METROL

For everyone concerned about machining defects and inspection workload

Ultra-small touch probe can easily be mounted even in tiny spaces.
It provides ideal on-machine measurement.

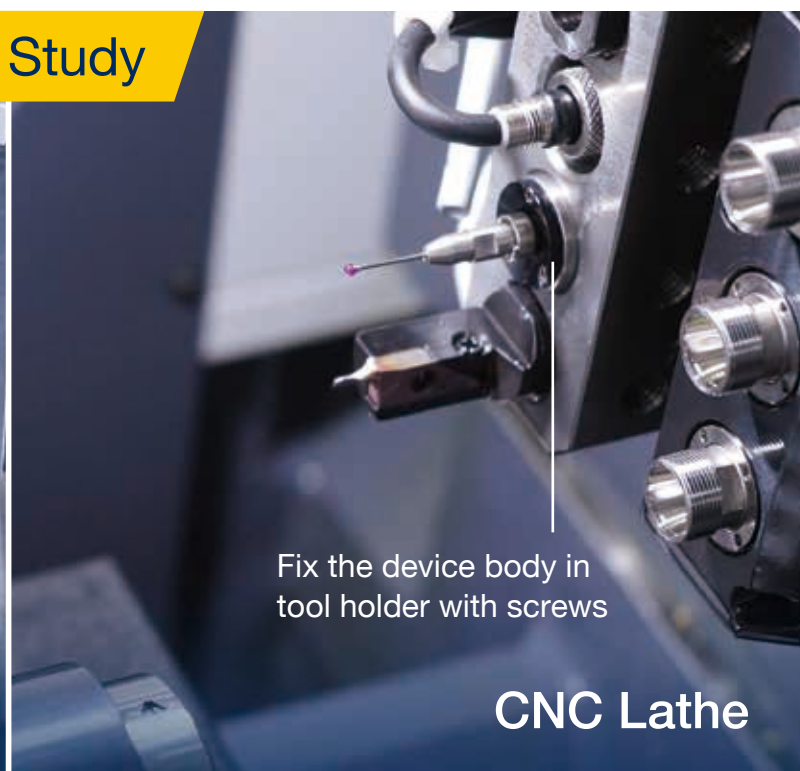| Measuring workpiece dimensions | Zero point setting |

Fits precisely in tool holders

Outer diameter: From **Ø19.05 mm**

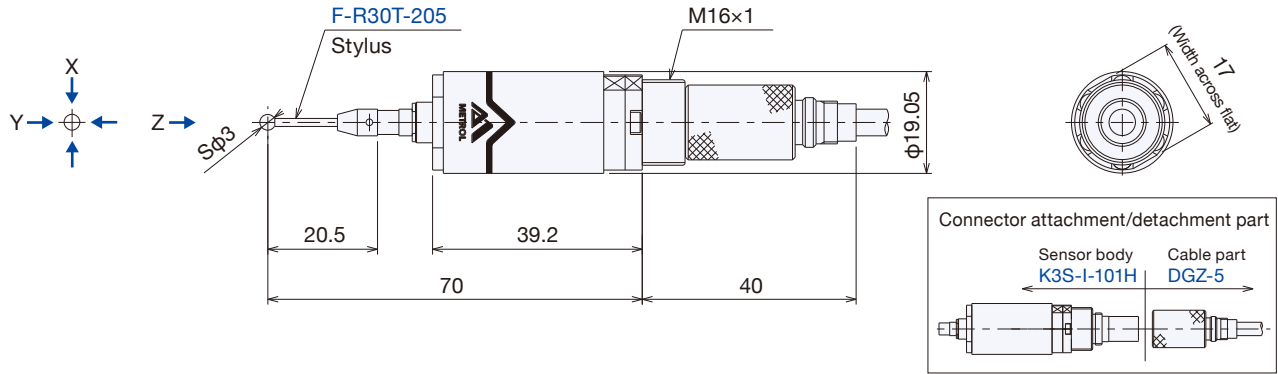---

Case Study

NC Surface Grinder
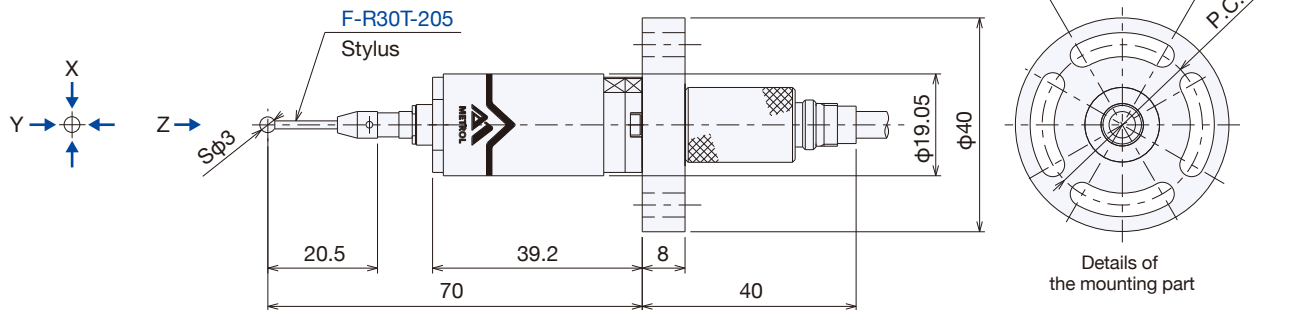
Fix the device body in tool holder with screws

CNC Lathe

■ External Dimensions Diagram

K3S-I-001S (Mounting method: Set screws) Material: Stainless steel

F-R30T-205
Stylus

M16×1

Φ19.05

20.5   39.2

70   40

17 (Width across flat)

Connector attachment/detachment part

| Sensor body | Cable part |
| K3S-I-101H | DGZ-5 |

K3S-M-001S (Mounting method: Flange) Material: Stainless steel

F-R30T-205
Stylus

Φ19.05

Φ40

20.5   39.2   8

70   40

60°   P.C.D.Φ30

Details of
the mounting part

■ Model

Product number	Outer Diameter	Output Mode	Protective Structure	Cable	Mounting Method	Stylus
K3S-I-001S	Φ19.05	NC	IP68	5m	Set screws	**F-R30T-205**
K3S-I-101S						Select from stylus list
K3S-M-001S					Flange	**F-R30T-205**
K3S-M-101S						Select from stylus list

*Please ask us if you wish to use a 10m cable.

CL-Z1 Exterior

In-phase output   Inverted-output

1 4
5 8
9 12
13 14

DC24V
Switch input

21   6.4   35.2

27.4
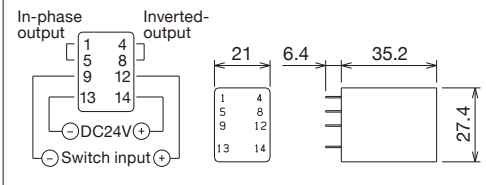
■ Standard Specifications (mm)
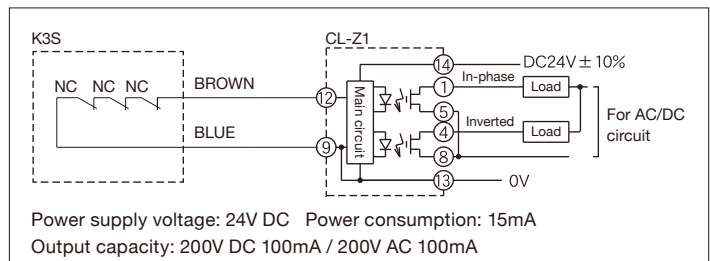
Product name	K3S
Device body material	Stainless steel
Output mode	NC (Normally closed)
Output	NC (Normally closed) or NO (Normally open) (When using the external I/F unit CL-Z1)
Pretravel*	0
Stroke*	X,Y=±9° Z=3.5
Repeatability	0.001 (2σ) (Recommended operating speed of 50 - 500mm/min)
Protective structure	IEC IP68
Contact force*	X,Y=0.5-0.75N Z=5.5N
Contact material	Φ3 Ruby ball
Contact rating	24V DC Steady current: 10mA or less Rush current: 20mA or less
Cable	Oil resistant Φ5 / 2 cores Tensile strength 30N, Minimum bending R7
Operating temperature range	0 - 60°C, Ice-free
Accessories	External I/F unit CL-Z1

*Based on an inspection with the standard stylus (**F-R30T-205**)

■ Precautions

· As the built-in contact serves as a swing fulcrum, excessive operation speed will accelerate the deterioration of the contacts. In addition, as the contact material with low electrical resistance cannot be used, it needs to be energized only during measurement to protect the contact life.

· Operating speed slower than 10mm/min is not recommended.

■ Circuit Diagram

K3S   CL-Z1

NC NC NC   BROWN   DC24V±10%
14 In-phase Load
1
BLUE   5 Inverted Load
4
8   For AC/DC circuit
9
13   0V

Power supply voltage: 24V DC   Power consumption: 15mA
Output capacity: 200V DC 100mA / 200V AC 100mA

*The socket is not included. Use OMRON's MY2 relay socket or terminal block socket.
 Terminal block socket: OMRON PYFZ-08

Stylus list (mm)

| Model | Material | | D | Φd | L1 | L2 |
	Contact	Shaft				
F-R60C-405	Ruby	Ceramic	6.0	3	40.5	33
F-R50T-405		Cemented carbide	5.0	2.5	40.5	33
F-R40T-405			4.0	2.0	40.5	33
F-R30T-405			3.0	1.5	40.5	33
F-R20T-205			2.0	0.8	20.5	13

Ball D   M3
Φd
L2
L1   4   Φ5
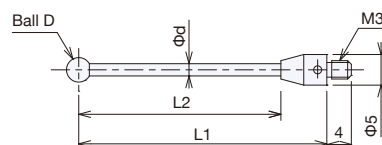
*Example of entry when ordering: **K3S-I-101S** (device body) + **F-R20T-205** (stylus)

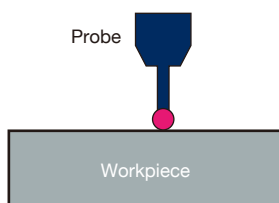## Case Study 1 | Full automation of CNC grinder workpiece measurement
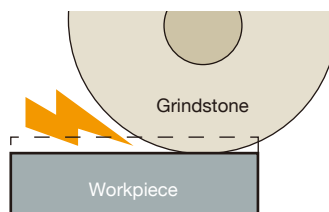

Touch probe for workpiece measurement

Position detection / zero point setting
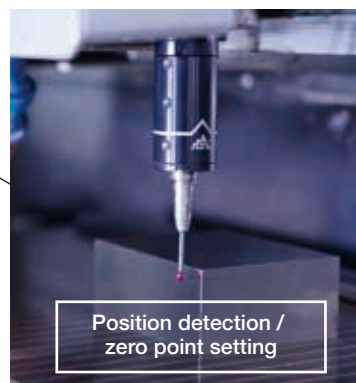
Mounting example:
Okamoto Machine Tool Works, Ltd.: CNC high-precision form grinder HP500NCS

Measurement Image

(1) Setting zero point
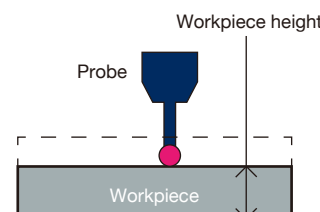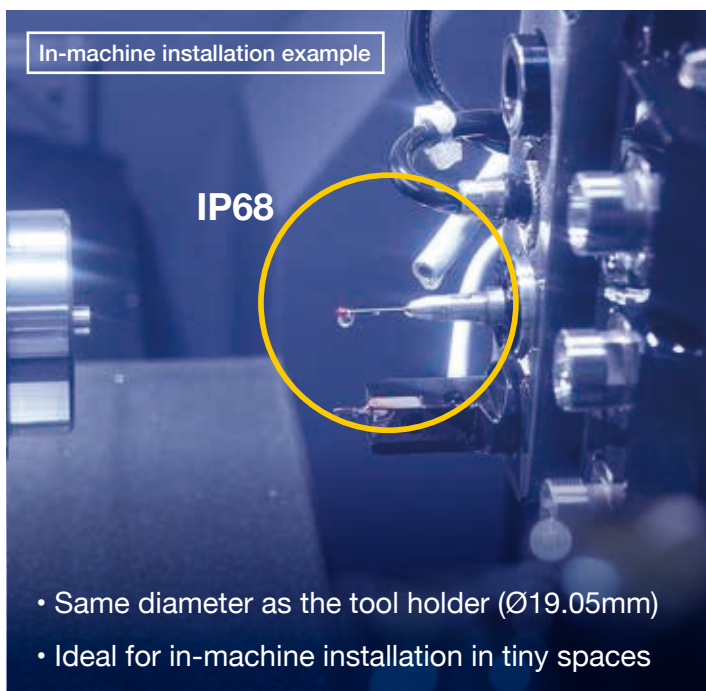
Probe

Workpiece

(2) Grinding

Grindstone

Workpiece

(3) Measuring height after machining

Workpiece height

Probe

Workpiece

Case Study 2 | Workpiece inside & outside diameter inspection in the CNC lathe

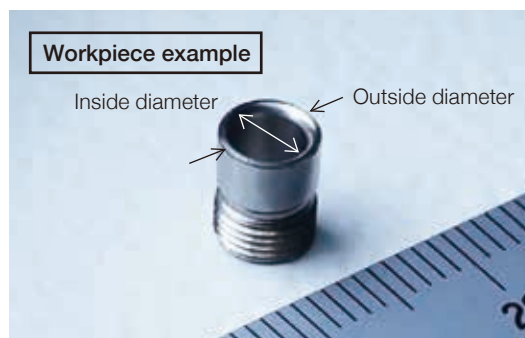**In-machine installation example**

IP68

Workpiece example

Inside diameter

Outside diameter

- Same diameter as the tool holder (Ø19.05mm)
- Ideal for in-machine installation in tiny spaces

Mounting example:
CITIZEN MACHINERY: CNC lathe Cincom

Contact us for product customization and selection

We will meet your needs with a sensor designed just for you as sensor development professionals.

Examples of Inquiries

- We want to use a sensor to detect…, but we don't know **which one to choose**.
- Is it possible to **further miniaturize** the sensor that we are currently using?
- We would like to **change the material of the parts** used in the senor.
- We would like you to design the sensor **to match the operation of our device**.
- We want you to change the **shape of the sensor**.
- Wiring is difficult, so we would like you to make it **wireless**.

Examples of customization

The K3S Series has a wide range of customizable options for mounted devices.

Device body material: SUS model

Flange mounting model
Flange

Direct-out connector model
Connector

Contact

Please feel free to contact us about your product selection questions and technical inquiries. Our highly-experienced switch development designers will directly handle your inquiry.

● **Technical Inquiries Desk**
(Available: 8:30 a.m. to 5:30 p.m. on weekdays)

TEL +81-50-5558-7366
Please contact us by telephone if you are in a hurry (mobile phone OK)

FAX +81-42-528-1442

e-mail **touchsensor@metrol.co.jp**

● **Website**

We feature a technical blog for engineers and improvement case studies on the Metrol website.

metrol-sensor.com

METROL

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K3S-E-K001