phase II+
"The Source of Quality"

SURFACE ROUGHNESS GAGE

Model No. SRG-2000

INSTRUCTION MANUAL

Manual should be read prior to operation!

CONTENTS

1) GENERAL 3

2) WORK PRINCIPLE AND STRUCTURE FEATURES 3

3) MAJOR TECHNICAL PARAMETERS 4

4) USE AND OPERATION 5

5) MAINTENANCE AND REPAIR 6

APPENDIX: RECOMMENDED SAMPLING LENGTH 7

1) GENERAL

The Phase II model # **SRG-2000** Mini Surface Roughness Tester is a next generation of product developed for the Phase II Metrology Group that features high accuracy, a wide range of application, simple operation and stable performance. It is widely applicable in testing surfaces of all kinds of metals and non-metals. Integrating the sensor with its mainframe, its a hand-held set especially suited for use on any production site.

2) WORK PRINCIPLE AND STRUCTURE FEATURES

2.1) WORK PRINCIPLE

When the sensor driven by a driver is making a linear uniform motion along the test surface, the contact stylus being perpendicular to the work surface, moves up and down with the work surface. Its motion is converted into electric signals, which are amplified, filtered and transformed into digital signals through a/d. the signals are then processed by the CPU into **Ra** and **Rz** values before being displayed on the screen.

2.2) STRUCTURAL FEATURES

2.2A) BASIC SETUP: FOR OUTWARD APPEARANCE, SEE FIGURE 1.

Base Instrument	1 UNIT
Battery Charger	1 UNIT
Calibration Standard/Base	1 UNIT

FIGURE 2: STRUCTURE OF MAINFRAME

1) Start Test Button
2) Lcd Screen
3) Scale Selection / Up
4) Inch/Metric Conversion / Down
5) Power Switch
6) Charging Socket
7) Stylus Mark
8) Stylus Protective Guard

3) MAJOR TECHNICAL PARAMETERS

ROUGHNESS PARAMETERS	Ra, Rz, Rq, Rt
MEASURING RANGE	RA: **0.05-10.0µM** RZ: **0.1 - 50µM** Rq :**0.05 ~ 10.0µm** Rt: **0.1 ~ 50µm**
CUT-OFF LENGTHS	0.25, 0.80, 2.50
FILTER	RC ANALOG
TRACING LENGTH	0.23IN (6MM)
TRACING SPEED	0.04IN/SECOND (1.0MM/SECOND)
ACCURACY	+/-12% of known value
PICK UP STYLUS	PIEZO-ELECTRIC
TRACER TIP	DIAMOND, RADIUS 10µM +/- 1µM
OPERATING TEMPERATURE	32-104 DEGREES F (0-40 DEGREES C)
POWER	3.7v Lithium ion Battery
CONTACT FORCE ON PROBE	<0.5N
STATIC MEASURING FORCE OF SENSOR STYLUS	< 0.016N
DIMENSIONS	106 X 70 X 24mm
WEIGHT	0.4LBS (200G)

4) USE AND OPERATION

4.1) OPERATION:

POWER ON THE DEVICE.

Press and hold the Red Power button  on the front panel for 1 second. After a "beep" sound, the device is ready to work. The large LCD display will show the measuring parameters and sampling length of the previous test. Before taking a test, choose the desired parameter **Ra**, **Rz**, **Rq**, or **Rt** and proper sampling length **2.5**, **0.8** or **0.25** (for sampling length option, consult the appendix).

After switching on the device, press the  to change parameters.

To choose the proper sampling length, press the keypad  (**0.25**, **0.8** OR **2.5**).

After the parameters and sampling lengths are taken, you may begin testing. Position the ➢l l◅ mark over the test area and press the start button on top of the unit. The stylus moves automatically. When the device beeps twice, the measurement has been completed and the results will be shown upon the LCD screen.

POINTS FOR ATTENTION:

While the stylus is in motion, you must keep the device even and steady so as not to affect the accuracy of the reading.

Before the sensor returns to the original position, the device will not respond to any operation until the measurement is completed.

4.2) CALIBRATION

When abnormal errors are found, the standard sample block may be used for calibration. The **Ra** values of the sample block used for calibration, range from 0.1 μM - 10μM.

METHOD: with the tester in metric mode and the power off, press the red Start button on top while pressing the Power button together. When a beep sounds, release the button and the device enters its calibration mode. The LCD screen should read **"CAL"** and there will be a Ra value on the display. If this value doesn't match your test sample then you must adjust it by pressing the up/down arrow buttons on the keypad. Press the Start button on top and the unit will begin calibrating itself. The value displayed at the end of this process should fall within the allowable tolerance of your test sample. To complete the process. Power the unit off. This will now save the new calibration. Normal measurements can resume at this time.

4.3) CONVERTING IN/MM

Press and hold the 

keypad for about 1 second. The system will convert from Metric to English or English to Metric

4.5) LOW VOLTAGE INDICATOR

When the battery symbol is near empty then its time to recharge the SRG-2000. The tester must be recharged before further usage.

4.6) RECHARGING

Plug the charger into the socket of the tester. A full recharge should take between 3-5 hours. If needed, the tester can function while charging.

5) MAINTENANCE AND REPAIR

5.1) MAINTENANCE

Avoid collision, violent shock, heavy dust, dampness, oil and a strong magnetic field.

The Piezo-electric pick up stylus with diamond tip is extremely sensitive and accurate. After each use, make sure that the supplied protective cover goes on this tip after each use. Damage to this tip will result in false and erroneous readings.

5.2) REPAIR

ALL REPAIRS MUST BE DONE THROUGH THE PHASE II SERVICE DEPARTMENT.

A return authorization number must is mandatory in order for a defective tester to be accepted for repair and/or replacement. All testers must be accompanied by your warranty card or serial number. Complete description of problem and a contact person for authorization of repairs must be supplied as well.

ANY ATTEMPT AT HOME REPAIR WILL AUTOMATICALLY VOID THE STATED WARRANTY! ***NO EXCEPTIONS!***

Appendix: Recommended Sampling Length.

Ra (µm)	Rz (µm)	SAMPLING LENGTH
>40 - 80	>160 - 320	8
>20 - 40	>80 - 160	8
>10 - 20	>40 - 80	8
>5 - 10	20 - 40	2.5
>2.5 - 5	>10 - 20	2.5
>1.25 - 2.5	>6.3 - 0	0.8
>0.63 - 1.25	>3.2 - 6.3	0.8
>0.32 - 0.63	>1.6 - 3.2	0.8
>0.25 - 0.32	>1.25 - 1.6	0.25
>0.20 - 0.25	>1.0 - 1.25	0.25
>0.16 - 0.20	>0.8 - 1.0	0.25
>0.125 - 0.16	>0.63 - 0.8	0.25
>0.1 - 0.125	>0.5 - 0.63	0.25
>0.08 - 0.1	>0.4 - 0.5	0.25
>0.063 - 0.08	>0.32 - 0.4	0.25
>0.05 - 0.063	>0.25 - 0.32	0.25
>0.04 - 0.05	>0.2 - 0.25	0.25
>0.032 - 0.04	>0.16 - 0.2	0.25
>0.025 - 0.032	>0.125 - 0.16	0.25
>0.02 - 0.025	>0.1 - 0.125	0.25
>0.016 - 0.02	>0.08 - 0.1	0.08
>0.0125 - 0.016	>0.063 - 0.08	0.08
>0.01 - 0.0125	>0.5 - 0.063	0.08
>0.008 - 0.01	>0.04 - 0.05	0.08
>0.0063 - 0.008	>0.032 - 0.04	0.08
<0.0063	<0.032	0.08