

**DRG-T  
RADIATION SURVEY  
DEVICE**

**LOGBOOK  
BICT.412129.017-02 ΦΟ**

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## **1 GENERAL GUIDELINES**

Carefully study the operating manual before using the DRG-T radiation survey device.

The logbook is included in the delivery kit of the device and should always be kept with it.

All records should be made with a waterproof ink, be accurate and clear. Erasures, records made with a pencil or a blurry ink are not allowed. An incorrect record should be carefully crossed out, and a correct one should be written beside.

New records should be certified by the responsible official. The signature of the responsible official should be followed by his/her surname and initials (personal stamp of the official may be used instead of the signature).

The device can be used under the following conditions:

- ambient air temperature from – 40 to + 60 °C;
- relative humidity up to 98 % at +25 °C temperature;
- condensed atmospheric precipitations (hoarfrost, dew);
- atmospheric pressure from 60 to 106.7 kPa.

## **2 GENERAL INFORMATION ABOUT DEVICE**

2.1 The DRG-T radiation survey device (hereinafter called the device) is designed to measure exposure dose rate (EDR) of gamma radiation, and to provide audio and light alarm in case of a dangerous level of that radiation, and to issue commands to start the actuators of protection equipment.

The device is installed in special-purpose vehicles, in particular in radiochemical reconnaissance units of armed forces and civil defense, with the attenuation degree of gamma radiation level ( $K_{att,\gamma}$ ) from 1 to 35, and provides the possibility to set or change that degree in the device by the manufacturer as desired by the customer, or at departmental repair unit.

2.2 This device is intended for installation in special-purpose vehicles with the attenuation degree of gamma radiation level  $K_{att,\gamma} =$  \_\_\_\_\_.

The DRG-T radiation survey device of BICT.412129.017-02 type with \_\_\_\_\_ serial number is produced by the PE „SPPE "Sparing-Vist Center".

Address of the producer enterprise:

*PE „SPPE "Sparing-Vist Center"*

*33 Volodymyr Velyky Str., Lviv 79026, Ukraine*

*Tel.: (+38032) 242-15-15, fax: (+38032) 242-20-15.*

### 3 KEY SPECIFICATIONS

3.1 Key specifications are presented in Table 3.1

Table 3.1


Name	Standardized values according to the technical specifications	Actual data
1 Measurement range of gamma radiation exposure dose rate (EDR), R/h	$1 \cdot 10^{-5} - 1000$	meets the requirements
2 Main relative permissible error limit of gamma radiation EDR measurement at calibration relative to $^{137}\text{Cs}$ with confidence probability of 0.95, %	$15 + \frac{0.2}{\bar{X}}$ , where $\bar{X}$ - is a numeric value of the measured EDR in mR/h	
3 Energy range of registered gamma radiation, MeV	0.66 – 1.25	meets the requirements
4 Energy dependence of the device readings at measurement of gamma radiation within 0.66 to 1.25 MeV, %	$\pm 25$	meets the requirements
5 Anisotropy of the device for gamma radiation $^{137}\text{Cs}$ (at gamma quanta incidence at solid angle of $\pm 60^\circ$ relative to the main measurement direction, which is marked with the „+R” symbol), %	$\pm 30$	meets the requirements
6 Additional permissible error limit at measurement, caused by supply voltage variation from 9.0 to 28.5 V, %	10	meets the requirements
7 Additional permissible error limit at measurement, caused by ambient air temperature variation, per each 10 °C deviation from + 20 °C in the temperature range from – 40 °C to + 60 °C, %	5	meets the requirements
8 Useful current of the device at operating supply voltage of 24 V, A, not more than	1	meets the requirements
9 Time of continuous operation of the device, with subsequent switching off the device at least for 2 hrs, not less than, hours	48	meets the requirements
10 Dimensions of the device (without a connector), mm, not more than	160x160x66	meets the requirements
11 Weight of the device, kg, not more than	2	meets the requirements

3.2 The device is powered from the DC onboard mains of 9.0 to 28.5 V voltage with electric power quality according to ГOCT B 21999-86.

3.3 The device provides protection from short circuit at incoming and outgoing lines.

3.4 The device generates commands and signals (“R” circuit) in the presence of gamma radiation (for not less than 3 s) in the place of the device location with gamma quanta energy of 0.66 MeV, EDR of which exceeds the threshold level “R”, and in the mode of electrical test (when pushing the TEST R button). Commands and signals names and parameters are given in Table 3.2.

Table 3.2 - Commands and signals. “R” circuit

Signal (command) name	Signal (command) parameters	Actual data
Command „R”	Command presence: $U_{com.R} = U_{onboard.m.} \pm 2.0 V$ , $I_{nom.com.R} \leq 1.2 A$	meets the requirements
	Command absence: $U_{com.R} \leq 0.7 V$	
	Command duration: $t_{com.R} \geq 0.05 s$	
Signal „R”	Signal presence: $U_{sign.R} = U_{onboard.m.} \pm 2.0 V$ , $I_{nom.com.R} \leq 0.1 A$	meets the requirements
	Signal absence: $U_{sign.R} \leq 0.7 V$	
	Signal duration: $t_{sign.R} \geq 10 s$	
Light signal „R”	Periodic illumination of  symbol on the front panel of the device with $(0.8 \pm 0.3) s$ interval.	meets the requirements
	Signal duration: $t_{light.sign.R} \geq 10 s$	

3.4.1 The threshold level „R( $K_{att.\gamma}$ )” for the device to be installed in the vehicles with the attenuation degree of gamma radiation level  $K_{att.\gamma} = 1$ , is set in the range from  $R_{min}(1) = 40 mR/h$  to  $R_{max}(1) = 60 mR/h$ .

If desired by the customer, for the devices to be installed in the vehicles with other values of attenuation degree of gamma radiation level  $K_{att.\gamma}$ , the threshold level „R( $K_{att.\gamma}$ )” can be set within  $R_{min}(K_{att.\gamma}) = R_{min}(1) / K_{att.\gamma}$  to  $R_{max}(K_{att.\gamma}) = R_{max}(1) / K_{att.\gamma}$ .


The threshold level „R” for the device installation option in the vehicles with the attenuation degree of radiation level  $K_{att.\gamma}$  (see 2.2) is given in Table 3.3.

Table 3.3. “R” threshold level value

Attenuation degree $K_{att.\gamma}$	Threshold level „R”, R/h	
	$R_{min}(K_{att.\gamma})$	$R_{max}(K_{att.\gamma})$

3.5 The device generates commands and signals (“A” circuit) in the presence of gamma radiation (for not less than 0.1 s) in the place of the device location with gamma quanta energy of 1.25 MeV, EDR of which exceeds the threshold level “A”, and in the mode of electrical test (when pushing the TEST A button). Commands and signals names and parameters are given in Table 3.4.

Table 3.4 - Commands and signals. “A” circuit

Signal (command) name	Signal (command) parameters	Actual data
Command „A”	Command presence: $U_{com.A} = U_{onboard.m.} \pm 2.0 V$ , $I_{nom.com.A} \leq 1.2 A$	meets the requirements
	Command absence: $U_{com.A} \leq 0.7 B$	
	Command duration: $t_{com.A} \geq 0.05 s$	
Signal „A”	Signal presence: $U_{sign.A} = U_{onboard.m.} \pm 2.0 V$ , $I_{nom.com.A} \leq 0.1 A$	meets the requirements
	Signal absence: $U_{sign.A} \leq 0.7 V$	
	Signal duration: $t_{sign.A} \geq 10 s$	
Light signal „A”	Periodic illumination of  symbol on the front panel of the device with $(0.8 \pm 0.3) s$ interval.	meets the requirements
	Signal duration: $t_{light.sign.A} \geq 10 s$	

3.5.1 The threshold level „A( $K_{att.\gamma}$ )” for the device to be installed in the vehicles with the attenuation degree of gamma radiation level  $K_{att.\gamma} = 1$ , is set in the range from  $A_{min}(1) = 11500 R/h$  to  $A_{max}(1) = 17300 R/h$ .

If desired by the customer, for the devices to be installed in the vehicles with other values of attenuation degree of gamma radiation level  $K_{att.\gamma}$ , the threshold level „A( $K_{att.\gamma}$ )” can be set within  $A_{min}(K_{att.\gamma}) = A_{min}(1) / K_{att.\gamma}$  to  $A_{max}(K_{att.\gamma}) = A_{max}(1) / K_{att.\gamma}$ .

The threshold level „A” for the device installation option in the vehicles with the attenuation degree of radiation level  $K_{att.\gamma}$  (see 2.2) is given in Table 3.5.

Table 3.5 - “A” threshold level value

Attenuation degree $K_{att,\gamma}$	Threshold level „A”, R/h	
	$A_{min}(K_{att,\gamma})$	$A_{max}(K_{att,\gamma})$

3.6 In the presence of signals “R” or “A” the device generates audio signal “Aud. signal” and “Sign. RA” with the parameters presented in Table 3.6.

Table 3.6 – „Aud. signal” and „Sign. RA” parameters

Signal (command) name	Signal (command) parameter	Actual data
Audio signal “Aud. signal”	Signal presence: sequence of pulsed sendings of audio signal with a period $t_{aud.} = (1.25 \pm 0.4)$ ms, duration $T_{send} = (1.2 \pm 0.8)$ s, interval between sendings $T_{int.aud.} = (12 \pm 8)$ s and pulse amplitude $U_{aud.} = 0.13 \dots 0.23$ V at load resistance $R_l = (600 \pm 60)$ Ohm	meets the requirements
Signal „Sign. RA”	Signal presence: duration of pulses $t_{RA} = 0.6 \dots 1.1$ s and period $T_{RA} = 1.2 \dots 2.2$ s with minimum voltage of $U_{sign.RA1}$ and maximum voltage $U_{sign.RA2}$ , where $3 \text{ V} \leq U_{sign.RA1} \leq 8 \text{ V}$ $U_{sign.RA2} = U_{onboard m.} \pm 2.2 \text{ V}$ $I_{nom} \leq 0.1 \text{ A}$ Signal absence: $3 \text{ V} \leq U_{sign.RA1} \leq 8 \text{ V}$ , $I_{nom} \leq 0.06 \text{ A}$	meets the requirements

QCD representative \_\_\_\_\_ (signature)

Contracting Officer \_\_\_\_\_ (signature)

### 3.7 Precious materials content

The device contains no precious materials.



#### **4 DELIVERY KIT**

The delivery kit of the device corresponds to Table 4.1.

Table 4.1 – Delivery kit

Type	Item	Quantity
BICT.412129.017-02	DRG-T radiation survey device	1
BICT.412129.017-02 PЭ	Operating manual	1
BICT.412129.017-02 ФO	Logbook	1
BICT.411915.013	Package	1
Mounting parts kit (MPK)*		
ГE0.364.126 TУ	Receptacle 2PMT22KПЭ10Г1B1B	1
* MPK is used by the user during installation onsite		

## **5 OPERATING, SERVICE AND SHELF LIFE, WARRANTY**

### 5.1 Operating, service and shelf life

5.1.1 Mean time to failure is not less than 4000 hrs.

Failure criterion is refusal of electrical test of the device performance, or no signals when “R” or “A” thresholds of gamma radiation EDR are exceeded.

5.1.2 Average operating life of the device till the first major repair is not less than 16000 hours; average service life till the first major repair is not less than 6 years.

5.1.3 Average service life of the device is not less than 20 years with maintenance check in 10 years.

### 5.2 Warranty

5.2.1 The warranty period of use shall terminate and be of no further effect in 18 months after the date of putting the device into operation, or after completion of the guaranteed shelf life

5.2.2 Guaranteed shelf life – 6 months from the manufacture date.

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

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

### 5.3 Revisions of operating, service and shelf life, warranty

Warranty period of use \_\_\_\_\_

Shelf life \_\_\_\_\_

Service life \_\_\_\_\_

## 6 CERTIFICATE OF ACCEPTANCE

The DRG-T radiation survey device of BICT.412129.017-02 type with \_\_\_\_\_ serial number is produced, verified and accepted in accordance with the TY Y 33.2-22362867-011:2009 standard technical requirements, and acknowledged suitable for use.

QCD head

Stamp here

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(print full name)

\_\_\_\_\_  
(year, month, date)

State Verification Officer

Verification mark here

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(print full name)

Contracting Officer

Stamp here

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(print full name)

\_\_\_\_\_  
(year, month, date)

## **7 PACKING CERTIFICATE**

The DRG-T radiation survey device of BICT.412129.017-02 type with \_\_\_\_\_ serial number is packed by the PE “SPPE “Sparing-Vist Center” in accordance with the TY Y 33.2-22362867-011:2009 standard technical requirements.

\_\_\_\_\_  
(position)

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(print full name)

\_\_\_\_\_  
(year, month, date)

## 8 PUTTING IN PROLONGED STORAGE

8.1 Information about putting in prolonged storage, removal from storage and reconservation during use

Table 8.1

Date	Operation name	Duration, years	Position, name and signature

## 9 RELOCATION DURING USE

### 9.1 Information about relocation of the device during use

Table 9.1

Installation date	Installation place	Date of uninstalling	Operating time		Reason for uninstillation	Signature of the person, responsible for installation (uninstillation)
			since putting in service	since last repair		

9.2 Transfer and acceptance of the device

Table 9.2

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

9.3 Assignment of the device during use

Table 9.3

Device name (component part) and type	Position, surname and initials	Grounds (title, number and date of the document)		Note
		for assignment	for deallocation	



## 10 PERFORMANCE RECORDS

### 10.1 Performance records

Table 10.1

Date	Purpose of operation	Time		Operation duration	Operating time		Who operated	Position, name and signature of the person filling out the logbook
		of operation start	of operation completion		since last repair	since putting in service		

## 11 MAINTENANCE RECORDS

### 11.1 Maintenance records

Table 11.1

Date	Maintenance type	Operating time		Grounds (title, number and date of the document)	Position, name and signature of the person		Note
		since last repair	since putting in service		who performed the operation	who checked the operation	

**12 OPERATIONS DURING USE**

12.1 Operation register

Table 12.1

Date	Name and reason for operation	Position, name and signature of a person		Note
		who performed the operation	who checked the operation	

12.2 Special remarks about use and emergencies

Table 12.2

Date and time of failure. Operating mode	Type (external manifestation) of trouble	Cause of trouble, number of operation hours of the failed element	Action taken and claim note	Position, name and signature of the person responsible for solving the problem	Note

12.3 Periodic testing of key specifications

Table 12.3

Name and measurement unit of tested specification	Rated value	Limiting deviation	Testing frequency	Test result					
				Date	Value	Date	Value	Date	Value
Main relative permissible error of the device at measurement of gamma radiation EDR, %	$15 + \frac{0.2}{\dot{X}}$ , where $\dot{X}$ – is a numeric value of the measured EDR in milli-roentgens per hour								

12.4 Technical inspection by supervising authorities

Table 12.4

Name and type of the device component part	Serial number	Manufacture date	Inspection frequency	Inspection						Note
				Date	Regular inspection deadline	Date	Regular inspection deadline	Date	Regular inspection deadline	

## 12.5 Claims

12.5.1 In case of failure or troubles during the warranty period of the device, the user should draw up a Statement about the necessity of repair and delivery of the device to the producer enterprise at the address:

PE “SPPE “Sparing-Vist Center”  
33 Volodymyr Velyky Str., Lviv 79026, Ukraine,  
Tel.: (+380 32) 2421515, fax: (+380 32) 2422015  
12.5.2 All claims are registered in Table 12.5

Table 12.5

Date of failure	Claim summary	Action taken	Note

**13 STORAGE**

## 13.1 Information about storage

Table 13.1

Date		Storage conditions	Storage type	Note
of placing in storage	of removing from storage			



**14 REPAIR**

14.1 Information about repair of the device

Table 14.1

Position, name and signature of the responsible official	who performed the repair	who accepted after repair
Name of repair		
Type of repair		
Number of hours worked before repair		
Name of the repair organization		
Date	of repair completion	
	of arriving for repair	
Reason for repair		
Name and type of the component part		

## 14.2 Certificate of acceptance and warranty

The DRG-T radiation survey device of BICT.412129.017-02 type with \_\_\_\_\_ serial number was repaired by the Private Enterprise “SPPE “Spring-Vist Center” in accordance with the TY Y 33.2-22362867-011:2009 standard technical requirements, and acknowledged suitable for use.

Life to regular repair  
during service life  
shelf life including

\_\_\_\_\_  
\_\_\_\_\_ years,  
\_\_\_\_\_  
(storage conditions, years)

A person performing the repair warrants that the device meets the requirements of valid technical documentation, provided that the customer observed the guidelines for its use, shipping and storage described in the operational documentation for the device.

QCD head

Stamp here

\_\_\_\_\_  
(signature)

\_\_\_\_\_  
(print full name)

\_\_\_\_\_  
(year, month, date)

**15 DEVICE CONDITION MONITORING AND LOGBOOK KEEPING**

Table 15.1

Date	Monitoring type	Position of the person, who carried out inspection	Conclusion and estimation		Signature of the person, who carried out inspection	Note of remarks resolution and signature
			of the device condition	of the logbook keeping		

## **16 DISPOSAL**

Disposal of the device is performed in compliance with the group 4 СанПиН 3183-84, СН 3209-85: metals are recycled or melted, and plastic parts are dumped.

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

The device should be disassembled in accordance with the procedure established by the user enterprise.

## **17 SPECIAL NOTES**