«aGent-R»

GAMMA RADIATION ALARM DEVICE

PASSPORT

ВІСТ.412112.002-02 ПС

CONTENTS

1 MAIN INFORMATION ABOUT PRODUCT AND TECHNICAL SPECIFICATIONS

The “aGent-R” gamma radiation alarm device is designed to estimate ambient dose equivalent rate (hereinafter called DER) of gamma radiation and to alarm when threshold levels of gamma radiation DER are exceeded.

The gamma radiation alarm device (hereinafter the alarm device) is used to control personal radiation safety.

General view of the alarm device is depicted in Figure 1.

Caution!

1 The alarm device belongs to the class of indicators and alarm devices and is not intended for formal (professional) measurements.

2 The alarm device is calibrated according to the standard sources of ionizing radiation after manufacture and is not subject to verification.

Figure 1 – General view of the alarm device

The four-level threshold LED and vibrating alarm system is realized in the alarm device.

The device alarms about threshold levels exceeding under the following conditions:

- ambient air temperature from – 20 ºC to +50 ºC;
- relative humidity up to 100 % at 35 ºC temperature;
- atmospheric pressure from 84 kPa to 106.7 kPa;
- after the influence of photon ionizing radiation with gamma radiation DER up to 10 Sv/h during 5 min.

The ingress protection rating of the alarm device is IP67.

Key specifications are presented in Table 1.

Table 1 – Key specifications

Name	Unit of measurement	Standardized values according to the technical specifications
1 Dynamic range of gamma radiation DER registration	Sv/h	10×10^{-8} – 10
2 Energy range of gamma radiation DER registration	MeV	0.05 – 3.00
3 Threshold levels of gamma radiation DER: first threshold second threshold third threshold forth threshold	 μSv/h μSv/h mSv/h mSv/h	 1 10 1 100

Table 1 (continued)

Name	Unit of measurement	Standardized values according to the technical specifications
4 Main relative permissible error limit of threshold alarm of gamma radiation DER with confidence probability of 0.95	%	25
5 Time of operating mode setting, not more than	s	120

Table 1 (continued)

Name	Unit of measurement	Standardized values according to the technical specifications
6 Time of continuous operation of the alarm device when powered from two new AAAA alkaline batteries of 550 mAh at natural background radiation, ambient air temperature (20±2) °C and residual battery capacity testing maximum 3 times per 24 hours, not less than	h	1300
7 Operating supply voltage	V	3.0

Table 1 (continued)

Name	Unit of measurement	Standardized values according to the technical specifications
8 Complementary permissible error limit of threshold alarm caused by supply voltage variations from standardized value within 3.0 – 2.2 V	%	±10
9 Complementary permissible error limit of threshold alarm caused by ambient air temperature variations from – 20 °C to +50 °C, per each 10 °C deviation from +20 °C	%	±5

Table 1 (continued)

Name	Unit of measurement	Standardized values according to the technical specifications
10 Dimensions of the alarm device without a strap, not more than	mm	55×55×27
11 Weight of the alarm device, not more than	kg	0.11

2 DELIVERY KIT

Delivery kit of the alarm device consists of units and maintenance documentation presented in Table 2.

Table 2 – Delivery kit of the alarm device

Type	Item	Quantity	Note
BICT.412112.002-02	“aGent-R” gamma radiation alarm device	1 pc.	
BICT.412112.002-02 ПС	Passport	1 copy	
BICT.412915.014	Package	1 pc.	
BICT.323369.001	Case	1 pc.	
ENERGIZER E96	AAAA alkaline battery of 1.5 V	2 pcs.	Analogs permitted. Completed as required by the user.

3 OPERATING, SERVICE AND SHELF LIFE

Average operating life of the alarm device till the first major repair is not less than 10000 hours.

Average service life of the alarm device till the first major repair is not less than 6 years.

Mean time to failure is not less than 6000 hours.

Average value of availability factor is not less than 0.999.

Average shelf life of the alarm device is not less than 6 years.

4 WARRANTY

4.1 The manufacturer guarantees the conformity of the alarm device to the technical requirements provided that the customer observes the guidelines for its use, shipping and storage presented in this passport.

4.2 The warranty period of the alarm device shall terminate and be of no further effect in 24 months after the date of putting it into operation or after the warranty period of storage terminates.

4.3 The warranty storage life is 6 months after its manufacture date.

4.4 Free of charge repair or replacement during the warranty period of use is performed by the producer enterprise provided the customer observes the guidelines for its use, shipping and storage.

4.5 If the fault (according to the claim) is eliminated, the warranty period is prolonged for the time period when the alarm device was not used because of the detected faults.

4.6 The battery failure is not a reason for claim after the warranty period of the battery is finished.

5 PUTTING IN PROLONGED STORAGE

5.1 Information about putting in prolonged storage, removal from storage and reconservation of the product during use is provided in Table 3.

Table 3

Date	Operation name	Duration, years	Position, name and signature

6 PACKING CERTIFICATE

The “aGent-R” gamma radiation alarm device of BICT.412112.002-02 type with _____serial number is packed by the PE “SPPE “Sparing-Vist Center” in accordance with the requirements outlined in the valid technical documentation.

_____	_____	_____
position	signature	print full name

_____

year, month, date

7 CERTIFICATE OF ACCEPTANCE

The “aGent-R” gamma radiation alarm device of BICT.412112.002-02 type with _____ serial number is calibrated, produced and accepted in accordance with the requirements of ТУ У 33.2-22362867-020:2009, and is acknowledged suitable for use.

QCD head

Stamp here

_____ _____

signature print full name

_____

year, month, date

8 RELOCATION OF ALARM DEVICE DURING USE

8.1 Information about relocation of the device during use is given in Table 4.

Table 4

Date of assignment	Name of the responsible person	Date of unassignment	Operating time		Reason for unassignment	Signature of the person responsible for assignment (unassignment)
			since putting in service	since last repair		

8.2 The order of acceptance and transfer of the alarm device is given in Table 5.

Table 5

Date	Condition of the alarm device	Grounds (title, number and date of the document)	Enterprise, position and signature		Note
			yielded up	accepted	

9 REPAIR

9.1 In case of failure or troubles during the warranty period of the alarm device, 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"
33 Volodymyra Velykoho Str.,
Lviv 79026,
Ukraine.
tel./ fax: (+38032) 242-33-97
E-mail: sales@ecotest.ua

10 USE, STORAGE, SHIPPING GUIDELINES

10.1 Guidelines for switching on and testing of the alarm device.

10.1.1 Prepare the alarm device to operation. Do the following:

- unpack the alarm device;
- open the battery compartments and insert one AAAA alkaline battery in each compartment observing the correct polarity (with the “+” symbol of each battery facing up the cover). Then fasten the screws on the cover. The alarm device immediately turns on.

10.1.2 When the device alarm is switched off, press and hold the ON/OFF button for more than 1 s to turn it on. The alarm device checks the vibro electric motor by switching it on for 1 s. After it stops vibrating, the residual capacity of batteries is displayed with the help of LEDs for 2 s, and the alarm device changes over to regular operation. It is indicated by periodic, short flashes (with 3 s interval) of the green LED NORM.

When the ON/OFF button is pressed and held, the red LED "100 mSv/h" becomes highlighted and the alarm device is not switched on, and when the button is released the LED dies out, it means that batteries should be replaced.

10.1.3 Perform manual testing of the vibro electric motor and residual capacity of batteries:

- press and hold the ON/OFF button for 2 s and longer until all LEDs are on;
- release the ON/OFF button during successive extinction of LEDs till the last one dies out.

At this the alarm device switches off all LEDs and switches on the vibro electric motor for 1 s. After the vibro electric motor is off, LEDs display the battery discharge condition for 2 s. The correspondence of residual capacity and LED indication is provided in Table 6.

Table 6 – The value of residual capacity of batteries

LED labeling					The value of residual capacity of batteries, %
NORM	1 μSv/h	10 μSv/h	1 mSv/h	100 mSv/h	
+	+	+	+	+	> 85
–	+	+	+	+	> 50
–	–	+	+	+	> 25
–	–	–	+	+	> 10
–	–	–	–	+	> 5
–	–	–	–	–	≤ 5

Note – “+” means that the corresponding LED is on, “–” means it is off.

10.1.4 The switched on alarm device carries out a non-stop control of residual capacity of the batteries. If the capacity is changing from 10 to 5 %, the green LED NORM is blinking during 5 seconds with 0.25 s duration and 0.5 s interval, and the vibro electric motor is switched on for 0.25 s with 0.5 s interval. Such alarm is activated repeatedly each 10 minutes to inform the user that the batteries should be soon replaced. Regular operation begins to be displayed with periodic (with 1 s interval) short blinking of the green LED NORM.

If the batteries capacity becomes even lower, the green LED NORM starts blinking with 0.1 s duration and 0.25 s interval, and the vibro electric motor is switched on for 0.1 s with 0.25 s interval. This means that the batteries should be immediately replaced. To do this, turn off the alarm device, shortly pressing the ON/OFF button. If the button is not pressed, the alarm device turns off automatically in 30 s.

10.1.5 The switched on alarm device carries out a non-stop control of gamma radiation detector operability by registration and measurement of normal radiation background. If no measurements of radiation background are performed during 300 s, the alarm device periodically (every 0.5 s) and gradually switches on and off the LEDs (from green NORM to red “100 mSv/h”), and switches on the vibro electric motor for 3 s each 10 s, which is an indication of the detector’s malfunction. In such a case, turn off the alarm device by shortly pressing the ON/OFF button, and send it for repair. If the button is not pressed, the alarm device turns off automatically in 60 s.

10.1.6 When DER changes, the alarm device automatically switches to the corresponding threshold level. Vibrating alarm can be switched off for 10 min at exceeding any threshold level by shortly pressing the ON/OFF button. Vibrating alarm is activated again at next change of the threshold level.

10.1.7 To turn off the alarm device press and hold the ON/OFF button for 2 s and longer until all LEDs are on, which consequently extinct. After that, release the button.

10.2 Guidelines for storage of the alarm device

10.2.1 The alarm device should be stored in the package in heated and ventilated storehouses with air-conditioning at ambient air temperature from +5 ºC to +40 ºC and relative humidity up to 80 % at +25 ºC temperature, non-condensing. The storehouse should be free of acids, gas, vapors of organic solvents, and alkali that may cause corrosion.

10.2.2 The location of the alarm devices in the storehouses should ensure their free movement and access to them.

10.2.3 The alarm devices should be stored on the shelves.

10.2.4 The distance between the walls, the floor of the storehouse and the alarm devices should be at least 100 mm.

10.2.5 The distance between the heating gadgets of the storehouse and the alarm device should be at least 0.5 m.

10.3 Guidelines for shipping of the alarm device

10.3.1 Packed alarm devices may be shipped by any kinds of closed transport vehicles with temperature limitation in the range of - 25 to + 55 ^{o}C, and according to rules and standards effective for each means of transport.

10.3.2 The alarm devices 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 transport).

10.3.3 The alarm devices in shipping container endure:

- temperature from - 25 to + 55 ^{o}C;
- relative humidity (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).

10.3.4 Canting is forbidden.

11 DISPOSAL

Disposal of the alarm device is performed in compliance with the general rules, i.e. metals are recycled or melted, and plastic parts are dumped.

Disposal of the alarm device is not dangerous for service personnel, and is environmentally friendly.

12 NOTES