PD IEC/TR 61948-1:2016

BSI Standards Publication

Nuclear medicine instrumentation -- Routine tests

Part 1: Gamma radiation counting system

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National foreword

This Published Document is the UK implementation of IEC/TR 61948-1:2016. It supersedes PD IEC/TR 61948-1:2001 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee CH/62, Electrical Equipment in Medical Practice, to Subcommittee CH/62/3, Equipment for radiotherapy, nuclear medicine and radiation dosimetry.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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TECHNICAL REPORT

Nuclear medicine instrumentation – Routine tests –
Part 1: Gamma radiation counting system

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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NUCLEAR MEDICINE INSTRUMENTATION – ROUTINE TESTS –

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FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 61948-1, which is a technical report, has been prepared by subcommittee 62C: Equipment for radiotherapy, nuclear medicine and radiation dosimetry, of IEC technical committee 62: Electrical equipment in medical practice.

This second edition cancels and replaces the first edition published in 2001. This edition constitutes a technical revision and includes the following significant technical changes with respect to the previous edition:

a) Geiger-Mueller counters are explicitly excluded from the scope;

b) the routine test for energy calibration has been split into a test for energy calibration (frequency: daily) and a test for energy calibration linearity (frequency: semi-annual);

c) the test for window presets has been removed.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
62C/621/DTR	62C/642/RVC

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

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

In this technical report the following print types are used:

– requirements, compliance with which can be tested, and definitions: in roman type;

– notes, explanations, advice, introductions, general statements, exceptions and references: in smaller roman type;

– *test specifications: in italic type;*

– TERMS DEFINED IN CLAUSE 3 OF THIS TECHNICAL REPORT OR LISTED IN ANNEX A: SMALL CAPITALS.

The requirements are followed by specifications for the relevant tests.

A list of all parts in the IEC 61948, published under the general title *Nuclear medicine instrumentation – Routine tests*, can be found on the IEC website.

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

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

A bilingual version of this publication may be issued at a later date.

NUCLEAR MEDICINE INSTRUMENTATION – ROUTINE TESTS –

Part 1: Gamma radiation counting system

1 Scope

This part of IEC 61948, which is a technical report, describes test methods of instruments that count and measure the energy of photons emitted by RADIONUCLIDES *in vivo* and *in vitro* without the option of imaging. This includes, for example, well counters and organ probes. Geiger-Mueller counters and dose calibrators are not within the scope of this document.

As part of QUALITY CONTROL this report is defining ROUTINE TESTS to be performed by the user of gamma radiation counting systems to maintain proper operation conditions. The results of these ROUTINE TESTS are compared to the REFERENCE DATA determined during or after the ACCEPTANCE TEST.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TR 60788:2004, *Medical electrical equipment – Glossary of defined terms*

3 Terms and definitions

For the purposes of this document the terms and definitions given in IEC TR 60788, as well as the following definitions apply (see Annex A).

NOTE Defined terms are printed in small capital letters.

3.1
acceptance test
test carried out after new EQUIPMENT has been installed, or major modifications have been made to existing EQUIPMENT, in order to verify compliance with contractual specifications

Note 1 to entry: During or immediately after ACCEPTANCE TEST, REFERENCE DATA are collected to be used as a standard for comparison with future ROUTINE TESTS.

[SOURCE: IEC TR 60788:2004, rm-70-01, modified – addition a new Note to entry.]

3.2
activity
A
quantitative indication of the radioactivity of an amount of RADIONUCLIDE in a particular energy state at a given time. ACTIVITY is determined as the quotient of dN by dt, where dN is the expectation value of the number of spontaneous nuclear transitions from that energy state in the time interval dt:

$$A = \frac{\mathrm{d}N}{\mathrm{d}t}$$