

**SLOVENSKI STANDARD**  
**SIST EN 61243-1:2007/A1:2010**  
**01-junij-2010**

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**Delo pod napetostjo - Napetostni detektorji - 1. del: Kapazitivni tip za uporabo pri izmeničnih napetostih nad 1 kV (IEC 61243-1:2003/A1:2009)**

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

Arbeiten unter Spannung - Spannungsprüfer - Teil 1: Kapazitive Ausführung für Wechselspannungen über 1 kV (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)

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**Ta slovenski standard je istoveten z: EN 61243-1:2005/A1:2010**

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**ICS:**

13.260      Varstvo pred električnim      Protection against electric  
udarom. Delo pod napetostjo      shock. Live working

**SIST EN 61243-1:2007/A1:2010**      en,fr

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 61243-1/A1**

February 2010

ICS 29.240.99

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

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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.

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### 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.

[SIST EN 61243-1:2007/A1:2010](https://standards.iteh.ai/catalog/standards/sist/6ca5412a-4ae4-4ae2-8302-3bb301fd29cc/sist-en-61243-1-2007-a1-2010)

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## 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

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IEC 61243-1

Edition 2.0 2009-04

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

AMENDMENT 1  
AMENDEMENT 1

Live working – Voltage detectors –  
Part 1: Capacitive type to be used for voltages exceeding 1 kV a.c.

Travaux sous tension – Détecteurs de tension –  
Partie 1: Type capacitif pour usage sur des tensions alternatives de plus de 1 kV

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
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PRICE CODE  
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ICS 29.240.99

ISBN 2-8318-1040-4

## FOREWORD

This amendment has been prepared by IEC technical committee 78: Live working.

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

CDV	Report on voting
78/751/CDV	78/794/RVC

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

The committee has decided that the contents of this amendment and the base publication 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.

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### 2 Normative references

[SIST EN 61243-1:2007/A1:2010](http://standards.iteh.ai/catalog/standards/sist-en-61243-1-2007-a1-2010)

Replace the existing reference to IEC 60071-1:1993 by the following:  
<http://standards.iteh.ai/catalog/standards/sist-en-61243-1-2007-a1-2010>

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

Replace the existing reference to IEC 61318:2003 by the following:

IEC 61318:2007, *Live working – Conformity assessment applicable to tools, devices and equipment*

### 3 Terms and definitions

Replace the first sentence by the following:

For the purposes of this document, the terms and definitions given in IEC 61318:2007 and the following apply.

#### 3.1 voltage detector

Replace the existing definition and note by the following:

device used to provide clear evidence of the presence or the absence of the operating voltage

NOTE For example, voltage detectors can be described as capacitive type or resistive type.

[Definition 11.2.5 of IEC 60743, modified, and IEC 651-10-04, modified]



### 3.4 family of voltage detectors

*Replace the existing definition by the following:*

for testing purposes, a group of voltage detectors, delimited by a minimum and a maximum rated voltage, that are identical in design (including dimensions) and only differ by their nominal voltages or nominal voltage ranges

### 3.10 insulating stick

*Replace the existing definition by the following:*

insulating tool essentially made of an insulating tube and/or rod with end fittings

[Definition 2.5.1 of IEC 60743 and IEC 651-02-01]

NOTE For voltage detection, an insulating stick is intended to be attached to a voltage detector as a separate device in order to provide the length to reach the installation to be tested and adequate safety distance and insulation to the user.

### 3.29 type test

*Delete the definition.*

### 3.30 routine test

*Delete the definition.*

### 3.31 sampling test

*Delete the definition.*

### 3.32 acceptance test

*Delete the definition.*

## 4.2 Functional requirements

### 4.2.1 Clear indication

*Replace the existing text by the following:*

The voltage detector shall give an unambiguous indication of the presence and/or the absence of the system operating voltage as a function of the nominal voltage or nominal voltage range of the voltage detector, and its nominal frequency or nominal frequencies.

Indication may not be reliable in the vicinity of large conductive parts that create equipotential zones.

When the voltage detector is used in accordance with instructions for use, the presence of an adjacent live or earthed part shall not affect its indication.

When used in accordance with instructions for use, the voltage detector shall not indicate "voltage present" for usual values of interference voltages.

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#### 4.2.1.1 Continuous indication

The voltage detector shall give continuous indication when in direct contact with a live part.

#### 4.2.1.2 Threshold voltage

##### 4.2.1.2.1 General

The user shall not have access to the threshold voltage setting.

The indication "voltage present" shall appear if the voltage to earth on the part to be tested is greater than 45 % of the nominal voltage.

NOTE 1 45 % of the nominal voltage corresponds to  $0,78 U_n / \sqrt{3}$ .

The indication "voltage present" shall not appear if the voltage to earth on the part to be tested is equal to or less than 10 % of the nominal voltage.

NOTE 2 10 % of the nominal voltage corresponds to  $0,17 U_n / \sqrt{3}$  and is the maximum phase to earth induced voltage normally encountered in the field.

To fulfil the above requirements, the threshold voltage  $U_t$  shall satisfy the following relationship:

$$0,10 U_n \max < U_t \leq 0,45 U_n \min$$

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For voltage detectors with only one nominal voltage,  $U_n \max$  equals  $U_n \min$ .

NOTE 3 There is a theoretical limit of 4,5 to the ratio between  $U_n \max$  and  $U_n \min$  to achieve clear indication of the voltage detector. This value corresponds to the division of 0,45 by 0,1.

NOTE 4 It may happen that the induced voltage level on a specific network is higher than 10 % of the nominal voltage or of the maximum nominal voltage of the range.

It may also happen that the variations of the nominal voltage network are such that the  $0,45 U_n$  or  $0,45 U_n \max$  is not the lowest possible value.

Moreover, when is it expected that the voltage detector will be used in the vicinity of large conductive parts that create equipotential zones (see 4.2.1), the customer may specify a low value of the threshold voltage.

In all these cases, manufacturer and customer should reach an agreement to set the appropriate value for the threshold voltage, while keeping it within the range specified above. The setting of the threshold voltage is further limited by the requirements for clear indication which shorten the range of possible values, and the relevant tests (clear indication) have to be passed.

##### 4.2.1.2.2 Particular case of voltage detectors to be used on networks with low values of interference voltage

In some cases, the customer may wish to take advantage of a network with low values of interference voltage by reducing the lower limit of the threshold voltage below  $0,10 U_n \max$ .

NOTE 1 This particular case could help to deal with the use of the voltage detector in the vicinity of large conductive parts. In spite of this change of the threshold voltage for a lower value, the theoretical limit of 4,5 for the ratio between  $U_n \max$  and  $U_n \min$  still remains valid, and the relevant tests (clear indication) have to be passed.

In such case, the voltage detector shall have a special marking and a warning shall be included in the instructions for use to inform the users of the modification brought to the threshold voltage.

NOTE 2 The special marking should be the result of an agreement between the manufacturer and the client.

### 4.2.3 Temperature and humidity dependence of the indication

Replace the existing fourth paragraph by the following:

In these cases, the threshold voltage shall satisfy 4.2.1.2.

### 4.4.2 Dimensions, construction

Replace the existing Table 2 and the notes by the following:

**Table 2 – Minimum length of the insulating element ( $L_i$ ) of a voltage detector as a complete device**

$U_r$ kV	$L_i$ mm
$1 < U_r \leq 7,2$	320
$7,2 < U_r \leq 12$	360
$12 < U_r \leq 17,5$	370
$17,5 < U_r \leq 24$	470
$24 < U_r \leq 36$	520
$36 < U_r \leq 72,5$	830
$72,5 < U_r \leq 123$	1 300
$123 < U_r \leq 170$	1 700
$170 < U_r \leq 245$	2 300
$245 < U_r \leq 420$	3 600
$420 < U_r \leq 525$	4 300
$525 < U_r \leq 765$	6 600

NOTE 1 The nominal voltage  $U_n$  is used when the parameters to be specified are related to the installation dimensioning or to the functional performance of the voltage detector, while the rated voltage  $U_r$  is used when insulation performance of the voltage detector is concerned.

NOTE 2 The  $L_i$  values of Table 2 correspond to the minimum  $L_i$  distance in air (obtained from Tables 1 and 2 of IEC 61936-1) plus an additional safety distance.

NOTE 3 The  $L_i$  values of Table 2 can be used as a guidance to determine the length of the insulating stick used with a voltage detector as a separate device. However, the length of the insulating stick for live working can be shortened for voltage detectors as a separate device taking into account the minimum approach distances or in accordance with national or regional regulations.

Replace the second paragraph by the following:

For  $L_i$  equal to or greater than 520 mm, conductive parts not exceeding 200 mm (in total), measured from the limit mark towards the handle, are allowed within the minimum length of the insulating element if they are completely externally insulated.

### 4.5 Markings

In the list of items of marking, add the following item after the second existing item:

- special marking for low interference voltage, when relevant;

Replace the last item of the existing list of markings by the following:

- number of the relevant IEC standard immediately adjacent to the symbol, (IEC 61243-1).