

USER MANUAL

RADIATION TESTER

PCE-RAM 3

ENGLISH



User manuals in various languages (français, italiano, español, português, nederlands, türk, polski) can be found via our product search on:
www.pce-instruments.com

NOTICE TO USER

- » Please read this instruction manual and operation instructions carefully, Follow the instructions in the manual, In order to make the detector function fully.
- » Please keep this manual
- » Dont use this equipment in a flammable and explosive environment.
- » Replaced used batteries and discarded instruments cannot be disposed of with household waste. Please handle according to relevant national or local laws.
- » When there are any quality problems with the instrument or questions about using the instrument. You can contact PCE Instruments online customer service or the manufacturer. We will solve it for you as soon as possible.

PRODUCT DESCRIPTION

This product uses a Geiger-Miller counter. Counter for detecting the intensity of ionizing radiation (beta particles, gamma rays and x-rays). Use a gas tube or a small chamber as a probe. When the voltage applied to the probe reaches a certain range. Each time the ray is ionized in the tube to produce a pair of ions, it can be amplified to produce an electric pulse of the same size. And recorded by the connected electronic device. The number of rays per unit time thus measured. The alarm threshold measurement rate can be arbitrarily selected.

KEY FEATURES

- » Detect x ray, y rays and β rays.
- » High sensitivity, can be used in various environments.
- » Data is saved during shutdown.
- » High-definition LCD display. The status display is clear at a glance.
- » Light/Vibration/Sound 3 combined alarm modes to choose.
- » Real-time clock display.
- » The product can preset dose rate and cumulative dose alarm threshold

3.PRODUCT PARAMETERS

Produkt name	Nuclear radiation detector
Size	120x78x27mm
Types of detection rays	γ rays, x rays, β rays
Detector	Energy Compensation GM Tube (Geiger Counter Meter)
Dose equivalent rate	0.00-10000μSv/h (10mSv/h)
Cumulative dose equivalent	0.00μSv-500.0mSv
Energy range	48keV-1.5Mev.;,;±30% (for 137Cs-)
Language	Chinese/English switch
Sensitivity	80CPM/μSv (For Co-60)
Dosage unit	μSv/h,μGy/h,mR/h,cps,cpm Switch
Battery capacity	1100mAh lithium battery
Alarm method	light, vibration, sound

THE BUTTON DESCRIPTION

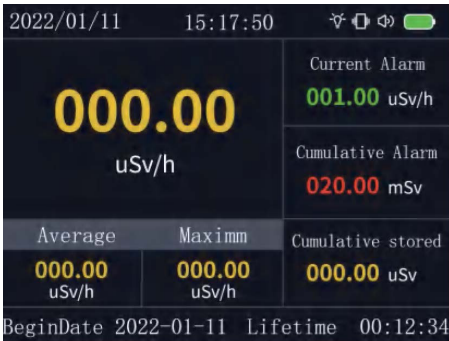
- » Left/Back key: Return to the upper menu from the lower menu
- » Right key/setting key: Enter the setting menu/enter the lower menu
- » Power on/off key/OK key: Switch on/Off/Confirm
Up key: Switch options up and down
- » Down key: Switch options up and down

HOW TO OPERATE

1. Power on/off

Short press the power button to turn it on.Long press the power button to shut down.

2. Monitoring interface



Automatically enter this page after booting, and monitor parameters:

- » Real-time detection amount, displayed in the upper left panel
- » Average value/Maximum value
- » Current dose alarm value
- » Cumulative dose alarm value
- » Cumulative stored dose rate



Press the left and right keys to switch to the waveform detection page as follows:

- » Waveform monitoring
- » Current dose rate real-time value
- » Maximum value
- » Minimum

3. Settings

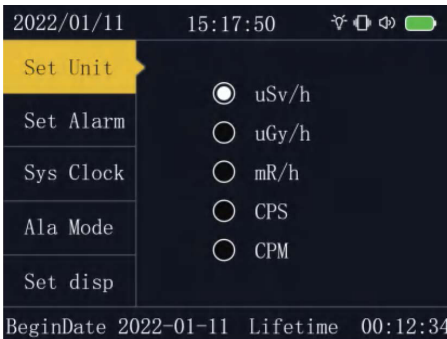
Long press the right key/setting key to enter the setting menu.Long press the left button/back button on the setting page to return to the monitoring page.Press the up and down keys to switch the setting options.



Setting Options:

- » Unit Settings
- » Alarm settings
- » System clock
- » Alarm mode
- » Display settings

3.1 Unit setting



Press the right button to enter the lower level to set five measurement units:

- » μ Sv/h
- » μ Gy/h
- » mR/h
- » CPS
- » CPM

3.2 Alarm settings

Long press the right key/setting key to enter the setting menu. Press the up and down keys to switch the setting options. Press the right button to enter the lower settings to set or change the values of the following options:

2022/01/11

15:17:50



Set Unit

Set Alarm

Sys Clock

Ala Mode

Set disp

Current Alarm:
001.00 uSv/h

Cumulative Alarm:
020.00 mSv

Cumulative Reset
001.00 uSv

» Current dose alarm value

» Cumulative dose alarm value

» The accumulated dose is reset to zero

BeginDate 2022-01-11

Lifetime 00:12:34

3.3 System Clock

2022/01/11

15:17:50



Set Unit

Set Alarm

Sys Clock

Ala Mode

Set disp

Date: 2022-07-12

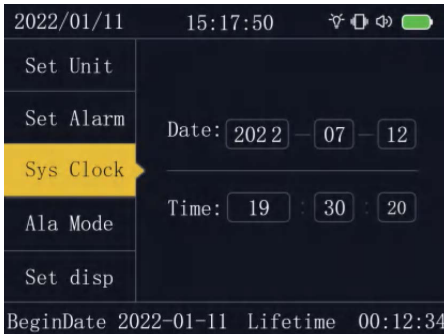
Time: 19:30:20

Long press the right key/setting key to enter the setting menu. Press the up and down keys to switch the setting options. Press the right button to enter the lower level settings to set the date and time.

BeginDate 2022-01-11

Lifetime 00:12:34

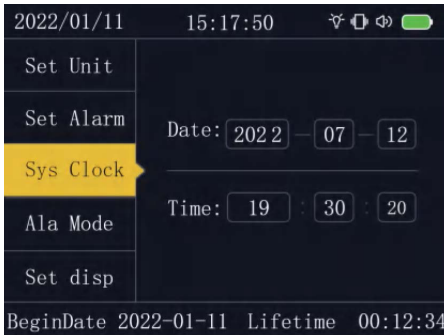
3.4 Alarm mode



Long press the right key/setting key to enter the setting menu. Press the up and down keys to switch the setting options. Press the right button to enter the lower level settings. On or off:

- » Indicator
- » Vibration
- » Sound

3.5 Display Settings



Long press the right key/setting key to enter the setting menu. Press the up and down keys to switch the setting options. Press the right button to enter the lower settings:

- » Screen brightness adjustment
- » Switch between Chinese/English

CONVERSION OF RADIOACTIVE UNITS

1. International Standards (1990)

Radioactive staff: 20mSv/year (10μSv/hour)
General public: 1mSv/year (0.52μSv/hour)

2. Unit conversion

1μSv/h=100μR/h Inc/kg.h=4μR/h
1μR=1y (The unit used for prospecting in the pronuclear industry)

Radioactivity:

$$1\text{Ci}=1000\text{mCi}$$

$$1\text{mCi}=1000\mu\text{Ci}$$

$$1\text{Ci}=3.7 \times 10^{10} \text{ Bq} = 37\text{GBq}$$

$$1\text{mCi}=3.7 \times 10^7 \text{ Bq} = 37\text{MBq}$$

$$1\mu\text{Ci}=3.7 \times 10^4 \text{ Bq} = 37\text{KBq}$$

$$1\text{Bq}=2.703 \times 10^{-11}\text{Ci}=27.03\text{pci}$$

Metering equivalent:

$$1\text{Sv}=10 \text{ mSv}=10^6\mu\text{Sv}$$

$$1\text{Sv}=100\text{rem} \quad 100\mu\text{rem}=1\mu\text{Sv}$$

Exposure:

$$1\text{R}=10^3\text{mR}=10^6\mu\text{R}$$

$$1\text{R}=2.58 \times 10^{-4}\text{C/kg}$$

Absorption metering:

$$1\text{Gy}=10^3\text{mGy}=10^6\mu\text{Gy}$$

$$1\text{Gy}=100\text{rad} \quad 100\mu\text{rad}=1\mu\text{Gy}$$

Radon unit:

$$1\text{Bq/L} = 0.27 \text{ em} = 0.27 \times 10^{-10}\text{Ci/L}$$

Other:

$$1\text{Sv} \text{ is equivalent to } 1\text{Gy Ig radium} = 0.97\text{Ci}=1\text{Ci}$$

3. Calculation of radioisotope decay values

$$A=A_0e^{-\lambda t} \quad \lambda = \ln 2/T_{1/2}$$

A_0 The known source strength A is how much time has elapsed, According to the radioactive decay calculation table look-up table calculation.

4. The relationship between radioactive source and distance

The intensity of the radioactive source is inversely proportional to the square of the distance.

$$X=A \cdot r/R^2$$

A : The activity of the point source; R : Distance from source;

r : Exposure rate constant

Note: Ra-226 ($t_{1/2}$ 1608) $r=0.825 \text{ ren. m}^2/\text{hour. Curie}$

Cs-137 ($t_{1/2}$ 29.9 years) $r=0.33 \text{ ren. m}^2/\text{hour. Curie}$

Co-60 ($t_{1/2}$ 5.23 years) $r=1.32 \text{ ren. m}^2/\text{hour. Curie}$

According to the radioactive decay calculation table, look up the table to calculate the radioactive shielding:

Halved and reduced to 1/10 value (cm) for different substances						
Radioactive source	Pencil		Iron		Concrete	
	Halving	1/10	Halving	1/10	Halving	1/10
Cesium-137	0.65	2.2	1.6	5.4	4.9	16.3
Iridium-192	0.55	1.9	1.3	4.3	4.3	14.0
Iridium-192	1.10	4.0	2.0	6.7	6.3	20.3

NOTE

Nuclear radiation detectors are sophisticated instruments. Please be careful. The following recommendations will facilitate instrument maintenance and prolong life.

1. Keep as dry as possible during storage and use. Excessive humidity can cause malfunction and damage to the instrument.
2. Please don't use the instrument violently or rudely, prevent dropping, knocking and violent vibration of the instrument. Otherwise, the instrument will be damaged.
3. When the power display is too low, it is in an undervoltage state and should be charged in time. In case of serious undervoltage, the instrument can not be turned on and off, and abnormal phenomena such as blurred screen occur.

If the instrument cannot work normally, please contact our company after sales. We will solve the problem.

INSTRUMENT MAINTENANCE

- » Please keep it dry and wipe off the dirt on the surface of the instrument with a soft cloth before use. Don't use detergents or solvents
- » Please recycle and use damaged instruments, accessories and packaging materials in an environmentally friendly manner.
- » Please shut down in time when not in use for a long time
- » Don't disassemble or replace components without permission to avoid failure.
- » Please store in a dry place when not in use.

DISPOSAL

For the disposal of batteries in the EU, the (EU) 2023/1542 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.

PCE INSTRUMENTS CONTACT INFORMATION

Germany

PCE Deutschland GmbH
Im Langel 26
D-59872 Meschede
Deutschland
Tel.: +49 (0) 2903 976 99 0
Fax: +49 (0) 2903 976 99 29
info@pce-instruments.com
www.pce-instruments.com/deutsch

France

PCE Instruments France EURL
2, rue Georges Kuhnmmunch
67250 Soultz-sous-Forêts
France
Tel.: +33 (0) 972 35 37 17
Fax: +33 (0) 972 35 37 18
info@pce-france.fr
www.pce-instruments.com/french

Spain

PCE Ibérica S.L.
Calle Mula, 8
02500 Tobarra (Albacete)
España
Tel.: +34 967 543 548
info@pce-iberica.es
www.pce-instruments.com/espanol

United Kingdom

PCE Instruments UK Ltd
Trafford House
Chester Rd, Old Trafford
Manchester M32 0RS
United Kingdom
Tel: +44 (0) 161 464902 0
Fax: +44 (0) 161 464902 9
info@pce-instruments.co.uk
www.pce-instruments.com/english

Italy

PCE Italia s.r.l.
Via Pesciatina 878 / B-Interno 6
55010 Loc. Gragnano
Capannori (Lucca)
Italia
Telefono: +39 0583 975 114
Fax: +39 0583 974 824
info@pce-italia.it
www.pce-instruments.com/italiano

Turkey

PCE Teknik Cihazları Ltd.Şti.
Halkalı Merkez Mah.
Pehlivan Sok. No.6/C
34303 Küçükçekmece - İstanbul
Türkiye
Tel: 0212 471 11 47
Faks: 0212 705 53 93
info@pce-cihazlari.com.tr
www.pce-instruments.com/turkish

The Netherlands

PCE Brookhuis B.V.
Twentepoort West 17
7609 RD Almelo
Nederland
Telefoon: +31 (0)53 737 01 92
info@pcebenelux.nl
www.pce-instruments.com/dutch

United States of America

PCE Americas Inc.
1201 Jupiter Park Drive, Suite 8
Jupiter / Palm Beach
33458 FL
USA
Tel: +1 (561) 320-9162
Fax: +1 (561) 320-9176
info@pce-americas.com
www.pce-instruments.com/us

Denmark

PCE Instruments Denmark ApS
Birk Centerpark 40
7400 Herning
Denmark
Tel.: +45 70 30 53 08
kontakt@pce-instruments.com
www.pce-instruments.com/dansk



Subject to change without notice