



User Manual

PCE-CT 24FN Coating Thickness Gauge

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1 Safety notes

Please read this manual carefully and completely before you use the device for the first time. The device may only be used by qualified personnel and repaired by PCE Instruments personnel. Damage or injuries caused by non-observance of the manual are excluded from our liability and not covered by our warranty.

- The device must only be used as described in this instruction manual. If used otherwise, this can cause dangerous situations for the user and damage to the meter.
- The instrument may only be used if the environmental conditions (temperature, relative humidity, ...) are within the ranges stated in the technical specifications. Do not expose the device to extreme temperatures, direct sunlight, extreme humidity or moisture.
- Do not expose the device to shocks or strong vibrations.
- The case should only be opened by qualified PCE Instruments personnel.
- Never use the instrument when your hands are wet.
- You must not make any technical changes to the device.
- The appliance should only be cleaned with a damp cloth. Use only pH-neutral cleaner, no abrasives or solvents.
- The device must only be used with accessories from PCE Instruments or equivalent.
- Before each use, inspect the case for visible damage. If any damage is visible, do not use the device.
- Do not use the instrument in explosive atmospheres.
- The measurement range as stated in the specifications must not be exceeded under any circumstances.
- Non-observance of the safety notes can cause damage to the device and injuries to the user.

We do not assume liability for printing errors or any other mistakes in this manual.

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

If you have any questions please contact PCE Instruments. The contact details can be found at the end of this manual.



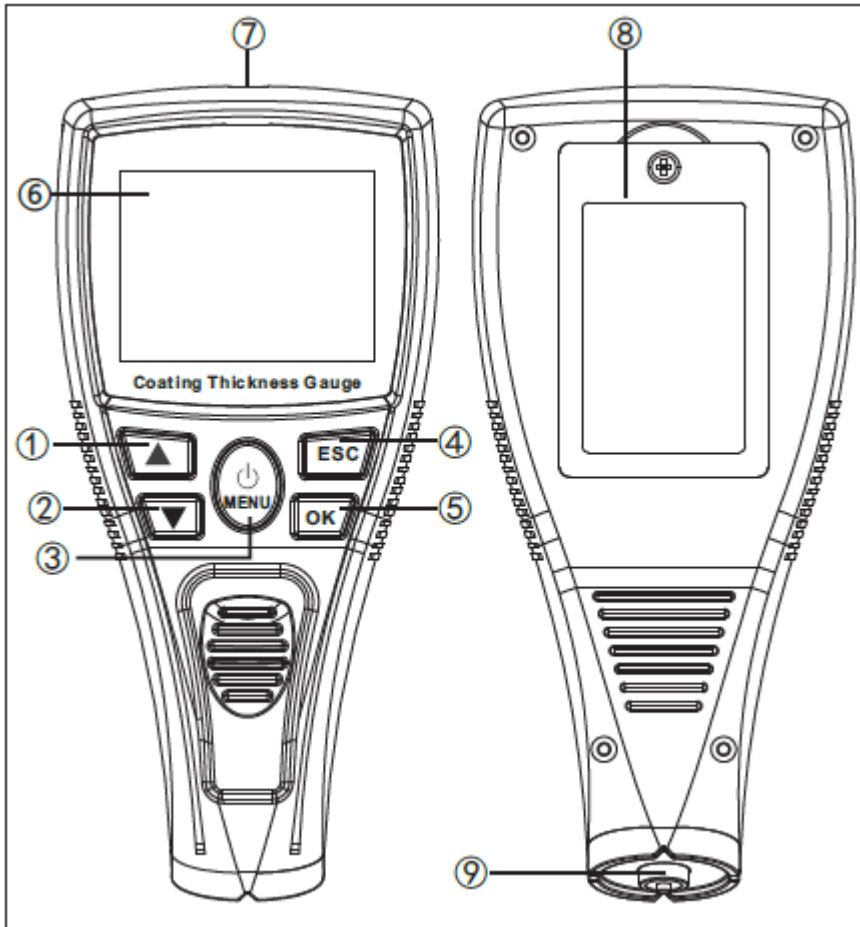
2 Specifications

Specification	Explanation
Measurement range	0 ... 1500 μm / 0 ... 59 mil / 0 ... 1.5 mm
Resolution	0.1 μm (at <100 μm) 1 μm (at >100 μm) 0.001 mm 0.1 mil
Accuracy	$\pm 5 \mu\text{m}$ (at <150 μm) $\pm 3 \% + 1 \mu\text{m}$ (at >150 μm)
Smallest diameter (Fe)	12 mm
Smallest thickness (Fe)	0.5 mm
Radius of curvature min. (Fe)	convex: 2 mm; concave: 11 mm
Smallest diameter (nFe)	50 mm
Smallest thickness (nFe)	0.5 mm
Memory	100 groups of 15 readings each
Display	2.25 inch LC display
Ambient temperature	0 ... + 50 °C / 32 ... 122 °F
Power supply (batteries)	3 x 1.2 V AA Ni-MH 800 mAh
Power supply (mains adaptor)	Primary: 100 ... 240 V; 50 / 60 Hz; 0.45 A Secondary: 5 VDC; 1 A
Dimensions	70.3 x 38.6 x 149.59 mm / 2.8 x 1.5 x 5.9 in
Weight	approx. 136.9 g / <1 lb with batteries

3 Delivery scope

- 1 x coating thickness gauge PCE-CT 24FN
- 6 x different reference foils
- 1 x set of calibration standards (Fe and NFe)
- 3 x 1.2 V batteries
- 1 x micro USB cable
- 1 x USB power plug
- 1 x carrying case
- 1 x user manual

4 System description



- ① Up
- ② Down
- ③ On / Off, Menu
- ④ Back
- ⑤ OK / Enter

- ⑥ Display
- ⑦ USB socket
- ⑧ Battery compartment
- ⑨ Sensor








5 Preparation

1. Open the battery compartment on the back of the meter.
2. Insert the supplied batteries into the battery compartment, observing correct polarity.
3. Close the battery compartment.
4. Fully charge the batteries.

Attention! Only batteries with a nominal voltage of 1.2 V may be used.

6 Battery indicator

-  Battery level
-  Battery is being charged
-  Battery fully charged
-  Mains operation without inserted battery
-  Battery temperature too high

The charging process is interrupted if the battery temperature exceeds 45 °C. The unit switches off. The display flashes at 10 second intervals.

7 Operation

7.1 On / off

To switch on the meter, press the "③ On / Off, Menu" key.

When switching on, make sure that the probe is at least 10 cm away from the object to be measured.

To switch off the meter, press and hold the "③ On / Off, Menu" key for approx. 3 seconds.

Automatic power off takes place after the inactivity time set in the menu.

7.2 Menu (settings)

Press the "③ On / Off, Menu" key to open the menu.

6 options are available.

- Measure (measurement settings)
- Calibration
- Limit (threshold values)
- Memory
- View (display indications)
- Settings

You can make changes and settings within the menu as follows. Use the "① Up" or "② Down" keys to navigate to the desired option and confirm with the "⑤ OK" key.

Within the sub-menus, you can also navigate to the desired option by pressing the "① Up" or "② Down" keys.

Depending on the option, you can press the "⑤ OK" key to change an option directly or to move to the next lower menu level.

Proceed in the same way in the lower menu levels.

7.3 Menu levels

7.3.1 Measure (measurement settings)

- Measure (measurement settings)
 - > Measure mode
 - Single SNG
 - Continuous CTN
 - > Measure unit
 - mm
 - mil
 - μm

7.3.2 Calibration

- Calibration
 - > Base calibration (basic calibration)
 - > Offset calibration (calibration of measured values)
 - > Zero calibration (zero calibration)

7.3.3 Limit (threshold values)

- Limit (threshold values)
 - > Adjustment of the limit values
 - High Limit
 - Low Limit
 - > Limit sound
On / Off

7.3.4 Memory

- Memory
- Look back (short-term memory)
 - Look Data
 - Save Data
 - Clear data
 - > Browse from the first group (data memory sorted by groups)
Listing of saved groups
 - > Browse from the selected group (direct selection of memory group)
 - > Delete selected group
 - > Delete all

7.3.5 View (display indications)

- View (Display indications)
 - > Measured Value
On / Off
 - > Measured Value + Trend Graph
On / Off
 - > Measured Value + Statistics
On / Off
 - > Measured Value + Last Value (reading+ last few readings)
On / Off
 - > Measured + Bar Graph
On / Off



7.3.6 Settings

Settings

- > Language settings
 - Chinese
 - English
- > Screen rotation
On / Off
- > No operation auto off time
 - 2 minutes
 - 5 minutes
 - 10 minutes
 - 30 minutes
 - Never
- > Key sound
On / Off
- > High backlight
On / Off
- > Selected colours
 - Blue
 - Orange
 - Red
 - Purple
 - Green
 - Gray
- > Software version
- > Restore factory setting
Yes / No confirmation

7.4 Measurement

Place the device with the probe perpendicular to the measurement surface at the point to be measured and press the device lightly towards the measurement object. Hold the device still during measurement to avoid measurement errors. The successful measurement is acknowledged by a sound and the measured value is shown on the display.

The V grooves on the probe help you to align the device on convex measurement objects.

7.4.1 Single / continuous measurement

The setting "Single measurement" is indicated by "SNG" on the left-hand side of the display.

For single measurements, observe a time interval of 2 seconds between two measurements.

To avoid scratches and damage to the measured object and the probe, lift the meter off the surface between measurements.

To switch to the measurement mode "continuous measurement", proceed as described in the menu.

The setting "continuous measurement" is indicated by "CTN" on the left-hand side of the display.

Traces and scratches can occur on the measured object during continuous measurement.

7.5 Display indication

If enabled in the menu, you can select from the following displays with the "① Up" or "② Down" keys.

Typical display



Header:

- Display mode
- Battery indicator

Upper part:

- Number of current measurements
- Base material: Fe = magnetic / nFe = non-magnetic
- Measuring mode: SNG = Single measurement / CTN = Continuous measurement

Middle part:

- Current reading

Lower part:

- Unit of measurement mm / μm / mil



Measured value + graph of the last few values



Header:

- Display mode
- Battery indicator

Upper part:

- Number of current measurements
- Base material: Fe = magnetic / nFe = non-magnetic
- Measuring mode: SNG = Single measurement / CTN = Continuous measurement

Middle part:

- Current reading / unit of measurement

Lower part:

- Graph with limit value setting

Measured value + statistics



Lower part:

- Statistical values

Dif: Difference to the previously measured value
 Avg: Average of the last few measurements
 Max: Maximum value of the last few measurements
 Min: Minimum value of the last few measurements
 High: Upper limit value
 Low: Lower limit value
 Sdev: Deviation
 CV%: Percentage deviation

Sdev and CV% are calculated from the last max.100 measured values.

Measured value + last measured values



Lower part

- Readings of the last few measurements

Measured value + bargraph display



Lower part

- Bar graph display with upper and lower limit marker

7.6 Rotate display

If enabled in the menu, the display is rotated automatically in 90° steps: 0°, 90°, 180°, 270°

When making a vertical measurement, with the probe pointing up or down, the display set under display indication is shown. When making a horizontal measurement, with the probe pointing to the right or left, the display "Measured value + statistics" is shown.

7.7 Memory

7.7.1 Short-term memory

The short-term memory contains the values measured after the last switch-on.

When the meter is switched off, the measured values not saved to the long-term memory are lost.

To view, save or delete the measured values, press the "⑤ OK" key in measurement mode

Use the "① Up" or "② Down" keys to navigate to the desired option and confirm with the "⑤ OK" key.

When you select the option "Look Data", the measured values are listed.

With the "Save Data" option, you can copy the 100 most recently measured values from the short-term memory to the long-term memory.

The "Clear Data" option deletes the measured values from the short-term memory.

Press the "③ On / Off, Menu" key to return to measuring mode.

7.7.2 Long-term memory

The long-term memory contains all the measured values that were saved there from the short-term memory via the Save option.

To call up the stored measured values, proceed as described in the menu.

Navigate to the desired view as described in chapter 7.3

24 measured values are listed per page. Press the "② Down" key to call up the other pages and the graphic display. Press the "① Up" key to scroll back one page.

In the list, the min and max values are marked by red numbers.

The graph shows a bar chart with the limit value setting. The measured values that are outside the set limit values are shown with a red bar.

In the header, the unit of measurement, the average value and the number of measurements are shown.

Press the key "③ On / Off, Menu" to return to measuring mode.

7.8 Calibration

In order to ensure the accuracy of the measurement, it is necessary to calibrate the meter.

Before each measurement, carry out a control measurement on the calibration standard without and with a foil of defined thickness. If there are deviations in the accuracy from the technical data, carry out at least one zero and one offset calibration. After resetting the meter to factory settings or when the system has not been used for more than 10 days, a base calibration should also be performed.

Always use the calibration standard corresponding to the base material of your measurement object for calibration.

7.8.1 Base calibration

For a base calibration, prepare a calibration standard and the calibration foils with increasing thicknesses.

Navigate to the "Base calibration" menu option as described in chapters 7.2 and 7.3 and open it.

Follow the instructions on the display and start measuring on the calibration standard without a foil. You will then be prompted to perform one measurement after the other on a film with a thickness of approx. 52, 105, 262, 490, 991 and 1486 μm . A beep means that the next measurement is due.

Always carry out the respective measurement on the film that is closest to the thickness specified by the coating thickness gauge.

The set of foils included in the scope of delivery is matched to the device. The set of foils may show slight deviations from the foil thicknesses required by the test instrument during base calibration. These can be neglected during the base calibration.

7.8.2 Offset calibration

For calibration of the measured values, prepare a calibration standard and the calibration foils.

Navigate to the menu option "offset calibration" as 7.3 in chapters 7.2 and 7.3 and open it.

Place the calibration foil on the calibration standard that most closely matches the coating thickness on the object to be measured.

Place the meter on the film in the same way as for a measurement. The gauge will perform a few measurements. Correct the displayed value with the keys "① Up" or "② Down" and confirm the setting with the "⑤ OK" key.



7.8.3 Zero calibration

Prepare a calibration standard for zero calibration.

Navigate to the menu item "Zero calibration" as described in chapters 7.2 and 7.3 and open it. Place the test instrument on the calibration standard as you would for a measurement. The meter performs a few measurements and exits the calibration mode.

7.9 Error messages

Display	Cause
ERR1	Probe or base material defective
ERR2	Probe or base material defective
"----"	Unit not calibrated to the base material
-OL-	Coating too thick

8 Warranty

You can read our warranty terms in our General Business Terms which you can find here: <https://www.pce-instruments.com/english/terms>.

9 Disposal

For the disposal of batteries in the EU, 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.

For countries outside the EU, batteries and devices should be disposed of in accordance with your local waste regulations.

If you have any questions, please contact PCE Instruments.



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