



Dial Test Indicator

Safety Precautions

To ensure operator safety, use this product in conformance with the directions, functions and specifications given in this User's Manual.
Use under other conditions may compromise safety.

NOTICE Shows risks that could result in property damage.

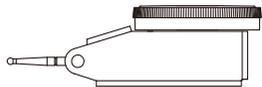
- Do not disassemble or modify. This may cause damage.
- Do not use or store the product in a place with sudden temperature changes. Also, before using the product, allow it to acclimate to room temperature.
- Do not store the product in a place with high humidity or a lot of dust.
- Do not apply excessive force or subject to sudden impacts such as dropping.
- Remove dust, cutting chips, etc. before and after use.
- Apply anti-rust treatment if the product is used in a place where it is directly exposed to splashes of coolant, etc. Rust may cause malfunction.

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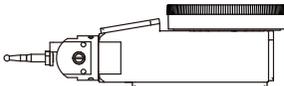
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1. Types

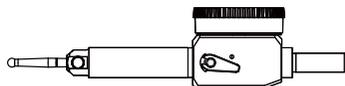
- Standard type
513-4■-10■
513-4■-16■



- Universal type
513-30■-10■

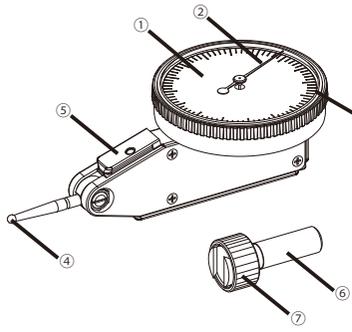


- Pocket type
513-5■-10■



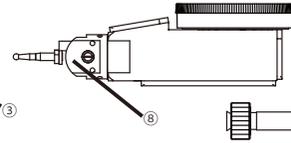
2. Names of Components

- Standard type

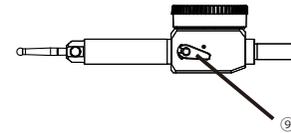


- ① Crystal
- ④ Contact point
- ⑦ Nut
- ② Pointer
- ⑤ Dovetail plate
- ⑧ Head

- Universal type



- Pocket type

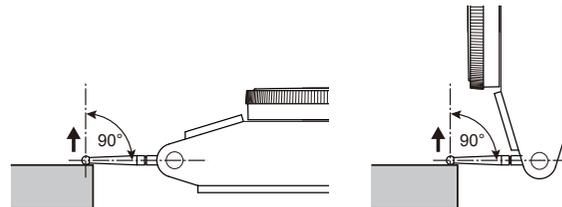


- ③ Bezel
- ⑥ Stem
- ⑨ Clutch lever

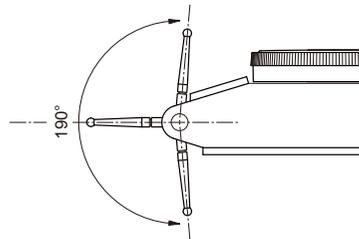
3. Precautions for Use

1) Measurement direction and contact point angle

- Set the contact point at a right angle to the measurement direction for the workpiece.
For models with large measurement range, place the contact point at a right angle in the center of the measurement range.
In particular, be sure to place the contact point at a right angle during reference point setting.



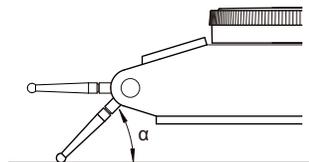
- Contact point angle



- If the contact point cannot be placed at a right angle to the measurement direction, the true value (approximate value) can be obtained with angle correction. To obtain the true value (approximate value), correct the reading according to the following method.

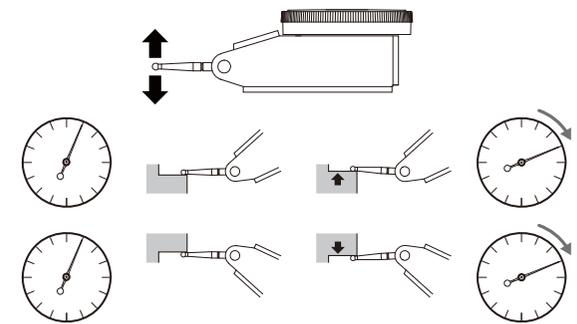
True value (approximate value) = reading x correction factor (k)
For example, if the angle (α) is 30° and the reading is 0.05 mm,
0.05 mm (reading) x 0.87 (correction factor for 30°) = 0.0435 mm [true value (approximate value)]

Angle (α)	Correction factor (k)
10°	0.98
20°	0.94
30°	0.87
40°	0.77
50°	0.64
60°	0.50

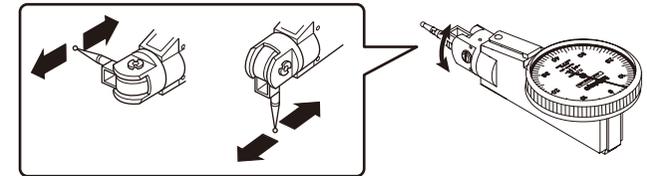


2) Pointer rotation direction and measurement direction

- Standard type
Whether the contact point moves upward or downward, the pointer always rotates clockwise.
Pointer rotation direction cannot be switched.



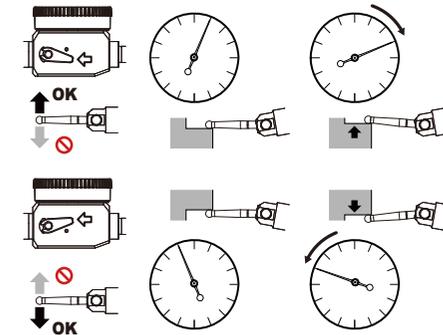
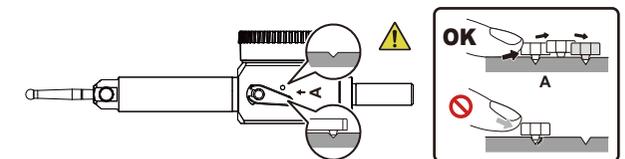
- Universal type
The operation direction of the contact point can be changed by rotating the head.
As with the standard type, pointer rotation direction cannot be switched.



- Pocket type
Pointer rotation direction and measurement direction can be changed with the clutch lever.

Tips

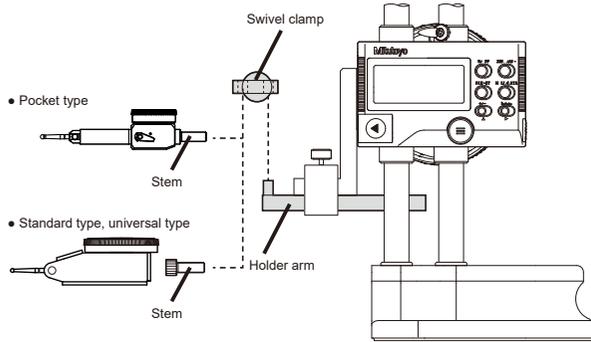
Since there is a protrusion on the back side of the lever, the clutch lever may be stiff and may not move. When moving the lever, apply force in the direction of pushing it up.



3) Mounting

- Securely attach the Dial Test Indicator to a rigid holder, using the dovetail plate or stem, so that it will not be affected by bending, etc.
When attaching by the stem, tighten firmly so that the nut will not loosen due to vibration, etc. If mounted to a holder with insufficient rigidity, the pointer may not operate smoothly.
- When using standard or optional mounting accessories securely attach them to the Dial Test Indicator.
- Move the contact point up and down in order to confirm that it moves smoothly after mounting.

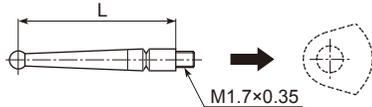
Mounting example



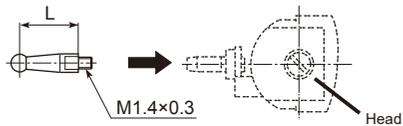
4) Contact point length and replacement

- The contact point length (L) varies depending on the Dial Test Indicator model. The use of a contact point other than the specified length will cause significant error in measurement results. Be sure to use a contact point with a proper length corresponding to the model.
- Accuracy will change after contact point replacement and must be confirmed.

- Standard type, pocket type
 - The contact point is threaded. For replacement, wrap it with a soft cloth to prevent it from being damaged and then turn it with a tool such as pliers.

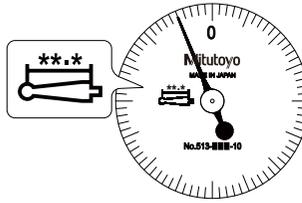


- Universal type
 - The tip of the contact point is threaded. For replacement, turn the contact point with the provided wrench (Component No. 102037) while holding the head securely.



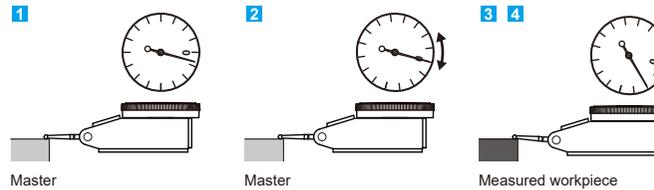
Tips

- The contact point length (**.*) is described on the dial face.
- In case of replacement, use a contact point with a length described on the dial face.



4. Measurement Method

- Set the reference point with a reference gage or master gage.
- Turn the bezel to adjust the zero point as required.
- Measure the workpiece in the same orientation and conditions as the reference position alignment.
- Read the pointer value from the front.



5. Precautions after Use

- Clean the crystal with a soft, dry cloth or a cloth slightly moistened with neutral detergent. Do not use anything but neutral detergent, as it may cause cracks, etc.
- The performance of the Dial Test Indicator is strongly influenced by usage and storage conditions. We recommend stipulating a maintenance cycle in-house according to usage frequency, environment, storage method, etc., and inspecting the product periodically.
- If the product is repaired or disassembled by a party other than Mitutoyo, its performance cannot be guaranteed.

6. Specifications

- Operation environment: Temperature 0°C to 40°C, humidity 30% to 70% (no condensation)

7. Accessories (Optional)

Standard type, universal type

Mounting bracket	Component name	Component No.
Stem	ø4 (0.157 in diameter) stem with dovetail groove	21CZB131
	ø6 stem with dovetail groove	21CZB128
	ø8 stem with dovetail groove	21CZB129
	0.375 in diameter stem with dovetail groove	21CZB130
Clamp	For ø6/ø8 mm with dovetail groove	902053
	For 0.157 in/0.375 in diameter with dovetail groove	900322
	For ø4/ø8 mm with dovetail groove	900321
Holder	Holder arm A (square 9 x 9 x 100 mm)	900209
	Holder arm B (ø8 x 115 mm)	900211
	Holder arm (square 9 x 9 x 50 mm)	953638
	Holder arm (square 6.35 x 12.7 x 50 mm)	953639

Pocket type

Mounting bracket	Component name	Component No.
Stem	ø4 (0.157 in diameter) stem	102036
	ø6 stem	102389
	ø8 stem	102822
	0.375 in diameter stem	102081
Clamp	For ø6/ø8 mm with dovetail groove	902053
	For 0.157 in/0.375 in diameter with dovetail groove	900322
	For ø4/ø8 mm with dovetail groove	900321
Holder	Holder arm A (square 9 x 9 x 100 mm)	900209
	Holder arm B (ø8 x 115 mm)	900211
	Holder arm (square 9 x 9 x 50 mm)	953638
	Holder arm (square 6.35 x 12.7 x 50 mm)	953639

8. Off-Site Repairs (Subject to Charge)

Off-site repair (subject to charge) is required in the case of the following malfunctions. Contact your nearest dealer or our sales office.

- The sensitivity or the traceability of the contact point is poor.
Increased play or gear engagement gap will lead to poor sensitivity (traceability).