SRT6210
User Manual

1. Features

The instrument adopts computer technology, in line with the national standard GB/T6062 and ISO, DIN, ANSI and JIS four standards, can be widely applied to the production site, can measure the surface roughness of a variety of machined parts, according to the selected conditions of the measurement of the calculation of the corresponding parameters: in the gilt-anomalous dew on the clear show all the measurement of the base of the workpiece on the surface to be measured by the internal drive mechanism driven by the instrument. The sensor is driven by the internal drive mechanism of the instrument to glide along the measured surface at the same speed, and the sensor feels the roughness of the measured surface through the sharp stylus in the inner bitter, at this time, the roughness of the measured surface of the workpiece causes the stylus to generate displacement, which causes the inductance of the sensor inductance to change, and then generates an analog signal proportional to the roughness of the measured surface at the output of the phase-sensitive rectifier, and the signal enters into the data acquisition system after amplification and level conversion. The signal is amplified and level-converted into the data acquisition system, the DSP chip will collect the data for digital filtering and parameter calculation, the measurement results in the LCD display, at the same time can be communicated with the PC to realize the data analysis statistics and printing.

* Multi-parameter measurement: Ra, Rz, Rq, Rt;
* High precision inductance sensor;
* Four filtering modes: RC, PC-RC, GAUSS, D-P;
* Built-in lithium-ion rechargeable battery and charging control circuit, high capacity;
* Mechatronics design, small size, light weight, the use of another keyboard operation after 5 minutes automatically shut down;
* With automatic shutdown function.
* This table has two shutdown methods: one is manual shutdown, convenient; Built-in standard RS232 interface, can communicate with PC;
* This table can remember 7 groups of measurement data and the following measurement conditions for next review or online processing;
* With imperial conversion function.

2. Specifications and parameters

Display: Blue backlight, 4-bit digital display, 10mm LCD
Measurement parameters: Ra, Rz, Rq, Rt.
Measuring range:

Ra，Rq 0.005~16.00μm /0.020~629.9uinch

Rz， Rt 0.020~160.0 μm /0.078 ~6299uinch

110 Accuracy: not more than ±10%
Indicating value variability: not more than 6%
Sensor:

Measurement principle: inductive type

Radius: 5μm
Material: Diamond
Force measurement: 4mN(0.4gf)
Angle: 90°
Longitudinal radius: 48mm
Maximum drive stroke: 17.5mm/0.7inch
Sampling length (optional): 0.25mm, 0.8mm,2.5mm

Driving speed:
Measuring time
When sampling length =0.25mm, Vt=0.135mm/s
When sampling length =0.8mm,Vt=0.5mm/s
When sampling length =2.5mm, Vt=1mm/s
when return Vt=1mm/s

Filter profile

Filter profile:RC
PC-RC
GAUSS
Unfiltered contour:D-P

Resolution:
0.001 μm When the measured value is <10μm
0.01 μm When 10μm< measured value <100μm
0.1μm When the measurement value is greater than 100μm

Rating Length Ln: 1-5L Optional
Power supply: built-in lithium-ion rechargeable battery.
Working environment: Temperature: 0 ~ 50℃
Humidity: <80% RH
Dimensions: 140×52×48mm
Net weight: About 420g

Standard configuration

Portable box host.....1
Standard sensor.....1
Standard template.....1
Power adapter.....1
Instruction manual.....1
Screwdriver.....1
Adjustable support.....1
Sensor case.....1

Optional accessories:
RS-232 cable and software

3. Panel and component description

3.1 Key Description

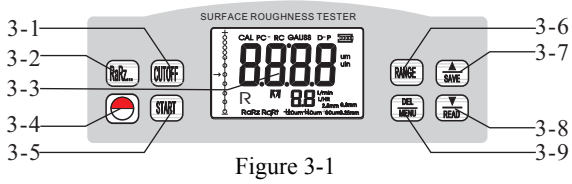


Figure 3-1

3-1 Sampling length selection key
3-2 Parameter selection key
3-3 monitor
3-4 Power switch
3-5 Measurement keys
3-6 Measurement range selection key
3-7 Up/Save key
3-8 Down 7 Browse key
3-9 Delete/Menu key

3.2 Component Description

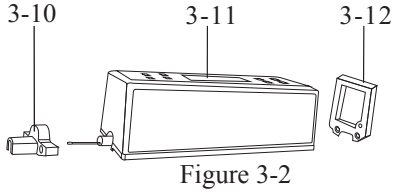


Figure 3-2

3-10 Probe protector 3-11 Panel 3-12 Adjustment rack

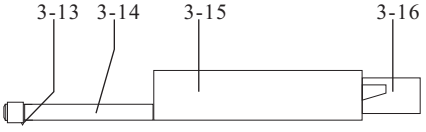
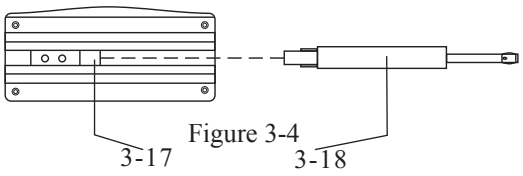


Figure 3-3



3-13 Pins
3-14 Protective casing
3-15 Host
3-16 Sensor socket

Figure 3-4

3-17 Connecting sleeves
3-18 Sensor

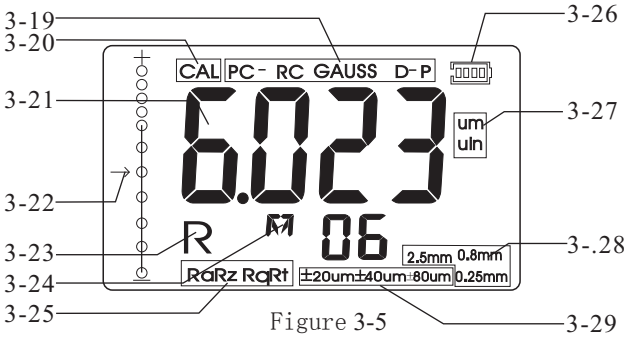


Figure 3-5

3-19 Filter indication
3-20 Calibration indicator
3-21 Measured values
3-23 Viewing status indicators
3-24 Memory status indicator
3-25 Measurement parameter indication
3-26 Battery status indicator
3-27 Measurement unit instructions
3-28 Sampling long light indication
3-29 Range selection indication

3.3 Sensor Loading and Unloading

During installation, hold the main part of the sensor by hand, insert the sensor into the sensor connecting sleeve at the bottom of the instrument as shown in Figure 3-4, and then gently push it to the end. When disassembling, hold the main part of the sensor or the root of the protective sleeve in your hand and slowly pull it out.

Note:

A. When measuring the workpiece in the charging state, attention should be paid to the placement of the cable not to affect the measurement operation.
B. The meaning of low battery warning :1 The black part inside the battery can display the battery amount, indicates that the battery is too low, must be charged as soon as possible.
Indicates that the power is sufficient and can be measured normally.
C. When the battery is charging, relatively large power noise will affect the measurement and weaken the measurement signal.
D. The instrument can control the charging process, so that it is not necessary to shut down and charge. Even if the instrument is turned off. It will turn on automatically when charging.

4. Measurement steps:

4.1 Preparations before measurement

A. Turn on the device to check whether the battery voltage is normal.
B. The instrument automatically restores the last measurement state after starting up. The second two-digit line on the display indicates the number of groups stored. Before making a measurement, you must do your homework.
C. Check whether the measurement range is selected correctly. If not, press the RANGE button to select.
D. Check whether the sampling length is selected correctly. If not, press the ---- key to select. For sampling length selection, please refer to Table 10-7 recommendations on page 15.
E. Check whether the filter selection is correct. If it is not correct, press the DEL/MENU key until 'FILT' appears on the display. It takes about four seconds from pressing DEL/MENU. Then press the SAVE and READ keys to select from four filters (RC,PC-RC,Gause,D-P). You can press the meaning key other than SAVE or READ to exit the setting.

Note:

A. The stylus of the sensor is A key part of the instrument and should be attached great importance.
B. In the process of loading and unloading sensors, special attention should be paid not to touch the stylus, so as not to cause damage and affect the measurement.
C. When installing the sensor, pay attention to the reliable connection.

3.4 Power Adapter and Battery charging

When the battery voltage is too low, i.e. when the battery symbol on the display shows that the voltage is too low, the instrument should be charged as soon as possible. When charging, please insert the power plug of the power adapter into the power socket of the instrument as shown in Figure 3-6, and then connect the power adapter to 220V50Hz utility power, that is, start charging. The input voltage of the power adapter is 220V AC, the output is 5-7V DC, the charging current is about 300mA, and the maximum charging time is about 5.0 hours. This instrument is a lithium-ion rechargeable battery, no memory effect, can be charged at any time, charging the instrument can work as usual.

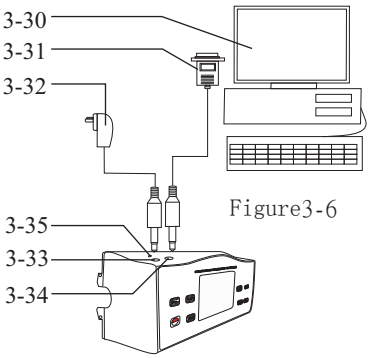


Figure3-6

3-30 Computer
3-31 RS-232 jack
3-32 Power adapter
3-33 Accessory mounting machine
3-34 RS-232 Flower arrangement
3-35 calibration hole

F. Check that the UNIT of measurement is set correctly. If not, press DEL/MENU until "Unit" appears on the monitor. Start by pressing the DEL/MENU key, take about 8 seconds, and then use the SAVE key to switch to the READ key. You can press any key other than SAVE key or READ key to exit the setting.
G. Wipe the measured surface of the workpiece.
H. Place the device according to Figure 4-1, 4-2, and ensure that cables are correctly and reliably connected.
I. Refer to Figure 3-8, the sliding trajectory of the sensor must be perpendicular to the direction of the processed texture of the measured surface of the workpiece.
J. Brackets and sensors When the surface of the measured part of the object is smaller than the bottom surface of the instrument, the sensor jacket and bracket can be used to assist support for correct measurement. (As shown in Figure 4-3)

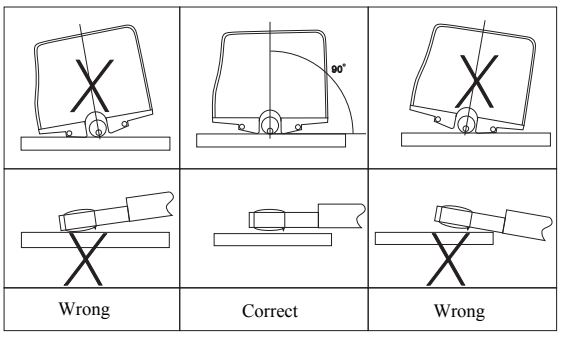


Figure 4-1

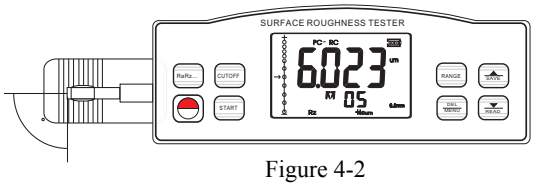


Figure 4-2

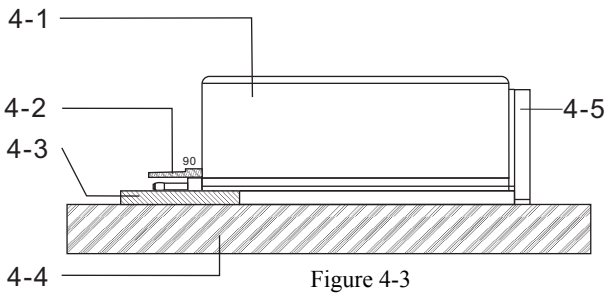


Figure 4-3

4-1 Roughness measuring instrument
4-2 Sensor jacket
4-3 Workpiece under test
4-4 Measurement platform
4-5 Adjustable brackets

4.2 Measurement

After the preparation work is done, if the measurement conditions do not need to be changed, press the power key to start the measurement, first on the display will see "--", at the same time, the sensor is sliding on the surface of the test, and then the sensor stops sliding, and then slides backward, until the sensor returns to the original position, the measurement value is displayed on the display.

4.2.1 Save the measured values for later use

After measurement, it will be seen that the original "M" becomes『M』. In this state, you can press SAVE key to save the Ra, Rz, Rq, Rt data and measurement conditions into the instrument, and the number of data sets will be automatically increased by 1. When stored, M will automatically become "M".

4.2.2 How to view Parameters

In the "M" state, you can browse different parameters and press the Ra/z key to display the corresponding parameters and measurement conditions on the monitor.

4.2.3 Deleting Measurement Results

In the "M" state, delete the current set of measurement results by pressing the DEL/MENU key, then "M" is automatically converted to『M』, in addition, in the "M" state by pressing the Start key, the new measurement results will replace the previous measurement results

5. How to read stored values

Regardless of whether the instrument is in the "M" or "M" state, we can read the stored value by pressing the READ key. The "R" on the monitor indicates that it is in the reading state. When it is in the "R" state, we can browse different sets of values by pressing the SAVE and READ keys. The serial number of each group is displayed simultaneously on the monitor. For any of these groups, we can read the measured values under different parameters. When the READ key is pressed, the relevant parameters and their values will be displayed on the display.

6. How to calibrate the instrument

6.1 To enter the calibration state, simply hold down the DEL/MENU key for about 12 seconds until "CAL" appears on the monitor. The calibration status is marked with "CAL".

6.2 When measuring on a standard sheet, be sure to compare the measured value with the standard value on the same parameter.
6.3 Press SAVE or READ Adjust to the correct value.
6.4 Repeat 6-2 6-3 until the specified accuracy is reached. 6.5 Press any key other than the Start key to exit.
6.6 Before leaving the factory, the instrument has been fully adjusted, the error is less than 10%, the user should not often use the calibration function.

7. How do I restore the factory Settings

7.1 When to Restore Factory Settings

When the measurement value is too large or too small, it is necessary to restore the factory setting value.

7.2 How Can I Restore Factory Settings

Press and hold the DEL/MENU key until "FAC" appears on the display (about 16 seconds). This state is also marked by "CAL ", the display will appear after three seconds have been jumping numbers, press any key except the power button to exit.

7.3 After restoring the factory Settings, if the instrument measurement is still inaccurate, you can refer to the calibration section to calibrate the instrument.

8. Communicate with the PC

8.1 Insert the RS-232 cable into the appropriate hole of the instrument
8.2 Connect the instrument with the RS-232 on-line cable
8.3 Open the software on the operating platform and select the COM port in system Settings
8.4 Click the Data Collection button and then click the Start/ Continue button.

8.5 Press the -- key to download the data in the instrument to the computer.

9 Daily maintenance and maintenance

Avoid collision, violent vibration, dust, moisture, oil, strong magnetic field, etc. The sensor is a precision part of the instrument and should be carefully protected. After each use, the sensor should be put back in the packaging box; The random standard template should be carefully protected to avoid calibration instrument errors after scratching.

10. Parameters

10.1 Filter

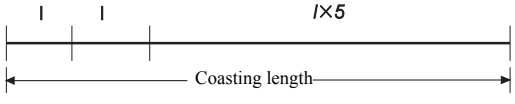
RC filter: Traditional 2-order filter
PC-RC filter: Phase corrected RC filter
GAUSS filter: DIN4777
D-P direct contour: The root mean square method is adopted

10.2 Center Line

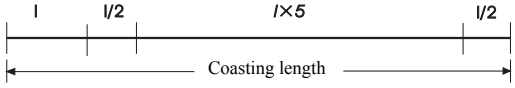
This instrument adopts root-mean-square algorithm

10.3 Taxi Length

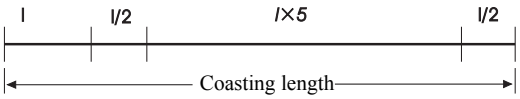
10.3.1 RC filter



10.3.2 PC-RC filter



10.3.3 GAUSS Filter



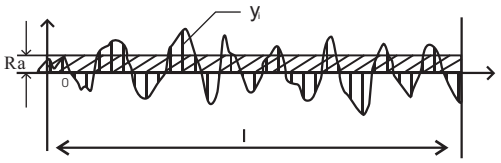
10.3.4 D-P filter

10.4 Definition of roughness parameters

10.4.1 Arithmetic mean deviation of Ra profile

The arithmetic mean of the absolute value of the ordinate value over a sample length

$$Ra = \frac{1}{n}\sum_{i=1}^{n}|y_i|$$



10.4.2 Rz microscopic unevenness,10 point height value

The sum of the 5 largest profile peaks and the average of the 5 largest profile valleys within a sampling length

$$Rz = \frac{\sum_{i=1}^{5} y_i + \sum_{i=1}^{5} y_V}{5}$$

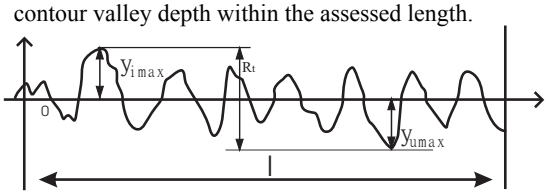
10.4.3 Rq contour root-mean-square deviation

The root-mean-square value of the ordinate value over a sample length

$$Rq = \left(\frac{1}{n}\sum_{i=1}^{n} y_i^2\right)^{\frac{1}{2}}$$

10.4.4 Rt contour total peak and valley height.

The sum of maximum contour peak height and maximum contour valley depth within the assessed length.



10.5 Fault Information

Errl: No data available.

Err2: The contour arithmetic mean deviation value is too small to be calibrated.

Err3: The read value is too small and cannot be reduced.

10.6 Meet the national standard code standard name:

ISO4287	International standard
DIN4768	German standard
JIS B	Japanese industrial standard
ANSI46.1	American standard

10.7 Recommendation table for sampling length selection

(See next page)

Ra (μm)	Rz (μm)	Sampling length meter (mm)
>5~10 >2.5~5	>20~40 >10~20	2.5
>1.25~2.5	>6.3~10	0.8
>0.63~1.25	>3.2~6.3	
>0.32~0.63	>1.6~3.2	
>0.25~0.32	>1.25~1.6	0.25
>0.20~0.25 >0.16~0.20	>1.0~1.25 >0.8~1.0	
>0.125~0.16 >0.1~0.125 >0.08~0.1	>0.63~0.8 >0.5~0.63 >0.4~0.5	
>0.063~0.08 >0.05~0.063 >0.04~0.05	>0.32~0.4 >0.25~0.32 >0.2~0.25	
>0.032~0.04 >0.025~0.032 >0.02~0.025	>0.16~0.2 >0.125~0.16 >0.1~0.125	