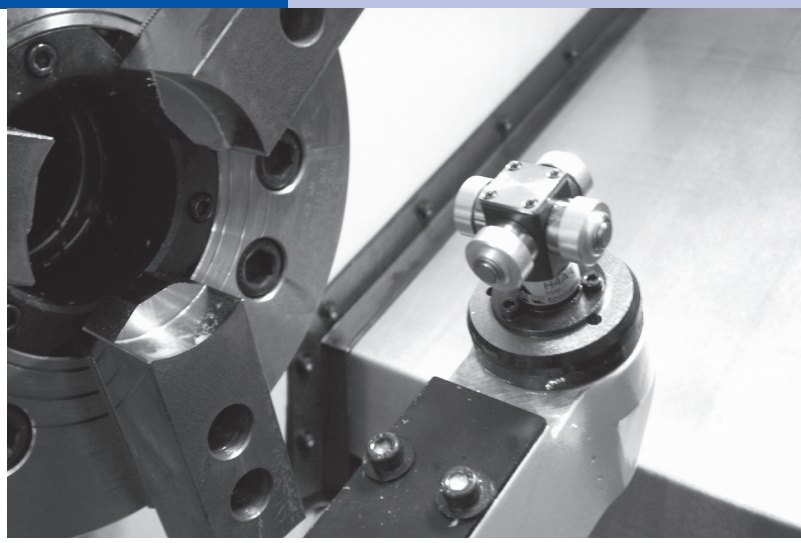
Tool Setter Series for CNC Lathes



Summary

- Tool setters for CNC lathes are used to preset the tool bit.
- When a tool bit presses against the contact of the sensor, a signal from an ON-OFF switch demonstrating superior repeatability is output to the CNC or PC to automatically program the bit position.
  As a result, there is no longer necessary to repeat the process of test cutting, measuring, calculating and inputting to the CNC as in the past, thus the need for tool setting expertise is eliminated, and there are no more concerns over damaging machine due to setting errors.
- Tool bit breakage can be detected and the worn amount can be corrected.

■Handling Precautions of Tool Setters for Lathes

■Mechanical

1.Mounting

Use the datum surface of the flange in order to attach the contact surface in parallel (in case of angular flange).

If the flange does not have a datum surface (such as in case of round flange), use the contact surface as the datum surface.

Place an indicator against the datum surface to confirm that the contact is mounted in parallel.

2.Cables

1) Since switch contacts may be damaged by the current higher 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 cables).
2) Do not pull on cables with excessive force (up to about 30 N (3 kgf)).
3) The cable bending radius should be R7 or more.
4) Do not damage cables during wiring. This can impair water resistance capacity.
5) Cover cables with protective tubes when there is a risk of damaging to cables by the usage environment.
   Minimum bending radius when using protective tubes is R 2.5 and the maximum length is 15 m.

3.Electrical

1) Contact rating: DC5~24V, 20mA (max)
2) Make electrical connections so that the sensor is grounded when the machine body is grounded.
3) Since sensors equipped with an LED have polarity, make sure the (+) and (-) terminals are properly connected. Recommended value: 10 mA, resistance load
4) Refer to the technical guide for information on output structure when an interface unit is provided.

■Proper Tool Contact

1) Ensure that the tool bit touches the contact along a straight line in the direction in which it is pushed.
2) Since the speed at which the tool bit touches the contact is related to the electrical response speed of the machine, set the machine speed so as to not exceed the specified speed.
   It is recommended to set the speed as indicated below to ensure sensor accuracy.

Repeatability of 0.001 mm at 50~200 mm/min (based on a response speed of within 0.5 msec of the machine control system)

Notes:

- Do not allow the sensor to push in excessively beyond the sensor stroke.
  The sensor or tool bit may be damaged if pushed in excessively.
- Avoid using at a feeding speed of 10 mm/min or less.

●Requesting Quotation

- Send us the quotation request along with attached spec sheet (with additional requirement if any) by Fax/E-mail.
- Reference drawing(s) will be sent based on the requirements for customer`s confirmation.
- Upon selection /confirmation by the client,quotation with tentative lead time will be sent for the selected model.

●Ordering Replacement and Spare Parts

- Please specify the model name on the nameplate attached to the product.
- Please add an "H" after the model name when not requiring accessories such as an I/F unit or relay cable (machine side).
- Please add an "S" at the end of the model name when ordering a set.

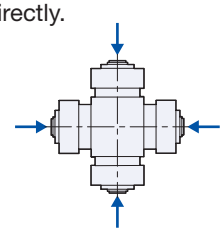
Selection Guide

●A wide variety of dedicated types depending on the intended use.

for CNC Lathes

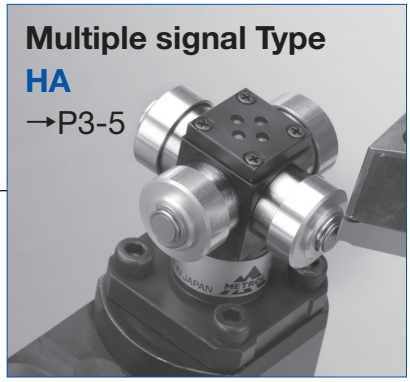
Linear Type

Touch sensors are placed each directions and act directly.



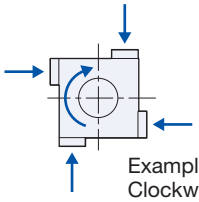
1 signal Type
HA
→P3-3

Multiple signal Type
HA
→P3-5



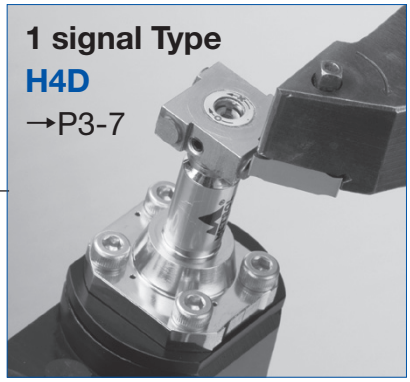
Rotating Contact Type

The shaft rotates when an edge pushes each touch sensor.



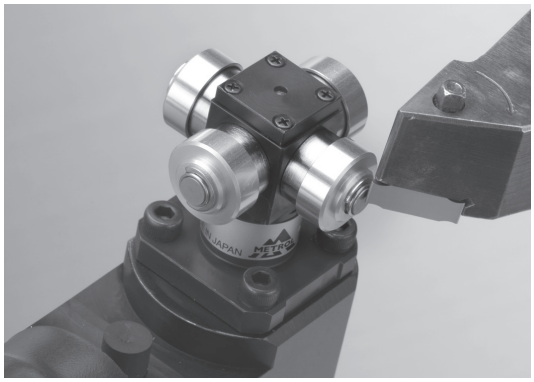
Example of Clockwise

1 signal Type
H4D
→P3-7



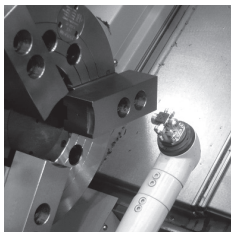
HA

1 Signal Type



■Tool setters for CNC lathes are used for precise blade positioning, and detection of the wear and breakage.

■Touch sensors are arranged and directly linked in each direction.



■Standard specifications

unit:mm

Product name	**HA**
Output mode	NC (Normally close)
Pretravel	Approx. 0
Stroke	2
Repeatability	0.001* (Recommended operating speed of 50 - 200mm/min)
Contact life time	3 million
Protective structure	IP67
Contact force	2N
Contact material	Tungsten carbide
Surface finishing	Grinding 4s
Contact rating	DC5V - DC24V 10mA (Max20mA) resistance load
Cable	Oil resistant ϕ5 / 2 cores Tensile strength 30N, Minimum bending R7
LED lamp	Default : LED ON / Operating : LED OFF

*Repeatability of the arm is not included.

■Precautions

· Do not press the adjacent contact simultaneously.

· Do not turn the protective boot cover during cleaning and so forth. The rubber boot inside will not return properly if it becomes twisted.

· In the case of horizontal mounting, a D-cover (Downward cover) is highly recommended so as to prevent coolant from entering inside the cover when any one of the switches faces the ground.

· Rubber materials used in some products provide protection against water-soluble coolants and alkaline liquids. (Refer to P5-4)

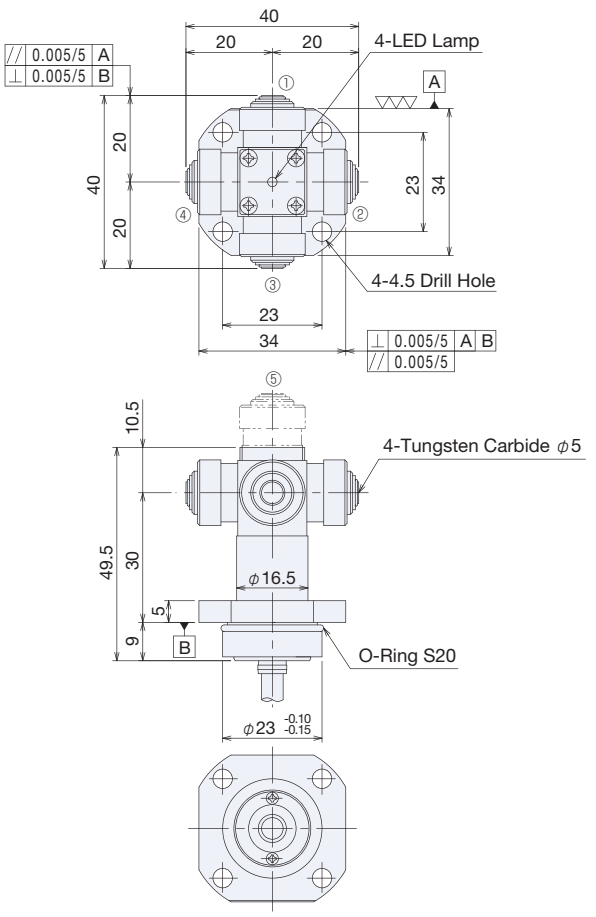
●Precautions for Tool Setters ····· P3-1
●Precautions for sensor connecting ····· P5-1
●Cable options ····· P5-2
●Technical guide ····· P5-3

1 Signal Type

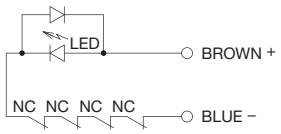
Tool Setter for CNC Lathes Lenear Type

■Outer dimensions

H4A-001



●Circuit diagram



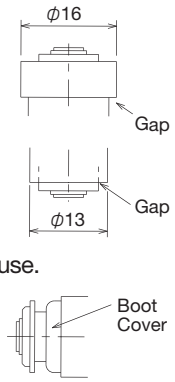
●Protective boot cover

Select a type that prevents coolant from entering through the gap and accumulating inside.

U type (standard)
Upward, sideways

D type
Downward
Detecting direction
: select from ①~④

Not required
Always make sure to enclose when not in use.



Specification sheet

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Optional specifications (**Bold**:Standard) Date:(mm,dd,yy) _____

Location No. of detecting direction	☐ ① ☐ ② ☐ ③ ☐ ④ ☐ ⑤
Protective boot cover	☐ **U type** ☐ Direction number including D type _____ ☐ Not required (Case of enclosed types)

Cable options (1m/unit)

Length / Protective cable		_____ m / ☐ Not required ☐ Protective tube_____ m (Upper limit :15m) ☐ Wire braid_____ m (Upper limit :10m)
Connector (Refer to P5-2)		☐ Not required ☐ Connector
Machine side cable option from connector (if desired)	Length	_____ m
	Protective cable	☐ Not required ☐ Protective tube_____ m (Upper limit :15m) ☐ Wire braid_____ m (Upper limit :10m)

Company :
Dept. / Title :
Customer name :
Address :
Tel : Fax :
E-mail :
Other (if any) :

Ordering and Inquiries

1.Customer Fill out the specification sheet and send to Metrol.

Fax or E-mail

2.Metrol Send the drawing(s) of specific model based on spec sheet received.

Fax or E-mail

3.Customer Select/confirm the specific model by the customer.

Fax or E-mail

4.Customer /Metrol Placement of order

Metrol sends the quote,and the customer places the order for the same.

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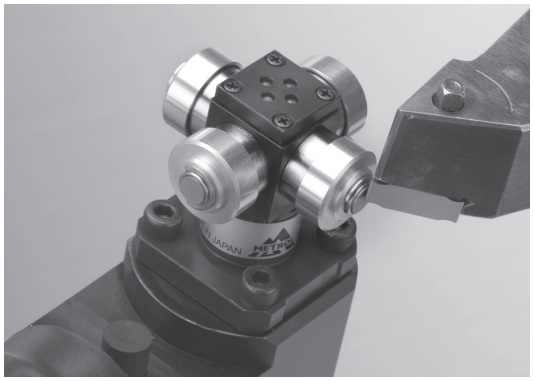
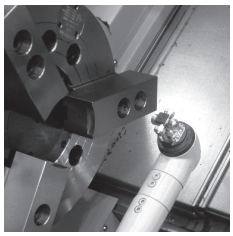
HA

Multiple Signal Type



- Tool setters for CNC lathe are used for precise blade positioning, and detection of the wear and breakage.
- Touch sensors are arranged and directly linked in each direction.
- A different signal is emiitted for each direction (parallel).



Standard specifications

unit:mm

Product name	**HA**
Output mode	NC (Normally close)
Pretravel	Approx. 0
Stroke	2
Repeatability	0.001* (Recommended operating speed of 50 - 200mm/min)
Contact life time	3 million
Protective structure	IP67
Contact force	2N
Contact material	Tungsten carbide
Surface finishing	Grinding 4s
Contact rating	DC5V - DC24V 10mA (Max20mA) resistance load
Cable	Oil resistant ϕ5 / 2 cores Tensile strength 30N, Minimum bending R7
LED lamp	Default : LED ON / Operating : LED OFF

*Repeatability of the arm is not included.

Precautions

- Do not press the adjacent contact simultaneously.
- Do not turn the protective boot cover during cleaning and so forth. The rubber boot inside will not return properly if it becomes twisted.
- In the case of horizontal mounting, a D-cover (Downward cover) is optionally required so as to prevent coolant from remaining inside the cover when any one of the switches faces to the ground.
- Rubber materials used in some products are applicable to water-soluble coolants and alkaline liquids. (Refer to P5-4)

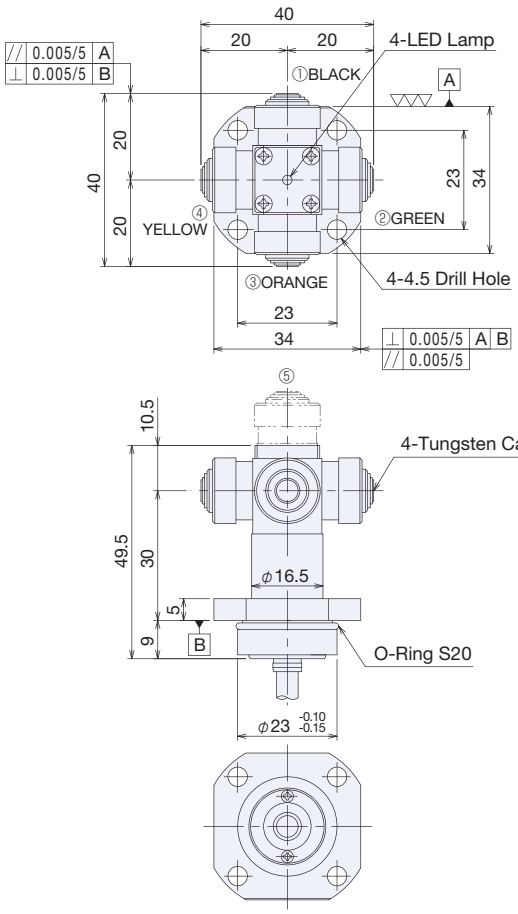
●Precautions for Tool Setters ····· P3-1
●Precautions for sensor connecting ····· P5-1
●Cable options ····· P5-2
●Technical guide ····· P5-3

Multiple Signal Type

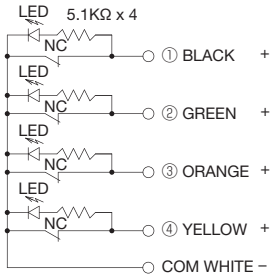
Tool Setter for CNC Lathes Standard Type

■Outer dimensions

H4A-002



●Circuit diagram



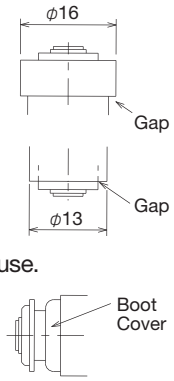
●Protective boot cover

Select a type that prevents coolant from entering through the gap and accumulating inside.

U type (standard)
Upward, sideways

D type
Downward
Detecting direction
: select from ①～④

Not required
Always make sure to enclose when not in use.



Specification sheet

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Optional specifications (**Bold**:Standard) Date:(mm,dd,yy) _____

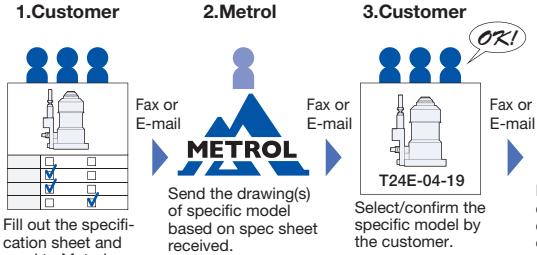
Location No. of detecting direction	☐ ① ☐ ② ☐ ③ ☐ ④ ☐ ⑤
Protective boot cover	☐ **U type** ☐ Direction number including D type _____ ☐ Not required (Case of enclosed types)

Cable options (1m/unit)

Length / Protective cable		_____ m / ☐ Not required ☐ Protective tube_____ m (Upper limit :15m) ☐ Wire braid_____ m (Upper limit :10m)
Connector (Refer to P5-2)		☐ Not required ☐ Connector
Machine side cable option from connector (if desired)	Length	_____ m
	Protective cable	☐ Not required ☐ Protective tube_____ m (Upper limit :15m) ☐ Wire braid_____ m (Upper limit :10m)

Company :
Dept. / Title :
Customer name :
Address :
Tel : Fax :
E-mail :
Other (if any) :

Ordering and Inquiries



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Select/confirm the specific model by the customer.

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Rotating Contact Type

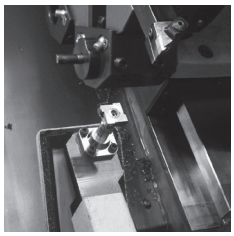
H4D

Tool Setter for CNC Lathes

1 Signal Type

■Tool setters for CNC lathe are used for precise tool bit positioning, and detection of the wear and breakage.

■Dimensions from the contact to the edge have been reduced.



■Standard specifications

unit:mm

Product name	**H4D**
Output mode	NC (Normally closed)
Pretravel	Approx. 0
Stroke	2
Rotating direction	Clockwise / Counterclockwise
Repeatablity	0.001* (Recommended operating speed of 50 - 200mm/min)
Contact life time	3 million
Protective structure	IP67
Contact force	2N
Contact material	Tungsten carbide
Surface finishing	Grinding 4s
Contact rating	DC5V - DC24V 10mA (Max20mA) resistive load
Cable	Oil resistant ϕ5/ 2 cores Tensile strength 30N, minimum bending R7

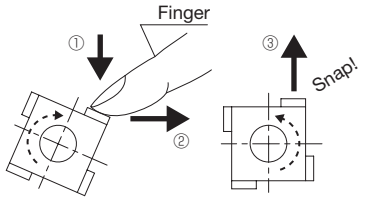
*Repeatability of the arm is not included.

■Precautions

· Do not rotate in the opposite direction of the specifications.

· Rubber materials used in some products provide protection against water-soluble coolants and alkaline liquids. (Refer to P5-4)

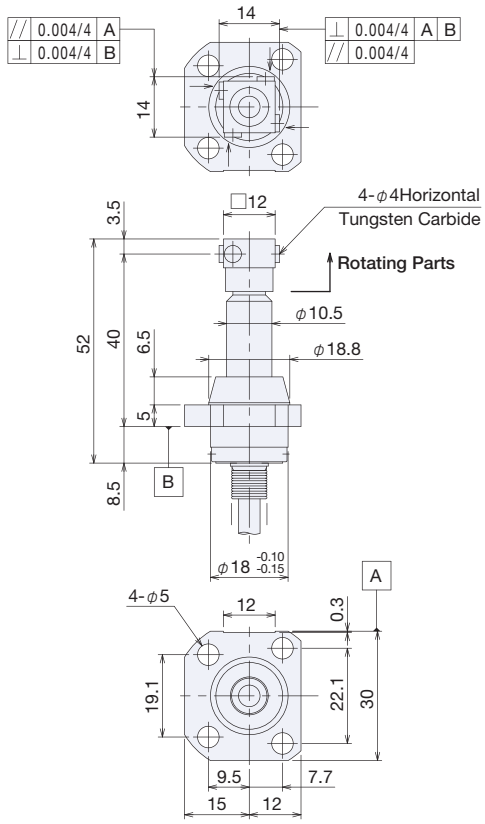
· After pushing the detecting contact surface to the stroke end with your finger, do not remove your finger suddenly as show in the drawing.
Such action often causes a malfunction resulting from disengagement of internal components. When pushing the detecting contact by a tool during operation, do not slide the tool sideways while holding it down.



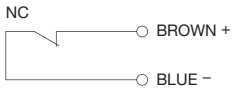
●Precautions for Tool Sette ····· P3-1
●Precautions for sensor connecting ····· P5-1
●Cable options ····· P5-2
●Technical guide ····· P5-3

■Outer dimensions

H4D

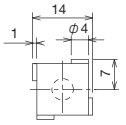


●Circuit diagram

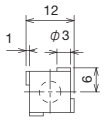


●Contact opposite side length

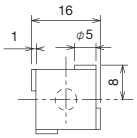
Opposite side length : 14 (standard)
Contact diameter : φ4
Contact force : 1.2N



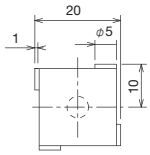
Opposite side length : 12
Contact diameter : φ3
Contact force : 1.4N



Opposite side length : 16
Contact diameter : φ5
Contact force : 1N



Opposite side length : 20
Contact diameter : φ5
Contact force : 0.8N



Specification sheet

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Optional specifications (Bold:Standard) Date:(mm,dd,yy) _____

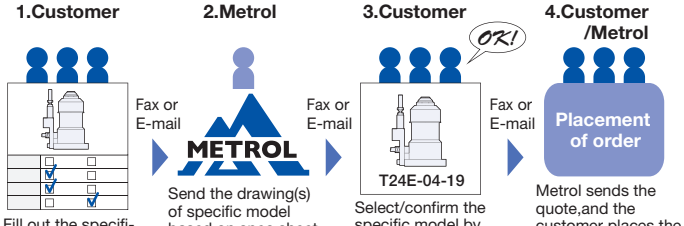
Rotating direction	☐ **Clockwise** ☐ Counterclockwise
Opposite side length contact diameter	☐ **Opposite side length 14 / Contact diameter φ4** ☐ Opposite side length 12 / Contact diameter φ3 ☐ Opposite side length 16 / Contact diameter φ5 ☐ Opposite side length 20 / Contact diameter φ5

Cable option (1m/unit)

Length / Protective cable	_____ m / ☐ Not required ☐ Protective tube_____ m (Upper Limit :15m) ☐ Wire braid_____ m (Upper Limit :10m)	
Connector (Refer to P5-2)	☐ Not required ☐ Connector	
Machine side cable option from connector (if desired)	Length	_____ m
	Protective cable	☐ Not required ☐ Protective tube_____ m (Upper Limit :15m) ☐ Wire braid_____ m (Upper Limit :10m)

Company :
Dept. / Title :
Customer name :
Address :
Tel : Fax :
E-mail :
Other (if any) :

Ordering and Inquiries



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