“EcotestVIP”
PERSONAL RADIOACTIVITY DETECTOR

Operating manual
ВІСТ.412129.020-02 РЭ

The enterprise works in accordance with the introduced and certificated Quality Management System in compliance with the ISO 9001:2008 standard.

Dear users,

You had chosen well if purchased the “EcotestVIP” personal radioactivity detector. From now on you will be able to evaluate the degree of your personal radiation safety whether you are at home or in the office, in the country or during the trip. Your device is simple and undemanding in use, and can be applied without special training of the user.

The company managers are always ready to consult and advice you by the telephone numbers: (+38 032) 242-15-15, fax (+38 032) 242-20-15 and E-mail: sales@ecotest.ua.

We would greatly appreciate to receive your comments and suggestions on operation of the detector. Please keep in mind that the device is under 18-months (free of charge) warranty maintenance since its purchase date.

Best regards, International Sales Department.

CONTENTS

Shortly about radioactivity

Before you get acquainted with the operation of the "EcotestVIP" personal radioactivity detector, we suggest you read some information about radioactivity.

Radioactive ionizing radiation is a natural phenomenon permanently existing in the environment. Radiation background of the Earth and the space adversely affects us on the regular basis. We are constantly influenced by natural radioactive materials stored in soil and construction materials of the buildings we live and work in.

It also happens that more and more frequently we are exposed to the radioactive influence of specific life activities, for example, certain medical procedures, smoking etc. To say nothing of the impact of radioactive sources of artificial origin produced by Chernobyl Fallout that caused contamination of the vast territories. Therefore not only natural ionizing radiation but also Chernobyl Atomic Power-Station Disaster component that gets into human organism with agricultural products, grown on the polluted territories, berries and mushrooms, makes a great impact on people.

Ionizing radiation is primarily X-ray, gamma, beta, alpha and neutron radiation.

X-ray and gamma radiation is transmitted as energy waves, similar to the transmission of sunlight and sun warmth. X-ray and gamma radiation have similar nature. They differ only in their origin and wavelength.

Normally, humans are influenced by X-rays emanated by electronic apparatuses used in hospitals.

Gamma rays are radiated by unstable radioactive isotopes.

X-ray and gamma radiation is characterized by deep permeability into human organism, which is dependent on the energy of the rays. Gamma radiation permeability is so high that it can be hindered only by the thick lead or concrete plates.

Alpha radiation is a flow of nucleuses of helium. It has small permeability and can be hindered, for example, simply by a piece of paper. Therefore it is not hazardous until radioactive materials emanating alpha particles get into human organism either through open wound, or with food and air.

Beta radiation is a flow of electrons. Beta radiation obtains higher permeability and penetrates organism tissues at the depth of 1-2 cm.

Neutron radiation is a flow of neutrons originating from the process of nuclear fission in the reactors, or as a result of spontaneous division in the nuclear materials. Since neutrons are electroneutral particles they deeply penetrate any substance, including living tissues.

However, because people are more often exposed to gamma radiation in everyday life, the majority of radiation monitoring devices measure exactly this kind of radiation. As a matter of fact, the "EcotestVIP" personal radioactivity detector serves to prevent gamma hazard.

Overview

This operating manual (hereinafter referred to as the OM) is intended to inform the user about the principles of operation of the "EcotestVIP" personal radioactivity detector and its operation procedure. The OM contains all information necessary for proper use of the detector and full realization of its technical possibilities.

The OM contains the following abbreviations and symbols:

ED - equivalent dose;

EDR - equivalent dose rate;

MODE - on/off button and switch between the corresponding modes of indication (gamma radiation EDR, gamma radiation ED, real time (clock) and alarm clock);

THRESHOLD - button of threshold levels programming and correction of clock and alarm clock time.

Note. Equivalent dose (expressed in "Sieverts" ("Sv")) characterizes the influence of ionizing gamma radiation on the biological object (human), as opposed to exposure dose (expressed in "Roentgens ("R")") that characterizes the capacity of gamma radiation to ionize the air.

Generally, to make it simple, use the coefficient circa 100 to covert equivalent dose units into exposure dose units: 1.0 μSv ≈ 100.0 μR.

Dose rate conversion, correspondingly: 1.0 μSv/h ≈ 100.0 μR /h.

Natural radiation background normally equals circa 0.1 μSv/h (≈10 μR /h).

Maximum permissible level for premises according to the regulatory documents of Ukraine is 0.30 μSv/h (≈30 μR /h).

1 Purpose of use

The “EcotestVIP” personal radioactivity detector (hereinafter called the detector) is designed to alarm about dangerous levels of gamma radiation, as well as to evaluate the levels of equivalent dose (ED) and equivalent dose rate (EDR) of gamma radiation. The detector is sensitive to hard X-rays. Additionally, the detector performs the functions of clock and alarm clock.

The detector is used:

- to control personal radiation safety of the user;

- to carry out radiation monitoring of apartments, offices, items of everyday use, clothes, ground surface of infields and vehicles;
- to evaluate radioactive contamination of wild berries and mushrooms.

Caution:

1 The "EcotestVIP" personal radioactivity detector belongs to the class of indicating and warning devices and is not an instrument for formal (professional) measurements.

2 The "EcotestVIP" personal radioactivity detector is calibrated according to standard sources of ionizing radiation after manufacture and is not subject to verification.

2 Technical specifications

2.1 Key specifications are presented in Table 2.1.

Table 2.1 – Key specifications

Name	Unit of measurement	Standardized value according to the technical specifications
1	2	3
1 Indication range of gamma radiation EDR	μSv/h	0.1 – 999.9

Table 2.1 (continued)

1	2	3
2 Main relative permissible error limit of gamma radiation EDR indication with confidence probability of 0.95 (calibrated relative to ^{137}Cs)	%	$\pm(25+2/\dot{H})$, where $\dot{H}$ is a numeric value of EDR in μSv/h
3 Indication range of gamma radiation ED	mSv	0.001 - 9999

Table 2.1 (continued)

1	2	3
4 Main relative permissible error limit of gamma radiation ED indication with confidence probability of 0.95	%	±25
5 Energy range of registered gamma radiation	MeV	0.05 – 3.00
6 Energy dependence of the detector readings at gamma radiation EDR and ED evaluation in the energy range of 0.05 to 1.25 MeV	%	±30

Table 2.1 (continued)

1	2	3
7 Battery life (AAAA size×2 of 620 mA·h capacity) under natural background radiation, not less than	hour	2500
8 General operating supply voltage of the detector from two AAAA size batteries	V	3.0

Table 2.1 (continued)

1	2	3
9 Mean time to failure, not less than	hour	6000
10 Average service life of the detector, not less than	year	6
11 Dimensions, not more than	mm	33×15×137
12 Weight (without batteries), not more than	kg	0.06

2.2 Threshold level values of gamma radiation EDR in the range of 0.01 to 9.99 μSv/h with discreetness of one programmed digit of the scale are programmed in the detector.

Threshold level value is set automatically after the detector is switched on and equals 0.30 μSv/h. It corresponds to the maximum permissible gamma background level for premises in compliance with the regulatory documents of Ukraine.

2.3 The detector sends audio signals of different periodicity and keys if the programmed EDR level is exceeded, the alarm clock goes off, or the battery is discharged.

2.4 The detector provides four level indication of battery discharge.

2.5 Values of EDR and EDR threshold levels, real time and preset time of the alarm clock alternatively appear on the digital liquid crystal display (LCD), which depends on the chosen mode indicating the correspondence of information.

2.6 The detector performs measurements under the following conditions:

- temperature from – 10 to + 50 ^{o}C;
- relative humidity up to (95±3) % at + 35 ^{o}C;
- atmospheric pressure from 84 to 106.7 kPa.

3 Delivery kit

3.1 The delivery kit consists of the items and maintenance documentation presented in Table 3.1.

Table 3.1 – Delivery kit of the detector

Type	Item	Quan-tity	Note
BICT.412129.019-06	“EcotestVIP” personal radioactivity detector	1 pc.	

Table 3.1 (continued)

Type	Item	Quantity	Note
BICT.323365.001	Case	1 pc.	
BICT.412129.020-02 РЭ	Operating manual	1 copy	
BICT.412915.016	Package	1 set	
	Gold Peak Group AAAA size battery of 1.5 V	2 pcs.	AAAA batteries of 1.5 V voltage produced by other manufacturers are permissible.

4 Design and principle of operation

4.1 General information

The detector is a mono block construction with a built in gamma radiation detector (Geiger-Muller counter), a printed circuit board equipped with electronic components, and batteries.

The operation principle of the detector is based on transformation of radiation by Geiger-Muller counter into the sequence of voltage pulses; the number of pulses is proportional to the registered radiation intensity.

The power for operation is supplied by two AAAA batteries.

4.2 Design description

The detector is designed as a flat oblong plastic body with rounded corners. The body (Figure 1, 2) consists of the upper (1) and the lower (2) covers. The indication panel (3) is located in the right part of the upper cover (1); two buttons (4) of control are located to the left and to the right under the panel.

The clip (8) and the battery compartment (5) are located on the lower cover (2) of the detector. The battery compartment (5) is closed with the lid (6) fastened due to the elastic capacities of the material. The battery compartment includes the contacts (7) for batteries connection.

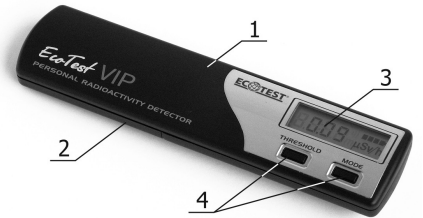

Figure 1 – Main view of the detector

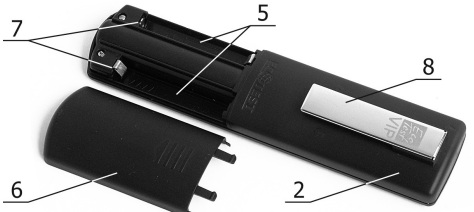

Figure 2 – Rear view with the removed lid

5 Preparation for operation and testing

5.1 Operating limitations

Operating limitations are presented in Table 5.1.

Table 5.1 – Operating limitations

Operating limitations	Limitation parameters
1 Ambient air temperature	from - 10 to +50 ^{o}C
2 Relative humidity	up to (95±3) % at + 35 ^{o}C, non-condensing
3 Gamma radiation influence	EDR up to 100.0 mSv/h during 5 minutes

Note. The detector is not protected against atmospheric precipitations or dust. If operating in dusty environment or during atmospheric precipitations, the detector should be placed into a plastic bag or a protective cover.

5.2 Preparation for operation and guidelines on switching on and testing the detector

5.2.1 Examine the location and purpose of use of the controls before using the detector.

5.2.2 Prepare the detector for operation by doing the following:

- unpack the detector;
- open the battery compartment and make sure the batteries are inserted;
- insert two AAAA size batteries, observing the polarity, if there are none.

Note. The detector turns on automatically if the batteries are inserted for the first time.

5.2.3 Press shortly the MODE button if the batteries are already inserted into the battery compartment. The detector should enter the mode of gamma radiation EDR indication at once, which is shown by EDR measurement units expressed in “μSv/h” that appear on the digital LCD, and by brief audio signals that follow the detection of every gamma quantum. All the digits of the LCD will blink until the completion of measurement interval.

The readings of gamma background measurement will appear on the LCD after the measurement interval is completed.

5.2.4 Press shortly the MODE button and make sure the detector has entered the mode of gamma radiation ED indication. ED units of measurement expressed in “mSv” should appear on the LCD.

5.2.5 Press shortly the MODE button and make sure the detector has entered the mode of real time indication. Two dots between the two pairs of digits on the LCD that blink with one-second interval should appear on the LCD.

5.2.6 Press shortly the MODE button and make sure the detector has entered the mode of indication of the alarm clock settings, which is displayed by two unblinking dots between the two pairs of digits on the LCD.

5.2.7 Hold the MODE button pressed till extinction of the LCD to switch the detector off.

Note. The batteries should be replaced if the detector is switched on, and irrespective of the chosen mode, the batteries discharge is observed (blinking of all four segments of the battery symbol on the display, and periodic brief two tone audio signals).

5.3 List of possible troubles and troubleshooting

5.3.1 The list of possible troubles and troubleshooting is presented in Table 5.2.

Table 5.2 – List of possible troubles and troubleshooting

Trouble	Probable cause	Troubleshooting
1 The detector does not switch on after the MODE button is pressed	1 The batteries are discharged 2 No contact between the batteries and the battery compartment clamps 3 One of the batteries is out of order	1 Replace the batteries 2 Restore the contact between the batteries and the clamps 3 Replace the defected battery

Table 5.2 (continued)

Trouble	Probable cause	Troubleshooting
2 Low battery symbol is displayed after the batteries have been replaced when the detector is switched on	1 Poor contact between the batteries and the battery compartment clamps 2 One of the batteries is out of order	1 Clean out the contacts on the clamps and the batteries 2 Replace the defected battery

5.3.2 At failure to eliminate the troubles presented in Table 5.2, or at detection of more complicated troubles, the detector should be sent for repair to the repair services or to the manufacturer (see Repair section).

6 Use of the detector

6.1 Safety measures during use of the detector

The detector contains no external parts exposed to voltages hazardous for life.

Direct use of the detector is not dangerous for the service personnel, and is environmentally friendly.

A special protective jacket is used to prevent accidental contact with conductive parts.

Ingress protection rating is IP30.

The detector belongs to fire safety equipment.

Note. Caution! Do not open or charge the batteries!

6.2 List of operating modes

The detector uses the following indications and operates within the following modes:

- gamma radiation EDR measurement;
- programming of audio alarm threshold levels of gamma radiation EDR and switching on/off audio signaling of registered gamma quanta;
- indication of gamma radiation ED measured value;
- indication and correction of real time;
- indication and correction of the alarm clock settings, switching the alarm clock on/off.

6.3 Operation procedure of the detector

Dear user,

We remind you that the "EcotestVIP" personal radioactivity detector is simple and undemanding in use, and can be applied without special training. Simply turn it on and locate it in a place that best suits you to make the device perform its function – alert about dangerous levels of gamma radiation. Now the detector evaluates radiation background level in the automatic mode, and if the level increases it alerts you about danger with sound signals.

If the radiation background level is safe, the detector's LCD switches off in 5 minutes from the point the power is on, and the detector proceeds to the energy saving mode. It continues evaluating the background level of radiation and warns you at once if the radiation situation changes.

For inquisitive users who are interested in more detailed information about the detector's operating modes and want to use all of its technical possibilities see the information below.

6.3.1 **Switching the detector on/off**

Press shortly the MODE button to switch the detector on. The information displayed on the LCD shows that the detector is on.

Press the MODE button once again and hold it pressed until the LCD extincts to switch the detector off.

6.3.2 **Measurement of gamma radiation EDR**

The mode of gamma radiation EDR measurement is entered automatically after the detector is switched on. The mode is indicated by the "μSv/h" symbol that appears on the LCD and short-term audio signals following the registered gamma

quanta. The results of measurement will appear on the LCD during the first few seconds, enabling efficient evaluation of the radiation level. Since the detector provides constant averaging of measurement results, every next value update on the LCD is followed by a process of its averaging.

Therefore, it is possible to receive the readings approximately in a minute with a precision within the limits of rated error. The time needed to get a reliable result depends on the radiation intensity and will not exceed 100 seconds, as a rule, whereas the digits on the LCD will be blinking.

To measure gamma radiation EDR, direct the detector with its main axis in parallel to the examined object.

Consider the arithmetic mean of five last measurements in 10 seconds after the beginning of measurement, or each single reading received after the LCD digits stopped blinking, provided that position of the detector towards the examined object was not changed, as gamma radiation EDR measurement results. Units of measurement are expressed in μSv/h.

Measurement of gamma radiation EDR and comparison of the results with the programmed audio alarm threshold level is performed continually and irrespective of the chosen mode of indication and operation from the moment the detector is on.

Note 1. The process of data averaging can be stopped forcibly to provide effective evaluation of the radiation level. To do this, change the object of examination and press shortly the THRESHOLD button. Rough evaluation of gamma background level of every new object may be performed within 10 seconds.

Note 2. The detector automatically switches off the LCD and audio signaling of registered gamma quanta to preserve battery energy. The LCD turns off in 5 minutes after the last pressing of any control button if the EDR value does not exceed the preset threshold level, and the alarm clock does not go off. The digital LCD and audio signaling of registered gamma quanta turn on immediately after pressing any control button or at audio alarming (of the threshold device or the alarm clock).

Remember to turn off the power supply after you finished working with the detector, since the switched off indication does not mean the detector is off!

6.3.3 **Programming of audio alarm threshold levels of gamma radiation EDR and switching on/off audio signaling of registered gamma quanta**

The EDR threshold level value of 0.30 μSv/h, which is the maximum permissible level for premises in compliance with the regulatory documents of Ukraine, is set automatically when the detector is switched on.

Programming (change) of audio alarm threshold levels of EDR is performed in the mode of gamma radiation EDR measurement, if necessary.

To start programming, press and hold the THRESHOLD button. The low-order digit should start blinking on the digital LCD.

Successive short presses and releases of the THRESHOLD button set the necessary value of the low-order digit. Press shortly the MODE button to program the next digit, which will start blinking at that.

Other digits are programmed likewise.

To fix a new value of the threshold level, set all digits of the LCD by pressing the MODE button, even if the values of the high-order digits are not changed.

Press shortly the MODE button after you have programmed the last digit. A blinking sound symbol “)))” should appear on the digital LCD. Press shortly the THRESHOLD button to switch off audio signaling of registered gamma quanta. The sound symbol disappears at that. Press the THRESHOLD button once again to enable audio signaling of registered gamma quanta; the sound symbol appears on the LCD.

Next short press of the MODE button fixes a new value of the threshold level and the status of audio signaling system of registered gamma quanta. Fourfold extinction of the LCD indicates that new settings have been fixed.

To check the value of the fixed EDR threshold level, press the THRESHOLD button and hold it pressed for not longer than 2 seconds after the threshold level value appears.

If the THRESHOLD button is pressed for more than two seconds, the low-order digit starts blinking, indicating that a new threshold level value can be programmed.

A two-tone audio signal indicates that the programmed EDR threshold level has been exceeded.

Note 1. Audio signaling of registered gamma quanta is switched on automatically along with the detector. Extinction of the digital LCD automatically switches off audio signaling of registered gamma quanta.

Note 2. Audio alarm of exceeded programmed EDR threshold level is independent of the status of audio signaling system of registered gamma quanta.

6.3.4 **Indication of gamma radiation ED measurement value**

Press shortly the MODE button to enter the mode of ED measurement value indication. This mode follows the mode of gamma radiation EDR measurement (switched on automatically along with the detector). A “mSv” symbol that appears on the LCD indicates you have entered the appropriate mode. The measurement units of gamma radiation ED are expressed in mSv. A comma after the first left digit will appear on the LCD when the detector is switched on. The comma will automatically shift to the right until full completion of the ED scale of the detector as the gamma radiation ED value increases.

Note. Under natural background gamma radiation (c 0.1 μSv/h) a change by one low-order digit of the ED scale will take place approximately in 10 hours, and the LCD will display the result of "0,001" mSv equal to 1.0 μSv.

6.3.5 **Indication and correction of real time**

Press shortly the MODE button to initiate the mode of real time indication. This mode follows the mode of indication of gamma radiation ED measurement value.

It is indicated by a one-second blinking double point between the two pairs of the LCD digits.

The digits from the right to the left show the following: the first digit indicates minutes; the second one - tens of minutes; the third one - hours; the fourth one - tens of hours.

Press the THRESHOLD button and hold it pressed until two digits to the right from double point start blinking to correct the value of real time, and then release the button. The proper values of units and tens of minutes are fixed by further pressing and holding the THRESHOLD button. Press shortly the THRESHOLD button to correct the value of minutes. Each pressing will change the value per unit. Press shortly the MODE button to correct the value of hours. Two digits on the left of double point start blinking at that. The hour value correction is performed likewise. Press shortly the MODE button once again to exit the mode of real time correction.

6.3.6 **Indication and correction of alarm clock settings, switching alarm clock on/off**

Press shortly the MODE button to initiate the mode of indication of the alarm clock time. This mode follows the mode of real time indication. A non-blinking double point between the two pairs of digits on the LCD indicates you have entered the appropriate mode.

Press the THRESHOLD button and hold it pressed until two digits to the right from double point start blinking to correct the alarm clock setting and to switch it on/off. Then release the button. The proper values of units and tens of minutes are fixed by further pressing and holding the THRESHOLD button. Press shortly the

THRESHOLD button to correct the value of minutes. Each pressing will change the value per unit. Press shortly the MODE button to correct the value of hours. Two digits on the left of double point start blinking at that. The hour value correction is performed likewise.

Press shortly the MODE button to switch the alarm clock on/off after correction of hour values of the alarm clock. A blinking sound symbol "))))" should appear on the LCD. Press shortly the THRESHOLD button to switch the alarm clock off, the sound symbol should extinct. To switch the alarm clock on, press the THRESHOLD button once again. The sound symbol appears at that on the digital LCD.

Next short presses of the MODE button fix the alarm clock settings. If the alarm clock is on, the sound symbol will be displayed on the LCD irrespective of the chosen operating mode.

Note. The alarm clock will continue to work even after the power supply of the detector is off (provided that the batteries are inserted). The detector will automatically enter the mode of real time indication when the alarm clock goes off. Press any control button to switch off audio signal of the alarm clock. Otherwise, audio signal will be disabled automatically in a minute after the alarm clock rings.

7 Technical maintenance

7.1 General guidelines

Technical maintenance includes the following operations:

- external examination;
- operability check of the detector;
- power supply switch off.

7.1.1 Safety measures

Safety measures during technical maintenance fully comply with safety measures stated in item 6.1 of the present OM.

7.1.2 **External examination**

External examination of the detector should be performed in the following order:

a) check the technical condition of surface, inspect for integrity of seal, absence of scratches, traces of corrosion, surface damages of the detector;

b) check the condition of clamps in the battery compartment.

7.1.3 **Operability check of the detector**

Operability check of the detector is performed according to item 5.2 of the present OM.

7.1.4 **Power supply switch off**

Power supply should be switched off each time the detector is not in use for a long time. Do the following:

- switch the detector off;
- open the lid of the battery compartment;
- remove the batteries;
- examine the battery compartment, check the contact clamps accuracy, clean the battery compartment from contamination and contact clamps from oxides;
- make sure there is no humidity, no salt spots on the surface of the batteries, and no damages of the insulated coating.

8 Certificate of acceptance

The “EcotestVIP” personal radioactivity detector of BICT.412129.020-02 type with _____ serial number meets the ТУ У 33.2-22362867-024-2010 technical requirements, is calibrated and accepted for use.

Manufacture date _____

Stamp here QCD representative:_____
(signature)

9 Packing certificate

The “EcotestVIP” personal radioactivity detector of BICT.412129.020-02 type with _____ serial number is packed by the Private Enterprise “SPPE “Sparing-Vist Center” in accordance with the requirements specified in ТУ У 33.2-22362867-024-2010.

Date of packing _____

Stamp here

Packed by _____
(signature)

10 Warranty

10.1 The warranty period of the detector use shall terminate and be of no further effect in not less than 18 months after the date of putting it into operation, or after the end of the storage period.

10.2 The warranty period of storage of the detector is 6 months after its manufacture date.

10.3 Free of charge repair or replacement during the warranty period of use is performed by the producer enterprise provided that:

10.3.1 The customer observed the guidelines on its use, shipping and storage.

10.3.2 The customer encloses a warranty certificate filled out accurately and clearly.

10.3.3 The customer encloses the failed detector.

10.4 If the defect (according to the claim) is eliminated, the warranty period is prolonged for the time when the detector was not used because of the detected defects.

10.5 The batteries failure is not a reason for claim, after their warranty period is finished.

10.6 Warranty is void in case of:

10.6.1 Any mechanical damage;

10.6.2 Damage caused by natural disaster;

10.6.3 Any liquid remains;

10.6.4 Foreign objects detected inside the detector;

10.6.5 The warranty seal is violated, the body opened, repairs or any internal changes made;

10.6.6 The serial number of the detector deleted or changed;

10.6.7 The accessories used other than allowed by the manufacturer.

11 Repair

11.1 In case of failure or troubles during the warranty period of the detector, the user should contact the enterprise producer by e-mail (see below) to receive the address of the nearest service center:

PE “SPPE “Sparing-Vist Center”
Tel.: (+380 32) 242 15 15; Fax: (+380 32) 242 20 15
E-mail: sales@ ecotest.ua

11.2 Warranty and post warranty repair is performed if only the warranty certificate is available.

12 Storage

12.1 The detectors should be stored in a packing box in heated and ventilated storehouses with air-conditioning at the ambient temperature from +5 to +40 °C and relative humidity up to 80 % at +25 °C temperature, non-condensing. The storehouse should be free of acids, gas, and alkali that may cause corrosion, and vapors of organic solvents.

12.2 The location of the detectors in storehouses should ensure their free movement and access to them.

12.3 The detectors should be stored on the shelves.

12.4 The distance between the walls, the floor and the detectors should not be less than 100 mm.

12.5 The distance between the heating gadgets of the storehouse and the detectors should not be less than 0.5 m.

13 Shipping

13.1 The packed detectors may be shipped by any kind of closed transport vehicles under the conditions with temperature limitation in the range of - 25 to + 55 ^{o}C, and according to rules and standards effective for each means of transport.

13.2 The detectors in shipping container should be placed and fixed in the vehicle to ensure their stable position and to avoid shocks (with each other and the sidewalls of the vehicle).

13.3 The detectors in shipping container endure:

- temperature from - 25 to + 55 ^{O}C;
- relative humidity of (95±3) % at + 35 ^{O}C temperature;
- shocks with acceleration of 98 m/s^2, a shock pulse duration of 16 ms (number of shocks - 1000 ± 10 in each direction).

13.4 Canting is forbidden.

WARRANTY CERTIFICATE

for “EcotestVIP” personal radioactivity detector ТУ У 33.2-22362867-024-2010

Serial number _____

Manufacture date _____

Primary calibration performed _____

Hereby I confirm the acceptance of the packed detector applicable for use and the acceptance of the warranty terms.

Sales date _____

Salesperson signature _____

Consumer signature _____

(warranty certificate is not valid unless signed by the consumer)

Note. If any controversy arises, the parties should act in accordance with the Art. 14 of the Law of Ukraine on the Protection of Consumer Rights

Practical tips
for using the "EcotestVIP" personal radioactivity detector

- Read carefully the operating manual before you switch on the detector.
- Keep the detector clean and check the condition of the batteries and the clamps in the battery compartment at least on a quarterly basis.
- Do not use the detector directly in the rain without a protective cover (plastic bag, for instance).

- Keep an eye on the battery discharge indicator to ensure timely replacement of the discharged batteries.
- Set the correct time of the detector's clock after you change the batteries.
- If you travel by air, set the value of the alarm threshold level of the detector more than 2.0 μSv/h, since gamma background level becomes much higher as you ascend than automatically preset value of 0.3 μSv/h, and the detector will constantly disturb you with its alarm.

• Change the value of the threshold level for the previous one on arrival with the help of the THRESHOLD and the MODE buttons, or by switching off and then on again the power of the detector.

• After you finished using the detector, make sure you have switched it off, since the detector can be in the energy saving mode. In this case the digital LCD is switched off while the detector is in on-state.

• Before the long-term storage of the detector it is recommended to remove the batteries from the battery compartment.