Mitutoyo

Mitutoyo Quality

Lever-Type Dial Indicators

DIAL TEST INDICATORS

SMALL TOOL INSTRUMENTS
AND DATA MANAGEMENT

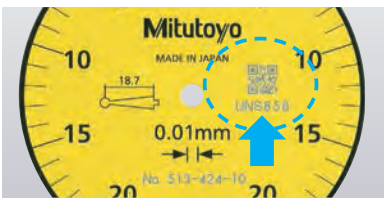
Products

Enhanced Durability, Sensitivity and Readability

NEW Products

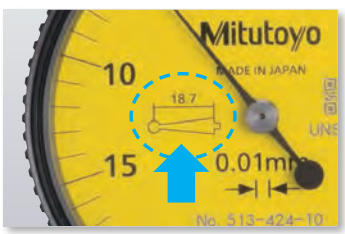
Inspection

- The QR code is used by the factory to accurately match the inspection certificate to the test indicator.



Stylus length is marked on the dial face

- Stylus length is marked on the dial face to assist customers when ordering replacement styli.



Attachable limit hands

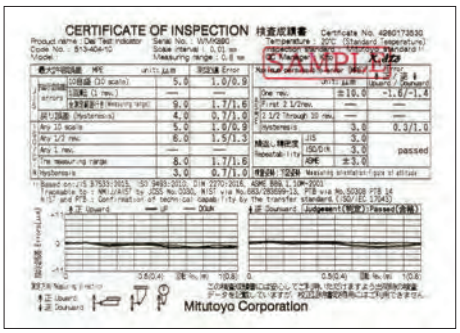
- Limit hands (optional) can be attached to the bezel, allowing easy identification of the upper and lower limits of tolerance.

ø8/ø9.52 stem to fit dovetails is a standard accessory

- A ø8mm (ø0.315 in) plain stem (**21CAB104**) for the Metric models or a ø9.52mm (ø3/8 in) plain stem (**21CAB105**) for the Inch models that attaches to any dovetail on the frame is supplied as a standard accessory. Other sizes are available as optional accessories:

ø4mm (ø0.157 in) stem: **21CAB106**
ø6mm (ø0.236 in) stem: **21CAB103**

certificate provided

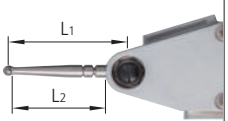

CERTIFICATE OF INSPECTION

Mitutoyo Corporation

Extended stylus length for 0.001mm, 0.002mm, and 0.0001" graduation models

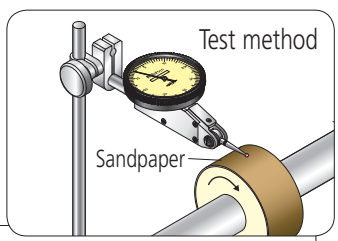
- Longer styli for the most sensitive indicators allow access to difficult-to-measure features.

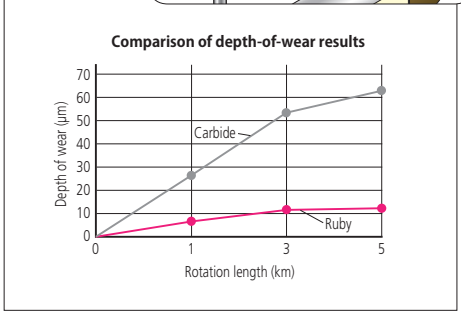
0.001mm graduation models: L_2 now 15.2mm, was 11.2mm
0.002mm graduation models: L_2 now 11.2mm, was 9.4mm
0.0001 in graduation models: L_2 now 0.61 in, was 0.45 in



Ruby ball-tipped stylus added

- A ruby tip has wear-resistance several times greater than a carbide tip and, since it is nonconductive, it can be used safely on an electrical discharge machine.





Enhanced Durability, Sensitivity and Readability

Crystal for readability

- Glare-free flat crystal face allows easy reading of graduations.

Conventional New

Prevents dust and oil from penetrating the dial face

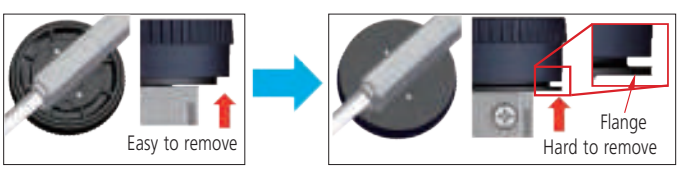
- The O-ring seal on the bezel provides smooth rotation and prevents dust and oil from penetrating the dial face.

Bonded bezel and crystal

- Bonding the bezel and crystal eliminates a gap for cutting fluid or oil to penetrate the dial face.

Prevents bezel detachment

- A flange prevents the bezel from unintentionally being removed during handling.



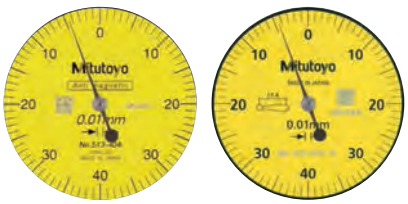
Conventional New

Maintain trackability

- The ability of the indicator to track small changes in displacement deteriorates with prolonged use due to minute changes in clearance between the gears. Redesigned mounting for the gears enables the ability to maintain good trackability.

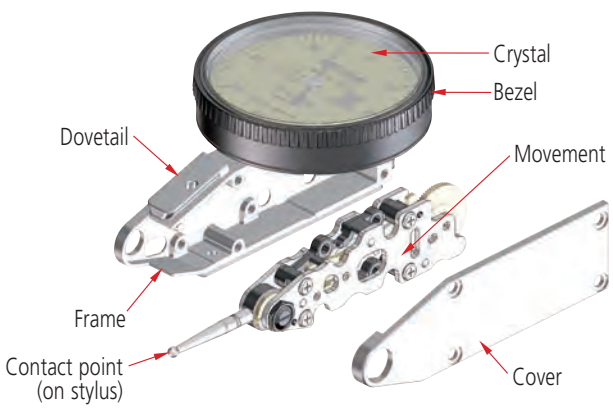
Improved readability

- Using universal fonts, changing dial face color and reviewing the relationship between pointer and scale marks have drastically improved readability.



Conventional New

Parts



Choice of dial position

Four models are available, each with a different orientation of the dial to allow the best visibility in any situation.

- Horizontal (standard model) - dial is on top of the frame.
- Vertical: dial is on the end of the frame.
- Horizontal (20° tilted face): dial is on top of the frame but tilted 20°.
- Parallel: dial is on the side of the frame.

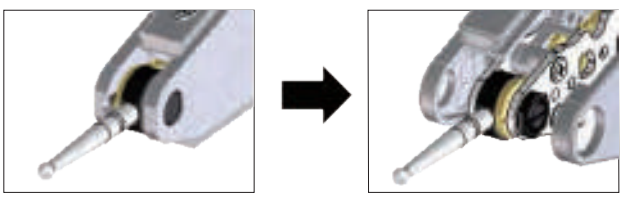
Horizontal | Vertical | Horizontal (20° Tilted face) | Parallel

Multi-layer coatings on the crystal

- Hard, antifouling and non-glare coatings on the crystal inhibit scratches, contamination and glare on the surface.

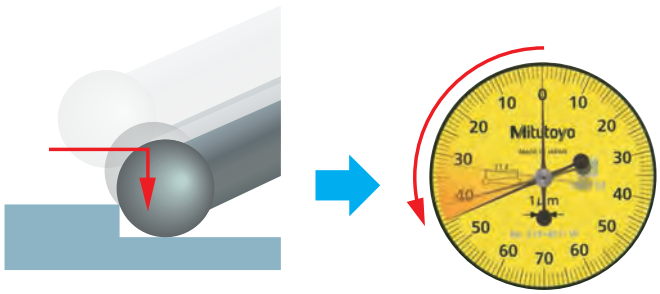
Improved stylus bearing

- The conventional method of mounting the stylus pivot bearing screw in the frame is prone to loosen with prolonged use. A unique sub-plate structure has been incorporated in all models to eliminate this issue.



Stylus bearing screw held in frame.

Stylus bearing screw held in sub-plate.

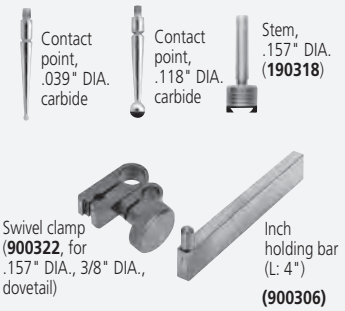


Indicator trackability depends on maintaining gear-train stability

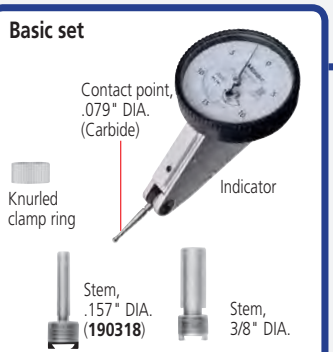
Set Configuation

Inch

Full set — **T set**

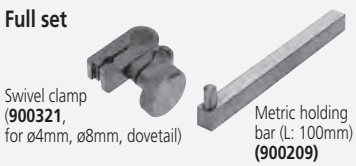


Basic set — **E set**

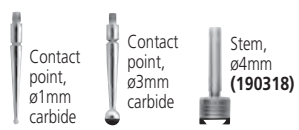


Metric

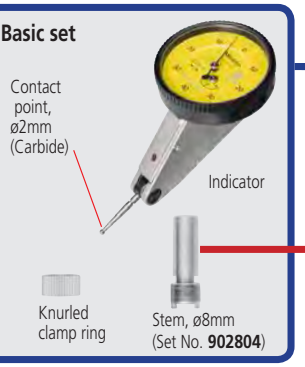
Full set — **T set**



Plus set — **A set** / **C set** (ø 6 Stem)



Basic set — **E set**



H set (ø 6 Stem)

Horizontal (Standard model)

Metric Wide variations of models conform to the required accuracy, range and surface of workpieces.

513-424-10

Contact point No. 137557

Graduation: 0.01mm
Range: 0.5mm

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

- Standard
- Double scale spacing
- Carbide contact point (Anti-magnet)

513-478-10

Contact point No. 21CZA210

Graduation: 0.01mm
Range: 0.5mm

513-478-10E

- Ruby contact point (non-magnet)
- Standard
- Double scale spacing

513-466-10

Contact point No. 137557

Graduation: 0.01mm
Range: 0.5mm

513-466-10E

- Small face diameter
- Double scale spacing
- Compact
- Carbide contact point (Anti-magnet)

513-404-10

Contact point No. 103006

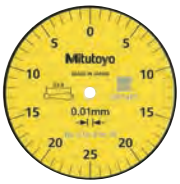
Graduation: 0.01mm
Range: 0.8mm

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

- Standard
- Carbide contact point (Anti-magnet)

513-414-10

Contact point No. 131324



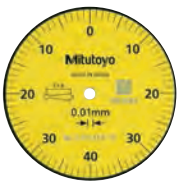
Graduation: 0.01mm
Range: 0.5mm

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

- Long stylus
- Carbide contact point (Anti-magnet)
- Double scale spacing

513-474-10

Contact point No. 21CZA201



Graduation: 0.01mm
Range: 0.8mm

513-474-10E

- Ruby contact point (non-magnet)
- Standard

513-464-10

Contact point No. 103006

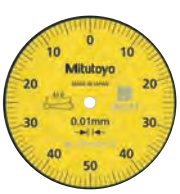
Graduation: 0.01mm
Range: 0.8mm

513-464-10E

- Small face diameter
- Compact
- Carbide contact point (Anti-magnet)

513-415-10

Contact point No. 136013



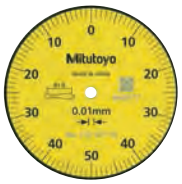
Graduation: 0.01mm
Range: 1.0mm

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

- Long stylus
- Carbide contact point (Anti-magnet)

513-477-10

Contact point No. 21CZA211



Graduation: 0.01mm
Range: 1.0mm

513-477-10E

- Ruby contact point (non-magnet)
- Long stylus

513-475-10

Contact point No. 21CZB068

Graduation: 0.002mm
Range: 0.2mm

513-475-10E

- Ruby contact point (non-magnet)
- Standard

513-426-10

Contact point No. 137557

Graduation: 0.01mm
Range: 1.5mm

513-426-10E/513-426-10A

- With revolution counter
- Double scale spacing
- Carbide contact point (Anti-magnet)

513-425-10

Contact point No. 103011

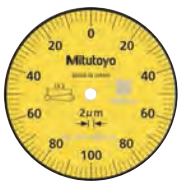
Graduation: 0.002mm
Range: 0.6mm

513-425-10E/513-425-10A

- With revolution counter
- Carbide contact point (Anti-magnet)

513-405-10

Contact point No. 103011



Graduation: 0.002mm
Range: 0.2mm

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

- Standard
- Carbide contact point (Anti-magnet)

513-465-10

Contact point No. 103011

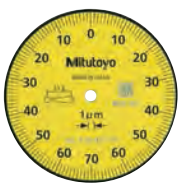
Graduation: 0.002mm
Range: 0.2mm

513-465-10E

- Small face diameter
- Compact
- Carbide contact point (Anti-magnet)

513-471-10

Contact point No. 21CZA209



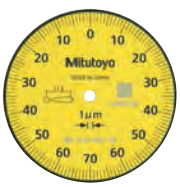
Graduation: 0.001mm
Range: 0.14mm

513-471-10E

- Ruby contact point (non-magnet)
- High accuracy

513-401-10

Contact point No. 103010



Graduation: 0.001mm
Range: 0.14mm

513-401-10E

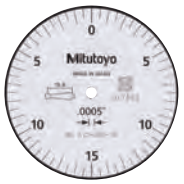
- High accuracy
- Carbide contact point (Anti-magnet)

Horizontal (Standard model)

Inch

513-402-10

Contact point No. 133195



Graduation: 0.0005 in
Range: 0.03 in

513-402-10E/513-402-10T

- Standard
- Carbide contact point (Anti-magnet)

513-462-10

Contact point No. 133195

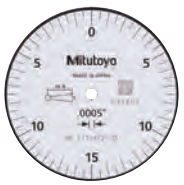
Graduation: 0.0005 in
Range: 0.03 in

513-462-10E

- Compact
- Carbide contact point (Anti-magnet)

513-472-10

Contact point No. 21CZA204



Graduation: 0.0005 in
Range: 0.03 in

513-472-10E

- Standard
- Ruby contact point (non-magnet)

513-403-10

Contact point No. 21CZB064

Graduation: 0.0001 in
Range: 0.008 in

513-403-10E/513-403-10T

- Standard
- Anti-magnet (non-magnet)

513-412-10

Contact point No. 136290

Graduation: 0.0005 in
Range: 0.03 in

513-412-10E/513-412-10T

- Long stylus
- Carbide contact point (Anti-magnet)

513-473-10

Contact point No. 21CZB112

Graduation: 0.0001 in
Range: 0.008 in

513-473-10E

- Standard
- Ruby contact point (non-magnet)

512-479-10

Contact point No. 21CZA214

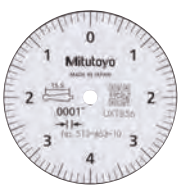
Graduation: 0.0005 in
Range: 0.03 in

512-479-10E

- Long stylus
- Ruby contact point (non-magnet)

513-463-10

Contact point No. 21CZB064



Graduation: 0.0001 in
Range: 0.008 in

513-463-10E

- Compact
- Carbide contact point (Anti-magnet)

Metric/Inch

513-409-10

Contact point No. 103011

Graduation: 0.002mm/0.0001 in
Range: 0.2mm/0.0076 in

513-409-10E/513-409-10T

Carbide contact point (Anti-magnet)

Inch/Metric

513-406-10

Contact point No. 133195

Graduation: 0.0005 in/0.01mm
Range: 0.03 in/0.7mm

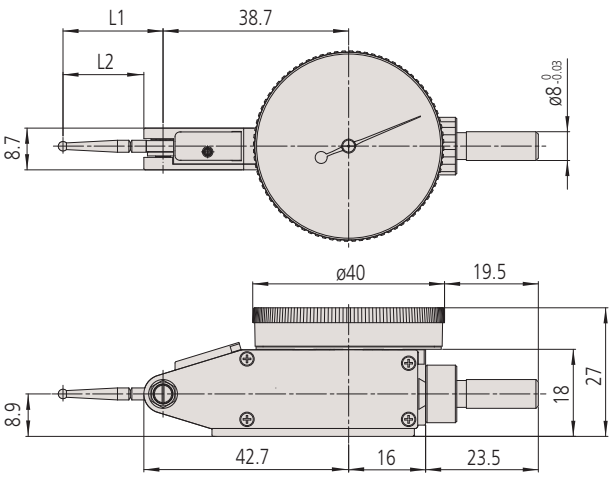
513-406-10E/513-406-10T

Carbide contact point (Anti-magnet)

DIMENSIONS

Vertical

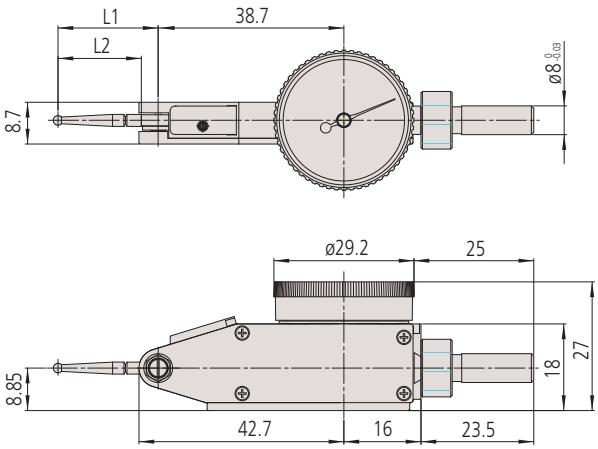
Unit: mm



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

Compact

Unit: mm



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

Horizontal (Standard model)

SPECIFICATIONS

Metric

Order No.			Graduation	Range	Dial reading	Indication accuracy				Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-424-10E	**513-424-10A**	**513-424-10T**	0.01 mm	0.5 mm	0-25-0	6 µm	5 µm	4 µm	3 µm	45g	0.3N or less				✓	✓		✓	
513-478-10E	–	–													✓	✓			✓
513-466-10E	–	–				6 µm		4 µm		41g	0.3N or less					✓	✓	✓	
513-404-10E	**513-404-10A**	**513-404-10T**		0.8 mm	0-40-0	9 µm				45g					✓			✓	
513-414-10E	**513-414-10A**	**513-414-10T**		0.5 mm	0-25-0	10 µm		5 µm			0.2N or less			✓		✓		✓	
513-474-10E	–	–		0.8 mm	0-40-0	9 µm		4 µm			0.3N or less				✓				✓
513-464-10E	–	–								41g							✓	✓	
513-415-10E	**513-415-10A**	**513-415-10T**		1.0 mm	0-50-0	10 µm		5 µm		45g	0.2N or less			✓				✓	
513-477-10E	–	–												✓					✓
513-426-10E	**513-426-10A**	–		1.5 mm	0-25-0	16 µm					0.4N or less		✓			✓		✓	
543-405-10E	**543-405-10A**	**543-405-10T**	0.002 mm	0.2 mm	0-100-0	4 µm	2 µm	3 µm	1 µm		0.3N or less				✓			✓	
513-471-10E	–	–	0.001 mm	0.14 mm	0-70-0							✓							✓
513-475-10E	–	–		0.2 mm											✓				✓
513-425-10E	**513-425-10A**	–	0.002 mm	0.6 mm	0-100-0	7 µm		4 µm			0.4N or less		✓					✓	
513-465-10E	–	–		0.2 mm		4 µm		3 µm		41g	0.3N or less						✓	✓	
513-401-10E	–	–	0.001 mm	0.14 mm	0-70-0					45g		✓						✓	

Inch

Order No.			Graduation	Range	Dial reading	Indication accuracy			Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				One rev.	Hysteresis	Repeatability											
513-402-10E	–	**513-402-10T**	0.0005 in	0.03 in	0-15-0	±0.0005 in	0.0002 in	0.0002 in	45g	0.3N or less				✓				✓	
513-472-10E	–	–												✓					✓
513-412-10E	–	**513-412-10T**								0.2N or less			✓					✓	
513-479-10E	–	–											✓						✓
513-462-10E	–	–							41g	0.3N or less						✓	✓	✓	
513-403-10E	–	**513-403-10T**	0.0001 in	0.008 in	0-4-0	±0.0001 in	0.0001 in	0.00004 in	45g					✓				✓	
513-473-10E	–	–												✓					✓
513-463-10E	–	–							41g							✓	✓		

Metric/Inch

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

Inch/Metric

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

* Stem with ø6 dovetail groove is not included in the mass.

* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

Parallel (The scale can be read from the front, with the contact point pivoting in a plane parallel to that of the dial face.)

Metric

513-484-10

Contact point No. 103006

Graduation: 0.01mm
Range: 0.8mm

513-484-10E/513-484-10A/ 513-484-10T

Carbide contact point (Anti-magnet)

513-486-10

Contact point No. 137557

Graduation: 0.01mm
Range: 0.5mm

513-486-10E

Double scale spacing
Carbide contact point (Anti-magnet)

513-485-10

Contact point No. 103011

Graduation: 0.002mm
Range: 0.2mm

513-485-10E

Carbide contact point (Anti-magnet)

Inch

513-482-10

Contact point No. 133195

Graduation: 0.0005 in
Range: 0.03 in

513-482-10A/513-482-10T

Carbide contact point (Anti-magnet)

SPECIFICATIONS

Metric

Order No.			Graduation	Range	Dial reading	Indication accuracy				Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-484-10E	**513-484-10A**	**513-484-10T**	0.01mm	0.8mm	0-40-0	9µm	5µm	4µm	3µm	53g	0.3N or less							✓	
513-485-10E	–	–	0.002mm	0.2mm	0-100-0	4µm	2µm	3µm	1µm									✓	
513-486-10E	–	–	0.01mm	0.5mm	0-25-0	6µm	5µm	4µm	3µm							✓		✓	

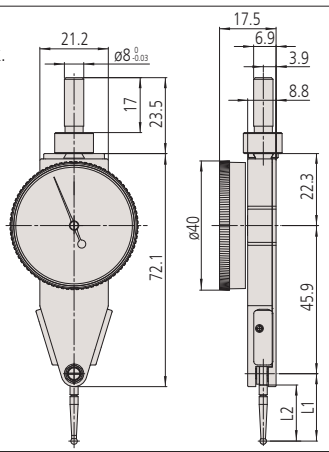
Inch

Order No.			Graduation	Range	Dial reading	Indication accuracy			Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	Hysteresis	Repeatability										
–	**513-482-10A**	**513-482-10T**	0.0005 in	0.03 in	0-15-0	±0.0005 in	0.0002 in	0.0002 in	53g	0.3N or less							✓	

* Stem with ø6 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

DIMENSIONS

* No dovetail in the back.



Unit: mm

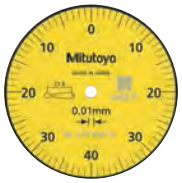
Order No.	L1	L2
513-484-10E	20.9	17.4
513-485-10E	18.7	15.2
513-486-10E	22.2	18.7

Vertical (Best suited for centering holes under the spindle of a machine tool.)

Metric

513-454-10

Contact point No. 103006



Graduation: 0.01mm
Range: 0.8mm

513-454-10E/513-454-10A/ 513-454-10T

Carbide contact point (Anti-magnet)

513-455-10

Contact point No. 103011

Graduation: 0.002mm
Range: 0.2mm

513-455-10E/513-455-10A/ 513-455-10T

Carbide contact point (Anti-magnet)

513-456-10

Contact point No. 137557

Graduation: 0.01mm
Range: 0.5mm

513-456-10E

Double scale spacing

Carbide contact point (Anti-magnet)

Inch

513-452-10

Contact point No. 133195

Graduation: 0.0005 in
Range: 0.03 in

513-452-10E/513-452-10T

Carbide contact point (Anti-magnet)

513-453-10

Contact point No. 21CZB064

Graduation: 0.0001 in
Range: 0.008 in

513-453-10E/513-453-10T

Carbide contact point (Anti-magnet)

SPECIFICATIONS

Metric

Order No.			Graduation	Range	Dial reading	Indication accuracy				Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-454-10E	**513-454-10A**	**513-454-10T**	0.01mm	0.8mm	0-40-0	9µm	5µm	4µm	3µm	46g	0.3N or less							✓	
513-455-10E	**513-455-10A**	**513-455-10T**	0.002mm	0.2mm	0-100-0	4µm	2µm	3µm	1µm									✓	
513-456-10E	–	–	0.01mm	0.5mm	0-25-0	6µm	5µm	4µm	3µm							✓		✓	

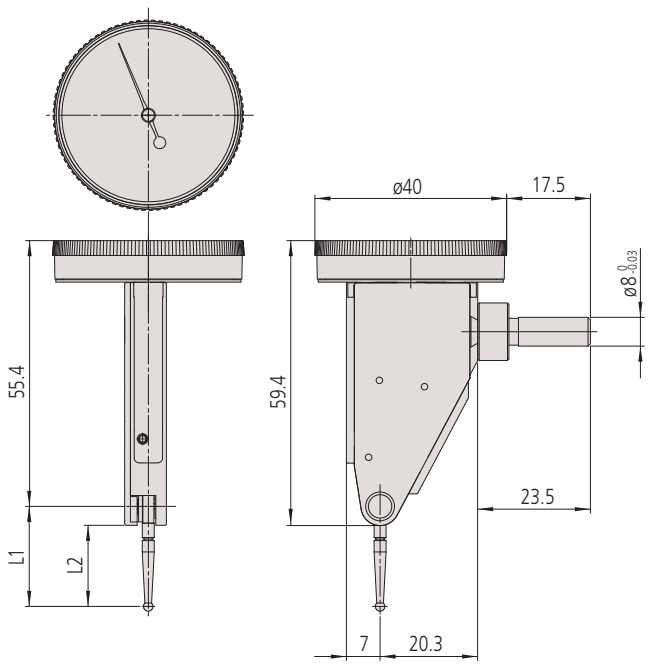
Inch

Order No.			Graduation	Range	Dial reading	Indication accuracy			Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	Hysteresis	Repeatability										
513-452-10E	–	**513-452-10T**	0.0005 in	0.03 in	0-15-0	±0.0005 in	0.0002 in	0.0002 in	46g	0.3N or less							✓	
513-453-10E	–	**513-453-10T**	0.0001 in	0.008 in	0-4-0	±0.0001 in	0.0001 in	0.00004 in									✓	

* Stem with ø6 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

DIMENSIONS

Unit: mm



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

Horizontal (20° Tilted Face) (Dial face inclined 20°, compared with the vertical type.)

Metric

513-444-10

Contact point No. 103006

Graduation: 0.01mm
Range: 1.6mm

513-444-10E/513-444-10A/ 513-444-10T

- With revolution counter
- Carbide contact point (Anti-magnet)

513-445-10

Contact point No. 103011

Graduation: 0.02mm
Range: 0.4mm

513-445-10E/513-445-10A/ 513-445-10T

- With revolution counter
- Carbide contact point (Anti-magnet)

Inch

513-442-10

Contact point No. 133195

Graduation: 0.0005 in
Range: 0.06 in

513-442-10A/513-442-10T

- With revolution counter
- Carbide contact point (Anti-magnet)

513-442-16

Contact point No. 133195

Graduation: 0.0005 in
Range: 0.06 in

513-442-16A/513-442-16T

- With revolution counter
- Carbide contact point (Anti-magnet)

513-446-10

Contact point No. 136290

Graduation: 0.0005 in
Range: 0.06 in

513-446-10A/513-446-10T

- With revolution counter
- Long stylus
- Carbide contact point (Anti-magnet)

513-446-16

Contact point No. 136290

Graduation: 0.0005 in
Range: 0.06 in

513-446-16A/513-446-16T

- With revolution counter
- Long stylus
- Carbide contact point (Anti-magnet)

513-443-10

Contact point No. 21CZB064

Graduation: 0.0001 in
Range: 0.016 in

513-443-10A/513-443-10T

- With revolution counter
- Carbide contact point (Anti-magnet)

513-443-16

Contact point No. 21CZB064

Graduation: 0.0001 in
Range: 0.016 in

513-443-16A/513-443-16T

- With revolution counter
- Carbide contact point (Anti-magnet)

SPECIFICATIONS

Metric

Order No.			Graduation	Range	Dial reading	Indication accuracy				Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	10 scale divisions	Hysteresis	Repeatability										
513-444-10E	**513-444-10A**	**513-444-10T**	0.01mm	1.6mm	0-40-0	16µm	5µm	5µm	3µm	48g	0.3N or less		✓					✓	
513-445-10E	**513-445-10A**	**513-445-10T**	0.002mm	0.4mm	0-100-0	6µm	2µm	4µm	1µm				✓					✓	

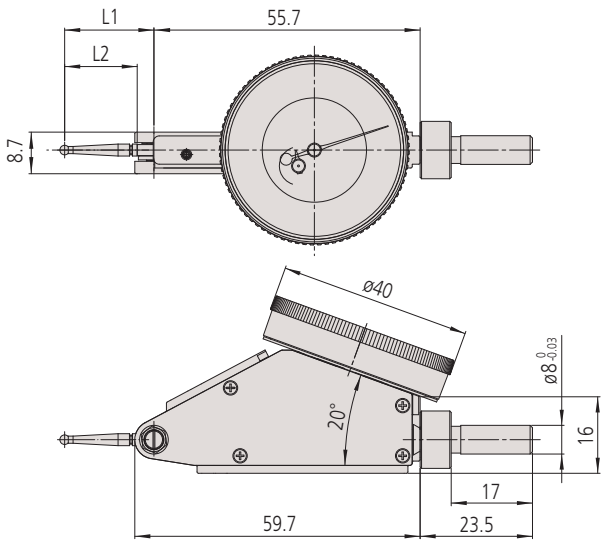
Inch

Order No.			Graduation	Range	Dial reading	Indication accuracy			Mass	Measuring force	High accuracy	With revolution counter	Long stylus	Standard	Double scale spacing	Compact	Carbide contact point (Anti-magnet)	Ruby contact point (non-magnet)
Basic set	Plus set	Full set				Measuring range	Hysteresis	Repeatability										
–	**513-442-10A**	**513-442-10T**	0.0005 in	0.06 in	0-15-0	±0.0005 in	0.0002 in	0.0002 in	48g	0.3N or less		✓					✓	
–	**513-442-16A**	**513-442-16T**										✓					✓	
–	**513-446-10A**	**513-446-10T**								0.2N or less		✓	✓				✓	
–	**513-446-16A**	**513-446-16T**										✓	✓				✓	
–	**513-443-10A**	**513-443-10T**	0.0001 in	0.016 in	0-4-0	±0.0002 in	0.0001 in	0.00004 in		0.3N or less		✓					✓	
–	**513-443-16A**	**513-443-16T**										✓					✓	

* Stem with ø6 dovetail groove is not included in the mass.
* Be sure to perform calibration with reference gage, etc. after changing the contact point. The inside parts may be damaged when the contact point is changed due to the breakage. In the case the of the significant deterioration during the operation, repair is required.

DIMENSIONS

Unit: mm



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

Refer to MEASURING INSTRUMENTS CATALOG No. US-1004 for the accessories such as styli, stems with dovetail, holding bars, etc.