

# Manual for Tool Setters

## TM26D

The METROL tool setters provide very high accurate tool positioning on CNC machine tools such as machining centers, milling machines, boring machines, and drilling machines.

The skip signals to NC systems and the program are used for the purpose of tool position setting, measurement of tool wear, and tool breakage detection.

Dust- and water-resistant structure resulted from careful study of harsh machining environment enables long product life.

### Installation

#### 1. Mechanical

- When installing the tool setter on a machine table with guaranteed parallelism or an angle plate, clean up the surface and fix the tool setter on it firmly.
- When installing the tool setter on the places other than either one of the above, confirm the parallelism between the installing surface and the detecting contact surface.
- In the case of using retractable system, especially pay attention to repeatability of its position, squareness and parallelism in the operating position and thermal expansion and rigidity of the installing surface.

#### 2. Electrical

- Contact rating: DC24V ± 10%, 20mA(Max)
- If the equipment itself is grounded, connecting the sensor so that it is connected to the ground side is recommended.
- In the case of LED indicator being equipped on the sensor, be aware of polarity. 10mA(Recommended) non-inductive load.
- In the case of using Interface Unit, refer to the separate guide manual for output specification.

#### 3. Cable handling

- Since the switching contacts and interface elements may be damaged due to the flow of current in excess of the rating caused by noise or surge induction, place the sensor at an adequate distance from any power lines or other sources of noise.
- Do not pull the cable by excessive force. Max. 30N (3kgf).
- The minimum bending radius of the cable is R7.
- Be careful during installation to avoid any damage on the cable. (resulting in loss of waterproofing property) In the case of the damage can be expected, use of wire braid and protect tube is recommended.

### Other precautions

- The contact force mentioned on the drawing is true only in the specified installation manner (If the installation manner is not mentioned, it is taken as vertical).
- When using a vertical type tool setter as a horizontal one, the contact force increases.

#### Cleaning

Clean off periodically the detecting contact surface, and get rid of oil and cuttings which cannot be removed by the air blower.

#### How to check the sensor output

Although the contact structure is NC, the output is NO due to the inverted output. When the sensor contact is not pressed, an analog multimeter shows ∞Ω.

### Dimensions and specifications

Refer to the attached drawings for dimensions and specifications.

### How to use

#### 1. Proper Tool Contact

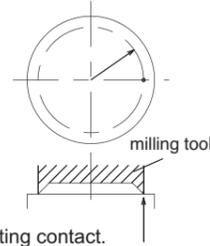
- Install the tool setter so that the tool touches detecting contact surface at right angle.
- Do not excessively press the detecting contact surface to the stroke end. It may cause malfunction due to the impact.
- Since the speed of the tool applying to the detecting contact surface is related to the electrical response speed of the machine, set the speed properly not to exceed the designated speed.

The recommended speed to maintain repeatability of 0.001mm is 50 to 200mm/min.

Set to a lower speed in the case of a narrow drill diameter(φ0.5-0.9 mm). It may also be necessary to select a low contact force type in case of drill diameter.

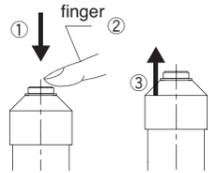
#### 2. How to preset a large milling tool with a large-diameter detecting contact

To avoid inclination error, place the cutter so that it touches the detecting contact as the picture (the distance from the center of the detecting contact to the point each cutter touches is constant). Or place the cutter so that it touches the center of the detecting contact.



#### Caution:

When pushing the detecting contact surface to the stroke end by a finger, do not flip the finger off abruptly as the picture. Such action often cause malfunction resulting from disengagement of the interior components. When pushing down the detecting contact by a tool in operation, do not slide the tool side way while holding it down.

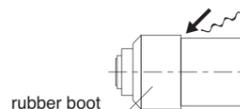


#### How to protect the sensor from cuttings

In the following cases, provide a separate protector.

(Especially in automated production line)

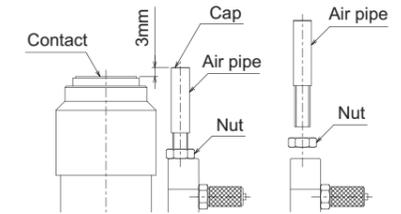
- When there is the risk of cuttings and other debris having accumulated to where they impair movement or return of the rubber boot.
- When there is the risk that cuttings and coolant make the protect boot cover displaced and the air pipe damaged.
- When using a vertical type tool setter as a horizontal one. (see the picture on the right)



### Air Pipe Replacement Method

- Loosen the nut.
- Detach the air pipe.
- Attach the new air pipe.
- Adjust the height of the air pipe so that it is higher than the contact surface by 3mm.

**Caution:** Nut tightening torque is 1.5N/m (15kgf/cm). Do not apply excessive force.



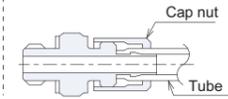
### Piping Method

- Cut the tube in necessary length at right angles to the axial direction.
- Pass the tube through the cap nut.
- Make sure to insert the tube at the end of the hose nipple. A loose tube may cause the air to leak and the tube to fall out.
- Tighten the cap nut.

#### Applications

|                          |                     |
|--------------------------|---------------------|
| Tube                     | O.D. φ4 / I.D. φ2.5 |
| Recommended air pressure | 0.3~0.6MPa*         |

\*Caution: Measurement signal may be output due to the blowing of the air.



### Terms of Warranty

We strive to achieve zero claims and complaints with respect to quality assurance.

Although malfunctions are a problem that comes before the warranty and even one should be prevented, malfunctions cannot be prevented through our efforts alone. We would therefore like to request that our customers have an understanding of the functions and specifications of applicable products as indicated in our catalogs, instruction manuals and web site to ensure that they are used properly.

Furthermore, applicable products are designed and manufactured primarily for general industrial use. Therefore, we would also like to request that our customers cooperate in employing a safe design for preventing accidents, fires and the like through the providing of failsafe measures, preventing operational errors and employing redundant designs.

#### 1) Applicable Products

The warranty defined below is applicable to products manufactured and sold by Metrol (to be referred to as the "applicable products").

#### 2) Warranty Period

The warranty period for applicable products is one year and three months following purchase or following delivery to the location designated by the customer.

*\*The initial three months are assumed to be a preparation period until use of the products following purchase.*

#### 3) Range of Coverage

a. A replacement product will be provided or the malfunctioned product will be repaired free of charge in the case a malfunction has occurred in an applicable product that is attributable to the responsibility of the manufacturer within the warranty period.

However, applicable products are not covered by the warranty in the case of the following malfunctions even though said malfunctions have occurred within the warranty period.

(I) Malfunctions having occurred due to use of a product in a manner that deviates from standards, specifications, environments, usage procedures or usage precautions described in the catalog, instruction manual or specifications.

(II) Malfunctions having occurred for reasons other than those attributable to a delivered product.

(III) Malfunctions having occurred due to modifications or repairs made by persons other than the manufacturer.

(IV) Malfunctions having occurred due natural disasters, fires or other force majeure.

b. The range of coverage is limited to warranty of the applicable product only, and secondary damage attributable to a malfunction of an applicable product is not covered by the warranty.

c. Please be aware that charges for service calls (including installation, on-site confirmation and repairs) are not included in the price of products.

#### 4) Applications

Applicable products are designed and manufactured as general-purpose products used in ordinary industrial environments.

In the case of incorporating an applicable product in an apparatus, machine or system, please confirm the suitability of the application along with any related standards, regulations and restrictions.

With respect to the applications indicated below in particular, customers are requested to conduct necessary tests on an actual product in advance after consulting with the manufacturer regarding usage conditions and other details.

a. Applications for which usage conditions or environment are outside those presumed by the manufacturer or applications unable to be confirmed as being appropriate by the manufacturer when using applicable products.

b. Applications likely to have an effect on human life or property (such as nuclear power equipment, transportation machinery or medical devices), applications used in public utilities (such as electricity, gas or water lines), or applications applying correspondingly thereto.

c. Applications in harsh environments (special environments requiring heat resistance, vacuum and the like)

*\*Although Metrol believes that sound reliability in harsh environments is one of the characteristics of our products, there are still cases in which it is difficult to ascertain actual circumstances.*

*Since there is the potential for accidents in such cases, customers are requested to have an understanding of protective structures, materials and so forth and provide additional covers and other equipment as necessary.*

#### 5) Other Matters

The contents of this catalog, including types, specifications, and other matters, are subject to change without notice.