



CNC Enhancement Accessories



Probing System

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www.silvercnc.com



*A large number of customer application cases can prove :
High accuracy and stability*

SilverCNC probing system

Silvercnc provide total solution of on-line measuring for machine tools. Whatever your machine, application or difficulty, there is a Silvercnc probing system that will transform your manufacturing process and increase your profitability

Our Misslon: We hope to help customers solve problems, help our customers find the most appropirate products,and help our customers reduce cost

Our Values: Honesty and win winWe believe that honesty is very important.Honesty can make us trust each other more. We also pay attentlon to win-win, Only win-win can make our relationship more lasting

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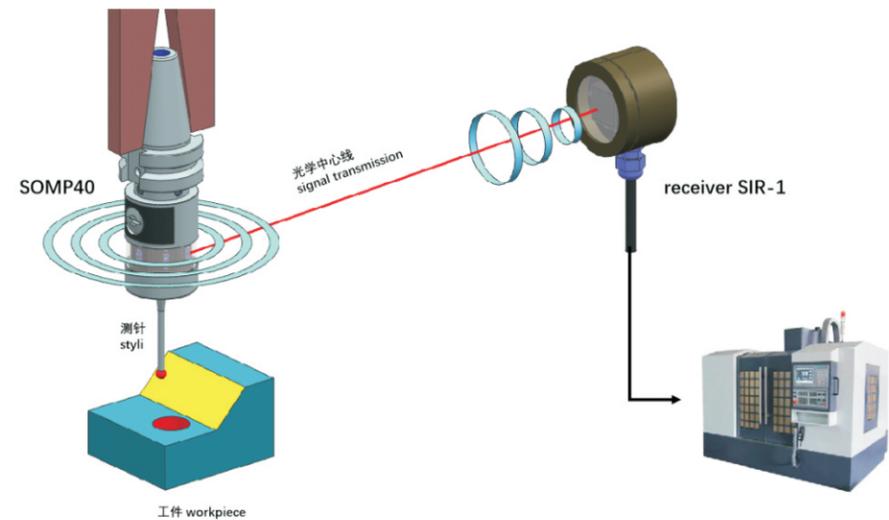
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Machine tool touch probe

SilverCNC probing system

The following figure shows a typical workpiece measurement system, The higher the degree of human involvement in the manufacturing process, the higher risk for error. Automated in-process measurement using touch probes can help eliminate the risk.

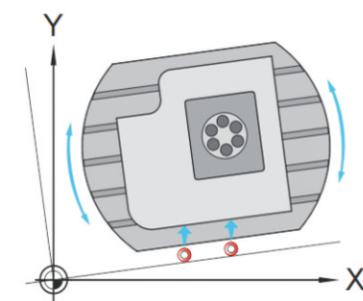
SilverCNC touch probe system can facilitate the following measures for enhanced management of your production, leading to an increase in your profits.



Benefits of touch probe

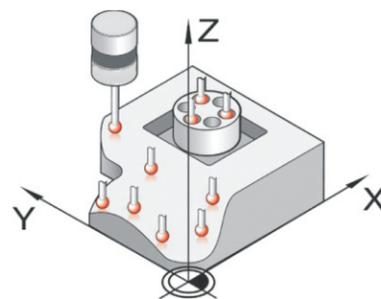
Process setting:

- 1.Reduced machine downtime,
- 2.Automatic fixture, job alignment and rotary axis set-up,
- 3.Manual setting errors eliminated,
- 4.Increased productivity and batch-size flexibility.



Inspect feature dimensions on-machine

- 1.In-cycle part measurement with automatic offset correction
- 2.Increased confidence in unmanned machining
- 3.Adaptive machining, providing process feedback to minimise variation
- 4.First-off inspection with automatic offset update
- 5.Reduced machine downtime awaiting first-off inspection results



SilverCNC touch probe technology

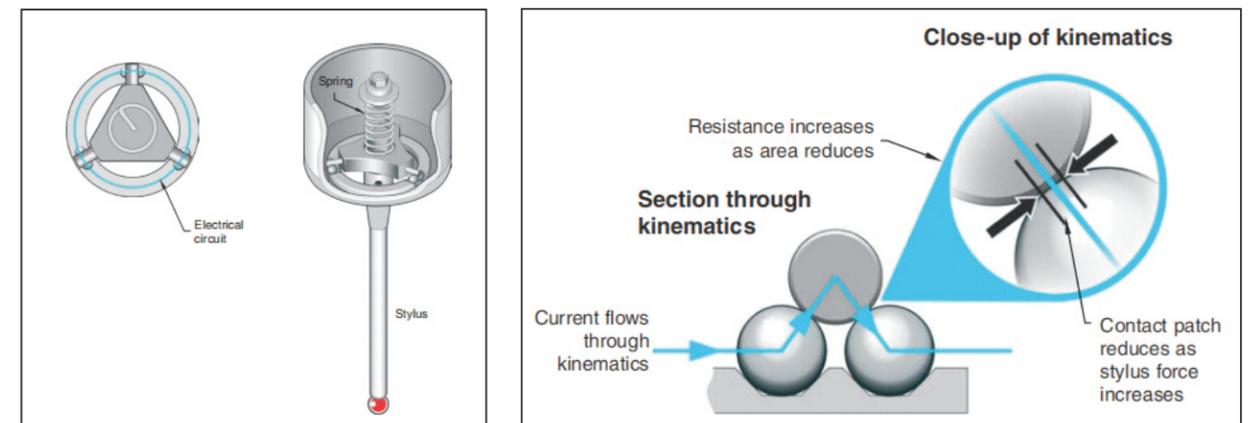
Mechanical technology

SilverCNC probe adapt Kinematic resistive technology, which is the same as renishaw brand, three equally spaced rods rest on six tungsten carbide balls to provide six points of contact.

Under load of the spring, contact patches are created between the balls and the rods through which the electrical current flows. Upon making contact with (touching) a workpiece, the force translated through the stylus moves the balls and rods apart thus reducing the size of the contact patches and increasing their electrical resistance.

When a defined threshold is reached the probe is triggered.

Repeatable electrical triggering and mechanical reseating of the mechanism are critical to this process and fundamental to reliable metrology.



Reliable Circuit technology

1. SilverCNC use coded signals optimized optical communication technology, to sure that the signal transmission is stable, response speed fast, and don't lose signals.
2. SilverCNC probe adopts the multi-threshold power consumption control technology, which greatly reduces the product power consumption, and by optimizing the chip design and circuit design, improves the battery life further.

SilverCNC touch probe details

Probe receiver

The probe receiver is a newly designed and developed product, which has the following advantages:

1. Compact structure and wide applicability. The diameter of the receiver is only 52mm, installation more convenient.
2. The universal adjustment mechanism is adopted to facilitate the alignment of the probe direction, which is more flexible than the traditional mechanism.
3. The strong magnet is installed on the metal parts of the machine tool to avoid the trouble of disassembly and assembly of screws.
4. Adopt positive and negative power protection design to avoid problems caused by wrong wiring.
5. The 4-core installation mode is adopted to simple the installation difficulty and risk greatly.



Tool holder

The probe connected to the machine tool spindle through the tool holder. When the measurement program don't executed, it can be conveniently stored in the tool magazine. Various types of tool holders are delivered with the probe. A complete selection is listed here, non-standard tool holder can be provided on request. Common tool holder include:

- ISO10, ISO20
- BT30, BT40, BT50
- HSK-E25, HSK-E32, HSK-E40
- CAT30, CAT40



Styli

SilverCNC offers probe styli with various ball-tip diameters and stylus lengths. All styli are attached to the touch probes with an M4 thread. Starting from a ball-tip diameter of 4 mm, a rated breaking point protects the touch probe from mechanical damage caused by operator error.

The standard probe is a 4 * 50 ruby probe, which is delivered with the probe. For other types of probe, please see the detailed list



Hardware and marco program

Hardware

A standard touch probe contains the following accessories, which can be used after installation and debugging without the need to purchase additional accessories, list:

Model	Quantity	Specification
probe	1 piece	standard
reciver	1 piece	standard
styli	1 piece	standared is $\phi 4 * 50$ flat stylus
battery	2 piece	SaFT 14250
tool holder	1 piece	BT30/BT40
pull stud	1 piece	match with tool holder
Magnetic base	1 piece	standard
spanner	1 piece	standard



Marco

SilverCNC are basically universal with renishaw ,to measure 2D dimensions, no additional software is required, only marco needed.

Macro program templates can be provided. If have experience in using Renishaw , Blum and Marposs probes, you can also use their programs directly. just need to change a few parameters.

Many brands of CNC controler system can installed successfully include: FANUC, Brothers, Mitsubishi, Siemens, Heidenhain, SYNTEC, LNC,FAG, Haas, Mazak, Makino and so on.

Wireless touch probe - SOMP40/SRMP40

Features:

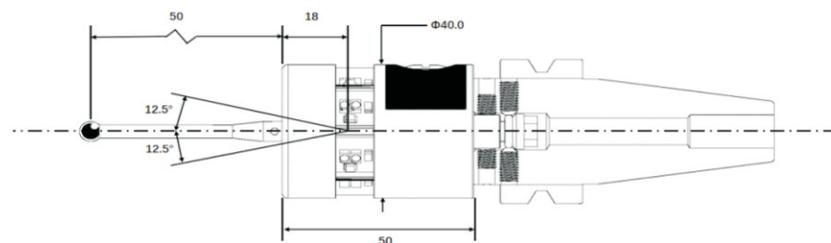
- Compact design, probe diameter only 40mm, with tool holder, can used on kinds of machine tools.
- repeatability 1um (50mm styli at 600mm/min speed), good stability
- Ultra low power design, battery life up to 300 days year when normal use



Specification

Model	SOMP40		SRMP40	
Unidirectional repeatability (Use standard 50mm probe styli at 600mm/min speed)	1um (2σ)		1um (2σ)	
Sense directions	±X,±Y,+Z		±X,±Y,+Z	
Stylus trigger force (Use standard 50mm probe)	XY plane: 0.4 - 0.8N	Z direction: 4.0N	XY plane: 0.4 - 0.8N	Z direction: 4.0N
Trigger protection trip	XY plane +/-12.5°	Z direction 6.35mm	XY plane +/-12.5°	Z direction 6.35mm
3	Optical transmission		Radio transmission	
Operating range	5m		15m	
Trigger life	>10 Million times		>10 Million times	
Transmission angle	360 ° along the probe axis		360 ° along the probe axis	
Transmission on/off style	NO		NO	
Weight without shank (including batteries)	260g		300g	
type of battery	2x lithium battery 14250		2x lithium battery 14250	
battery life	Standby	>500 days	Standby	>500 days
	5% use	>450 days	5% use	>450 days
	continue use	>300 days	continue use	>300 days
Sealing	IP68		IP68	
Operating temperature	0-60°C		0-60°C	

Dimensions



Cable touch probe - SLP25

Features:

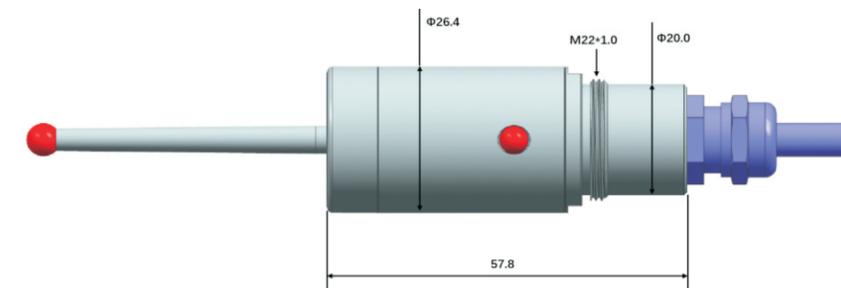
- The trigger signal is transmitted to the machine tool through hard cable, which is stable and reliable.
- Adapt Kinematic resistive technology to make sure good repeatability.
- Suitable for machining applications without tool change.



Specification

Model	SLP25	
Unidirectional repeatability (Use standard 50mm probe at 60mm/min speed)	1um (2σ)	
Sense directions	±X,±Y,+Z	
Stylus trigger force Use standard 50mm probe	XY plane 0.4 - 0.8N	Z direction 4.0N
Trigger protection trip	XY plane: +/-15°	Z direction: 6.35mm
Signal transmission method	Hard wired	
Trigger life	>10 Million	
Transmission on/off style	NO	
Weight without shank (including batteries)	80g	
Hard wire	5m, oil resistance, 4 core	
Sealing	IP68	
Operating temperature	0-60°C	

Dimensions



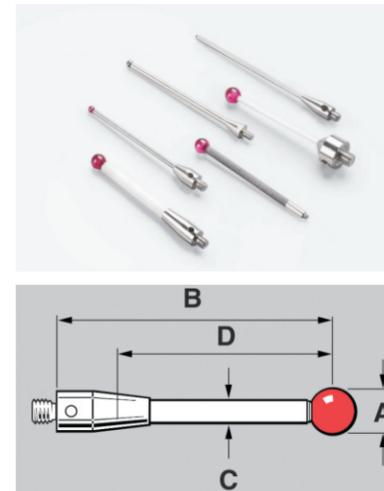
Machine tool styli

Styli introduction

The design and quality of stylus have a decisive influence on measurements in tactile metrology. If the roundness of the styli ball is poor, the position incorrect, the deformation of the ball and the thread tolerance is large, which will lead to the measuring rod large deformation. Any error may become an influencing factor of measurement uncertainty and may reduce the measurement accuracy by up to 10%

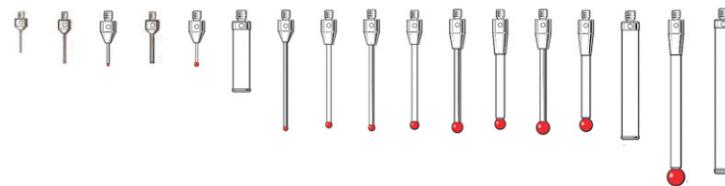
SilverCNC provide various specifications of touch probe styli, small deformation, stable quality and reasonable price.

For more types of styli information, please get the detailed styli list.

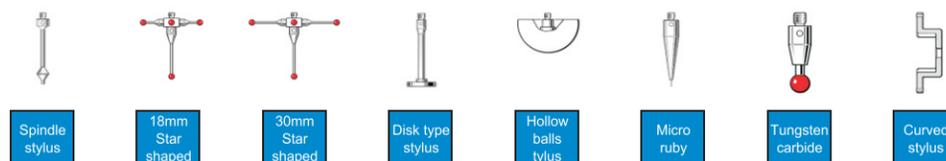


Common models

pointed end material	Tungsten steel	Tungsten steel	Ruby	Tungsten steel	Ruby	Ceramic	Ruby	Ruby	Ruby	Ruby	Ruby	Ruby	Ruby	Ruby	Ceramic	Ruby	Ceramic
pointed end Diam A/mm	0.5	1.0	1.0	2.0	2.0	7.4	2.0	3.0	3.0	4.0	5.0	5.0	6.0	6.0	7.4	6.0	7.4
styli material	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel	Ceramic	Ceramic	Tungsten steel	Ceramic	Ceramic	Ceramic	Ceramic						
Total length B/mm	10.0	20.0	20.0	20.0	30.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	100.0	100.0
Effective length D/mm	5.0	10.0	10.0	10.0	10.0	30.0	40.0	40.0	40.0	40.0	35.0	35.0	35.0	35.0	50.0	85.0	100.0



pointed end material	Ruby	carbon fibre															
pointed end Diam A/mm	4.0	5.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	3.0	3.0	3.0	6.0	3.0	6.0	6.0	6.0
styli material	carbon fibre																
Total length D/mm	30.0	30.0	30.0	50.0	50.0	100.0	150.0	200.0	200.0	40.0	50.0	70.0	80.0	90.0	100.0	150.0	200.0
Effective length B/mm	25.0	25.0	25.0	40.0	40.0	85.0	135.0	185.0	185.0	40.0	50.0	70.0	80.0	90.0	100.0	150.0	200.0



Machine tool tool setter

SilverCNC tool measurement solutions for machining centres

- SilverCNC has provide a range of tool setters, offering both contact and non-contact tool measurement and broken tool detection,
- Various principles models tool setter available for your choice: 3D touch trigger, wireless(infrared and radio), Optoelectronic trigger.
- Large number of machine tool machining applications case can prove the accuracy and stability level.

Various tool setter models features:

Contact tool setters	Machine model	Signal transmission	tool setting	Minimum tool detection	Repeatability (2σ)
SLTS	Small – large	Hard-wired	tool length and diameter	Ø1.0 mm	1.0 μm
SOTS	Small – large	Infrared	tool length and diameter	Ø1.0 mm	1.0 μm
SRTS	Small – large	Radio	tool length and diameter	Ø1.0 mm	1.0 μm
SPTS20/10	Small – large	Hard-wired	only tool length	Ø1.0 mm	1.0 μm
M-P11/P21-10	Small CNC Machining Centers	Hard-wired	only tool length	Ø1.0 mm	1.0 μm
M26D	Small – large	Hard-wired	only tool length	Ø1.0 mm	1.0 μm
M-T24E-20/40/60	large	Hard-wired	only tool length	Ø1.0 mm	1.0 μm

Non-actant tool setters	Machine model	Signal transmission	tool setting	Minimum tool detection	Repeatability (2σ)
SNC86	Small – large	laser	tool length and diameter	Ø0.03 mm	±1.0 μm

Benefits of automated tool setter

Before machining, accurately setting the length and diameter of the cutting tool on the CNC machining center can reduce waste materials and improve productivity.

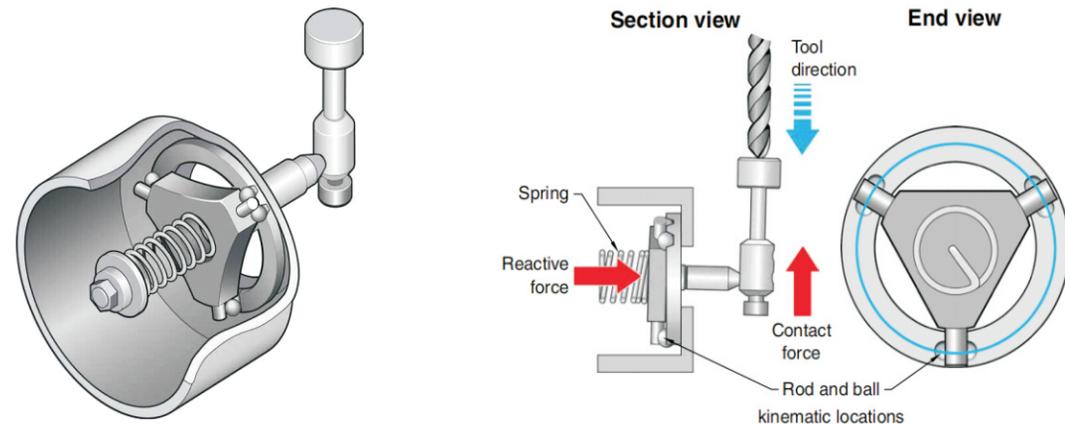
Tool setting probes are easily installed on machining centres and CNC turning centres, allowing automated operation with the following benefits:

1. Significant time savings with reduced machine downtime
2. Accurate tool length and diameter measurement
3. Automatic tool offset calculation and correction
4. Elimination of manual setting errors
5. In-cycle tool breakage detection
6. Reduced scrap

3D Touch trigger tool setter - SLTS

SLTS technology

- 1.The SLTS tool setter use a proven technology -kinematic resistive principle(the same as renishaw) that can stably operate for long time.
- 2.Proven over four decades, this design has been the main choice for the majority of machine builders and end users to ensure accuracy and reliability.
- 3.The ability of the probe mechanism to reset after triggering to within 1.00 μm is fundamental for repeatability and good metrology.
- 4.From simple length and radius checking to broken tool detection, this technology is available in silvercnc touch probe and contact tool setters.



SLTS Tool setter benefits:

- In addition to measuring tool length, breakage and broken tool detection, it can also detect tool diameter
- Alarm signal will occur in the course of travel and damage accident will be prevented.
- 1 μm (0.001) repeatability precision improves the processing precision.
- Shorten the measuring time, improve the efficiency of the operation of the machine tool
- Automatic operation, save labor, prevent the emergence of substandard products
- Applicable to the Engraving machine and all kinds of control machinery in Japan, Taiwan, South Korea, China, Germany. Such as fanuc, SYNTEC, LNC, Siemens, FAGOR, Mitsubishi, etc.

Cable 3D Touch trigger tool setter - SLTS

Features:

- The 3D touch tool setter use cable probe as trigger signal source,
- Touch trigger signal transmission to to machine tool though hard cable.
- Mature technology,1 μm repeatability, good signal stability

Specification:

model	SLTS
output	NO(Normally open)
Sense directions	$\pm X, \pm Y, +Z$
Pretravel	0
travel	XY $\pm 12.5^\circ$, Z-6.35mm
Repeatability	<1 μm
Trigger life	>10million
Protect structure	IP68
contact force	XY0.4N-0.8N,Z-4.0N
Signal transmission	Cable
Contact material	Tungsten carbide
Surface finishing	Grinding 4s
Rated voltage and current	DC24V 20mA
Cable	Oilresistant,standard3m(length can becustomized), Minimum radius R7
LED lamp	Default: LED OFF/Operating: LED ON

Wiring diagram of tool setting

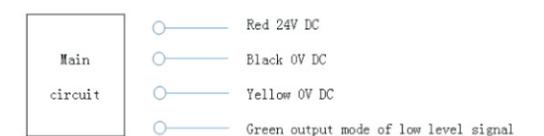
A:output mode of high level signal:

Electrical circuit diagram

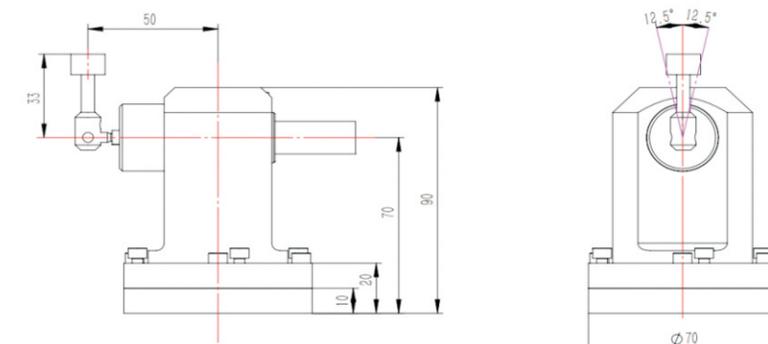


B.output mode of low level signal :

Electrical circuit diagram



Dimensions



Wireless 3D touch trigger tool setter - SOTS/SRTS

Optoelectronic signal trigger tool setter - SPTS20

Features:

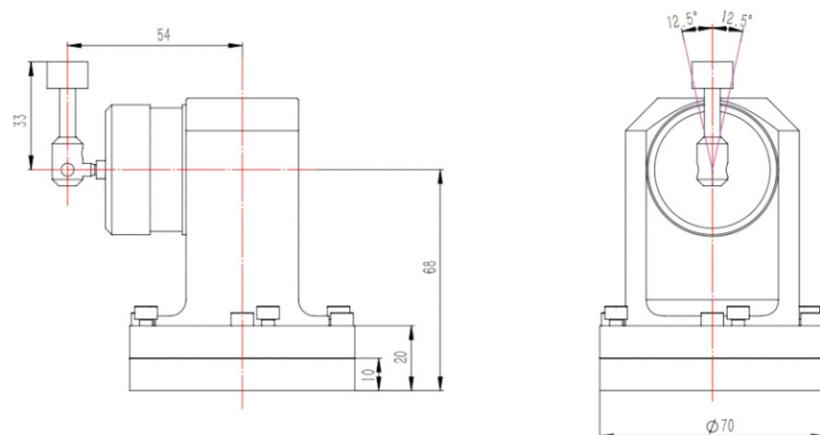
- The wireless tool setter use infrared or radio probe as trigger signal source
- SIR or SRR as the tool setter signal receiver.
- Mature technology, 1um repeatability, good signal stability
- Can share a receiver with the workpiece touch probe



Specification:

model	SOTS	SRTS
output	NO(Normally open)	NO(Normally open)
Sense directions	$\pm X, \pm Y, +Z$	$\pm X, \pm Y, +Z$
Pretravel	0	0
travel	XY $\pm 12.5^\circ$, Z-6.35mm	XY $\pm 12.5^\circ$, Z-6.35mm
Repeatability	<1um	<1um
Trigger life	>10million	>10million
Protect structure	IP68	IP68
contact force	XY0.4N~0.8N,Z-4.0N	XY0.4N~0.8N,Z-4.0N
Signal transmission	Infrared	Radio
Contact material	Tungsten carbide	Tungsten carbide
Surface finishing	Grinding 4s	Grinding 4s
Rated voltage and current	DC24V 20mA	DC24V 20mA
Cable	Oilresistant, standard 3m (length can be customized), Minimum radius R7	Oilresistant, standard 3m (length can be customized), Minimum radius R7
LED lamp	Default: LED OFF/Operating: LED ON	Default: LED OFF/Operating: LED ON

Dimensions



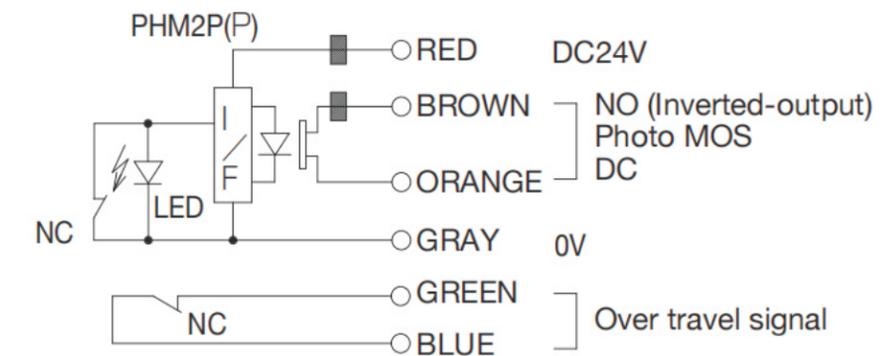
The SPTS series tool setter composed by a photoelectric switch, a with high hardness and wear resistance contact, a signal transmission interface. the photoelectric switch is key parts, When the sensor beam is interrupted, a trigger signal will be sent out and transmitted to the NC system through the interface device to identify, calculate, compensate and access the tool length



Advantage of optoelectronic tool setter

- Enables much higher measuring speeds than with conventional tool setter
- High precision (<0.5um (2σ)) and stable signal
- Wear-free with long-term stability

Circuit diagram



Power supply voltage : DC24V
 Power consumption : 10mA
 Output capacity : DC60V 100mA (Resistance load)

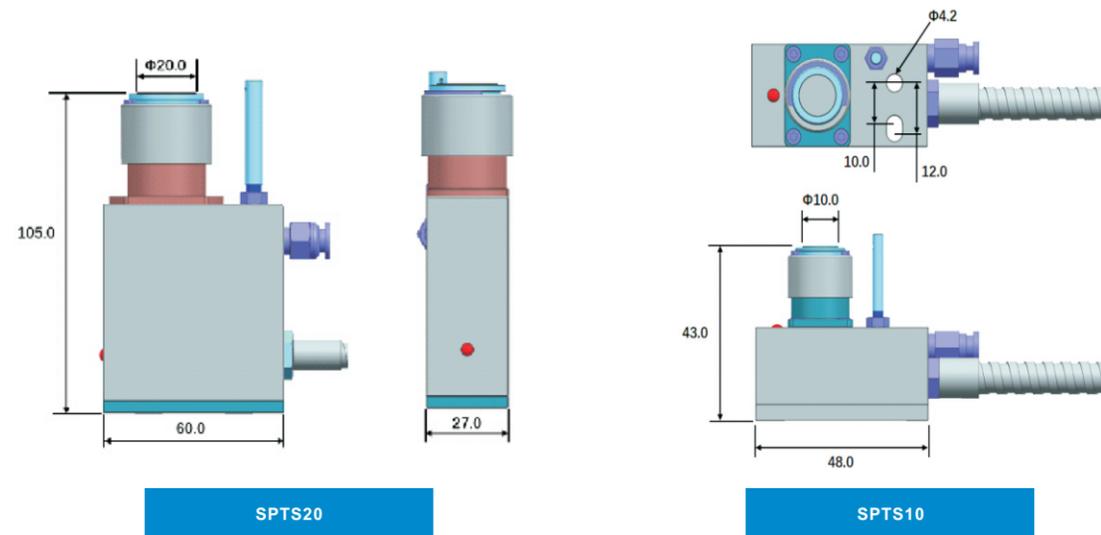
Optoelectronic signal trigger tool setter - SPTS20

Z axis touch trigger tool setter - M series

Specifications

Product	SPTS20	SPTS10
Contact diameter	20	10
Direction	Z	Z
Pretravel	No	No
Signal	Normally open	Normally open
Stroke	11	5.4
Protective stroke	5.5	No
Repeatability	0.5um	0.5um
Contact life time	20 million times	20 million times
Signal transmission	cable	cable
sealing	IP68	IP68
Contact force	1.5N (Installation position: Vertical)	1.3N (Installation position: Vertical)
Surface finishing	Grinding 4s	Grinding 4s
Contact material	Tungsten carbide	Tungsten carbide
Contact rating	DC24V 20 mA resistive load	DC24V 20 mA resistive load
Cable	5m	1.5m
LED lamp	Default : LED OFF / Operating : LED ON	Default : LED OFF / Operating : LED ON

Dimession



Summary

Silvercnc M series is a contact switch type tool setters ,The trigger signal is transmitted through the opening and closing of the precision contact switch.

In addition to presetting tool length, tool setters can be used to detect wear and breakage and correct thermal distortion.

Shorten the measuring time of tools and improve the running time of machine tools,Save manpower and prevent unqualified products



Features

- As the signal is output by directly contacting the leading edge of the tool, it does not cause false positives and has high reliability.
- The internal switch is of the contact type with high precision (repeatability: 1 μ m), and is free of movement differential.
- Since there is no need of an amplifier, there is no temperature drift caused by self-generation and temperature characteristic of the sensor unit.
- Dustproof and waterproof structure has superior durability even under harsh conditions caused by the presence of coolant and cuttings.
- Outputs over-travel warning signal .(exclude P11)

Product selection

Product model	M-P11-10	M-P21-10	M26D-20	M-T24E-20/40/60
Contact diameter	Ø10mm	Ø10mm	Ø20mm	Ø20/40/60mm
Stroke	3mm	3	5mm	12mm
Bearing	Metal bearing	Metal bearing	Metal bearing	Linear bearing
Over travel signal	Not Equipped	Equipped	Equipped	Equipped
Machine	Small CNC Machining Centers	Small CNC Machining Centers	Small CNC Machining Centers	CNC Machining Centers
Shape	Flat Type	Flat Type	Cylindrical Type	Cylindrical Type

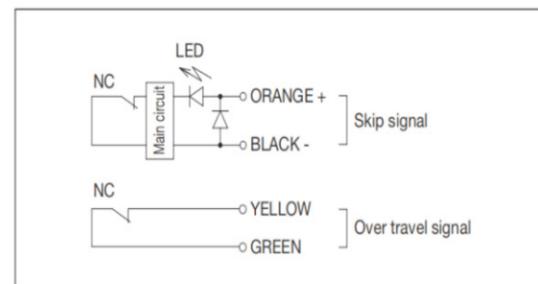
Z axis touch trigger tool setter - M series

Dimensions

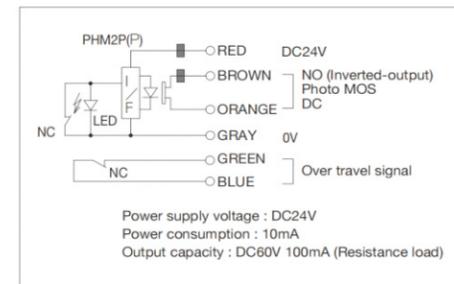
Specifications

Product Models	M-P11-10	M-P21-10	M26D-20	M-T24E-20/40/60
Contact diameter	Ø10mm	Ø10mm	Ø20mm	Ø20/40/60mm
Surface finishing	Grinding 4s	Grinding 4s	Grinding 4s	Grinding 4s
Contact material	Tungsten carbide	Tungsten carbide	Tungsten carbide	Tungsten carbide
Contact structure	NC (Normally closed)	NC (Normally closed)	NC (Normally closed/open)	NC (Normally open)
Pretravel	0	0	0	0.5mm
Stroke	3mm	5mm	5mm	12mm
Repeatability	0.001(Recommended operating speed of 50 - 200mm/min)	0.001(Recommended operating speed of 50 - 200mm/min)	0.002(Recommended operating speed of 50 - 200mm/min)	0.002(Recommended operating speed of 50 - 200mm/min)
Contact life time	3 million	3 million	3 million	3 million
Protective structure	IP67	IP67	IP67	IP67
Contact force	1.5N (Installation position: Vertical)	1.5N (Installation position: Vertical)	1.5N (Installation position: Vertical)	2.5N (Installation position: Vertical)
Cable	Oil resistant, standard 3 m (length can be customized)φ5/ 2cores	Oil resistant, standard 3 m (length can be customized)4cores	Oil resistant, standard 5 m (length can be customized)φ 4.8 / 6 cores	Oil resistant, standard 5 m (length can be customized)φ4.8 / 6 cores
LED lamp	NONE	NONE	Default : LED OFF / Operating : LED ON	Default : LED OFF / Operating : LED ON
Over travel signal (built-in microswitch)				
Output mode	NONE	NC normally closed (an emergency stop when the signal broken)	NC normally closed (an emergency stop when the signal broken)	NC normally closed (an emergency stop when the signal broken)
Contact rating	NONE	DC24V 20 mA resistive load	DC24V 20 mA resistive load	DC24V 20 mA resistive load

Circuit diagram

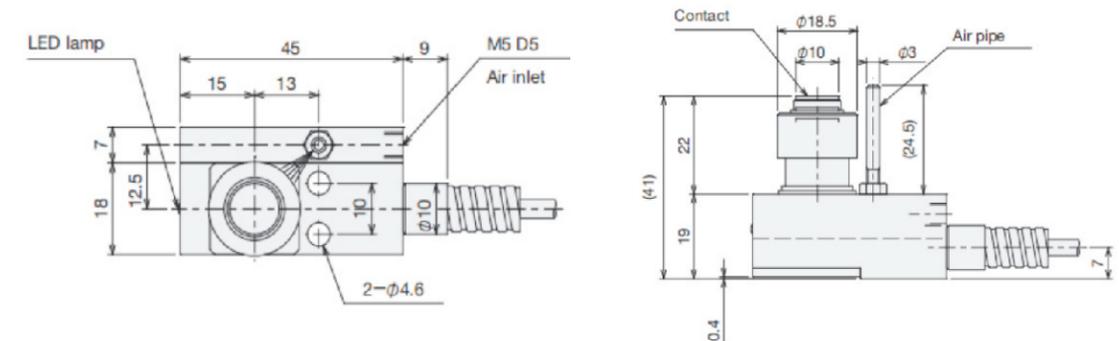


M-P21-10

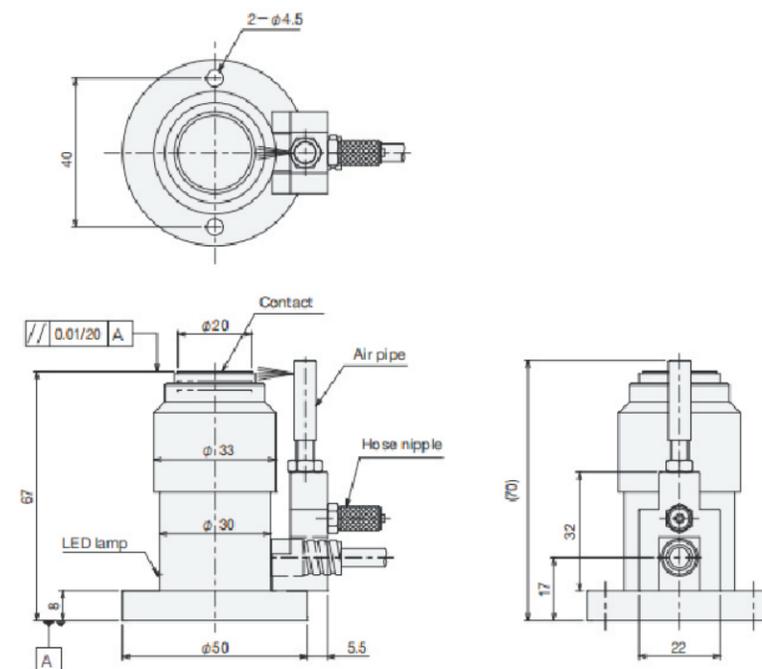


M26D / M-T24E-20/40/60

M-P21-10



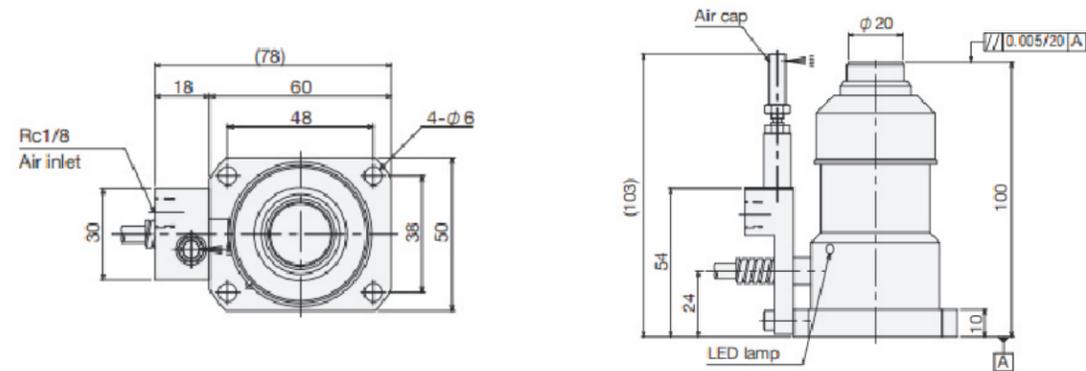
M26D-20



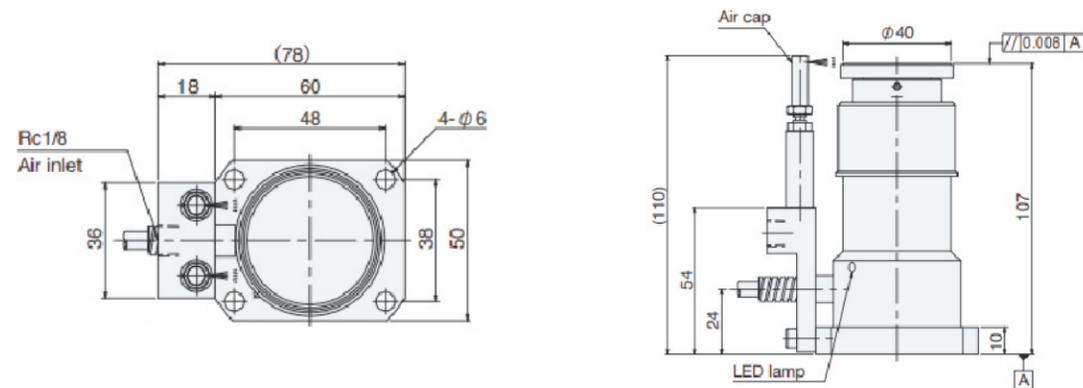
Dimensions

Laser tool setter - SNC86

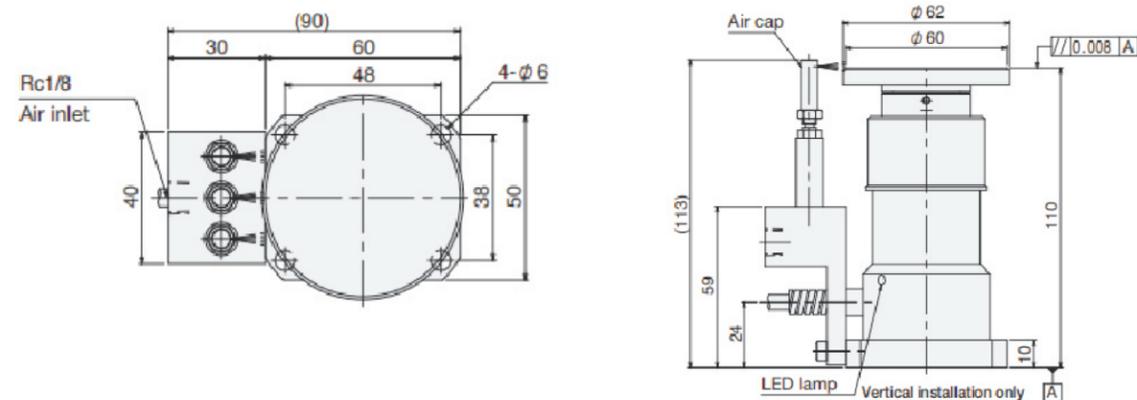
M-T24E-20



M-T24E-40



M-T24E-60



Description

1. There is a laser beam in front of the transmitter and receiver of the tool setting, when the tool into the beam causes a reduction in laser light seen at the receiver, a trigger signal generated. This latches the machine position at that instant, providing the information to determine a tool's dimension. With approaches from several directions, tool geometry can also be accurately determined. These systems can also be used to detect broken tools, by rapidly moving the tool into a position where it should intersect the laser beam, if light reaches the receiver, the tool tip must be missing.

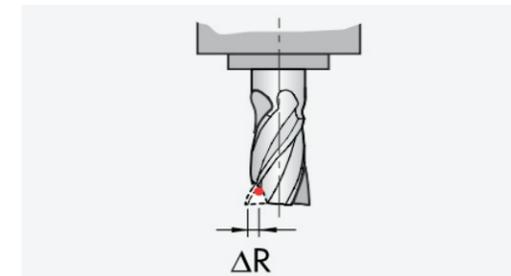
2. The non-contact laser beam can check very small tools quickly, reliably and without collision risk. Even the latest high hardness brittle cutting materials can be measured with this laser tool setting instrument system.

3. Because the tool is measured at the rated speed, the errors of tool, spindle and tool holder are all detected and can be corrected directly.

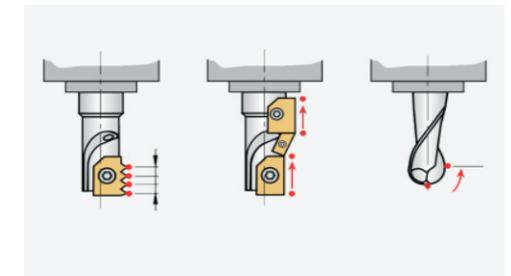


Laser Measuring Function

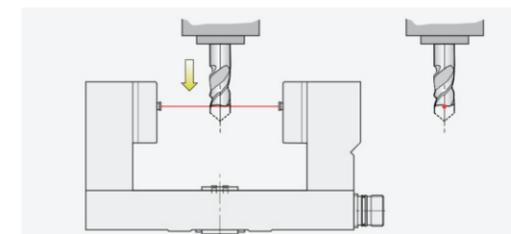
1. Tool length measurement
2. Measure the tool radius and detect the tool breakage
3. Quick tool breaking detection alarm
4. Single edge inspection and shape inspection
5. Anti drip function
6. Machine tool temperature compensation function



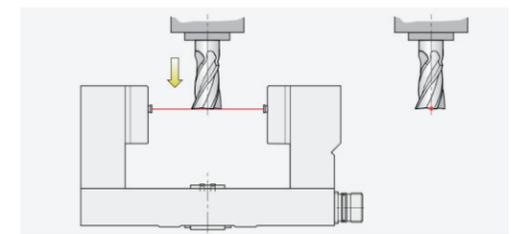
Tool radius measurement, detection of tooth breakage



Single tooth and shape inspection



Tool length measurement



Detection of tool breakage

Laser tool setter - SNC86

Touch probe and tool setter application

Parameters

Principal application	High-precision, high-speed non-contact tool setting and tool breakage detection on all sizes of vertical and horizontal machining centres, multi-tasking machines and gantry machining centres
Laser beam alignment	The unit is supplied with an adjustable mounting plate on the underside
laser type	Power <1mW, wavelength 680nm
Cable(to interface)	Hard-wired systems: cable on the end of the unit.
Sealing	IPX8
repeatability	$\pm 0.1 \mu\text{m } 2\sigma$
typical Repeatability	$\pm 1 \mu\text{m } (2\sigma)$
minimum tool or feature size	$\text{Ø}0.1 \text{ mm}$ or larger
max tool or feature size	86 mm ,
minimum tool for breakage detection	$\text{Ø}0.1 \text{ mm}$ or larger
power	100 mA @ 24 V
output signal	No voltage solid state relay (SSR). Each relay may be normally open. Current (Max.) 50 mA, voltage (Max.) $\pm 50 \text{ V}$
储存温度 Storage temperature	$\sim 10 \text{ }^\circ\text{C} - 50 \text{ }^\circ\text{C}$
工作温度范围 Operating temperature	$5 \text{ }^\circ\text{C} - 50 \text{ }^\circ\text{C}$
工作寿命/Life	Tested to > 1 million on/off cycles
气源要求/pneumatic supply	4 mm Air pipe, 6.0 bar (87.02 psi) maximum 3 bar(43psi) min.
电缆规格/Cable	$\text{Ø}6.0 \times 8\text{m}$ (0.24 in) , two twisted pairs, two individual cores plus screen, each core $18 \times 0.1 \text{ mm}$ insulated
安装/Mounting	M10 (3/8 in)

Dimensions

