point (carbide)
- Stem, 0.157 inch DIA.
- Spare 0.079 inch DIA. contact point (carbide)
- Inch holding bar (L: 4 in)

**Basic set**

- 0.079 inch DIA. contact point (carbide) (102825)
- 0.375 inch DIA. stem
- Indicator
- Knurled clamp ring
- Spanner (102037)

SPECIFICATIONS

Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* ( $\mu\text{m}$ )				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Dustproof	Carbide contact point	Ruby contact point
Basic set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis											
513-304-10E	513-304-10T	0.01	0.8	0-40-0	9	—	5	4	3	71	0.3 or less	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)			Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Dustproof	Carbide contact point	Ruby contact point
Basic set	Full set				One rev.	Hysteresis	Repeatability											
513-302-10E	513-302-10T	0.0005	0.03	0-15-0	$\pm 0.0005$	0.0003	$\pm 0.0003$	71	0.3 or less	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\* The accuracy is guaranteed when used with the dial face facing upward and the contact point oriented as shown in the figure. Note: 513-3XX-10 is indicated on the dial face. But the Order No. for the set provided with the stem etc. has a suffix (E or T) at the end.

DIMENSIONS

Unit: mm

513-304-10E

Optional Accessories

- Swivel clamps (See page F-75)
- Holding bars (See page F-75)
- Stems (See page F-75)
- 102824:  $\varnothing 1$  mm contact point (carbide)
- 102825:  $\varnothing 2$  mm contact point (carbide)
- 102826:  $\varnothing 3$  mm contact point (carbide)

# Dial Test Indicators



## Pocket Type Dial Test Indicator SERIES 513

- Slim design is suited for measurement in deep holes.
- Visibility of the dial face has been greatly improved thanks to a universal font, the selected color of the dial face, and improved balance between the pointer and the thickness of scale lines. The length of the contact point is shown in the illustration on the dial face.
- The crystal surface is flat to reduce glare and is coated to prevent scratches, dirt, and reflections.
- Bonding the bezel and crystal together leaves no gap for cutting fluid or oil to penetrate through to the dial face. (Note that this type is NOT water-proof.)
- Clutch type (with a clutch lever)
- With  $\varnothing 2$  mm Carbide contact point
- Metric Dial Test Indicator is inspected according to JIS B 7533:2015. We guarantee accuracy by inspecting with the dial face facing upward.

Graduation: 0.01 mm  
Range: 0.8 mm

**513-517-10E/  
513-517-10T**

- Standard
- Compact
- Carbide contact point

Graduation: 0.01 mm  
Range: 0.5 mm

**513-514-10E/  
513-514-10T**

- Long contact point
- Double scale spacing
- Compact
- Carbide contact point

Graduation: 0.001 in  
Range: 0.04 in

**513-518-10E/  
513-518-10T**

- Compact
- Carbide contact point

Graduation: 0.01 mm  
Range: 1 mm

**513-515-10E/  
513-515-10T**

- Long contact point
- Compact
- Carbide contact point

Graduation: 0.002 mm  
Range: 0.2 mm

**513-503-10E/  
513-503-10T**

- Standard
- Compact
- Carbide contact point

Graduation: 0.0005 in  
Range: 0.02 in

**513-512-10E/  
513-512-10T**

- Long contact point
- Double scale spacing
- Compact
- Carbide contact point

Graduation: 0.001 mm  
Range: 0.14 mm

**513-501-10E/  
513-501-10T**

- High accuracy
- Compact
- Carbide contact point

Graduation: 0.0001 in  
Range: 0.01 in

**513-504-10E/  
513-504-10T**

- Compact
- Carbide contact point

## SPECIFICATIONS

### Metric

Order No.		Graduation (mm)	Range (mm)	Dial reading	Maximum permissible error (MPE)* (μm)				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point
Basic set	Full set				Measuring range	One rev.	10 scale divisions	Hysteresis										
513-517-10E	513-517-10T	0.01	0.8	0-40-0	9	-	5	4	3	50	0.3 or less							
513-514-10E	513-514-10T	0.01	0.5	0-25-0	10	-	5	5	3	51	0.3 or less							
513-515-10E	513-515-10T	0.01	1	0-50-0	10	-	5	5	3	51	0.3 or less							
513-503-10E	513-503-10T	0.002	0.2	0-100-0	4	-	2	3	1	50	0.4 or less							
513-501-10E	513-501-10T	0.001	0.14	0-70-0	4	-	2	3	1	50	0.5 or less							

### Inch

Order No.		Graduation (in)	Range (in)	Dial reading	Maximum permissible error (MPE)* (in)				Mass (g)	Measuring force (N)	High accuracy	With revolution counter	Long contact point	Standard	Double scale spacing	Compact	Carbide contact point	Ruby contact point
Basic set	Full set				One rev.	First 2.5 rev.	Hysteresis	Repeatability										
513-518-10E	513-518-10T	0.001	0.04	0-20-0	±0.001	-	0.0002	±0.0004	50	0.3 or less								
513-512-10E	513-512-10T	0.0005	0.02	0-10-0	±0.0005	-	0.0002	±0.0002	51	0.3 or less								
513-504-10E	513-504-10T	0.0001	0.01	0-5-0	±0.0002	-	0.0001	±0.00004	50	0.3 or less								

\* We guarantee the accuracy of completed products by inspecting them with the dial face facing upward.

Note 1: Be sure to perform calibration with reference gage, etc. after exchanging the contact point. The inside parts may be damaged when the contact point is exchanged due to the breakage. In the case the of the significant deterioration in the operation, repair is required.

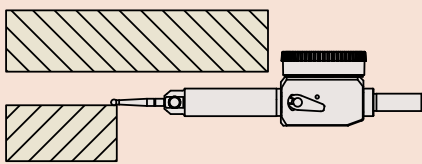
Note 2: Stem is not included in the mass.

Note 3: **513-5XX-10** is indicated on the dial face. But the Order No. for the Special Set provided with the stem etc. has a suffix (E or T) at the end.

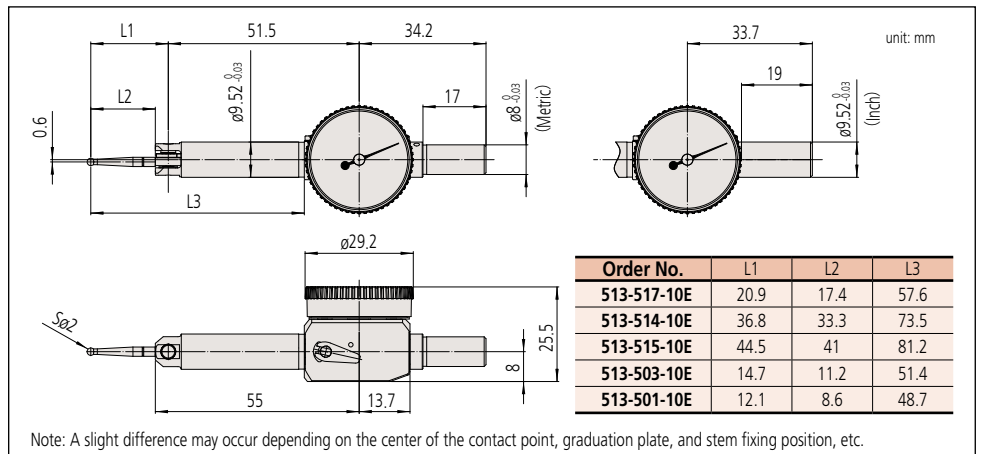
## DIMENSIONS



Pocket type can be fixed at the body (at  $\varnothing 9.52$ )



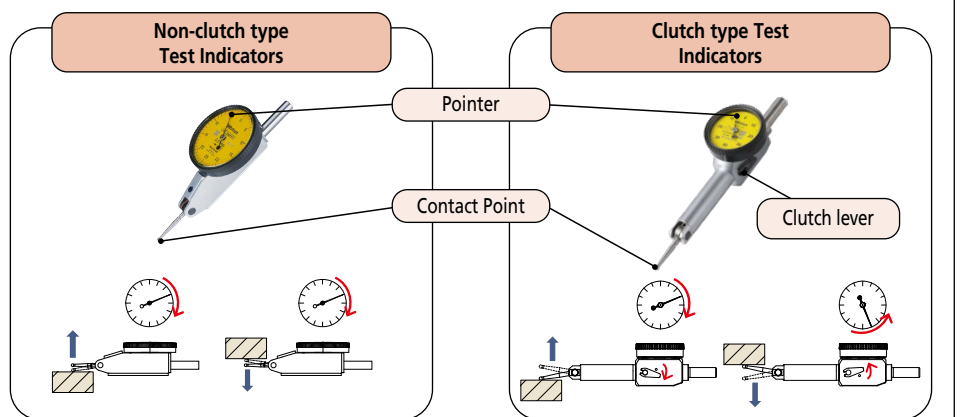
The slim body allows measurements in shallow space.



Note: A slight difference may occur depending on the center of the contact point, graduation plate, and stem fixing position, etc.

There are two types of Mitutoyo Dial Test Indicator:

The non-clutch type (without a clutch lever) and the clutch type (with a clutch lever)



In the non-clutch type, although the contact point may move either in the upward or downward direction, the pointer always rotates clockwise.

In the clutch type, if the clutch lever is set in one position the contact point moves in the upward direction and the pointer rotates clockwise. Conversely, if the lever is set in the other position the contact point moves in the downward direction and the pointer rotates counterclockwise.

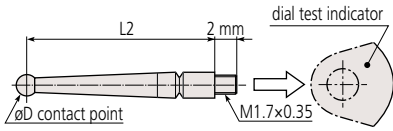


# Dial Test Indicators

## Contact points, Stems and Holders Optional Accessories for Dial Test Indicators

### Contact point (for Metric Models Only\*)

\* Except for universal type dial test indicator (513-304-10).



**ø0.5 mm contact point (Steel)**      **ø0.7 mm contact point (Steel)**



- |                       |                       |
|-----------------------|-----------------------|
| 190547 (L2=11.2 mm)   | 190548 (L2=11.2 mm)   |
| 21CAB109 (L2=15.2 mm) | 21CAB110 (L2=15.2 mm) |
| 190549 (L2=17.4 mm)   | 190550 (L2=17.4 mm)   |
| 190654 (L2=18.7 mm)   | 190653 (L2=18.7 mm)   |
| 21CAB111 (L2=33.9 mm) | 21CAB112 (L2=33.9 mm) |
| 190656 (L2=41.0 mm)   | 190655 (L2=41.0 mm)   |

**ø1 mm contact point (Carbide)**      **ø2 mm contact point (Carbide)**



- |                     |                     |
|---------------------|---------------------|
| 103017 (L2=11.2 mm) | 103010 (L2=11.2 mm) |
| 131314 (L2=15.2 mm) | 103011 (L2=15.2 mm) |
| 103013 (L2=17.4 mm) | 103006 (L2=17.4 mm) |
| 137558 (L2=18.7 mm) | 137557 (L2=18.7 mm) |
| 131316 (L2=33.9 mm) | 131324 (L2=33.9 mm) |
| 136235 (L2=41.0 mm) | 136013 (L2=41.0 mm) |

**ø2 mm contact point (Ruby)**      **ø3 mm contact point (Carbide)**



- |                       |                     |
|-----------------------|---------------------|
| 21CZA209 (L2=11.2 mm) | 103018 (L2=11.2 mm) |
| 21CZB068 (L2=15.2 mm) | 131315 (L2=15.2 mm) |
| 21CZA201 (L2=17.4 mm) | 103014 (L2=17.4 mm) |
| 21CZA210 (L2=18.7 mm) | 137559 (L2=18.7 mm) |
| 21CZA211 (L2=41.0 mm) | 131317 (L2=33.9 mm) |
|                       | 136236 (L2=41.0 mm) |

### Swivel Clamps

For ø6 mm stem, ø8 mm stem, and dovetail



902053

For ø4 mm stem, ø8 mm stem, and dovetail

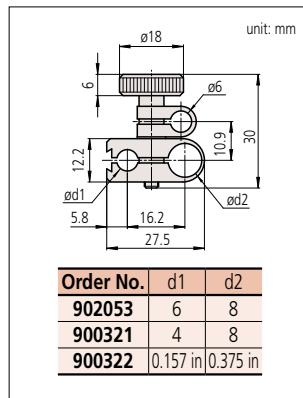


900321

For 0.157 inch DIA. stem, 0.375 inch DIA. stem, and dovetail



900322



### Spanner



102037

### Holding Bars

- |                               |   |
|-------------------------------|---|
|                               | <b>953638</b> (Length: 50 mm)           |
|                               | <b>900209</b> (Length: 100 mm)          |
| <b>ø8 mm</b> (0.315 inch DIA) | <b>900211</b> (Length: 115 mm/4.528 in) |
|                               | <b>953639</b> (Length: 2 in)            |
|                               | <b>900306</b> (Length: 4 in)            |

### Stems with Knurled Clamp Ring

**ø4 mm (0.157 inch DIA.)**



21CZB131



21CZB129

21CZB130

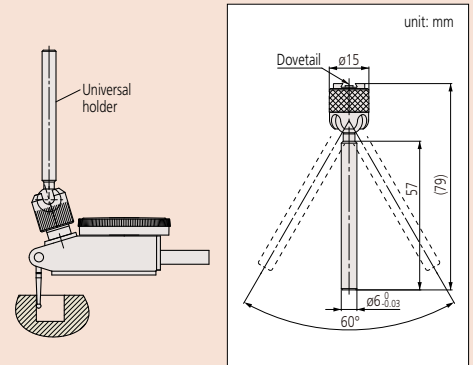
Stem DIA. ød	Stem with dovetail (Individual item)	Nut (Individual item)	Full set (Stem with dovetail+Nut)
	Order No.		
ø4	21CAB106	190322	21CZB131
ø6	21CAB103	190322	21CZB128
ø8	21CAB104	190322	21CZB129
ø0.375 in	21CAB105	190322	21CZB130

### Universal Holder (dovetail clamp)

- A universal holder is an attachment used to mount a dial test indicator in a machine tool spindle so that it can be used to align the spindle axis with a workpiece feature such as a hole center, or a machine axis with an edge. (See diagram below.) It also gives some protection against accidental impacts on the indicator.

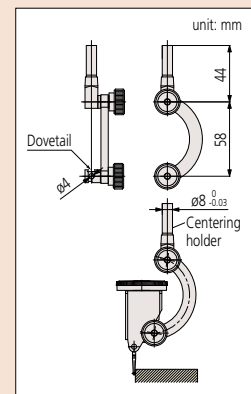


- 21CZA233 (ø8 mm stem)
- 21CZA231 (0.25 inch DIA. stem)
- 21CZA229 (ø6 mm stem)



### Centering Holder

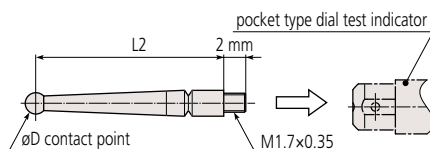
- Allows large diameter cylinders or holes to be centered on a machine tool.



- 901959 (ø8 mm stem)
- 901997 (0.25 inch DIA. stem)

## Optional Accessories for Pocket Type Dial Test Indicators

### Contact point (for Metric Models Only)



**$\phi 0.5$  mm contact point  
(Steel)**



**190547** (L2=11.2 mm)  
**190549** (L2=17.4 mm)  
**190656** (L2=41.0 mm)

**$\phi 0.7$  mm contact point  
(Steel)**



**190548** (L2=11.2 mm)  
**190550** (L2=17.4 mm)  
**190655** (L2=41.0 mm)

**$\phi 1$  mm contact point  
(Carbide)**



**136756** (L2=8.6 mm)  
**103017** (L2=11.2 mm)  
**103013** (L2=17.4 mm)  
**137746** (L2=33.3 mm)  
**136235** (L2=41.0 mm)

**$\phi 2$  mm contact point  
(Carbide)**



**136104** (L2=8.6 mm)  
**103010** (L2=11.2 mm)  
**103006** (L2=17.4 mm)  
**129949** (L2=33.3 mm)  
**136013** (L2=41.0 mm)

**$\phi 2$  mm contact point  
(Ruby)**



**21CZA209** (L2=11.2 mm)  
**21CZA201** (L2=17.4 mm)  
**21CZA211** (L2=41.0 mm)

**$\phi 3$  mm contact point  
(Carbide)**



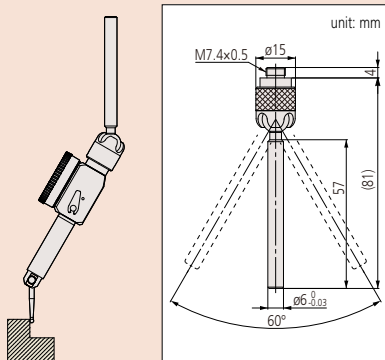
**136758** (L2=8.6 mm)  
**103018** (L2=11.2 mm)  
**103014** (L2=17.4 mm)  
**137747** (L2=33.3 mm)  
**136236** (L2=41.0 mm)

### Universal Holder (screw clamp)

- A universal holder is an attachment used to mount a dial test indicator in a machine tool spindle so that it can be used to align the spindle axis with a workpiece feature such as a hole center, or a machine axis with an edge. (See diagram below.) It also gives some protection against accidental impacts on the indicator.



**21CZA234** ( $\phi 8$  mm stem)  
**21CZA232** (0.25 inch DIA. stem)  
**21CZA230** ( $\phi 6$  mm stem)



### Stems

**$\phi 4$  mm** (0.157 inch DIA.)  **$\phi 8$  mm** (0.315 inch DIA.) **0.375 inch DIA.**



**102036**



**102822**



**102081**

### Holding Bars



**9x9 mm**

**900209** (Length: 100 mm)



**$\phi 8$  mm (0.315 inch DIA)** **900211** (Length: 115 mm)



**0.25x0.5 in**

**953639** (Length: 2 in)  
**900306** (Length: 4 in)

Note: Suitable for height gages with a scriber section of 12.7x6.35 mm.

### Spanner

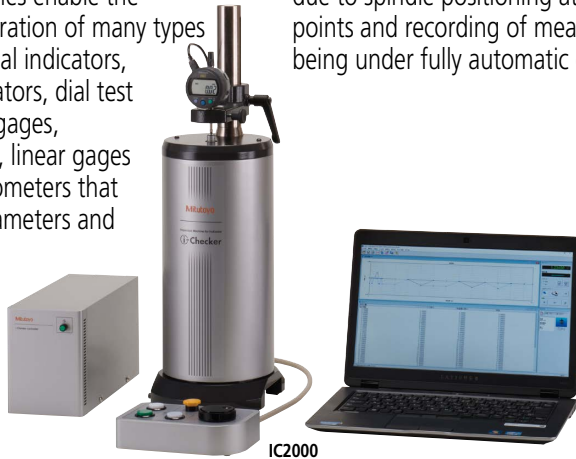


**301336**

# Indicator Calibration

## i-Checker IC2000 SERIES 170

- Indication accuracy of  $(0.1 + 0.4L/100) \mu\text{m}$ , the highest level in the world, is achieved. (When inspected in the vertical orientation.)
- Can directly inspect indicators with a stroke of up to 100 mm. Moreover, a wide variety of optional accessories enable the inspection and calibration of many types of gage including dial indicators, lever-type dial indicators, dial test indicators, cylinder gages, Digimatic indicators, linear gages and electronic micrometers that use various stem diameters and support systems.
- The pointer of the analog indicator is positioned just before the measuring point automatically in the semi-automatic mode.
- Digital indicators equipped with a data output function are checked very efficiently due to spindle positioning at the inspection points and recording of measurement results being under fully automatic control.

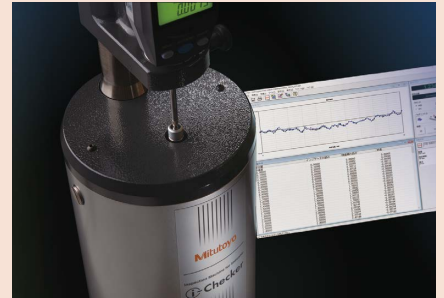


### SPECIFICATIONS

Order No.	170-402	170-403
Remarks	with 8 mm bush	with 3/8 in bush
Measuring Range	100 mm	
Resolution	0.01 $\mu\text{m}$	
Accuracy (20 °C)	$(0.1 + 0.4L/100) \mu\text{m}$ L=Arbitrary length (mm) (0.15 + 0.6L/100) $\mu\text{m}$ L=Arbitrary length (mm)	
Feed speed	Maximum 10 mm/s	
Drive method	Motor drive (semi-automatic/fully-automatic)	
Measuring Unit	Separate type Linear Encoder	
Measurement method	Semi-automatic measurement Fully automatic measurement (only when using an indicator equipped with data output function)*1*2	
Mass	20 kg	
Operating temperature range	20 °C±0.5 °C	

\*1 Automatic measurement requires the indicator's connecting cable. Additionally some form of indicator, along with the normally connected accessory (the optional accessory for the indicator such as a Digimatic power-supply unit in an EF counter) will be required.

\*2 The indicator measured via RS-232C has the capability to receive data from the main unit and output the counter value.



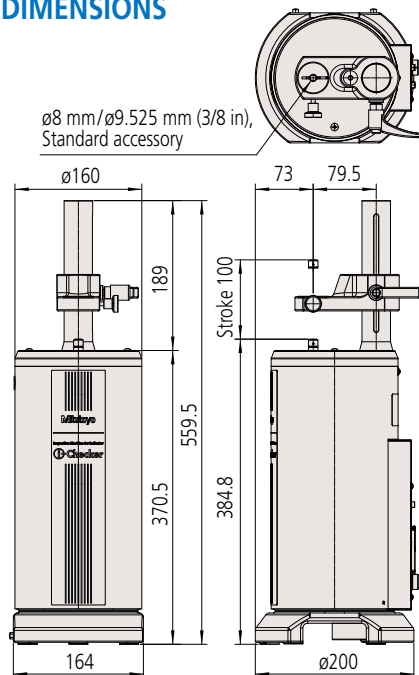
Typical application for Dial Test Indicator Accessory Set



Typical application using dial test indicator attachment set (02ASK000)



### DIMENSIONS



Refer to the i-Checker Brochure (E12015) for more details.

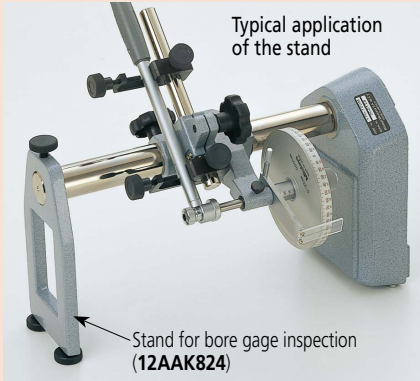


## SERIES 170 — UDT-2 Dial Indicator Tester

### Optional accessory

Stand for bore gage inspection (12AAK824)

Note: Can be used for the inspection of bore gages 511 SERIES standard type and with micrometer head up to 400 mm. (Refer to pages C-35 and C-42 for details.)



- UDT-2 is the accuracy tester for 0.01 mm resolution/graduation dial indicators, dial test indicators and bore gages.
- Stem mounting hole:  $\varnothing 6$ ,  $\varnothing 8$  mm (Metric)  
 $\varnothing 1/4$  in,  $\varnothing 3/8$  in (Inch)



170-102-12

### SPECIFICATIONS

Metric				
Order No.	Micrometer head		Accuracy ( $\mu\text{m}$ )	
	Graduation (mm)	Range (mm)	Feed accuracy (25 mm stroke)	Hysteresis
170-102-12	0.001	0 - 25	$\pm 2$	0.5

Inch				
Order No.	Micrometer head		Accuracy (in)	
	Graduation (in)	Range (in)	Feed accuracy (25 mm stroke)	Hysteresis
170-101-10	0.0001	0 - 1	$\pm 0.0001$	0.00002

## SERIES 521 — Calibration Tester

- Can also be used to inspect dial indicators and dial test indicators with 0.001 mm graduations, or to adjust the sensitivity of electronic micrometers.
- The mounting bracket, which can move in any direction, accepts a wide range of indicator stem sizes ( $\varnothing 4$  mm to  $\varnothing 10$  mm).



521-103

### SPECIFICATIONS

Metric				
Order No.	Micrometer head		Accuracy ( $\mu\text{m}$ )	
	Graduation (mm)	Range (mm)	Indication accuracy	Hysteresis
521-103	0.0002	0 - 1	$\pm 0.2$	0.2
521-105	0.0002	0 - 5	$\pm 0.8$	0.8

Inch				
Order No.	Micrometer head		Accuracy (in)	
	Graduation (in)	Range (in)	Indication accuracy	Hysteresis
521-104	0.00001	0 - 0.05	$\pm 0.00001$	0.00001
521-106	0.00001	0 - 0.2	$\pm 0.00003$	0.00003

# Dial Indicator Applications

## Thickness Gages SERIES 547, 7

- With a single touch, the dial thickness gage can quickly measure the thickness of small parts, paper, felt, etc.
- For models using a ceramic contact and anvil, there is no need to worry about rust.
- Watertight assembly of bezel and crystal prevents water or oil from penetrating the dial indicator.

Standard Type (Resolution: 0.01 mm)



547-301A



547-321A

High Accuracy Type (Resolution: 0.0005 mm)



547-401A

Standard Type (Graduation: 0.01 mm)



7301A

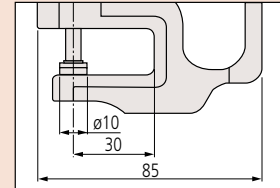


7321A

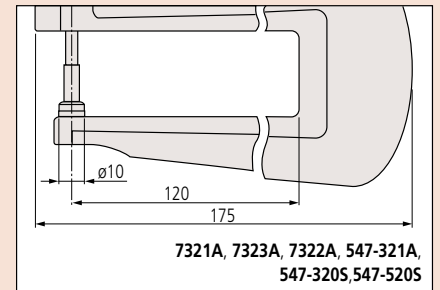
MeasurLink<sup>®</sup> ENABLED  
Data Management Software by Mitutoyo

## DIMENSIONS

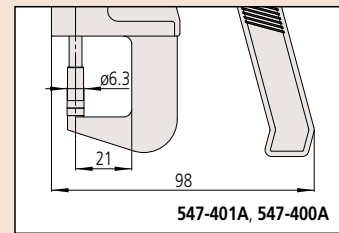
Unit: mm



7301A, 7305A, 7327A, 547-301A,  
547-526S, 547-300A, 547-500S



7321A, 7323A, 7322A, 547-321A,  
547-320S, 547-520S



547-401A, 547-400A

- Display: 6-digit LCD, sign (7-digit for models with 0.0005 mm resolution)
- Battery: CR2032 (1 pc.), for initial operational checks (standard accessory)
- Battery life: Approx. 2.5 years under normal use  
Approx. 2,700 hours of continuous use
- Maximum response speed: Not restricted (except for scanning measurement)
- Zero-setting (INC system)
- Presetting (ABS system)
- Measuring direction switching
- Tolerance judgment
- Resolution switching (For **547-401A** and **547-400A**)
- Function Lock
- Calibration schedule warning function
- Data output
- Display value holding (when no external device is connected)
- 330° rotary display
- Low battery voltage alarm display
- Error alarm display

### Optional Accessories

- SPC Cable:
  - 06AGL011** (1 m)
  - 02AGL021** (2 m)
- USB Input Tool Direct (2 m): **06AGQ001F**
- Note: A **06AGQ001F** is necessary for each ID.
- Measurement Data Management USB-ITPAK V3.0: **06AGR543**
- Input Tool Series
  - IT-020U** (USB Keyboard Signal Conversion Type): **264-020**
  - IT-007R** (RS-232C Communication Conversion Type): **264-007**
- Connecting Cables for **U-WAVE-T** (160 mm): **02AZG011**
- For foot switch: **02AZG021**
- Digimatic Mini-Processor **DP-1VA LOGGER**: **264-505**

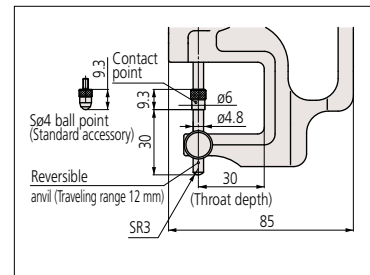
### Lens thickness measurement

- Thickness of concave-convex lenses and surfaces can be measured. (Contact point, Anvil: hardened steel)
- Anvils and contact points are interchangeable to enable concave surfaces to be measured.

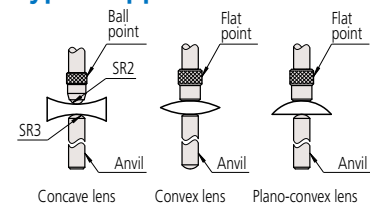


### DIMENSIONS

Unit: mm



### Typical applications



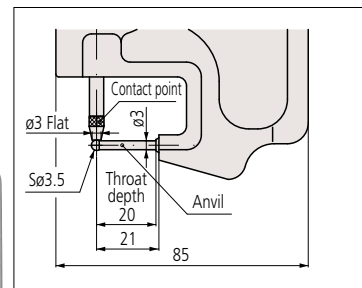
### Pipe gage measurement

- Pipe wall thickness, thickness of curved boards can be measured. (Contact point, Anvil: hardened steel)



### DIMENSIONS

Unit: mm



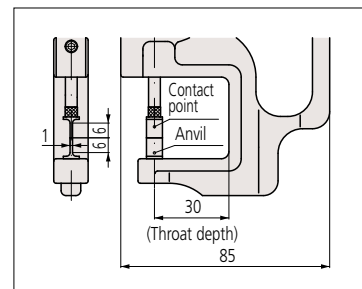
### Blade thickness measurement

- Ideal for measuring narrow grooves on round objects.
- The measuring faces of the contact point and anvil are in the shape of a 1 mm-thick blade.



### DIMENSIONS

Unit: mm



# Dial Indicator Applications

## Thickness Gages SERIES 547, 7

### SPECIFICATIONS

Metric									
Order No.	Resolution (mm)	Range (mm)	Measuring depth (mm)	Contact point, Anvil (mm)	Parallelism of Contact point, Anvil (μm)	Accuracy (μm)	Measuring force (N)	Mass (g)	Remarks
547-401A	0.0005 (0.001/0.01 selectable)	0 - 12	21	ø6.3 Flat (Carbide)	3	±3	3.5 or less	275	High accuracy, carbide point anvil
547-301A	0.01	0 - 10	30	ø10 Flat	10	±20	1.5 or less	245	Standard, ceramic point/anvil
547-321A	0.01	0 - 10	120	ø10 Flat	10	±20	1.5 or less	385	Deep throat, ceramic point/anvil
547-313A	0.01	0 - 10	30	ø6 Flat (Contact point) ø4.8 Flat (Anvil)	10	±20	1.5 or less	265	Lens thickness
547-315A	0.01	0 - 10	30	t=1 Blade	10	±20	1.5 or less	260	Blade thickness
547-360A	0.01	0 - 10	20	ø3 Flat (Contact point) ø3.5 Ball (Anvil)	—	±20	1.5 or less	230	Pipe gage

Inch / Metric									
Order No.	Resolution	Range (in)	Measuring depth	Contact point, Anvil	Parallelism of Contact point, Anvil	Accuracy	Measuring force (N)	Mass (g)	Remarks
547-400A	0.00002/0.00005/ 0.0001/0.0005 in 0.0005/0.001/ 0.01 mm (selectable)	0 - 0.47	21 mm (0.83 in)	ø6.3 mm (ø0.25 in) Flat	0.0001 in/0.003 mm	±0.00012 in/±3 μm	3.5 or less	275	High accuracy, carbide point anvil
547-526S*	0.0001 in/0.001 mm	0 - 0.47*	30 mm (1.18 in)	ø10 mm (ø0.39 in) Flat	0.0002 in/0.005 mm	±0.0002 in/±5 μm	1.5 or less	225	Standard, ceramic point/anvil
547-300A	0.0005 in/0.01 mm	0 - 0.4	30 mm (1.18 in)	ø10 mm (ø0.39 in) Flat	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	245	Standard, ceramic point/anvil
547-500S*	0.0005 in/0.01 mm	0 - 0.47*	30 mm (1.18 in)	ø10 mm (ø0.39 in) Flat	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	225	Standard, ceramic point/anvil
547-320A	0.0005 in/0.01 mm	0 - 0.4	120 mm (4.72 in)	ø10 mm (ø0.39 in) Flat	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	385	Deep throat, ceramic point/anvil
547-520S*	0.0005 in/0.01 mm	0 - 0.47*	120 mm (4.72 in)	ø10 mm (ø0.39 in) Flat	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	380	Deep throat, ceramic point/anvil
547-312A	0.0005 in/0.01 mm	0 - 0.4	30 mm (1.18 in)	ø6 mm (ø0.24 in) Flat (Contact point) ø4.8 mm (ø0.19 in) Flat (Anvil)	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	265	Lens thickness
547-512A*	0.0005 in/0.01 mm	0 - 0.47*	30 mm (1.18 in)	ø6 mm (ø0.24 in) Flat (Contact point) ø4.8 mm (ø0.19 in) Flat (Anvil)	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	240	Lens thickness
547-316A	0.0005 in/0.01 mm	0 - 0.4	30 mm (1.18 in)	t=1 mm (0.04 in) Blade	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	260	Blade thickness
547-516A*	0.0005 in/0.01 mm	0 - 0.47*	30 mm (1.18 in)	t=1 mm (0.04 in) Blade	0.005 in/0.01 mm	±0.001 in/±20 μm	1.5 or less	240	Blade thickness
547-361A	0.0005 in/0.01 mm	0 - 0.4	20 mm (0.79 in)	ø3 mm (ø0.12 in) Flat (Contact point) ø3.5 mm (ø0.14 in) Ball (Anvil)	—	±0.001 in/±20 μm	1.5 or less	230	Pipe gage
547-561S	0.0005 in/0.01 mm	0 - 0.47*	20 mm (0.79 in)	ø3 mm (ø0.12 in) Flat (Contact point) ø3.5 mm (ø0.14 in) Ball (Anvil)	—	±0.001 in/±20 μm	1.5 or less	215	Pipe gage

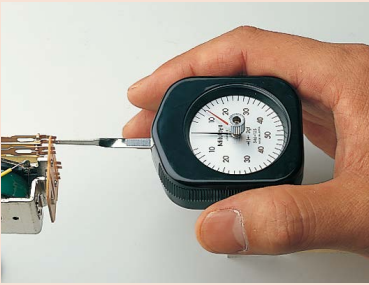
\* Using ID-SX Digimatic indicator.

Metric									
Order No.	Graduation (mm)	Range (mm)	Measuring depth (mm)	Contact point, Anvil (mm)	Parallelism of Contact point, Anvil (μm)	Accuracy (μm)	Measuring force (N)	Mass (g)	Remarks
7327A	0.001	0 - 1	30	ø10 Flat	5	±5	1.5 or less	225	Fine dial reading, ceramic point/anvil
7301A	0.01	0 - 10	30	ø10 Flat	5	±15	1.4 or less	205	Standard, ceramic point/anvil
7305A	0.01	0 - 20	30	ø10 Flat	5	±20	2.0 or less	220	Standard, ceramic point/anvil
7321A	0.01	0 - 10	120	ø10 Flat	5	±15	1.4 or less	370	Deep throat, ceramic point/anvil
7323A	0.01	0 - 20	120	ø10 Flat	5	±22	2.0 or less	370	Deep throat, ceramic point/anvil
7313A	0.01	0 - 10	30	ø6 Flat (Contact point) ø4.8 Flat (Anvil)	5	±15	1.4 or less	210	Lens thickness
7315A	0.01	0 - 10	30	t=1 Blade	5	±15	1.4 or less	220	Blade thickness
7360A	0.01	0 - 10	20	ø3 Flat (Contact point) ø3.5 Ball (Anvil)	—	±15	1.4 or less	200	Pipe gage

Inch									
Order No.	Graduation (in)	Range (in)	Measuring depth (in)	Contact point, Anvil (in)	Parallelism of Contact point, Anvil (in)	Accuracy (in)	Measuring force (N)	Mass (g)	Remarks
7326A	0.0001	0 - 0.05	1.18	ø0.39 Flat	0.0002	±0.0002	2.0 or less	205	Fine dial reading, ceramic point/anvil
7300A	0.001	0 - 0.5	1.18	ø0.39 Flat	0.0005	±0.001	1.8 or less	205	Standard, ceramic point/anvil
7304A	0.001	0 - 1	1.18	ø0.39 Flat	0.0005	±0.002	1.8 or less	220	Standard, ceramic point/anvil
7322A	0.001	0 - 1	4.72	ø0.39 Flat	0.0005	±0.002	1.8 or less	370	Deep throat, ceramic point/anvil
7312A	0.001	0 - 0.5	1.18	ø0.24 Flat (Contact point) ø0.19 Flat (Anvil)	0.0005	±0.001	1.8 or less	215	Lens thickness
7316A	0.001	0 - 0.5	1.18	t=0.04 Blade	0.0005	±0.001	1.8 or less	220	Blade thickness
7361A	0.001	0 - 0.5	0.8	ø0.12 Flat (Contact point) ø0.14 Ball (Anvil)	—	±0.001	1.8 or less	200	Pipe gage

Note: The dial indicator needs to be reset when a contact point is replaced.

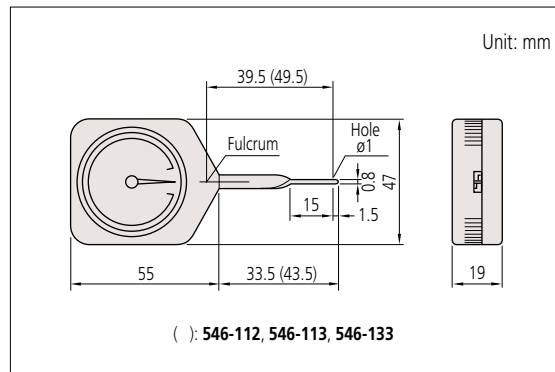
## Measuring contact force on a relay



## Contact Force Gage SERIES 546

- Contact Force Gages are widely used to determine the measuring force applied by an instrument to a workpiece, as well as contact forces of electrical relays, micro-switches, valves and precision springs.
- Thanks to the miniature anti-friction bearing in the fulcrum, stable measurement is guaranteed.
- 2 types are available: Standard and peak hold.

### DIMENSIONS



### SPECIFICATIONS

#### mN-scale models

##### Standard

Order No.	Graduation (mN)	Range (mN)	Accuracy (graduation)
546-112	2	6 - 50	±0.5
546-113	5	10 - 100	
546-114	10	30 - 300	

##### Peak hold

Order No.	Graduation (mN)	Range (mN)	Accuracy (graduation)
546-133	5	10 - 100	±0.5
546-134	10	30 - 300	

Note: Please note that these products are only available in their standard forms; they cannot be customized for special sizes or specifications.

#### N-scale models

##### Standard

Order No.	Graduation (N)	Range (N)	Accuracy (graduation)
546-115	0.02	0.06 - 0.5	±0.5
546-116	0.05	0.1 - 1	
546-117	0.05	0.15 - 1.5	
546-118	0.1	0.3 - 3	
546-119	0.2	0.6 - 5	

##### Peak hold

Order No.	Graduation (N)	Range (N)	Accuracy (graduation)
546-135	0.02	0.06 - 0.5	±0.5
546-136	0.05	0.1 - 1	
546-137	0.05	0.15 - 1.5	
546-138	0.1	0.3 - 3	
546-139	0.2	0.6 - 5	

Note: Please note that these products are only available in their standard forms; they cannot be customized for special sizes or specifications.



# Dial Indicator Applications

## Dial Snap Gage SERIES 201

- Enables single-handed comparison measurement of cylinder diameters, etc. even during machining.
  - Measuring faces: Carbide.
  - The anvil gage head can be moved up to 25 mm by turning the adjustment nut.
  - The anvil gage head position can be fixed by turning the clamp.
  - The gage head on the dial indicator side can be moved up to 2 mm.
  - Equipped with workpiece support.
  - Flatness of measuring face: 1  $\mu\text{m}$
  - Repeatability of indication: 2  $\mu\text{m}$  or better (repeatability of indicators is not included)
  - The dial indicator and dial protection cover are optional.
- Also, some dial indicators and dial protection covers cannot be used with the dial snap gage. Consult Mitutoyo if intending to use dial indicators which are not recommended.



201-101

Note: The dial indicator and dial protection cover are optional.

### Optional accessories

Dial protection cover: **21DZA000**

### Recommended dial indicators/ Digimatic indicators (optional)

- Metric models:
  - 2046AB:** Dial indicator (Graduation: 0.01 mm)
  - 2109AB-10:** Dial indicator (Graduation: 0.001 mm)
  - 543-700B:** Digimatic Indicator (Resolution: 0.0005/0.001/0.01 mm)
- Inch models:
  - 2414AB:** Dial indicator (Graduation: 0.001 in)
  - 2805AB-10:** Dial indicator (Graduation: 0.0001 in)
  - 543-702B:** Digimatic Indicator (Resolution: 0.00002/0.00005/0.0001/0.0005 in (0.0005/0.001/0.01 mm))

## SPECIFICATIONS

### Metric

Order No.	Range (mm)	Parallelism ( $\mu\text{m}$ )	Measuring force* (N)
201-101	0 - 25	5	15 $\pm$ 3
201-102	25 - 50		
201-103	50 - 75		
201-104	75 - 100		
201-105	100 - 125		
201-106	125 - 150		
201-107	150 - 175		
201-108	175 - 200		
201-109	200 - 225		
201-110	225 - 250		
201-111	250 - 275		
201-112	275 - 300		

### Inch

Order No.	Range (in)	Parallelism (in)	Measuring force* (N)
201-151	0 - 1	0.00025	15 $\pm$ 3
201-152	1 - 2		
201-153	2 - 3		
201-154	3 - 4		
201-155	4 - 5		
201-156	5 - 6		
201-157	6 - 7		
201-158	7 - 8		
201-159	8 - 9		
201-160	9 - 10		
201-161	10 - 11		
201-162	11 - 12		

\* Measuring force is that force present before an indicator is installed and is determined at the point where the spindle is retracted 1 mm from the rest position.

## DIMENSIONS

