SRTS Tool Setter User Manual

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1.1 Preface

First of all, thank you for buying our CNC machine tool tool setter SRTS
now , you can use advanced measurement tools to solve machining problems. Especially suitable for tool setting and broken tool detection.

It is imperative that the safety information contained in these operating instructions is strictly observed to guarantee the safe and reliable operation of the tool setter and avoid personal injury and damage to property.

if there are any difficulties, comments and suggestions in the process of using our products, you are welcome to contact us at any time through telephone or email , and also visit website to learn about the products .

Email: liuxuan@silvercnc.com
Tel：+86 075523307393
Website: Http://www.silvercnc.com

1.2 Safety Instructions

Risk of material damage!

• Guard the manual or automatic positioning of the tool setter to ensure that the machine comes to an immediate feed stop if the stylus is inadvertently deflected from the sensing process!

Risk of material damage from by third-party components!

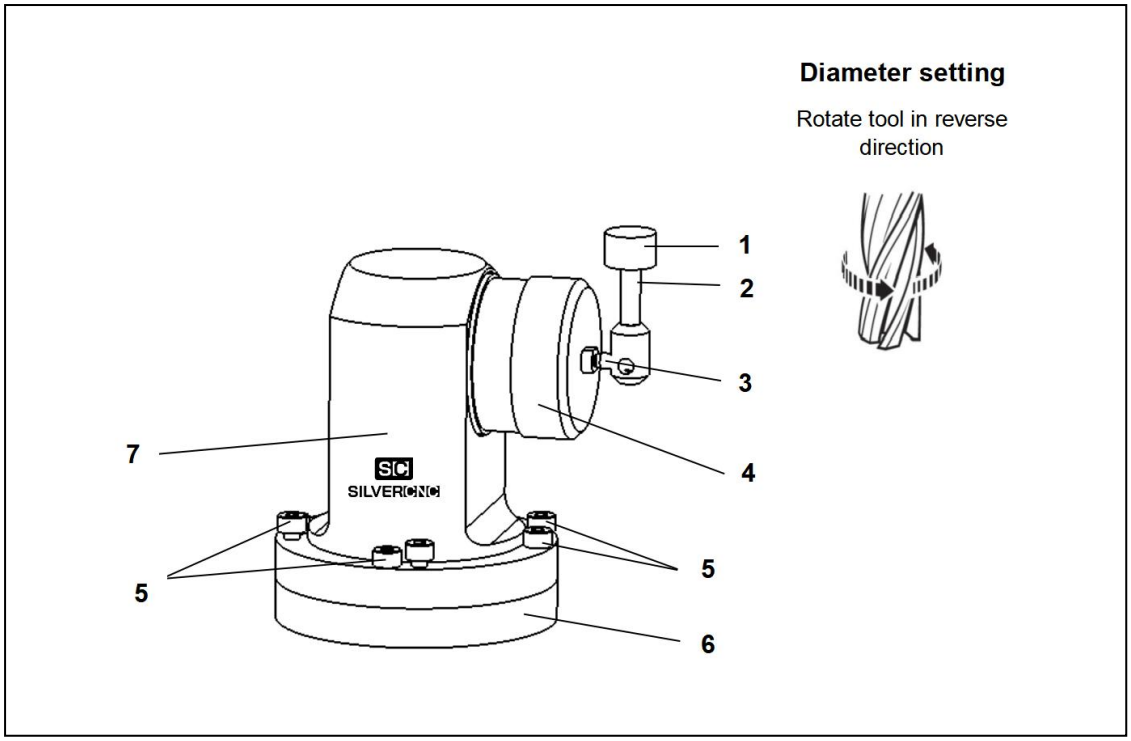
• Only use the original spare parts listed in these operating instructions to perform maintenance and repairs.

The information given in these operating instructions can be modified by the manufacturer without prior notification. It is therefore the responsibility of the user to enquire regularly about updated operating instructions.

1.3 Validity

This document is valid for the hardware available at the creation date of the manual itself. Technical changes by the manufacturer are reserved.The latest version of this manual can be downloaded under www.silvercnc.com in the Downloads section.

2.1 Components of tool setter



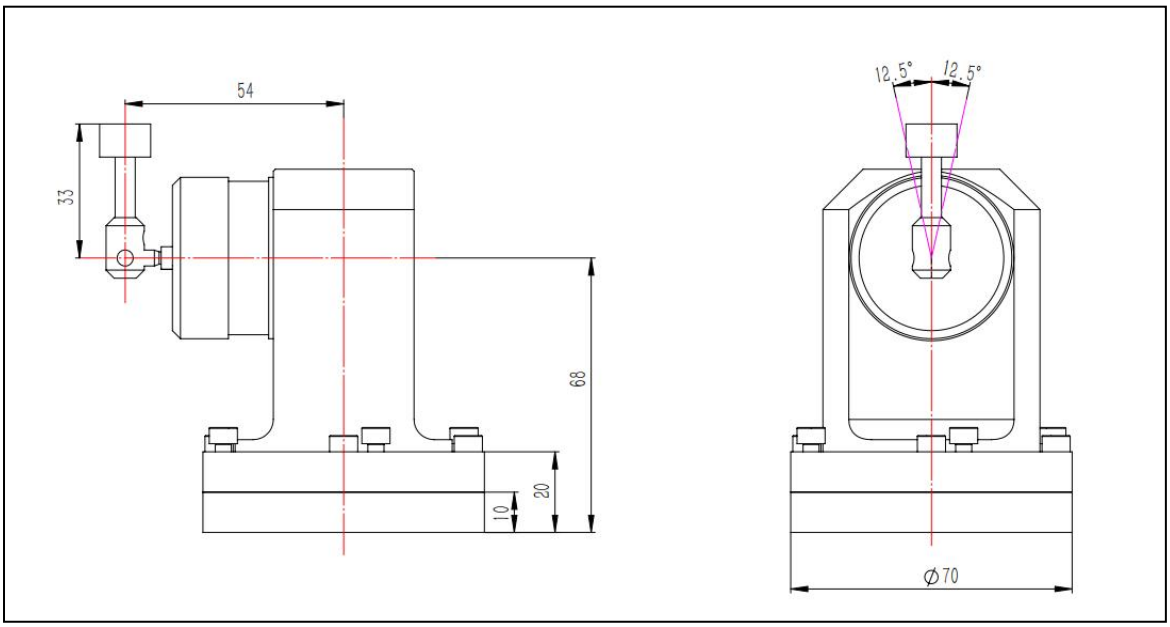
Fig(1)

1. Stylus
2. Stylus holder
3. Break stem
4. Infrared Probe
5. Stylus level alignment-adjusting screws
6. Base
7. Support

2.2 SRTS specification

Model	SRTS
Output	NO(Normally open)
Sense directions	5 axis
Pre-travel	0
Travel	+/-12.5°, Z-6.35mm
Repeatability	<1um
Trigger life	>10million
Protect structure	IP68
Contact force	0.4N~0.8N, Z-4.0N
Signal transmission	Radio wave
Radio frequency	2.4Hz
Contact material	Tungsten carbide
Surface finishing	Grinding 4s
Rated voltage and current	DC24V 20mA

2.3 Dimensions



Fig(2)

3.1 Install the tool setter

1. Clear the worktable and select the installation position.

2. Remove the lower base using a 4mm hex wrench.

3. Install T-bolts (not provided) and secure the lower base to the worktable

4. Install stylus (see section "Assembling stylus" for details)

5. Reinstall the tool setter on the lower base and install locking screws. Tighten the two locking screws. Do not tighten the adjusting screw before adjusting the stylus.

6. Adjust stylus level (see section "stylus Level Adjustment" for details).

7. Connection receiver.

8. Check the tool setter output signal and measurement.

3.2 Assembling stylus

1. Fitting the stylus

The stylus is retained in the stylus holder by tightening screw A.

2. Break stem

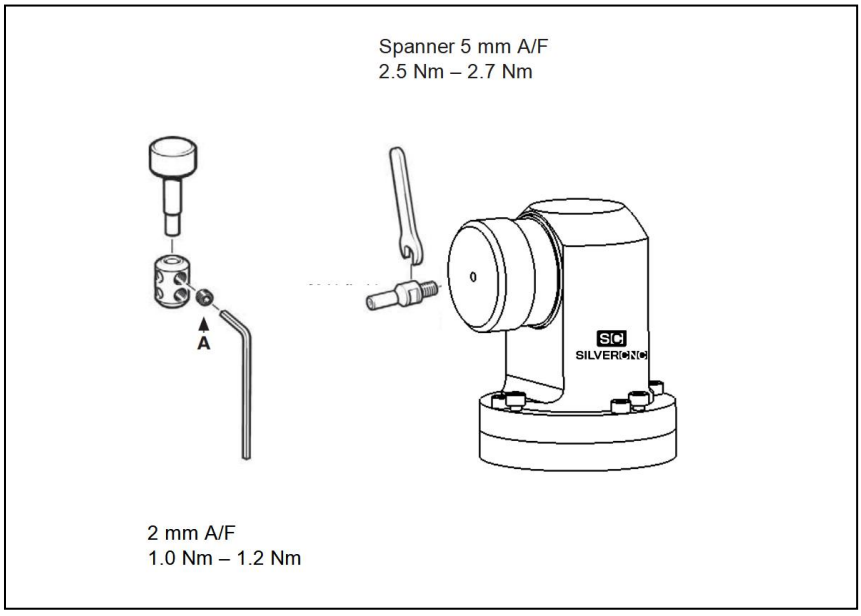
In the event of excessive stylus over travel, the break stem breaks at its weakest point, preventing damage to the probe mechanism.

3. Stylus and holder

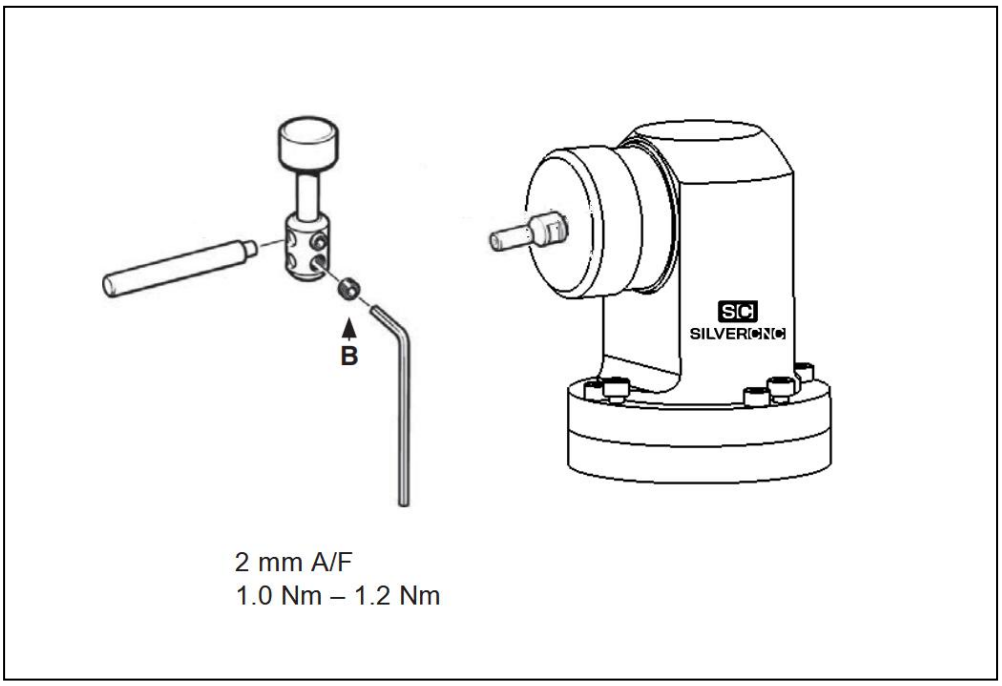
Place the stylus and holder onto the break stem and loosely fit screw B.

Fit screw C into the stylus holder, then tighten all the screws.

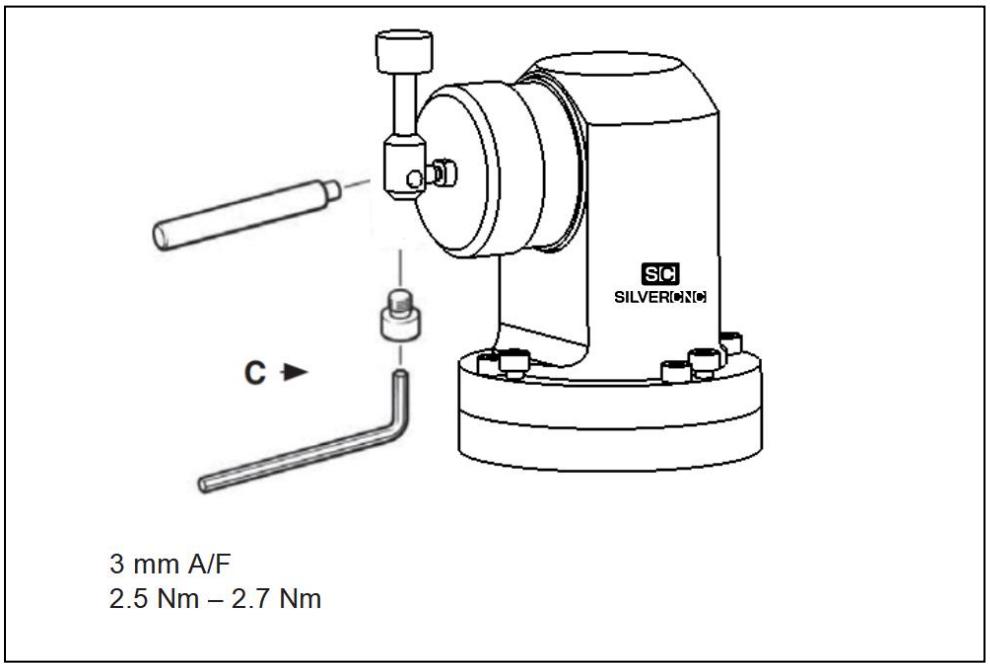
Note: Tighten all the screws to the torque values shown, remembering to use the support bar whenever adding or removing parts attached to the break stem.



Fig(3)


B
SC
SILVERCNC
2 mm A/F
1.0 Nm – 1.2 Nm

Fig(4)


C
SC
SILVERCNC
3 mm A/F
2.5 Nm – 2.7 Nm

Fig(5)

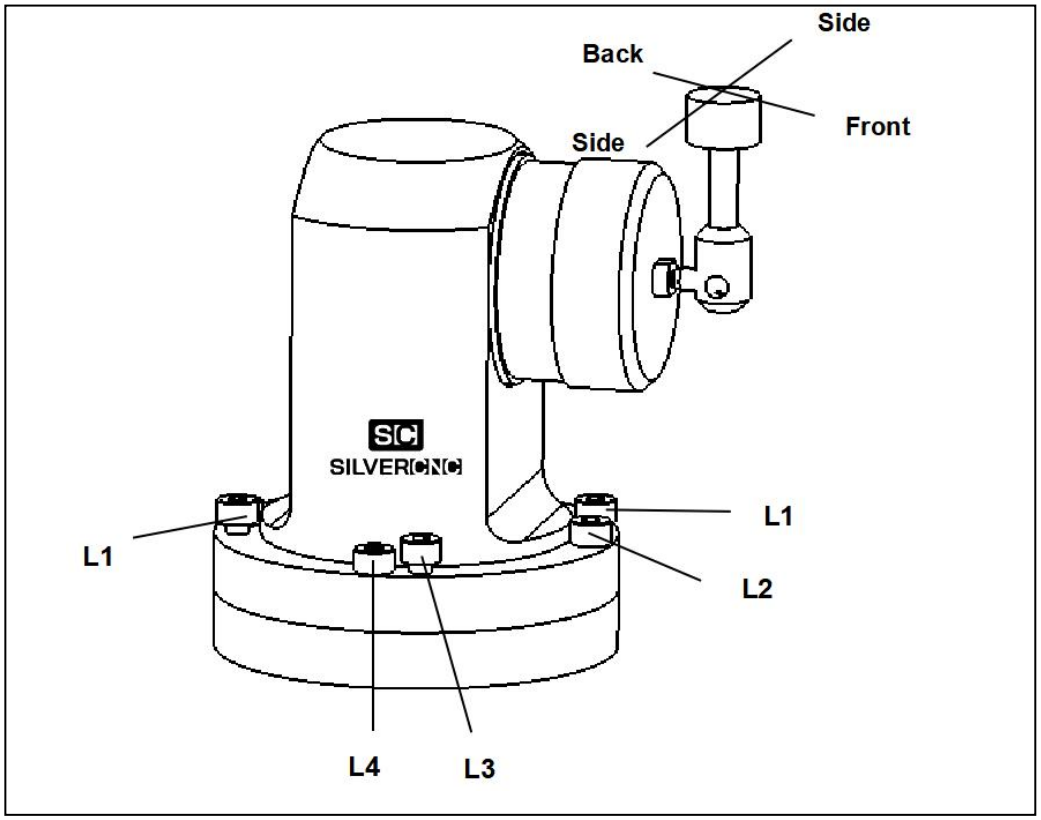
3.3 Stylus level adjustment

Two side direction adjustment:

1. First, adjust the stylus to be close to horizontal, preferably within 0.04mm.
2. Slightly tighten the connection screws to the bottom plate: L2 and L4
3. Adjust the two screws L3 on the side to ensure that the accuracy of the stylus is within 0.01mm.
4. Tighten 2side screw L4.

Front and back direction adjustment :

1. Before adjustment, the accuracy of the stylus in the front and back directions may be 0.1mm. The front direction will be higher and the back direction will be lower, so the front direction of the base plate should be adjusted as low as possible.
2. First, fix the Front L2 screw , the horizontal accuracy is approximately 0.05mm.
3. Tighten screw L1 slowly, raise the base plate in the back direction, and finally make the level of the stylus within 0.01mm.



Fig(6)

3.4 Connection receiver

Model	SRMI
Output signal	Power On signal or Trigger Signal
Mounting	Strong Magnetic Base / Universal Support
Supply voltage	24VDC +/-4VDC
Cable	5.0mm
IP rating	IP68
Operating temperature	10°- 60°

SRMI wired:

Red：+24V DC

Black：0V DC

White: Probe on input +

Brown: Probe on output -

Purple: Low battery voltage alarm +

Purple black: Low battery voltage alarm -

Green: Error alarm input+

Green Black：Error alarm output -

Blue: NO jump signal output

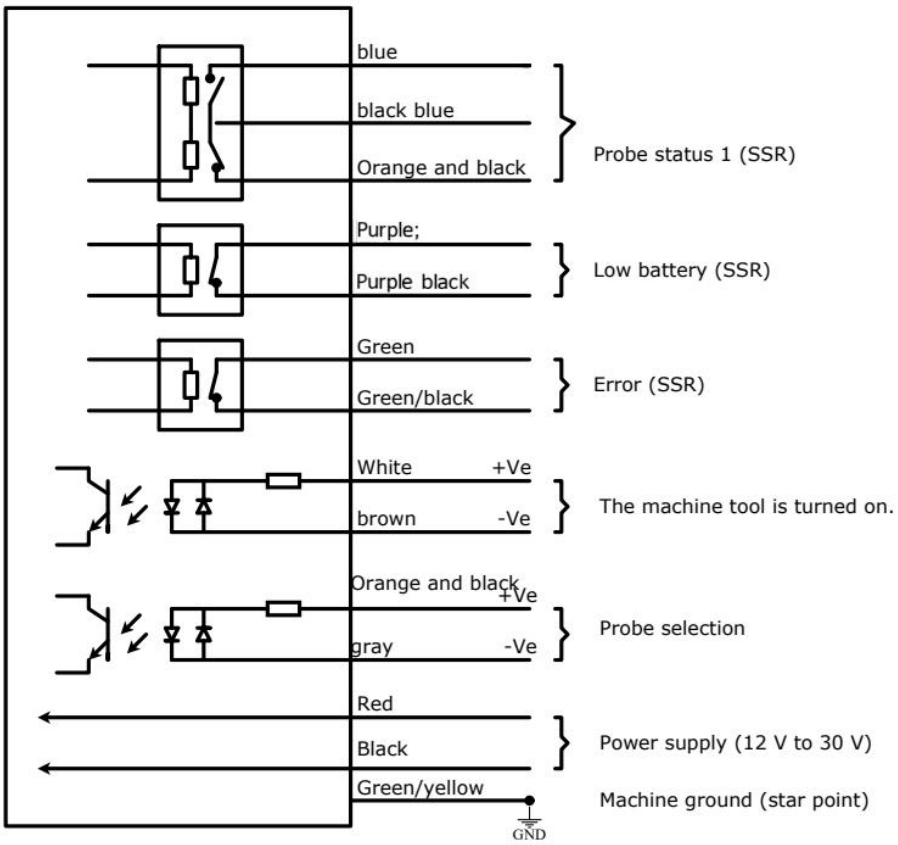
Blue Black: NO Jump signal input com

Orange: NC jump signal input

Orange Black: choose probe +

Gray: choose probe -

Yellow green：Shielding wire



3.5 Check the touch trigger signal(FANUC X4.7 example)

1. System - PMC - when touch the styli, Check the state value, X4.7 maybe changed to 1 from 0.
2. Turn to the MDI mode and input below :

G91 G31 X100. F100.;

G91 G01 Y100.F100.;

If only X axis changes at the beginning, when touch the probe styli , only Y axis changes, which proving G31 jump function is normal, receiver installed successfully.

3.6 Check the measurement progress at MDI model

When it is confirmed that the tool setter touch trigger signal can be received, then we suggested you to run the program step by step at MDI model .

Adjust the feed rate to low level at first, run some program, also check if our standard macro program can run properly, And press the emergency stop button as soon as possible when you find any wrong. After completed all the steps above , you can set the tool length, diameter or broken automatically

3.7 Calibration the SRTS

Why calibrate SRTS ?

SRTS tool setter is just one component of the measurement system which communicates with the machine tool. Each part of the system can introduce a constant difference between the position that the stylus touches and the position that is reported to the machine. If the not calibrated, this difference will appear as an inaccuracy in the measurement. Calibration of the SRTS allows the software to compensate for this difference.

During normal use, the difference between the touch position and the reported position does not change, but it is important that the SRTS is calibrated in the following circumstances:

- when SRTS system is to be used for the first time;
- when the enhanced trigger filter delay is changed;
- at regular intervals to compensate for mechanical changes of your machine tool.

More calibration detail please check SRTS program manual: cycle code L9855

3.8 Set the tool length and diameter automatically

The purpose to set the length of the tool is to establish the position relationship between the cutting tool and the surface of the work piece. This tool setter is a elastic device with fixed height, which is installed on the platform of the CNC machine, when the tool touch the working plane, the position relationship between the blade and the surface of the work piece can be achieved indirectly according to the relationship between the blade and the bench.

Steps:

Semi-automatic operation:

Move the spindle of the machine in manual mode and let the cutting tool axis upon the center of the working plane, make the cutting edge 10~20mm upper than the working plane.

Run the tool setting program, the length and the diameter value will be set up in the CNC system automatically.

Automatic operation: Put the program of preparation and semi┐automatic operation into one program to run.Read the software specification for detail information of the measuring program.

SilverCNC SRTS system have the following function:

- Tool length setting - cycle code L9857
- Tool radius/diameter setting-cycle code L9857
- Tool length and radius setting-cycle code L9857
- Automatic Length Setting, Up Feed - cycle code L9857
- Tool rotation breakage detection - cycle code L9858
- Measuring cycle for manual setting of the tool length-cycle code L9856
- Thermal compensation measurement- cycle code L9859

More tool setter detail please check SRTS program manual cycle

3.8 Installation precautions

1, try to install in the table with less iron filings and splash.

2. It must be installed vertically to ensure that the bottom is flat to avoid excessive accuracy error.

3. After the completion of wiring, place the tool setter in place of the tool setting, and fix the correct position after testing the tool setter.

4. Please use it within the DC+24V±10% 20mA(MAX) , to avoid overload and burn out the internal components.

5. The tension resistance of power supply and signal line is below 20N (2kg), and the bending radius of the metal tube of power line is R7.

6. If it is necessary to use pneumatic, the outer diameter and inner diameter of the air pipe shall be 4mm and 2.5mm respectively, and the recommended air pressure shall be 0.3-0.6Mpa.

Special precautions

1. The diameter of the tool should be controlled below 10mm

2. The tool speed below 50-200mm/min (the speed is related to the electrical response of the machine)

3. Please pay attention to the chip and clean the surface where the air pipe cannot be blown, and do not accumulate filings

4. Please do not rotate the head of the tool setter, which may hurt the precision components

5. Install the blowing device properly to prevent leakage and detonation of the pipe

6. When high pressure coolant and water jet impact the tool setter face, please set a protective cover

7. Please do not use your hands to press the surface to spring, which will damage the internal precision components

4 Guarantee

1. If the instrument is damaged, please take good care of it for the maintenance certificate.
2. The warranty period shall be 12 months from the date of purchase, and any problem within 15 days will be guaranteed.
3. In the case of normal use and maintenance of the product within the warranty period, if the material and process of the fuselage has problems or faults, the company will provide free repair and replacement of parts upon verification.

Not free under the following circumstances:

1. Tool setter is damaged due to improper installation and operation
2. Disassemble the product, modify and replace the internal parts
3. Water, oil and other substances infiltrate into the machine and cause damage due to negligent use.
4. Failure or damage caused by natural disasters.

For more products details, please visit our website at
www.silvercnc.com/contact