1.Features

This instrument adopts computer technology and conforms to the national standard GB/T 6062 as well as ISO, DIN, ANSI and JIS standards. It can be widely used in production sites and can measure the surface roughness of various machine-processed parts. According to the selected measurement conditions, the corresponding parameters are calculated, and all the measured parameters are clearly displayed on the liquid crystal display. When measuring the surface roughness of a workpiece, the sensor is placed on the surface to be measured, and the drive mechanism of the instrument drives the sensor to move along the measured surface at a constant speed. The sensor senses the roughness of the measured surface through the built-in sharp probe. At this time, the roughness of the workpiece measured surface causes the probe to move, which causes the inductance of the sensor's inductance coil to change. As a result, an analog signal proportional to the measured surface roughness is generated at the output end of the phase-sensitive rectifier. This signal is amplified and converted to an electrical level before entering the data acquisition system. The DSP chip collects the data and performs digital filtering and parameter calculation. The measurement results are displayed on the liquid crystal display, and at the same time, they can be communicated with a PC for data analysis, statistics, and printing.

* Multi-parameter measurement: Ra, Rz
* High precision inductance sensor;
* Built-in lithium-ion rechargeable battery and charging control circuit, high capacity;
* Mechatronics design, small size, light weight,
* Use with automatic shutdown function.

  This table has two shutdown methods: one is manual shutdown, and the other is automatic shutdown after 5 minutes of keyboard operation;
* Built-in standard RS232 interface, can communicate with PC;
* With the imperial conversion function.

Resolution:
0.001μm when the measured value is <10μm
0.01 μm When 10μm< Measured value <100μm
0.1μm when measured value ≥100μm

Rating length: 1-51 optional
Power supply: built-in lithium-ion rechargeable battery.
Working environment: Temperature :0~50℃
Humidity: <85%RH

Overall dimension：140×52×48mm
Net weight：420g

Standard: Portable case.....1
Host machine.....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

2. Specifications and parameters

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

Ra: 0.05-10.00um/1.000-400.0uinch
Rz: 0.020-100.0um/0.780-4000uinch

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

Measurement principle: inductive type

Radius: 10μm
Material: Diamond
Force measurement: 16mN(1.6gf)
Angle: 90°
Longitudinal radius: 48mm
Max drive stroke: 17.5mm/0.7inch Sampling length l(optional) : 0.25mm, 0.8mm,2.5 mm

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

3. Panel and component description

3.1 Key Description

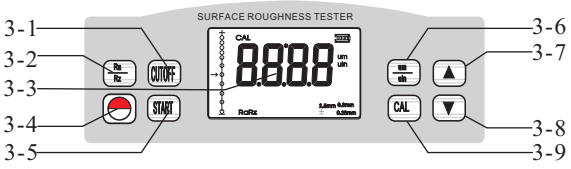


Figure3-1

3-1 Sampling length selection key
3-2Parameter selection key
3-3 monitor
3-4 Power switch
3-5 Measurement keys
3-6 unit conversion key
3-7. Press the up button
3-8 Down key
3-9 Calibration keys

3.2 Part description

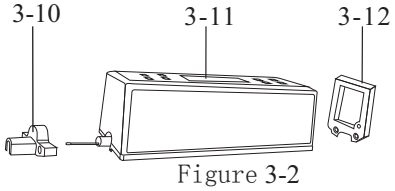


Figure 3-2

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

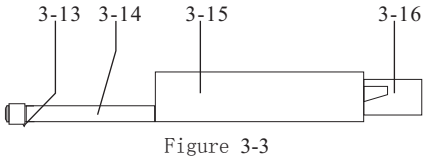


Figure 3-3

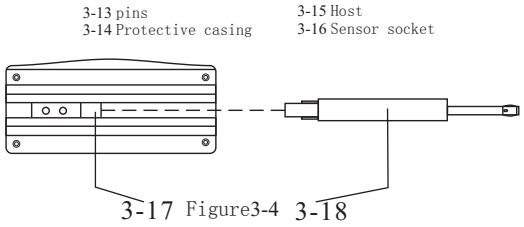


Figure3-4

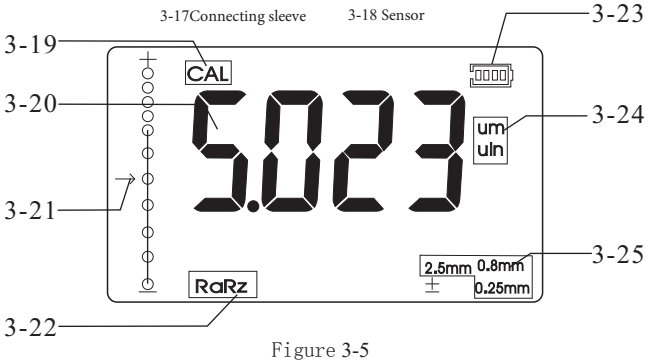


Figure 3-5

3-19 Calibration indicator
3-20Measured values
3-21 Stylus position cursor
3-22 Measurement parameter instructions
3-23 Battery status indicator
3-24 Measurement unit instructions
3-25 Sampling length indication
3-26 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 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. 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 a low voltage, the instrument should be charged as soon as possible. To charge the instrument, please follow the instructions shown in Figure 3-6 and insert the power adapter's power plug into the instrument's power socket, then connect the power adapter to the 220V 50Hz mains power, i.e., the charging will begin. The input voltage of the power adapter is 220V AC, the output is 5-7V current, and the charging current is about 300 milliamps. The longest charging time is about 5.0 hours. The instrument uses a lithium ion charging battery with no memory effect, which can be charged at any time, and the instrument can continue to work while charging.

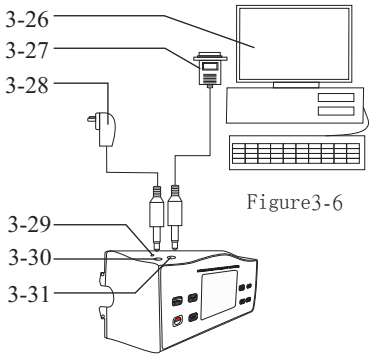


Figure3-6

3-26 Computer
3-27 RS-232 jack
3-28 Power adapter
3-29 Accessories mounting holes
3-30 RS-232 jack
3-31 Calibration hole

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 the low battery warning:
indicates that the black part inside the battery can display the battery amount, indicating that the power is too low and must be charged as soon as possible.
It 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. Before making a measurement, you must do your homework.

C. Check whether the measurement parameters are selected correctly. If not, press the RaRz key for selection.

D. Check whether the sampling length selection is correct, if not correct, press the CUTOFF key to select. For sampling length selection, refer to Table 10-7 recommendations on page 12.

E. Check whether the measurement unit is set correctly. If it is not set correctly, press the um/uin key to select it.

G. Wipe the measured surface of the workpiece H. Place the instrument according to Figure 4-1, 4-2 to ensure accurate and reliable wiring.

I. According 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)

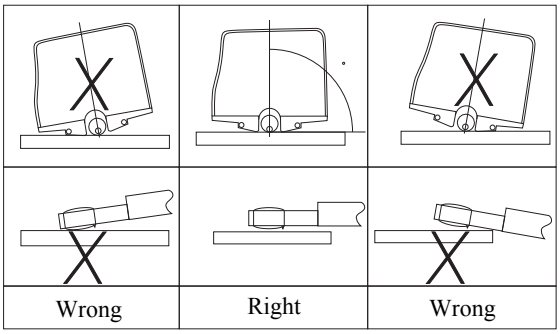


Figure 4-1

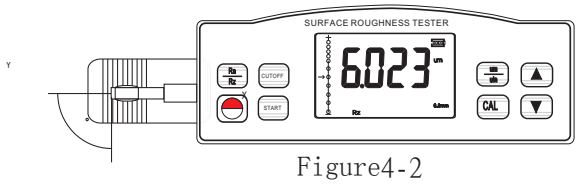


Figure4-2

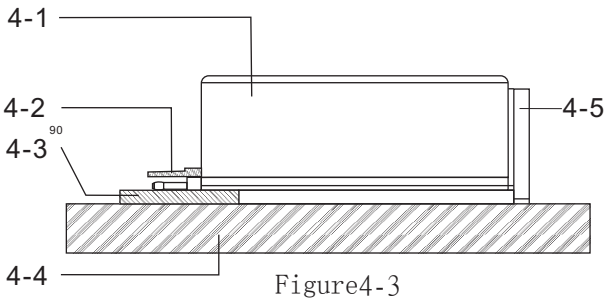


Figure4-3

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.

5. How to set the rating length

To set the rating length, simply hold down the CAL key until "LEN" appears on the monitor, about 12 seconds since the CAL was pressed. Then, press ▲ or ▼ to select. To save and exit, just press any key other than ▲ or ▼.

6. How to calibrate the instrument

6.1 To enter the calibration state, just press the CAL key and "CAL" will appear on the display.

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 ▲ or ▼ to 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. Daily maintenance and maintenance

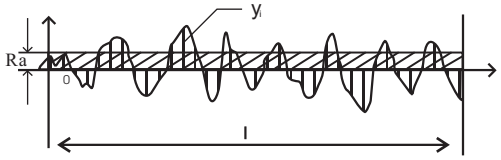
Avoid collision, violent vibration, dust, moisture, oil, strong magnetic field, etc.
The sensor is a precision part of the instrument and should be carefully protected. After each use, the sensor should be put back in the packaging box; The random standard template should be carefully protected to avoid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

8. Definition of roughness parameters

8.. 1 Arithmetic mean deviation of Ra profile

The arithmetic mean of the absolute value of the ordinate value over a sample length 1

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



8.2 Rz micro unevenness, 10 o 'clock height value

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

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

Sample length recommendation table

Ra (μm)	Rz (μm)	Sampling length (mm)
>5~10	>20~40	2.5
>2.5~5	>10~20	
>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	