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9410
TRIGGER-TYPE 3D PROBE (AUDIBLE AND VISUAL ALARM)
OPERATION MANUAL

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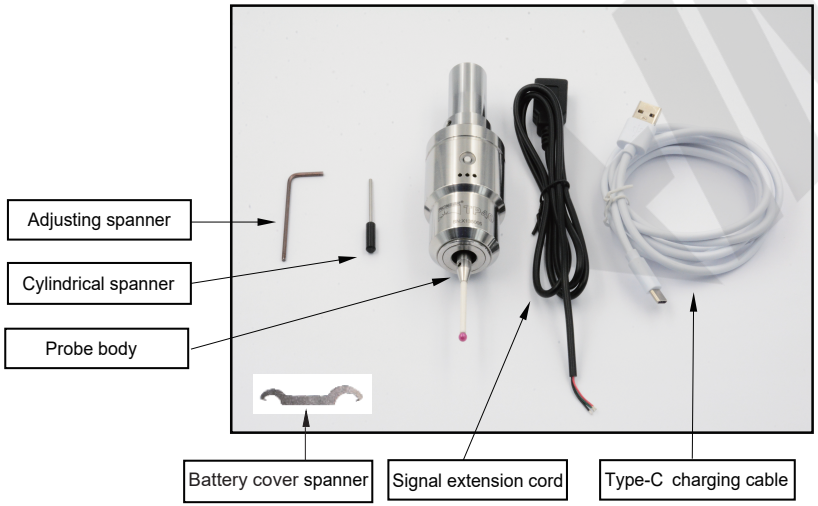
VIDEO

Safety Notice

- The charging and signal interfaces must be installed away from any potential electrical noise, such as transformers, servo drive devices, etc.
- All 0V and ground connections should be connected to the "zero point" of the machine (" zero point "is all equipment connections Ground and shielded cable single-point loop). This is very important, failure to comply with this rule will cause a potential difference between the ground;
- All shielding devices must be connected as described in the instruction manual;
- The cable line shall not be parallel with the high current source such as the motor power cable or close to the high-speed data transmission line;
- The cable length should always be kept to the minimum.

Description

1. 9410 probe is a small trigger probe produced by the company at present, which is mainly used in various machining centers, CNC boring, milling machines and other special equipment to measure various solid materials;
2. The handle of the measuring head is a cylindrical straight handle with a diameter of 20mm, which is used by the CNC tool handle;
3. Use LED indicator light and buzzer to indicate the trigger state of the probe;
4. Built-in lithium battery rechargeable, no need to replace the battery;
5. The use of signal extension cord with 9410 can provide alarm signals for the machine tool;
6. Standard measuring needle of 40mm length, as shown below:



1 Product size

The main dimensions of the probe are shown in Figure 1

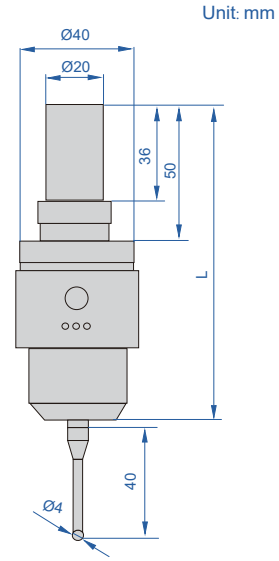


Fig. 1

2 Specification

Code	9410
Probe length(L)	115.5mm
Shank diameter(Ø)	20mm
Trigger direction	±X，±Y，+Z
Directional trigger protection stroke	X-Y±12°，Z+5mm
Arbitrary one-way repeated trigger accuracy	≤1μm
Trigger force in X-Y direction(with standard styli)	0.3-0.6N
Trigger force in Z direction	4N
Class of protection	IP67
Type-C charging cable	1.5m
Signal extension cord(provide signals to CNC)	1m

Install

1 Probe installation and replacement:

1.In order to avoid damage to the probe and styli during transportation, our company has disassembled the styli and packed it separately before delivery and transportation; Therefore, after receiving the styli, please install the styli according to the following instructions.

2. As shown in Figure 2, the matching adjusting spanner should be used when installing the styli: fix the probe first, and then screw the styli into the styli base in a clockwise direction. When the styli is screwed to a fixed position, insert the matching cylindrical wrench into the styli hole and properly tighten it.

3. The probe can be installed with a variety of styli with M4 standard threads. when the user needs to replace the styli, remove and install the styli in the preceding way, that is, fix the probe first, and then remove or install the styli. (The needle is rotated counterclockwise when disassembling)

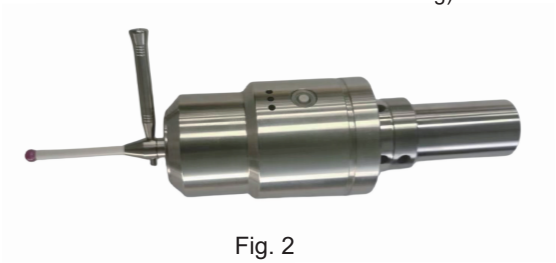


Fig. 2

Attention: after replacing the styli every time, the fine adjustment link between the probe and the mounting handle must be readjusted to make the position accuracy of the styli reach a reasonable state.

2 Removal of battery cover

1. The probe adopts built-in lithium battery, which can be used continuously for 90 days (5% utilization rate per shift) when fully charged, and is charged by matching Type-C charging cable. the probe indicator shows blue when charging, and green when charging is complete.

2. When the probe needs to be charged or to provide signals for the machine tool, remove it by rotating it counterclockwise using the battery cover spanner of battery compartment cover. Fig. 3

3. When installing battery cover, please pay special attention to the waist seal ring on its edge to prevent loss or damage during installation. The battery cover shall be screwed to the fixed position as shown in the figure to ensure the reliable sealing of the battery compartment.

Fig. 3

Function and characteristics of probe

1. Swing range and axial floating range of styli

The styli of Model 9410 probe has the protection function of downward floating and arbitrary radial swing, where the styli downward floating distance is 5mm and the Angle of arbitrary radial swing is 12°.

2. Reset accuracy of styli

In order to ensure the accuracy of continuous measurement of probe, the probe of model 9410 can automatically return to the initial position after the position change, and has a reset accuracy of no more than 1um. when measuring with probe on horizontal machine tool, the resetting precision of styli in vertical direction may be reduced due to the influence of dead weight of styli. when using a lengthened styli, the reset accuracy of styli in this direction should be tested first before using the styli.

3. Trigger working principle

9410 trigger type 3D probe has a special trigger mechanism inside the main body, when the measuring ball and the workpiece contact, the position of styli changes slightly, the trigger mechanism will cause the probe circuit trigger, produce trigger signal, this trigger signal will continue until the styli is fully restored to its original position. to avoid damaging the styli, the trigger mechanism allows the styli to swing a maximum of 12° in the X/Y direction, and to be indented a maximum of 5.0±0.5mm in the +Z direction.

4. Protection of probe

The Type 9410 probe has taken sufficient protective measures in terms of protection, so that the probe itself has reached IP67 protection class.

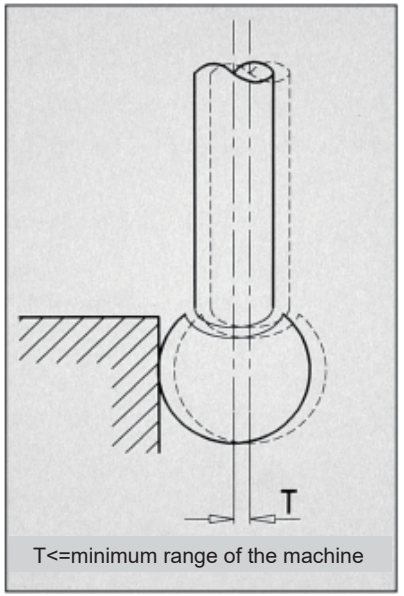
5. Precise contact

1) The working principle described above shows that the probe is actually a part of "measuring device" (probe + machine tool), and the coordinates of styli are determined by the precise contact with the workpiece during the measurement process, and the indicating signal is sent to ensure the accuracy of measurement results, and the measurement operation is convenient, fast, safe and reliable.

2) Precise contact: refers to the ideal contact state between the measuring ball on the styli and the workpiece surface; That is, the two have been in contact, but the amplitude of pendulum or indentation is small relative to the probe (generally 0.001-0.002mm), resulting in a negligible measurement error.

3) In order to ensure the measurement accuracy, the coordinate value of each measuring ball should be recorded when in accurate contact with the workpiece.

4) The way to obtain the accurate contact state is to carry out 2-3 contact and separation micro-adjustment, in this process should gradually reduce the feed speed of the machine tool.



T<=minimum range of the machine

6. Check the reset accuracy of styli
The specific operation of the operator to check the probe reset accuracy on the machine tool is as follows:
The first step is to install the probe on the spindle of machine tool, fix a block gauge on the workbench, and make the measuring surface of block gauge perpendicular to the workbench;
The second step is to manually control the movement of spindle of machine tool, so that the measuring ball on the styli can accurately contact the measuring surface of block gauge, and record the coordinates of this point through the display of machine tool system;
The third step, repeated accurate contact several times, compare the coordinate value of same point, according to the change of coordinate value to determine the "reference value" of reset precision of styli in the direction.
If you need to check the reset accuracy of styli in other directions, simply rotate the probe at an Angle and repeat the process.
Since the results of above inspection include repeated positioning errors of machine tool, the results of this inspection can only be used as a reference value for understanding the reset accuracy of styli. In the practical application process, as long as the reference value can meet the specific requirements in the actual work, it is not necessary to consider the specific reset accuracy index of styli.
7.Adjust the styli accuracy
The user adjusts the style translation on tool presetting instrument as follows:
The first step is to install the probe on tool presetting instrument, so that the measuring ball position of probe on the indicating screen of tool presetting instrument, and then slowly rotate the probe by hand to observe the deviation between the center of ball and the center of screen of tool presetting instrument.
In the second step, gradually adjust the tightness of 4 M4 fixing screws (as shown in Figure 4), so that the swing range of measuring ball on the tool presetting instrument is gradually reduced to 0.002-0.003(mm).
The third step is to tighten the four screws step by step to ensure that the accuracy of styli is not greater than 0.002-0.003(mm) under the premise that the four screws maintain basically the same tightening force.
Step 4: Remove the probe from the tool presetting instrument, tap the probe with a rubber mallet and place it for 1-2 days, then check the probe accuracy again, if the accuracy changes, re-make a small adjustment (step 3 above), at this time the adjustment operation is complete.

Fig. 4

Maintenance of probe

1. Before each use of the 9410 probe, the surface of the probe and the workpiece should be cleaned, the tool handle of probe and the measuring ball of the styli should be clean, and the surface of the workpiece to be measured should be free of metal cutting debris and oil, otherwise it may cause measurement data distortion.
2. Probe is a precision tool. in order to ensure the accuracy of probe, the surface of measuring ball and the tool holder installation and positioning surface of probe are both original precision machining surfaces, so special attention should be paid to moisture and rust prevention at these two locations. during the use of probe, the measuring ball on styli should be avoided from contact with corrosive liquid; if it is unavoidable, the surface of the measuring ball should be wiped clean in time after use.
3. The probe buzzer is installed on the side of probe body, and the sound hole of buzzer is easily blocked by liquid or dust, resulting in the reduction or disappearance of buzzer. Therefore, pay special attention to protection. in case of blockage, vacuum cleaner can be used to clean up.

Attention

1. When using the charging cable and signal extension cable, the protection level of probe will be reduced, so be sure to take protective measures;
2. When the probe battery voltage is too low, the sound emitted and the brightness of indicator light will decrease, and it needs to be charged in time.