

Manual Surface Texture Meter PCE-RT 10



Contents

1	Introduction	3
2	Safety notes	3
3	Specification	4
4	System description	5
4.1	Measurement unit	5
4.2	Delivery content	5
4.3	Measuring procedure	6
4.3.1	Preparations	6
4.3.2	Perform measurements	7
4.3.3	Set the measurement length	7
4.3.4	Calibration	7
4.3.5	Set Cutoff length	7
4.4	Notes	7
4.4.1	General Notes	7
4.4.2	Standards	7
4.4.3	Travel length	8
4.4.4	Recommended length of the cutoff frequency	8
5	Battery replacement	8
6	Disposal	9
7	Contact	9
7.1	PCE Instruments UK	9
7.2	PCE Americas	9

1 Introduction

Thank you for purchasing a surface texture meter from PCE Instruments.

The surface texture meter PCE-RT 10 is a small, light device with a very simple navigation. Despite the fact that the device functions on a very complex and elaborated level, the measurement results can be gained very easily and in a comfortable way. Due to a high insensitivity the device has a long lifetime. This device is calibrated according to ISO, DIN, ABSI and JIS standards. The surface texture meter can be applied for various mechanical manufacturing processes as controlling equipment. The device indicates all calculated measurement results on its LCD display at any time. In order to measure the roughness of a surface, the sensor has to be placed onto the surface. Subsequently, the sensor moves smoothly in the lead on the surface. Now the device will calculate the measuring values. Thus the indicated values are a result of the sensor's movement, while it is induced with electricity. The fast DSP processing supports quick measurements results, which are then shown on the surface texture meter's display. If the instrument is not used for five minutes, it will turn itself off automatically.

2 Safety notes

Please read this manual carefully and completely before you use the device for the first time. There is no warranty of damages or injuries caused by non-observance of the manual.

- The instrument may only be used as described in this manual. If it is not used in the described way it may cause injuries or break.
- Only use the device in the prescribed ambient conditions. Protect it from direct sunlight, fluids and high humidity.
- The instrument may only be used by qualified personnel and repaired by PCE Instruments personnel.
- Do not place the instrument on the user interface since scratches may appear on the interface.
- Do not make any technical changes on the device.
- The appliance should only be cleaned with a damp cloth / use only pH-neutral cleaner.
- Only use the tester with dry hands.
- The instrument can only be used with and replaced by accessory supplied by PCE Instruments.
- The measuring instrument cannot be used in explosive atmospheres.
- If the tester is not used for a longer period of time the batteries should be taken out of the device in order not to damage it.

This user's handbook is published from PCE Instruments without any guarantee.

We expressly point to our general guarantee terms, they can be found in our general terms of business.

If you have any questions please contact PCE Instruments.

3 Specification

Measurement range

Ra	0.05 ... 10 μm / 1 ... 400 μinch
Rz	0.02 ... 100 μm / 0.78 ... 40 μinch

Measurement accuracy

General	$\pm 10\%$
Fluctuation on display	Max. 6 %

Resolution

measurement range < 10 μ	0.001 μ
measurement range < 100 μ	0.01 μ
measurement range \geq 100 μm	0.1 μ

Sensor

Measuring type	Induction principle
Radius of sensor	10 μm
Material of sensor	Diamond
Measuring force of sensor	16 mN (1.6gf)
Sensor angle	90 °
Vertical radius of probe head	48 mm

Measurement speed

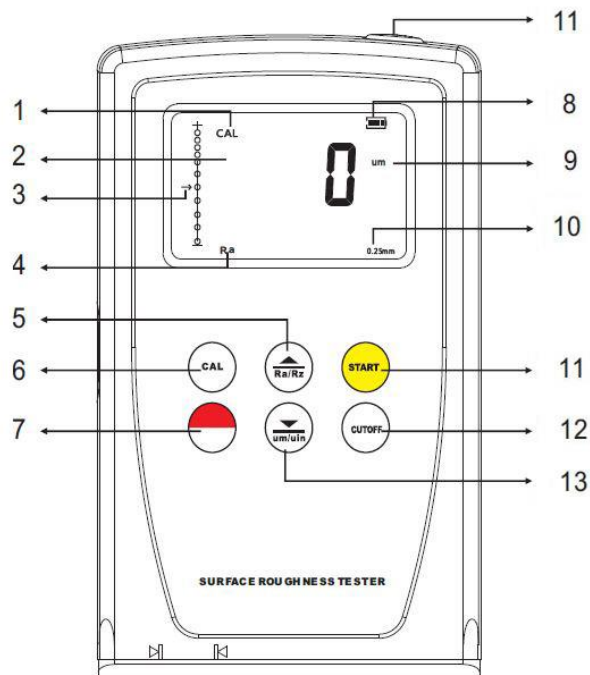
Sampling length: 0.25	Vt = 0.135 mm/s
Sampling length: 0.8	Vt = 0.5 mm/s
Sampling length: 2.5	Vt = 1 mm/s
Returning	Vt = 1 mm/s

General Technical Specifications

Maximum hub	2.5 mm / 0.5 inch
Limit of frequency length	0.25 mm / 0.8 mm / 2.5 mm optical
Units	Rz, Ra
Display	4-digit LCD display, with background lights
Maximum surrounding temperature	0 ... +50 °C
Maximum surrounding air humidity	< 80%
Diameters	140 x 52 x 48 mm
Weight	280 g

4 System description

4.1 Measurement unit



1. Calibration mode
2. Measured value
3. Position indicator
4. Chosen parameter
5. Parameter button / Up
6. Calibration button
7. Power on / off
8. Battery level
9. Measurement unit
10. Cutoff frequency
11. Start button
12. Cutoff frequency button
13. μm / μinch button / Down

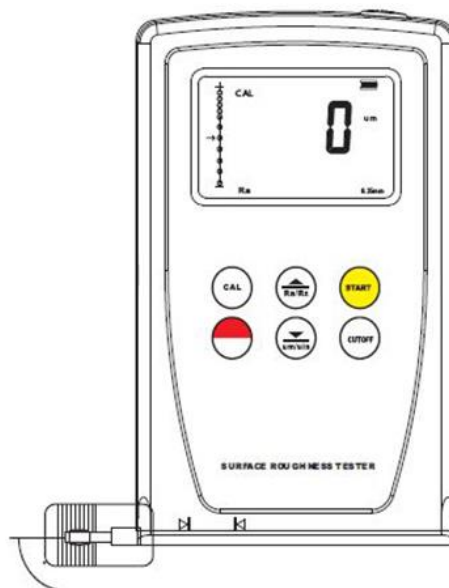
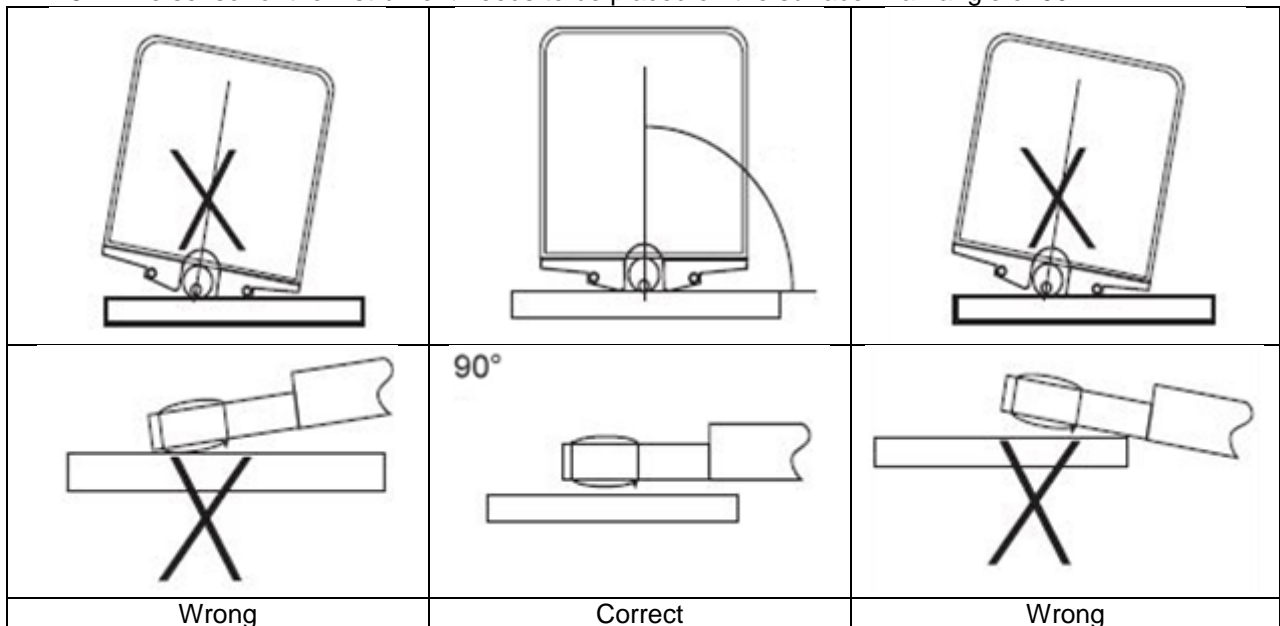
4.2 Delivery content

- 1 x Surface texture meter PCE-RT 10
- 1 x Calibration plate
- 1 x User's manual
- 1 x Screwdriver

4.3 Measuring procedure

4.3.1 Preparations

1. Switch on the device to check the battery level
2. The device will automatically set the conditions of the last measurement. Because of that all settings should be checked properly.
3. In order to check the settings the parameter button needs to be pressed.
4. Check if the cutoff frequency is set correctly. If that is not case, press the cutoff frequency button. To set the correct length of the cutoff frequency, refer to the table "Recommended length of the cutoff frequency" within this manual.
5. Press the μm / μinch button to check the correctness of the measuring units.
6. Clean the surface you want to measure in order to avoid faulty measuring results.
7. The device needs to be placed correctly on the surface. This is shown in the figure below. If it is not set up correctly the measured results may be faulty.
8. The sensor of the instrument needs to be placed on the surface in an angle of 90° .



4.3.2 Perform measurements

Press the Start button when all preparations are made. The display shows “- - -” while the measurement is made. After the selected area has been detected the probe only moves backwards to the position from where measurements are started. After this point has been reached, the measured value is displayed on the screen. Now it is possible to view the results in Ra or Rz by simply pressing the Parameter button.

4.3.3 Set the measurement length

The measurement length is set by making use of the Calibration button. Press the Calibration button until the display shows “LEN”. You can now choose length “1” and “2” by pressing the Up or Down button. The settings can be saved by pressing the Start button.

4.3.4 Calibration

To calibrate the device, press the Calibration button. “CAL” will show up in the display. Now place the device on the calibration plate and press the Start button. The display will show a result after measurement has been made. You can now adjust value according to the reference value on the calibration plate. To do so, use the Up / Down button. When the correct value has been set, switch the device off and on again.

4.3.5 Set Cutoff length

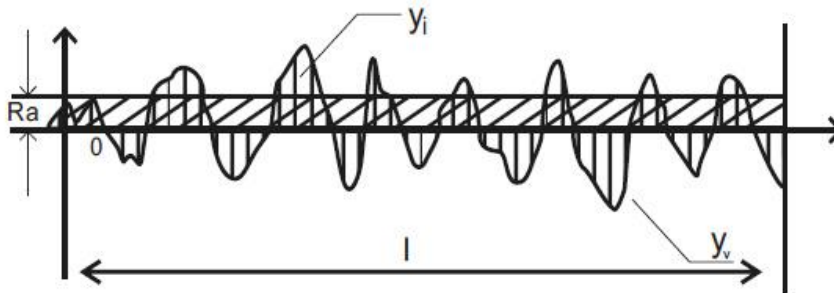
To set the cutoff length the Cutoff button simply needs to be pressed. You can choose between 2,5 mm, 0,25 mm and 0,8 mm.

4.4 Notes

4.4.1 General Notes

???

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



???

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

4.4.2 Standards

- ISO 4287
- DIN 4768
- JIS B601
- ANSI B46.1

4.4.3 Travel length

L = Length of the sampling
 n = amount of the sampling length
 l x n = Length of the calculation



4.4.4 Recommended length of the cutoff frequency

Ra (µm)	Rz (µm)	Cutoff frequency 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	>2,25 ... 1,6	0,25
>0,20 ... 0,25	>1,0 ... 1,25	
>0,16 ... 0,20	>0,8 ... 1,0	
>0,125 ... 0,16	>0,63 ... 0,8	
>0,1 ... 0,125	>0,5 ... 0,63	
>0,08 ... 0,1	>0,4 ... 0,5	
>0,063 ... 0,08	>0,32 ... 0,4	
>0,05 ... 0,063	>0,25 ... 0,32	
>0,04 ... 0,05	>0,2 ... 0,25	
>0,032 ... 0,04	>0,16 ... 0,2	
>0,025 ... 0,032	>0,125 ... 0,16	
>0,02 ... 0,025	>0,1 ... 0,125	

5 Battery replacement

The batteries need to be replaced, when indicated on the display. Open the battery lid and replace them by four new AA-batteries (1,5 V each).

6 Disposal

For the disposal of batteries, the 2006/66/EC directive of the European Parliament applies. Due to the contained pollutants, batteries must not be disposed of as household waste. They must be given to collection points designed for that purpose.

In order to comply with the EU directive 2012/19/EU we take our devices back. We either re-use them or give them to a recycling company which disposes of the devices in line with law.

If you have any questions, please contact PCE Instruments.



7 Contact

If you have any questions about our range of products or measuring instruments please contact PCE Instruments.

7.1 PCE Instruments UK

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