SINO AGE DEVELOPMENT TECHNOLOGY

PORTABLE SURFACE ROUGHNESS TESTER ROUGHSCAN

OPERATION MANUAL

CONTENTS

1. Description 2
2. Specification 3
3. Measurement parameters 4
4. Features 5
5. Battery installation /replacement (Alkaline only) 6
6. Controls and digital display 6
7. Calibration 7
8. Operation 9
9. Probes 11
10. Probe Replacement 13
11. Maintenance 14

11.1. Protection & Storage 14
11.2. Cleaning 14
11.3. Repairs 14

12. Accessory: Height Stand 15

1. Description

The ROUGHSCAN tester is a portable, battery-powered instrument for checking surface roughness with the measured values displayed on a digital readout. The instrument can be used in the laboratory, an inspection area, in the shop, or wherever on-site surface roughness testing is required.

NOTE: Even though this instrument is designed and built to withstand the rigors of handling and use, it is a precision instrument and should be treated with care to assure measurement accuracy and reliable performance.

A ROUGHSCAN standard kit is furnished in a fitted case, and includes:

- A ROUGHSCAN unit with a general purpose probe (SFP-2001)
- A precision reference specimen
- A 9-volt alkaline battery
- A riser plate for calibrating the gage with the reference specimen
- A screw driver

2. Specification

Measuring ranges:	Ra--0.03μ m~6.3μ m/1μ "~250μ "
	Rz--0.2μ m ~25.0μ m/8μ "~999μ "
	Ry/Rmax--0.2μ m ~25.0μ m/8μ "~999μ "
Display Resolution:	0.01μ m /1μ "
Cut-off:	0.8mm/0.30", ANSI 2RC Filter
Display:	3-digital LCD
Measure Accuracy:	Meets ISO and DIN standards

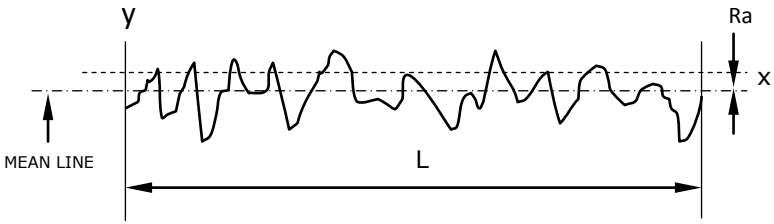
Traverse lengths and Evaluation lengths:

Traverse length	Evaluation length	Numbers of cutoff
0.5mm	0.25mm	1
1.2mm	0.8mm	
5.5mm	5.0mm	
1.25mm	0.75mm	3
3.0mm	2.4mm	
5.5mm	5.0mm	
1.75mm	1.25mm	5
4.5mm	4.0mm	
5.5mm	5.0mm	

Probe type:	piezoelectric
Maximum stylus force:	15.0mN/1500mgf
Power:	9-volt consume-type alkaline battery
Battery capacity:	approx. 3000 measurements
Operating temperature:	10°C~45°C /50°F ~113°F
Storage temperature:	0°C ~60°C /32°F ~147°F

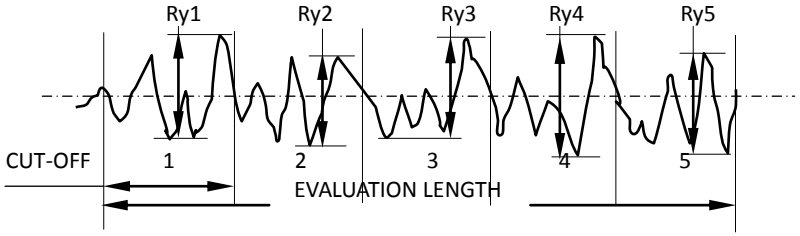
3. Measurement parameters

Ra Roughness Average --- the arithmetic average height of roughness irregularities measured from a mean line within the evaluation length (L).



$$Ra=1/L\int |y|dx\approx(y1+y2+y3+\cdots+yn)/n$$

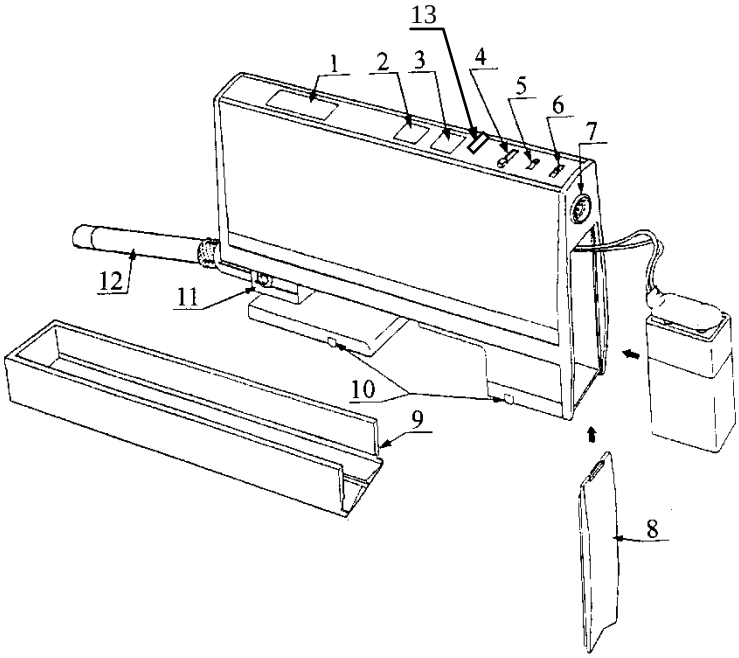
Rz Mean Roughness Depth --- the mean of 5 maximum peak-to-valley roughness depths in 5 successive sampling lengths.



$$Rz=(Ry1+Ry2+Ry3+Ry4+Ry5)/5$$

Ry Maximum Roughness Depth --- The largest of the peak-to-valley roughness depths in the evaluation length.

4. Features

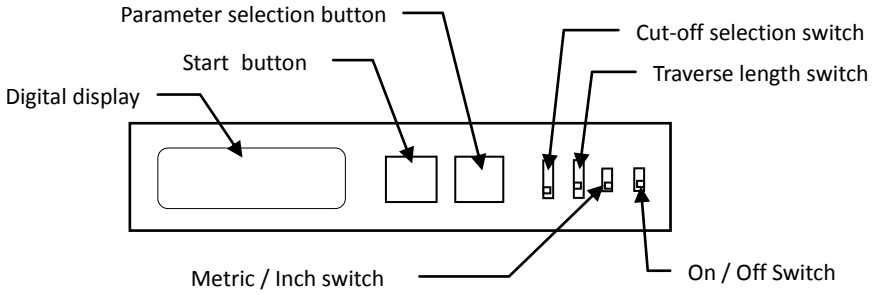


1--digital display
2--start button
3--parameter selection button
4--traverse length switch
5--meter/inch switch
6--on/off switch
7--output connector (accessory)
8--battery compartment cover
9--protective cover
10-- 2 "V" feet
11--probe holding block
12—probe
13—Cut-off selection switch

5. Battery installation /replacement (Alkaline only)

1) Remove Protective Cover from the gage base and slide Battery Compartment Cover off end of the gage.
2) Install/replace battery and replace Battery Compartment Cover.
3) Set On/Off switch for "on" to check battery condition (see next section).

6. Controls and digital display

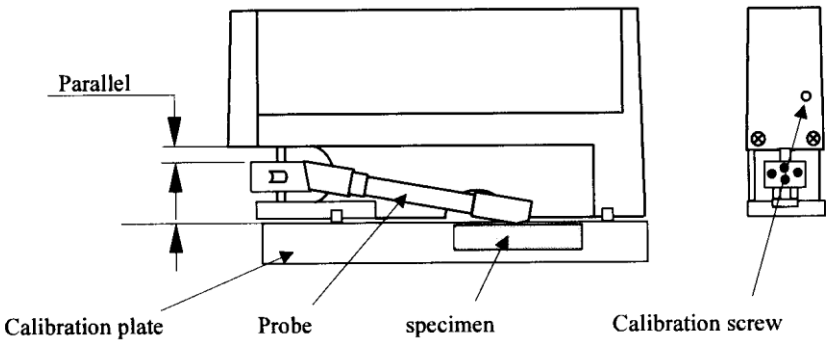


1) Set Power Switch for "on", it should display "1-000". If there isn't any display or it displays "8-888", that means low battery, you should change new battery.
2) Set Metric/Inch Switch for metric(μ m)or inch(μ ").
3) Set Traverse Length Switch for 1, 3 or 5. Refer to Specification section's Traverse Length for detail.
4) Press and release "start" button, the readout should display "1-X.XX"(Ra). If the readout display "8-888", it indicating a low battery, and need to replace the battery.
5) The digital readout also can display "2-X.XX"(Rz) and "3-X.XX"(Ry) in circularly by press and release the Parameter Selection Button.

7. Calibration

Prior to operating the tester, its calibration should be checked.

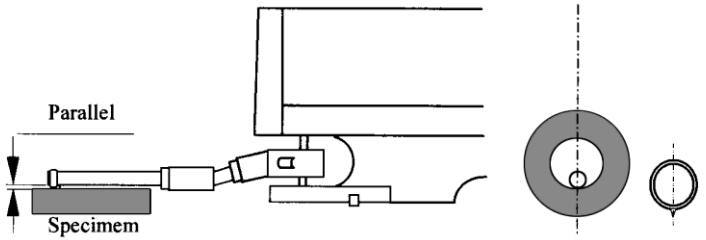
1) The tester is calibrated using the Reference Specimen. Set the Traverse Length Switch to position "5", and set the Metric/Inch Switch to position "metric". Place the specimen into the groove of the calibration plate, place the tester on the calibration plate. Make sure that the probe stylus was in the middle of the specimen.

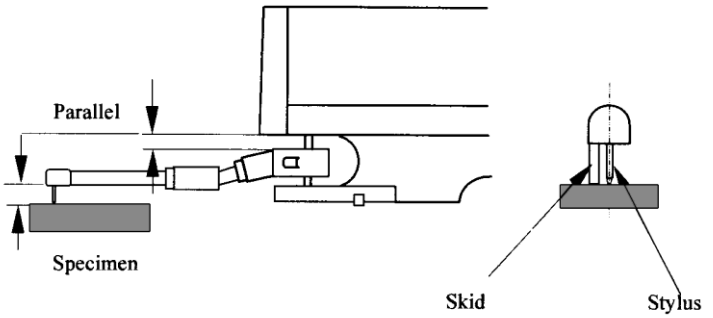


2) Press and release the Start Button, and take a reading from the center of the specimen. If the reading is within ±0.1μm of the value stated on the report of calibration certificate, calibration is within tolerance.
   If the reading differs from the value stated on the report of calibration certificate by more than ±0.1μm,take additional readings around the central area of the specimen. If the reading still differ by more than the allowable tolerance, recalibrate the tester following the procedure below.
3) Using a screwdriver, carefully adjust the calibration

control.
Clockwise to increase the displayed Ra value, or
Counter clockwise to decrease the displayed Ra value.

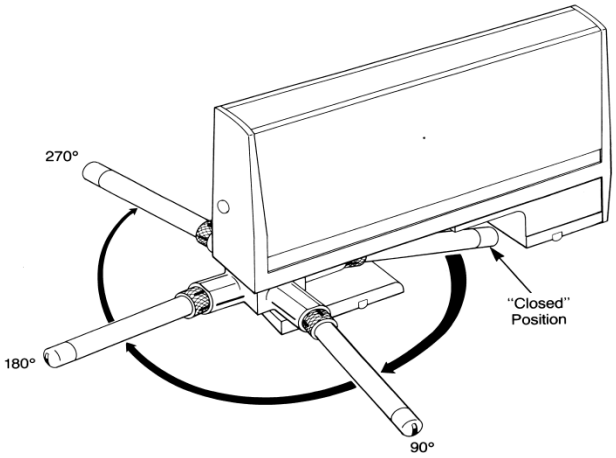
4) After adjusting the calibration control, remeasure the reference specimen to assure that the tester is within the calibration tolerance.
5) When calibrating with a Small Bore Probe or Groove Bottom Probe, the probe should be in the 180° position .And make sure that the tester base is on the same height as the surface of the calibration specimen. (as below)





8. Operation

The tester will operate in any one of four probe positions. Selection of the proper probe position depends on the application.



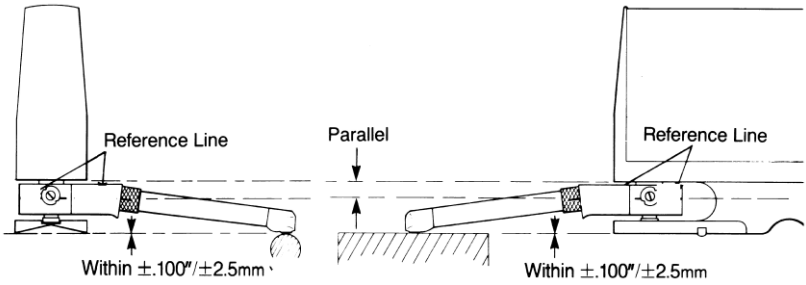
When changing probe positions, gently grasp the probe by its body; never handle the probe by its skid and stylus end.

During the measuring cycle, the probe stylus and skid should be in contact with a surface, and the setup should be properly aligned. Otherwise, any readings obtained are not valid and are not to be used for measurement or tester performance evaluation purposes. The tester can be hand held or placed on a surface in any attitude, it will operate in virtually any position ---– horizontally, vertically, at any angle in between, even upside-down.

With the probe positioned on the workpiece surface to be measured, carefully adjust the tester and workpiece setup, so that the Reference Line(the upside of the Probe Mounting Block) is parallel to the bottom of the tester housing and parallel to the workpiece's surface(see below).

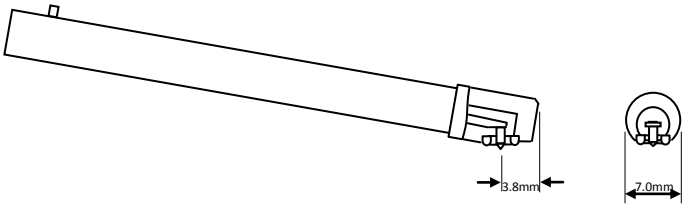
This ensures that the probe skid and stylus are flush on the

work surface, even though the probe body will be at an angle to the work surface.



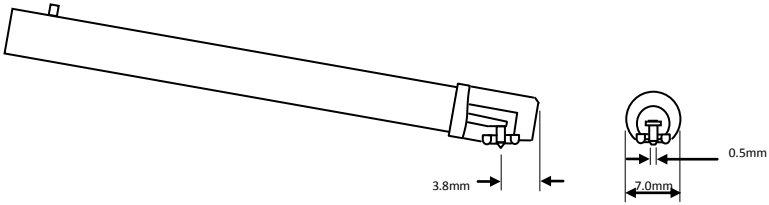
9. Probes

General Purpose Probe (SFP-2001 or SFP-2002)



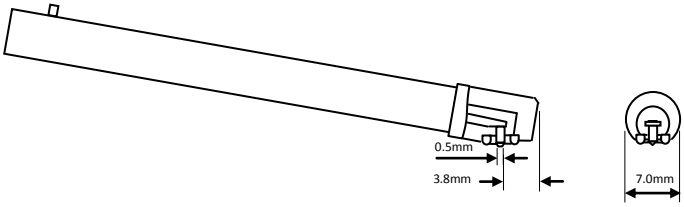
For most surface roughness applications.SFP-2001 has a 90° conical diamond stylus, .0004"/10μm radius per ISO specifications. SFP-2002 has a 90° conical diamond stylus, .0002"/5μm radius per DIN standards.

Transverse Chisel Probe (SFP-2003)



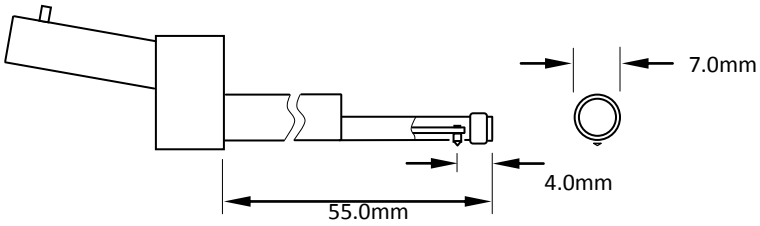
For gaging sharp edges or small O.D.'s where probe is aligned with (in 180° or closed position) to axis of traverse. 90° diamond chisel stylus, .0004"/10μm radius.

Parallel Chisel Probe(SFP-2004)



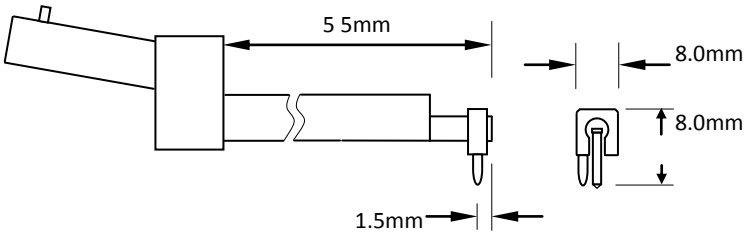
For gaging sharp edges or small O.D.'s where probe is perpendicular(in 90° or 270° position) to axis of traverse. 90° diamond chisel stylus, .0004"/10μm radius.

Small Bore Probe(SFP-2005 or SFP-2006)



For measuring small bores (min. inside diameter of 5.0mm, up to a depth of 15.0mm). 90° conical diamond stylus, .0004"/10μm radius for SFP-2005; .0002/5μm radius for SFP-2006.

Groove Bottom Probe (SFP-2007)



For measuring the bottoms of "O" ring grooves, recesses and holes to depth of 6.0mm. Also used for short lands and shoulders. 90° conical diamond stylus, .0004"/10μm radius.

10. Probe Replacement

1) Turn the tester upside down and swivel the Probe to its 90° position.
2) Loosen the knurled locking collar by turning it counter-clockwise approximately 3 turns, until the access solt is aligned with the probe pin solt in the probe mounting block. Grasp the probe by its body section, carefully withdraw the probe from its mounting block and the knurled locking collar.

   Do not grasp the probe by its skid and stylus end. Do not remove the knurled locking collar from the probe mounting block, loosen it only enough to slide the probe out easily.
3) Reverse the procedure to install a probe, aligning the pin on the bottom of the probe body with the acess solt in the locking collar.

   Make sure that the probe is fully inserted into the probe mounting block (so that the electrical connector is completely engaged) before tightening the locking collar. Finger tighten only.
4) Check the tester's calibration after changing probes.

11. Maintenance

11.1. Protection & Storage

To protect the tester when not in use, always return the probe to its closed position and replace the Protective Cover on the tester unit. Also, when not in use, always keep the tester and its accessories in the fitted case.

11.2. Cleaning

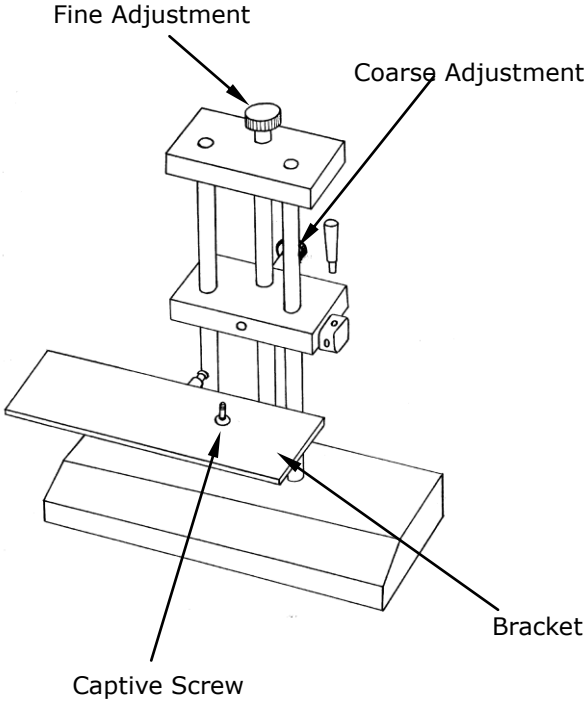
To clean the tester unit, use a soft, lint-free cloth moistened with a mild, non-abrasive, liquid or foam cleaning agent.
Using a magnifier, periodically inspect the probe skid and stylus area for dust, dirt or other contamination. To clean the probe skid and stylus, use a soft (camel's hair), artist's brush moistened with denatured alcohol.

11.3. Repairs

When finded any trouble in using the tester, contact the dealers.
Do not disassemble the unit or attempt any further remedies.

12. Accessory: Height Stand

The Height Stand is intended to be used on a surface plate or other suitably flat surface to measure workpiece surfaces ranging in height from flush with the work surface to a maximum height of approximately 175mm .the tester probe can be in either its 90^{o} or 180^{o} position.



1) Mount the tester in the Bracket on the Height Stand using the Captive Screw in the base of the Bracket. The screw mates with the tapped hole in the bottom of the tester housing. Tighten the screw by finger.
2) Position the Height Stand so that the probe is above the workpiece surface to be measured. Use the Coarse Height Adjustment to bring the probe skid and stylus barely in contact with the surface. Use the Fine

Adjustment to make the Reference Line (the upside of the Mounting Block) parallel to the bottom of the tester housing.

3) Once the setup is correctly adjusted, and the probe is properly positioned on the workpiece surface, gently press and release the Start button on the tester to make the measurement.

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