



**NSAI**  
Standards

Irish Standard  
I.S. EN 61243-1:2005

Live working - Voltage detectors -- Part  
1: Capacitive type to be used for  
voltages exceeding 1 kV a.c. (IEC 61243  
-1:2003 (MOD))

## I.S. EN 61243-1:2005

*Incorporating amendments/corrigenda issued since publication:*

EN 61243-1:2005/A1:2010

*This document replaces:*  
EN 61243-1:1997

*This document is based on:*  
EN 61243-1:2005  
EN 61243-1:1997

*Published:*  
31 March, 2005  
4 February, 1997

This document was published  
under the authority of the NSAI and  
comes into effect on:

20 May, 2005

ICS number:  
29.240.99

**NSAI**  
1 Swift Square,  
Northwood, Santry  
Dublin 9

T +353 1 807 3800  
F +353 1 807 3838  
E standards@nsai.ie  
W NSAI.ie

**Sales:**  
T +353 1 857 6730  
F +353 1 857 6729  
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

English version

**Live working -  
Voltage detectors -  
Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.  
(IEC 61243-1:2003/A1:2009)**

Travaux sous tension -  
DéTECTEURS de tension -  
Partie 1: Type capacitif pour usage  
sur des tensions alternatives  
de plus de 1 kV  
(CEI 61243-1:2003/A1:2009)

Arbeiten unter Spannung -  
Spannungsprüfer -  
Teil 1: Kapazitive Ausführung  
für Wechselspannungen über 1 kV  
(IEC 61243-1:2003/A1:2009)

This amendment A1 modifies the European Standard EN 61243-1:2005; it was approved by CENELEC on 2009-11-17. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

## **Foreword**

The text of document 78/751/CDV, future amendment 1 to IEC 61243-1:2003, prepared by IEC TC 78, Live working, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61243-1:2005 on 2009-11-17.

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

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2010-09-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2012-12-01

As a consequence of endorsing amendment 1:2009 to IEC 61243-1:2003, the common modifications in EN 61243-1:2005 are now covered by the IEC text.

---

## **Endorsement notice**

The text of amendment 1:2009 to the International Standard IEC 61243-1:2003 was approved by CENELEC as an amendment to the European Standard without any modification.

---

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
<i>Replace the existing reference to IEC 60071-1:1993 by the following:</i>				
IEC 60071-1	2006	Insulation co-ordination Part 1: Definitions, principles and rules	EN 60071-1	2006
<i>Add:</i>				
IEC 61318	2007	Live working - Conformity assessment applicable to tools, devices and equipment	EN 61318	2008

*This page is intentionally left BLANK.*

EUROPEAN STANDARD

**EN 61243-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2005

ICS 29.240.99

Supersedes EN 61243-1:1997 + A1:1997

English version

**Live working –  
Voltage detectors  
Part 1: Capacitive type to be used for voltages  
exceeding 1 kV a.c.  
(IEC 61243-1:2003, modified)**

Travaux sous tension –  
DéTECTEURS de tension  
Partie 1: Type capacitif pour usage  
sur des tensions alternatives  
de plus de 1 kV  
(CEI 61243-1:2003, modifiée)

Arbeiten unter Spannung –  
Spannungsprüfer  
Teil 1: Kapazitive Ausführung  
für Wechselspannungen über 1 kV  
(IEC 61243-1:2003, modifiziert)

This European Standard was approved by CENELEC on 2005-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

**CENELEC**

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

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## Foreword

The text of the International Standard IEC 61243-1:2003, prepared by IEC TC 78, Live working, together with the common modifications prepared by the Technical Committee CENELEC TC 78, Equipment and tools for live working, was submitted to the formal vote and was approved by CENELEC as EN 61243-1 on 2005-03-01.

This European Standard supersedes EN 61243-1:1997 + A1:1997 + corrigendum June 1999.

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2006-03-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2008-03-01

Annex ZA has been added by CENELEC.

---



## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references .....	7
3 Terms and definitions .....	8
4 Requirements .....	12
4.1 General requirements.....	12
4.1.1 Safety.....	12
4.1.2 Indication.....	12
4.2 Functional requirements .....	12
4.2.1 Clear indication .....	12
4.2.2 Clear perceptibility.....	13
4.2.3 Temperature and humidity dependence of the indication .....	14
4.2.4 Frequency dependence .....	14
4.2.5 Response time .....	14
4.2.6 Power source dependability.....	14
4.2.7 Testing element.....	14
4.2.8 Non-response to d.c. voltage .....	15
4.2.9 Time rating .....	15
4.3 Electrical requirements.....	15
4.3.1 Insulating material .....	15
4.3.2 Protection against bridging .....	15
4.3.3 Resistance against sparking .....	15
4.4 Mechanical requirements.....	15
4.4.1 Design.....	15
4.4.2 Dimensions, construction.....	16
4.4.3 Grip force and deflection .....	17
4.4.4 Vibration resistance.....	17
4.4.5 Drop resistance .....	17
4.4.6 Shock resistance .....	17
4.5 Markings .....	17
4.6 Instructions for use.....	18
5 Specific requirements .....	18
5.1 For insulating element of a voltage detector as a complete device.....	18
5.1.1 Dielectric strength .....	18
5.1.2 Leakage current .....	18
5.2 For indicator casing of voltage detector as a separate device.....	18
6 Tests.....	18
6.1 General.....	18
6.1.1 Tests under wet conditions .....	19
6.1.2 Type test .....	19
6.1.3 Test methods.....	20

6.2	Function tests.....	20
6.2.1	Clear indication .....	20
6.2.2	Clear perceptibility of visual indication.....	23
6.2.3	Clear perceptibility of audible indication.....	24
6.2.4	Frequency dependence .....	25
6.2.5	Response time .....	26
6.2.6	Power source dependability.....	26
6.2.7	Check of testing element .....	26
6.2.8	Non-response to d.c. voltage .....	27
6.2.9	Time rating .....	27
6.3	Dielectric tests .....	27
6.3.1	Protection against bridging for indoor/outdoor type voltage detector .....	27
6.3.2	Protection against bridging for outdoor type voltage detector.....	29
6.3.3	Spark resistance.....	30
6.4	Mechanical tests .....	31
6.4.1	Visual and dimensional inspection .....	31
6.4.2	Grip force and deflection (only applicable for voltage detector as a complete device).....	31
6.4.3	Vibration resistance.....	32
6.4.4	Drop resistance .....	32
6.4.5	Shock resistance .....	32
6.4.6	Climatic dependence .....	33
6.4.7	Durability of markings.....	33
7	Specific tests.....	34
7.1	Leakage current for voltage detector as a complete device.....	34
7.1.1	Leakage current under dry conditions .....	34
7.1.2	Leakage current under wet conditions (for outdoor type only) .....	34
8	Conformity assessment of voltage detectors having completed the production phase .....	35
	Annex A (normative) Suitable for live working; double triangle .....	51
	Annex B (normative) Instructions for use .....	52
	Annex C (normative) Chronology of type tests .....	53
	Annex D (normative) Classification of defects and tests to be allocated .....	55
	Annex E (normative) Mechanical shock tests – Pendulum method .....	57
	Annex F ( <i>Deleted</i> ).....	59
	Annex G (informative) In-service care .....	60
	Bibliography.....	62

INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

**LIVE WORKING – VOLTAGE DETECTORS –**

**Part 1: Capacitive type to be used for voltages  
exceeding 1 kV a.c.**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61243-1 has been prepared by IEC technical committee 78: Live working.

This edition includes the following major technical changes from the previous edition:

- a) the Scope has been extended to cover the use on electrical systems for voltages up to 765 kV a.c.;
- b) the notion of family of voltage detectors which are identical in terms of design and dimensions and only differ by their nominal voltages (or nominal voltage ranges) has been included;
- c) the classification in terms of the setting of the threshold voltage to give a clear indication has been eliminated;
- d) a new test set-up with bars has been introduced. Depending on the nominal voltage of the voltage detector, it is required or becomes an alternative test set-up for checking the influence of interference fields, the influence of interference voltages, the protection against bridging and the spark resistance;

**I.S. EN 61243-1:2005**

61243-1 © IEC:2003+A1:2009

– 5 –

- e) the revision of specific dielectric tests has been included;
- f) some test procedures (clear perceptibility of audible indication, drop resistance, climatic dependence) have been improved and completed.

This consolidated version of IEC 61243-1 consists of the second edition (2003) [documents 78/527/FDIS and 78/537/RVD], its amendment 1 (2009) [documents 78/751/CDV and 78/794/RVC] and its corrigendum of October 2005.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience.

It bears the edition number 2.1.

A vertical line in the margin shows where the base publication has been modified by amendment 1.

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

IEC 61243 consists of the following parts, under the general title *Live working – Voltage detectors*:

Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

Part 2: Resistive type to be used for voltages of 1 kV to 36 kV a.c.

Part 3: Two-pole low-voltage type

Part 5: Voltage detecting systems (VDS)

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the maintenance result 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

This International Standard has been prepared according to the requirements of IEC 61477, where applicable.

## LIVE WORKING – VOLTAGE DETECTORS –

### Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

#### 1 Scope

This part of IEC 61243 is applicable to portable voltage detectors, with or without built-in power sources, to be used on electrical systems for voltages of 1 kV to 765 kV a.c., and frequencies of 50 Hz and/or 60 Hz.

This part applies only to voltage detectors of capacitive type used in contact with the part to be tested, as a complete device including its insulating element or as a separate device, adaptable to an insulating stick which, as a separate tool, is not covered by this standard (see 4.4.1 for general design).

Other types of voltage detectors are not covered by this part of the standard.

Some restrictions on their use are applicable in the case of factory-assembled switchgear and on overhead systems of electrified railways (see Annex B, instructions for use).

NOTE Except where otherwise specified, all the voltages defined in this standard refer to values of phase-to-phase voltages of three-phase systems. In other systems, the applicable phase-to-phase or phase-to-earth (ground) voltages should be used to determine the operating voltage.

#### 2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068-1, *Environmental testing -Part 1: General and guidance*

IEC 60068-2-6:1995, *Environmental testing – Tests – Test Fc and guidance: Vibration (sinusoidal)*

IEC 60068-2-14:1984, *Environmental testing – Tests – Test N: Change of temperature*  
Amendment 1 (1986)

IEC 60068-2-32:1975, *Environmental testing – Tests – Test Ed: Free fall*  
Amendment 2 (1990)

IEC 60071-1:2006, *Insulation co-ordination – Part 1: Definitions, principles and rules*

IEC 60417-DB:2002<sup>1</sup>, *Graphical symbols for use on equipment*

IEC 60942, *Electroacoustics – Sound calibrators*

IEC 61260:1995, *Electroacoustics – Octave-band and fractional-octave-band filters*

---

<sup>1</sup> "DB" refers to the IEC on-line database.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-