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- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

PROJECT NUMBER: IEC 61526 ED4	
DATE OF CIRCULATION: 2020-04-10	CLOSING DATE FOR COMMENTS: 2020-07-03
SUPERSEDES DOCUMENTS: 45B/959/RR	

IEC SC 45B : RADIATION PROTECTION INSTRUMENTATION	
SECRETARIAT: France	SECRETARY: Mr Miroslav Voytchev
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE: Radiation protection instrumentation – Measurement of personal dose equivalents Hp(10), Hp(3) and Hp(0,07) for X, gamma, neutron and beta radiations – Direct reading personal dosimeters
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NOTE FROM TC/SC OFFICERS: The title of the revision is slightly changed following the discussions during the Paris meeting, 2019-04.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RADIATION PROTECTION INSTRUMENTATION –
MEASUREMENT OF PERSONAL DOSE EQUIVALENTS $H_p(10)$, $H_p(3)$
AND $H_p(0,07)$ for X, GAMMA, NEUTRON, AND BETA RADIATIONS –
DIRECT READING PERSONAL DOSEMETERS**

FOREWORD

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International Standard IEC 61526 has been prepared by subcommittee 45B: Radiation protection instrumentation, of IEC technical committee 45: Nuclear instrumentation.

This fourth edition cancels and replaces the third edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Inclusion of the measurement quantity for the dose to the lens of the eye, $H_p(3)$;
- b) Inclusion of $H_p(0.07)$ as measurement quantity for extremities
- c) Inclusion of dosimeters between active and passive: “hybrid dosimeters”
- d) Inclusion of software requirements
- e) Harmonization of requirements for linearity to IEC 62387

The text of this International Standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this document the stability date is 20XX..

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

INTRODUCTION

This International Standard applies to active, direct reading personal dosimeters and monitors used for measuring the personal dose equivalents $H_p(10)$, $H_p(3)$ and $H_p(0,07)$ for X, gamma, neutron, and beta radiations.

For the personal dose equivalent $H_p(10)$ or the personal dose equivalent rate $\dot{H}_p(10)$ and for X and gamma radiations, two minimum rated ranges for the photon energy are given. The first from 20 keV to 150 keV is for workplaces where low energy X-rays are used, e.g., in medical diagnostic, the second from 80 keV to 1,25 MeV is for workplaces where high energy X-rays and/or gamma sources are used, e.g., in industry. For neutron radiation the minimum rated range of neutron energy is from 0,025 eV (thermal neutrons) to 2 MeV. The rated ranges can be extended to all energies covered by the respective standards for reference radiation fields.

For the personal dose equivalent $H_p(3)$ or $H_p(0,07)$ and for X and gamma radiations, a minimum rated range for the photon energy from 20 keV to 150 keV is given and for beta radiation, the minimal rated range is from 0,2 MeV to 0,8 MeV (mean beta particle energy). The rated ranges can be extended to all energies covered by the respective standards for reference radiation fields.

In some applications, for example, at a nuclear reactor installation where 6 MeV photon radiation is present, measurement of personal dose equivalent (rate) $H_p(10)$ for photon energies up to 10 MeV should be required. In some other applications, measurement of $H_p(10)$ down to 10 keV should be required.

For personal dosimeters, requirements for measuring the dose quantities $H_p(10)$, $H_p(3)$ and $H_p(0,07)$ and for monitoring of the respective dose rate quantities are given. The measurement of these dose rate quantities is an option for personal dosimeters.

Establishments in some countries may wish to use this type of personal dosimeter as the dosimeter to provide the dose of record by an approved dosimetry service.

**RADIATION PROTECTION INSTRUMENTATION –
MEASUREMENT OF PERSONAL DOSE EQUIVALENTS $H_p(10)$, $H_p(3)$
AND $H_p(0,07)$ for X, GAMMA, NEUTRON, AND BETA RADIATIONS –
DIRECT READING PERSONAL DOSEMETERS –**

1 Scope

This International Standard applies to personal dosimeters with the following characteristics:

- a) They are worn on the trunk, close to the eye or on the extremities.
- b) They measure the personal dose equivalents $H_p(10)$, $H_p(3)$ and $H_p(0,07)$ from external X and gamma, neutron, and beta radiations, and may measure the respective personal dose equivalent rates for the same radiations (for alarming purposes).
- c) They have a digital indication. This indication may or may not be attached.
- d) They shall have alarm functions for the personal dose equivalents or personal dose equivalent rates except for hybrid dosimeters

NOTE 1 When reference is made in this standard to "dose", this is meant to indicate personal dose equivalent, unless otherwise stated.

NOTE 2 When reference is made in this standard to "dosimeter", this is meant to include all personal dosimeters, unless otherwise stated.

This standard specifies requirements for the dosimeter and, if supplied, for its associated readout system.

Usually, a dosimeter is not able to measure all quantities given above. Thus, the dosimeter is only tested with regard to those quantities and types of radiation it is intended to be used for. Other types of radiation are considered as influence quantities which also may have requirements.

This standard specifies, for the dosimeters described above, general characteristics, general test procedures, radiation characteristics as well as electrical, mechanical, safety and environmental characteristics. The only requirements specified for associated readout systems are those which affect its accuracy of readout of the personal dose equivalent and alarm settings and those which concern the influence of the reader on the dosimeter.

This standard does not cover special requirements for accident or emergency dosimetry although the dosimeters may be used for this purpose. The standard does not apply to dosimeters used for measurement of pulsed radiation, such as radiation emanating from most medical diagnostic X-ray facilities, linear accelerators or similar equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

- 71 IEC 60050-395, *International Electrotechnical Vocabulary - Part 395: Nuclear instrumentation:*
72 *Physical phenomena, basic concepts, instruments, systems, equipment and detectors*
- 73 IEC 60068-2-31:2008, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling*
74 *shocks, primarily for equipment-type specimens*
- 75 IEC 60086-1:2015, *Primary batteries – Part 1: General*
- 76 IEC 60086-2:2015, *Primary batteries – Part 2: Physical and electrical specifications*
- 77 IEC 60359:2001, *Electrical and electronic measurement equipment – Expression of*
78 *performance*
- 79 IEC 60529:2017, *Degrees of protection provided by enclosures (IP Code)*
- 80 IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement*
81 *techniques – Electrostatic discharge immunity test*
- 82 IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement*
83 *techniques – Radiated, radio-frequency, electromagnetic field immunity test*
- 84 IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement*
85 *techniques – Electrical fast transient/burst immunity test*
- 86 IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement*
87 *techniques – Surge immunity test*
- 88 IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement*
89 *techniques – Immunity to conducted disturbances, induced by radio-frequency fields*
- 90 IEC 61000-4-8, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement*
91 *techniques – Power frequency magnetic field immunity test*
- 92 IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement*
93 *techniques – Voltage dips, short interruptions and voltage variations immunity tests*
- 94 IEC 61000-6-2, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity*
95 *for industrial environments*
- 96 IEC 61187:1993, *Electrical and electronic measuring equipment – Documentation*
- 97 IEC 62387 *Radiation protection instrumentation – Dosimetry systems with integrating passive*
98 *detectors for individual, workplace and environmental monitoring of photon and beta radiation*
- 99 *To be checked if needed, i.e. hybrid dosimeters also for neutrons?:*
100 *ISO 21909-1:2015 Passive neutron dosimetry systems — Part 1: Performance and test*
101 *requirements for personal dosimetry*
- 102 IEC/TR 62461:2015, *Radiation protection instrumentation – Determination of uncertainty in*
103 *measurement*
- 104 ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of*
105 *uncertainty in measurement (GUM:1995)*
- 106 ISO/IEC Guide 98-3:2008/Suppl.1:2008, *Propagation of distributions using a Monte Carlo*
107 *method and Corr.1 (2009)*

108 ISO 4037 (all parts):2019, *X and gamma reference radiation for calibrating dosemeters and*
109 *doserate meters and for determining their response as a function of photon energy*

110 ISO 6980 (all parts), *Nuclear energy – Reference beta-particle radiation*

111 ISO 8529 (all parts), *Reference neutron radiations*

112 ISO 12789-1 (all parts), *Reference radiation fields – Simulated workplace neutron fields*

113 ISO 29661:2012 and ISO 29661:2012/Amd.1:2015:2016, *Reference radiation fields for radiation*
114 *protection — Definitions and fundamental concepts* 157

115 ICRU report 51:1993, *Quantities and units in radiation protection dosimetry*

116 **3 Terms and definitions**

117 For the purposes of this document, the terms and definitions given in IEC 60050-395,
118 IEC 60329 and ICRU Report 51, as well as the following terms and definitions, apply.

119 ISO and IEC maintain terminological databases for use in standardization at the following
120 addresses:

- 121 • IEC Electropedia: available at <http://www.electropedia.org/>
- 122 • ISO Online browsing platform: available at <http://www.iso.org/obp>

123 apply.

124 **3.1** 125 **acceptance test**

126 contractual test to prove to the customer that the device meets certain conditions of its
127 specification

128 [IEV 394-20-09; IEV 151-16-23; IEV 394-40-05]

129 **3.2** 130 **calibration (for the purpose of this standard)**

131 quantitative determination of the reference calibration coefficient, N_0 , and the correction for
132 non-constant response, r_n , under a controlled set of standard test conditions for which all the
133 m relative response values, r_q , are unity and all the l deviations, D_p , are zero

134 **3.3** 135 **calibration coefficient**

136 N
137 quotient of the conventional quantity value of a quantity, H_r , and the indicated value, G_r , at the
138 point of test for a specified reference radiation under specified reference conditions. It is
139 expressed as

$$140 \quad N = \frac{H_r}{G_r}$$

141 NOTE 1 The calibration coefficient N is dimensionless when the instrument indicates the quantity to be measured.
142 A dosimeter indicating the conventional quantity value correctly has the calibration coefficient of one.

143 [adopted from ISO 29661:2012, 3.1.5]

3.4**coefficient of variation**

ratio of the standard deviation s to the arithmetic mean $\bar{x}$ of a set of n measurements x_i given by the following formula:

$$v = \frac{s}{\bar{x}} = \frac{1}{\bar{x}} \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$$

[IEV 394-40-14]

3.5**combined standard measurement uncertainty**

combined standard uncertainty

u_c

standard measurement uncertainty that is obtained using the individual standard measurement uncertainties associated with the input quantities in a measurement model

NOTE In case of correlations of input quantities in a measurement model, covariances must also be taken into account when calculating the combined standard measurement uncertainty; see also ISO/IEC Guide 98-3:2008, 2.3.4.

[ISO/IEC Guide 98-3:2008, 2.31]

3.6**conventional quantity value**

conventional value of a quantity

conventional value

quantity value attributed by agreement to a quantity for a given purpose

NOTE 1 The term “conventional true quantity value” is sometimes used for this concept, but its use is discouraged.

NOTE 2 Sometimes a conventional quantity value is an estimate of a true quantity value.

NOTE 3 A conventional quantity value is generally accepted as being associated with a suitably small measurement uncertainty, which might be zero.

[ISO/IEC Guide 98-3:2008, 2.12]

3.7**correction for non-constant response**

r_n

quotient of the response, R , under specified conditions where only the quantity to be measured is varied and the reference response, R_0 . It is expressed as

$$r_n = \frac{R}{R_0}$$

NOTE For an instrument with constant response, r_n is equal to one.

3.8**detector assembly**

assembly of a radiation detector and the associated components needed for the calibration or the determination of the response

NOTE The calibration result is only valid for this detector assembly.

EXAMPLE A personal dosimeter is to be calibrated using a phantom. The combination of personal dosimeter and phantom and possibly further reading instruments and cables comprise one detector assembly.

3.9**deviation*****D***

difference between the indicated values for the same value of the measurand of a dose(rate) meter, when an influence quantity assumes, successively, two different values

[IEV 311-07-03, modified]

$$D = G - G_r$$

where G is the indicated value under the effect of an influence quantity and
 G_r is the indicated value under reference conditions.

NOTE 1 The original term in IEC 311-07-03 reads "variation (due to an influence quantity)". In order not to confuse variation (of the indicated value) and variation of the response, in this standard, the term is called "deviation".

3.10**effective range of measurement**

range of values of the quantity to be measured over which the performance of a dosimeter meets the requirements of this standard

[IEV 394-20-16, modified]

3.11**expanded measurement uncertainty**

expanded uncertainty

U

product of a combined standard measurement uncertainty and a factor larger than the number one

[ISO/IEC Guide 98-3:2008, 2.3.5, modified]

3.12**Hybrid dosimeter**

Dosimeter with active components but no direct dose indication. These dosimeters are read out by a dedicated reader.

3.13**indicated value (for the purpose of this standard)*****G***

value given by the digital indication of the dosimeter

3.14**influence quantity**

quantity that is not the measurand but that effects the result of the measurement

[GUM B.2.10, modified: skipped examples]

NOTE 2 If the effect on the result of a measurement of an influence quantity depends on another influence quantity, these influence quantities are treated as a single one. In this standard, this is the case for the influence quantities "radiation energy and angle of radiation incidence".

3.15**influence quantity of type F**

influence quantity whose effect on the indicated value is a change in response

NOTE 1 Examples are radiation energy and angle of radiation incidence (see 9.4 to 9.6) and dose rate when measuring the dose.

NOTE 2 "F" stands for factor: The indication due to radiation is multiplied by a factor due to the influence quantity.

3.16**influence quantity of type S**

influence quantity whose effect on the indicated value is a deviation independent of the indicated value

NOTE 1 Examples are electromagnetic disturbance (see Clause 11) and microphonics (see 12.4).

NOTE 2 “S” stands for sum: The indication is the sum of the indication due to radiation and due to the influence quantity, e.g., electromagnetic disturbance.

3.17**lower limit of effective range of measurement** H_0

lowest dose(rate) value included in the effective range of measurement

3.18**maximum possible measuring time** $t_{\max}$

longest measuring time within which all requirements of this standard are fulfilled

NOTE The time can be given by the battery life or by other requirements, see note to 9.3.6.

3.19**measured value (using response)** M

value that can be obtained from the indicated value G by applying the model function for the measurement

3.20**minimum rated range**

smallest range being specified of an influence quantity or instrument parameter over which the dosimeter will operate within the respective variation of the relative response in order to comply with this standard

3.21**non-constant response**

variation of the value of the (relative) response with the magnitude of the quantity to be measured

3.22**personal dose equivalent** $H_p(d)$

dose equivalent in soft tissue at a specified point in the human body at a depth d

[IEV 395-05-44: modified: skipped notes]

NOTE Typical depth are 0.07 mm, 3 mm and 10 mm.

3.23**personal dosimeter****personal dose equivalent meter**

assembly intended to measure the personal dose equivalent with a digital dose indication

3.24**personal dose equivalent rate** $\dot{H}_p(d)$

quotient of $dH_p(d)$ by dt , where $dH_p(d)$ is the increment of personal dose equivalent in the time interval dt

$$\dot{H}_p(d) = \frac{dH_p(d)}{dt}$$

Units of personal dose equivalent rate are a quotient of the sievert or its decimal multiples or submultiples by a suitable unit of time (for example, mSv h⁻¹)

3.25

point of test

point at which the conventional quantity value is determined and at which the reference point of the detector assembly is placed for calibration and test purposes

3.26

qualification tests

tests which are performed in order to verify that the requirements of a specification are fulfilled. Qualification tests are subdivided into type tests and routine tests

3.27

rated range

range of a quantity to be measured, observed, supplied, or set assigned to the instrument

3.28

rated range of use

range of values of an influence quantity giving the limits of operation within the stated limits of the relative response or the deviation

3.29

reference calibration coefficient

calibration coefficient, N_0 , for a reference value, $H_{r,0}$, of the quantity to be measured. With $G_{r,0}$ being the respective indicated value, it is expressed as

$$N_0 = \frac{H_{r,0}}{G_{r,0}}$$

NOTE For the value of $H_{r,0}$ see Table 3.

3.30

reference operating condition reference condition

operating condition prescribed for evaluating the performance of a measuring instrument or measuring system or for comparison of measurement results

3.31

reference orientation

orientation of the detector assembly with respect to the direction of the incident radiation stated by the manufacturer

3.32

reference point of a detector assembly

mark on the equipment by which the detector assembly is positioned for the purpose of calibration

NOTE The point from which the distance to the source is measured.

[IEV 394-40-15, modified]

3.33
reference response

R_0

response of the assembly under reference conditions:

$$R_0 = \frac{G_{r,0}}{H_{r,0}}$$

where $H_{r,0}$ is a reference (conventional) quantity value of the quantity to be measured for a specified reference radiation under specified reference conditions and $G_{r,0}$ is the respective indicated value.

3.34
relative expanded uncertainty

U_{rel}

expanded uncertainty divided by the result of the measurement

3.35
relative response

r

ratio of the response, R , and the reference response, R_0 , at the point of test under specified conditions:

$$r = \left(\frac{R}{R_0} \right) \times 100\%$$

3.36
response (of a radiation measuring assembly)

R

ratio, under specified conditions, given by the relation:

$$R = \frac{G}{H}$$

where G is the value of the quantity measured by the equipment or assembly under test and H is the conventional quantity value of this quantity

[IEV 394-40-21, modified]

NOTE 1 For an instrument with non-constant response, the value of the response varies when the conventional quantity value is changed.

3.37
routine test

conformity test made on each individual item during or after manufacture

[IEV 151-16-17, IEV 394-40-03]

3.38
standard test conditions

a value, values, or range of values of an influence quantity or instrument parameter, which are permitted when carrying out calibrations or tests on another influence quantity or instrument parameter (see column 3 of Table 3)

3.39
standard measurement uncertainty

standard uncertainty of measurement

standard uncertainty

u_i

measurement uncertainty expressed as a standard deviation

[ISO/IEC Guide 98-3:2008, 2.3.1]

3.40

supplementary tests

tests intended to provide supplementary information on certain characteristics of the dosimeters

3.41

type test

conformity test made on one or more items representative of the production

[IEV 394-40-02; IEV 151-16-16]

3.42

measurement uncertainty

uncertainty of measurement

uncertainty

parameter, associated with the result of a measurement, that characteres the dispersion of the values that could reasonably attributed to a measurand [VIM 3.9]

[IEV 311-01-02 modified: skipped notes]

4 Units and list of symbols

4.1 Units

In the present standard, the units of the International System (SI) are used. The definition of radiation quantities and dosimetric terms is given in IEC 60050-393, IEC 60050-394 and ICRU report 51. In addition, the following units are accepted:

- For energy: electron-volt (symbol eV). $1 \text{ eV} = 1,602 \cdot 10^{-19} \text{ J}$.
- For time: year, day (symbol d), hour (symbol h), minute (symbol min).

Multiples and submultiples of SI unit may be used, according to the SI system.

The SI unit of dose equivalent is the sievert (symbol Sv). $1 \text{ Sv} = 1 \text{ J kg}^{-1}$.

4.2 List of symbols

Table 1 gives a list of the symbols (and abbreviated terms) used.

Table 1 – Symbols (and abbreviated terms)

Symbol	Meaning	Unit
α	Angle of radiation incidence	deg
α_{max}	Maximum value of α within rated range of use	deg
D	Deviation	Sv
d	Depth in soft tissue. Recommended depths are 10 mm, 3 mm, and 0,07 mm	m

Symbol	Meaning	Unit
D_p	Deviation due to influence quantity no. p of type S	Sv
$\bar{E}$	Fluence weighted mean radiation energy	eV
G	Indicated dose(rate) value	Sv (Sv h ⁻¹)
G_a	Indicated dose value at which the alarm occurs	Sv
$\dot{G}_{\text{high}}$	Stabilized dose rate reading after an increase in dose rate	Sv h ⁻¹
G_K	Indicated dose value due to a single irradiation with the conventional quantity value H_K	Sv
G_{K+L}	Indicated dose value due to a (simultaneously) combined irradiation with the conventional quantity value $H_K + H_L$	Sv
G_L	Indicated dose value due to a single irradiation with the conventional quantity value H_L	Sv
$G_{\text{low},1}$	Indication of the dosimeter under the same conditions as given for G_{nom} , but when the battery voltage is low, for example, the dosimeter indicates “Low battery” for the first time.	Sv
Δg_{mix}	Relative change in indication caused by subsequent and mixed (simultaneously) exposure, see Clause 8	—
G_{nom}	Indication of the dosimeter under given conditions when the battery voltage has its nominal value.	Sv
G_{nat}	Accumulated dose in the environment	Sv
G_r	Indicated dose(rate) value under specified reference conditions	Sv (Sv h ⁻¹)
$G_{r,0}$	Reference value of the indicated dose(rate) due to exposure to $H_{r,0}$	Sv (Sv h ⁻¹)
H	Conventional quantity value of the dose (rate)	Sv (Sv h ⁻¹)
H_0	Lower dose(rate) limit of the effective range of measurement	Sv (Sv h ⁻¹)
H_a	Dose value to which the alarm is set	Sv
$H_{a,c}$	Conventional quantity value of the dose at which the alarm occurs	Sv
$\dot{H}_a$	Dose rate value to which the alarm is set	Sv h ⁻¹
$H_p(0,07)$	Personal dose equivalent at a depth 0,07 mm	Sv
$H_p(3)$	Personal dose equivalent at a depth 3 mm	Sv
$H_p(10)$	Personal dose equivalent at a depth 10 mm	Sv
$\dot{H}_p(0,07)$	Personal dose equivalent rate at a depth 0,07 mm	Sv h ⁻¹
$\dot{H}_p(3)$	Personal dose equivalent rate at a depth 3 mm	Sv h ⁻¹
$\dot{H}_p(10)$	Personal dose equivalent rate at a depth 10 mm	Sv h ⁻¹
$H_p(d)$	Dose equivalent in soft tissue at a specified point in the human body at a depth d	Sv
H_r	Conventional quantity value of the dose(rate) under specified reference conditions	Sv (Sv h ⁻¹)
$H_{r,0}$	Reference dose(rate) value of the quantity to be measured	Sv (Sv h ⁻¹)
$H_{\text{true,nat}}$	Expected personal dose equivalent due to natural environmental radiation	Sv
$\dot{H}_{\text{true,nat}}$	Known personal dose equivalent rate due to natural environmental radiation	Sv h ⁻¹