

# SRT5000

## Surface Roughness Tester

### Instruction Manual





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# 1 General introduction

The SRT 5000 is a portable surface roughness tester with high accuracy, simple handling and a stable performance. It is widely applicable for testing surfaces of all kinds of metals and non-metals.

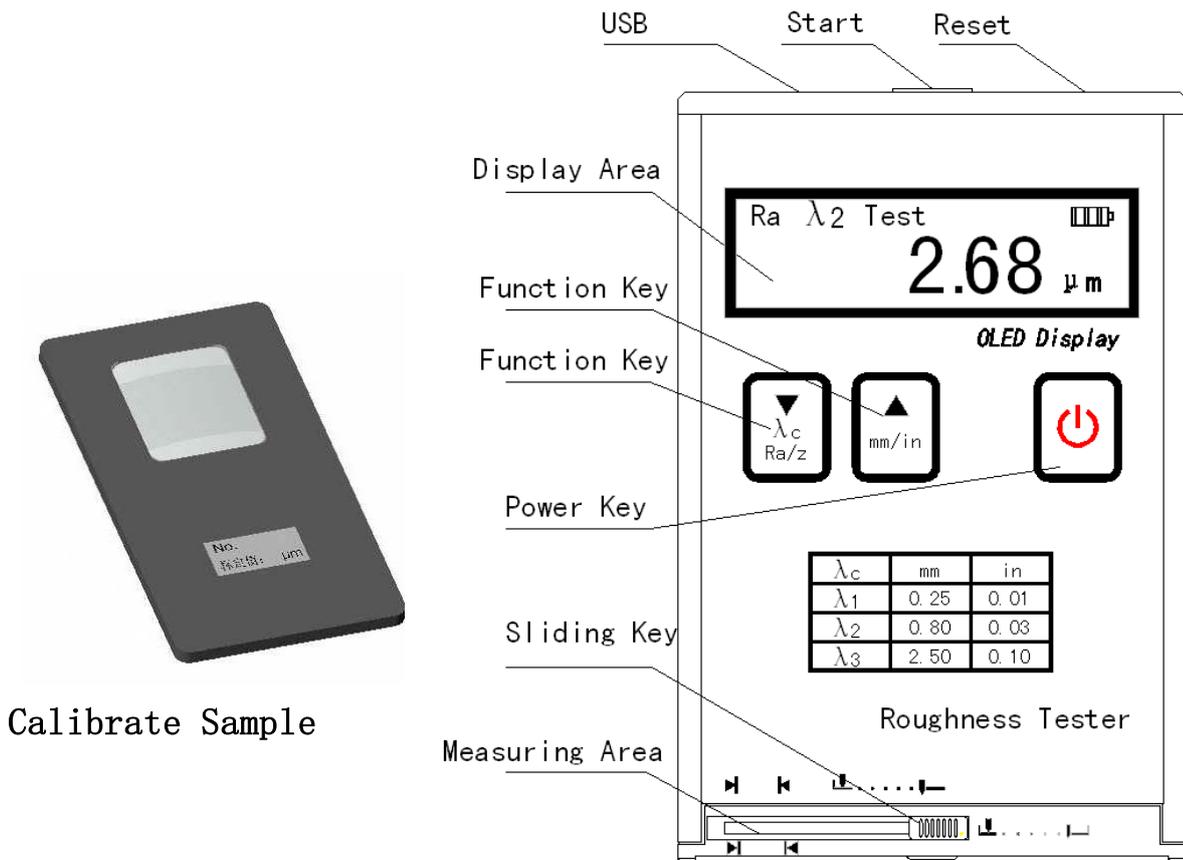
- By using a high-speed **DSP** processor for the data processing and calculation, measurement and calculation speed has been improved.
- Through the lithium ion rechargeable batteries, it can work many hours. The gauge can also work while charging. The charging time is short, while the battery life is long.
- The USB port enables fast battery charging.

**If you do not understand any of the technical terms, please refer to chapter 7 for explanation.**

## **2 Working principles**

When the sensor is making a linear uniform motion along the test surface, the contact stylus is perpendicular with the work surface and is moving up and down on 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 DSP into  $R_a$  and  $R_z$  (or  $R_q$  and  $R_t$ ) values before displayed on the screen.

### 3 Description of the gauge



## 4 Technical parameters

- ◆ **Measurement Parameters:** Ra (ISO), Rz (DIN), Rq, Rt
- ◆ **Units:**  $\mu\text{m}$ ,  $\mu\text{inch}$
- ◆ **Stroke Length (mm):** 6
- ◆ **Threshold wavelength (mm):** 0.25, 0.80, 2.50
- ◆ **Measurement Range ( $\mu\text{m}$ ):**
  - Ra: 0.05 ~ 10.0
  - Rz: 0.1 ~ 50
- ◆ **Accuracy:** According to ISO Class 3
- ◆ **Tip arc radius:**  $10 \mu\text{m} \pm 1 \mu\text{m}$
- ◆ **Touch needle static force measurement:**  $\leq 0.016\text{N}$
- ◆ **Force measurement rate:**  $\leq 800\text{N/m}$
- ◆ **Sensor guide head pressure:**  $\leq 0.5\text{N}$
- ◆ **Battery:** 3.7V Lithium Ion battery
- ◆ **Dimension:** 106 mm $\times$ 70 mm $\times$ 24 mm
- ◆ **Weight:** 200g
- ◆ **Working Environment Conditions:**
  - Temperature:  $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$
  - Relative Humidity:  $<90\%$
  - Surrounding: no vibration and no corrosive media.

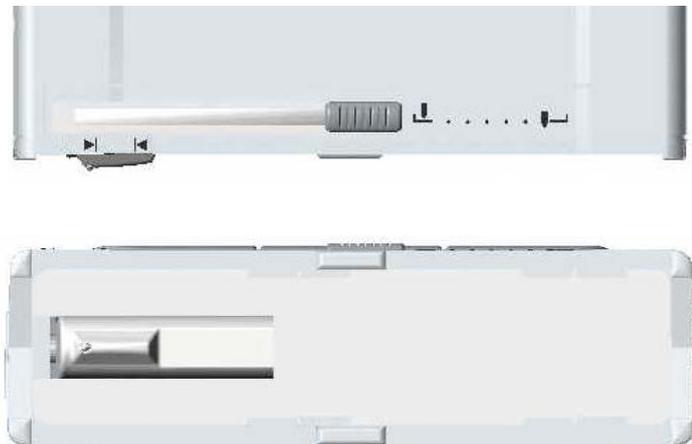
## 5 Entry into service

### 5.1 Measurement preparation

Take out the instrument from the case. The sensor protector should be closed as indicated below.



Move the switch to the right to open the protector so that the sensor comes out.



## 5.2 Turn on/off

To turn on the device press . The device will turn on being set as adjusted before shut down. In order to turn off the device press . If the device will be left unused for 3 minutes, it will shut down automatically.

## 5.3 Selecting parameters

Before measuring the user should set up following parameters:

- Measurement method: Ra, Rz, Rq, Rt adjustable using 
- Threshold wavelength: 0.25 mm, 0.8 mm, 2.5 mm adjustable using 
- Measuring units:  $\mu\text{m}/\mu\text{inch}$  adjustable by holding  for about 2 seconds

## 5.4 Measuring

When all parameters are set and the protector is open one can start measuring. Point the Stylus mark  $\blacktriangleright$   $\blacktriangleleft$  to the measured area and press the start button on the top of the gauge. After hearing a signal, the measurement has been finished and the screen will show the measured value.



Note:

- 1) During the pickups movement, make sure that the tester stands stable on the measured surface to avoid measurement errors.
- 2) During the sensors return to its starting position, the tester will not respond to further actions.
- 3) After a measurement has been taken it is possible to display the value according to all other measurement methods (Ra, Rz, Rq, Rt) by pressing . Note that this conversion is not very accurate. For precise values one has to set the corresponding measurement method before measuring.

## 5.5 Calibration

We advise you to run a calibration from time to time in order to ensure stable accuracy. The calibration should be done using the roughness standard included in the delivery. To enter calibration mode, the tester has to be turned off. Turn the tester on by pressing the start button at the top

simultaneously with . The tester will start in calibration mode as indicated below:



Using the arrow keys adjust the starting value to the value shown on the roughness standard.



Put the instrument on the scribed line area of the standard and press the start button.

In order to leave calibration mode, the gauge has to be turned off.

The user can perform a test measurement on the

roughness standard after calibration to ensure accuracy.

**Note: The roughness standard should be clean before calibration and test measurement!**

## **5.6 Battery recharge**

Plug the charger into the tester's USB port at the top. Following symbol will show up indicating charging: .

## **6. Daily maintenance**

### **6.1 Maintenance**

- Protect the tester from collision, violent shock, heavy dust, dampness, oil stain, strong magnetic fields etc.
- Please switch off the gauge if not used to save energy. Recharge the battery promptly when necessary.
- As the sensor is a sensitive part of the tester particular care should be taken off it. After each usage, put on the protector to avoid damages.
- Special protection should be given to the roughness standard provided with the tester to avoid scratches which may lead to inaccurate calibration.

## 6.2 Reparation

If any trouble occurs, the user should not try to dismantle and repair the gauge himself. The device should be returned to **SaluTron** for checking and repair, together with the roughness standard and a statement describing the problem. Please get in touch with the technical services department of our company or one of our sales agent.

## 7. Terminology

- **Surface Roughness** is a component of surface texture. It is quantified by the deviations in the direction of the normal vector of a real surface from its ideal form. If these deviations are large, the surface is rough; if they are small, the surface is smooth.
- **Threshold wavelength** is the necessary length for evaluating the roughness profile. It may consist of one or more sampling lengths.
- **Ra** (Arithmetic Average) is the arithmetic mean value of the deviation of the profile within sampling length.

- **Rz** (Maximum Height of Irregularities) is the distance between the maximum depth of the profile peaks and the maximum depth of the profile valley within the sampling length.
- **Rq** (Root-Mean-Square Deviation of the Profile) is the square root of the arithmetic mean of the squares of profile deviation from the mean within sampling length.
- **Rt** (Total Peak-to-valley Height) is the sum of the height of the highest peak and the depth of the deepest valley over the evaluation length.





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