Tool Setter Technical Guide

Contacting Part

1. Contact Diameter

・Contact diameter can be selected to match the tool (endmill cutter diameter, drill diameter)

2. Stationary Contact Type

・The surfaces of stationary contacts are polished following assembly to ensure proper parallelism with the datummounting surface

・If the contact surface is worn out or damaged, it must be replaced with the sensor

3. Replaceable Contact Type

・If the contact surface is worn out or damaged, it can be replaced by the customer

・The user is able to easily make the contact surface parallel again following replacement.(Parallelism can be ensured simply by aligning the parallel mark on the contact when installing.）

*Please indicate the "Contact No." or "Product name" when ordering replacement parts.
*Do not replace a contact with that of different diameter since this can cause a change in contact force.

Contact Structures (Output mode)

Output mode (Contact structure)

NC（b contact）	The contact is normally closed (ON) and opened during operation (OFF). Fault diagnosis (disconnection, contact trouble) can be performed by interlocking.
NO（a contact）	Contact normally open (**OFF**).Closed during measurement (ON). All NO types have

Pretravel (Distance up to signal point)

Without pretravel：

When the contact is pushed in, the signal output switches immediately.

As the push-in amount is small, load on the tool will be less.Vibration and impact may cause chattering.

With pretravel：

The contact needs to be pushed in by about 0.5 mm until the signal output is switched.

Chattering will occur less even when there is vibration or impact.

Contact Force

Amount of force required for contacting part to move from free position to signal point. (Unit :N)

1. The contact force will increase in accordance with the pushing amount of the contact. (depending on the spring

2. Contact force is set in the specified mounting orientation.This mounting orientation is the vertical orientation unless otherwise specified.

3. When using a vertical mounting type in horizontal orientation:Contact force increases by the weight of the movable unit.This requires caution particularly in case of large-diameter contacts and low levels of contact.

4. When using the horizontal mounting type vertically. The contact force decreases according to the weight of the movable part. It may cause the zero reset error.

Mounting

1. When mounting a tool setter at a right angle to the main axis directly on a table or angle plate, clean the mounting surface and tighten all bolts securely

2. When using it by moving the tool setter, please be aware of the temperature change, rigidity and the like of the bracket and guide in order to obtain the repeatability of the position (right angle, parallelism) of the contact

Cables

1. Do not pull on cables with excessive force (up to about 30 N (3 kgf)).
2. The cable bending radius should be R7 or more.
3. Since switch contacts may be damaged by higher current than the rated due to induction of noise and surges, install cables as far away from motor power sources and noise sources as possible (particularly when bundling
4. Do not damage cables during wiring. This can impair water resistance.
5. Cover cables with protective tubes when there is a risk of damage to cables by the usage environment. Minimum bending radius when using protective tubes is R25

Electrical

1. Contact rating : DC5V - DC24V .Steady current : 10mA or less (Rush current : 20mA or less)
2. Make electrical connections so that the sensor is grounded when the machine body is grounded.
3. As the sensors with LED have polarity, please be aware of the (+) (-) connection. Recommended value of 10 mA, resistive load. When using the sensor with LED, limit the current below 10mA.

Connectors

Cables can be branched between the sensor and machine with connectors, thereby facilitating assembly and maintenance. These connectors are also waterproof, and have superior durability.There are two types of connectors available and both types are rated IP67.

・Direct-out Connectors

The connector is attached to the sensor head (can not be attached in case of small diameter sensors).

・Connectors

The connector is attached at a midpoint in the cable (distance from sensor: 1 m)

Note: Do not pull the cable when you remove the connector. Push the connector firmly until it tightly fits with O-ring and make sure the protective ring is fastened.

Air Pipes

1. These pipes are used to blow off cuttings or coolant that have adhered to the contact surface or tool. Oil or debris adhered to the contact surface that cannot be blown off should be periodically removed by cleaning.
2. The threaded coupling on the end of the air pipe is designed to break when subjected to strong impacts by the t
3. The diameter of the air pathway should be at least φ2.

Protective Covers

Protective covers are for preventing rubber boots form damage, and preventing from impairment of water-resistance and dust proofing caused by metal fragments and other cuttings.

1. Protective covers are provided as standard specifications.
2. When there is no risk of damage to rubber boots caused by plastic or wooden chips or cuttings, sometimes it may be more effective to wash off any coolant and blow off any debris with air instead of attaching a protective
3. Install an extra cover saperately so as to avoid direct contact by high-pressure coolant or heavy cuttings.
4. Clean the protective cover when there is the risk of cuttings and other debris having accumulated to where they impair movement or return. (Use caution when blowing off accumulated material with air since this can cause the material to be blown into the protective cover.)

Proper Tool Contact

1. Ensure that the cutting tool makes contact along a straight line in the direction in which it is pushed.
2. Do not allow the sensor to push in excessively beyond the sensor stroke. The sensor or blade may be damaged if pushed in excessively.
3. When measuring the tool length, touch the contact without rotating the tool.
4. When measuring the tool length, touch the contact upon reversely rotating the tool.
5. Set to a lower speed in the case of a narrow drill diameter (φ0.5-0.9 mm). However, operating speed slower than 10mm/min is not recommended.
6. Even for the same tool, changing the operation speed or the contact point to the contact will cause errors in acc

Note: Please be sure that the operating speed when the contact that has been pushed in is returned to the original state is within the range in which the contact can follow the tool. When it is rapidly returned or the tool is shifted.horizontally, the internal may be damaged in reaction.Similarly, do not return it rapidly when testing it with a finger during installation, cleaning, etc.