

DOSIMETER-
INDICATOR

SEARCH-2

MANUAL
OF OPERATION

**All Union
Scientific Research
Institute of
Experimental
Physics**

DOSIMETER INDICATOR
SEARCH-2

Management
and Operation

Your suggestions,
comments are requested

Send to:
607200, Arzamas city
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VNIIEF

RESPECTED COMRADE

You are the owner of the dosimeter indicator SEARCH-2.

In your hands is a modern quick device to evaluate possible gamma-beta radioactive pollution areas, premises, products, food, clothes, etc.

Before using it, use this guide to operation.

IN THE CASE THAT HIGH LEVELS OF RADIATION AND RADIOACTIVE POLLUTION IS DETECTED, REPORT TO SANITARY EPIDEMIOLOGICAL STATION (SES) CONTROL - THIS LOCATION.

1. PURPOSE

Dosimeter indicator SEARCH-2 (Dosimeter) is intended for detection and evaluation of gamma radiation dose rates of surface pollution and beta-active substances.

2. BRIEF DESCRIPTION

Figure 1 shows a general view of the Dosimeter.

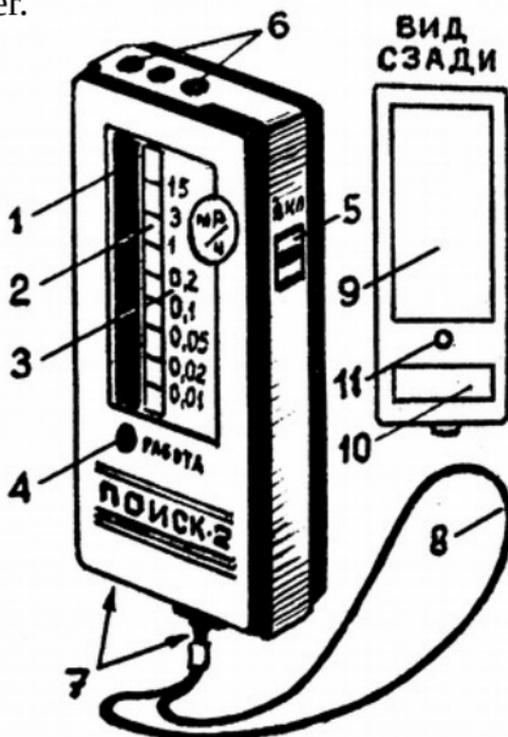


Fig. 1

- 1 - Light indication window;
- 2 - Color scale;
- 3 - Digital scale mR/h;
- 4 - "Working" indicator;
- 5 - ON/OFF touch switch;
- 6 - Inlets for beta pollution assessments;
- 7 - Sockets for connection to charger;
- 8 - Cord;
- 9 - Brief instructions for use;
- 10 - Factory data;
- 11 - Fixing screw;

In the light indication window, there are 9 indicators each of which corresponds to its power value dose in mR/h and color value. The color scale is used only when assessing the level of the doses of external gamma radiation.

●	R	15	More than 15	Staying in given place DANGER	
●	R	3	More than 3, less than 15		
●	R	1	More than 1, less than 3		
●	Y	0.2	More than 1, less than 3		CAUTION Radiation background elevated
●	Y	0.1	More than 1, less than 3		
●	Y	0.05	More than 0.05, less than 1		ACCEPTABLE radiological situation
●	G	0.02	More than 0.02, less than 0.05		
●	G	0.01	More than 0.01, less than 0.02		
●	G		Less than 0.01		

TECHNICAL DATA

Indication	Eight thresholds on red light emitting diodes
Control	Touch on and auto off
Power	4 batteries D-0.26
Continuous Operating time without recharge, h	300

Established light thresholds by gamma radiation mR/H	Scale color									
	Green			Yellow			Red			
	0.01	0.02	0.5	.1	.2	1	3	15		
Measurement time, s	32	32	16	8	4	1	0.5	0.5	0.5	
Rating Range beta pollution Th. Particles /(min cm ²)	$10^2 \dots 3 \cdot 10^5$ With a thickness of the input window 1.5mg/cm ²									

Energy Dependence %	+/- 30 in the range of gamma ray energies 0.05 . . . 3 MeV
Temperature, surrounding environment, °C	- 30 . . . + 40
Overall Dimensions, mm	126x54x27
Weight, kg	0.2

4. EVALUATION OF THE POWER OF THE DOSE OF EXTERNAL GAMMA RADIATION (RADIATION BACKGROUND)

Gamma radiation has a large penetrating power, affecting the entire human body and internal organs.

While holding the dosimeter at chest level, touch the switch with your finger, and the “Work” indicator will light up. A change in the brightness of the indicator informs about the natural background. Depending on the dose rate, the measurement time lasts from 32 s to 0.5 s.

THE LARGER THE DOSE POWER, THE LESS THE MEASUREMENT TIME. After finalizing the measurement, the “Work” indicator goes out, and the light corresponding to the measured dose rate will illuminate for not less than 3 sec. The dosimeter will be disabled automatically after the flashing indicator.

If it is necessary to continuously conduct measurements, the finger should remain on the switch.

Background radiation is everywhere in the world.

Depending on the conditions, time of year, etc., it can change even in the absence of accidents accompanied by the release of radioactive substances.

5. ESTIMATION OF RADIOACTIVE CONTAMINATION OF FOOD PRODUCTS (FOOD) BY GAMMA RADIATION

Measure the radiation background at the place of pollution assessment, as described in section 4. In case of background not exceeding 0.02 mR / h, take measurements of products (food) in an amount of approximately 1 kg (liter). Hold the back side of the radiation meter at a distance of about 1 cm from the item (food) and turn on the dosimeter. (Fig 2).



Fig. 2

If the dosimeter measures more than 0.02 mR / h , then the products (food) are contaminated by gamma radiation. If the external gamma-ray level is more than 0.02 mR / h , you should find a place with a lower background to assess the contamination. If this is not possible, then the contamination of products must be assessed by several measurements with large quantities of the products (food), which requires special knowledge.

6. ESTIMATION OF RADIOACTIVE CONTAMINATION OF SURFACES BY BETA RADIATION

In addition to assessing gamma radiation levels, the dosimeter also allows you to evaluate pollution levels of beta radiation. Therefore, it can be used in assessing the levels of contamination by such radionuclides that are inherently beta radiation only (strontium 90, etc.). Beta radiation has a large ionizing ability, affects the skin of a person, and primarily the eyes. Bring the dosimeter to the surface to be measured, covering the inlet holes with your fingers or the palm of your hand (Fig. 3).

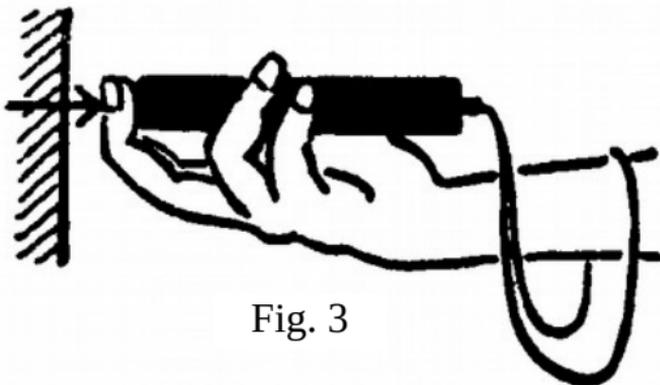


Fig. 3

Remember the measurement result shown on the mR/h scale. Opening the holes, bring the dosimeter to the surface to be measured at a distance of about 1 cm (Fig. 4)

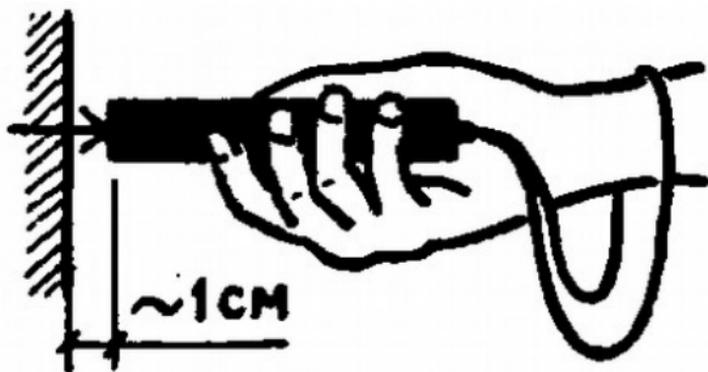


Fig. 4

Compare the resulting scale to mR / h. If with the aperture open, the indication is higher than that measured with a closed aperture, this indicates the presence of contamination with beta-active substances.

To quantify the levels of pollution, a table is given on the reverse side of the dosimeter for the conversion of the gamma dose rate into levels of beta contamination.

Red - Dangerous
 Yellow - Caution
 Green - Permissible

Δ

Γ	<u>mR</u> h	B	<u>particles</u> min cm ²
	15		300000
	3		45000
	1		10000
	0.2		2500
	0.1		1000
	0.05		500
	0.02		250
	0.01		100

Δ

TRANSFER TABLE
 with gamma background
 less than 0.01 mR /h

Upper sign Δ shows color scale used only when assessing the environmental gamma radiation. The lower sign Δ indicates beta levels that can be measured at a background level of external gamma radiation of less than 0.01 mR / h.

Example .

With holes closed, the dosimeter showed the level of 0.02 mR/h (Second indicator illuminates).

With holes open, the dosimeter showed the level of 0.05 mR/h (Third indicator illuminates).

From the table we find:

0.05 mR/h – 500 particles / min . cm²

0.02 mR/h – 250 particles / min . cm²

Surface pollution will be $500 - 250 = 250$ particles / min . cm²

7. EVALUATION OF CLOTHING AND VARIOUS SECTIONS OF A HUMAN BODY

Hold the dosimeter above the area to be measured. Turn on the dosimeter and gently swipe it over the area, remaining ~ 1 cm above the area. The frequency of the changes in the brightness of the “Working” indicator will identify areas of contamination.

THE HIGHER THE LEVEL OF CONTAMINATION, THE MORE THE BRIGHTNESS OF THE INDICATOR WILL CHANGE.

It is advisable to check body parts that are most likely to be contaminated strongly: Hands, feet or soles, face, head, knees, as well as clothing: Sleeves, bottom of trousers, pockets. When contamination is detected, clothes must be washed. Wash shoes. Wash contaminated body parts with soap and water at a temperature of 30 – 32 °C. Radioactive substances settled in the pores remain at a lower temperature (due to narrowing of the pores) and at higher temperature (due to expansion) and are more likely to enter the bloodstream.

8. INSTRUCTIONS FOR SAFETY AND MAINTENANCE

CAUTION! The device has a high voltage of +400 V. When working with the dosimeter do not touch the surface to be measured with hands or with the device. Doing so leads to contamination.

In case of contamination of the dosimeter, it is necessary to decontaminate it. How:

Disassemble the dosimeter, remove batteries, decontaminate the case and board, dry the parts. Do not contaminate hands, shoes and sleeves. Assemble the dosimeter. Check for contamination of the dosimeter with a calibrated dosimeter (For example the SES) ATTENTION! When disassembling and assembling the dosimeter, do not touch the input windows of the detectors because of the possibility of damage to them.

Decontamination can be carried out using household detergents such as: “Era” , “Astra”, “Lotus”, etc., which are rubbed on contaminated areas with a brush (brushes) for 3 minutes and then washed off after 2 minutes with warm water and a soft brush. The procedure is repeated a minimum of 3 times.

9. DELIVERY KIT

Dosimeter indicator
SEARCH-2

Management and Operation manual

Dosimeter is complete with installed batteries
D-0.26 (4 pcs.).

10. ACCEPTANCE CERTIFICATE

Dosimeter-Indicator Search-3 Serial Number

Corresponds to the CD and recognized as fit for
delivery.

Date of Release _____

Representative of OTK

11. WARRANTY LIABILITIES

Warranty period for the dosimeter – 24-months from the date of sale through the distribution network. In the absence of a sale date and a stamp, the warranty period is calculated on the day the dosimeter is issued. Malfunctions discovered within the specified period are repaired free of charge subject to the rules specified in the instruction manual.

Radioactive contamination of the dosimeter and disorders of the D-0.26 batteries are not covered under the warranty.

This Page not part of Original Manual
This Manual Provided by John A.
<http://linuxslate.com>

Translation includes my interpretations of original intent. It is not a word for word translation, or a copy of any other work.

The original page size was not preserved. This document is intended for A6 paper, which is a standard size reasonably close to the original. Other than that, an attempt was made to approximate the original formatting of each page.

The included figures remain the property of whoever owns them. They are included here to educate the public on the referenced unique device and ionizing radiation.

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IF YOU HAVE SOMETHING THAT YOU THINK IS RADIOACTIVE, OR OTHERWISE HAZARDOUS, OR IF YOU SUSPECT OTHERS OF HAVING SUCH, CONTACT YOUR LOCAL POLICE. THIS GUIDE IS A TECHNICAL DESCRIPTION OF CONSUMER ELECTRONIC DEVICES ONLY. IT DOES NOT, NOR DOES IT PURPORT TO GIVE MEDICAL OR ANY FORM OF HEALTH ADVICE. IF YOU SUSPECT THAT YOU HAVE BEEN EXPOSED TO A HAZARDOUS SUBSTANCE, OR ARE HAVING HEALTH PROBLEMS, CONTACT A PHYSICIAN OR YOUR LOCAL EMERGENCY SERVICES