Irish Standard
I.S. EN 61083-2:2013

Instruments and software used for measurement in high-voltage and high-current tests -- Part 2: Requirements for software for tests with impulse voltages and currents (IEC 61083 -2:2013 (EQV))

I.S. EN 61083-2:2013

Incorporating amendments/corrigenda issued since publication:

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SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

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English version

Instruments and software used for measurement in high-voltage and high-current tests - Part 2: Requirements for software for tests with impulse voltages and currents

(IEC 61083-2:2013)

Appareils et logiciels utilisés pour les mesures pendant les essais à haute tension et haute intensité -
Partie 2: Exigences pour le logiciel pour les essais avec des tensions et des courants de choc
(CEI 61083-2:2013)

Messgeräte und Software für Messungen bei Hochspannungs- und Hochstrom-Prüfungen -
Teil 2: Anforderungen an die Software bei Prüfungen mit Stoßspannungen und -strömen
(IEC 61083-2:2013)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61083-2:2013 E

Foreword

The text of document 42/318/FDIS, future edition 2 of IEC 61083-2, prepared by IEC/TC 42 "High-voltage testing techniques" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61083-2:2013.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-01-24
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-04-24

This document supersedes EN 61083-2:1997.

EN 61083-2:2013 includes the following significant technical changes with respect to EN 61083-2:1997:

a) the test data generator software has been updated;

b) the number of reference impulse waveforms included in the test data generator has been significantly increased;

c) all reference values have been recalculated according to new definitions in EN 60060-1 and EN 62475;

d) methods for estimating the uncertainty of parameter evaluation has been introduced and are in line with the procedure introduced in EN 60060-2.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61083-2:2013 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60060-1	2010	High-voltage test techniques - Part 1: General definitions and test requirements	EN 60060-1	2010
IEC 60060-2	-	High-voltage test techniques - Part 2: Measuring systems	EN 60060-2	-
IEC 60060-3	2006	High voltage test techniques - Part 3: Definitions and requirements for on-site testing	EN 60060-3 + corr. October	2006 2006
IEC 61083-1	2001	Instruments and software used for measurement in high-voltage impulse tests - Part 1: Requirements for instruments	EN 61083-1	2001
IEC 62475	2010	High-current test techniques - Definitions and requirements for test currents and measuring systems	EN 62475	2010
ISO/IEC Guide 98-3	-	Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)	-	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

INSTRUMENTS AND SOFTWARE USED FOR MEASUREMENT IN HIGH-VOLTAGE AND HIGH-CURRENT TESTS –

Part 2: Requirements for software for tests with impulse voltages and currents

FOREWORD

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International Standard IEC 61083-2 has been prepared by IEC technical committee 42: High-voltage and high-current testing techniques.

This second edition cancels and replaces the first edition, published in 1996, and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

a) the test data generator software has been updated:
b) the number of reference impulse waveforms included in the test data generator has been significantly increased;
c) all reference values have been recalculated according to new definitions in IEC 60060-1and IEC 62475;

d) methods for estimating the uncertainty of parameter evaluation has been introduced and are in line with the procedure introduced in IEC 60060-2.

The text of this standard is based on the following documents:

FDIS	Report on voting
42/318/FDIS	42/321/RVD

Full information on the voting for the approval of this standard 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.

A list of all the parts in the IEC 61083 series, published under the general title *Instruments and software used for measurement in high-voltage and high-current 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.

INTRODUCTION

IEC 61083-1 specifies the test requirements for digital recorders. Digital recorders, like analogue oscilloscopes, are susceptible to changes in their characteristics. However, the more stringent testing (than is practical for analogue oscilloscopes) specified for digital recorders for standard impulse voltage and current measurement has led to the accuracy of digital recorders being more clearly demonstrated.

This part of IEC 61083 applies to software used to process digital records to provide the values of the relevant impulse parameters. The raw data are retained for comparison with the processed data. However, since the parameters of the test impulse (including the test value) are to be read from the processed data, it is important to establish tests to ensure that the reading of parameters is adequately performed. The problem is how to ensure this, while permitting users to develop a wide range of techniques.

This problem is further complicated by the different needs of various users, ranging from single-purpose test laboratories, for example those of a cable manufacturer who may only test a few objects which are capacitive, to large high-voltage test/research laboratories, which may perform tests on a very wide range of objects, which have a correspondingly wide range of impedances.

The approach taken in this part of IEC 61083 is to provide, from a test data generator software, waveforms (and ranges of their parameters) which a user can employ to verify that a procedure gives values within the specified ranges. To reduce the amount of testing required, the waveforms are divided into groups, and the user needs only to check those groups that are appropriate for the high-voltage and/or high-current tests to be performed in his/her laboratory.

New definitions for lightning impulse parameters and switching impulse time-to-peak evaluation are introduced in IEC 60060-1. The changes in these definitions have lead to significant changes in some of the reference values in this standard. The number of impulse records in the test data generator has been increased to cover a wider range of impulse shapes seen in on-site testing.

INSTRUMENTS AND SOFTWARE USED FOR MEASUREMENT IN HIGH-VOLTAGE AND HIGH-CURRENT TESTS –

Part 2: Requirements for software for tests with impulse voltages and currents

1 Scope and object

This part of IEC 61083 is applicable to software used for evaluation of impulse parameters from recorded impulse voltages and currents. It provides test waveforms and reference values for the software required to meet the measuring uncertainties and procedures specified in IEC 60060-1, IEC 60060-2, IEC 60060-3 and IEC 62475.

Hardware with built-in firmware that cannot accept external numerical input data is not covered by this standard.

The object of this standard is to

- establish the tests which are necessary to show that the performance of the software complies with the requirements of the relevant IEC standards;
- define the terms specifically related to digital processing;
- specify reference values and the acceptance limits for the reference impulses;
- specify the requirements for the record of performance;
- define the methods to assess the contribution of software to the measurement uncertainty.

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 60060-1:2010, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60060-2, *High-voltage test techniques – Part 2: Measuring systems*

IEC 60060-3:2006, *High-voltage test techniques – Part 3: Definitions and requirements for on–site testing*

IEC 61083-1:2001, *Instruments and software used for measurement in high-voltage impulse tests – Part 1: Requirements for instruments*

IEC 62475:2010, *High-current test techniques – Definitions and requirements for test currents and measuring systems*

ISO/IEC Guide 98-3, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*