Český metrologický institut

Type Approval Certificate

No. 0111-CS-A038-18

Czech Metrology in accordance with the Law of metrology No. 505/1990 Coll. as amended

approved

detecting unit of gamma radiation
type BDBG-09

under observation of technical data referred to in Annex of this Certificate.

Type approval mark: **TCM 441/18 - 5611**

Applicant: **PE „SPPE“ Sparing-Vist Center (ECOTEST)**
33 Volodymyr Velyky Str.
79026 Lviv
Ukraine

Manufacturer: **PE „SPPE“ Sparing-Vist Center (ECOTEST)**
Ukraine

Valid until: **15 October 2028**

Information on judicial remedies:
The judicial remedies against this decision are available to the applicant through Czech Metrology Institute to Czech Office for Standardization, Metrology and Testing within 15 days since the receipt of this Certificate.

Description:
Essential characteristic, approved conditions special conditions, examination results including technical drawings and schemas are set out in the technical test report appertaining to this certificate. The certificate comprises the front page and the technical test report. Certificate has 3 pages.

Český metrologický institut
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Brno, 16 October 2018

RNDr. Pavel Klenovský
Director General

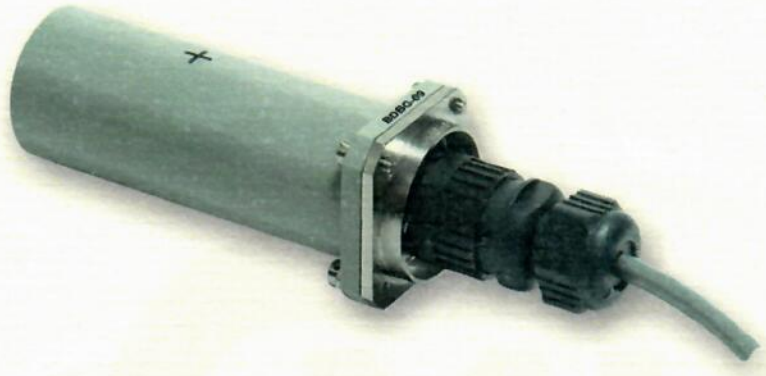
Technical test report

1 Description

The BDBG-09 detecting unit is designed to measure ambient dose equivalent rate of gamma radiation. It is intended to measure the ambient dose equivalent rate in range from natural background up to 10 Sv/h. The radiation is detected by a pair of GM tubes. Switching between tubes is done automatically. The detecting unit can be used as a part of computer-aided systems of radiation control.

The BDBG-09 detecting unit is intended for use in the function of legally controlled measuring instruments:

- non-spectrometric instruments for activity and doses measurements to check compliance with radiation limits protection or nuclear safety; for wrecking measurements



The BDBG-09 detecting unit

2 Basic metrology characteristic

Measured quantity	- ambient dose equivalent rate H*(10)
Measurement range	- natural background up to 10 Sv/h
Energy range	- 50 keV up to 3 MeV
Effective energy range	- 80 keV up to 1.25 MeV
Dimensions	- 170 x 60 x 60 mm (without fastening elements)
Weight	- 0.5 kg (without fastening elements)

3 Data on device

The device must be identified by the manufacturer identification, type, serial number and type approval mark.

4 Test

The aim of the tests is to verify whether the measurement device BDBG-09 fulfils the applicable requirements of the IEC 60532:2010 standard. The applicant submitted one sample of the device BDBG-09, S/N 1700178 with firmware FT2.24.11.11.

The applicant also submitted:

- Test report no. SPA-20140122-R2 issued by a testing laboratory BICON-EMC laboratories (The Netherlands). Also the certificate of Declaration of conformity was submitted. Based on this test report the results of EMC tests were fully accepted for the purpose of the type approval
- Statement of compliance with the requirements of TU U 33.2-22362867-009:2004 (Ukraine standard). Based on this test report the results of mechanical tests were accepted.

- Certificate confirming that based on the positive results of public acceptance testing by the State Committee of Ukraine for Technical Regulation and Consumer Policy the measuring instrument pattern has been approved for "BDBG-09 detecting unit of gamma radiation", which is registered in the State Register of measuring instruments by the number U2071-05.

- Certificate of public check - SE "Lviv Scientific and Production Center of Standardization, Metrology and Certification" (SE "LVIVSTANDARTMETROLOHIYA") during the period from June 19, 2014 till June 27, 2014 conducted unscheduled public check tests of BDBG-09 detecting units of gamma radiation.

- Operating manual, Logbook, Passport for BDBG-09 detecting unit

The data was read using software BDBG version v 1.5.0.2.

Tests of linearity, variation of the response due to photon radiation energy and angle of incidence, time response and statistical fluctuations, variation of the response due to beta radiation, overload characteristics, warm-up time and environmental characteristics (influence of temperature, relative humidity), were amended to submitted documentation. These tests were performed in Czech Metrology Institute – Regional Inspectorate Prague.

The requirements of the energy dependence test were not met for the whole energy range of HR tube. For energies 100 keV and 118 keV (narrow spectra of X-rays N120 and N150) responses were slightly higher than requirements of the IEC 60532 standard. Taking into account the uncertainty of reference value and coefficient of variation the difference of the measured value and the required value is not higher than 5 %. For LR tube are the requirements of the standard fully met.

The requirements of the angle dependence test were met only for ^{137}Cs gamma radiation. For energy 60 keV the requirements were not met (for both GM tubes). For this reason an effective energy range from 80 keV was determined.

During the overload test it has been found that the instrument did not indicate the overload, however, it withstands overload in required range (up to 100 Sv/h).

Technical test only applies to the measurement device itself and does not include any connected computer and communication route.

Based on the test results and submitted documentation assessment it was found that the measuring instrument can be used for the intended purpose stated in the paragraph 1 of this document and can be used as a legal measuring instrument in the scope of this protocol.

5 Verification

Within the verification, the test of the intrinsic error should be carried out according to the IEC 60532 standard. After verification, the verification mark identifying the year of the verification should be placed on the probe so as not to block any data on the device.

6 Time of verification validity

Time of verification validity is specified by the Notice of the Ministry of Industry and Trade.