User guide

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SST250 stylus setting tool

www.renishaw.com/sst250

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Contents

Legal notices

Terms and conditions and warranty

Unless a separate written agreement is in place between you and Renishaw, the equipment and/or software are sold subject to the Renishaw Standard Terms and Conditions supplied with such equipment and/or software, or available on request from your local Renishaw office.

Renishaw warrants its equipment and software for a limited period (as set out in the Standard Terms and Conditions), provided that they are installed and used exactly as defined in associated Renishaw documentation. Consult these Standard Terms and Conditions to find out the full details of your warranty.

Equipment and/or software purchased by you from a third-party supplier is subject to separate terms and conditions supplied with such equipment and/or software. Contact your third-party supplier for details.

Intended use

The SST250 is designed to allow the setting of stylus angles. It must be installed, operated, and maintained as specified in Renishaw documentation and in accordance with the Standard Terms and Conditions of the Warranty and all other relevant legal requirements.

The SST250 is designed to control and set stylus A and B-angles relative solely to the stylus-holder kinematic seat, providing a consistent and repeatable mechanical reference for stylus set-up. It does not compensate for any angular deviation originating from the co-ordinate measuring machine (CMM) or Equator™ gauge machine axes, probe body, sensor module, or other elements in the measurement chain. Any deviation external to the stylus-holder kinematic seat, such as probe head squareness errors, module seating variation, or machine-axis non-orthogonality must be identified and corrected within your metrology environment (for example through machine calibration routines, probe qualification, or software compensation). The SST250 ensures that the stylus assembly itself is set accurately; overall system alignment remains the responsibility of the measurement platform.

Registration, evaluation, authorisation and restriction of chemicals (REACH) regulations

Information required by Article 33(1) of Regulation (EC) No. 1907/2006 ("REACH") relating to products containing substances of very high concern (SVHCs) is available at www.renishaw.com/REACH.

Product overview

Compatibility

The SST250 is compatible with the following Renishaw stylus holders and knuckles:

Stylus holders

- SH25-1, SH25-2A, SH25-3A, SH25-4A, SH25-5, RSH3-1, RSH3-2, RSH3-3, RSH3-4

Inline knuckles

- M2 inline rotary knuckle — A-5000-9902
- M3 inline rotary knuckle — A-5003-4686

Offset knuckles

- M2 offset knuckle — A-5000-7534
- M3 offset knuckle — A-5000-7616

Star centres

- M2 4-way — A-5000-8395
- M2 5-way — A-5000-3627
- M3 5-way — A-5000-7610

NOTE: If your holder/knuckle is not listed, contact your local Renishaw representative for compatibility guidance.

Storage, handling and cleaning

Storage

- Store the SST250 in a clean, dry environment to protect the mechanical surfaces from dust and corrosion. Avoid areas with high humidity or airborne oils.
- Keep the tool inside its supplied case or on a stable bench surface when not in use. The integrated accessory slots help you organise small stylus components and protect them from damage.
- For long-term storage, maintain ambient conditions within the storage range (-25 °C to 70 °C).

Handling

WARNING: This product contains neodymium magnets. People with cardiac pacemakers or other sensitive medical implants should keep a safe working distance of 70 mm away from the magnets.

CAUTION: Always handle the SST250 using the main body. Do not use excessive force on moving elements, rails, or the stylus-holder connector.

CAUTION: Before mounting any stylus holder, make sure that the connector is free from debris. Insert the holder until the seating lip provides a clear indication of correct engagement. This ensures accuracy during the A and B-angle set-up and prevents wear.

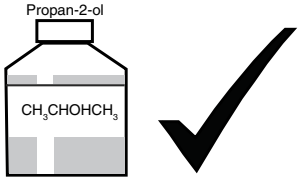
WARNING: Keep fingers clear of the sliding and rotating components. Spring-washer friction elements are designed to hold positions firmly once stationary but can still create minor pinch points.

CAUTION: Do not drop or strike the SST250. Impacts may compromise internal alignment that may affect measurement repeatability.

CAUTION: When handling stylus components, adopt clean, controlled movements. Several assemblies used across the SST250 system rely on clean mating surfaces to ensure the correct mechanical interaction.

Cleaning

- Wipe all accessible surfaces of the SST250 using a lint-free cloth. For stubborn residues, lightly dampen the cloth with isopropyl alcohol. Do not use aggressive solvents that may attack finishes or adhesives.
- Ensure that mating faces, guide rails, and seating surfaces remain free from particulate contamination. Although the tool does not require a clean-room environment, particulate build-up can affect mechanical seating and angle accuracy.
- If stylus holders or knuckles have been used in oily or dusty environments, clean them before installation on the SST250. Proper part cleanliness supports reliable seating and angle setting.
- Do not submerge the SST250 or expose it to running water. Localised cleaning with a cloth is sufficient.



Specifications

	B-angle setter	A-angle setter
Weight	1 kg	0.1 kg
Operating temperature	10 °C to 40 °C	
Storage temperature	-25 °C to 70 °C	
Accuracy*	±1°	±1.5°
Resolution	1°	1°
Angular range	-180° to 180°	-120° to 120°

NOTE: *These values may not correlate to your machine measurements due to build variations.

Kit contents

SST250 kits

Part number	Description	Number of components
A-7286-0003	SST250 basic kit	6
A-7286-0002	SST250 intermediate kit	9

A-7286-0003 - SST250 basic kit

Part number	Description	Quantity
A-7286-0003	SST250 B-angle setter	1
A-5555-0286	M3 stainless steel extension, length 30 mm	1
A-5004-7591	M2 stainless steel extension, length 30 mm	1
A-5004-7582	M2/M3 tightening tool	2
–	Case	1

A-7286-0002 - SST250 intermediate kit

Part number	Description	Quantity
A-7286-0015	SST250 A-angle setter	1
A-7286-0003	SST250 B-angle setter	1
P-TL01-0027	1.5 mm ball end hex key	1
P-TL01-0089	0.89 mm wrench key	1
A-5555-0286	M3 stainless steel extension, length 30 mm	1
A-5004-7591	M2 stainless steel extension, length 30 mm	1
A-5004-7582	M2/M3 tightening tool	2
–	Case	1

System components

A-angle setter

Extension rests

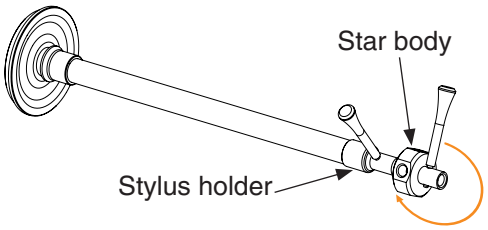
SST250 B-angle setter

B-angle setting of a star body and stylus

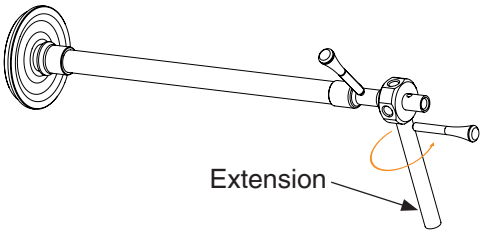
1. Make sure you have the following parts:

- SST250 B-angle setter (A-7286-0003)
- Stylus holder
- M3 or M2 centre body
- M3/M2 extension if required (when using M3 stylus holder and M2 star) (A-5004-7592)
- M2 or M3 30 mm extension
- 2 × stylus tools (A-5004-7582)
- Stylus to complete the star configuration as required.

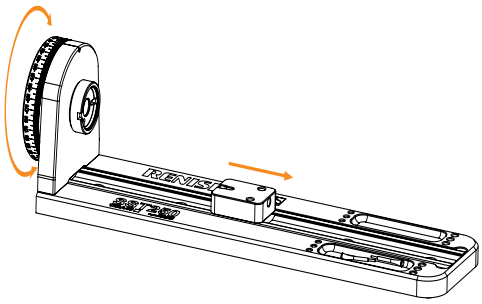
2. Assemble the stylus holder and star body, then tighten using stylus tools.



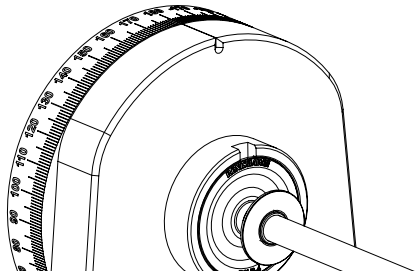
3. Fit the 30 mm extension to the star body and then tighten using stylus tools.



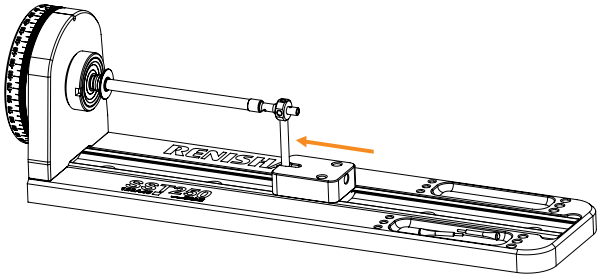
4. Loosen the star body by 1/8th of a turn so that the body can rotate freely.
5. Rotate the B-angle setter to 180° on the SST250. Slide the setting block to the far end of the SST250.



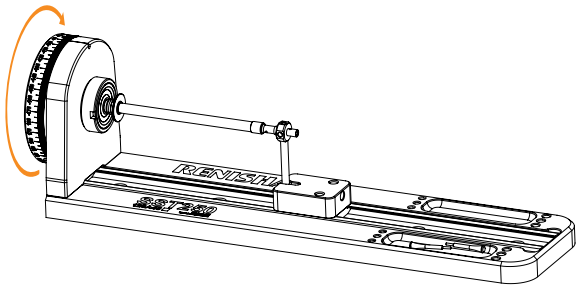
6. Position the stylus holder into the kinematic seat, aligning the Renishaw logo and engraving with the notch in the kinematic seat.



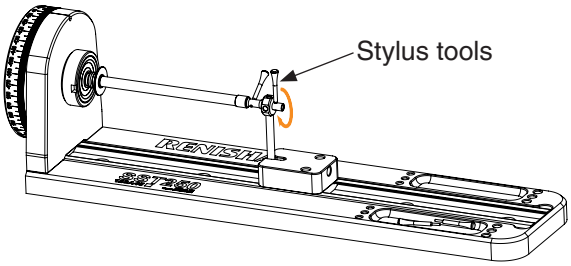
7. Engage the setting block gently onto the 30 mm extension, ensuring that the extension remains at 90° to the stylus holder.



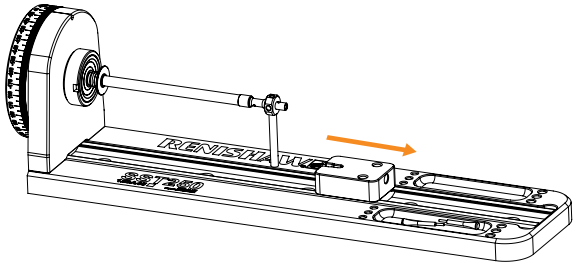
8. Rotate the B-angle setter in an anti-clockwise direction to the desired setting. Rotating in an anti-clockwise direction prevents the star centre tightening.



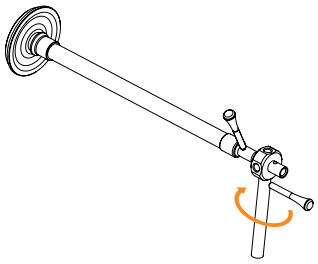
9. Insert the stylus tools into the stylus holder and star centre, then tighten the centre body.



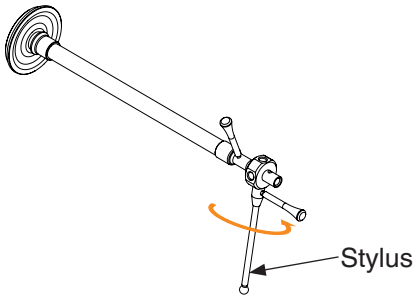
10. Remove the setting block, then remove the stylus holder from the kinematic seat.



11. Remove the extension from the centre body.



12. Fit the final stylus into the centre body and tighten using the stylus tools.

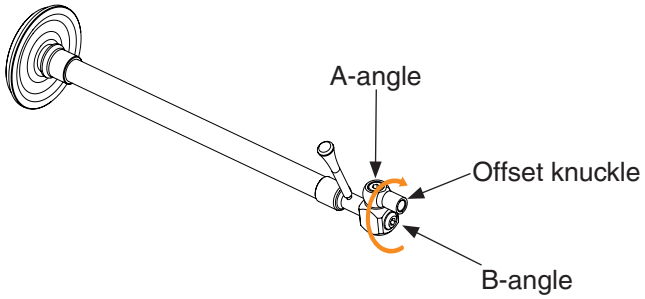


A and B-angle setting of offset knuckles

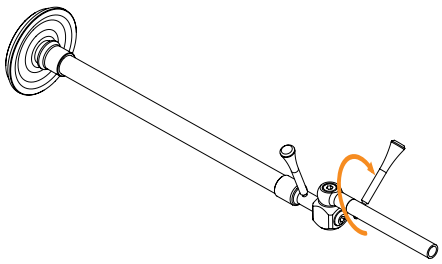
1. Make sure you have the following parts:

- SST250 B-angle setter (A-7286-0003)
- A-angle setter (A-7286-0015)
- Extension rest (A-7286-0024)
- Stylus holder
- M3 or M2 offset knuckle
- M3-M2 extension if required (when using M3 stylus holder and M2 knuckle) (A-5004-7592)
- M2 or M3 30 mm extension
- 2 × stylus tools (A-5004-7582)
- 1.5 mm hex key (P-TL01-0027)
- Stylus to complete the knuckle configuration as required.

2. Assemble the stylus holder and knuckle, then tighten the A and B-angle setting screws .

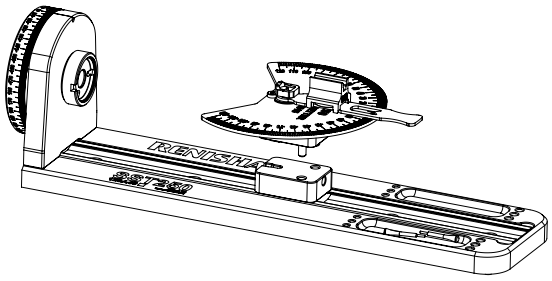


3. Fit the 30 mm extension to the knuckle and tighten using stylus tools.

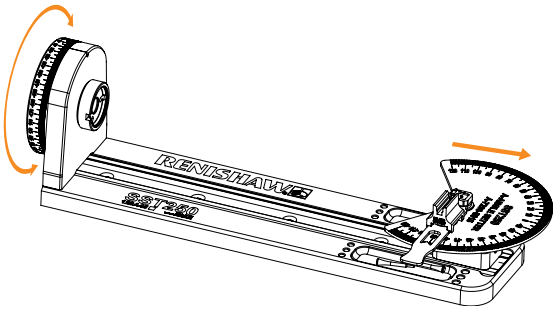


4. Loosen the A and B-angle setting screws by 1/8th of a turn.

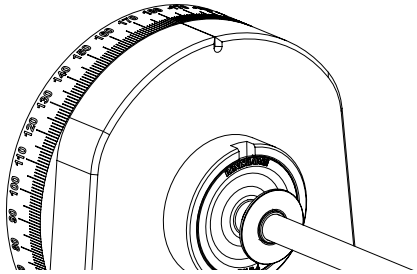
5. Assemble the B-angle setter, the A-angle setter and extension rest.



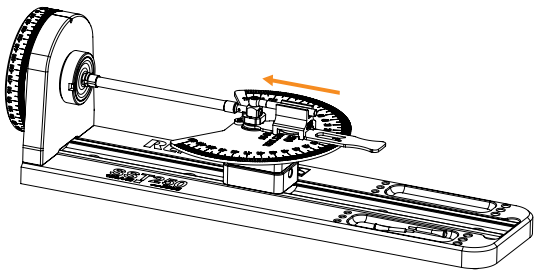
6. Set the B-angle setter to 180°, then move the A-angle setter to far end of the SST250.



7. Position the stylus holder into the kinematic seat, aligning the Renishaw logo and engraving with the notch in the kinematic seat.

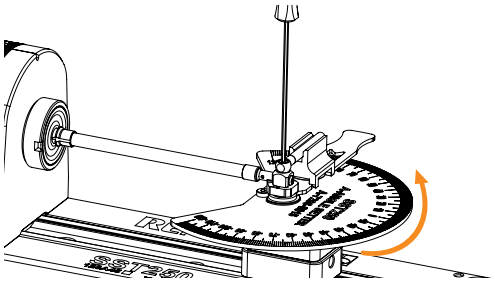


8. Support the knuckle body with the extension at the top. Bring in A-angle setter. Gently seat the knuckle and extension onto the A-angle setter and extension rest.

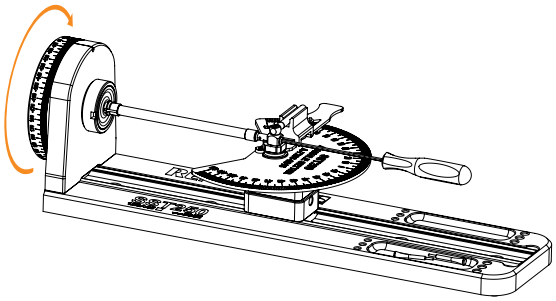


9. Ensure the A-angle knuckle body is centred to the A-angle setting pin centre.

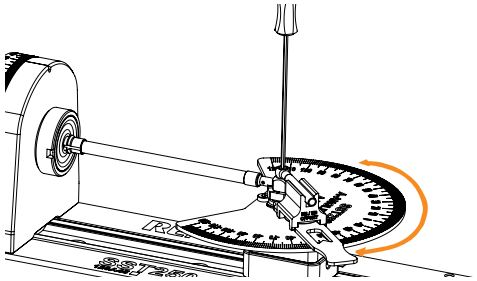
10. Set the A-angle to 90° and tighten the A-angle setting screw. Ensure the extension is well seated.



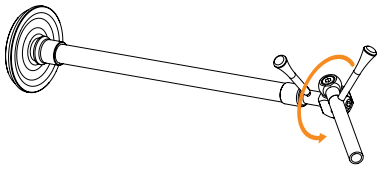
11. Set the required B-angle rotating anti-clockwise. Tighten the B-angle setting screw.



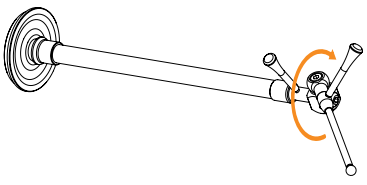
12. Loosen the A-angle setting screw. Set the required A-angle and tighten the A-angle setting screw.



13. Remove the stylus holder from the SST250, then remove the extension from the knuckle using stylus tools.



14. Fit the final stylus to the knuckle and tighten using stylus tools.

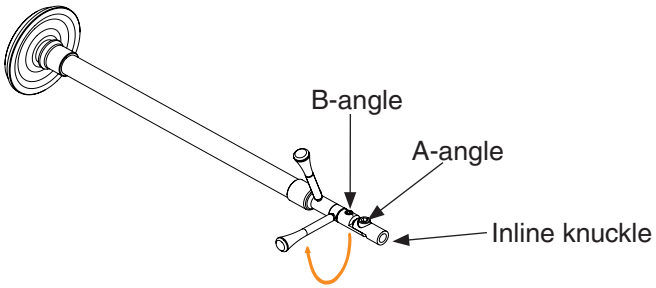


A and B-angle setting of inline knuckles

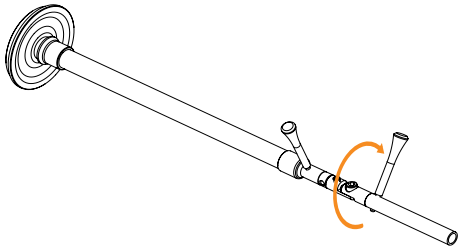
1. Make sure you have the following parts:

- SST250 B-angle setter (A-7286-0003)
- A-angle setter (A-7286-0015)
- M2 inline extension rest (A-7286-0025) or M3 inline extension rest (A-7286-0026)
- Stylus holder
- M3 or M2 inline knuckle
- M3/M2 extension if required (when using M3 stylus holder and M2 knuckle) (A-5004-7592)
- M2 or M3 30 mm extension
- 2 × stylus tools (A-5004-7582)
- 1.5 mm hex key (P-TL01-0027)
- 0.89 mm hex key (P-TL01-0089)
- Stylus to complete the knuckle configuration as required.

2. Assemble the stylus holder and knuckle, then tighten the A and B-angle setting screws.

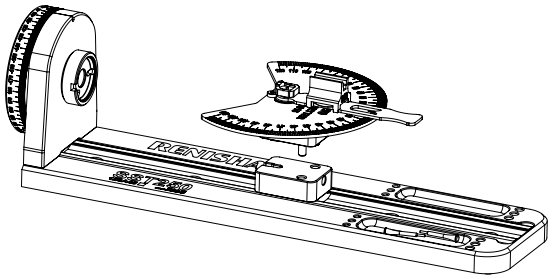


3. Fit the 30 mm extension to the knuckle and tighten using stylus tools.

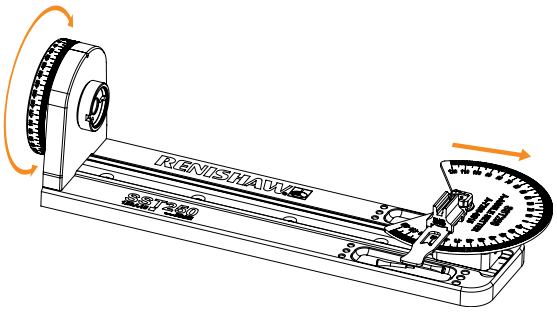


4. Loosen the A and B-angle setting screws by 1/8th of a turn.

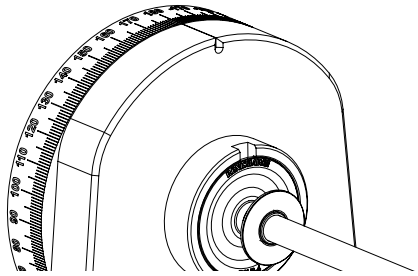
5. Assemble the B-angle setter, the A-angle setter and the extension rest.



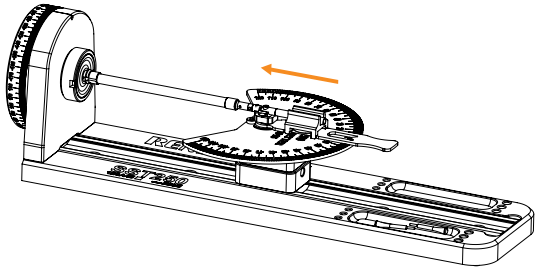
6. Set the B-angle setter to 180°, then move the A-angle setter to the far end of SST250.



7. Position the stylus holder into the kinematic seat, aligning the Renishaw logo and engraving with the notch in the kinematic seat.

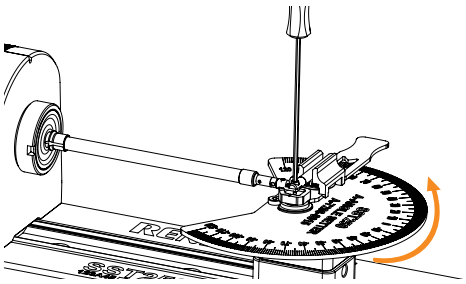


8. Support the knuckle body with the A-angle setting screw at the top. Bring in the A-angle setter. Gently seat the knuckle and extension onto the A-angle setter and extension rest.

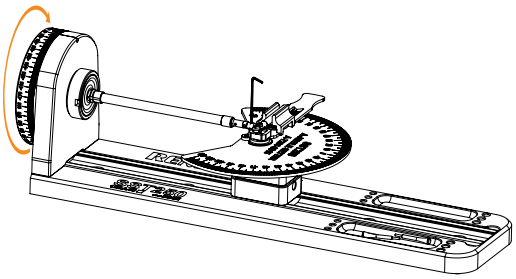


9. Ensure the A-angle setting screw is centred to the A-angle setting pin centre.

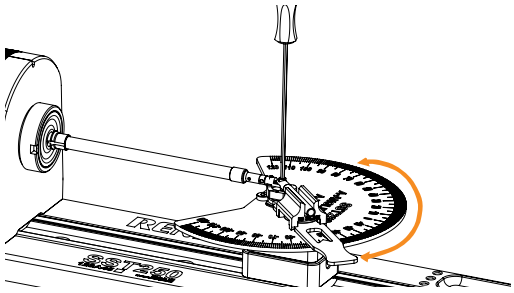
10. Set the A-angle to 90°, then tighten the A-angle setting screw. Make sure the extension is well seated.



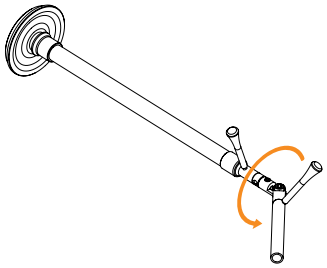
11. Set the required B-angle, rotating anti-clockwise. Tighten the B-angle setting screw.



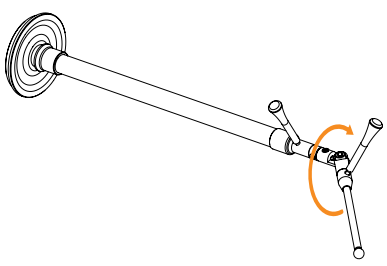
12. Loosen the A-angle setting screw. Set the required A-angle and tighten the A-angle setting screw.



13. Remove the stylus holder from the SST250, then remove the extension from the knuckle using the stylus tools.



14. Fit the final stylus to the knuckle and tighten using the stylus tools.

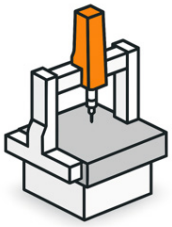


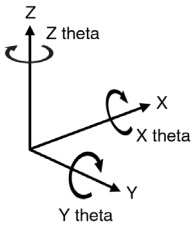
Compensating for machine probe alignment

During stylus set-up, the SST250 controls the A and B-angles only in relation to the stylus-holder kinematic seat. It does not reference the machine's Z-axis, probe head, module, or part alignment. Small angular discrepancies can occur between the stylus' mechanical orientation (as set using the SST250) and the machine's perceived axes.

Common contributors include:

- Probe head or module seating variation
- Angle of probe or module couplings
- Fixture and part alignment to the machine frame





To ensure accurate set-up, you must verify and, if needed, compensate for any offset while using the SST250 to create new stylus assemblies. If any factors that affect this alignment change, this offset should be verified. This will allow for the correct compensation to be applied to stylus angles.

Generally, where access is not restricted and the chance of "shanking out" is low, this offset is not critical.

How to measure and compensate for the offset

The machine controller and programming software determine the exact position of the final assembly when you calibrate a complete stylus assembly. This detail can be used to calculate the offset of the angles set on the SST250 versus the stylus holder in its mounted position.

NOTE: This does not account for the alignment of the workpiece relative to the machine and probe axes.

When using a new stylus assembly ensure that the stylus is aligned to the workpiece and the features you are intending to inspect. On first use, align the stylus carefully and confirm that it contacts the workpiece or feature at the intended points without "shanking out". Make any minor adjustments as required to the A and B-angles using the SST250.

Copying known stylus assemblies

In certain cases, having spare stylus assemblies can be invaluable to enable measurement inspection tasks to continue if there is stylus damage or deterioration. When you have a stylus assembly that you know performs correctly for your workpieces and features, use the SST250 to measure its A and B-angles. Reproduce the assembly using these angles to ensure consistent performance on the same machine.

Use caution when transferring stylus assemblies between machines. Each machine may have different levels of angular alignment.

Support

Further information

Further information relating to SST250 can be found from our website www.renishaw.com/sst250 and is also available from your local Renishaw representative.

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