

household
INDICATOR
Radiation
POLLUTION

BIR-3

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Technical description and brief information |
operating instructions I

Moscow

NPP "RAST"

technical description and brief information OPERATING instructions for the HOUSEHOLD RADIATION POLLUTION INDICATOR "BIR-3"

1. Purpose of the device "BIR-3"

The household radiation pollution indicator ("BIR-3") is intended for use in everyday life in order to check for radiation pollution (under the influence of gamma radiation and hard beta radiation) of the environment: air, earth, water, as well as various materials, objects or products.

2. Technical specifications

2.1. The device "BIR-3" is an indicator device that allows you to display-
there are three levels:

- natural radiation background. At the same time, 2 - 8 sound pulses are heard per minute and only the green indicator lights up;
- the level is approximately 60 microrentgens per hour. At the same time, 20-30 sound pulses per minute are heard and, in addition to the green indicator, it is regularly displayed yellow indicator;
- the level is approximately 120 microrentgens per hour. At the same time, 40 - 60 beeps per minute are heard and, in addition to the green indicator, yellow and red indicators are alternately displayed.

2.2. During the manufacture of the BIR-3 device, the approximate levels of 60 and 120 micro-X-rays / hour are compared with the radiation of an exemplary source - the isotope Co60. In the process of operation, these levels are not subject to verification.

2.3. With fully charged batteries, the duration of operation of the device is not less than it takes 15 hours (with continuous power on).

2.4. The device is operable at a temperature of -10°C - $+40^{\circ}\text{C}$.

2.5. The device remains operational after being in extreme temperatures -50°C - $+50^{\circ}\text{C}$.

Attention! The design of "BIR-3" is not subject to disassembly, because part of the elements of the electrical circuit is under a high voltage of 400 - 500 V!

3. Device device

3.1. Structurally, the device is made in the form of a removable indicator head based on a common electric rechargeable pocket flashlight "Lux" and is powered by the same three batteries of type D-0.26, from which

3.2. In the rear part of the device housing, under the removable cap, there is a plug for connecting to an alternating electric current network with a voltage of 127 or 220 V for recharging batteries.

4. Preparation for work

4.1. Before you start using the device "BIR-3", you must carefully read the technical description and brief information on the operation of "BIR-3".

4.2. Immediately after the purchase of the device and in the future, every three months, it is necessary to perform a control charging of the batteries. To do this, do not-

it is necessary to remove the cap in the back of the device body and turn on the two-pole plug into the socket of the AC lighting electrical network (it does not matter what voltage is in it, 127 or 220 V). A test charge of the battery should last approximately 10-12 hours.

Attention! Charging should be performed with the device turned off!

4.3. During intensive operation of the device, charging should be carried out as necessary: when the total operating time of the device is more than 15 hours or when the green indicator light weakens.

5. The procedure for using the device:

5.1. The device is switched on by a switch located on the housing and comes into a state of readiness for operation in 15-20 seconds after switching on. It should be borne in mind that immediately after switching on, the device may simultaneously display indicators of any color that go out (except green) after reaching readiness.

5.2. If the device is switched on in a normal radiation environment, i.e. when there is only a natural background and there is no radiation contamination, then only the green indicator will be constantly lit after being ready, briefly going out after each measurement period equal to 15-20 seconds.

5.3. After switching on the device, irregular sound signals appear. These signals arise due to the registration of the natural radiation background. The natural radiation background always exists. However, its level is unstable and varies significantly depending on the geographical location, time of day, time of year and a number of other natural factors. Therefore, the frequency of sound signals may vary. In a normal radiation environment (natural background radiation), the frequency of sound signals will fluctuate in the range of 2-8 per minute. In addition, the presence of sound signals simultaneously indicates the serviceability of the device.

5.4. In an environment with increased radiation, the frequency of sound signals increases. A yellow indicator may flash at the same time. Flashing of the yellow indicator regularly, during each measurement period (15-20 seconds), means that the exposure dose rate is approximately 60 microrentgens per hour or more. This dose, in accordance with the currently accepted norms (see appendix), is the maximum permissible for the population, even when staying around the clock in an environment with such a level of radiation pollution.

5.5. When the environment is polluted to a level that creates an exposure dose rate of about 120 microrentgens per hour or more, a red indicator will be displayed alternately with a yellow indicator during each measurement period (15-20 seconds). In accordance with the existing norms, this is twice the permissible dose for the population, provided that they are in such an environment around the clock.

5.6. With an increase in radiation pollution over 120 microrentgens per hour, the alternating flashing of yellow and red indicators will occur with greater frequency for the same measurement period is 15-20 seconds.

Attention! If you have detected a regular flashing of the red indicator, you are advised to leave the contaminated area and report the radiation to the district sanitary and epidemiological station, the district executive committee or the district department-militia division.

5.7. To assess the radiation purity of individual objects, materials or products, the head of the switched-on device should be brought to them. If the object is radiation-free, then the frequency of the sound signals should not increase in comparison with the sound signals that occur during the registration of natural radiation background.

6. Warranty obligations

6.1. The warranty period of operation of the device "BIR-3" is 18 months from the date of its manufacture- but not more than 12 months from the date of sale. Complaints are accepted if the device has not been opened during operation and does not have any mechanical damage.

6.2. If malfunctions are detected during the warranty period, the device should be sent for its replacement to the address: 111250, Moscow, Krasnokazarmennaya str., 14 MPP "RAST".

Date of manufacture

17 / 10 / 1999

Signature

Date of sale

" " _____ 199

M.P. _____

signature

brief information about the current sanitary standards

Currently, in the USSR, the "Standards of radiation safety NRB-76/87" are mandatory for all departments and organizations. These standards are compiled on the basis of data on the impact of exposure to ionizing radiation on the human body and taking into account the experience of eliminating the consequences of the Chernobyl

accident. These norms establish three different categories of irradiated persons:

Category A - professional workers who permanently or temporarily work directly with sources of ionizing radiation (III). In accordance with the requirements of NRB-76/87, the maximum permissible dose (SDA) for persons of this category has been established (in the case of general body irradiation) 5 X-rays* per calendar year, i.e. 2.9 millirentgen per hour (taking into account the 36-hour working week).

Category B - a limited part of the population - persons who do not work directly with sources of ionizing radiation, but according to the conditions of residence or placement of workplaces, may be exposed to radioactive substances and

* It should be noted that in the text of NRB-76/87 these values are indicated in units of the equivalent dose - of REM. (REM is the biological equivalent of an X-ray.) However, since the exposure dose rate, measured in millirentgens per hour, is approximately equal to the dose rate absorbed in the tissues of the human body, measured in millibers/hour, they can be considered numerically equal.

Exactly: the exposure dose of 1 X-ray corresponds to the absorbed dose in the tissues equal to 0.93 REM; respectively, a dose of 1 microrentgen = 0.93 microbe.

the medium of la cov radiation used in institutions and NRE-76/87 th vvo vneshnuyu (PD) is set 10 times less than for category A and is equal to 0.5 X-rays per calendar year, i.e. 0.06 millirentgen per hour, i.e. 60 microrentgen per hour, taking into account year-round stay in this environment.

Category B - the population of the country, republic, territory or region for which the PD it is not set separately, but it should be minimal, in any case no more than the PD for persons of category B.