

SR180 Surface Roughness Tester

English Instruction Manual

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1 Overview

The portable roughness meter is a new product, which is suitable for the laboratory and production site. It can measure the surface roughness of a variety of machined parts, calculate the corresponding parameters according to the selected measurement conditions, and clearly display the measurement results and outline on the LCD.

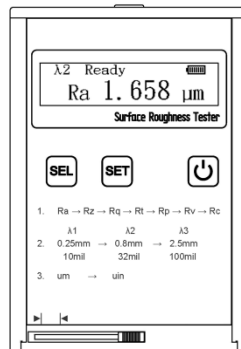


Figure 1-1 Main unit

1.1 Features:

- Multi parameter measurement: RA, RZ, RQ, RT, RP, RV, RC;
- High precision inductive sensor;
- Gauss filter;
- Comply with iso4287;
- 256 × 64 dot matrix OLED;
- Built in lithium ion rechargeable battery and charging control circuit, high capacity, no memory effect, continuous working time more than 15 hours;
- Mechatronics design, small volume, light weight, easy to use;
- Automatic shutdown and various information.

1.2 Parameters:

- Working theory: Inductive
- Testing range: $\pm 80 \mu\text{m}$
- Stylus Radius: $5 \mu\text{m}$
- Stylus material: Diamond

SUMMARY

- Measuring Force: 4mN(0.4gf)
- Sensor Angle: 90°
- Longitudinal radius guide head: 45mm
- Max driving length: 6mm
- Traverse speed: testing
 - λ 1: cut off=0.25mm Vt=0.135mm/s
 - λ 2: cut off=0.8mm Vt=0.5mm/s
 - λ 3: cut off=2.5mm Vt=1mm/s

Return

V=1mm/s

- Display resolution: $\leq \pm 10\%$
- Indication variability: $\leq 6\%$

2 Instrument interface display

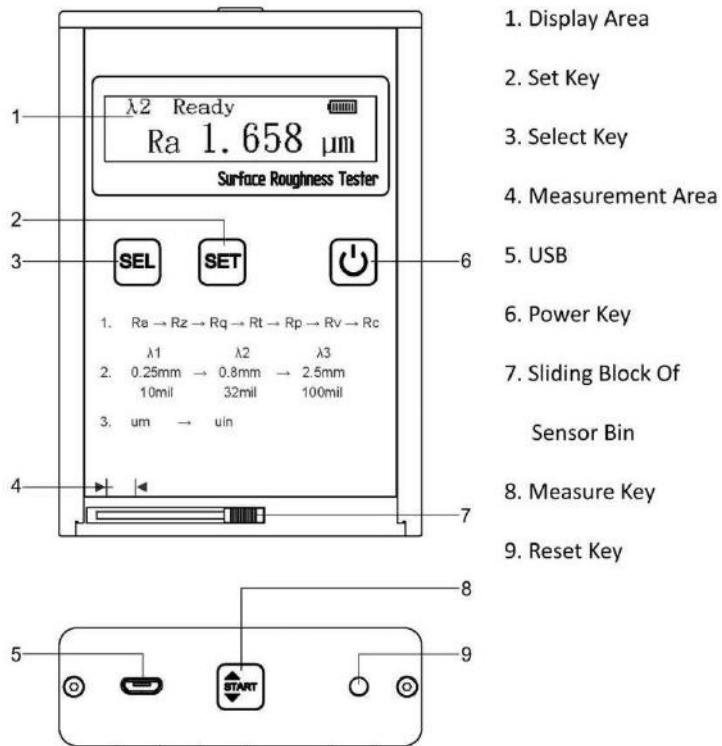


Figure 2-1 Operation key and menu display

3 Instrument Interface

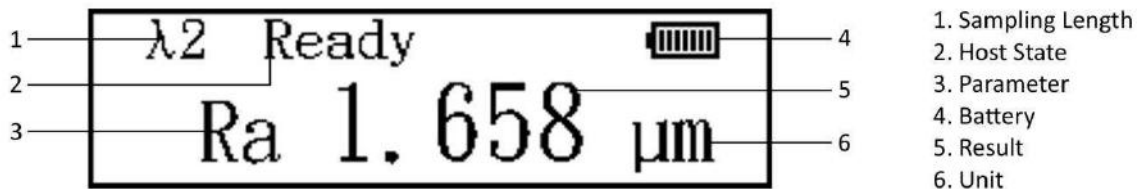



图 3-1 interface display

In the main interface, you can perform the following operations:


1. Press **Sel** to select sampling length, parameter, unit, and so on. The selected object will turn

black and highlight. Press  to change the selected setting.

2. Press  the instrument will measure according to the current settings and return to the main interface.

4 Instrument Operation

4.1 Power on

In the off state, long press the power key  to start the instrument and enter the main interface (as shown in Figure 4-1).

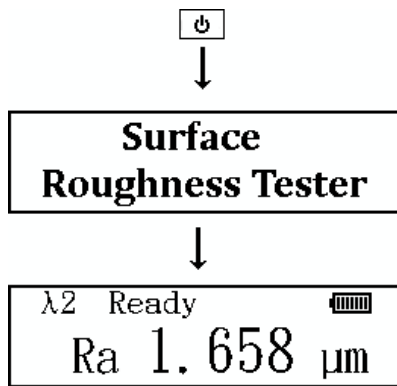



FIGURE 4-1 START UP DIAGRAM

4.2 SHUT DOWN

In the power on state, press the power button  for a long time to shut down the instrument. If there is no key operation within 3 minutes, the instrument will shut down automatically.

4.3 preparation before measurement

1. Start the machine and check whether the battery voltage is normal;
2. Clean the measured surface of the working piece;
3. Refer to Figure 4-2 and Figure 4-3 to place the instrument on the measured surface of the working piece correctly, stably and reliably;
4. Referring to Figure 4-4, the sliding track of the sensor must be perpendicular to the processing texture direction of the working piece surface.

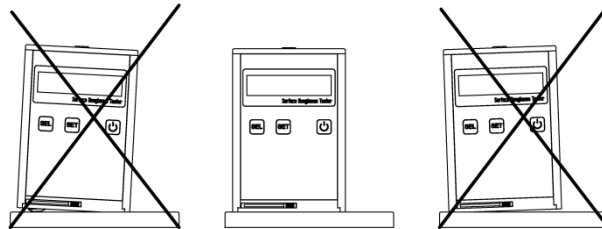


Figure 4-2 Front View During Test

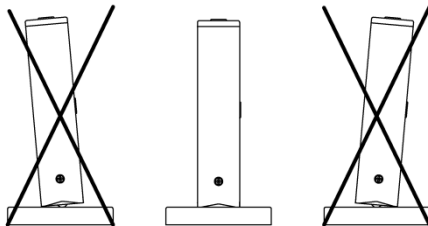


Figure 4-3 side view during test

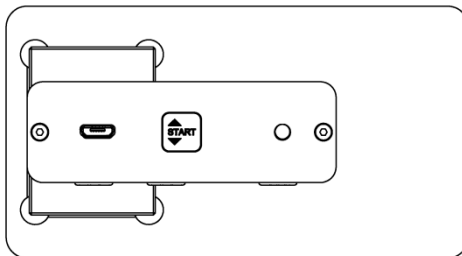




Figure 4-4 Measurement Direction

4.3 Measurement

Press the measurement  key, the instrument will measure according to the current settings, and return to the main interface after measurement.

4.4 Modify settings

4.4.1 Select settings to modify

By pressing the  key, you can select the three settings that need to be changed in sequence. (as shown in Figure 4-5)

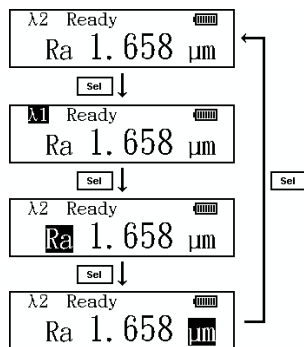


Figure 4-5 Select Settings

4.4.1.1 Modify sampling length

After selecting the sampling length, press the **set** key to select λ_1 , λ_2 and λ_3 in sequence (as shown in Figure 4-6).

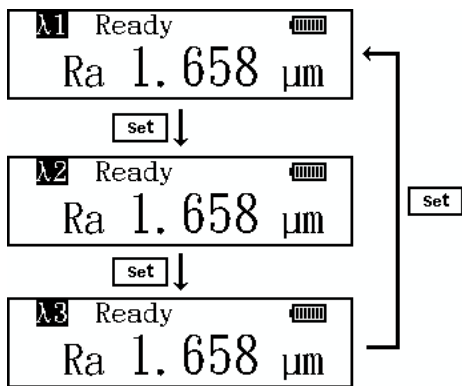


Figure 4-6 Modify sampling length

4.4.1.2 Modify parameter selection

After selecting the parameters, press the key to select RA, RZ, RQ, RT, RP, RV and RC in sequence (as shown in Figure 4-7).

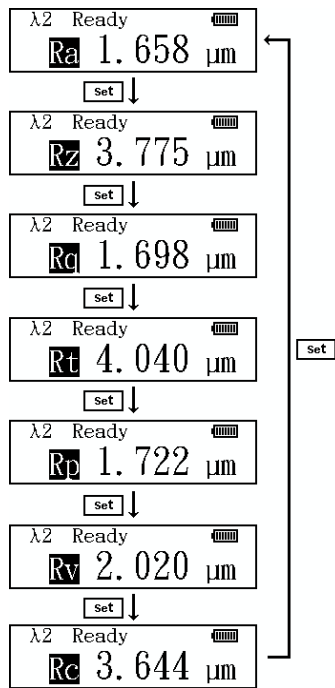


图 4-7 更改参数选择

4.4.1.3 Modify Unit

After selecting the unit, press the **Set** key to select the metric system and English system in order (as shown in Figure 4-8).

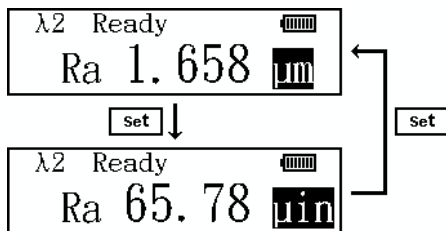




Figure 4-8 change units

4.5 Calibration


Before the instrument is used, it should be calibrated with the standard sample. The nominal value of standard sample is 1.650.

When the instrument is turned off, press and hold the measurement key  first, and then press the power key . After the instrument is turned on, the instrument enters the calibration state (as shown in Figure 4-9). In the calibration state, the result displayed on the main interface is the value of the random standard block, that is, you want to correct the measurement result to this value.

Place the instrument on the marking area of the template, and the sliding direction of the sensor is perpendicular to the texture direction of the marking. Press the start button to start a calibration measurement.

Repeated calibration can significantly improve the accuracy.

After the measurement, the calibration parameters will be stored automatically. At this time, the instrument will be shut down and restart normally.

Note: if the user has a multi line template close to the measured target value or a standard sample block with other values, this sample block can be used for calibration. It is necessary to adjust the value displayed in the main interface to the value of the new standard block. Use the  key to select a

single digit of the value. Use the **Set** key to adjust the number, you can select 0 ~ 9. Each digit can be adjusted one by one to get the required standard block value (as shown in Figure 4-10). After that, normal array calibration can be performed.

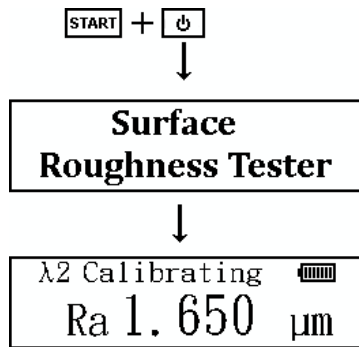


Figure 4-9 enter calibration interface

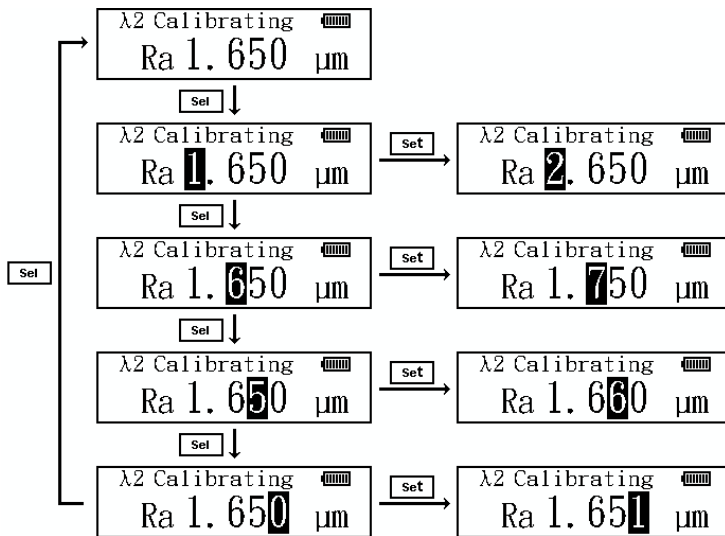


Figure 4-10 modifying calibration values

4.6 Adaptor and Battery Recharge

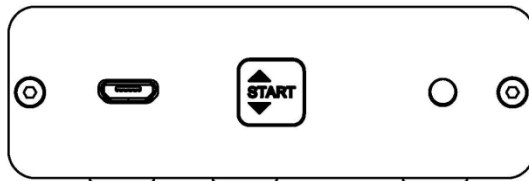



Figure 4-9 Recharge Port

When the battery voltage is too low, the battery prompt on the display shows  that the voltage is too low, the instrument should be charged as soon as possible. When charging, insert the power plug of the power adapter into the charging port of the instrument, and then connect the power adapter to the 220 V, 50 Hz power supply to start charging. The input voltage of the power adapter is 220 V AC, the output voltage is 5 V DC, the maximum charging current is about 500 mA, and the charging time is about 4 hours.



Tips:

The measurement can be carried out under the charging state, but the placement of the wiring should not affect the measurement operation.

When charging, the power on or power off of the instrument will not affect the charging, as long as the battery switch is in the on position.

The charging port is MINIUSB interface, which has only charging function and no data cable function.

Meaning of battery voltage prompt:



The black part inside the symbol represents the capacity of the battery;



It indicates that the voltage is too low and needs to be charged as soon as possible;



It means charging;



It means that it is full and the power can be cut off

5 daily maintenance

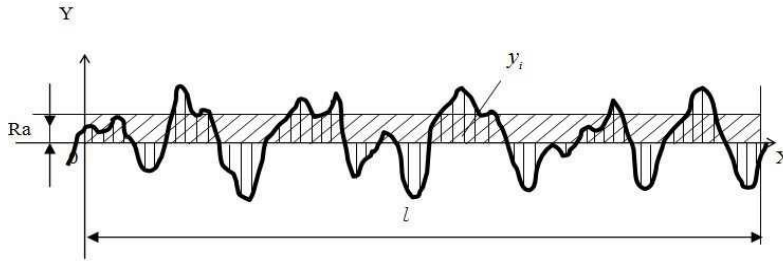
- Avoid collision, violent vibration, heavy dust, humidity, oil pollution, strong magnetic field, etc;
- The sensor is a precise part of the instrument and should be carefully maintained.
- The random standard template shall be carefully protected to avoid the inaccuracy of calibration instrument caused by scratch.

6 Definitions of Roughness Tester

The parameters of the roughness meter meet the requirements of iso4287, and Gauss digital filter is adopted. The parameters are defined according to iso4287.

4.7 Arithmetical Mean Deviation of Profile(Ra)

Ra is arithmetic mean of the absolute values of profile deviation (y_i) from mean within sampling length.

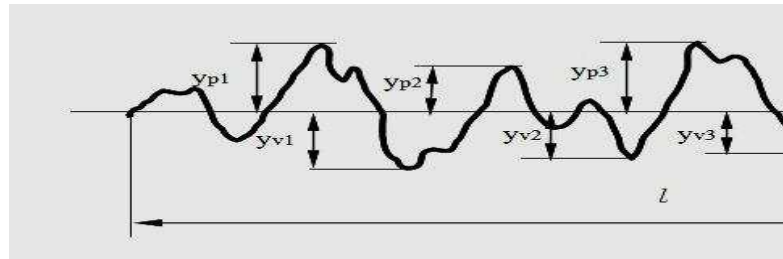


6.2 Root-mean-square Deviation of Profile (Rq)

Rq is the square root of the arithmetic mean of the squares of profile deviation (Y_i) from mean within sampling length.

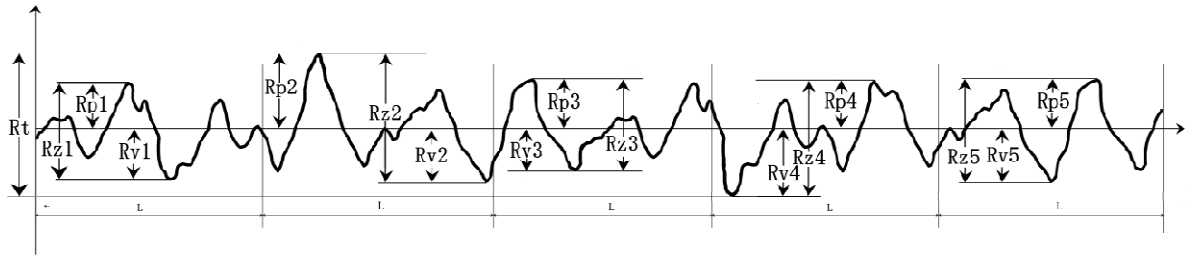
6.3 Ten Point Height of Irregularities(R_z)

The sum of the mean height of the five highest profile peaks and the mean depth of the five deepest profile valley from mean within the sampling length.



6.4 Total Peak-to-valley Height (Rt)

Rt is the sum of the height of the highest peak and the depth of the deepest valley over the evaluation length.

Figure 6-2 R_z 、 R_t 、 R_p 、 R_v

6.5 Maximum Depth of Profile Peak (R_p)

R_p is the height from the highest profile peak line to mean line within sampling

6.6 Profile maximum Valley depth (R_v)

The distance from the bottom line of the profile Valley to the middle line within the sampling length.

6.7 Average height of profile micro roughness (R_c)

The sum of the average value of the peak height and the average value of the valley depth within the sampling length.

7. Standard Delivery

ITEM	QTY	
MAIN UNIT	1	PC
TEST BLOCK	1	PC
POWER	1	PC
CABLE	1	PC
TEST SUPPORT BOARD	1	PC